

# Lecture 21: Econometrics in the Wild

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## Econometrics in the Wild

We've now covered the main econometric techniques that you will see in empirical work

You can use what you know now to understand most empirical work being done in academic economics today

I opened up the latest issue of the American Economic Review and picked out a few papers

For each paper, we will talk about what technique they are using and what assumptions are needed

## Preview

From the December 2025 AER:

- Hazell and Taska: Downward Rigidity in the Wage for New Hires
- Bucher-Koenen, Hackethal, Koenen, and Laudenbach: Gender Differences in Financial Advice
- Cattan, Salvanes, and Tominey: First Generation Elite: The Role of School Social Networks

Also, a nice recent paper using regression discontinuity:

- Méndez and Van Patten (2022): Multinationals, Monopsony, and Local Development: Evidence from the United Fruit Company

For each paper, I will just focus on the main empirical strategy, but these papers all have lots of other interesting pieces

## Hazell and Taska (2025): Downward Rigidity in the Wage for New Hires

Key Question in Macroeconomics: Why does unemployment rise during recessions?

In simple models of the economy, nobody is unemployed:

- Wages adjust until the number of people who want to work at that wage (labor supply) matches number of people firms want to hire at that wage (labor demand)

Classic answer (back to Keynes) is that wages are “downward rigid:”

- During a recession, the market clearing wage falls
- But, employers cannot/will not lower wages
- Instead, have to fire people and/or hire fewer people

**This paper: Measure that downward rigidity, focusing on wages for new hires**

# Data

Main data set is from Burning Glass Technologies:

- Scrape online job postings from the web
- Can see job titles, location, employer, pay frequency, and posted wages
- They have a panel: many observations for the same establishment over time

For example, the Starbucks on Eddy Street will regularly post vacancies

- Their data distinguishes between “Barista” and “Supervisor”
- Observes posted wage each time Starbucks posts a vacancy

# Measuring Downward Wage Rigidity

Two key approaches in the paper

1. Show that wages rarely change between consecutive vacancies
  - Typically only change once every 6 quarters (simple model would have said that wage is constantly adjusting)
  - Asymmetry: When they do change, four times more likely to rise than to fall
2. Show that wages are downward-rigid in response to unemployment rate
  - Wages rise during expansions
  - Wages do not fall during contractions
  - Use state-level unemployment rate to show this

Decline in Labor Demand + Downward-Rigid Wages  $\implies$  Rise in Unemployment

# Wage Cyclicity

The key regression they run is:

$$\Delta \log w_{ist} = \gamma_t + \zeta_t \cdot 1(\Delta U_{st} < 0) + \beta \cdot \Delta U_{st} + \delta \cdot 1(\Delta U_{st} < 0) \times \Delta U_{st} + \varepsilon_{ist}$$

where  $i$  = job,  $s$  = state,  $t$  = time (a quarter)

- $\Delta \log w_{ist}$  is quarterly percent growth in nominal wages between job postings
- $\Delta U_{st}$  is quarterly change in state-level unemployment rate between postings
- $1(\Delta U_{st} < 0)$  is an indicator for falling unemployment

Interpreting Interaction Effects: What do the different coefficients measure?

## Wages are Downward-Rigid

TABLE 4—NOMINAL POSTED WAGE GROWTH AND UNEMPLOYMENT CHANGES AT THE JOB LEVEL

	Nominal wage growth at the job level, $\Delta \log w_{jst}$			
	(1)	(2)	(3)	(4)
$\Delta U_{st}$	0.05 (0.01)	-0.05 (0.03)	-0.05 (0.03)	-0.65 (0.10)
$\Delta U_{st} \times I(\Delta U_{st} < 0)$	-1.40 (0.10)	-1.68 (0.11)	-1.68 (0.10)	
Observations	1,789,042	1,789,042	1,789,042	1,789,042
Time fixed effect		✓	✓	✓
State fixed effect			✓	



## Questions

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The theory is interested in how wages respond to *labor demand* shocks.

- Why might wages change other than labor demand shocks?
- When would this be a problem for our regression?

## Key Challenge: Labor Supply and COVID

Main challenge is labor supply shocks

- Sometimes employment falls because people want to work less
- Can show up as unemployment, or even just be correlated as unemployment

Biggest example of this is COVID

- Not always safe to work
- Increased unemployment benefits reduced incentive to work

Paper tries various instrumental variables strategies to isolate labor demand, and also tries dropping COVID period

Results robust to different checks

## Bucher-Koenen et al (2025): Gender Differences in Financial Advice

One function of the financial system is to offer clients financial advice

- Conflict of Interest: Client wants the best advice, but bank wants to make money!
- Bank wants client to invest in their funds, and pay high fees
- Legally, financial advisors have “fiduciary duty” to act in best interest of client
- In practice, they don't quite do this

Not all clients are financially literate (that is why they need advice)

- Banks can harm clients by giving them bad advice
- Can give worse advice to less sophisticated customers
- Some survey evidence (in the paper) that women are less financially literate and less confident about finance

**This paper: Do banks offer different advice to men and women?**

# Setting

Data from a large German bank

- Administrative data on advisory meetings
- Observe portfolio transactions, demographic data, and financial product recommendations

Advice Quality: Best advice for almost all clients is to invest in low cost mutual fund

- Research suggests that funds with higher fees do not perform better
- $\implies$  Fees just lower the after-fee return
- Measure high quality advice as offering low-fee products (focus on mutual fund recommendations)
  - Recurring fees (i.e. the expense ratio), up-front fees, and discretionary rebates

## Are Advisors Less Likely to Offer Rebates to Women?

Each observation is a recommendation ( $r$ ) to a client ( $i$ )

$$y_{ir} = \beta_0 + \beta_1 \text{female}_i + \beta_2 \text{value}_r + \beta_3 \text{personal}_i + \beta_4 \text{meeting}_{ir} + \mu_t + \mu_a + \mu_f + \varepsilon_{ir}$$

Outcome is indicator for getting a rebate,  $\text{female}_i$  is one if client is female. Controls for:

- Log of euro value of the recommendation
- Personal characteristics (risk tolerance, financial wealth, investment horizon, age, employment, education)
- Meeting characteristics (phone vs. in-person, meeting length over 30 minutes, length of client's relationship with bank)
- Time, advisor, and fund fixed effects



## Questions

Across specifications, find coefficient of roughly  $-0.02$  on *female*;

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What is the identifying assumption for OLS to be valid? What does that mean in this context?

## Advisors Recommend Worse Funds to Women

Similar regressions suggest advisors are more likely to recommend in-house funds to women, and recommend higher fees.

$$y_{ij} = \beta_0 + \beta_1 \text{female}_i + \beta_2 \text{characteristics}_i + \beta_3 \text{meeting}_{ij} + \mu_t + \mu_a + \varepsilon_{ir}$$

Where  $i$  is a client and  $j$  is a meeting, and  $y_{ij}$  is a variable related to the funds recommended in the meeting (e.g. their average fees or whether they include an in-house fund)

Why do the authors no longer include fund fixed effects?

## Adherence to Recommendations

Those are recommendations, but do the recommendations get accepted?

Run same regression again, but outcome variable is now an indicator equal to one if client implements the advisor's recommendation

$$y_{ir} = \beta_0 + \beta_1 \text{female}_i + \beta_2 \text{value}_r + \beta_3 \text{personal}_i + \beta_4 \text{meeting}_{ir} + \mu_t + \mu_a + \mu_f + \varepsilon_{ir}$$

Authors estimate coefficient of about 0.025 on *female<sub>i</sub>*

What does that mean? Why does that help to explain the advisors' behavior?

## Differences by Advisor Gender

TABLE 4—DIFFERENCES IN RECOMMENDATIONS BY ADVISOR'S GENDER

	Rebate on front-end load		IHMA fund		Fee rank		Adherence	
	Female advisor (1)	Male advisor (2)	Female advisor (3)	Male advisor (4)	Female advisor (5)	Male advisor (6)	Female advisor (7)	Male advisor (8)
Female	-0.021 (0.011)	-0.019 (0.011)	0.009 (0.009)	0.032 (0.008)	0.067 (0.027)	0.150 (0.026)	-0.001 (0.011)	0.041 (0.010)
Constant	-0.102 (0.072)	-0.202 (0.075)	0.515 (0.078)	0.247 (0.063)	3.618 (0.231)	2.993 (0.216)	0.611 (0.095)	0.524 (0.074)
Personal controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meeting controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month $\times$ year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Advisor FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISIN FE	Yes	Yes	No	No	No	No	Yes	Yes
Observations	11,943	15,803	11,162	14,158	11,162	14,158	14,044	19,370
$R^2$	0.340	0.341	0.452	0.463	0.359	0.356	0.266	0.257
Adjusted $R^2$	0.223	0.252	0.355	0.390	0.245	0.268	0.149	0.170
$F$ -test, prob $> F$	0.756		0.023		0.012		0.005	

*Notes:* The dependent variables are an indicator equal to one if a client received a rebate on the upfront fee on a mutual fund purchase (front-end load) (columns 1 and 2), an indicator equal to one if an IHMA fund was recommended during the meeting (columns 3 and 4), the fee rank quintiles within each risk category (columns 5 and 6), and an adherence indicator (columns 7 and 8). Standard errors are clustered at the client level and are reported in parentheses. Models are estimated separately for male and female advisors. The last row contains  $F$ -tests testing the difference between the coefficients in the male and the female model.

## Cattan et al (2025): First Generation Elite: The Role of School Social Networks

In Norway, a few university programs are considered “elite”

- Only 3% of people go to these programs
- Graduates tend to be at the top of the income distribution
- Leaders in the public and private sector mostly come from these elite programs

Elite graduates tend to come from wealthy backgrounds themselves, and very often their parents also graduated from an elite program

Moreover, children of elites tend to go to school with other children of elites

**What are the effects of going to high school with the children of elites?**



## High School Admissions Rule

Norwegian middle schoolers apply to high school through a competitive system

- Rank their different high school choices
- Students with higher middle school GPA get priority
- Oversubscribed schools set a minimum middle school GPA

This means that students at “better” schools:

- Have higher middle school GPAs (on average)
- Are more likely to have elite parents

## Peer Effects Specification

$$Y_{ics} = \beta_1 P_{-ics} + \beta_2 M_{ics} + \text{Controls} + \alpha_s + \rho_c + \varepsilon_{ics}$$

$Y_{ics}$  is an outcome for student  $i$  in cohort  $c$  at school  $s$

$P_{-ics}$  is the share of *other* students in that cohort-school with elite parents

$M_{ics}$  is middle school GPA

$\alpha_s$  and  $\rho_c$  are school and cohort fixed effects

## Questions

$$Y_{ics} = \beta_1 P_{-ics} + \beta_2 M_{ics} + \text{Controls} + \alpha_s + \rho_c + \varepsilon_{ics}$$

What is the identifying assumption for  $\hat{\beta}_1$  to be consistent?

Why is it important to include school fixed effects?

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In an extension to the main specification, the authors include the mean middle school GPA of the student's peers:

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Why is this an important extension?

At what level is the treatment is assigned? At what level would you cluster?

- They cluster at the school level. Is that valid?

## Findings

A one standard deviation increase in the share of peers with elite parents:

- Raises the probability of attending an elite program by 2.6 percentage points
- Lowers high school GPA (harder curve), but raises scores on external exams

When including both  $P_{ics}$  and  $M_{ics}$ :

- Coefficient on  $P_{ics}$  rises to 0.043 (as opposed to 0.026)
- Coefficient on  $M_{ics}$  is  $-0.058$
- What does this mean?

## Méndez and Van Patten (2022): Multinationals, Monopsony, and Local Development: Evidence from the United Fruit Company

United Fruit Company (Predecessor to Chiquita) was an American company that grew and exported bananas in many Latin American companies

- Controversial for political influence/interference in “banana republics,” corruption, and accusations of worker exploitation
- Controlled huge amounts of land across Latin America

United Fruit has its origins in Costa Rica:

- Costa Rican government paid an American entrepreneur to build a railroad connecting capital (San José) to the Caribbean
- When they defaulted, granted him a huge land concession for 99 years (ended in 1984)
- Started growing and exporting bananas: became the start of United Fruit

## United Fruit's Policies

United Fruit ran the concession like its own fiefdom

- Employees forced to live inside the concession
- United Fruit was a monopsonist: the only employer in the region

However, United Fruit also provided public goods

- School, hospitals, railroads and other infrastructure
- Actually seems to have provided more public goods than one would find the government providing outside of the concession

**Question of the paper: What effect did the United Fruit Company have on living standards inside the concession?**



## Regression Discontinuity Design

Run a geographic regression discontinuity along the boundary of the land concession:

$$y_{igt} = \gamma UFCo_g + f(\text{geographic location}_g) + \alpha_t + \text{Controls} + \varepsilon_{igt}$$

$y_{igt}$  is outcome for individual  $i$  in location  $g$  in year  $t$

$UFCo_g$  is a dummy for being inside the land concession

$f(\text{geographic location}_g)$  is a polynomial in latitude and longitude

All restricted to a narrow bandwidth around the boundary

## Questions

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When the concession was made, the company negotiated to have particular plots of land included or not. Why might this be a problem for our assumptions?

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To deal with this concern, main analysis focuses on a portion of the border that seems particularly “exogenous”

# Effects of United Fruit Company

TABLE I  
AVERAGE UFCO EFFECT.

	Probability of UBN in				Probability of	Total Number
	Housing (1)	Health (2)	Education (3)	Consumption (4)	Being Poor (5)	of UBN (6)
UFCo	-0.102 (0.026) [0.031]	-0.022 (0.017) [0.015]	-0.054 (0.022) [0.016]	-0.066 (0.024) [0.025]	-0.133 (0.030) [0.026]	-0.244 (0.056) [0.054]
Adjusted $R^2$	0.101	0.169	0.238	0.015	0.115	0.198
Observations	9179	9179	9179	9179	9179	9179
Clusters	206	206	206	206	206	206
Mean	0.171	0.058	0.232	0.199	0.475	0.658
% Variation w.r.t. Mean	-60.0	-39.0	-23.2	-33.0	-27.9	-37.1

*Note:* UBN = Unsatisfied Basic Need. The last row shows the percentage variation in each coefficient with respect to the sample's mean. The unit of observation is the household. Robust standard errors, adjusted for clustering by census block, are in parentheses. Conley standard errors are in brackets. All regressions include geographic controls (slope, elevation, temperature); demographic controls for the number of adults, children, and infants in the household; census fixed effects, and a linear polynomial in latitude and longitude.

# Effects of United Fruit Company

TABLE II  
CONTEMPORARY HOUSEHOLD OUTCOMES: DYNAMICS ACROSS YEARS.

	Probability of UBN in				Probability of	Total Number
	Housing (1)	Health (2)	Education (3)	Consumption (4)	Being Poor (5)	of UBN (6)
UFCo <sub>1973</sub>	-0.224 (0.062) [0.065]	-0.288 (0.079) [0.077]	-0.056 (0.045) [0.035]	-0.135 (0.045) [0.047]	-0.254 (0.067) [0.053]	-0.704 (0.157) [0.145]
UFCo <sub>1984</sub>	-0.068 (0.047) [0.033]	0.010 (0.028) [0.013]	-0.084 (0.028) [0.023]	-0.076 (0.035) [0.031]	-0.094 (0.047) [0.034]	-0.218 (0.092) [0.068]
UFCo <sub>2000</sub>	-0.089 (0.031) [0.031]	0.017 (0.017) [0.015]	-0.055 (0.022) [0.015]	-0.090 (0.027) [0.026]	-0.143 (0.037) [0.032]	-0.217 (0.059) [0.055]
UFCo <sub>2011</sub>	-0.089 (0.031) [0.030]	0.019 (0.016) [0.018]	-0.038 (0.029) [0.029]	-0.019 (0.035) [0.053]	-0.103 (0.038) [0.051]	-0.127 (0.063) [0.092]
Adjusted $R^2$	0.103	0.198	0.238	0.017	0.117	0.206
Observations	9179	9179	9179	9179	9179	9179
Clusters	206	206	206	206	206	206
Mean <sub>1973</sub>	0.462	0.353	0.393	0.208	0.777	1.416
Mean <sub>1984</sub>	0.209	0.060	0.362	0.201	0.579	0.832
Mean <sub>2000</sub>	0.145	0.031	0.230	0.178	0.452	0.584
Mean <sub>2011</sub>	0.118	0.016	0.156	0.211	0.396	0.501

## Connection to Broader Literature

There is an influential argument that “extractive” institutions are bad for growth, while “inclusive” institutions are good for growth

- This recently won Acemoglu, Johnson, and Robinson a Nobel prize

This paper suggests that sometimes it is more subtle:

- United Fruit Company was very extractive!
- But inside the land concession, they provided lots of public goods to encourage workers to stay

See also:

- Dell (2010) on the mita in Peru (negative long-run effects)
- Dell and Olken (2019) on the Dutch Sugar Cultivation System in Indonesia (positive long-run effects)