

ORGANIZING DATA FOR ECONOMIC RESEARCH

PART 3: SHARING YOUR WORK

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This presentation includes figures based on joint work with John Coglianesse of the Federal Reserve Board. The views expressed in this presentation are those of the authors and do not necessarily represent the views or policies of the Board of Governors of the Federal Reserve System or its staff.

Roadmap

Earlier: managing data

Today: presenting data

- Motivation
- Making tabs
- Making figs
- Making slides

Readings

A classic take on graphical design:

The Visual Display of Quantitative Information

— Edward Tufte

Readings

A classic take on graphical design:

The Visual Display of Quantitative Information

— Edward Tufte

A modern take on giving talks:

Better Presentations

— Jonathan Schwabish

motivation



The case for better visuals

The case for better visuals

Straw view: aesthetics is superficial

The case for better visuals

Straw view: aesthetics is superficial

My view: aesthetics aids communication & comprehension

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Beauty is truth, truth beauty.

John Keats, "Ode on a Grecian Urn"

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Slick visuals . . .

- reduce cognitive burden
- avert extraneous Q&A
- let you control the flow
- make your results stick

The case for better visuals

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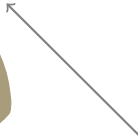
John Keats, "Ode on a Grecian Urn"

Slick visuals . . .

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Entertained \implies engaged

tables



(tables are a bit dull,
so the sloth is asleep)

When to use tables?

I have a strong bias towards figs:

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- Easier to create*
- Easier to digest
- Easier to share

*This is an artifact of imperfect workflow: my table-making process involves a bottleneck manual step that I haven't had a chance to sort out.

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But tables have their place:

- Compactly reporting **summary stats**
- Compactly reporting **many specifications**
- Giving readers **precise numbers**

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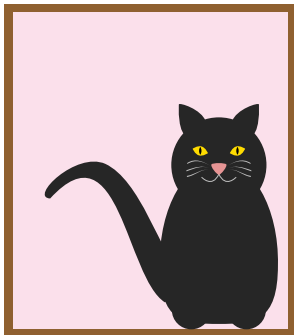
For slides, especially, err toward figs

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Tips for tabs

1. Give variables **intelligible names/labels**.
2. Make the font **big enough to read**.
3. **Add space as needed** between rows/cols.
4. In papers: write **concise but detailed notes**. (In slides: omit.)
5. In slides: use **highlighting/boxes** to emphasize key numbers.
6. Use **horizontal rules** to clarify structure. (Avoid vertical rules.)
7. Focus on **economic significance**, not just statistical.
8. Be ready to **use the point estimate in a sentence**.
9. Report **standard errors in parentheses** (not *t*-stats).
10. If **sample sizes change** across specs, make sure you know why.

pretty pictures



The road to better figures

Rules of thumb:

- Eliminate visual clutter
- Minimize time-to-absorption
- Emphasize patterns of interest

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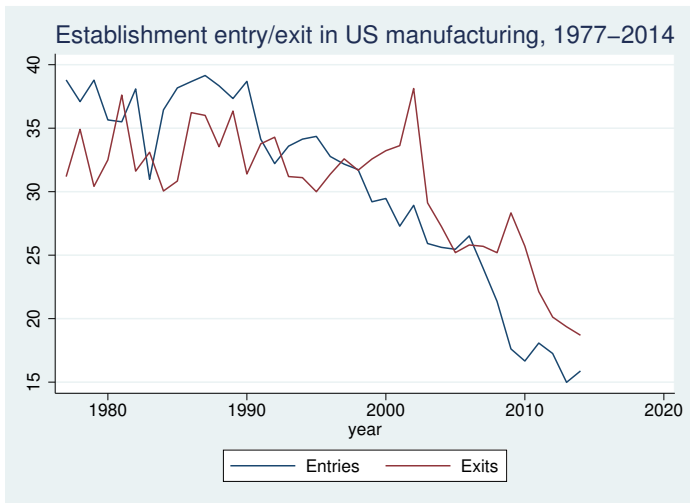
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Iterate 'til you get it right

Example: a time series from the [Business Dynamics Statistics](#)

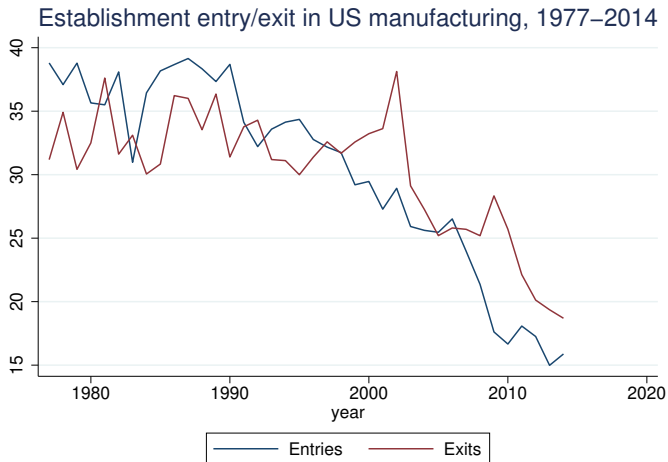
A first pass

This is based on Stata's well-worn default graphics settings.



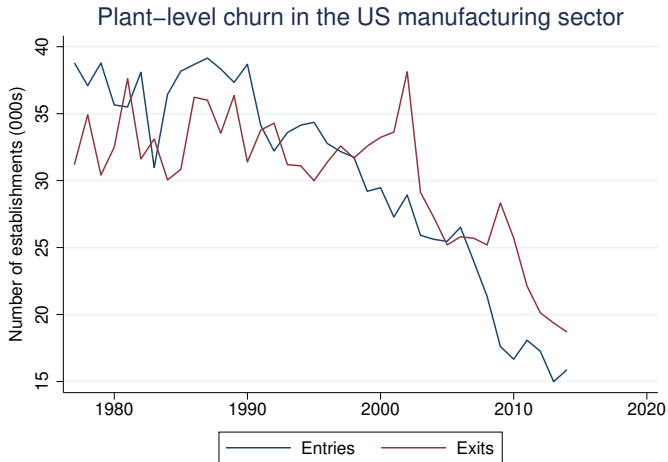
Banish the blue background

It's visual clutter, and it signals that you kept the defaults.



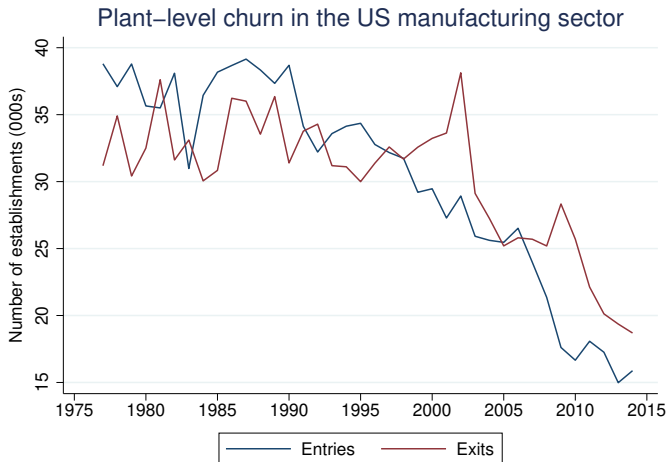
Improve the titles

Main title was dull; xtitle was self-evident; ytitle was missing.



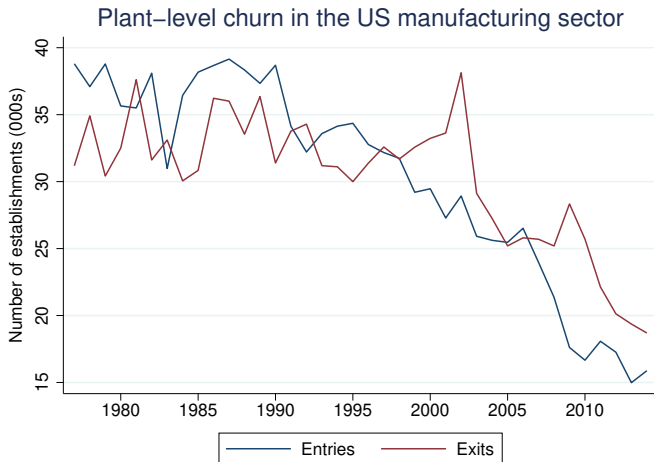
Fix Stata's oddly configured x-axis

Hm... the gaps are ugly and the x-labels are a bit crowded.



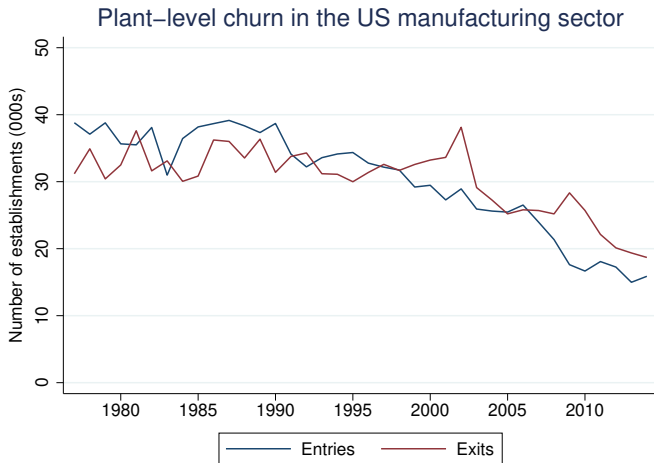
Keep tweaking the x-axis

I played with it a few times before settling on this.



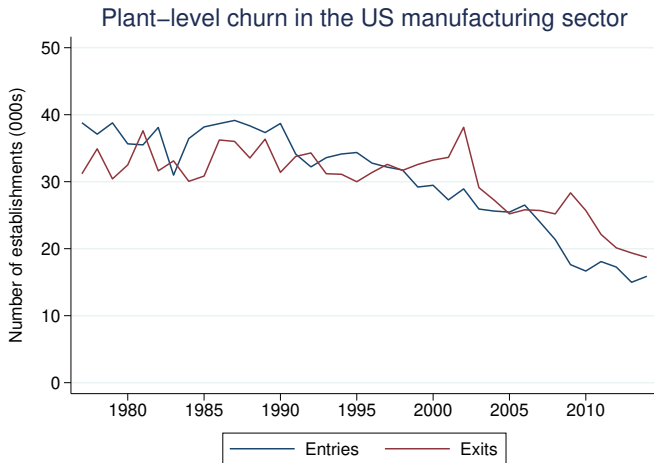
More transparent to start y -axis at 0

(Sometimes, though, it's better to "zoom in" on the variation.)



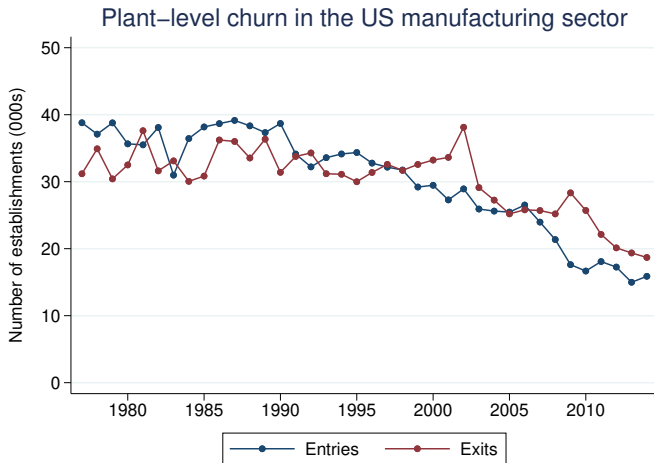
I prefer horizontal y-labels

This had the added benefit of letting the y-axis title breathe.



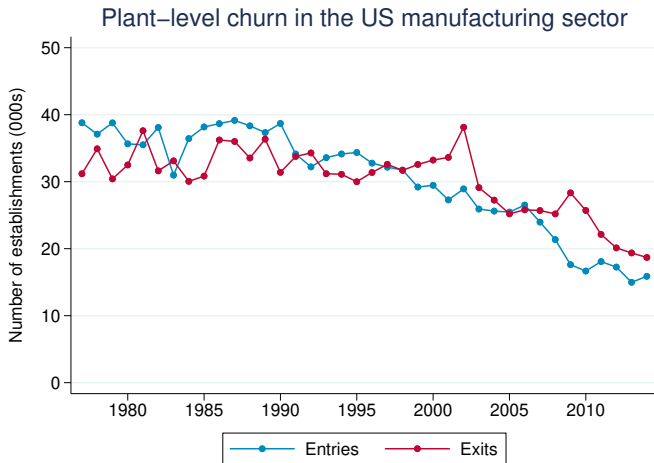
Markers add helpful visual contrast

Small markers work best here, so I've shrunken from the default.



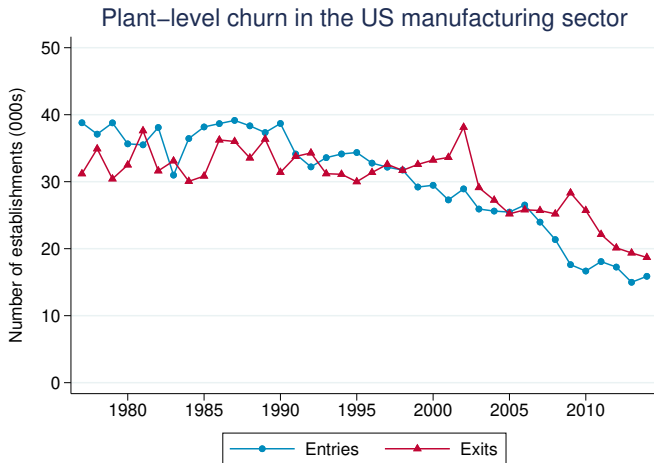
Bright colors are easier to distinguish

Plus—everybody uses navy/maroon, and I want my work to stand out.



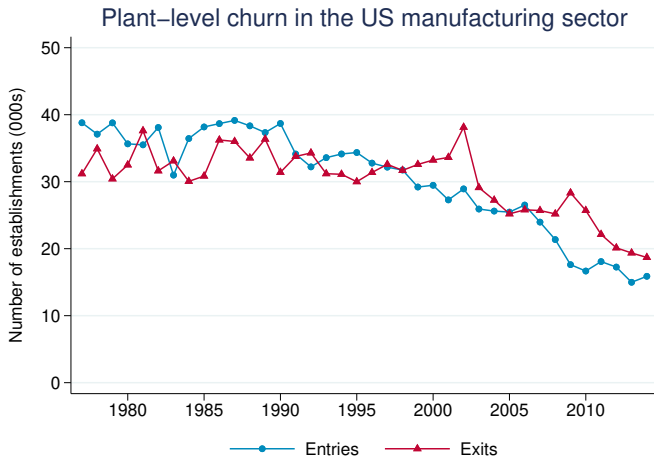
Vary marker symbols across series

Aids contrast, especially in grayscale and for the color-blind.



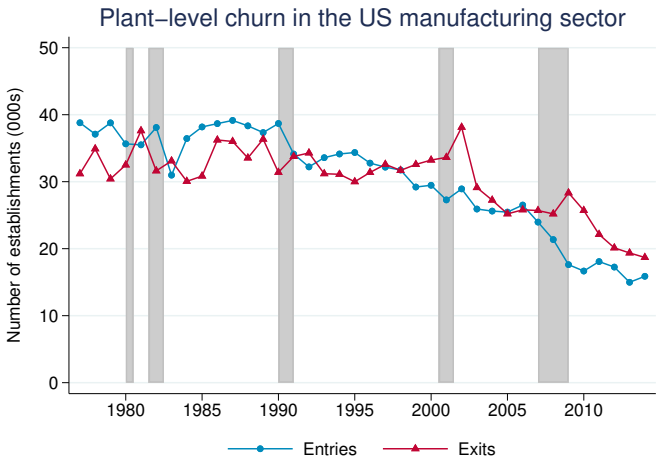
The legend border is pure clutter

Extraneous elements are a tax on the viewer's attention.



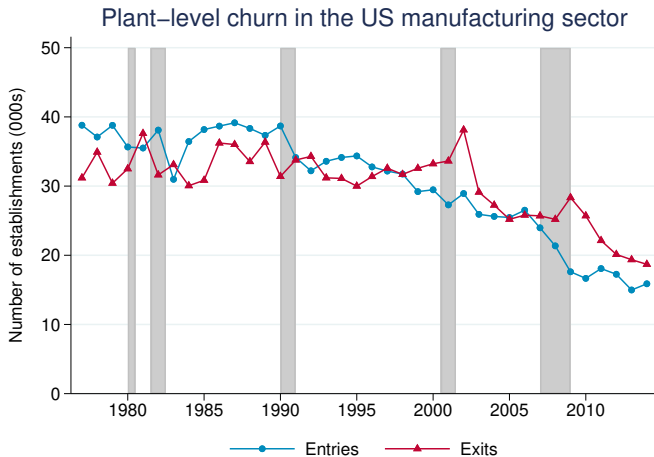
If focus is on cycle, shade recessions

Optimal signposting depends on the point you're trying to make.



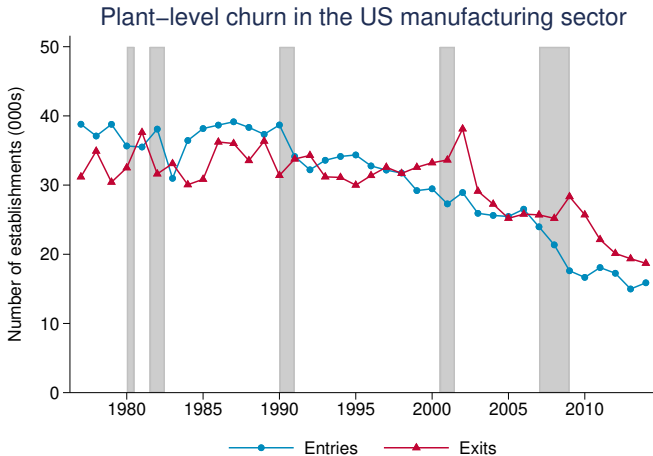
Remove the gap between shading and axis

Such imperfections draw the eye and distract the audience.



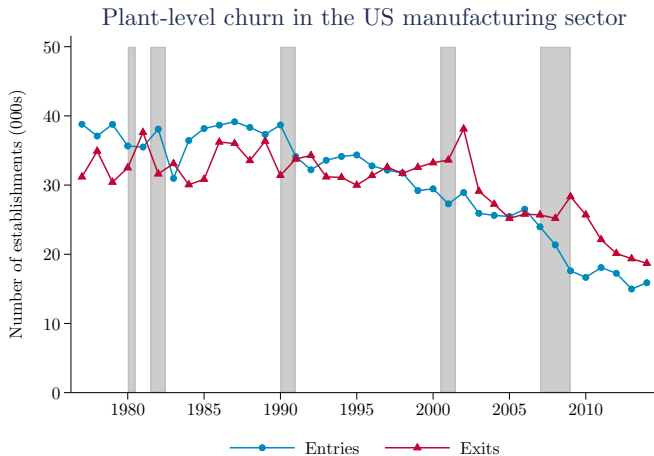
Cut the grid lines

Opinions differ. I usually go without, but I'm a little torn here.



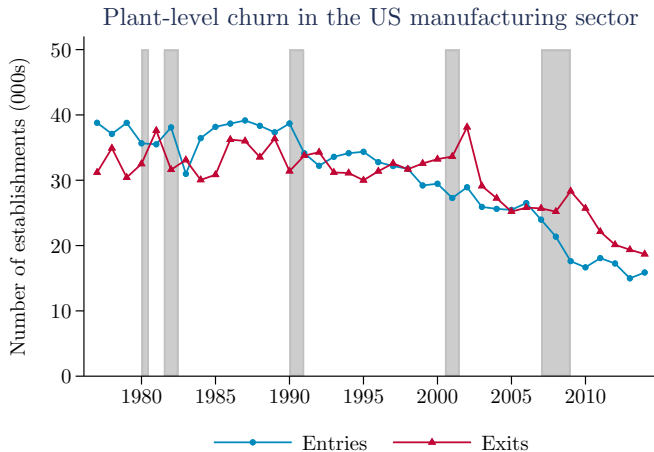
Spruce up the font

For papers: CMU Serif to match \LaTeX . For slides: maybe sans-serif.



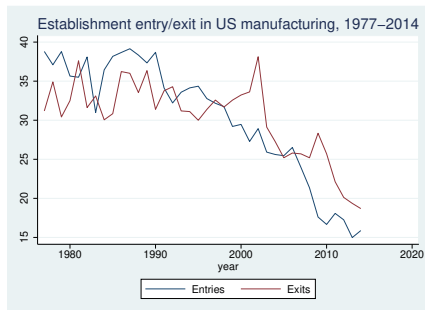
Rescale to boost font (esp. for slides)

Doing so made the titles & markers too big, so I re-shrank them.

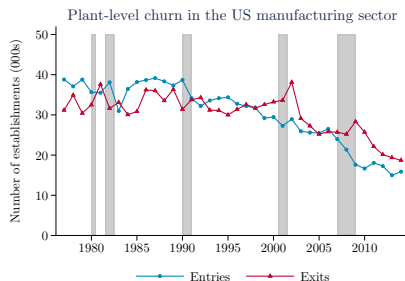


The cumulative effect is night and day

Night:



Day:



Automate, then fine-tune

Two problems with manual approach:

- Time-consuming
- Cross-fig inconsistencies

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- Time-consuming
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So, automate as much as possible:

- Write `.scheme` file w/preferred defaults
- Use global macros to control project-wide settings
- Fine-tune individual figures

Automate, then fine-tune

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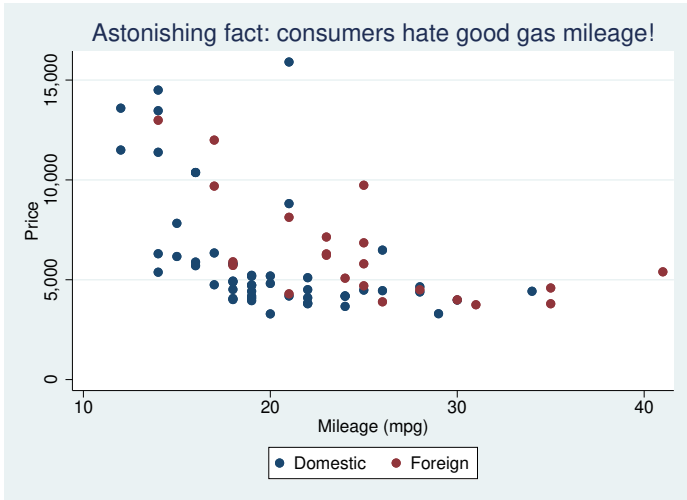
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So, automate as much as possible:

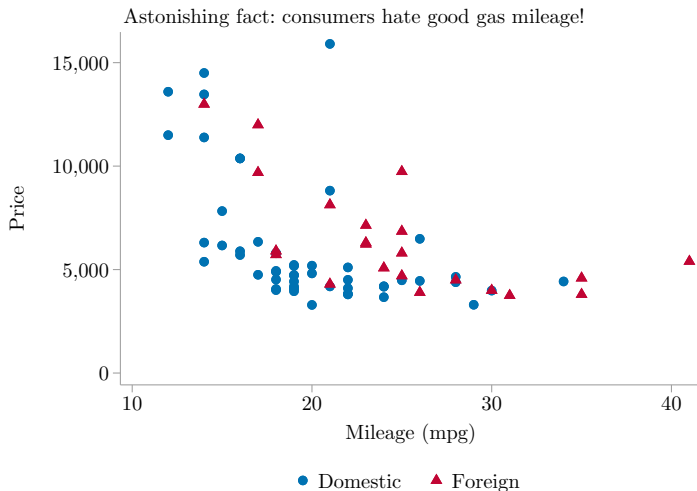
- Write `.scheme` file w/preferred defaults
- Use global macros to control project-wide settings
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Example: `sysuse auto` + simple `twoway` plot

Default scheme: much to be desired



Custom scheme: a better place to start



Upping your graphics game

How can you learn new visual tricks?

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- Read up on high-level principles
- Mimic your favorite papers/seminars
- Explore Stata `twoway_options`
- Tinker around

Upping your graphics game

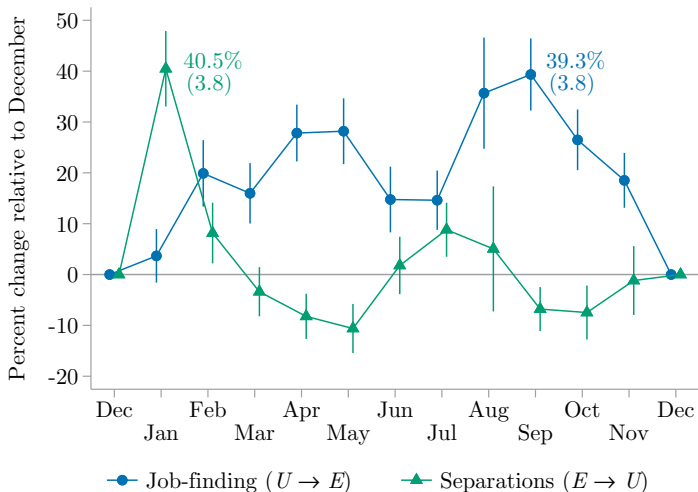
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Here are a few examples from Coglianese and Price (mimeo)

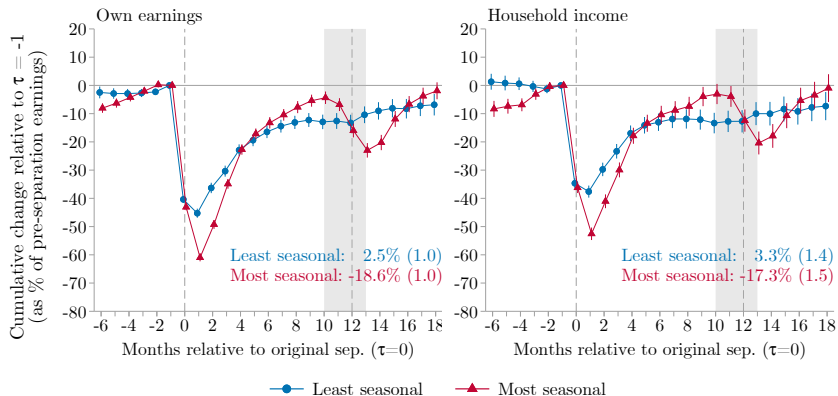
Mark key numbers directly in the figure

Points are slightly offset horizontally to improve visual clarity.



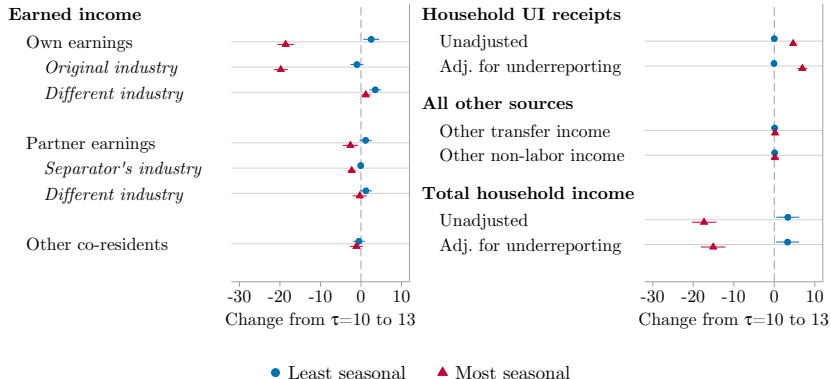
Use `xline` and `yline` as reference points

Shaded regions represent idiosyncratically timed “off-seasons”.



Look at many outcomes in a single fig

All expressed in a money metric and plotted on a common scale.



Killer command: Stata's `coefplot`

Last three figures: created using `coefplot`

- `ssc install coefplot`
- Load estimates from disk (see Part 2)
- Plot estimates—rich functionality

Shout-out to Ben Jann for awesome public goods

Color

Find a **color palette** you like

- 2-4 high-contrast base colors
- Reserve reds for emphasis*
- Use medium gray for muting

*I've been ignoring this advice throughout, but going forward I'll be using red less as a base color.

Color

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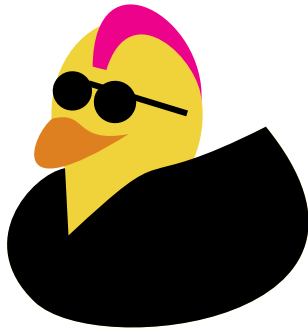
- 2-4 high-contrast base colors
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Choose **color-blind-friendly** combos

- Avoid Christmas colors (red/green)
- Other combos problematic too (**further reading**)
- Complement w/ dash patterns & marker symbols

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slick slides



Back in the bad old days, my slides looked like this

- Back in the day, my slides usually looked like this—to start with, sometimes the first bullet point just reiterated the title.
 - Itemize lists were very exciting and sometimes I got carried away.
 - Sometimes I had lists within lists within lists!
 - Now I stick to lists within lists.
 - I used longwinded complete sentences instead of short, punchy phrases.
 - Since I didn't know how to use overlays, the poor audience would get BOMBARDED WITH A WALL OF TEXT on every single slide.
 - And my slides were full of “orphans” that would get marooned on the next line.
- All the cool kids were using busy beamer themes, so I did too.
 - CambridgeUS isn't the worst offender, but it's full of clutter.
 - Gratuitous header and footer bars, navigation bar nobody uses.
 - Red text raises everybody's blood pressure.
- Ugh, does this dude seriously have 181 slides???

Isn't this better?

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Cut the visual clutter:

- `\usetheme{default}`
- `\setbeamertemplate{navigation symbols}{}`

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Switch outermost list from `itemize` to `description`

- Better yet: custom list with extra spacing*

*`\newenvironment{desclist}{\description\addtolength{\itemsep}{5pt}}{\enddescription}`

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Lighten the bullets:

- `\setbeamertemplate{itemize items}{--}`
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Suppress total slide count, mute footer using grays

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Make every slide count

Slides should tell a story

- Logical structure
- Narrative arc

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Every slide should advance the story

- Essential point \implies main slide
- Peripheral point \implies backup slide

Make every slide count

Slides should **tell a story**

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- Narrative arc

Every slide should **advance the story**

- Essential point \implies main slide
- Peripheral point \implies backup slide

Keep audience on a **need-to-know basis**

- First-order institutional details
- Full disclosure—but not TMI

Overlays: use 'em

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Overlays make slides dynamic

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Overlays make slides **dynamic**

<code>\pause</code>	what it sounds like
<code>\only<3></code>	stuff only exists/appears on click 3
<code>\uncover<3-5></code>	stuff concealed except on clicks 3-5
<code>\item<2-></code>	bullet appears on click 2+
<code>\alert<4></code>	highlight on click 4
<code>\againframe<2>\{1b1}</code>	redisplay slide

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Strongly recommended!

- Focus attention
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- Easier to skip if pressed for time

But share static version: `\documentclass[handout]beamer`

Don't show your hand

Some people use **transparent** overlays

- But then the audience reads ahead
- It's distracting and defeats the purpose

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Don't show your hand

Some people use `transparent` overlays

- But then the audience reads ahead
- It's distracting and defeats the purpose

Opt for stealth: `\setbeamercovered{invisible}`

Slides are for the audience

Temptation: larding slides with self-cues

Slides are for the audience

Temptation: larding slides with **self-cues**

- Transparent overlays so you know what's coming
- Complete clauses you can read word for word
- Frequent roadmaps to orient yourself

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- Frequent roadmaps ~~to orient yourself~~

Cut the cues: **your slides aren't for you**

- Practice 'til you don't need 'em
- Think like an audience member

Err on the side of bigger font

Fonts are often unreadably small

Err on the side of bigger font

Fonts are often unreadably small

- Rooms can be big
- Screens can be small
- 20-20 vision is inelastically supplied

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When in doubt:

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When in doubt: **embiggen**

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When in doubt: **embiggen**

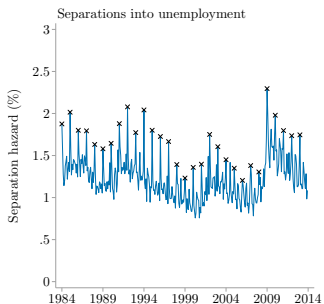
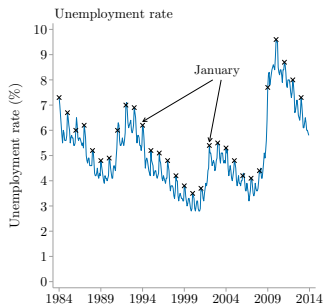
- Nobody will mind
- Bonus: big fonts enforce brevity

Figs or bullets—pick one

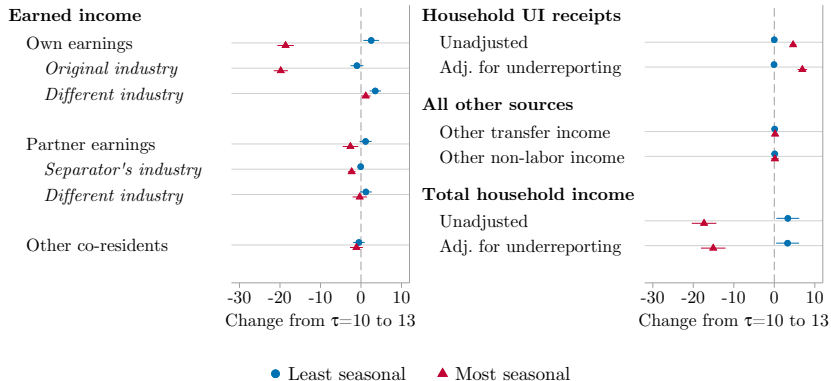
People often pack bullets & figs on same slide

Result is busy & inelegant

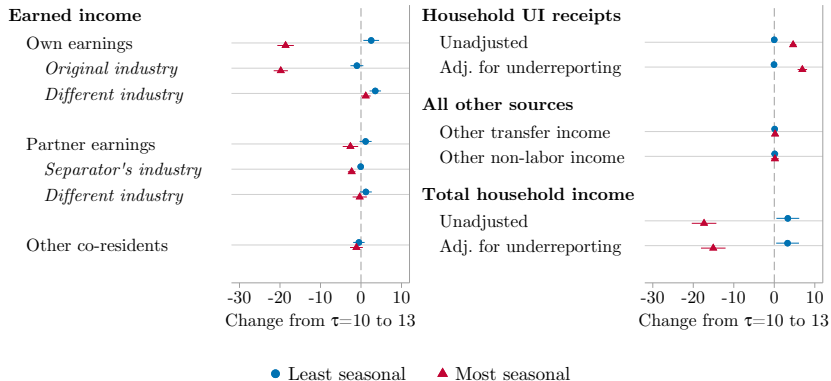
- Especially if you have nested lists
- Lots of text \implies cramped figs, tiny fonts



But a fig + a punch line can work well



But a fig + a punch line can work well



Bottom line: **\$1.00 in lost earnings** \implies **roughly \$0.80 in lost income**

wake up!

wake up!

("screamers" come in handy)

Edit edit edit!

Streamline your slides

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- Less visual clutter
- Less verbiage
- Clearer structure

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Rinse, repeat, rinse, repeat

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To illustrate: [pre/post contrasts from my job-market slides](#)

- h/t Jonathan Schwabish, *Better Presentations**
- Fortunately I read this *before* my first flyout

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Figures reflect an older version: [latest version of paper here](#)

Before:

The Duration and Wage Effects of
Long-Term Unemployment Benefits:
Evidence from Germany's Hartz IV Reform

Brendan Price

MIT

Public Finance/Labor Workshop

September 26, 2016

Before:

The Duration and Wage Effects of
Long-Term Unemployment Benefits:
Evidence from Germany's Hartz IV Reform

Brendan Price

MIT

Public Finance/Labor Workshop

September 26, 2016

After:

The Duration and Wage Effects
of Long-Term Unemployment Benefits:
Evidence from Germany's Hartz IV Reform

Brendan Price

MIT

January 18, 2017

Bigger font, better line breaks

Before:

The Duration and Wage Effects of
Long-Term Unemployment Benefits:
Evidence from Germany's Hartz IV Reform

Brendan Price

MIT

Public Finance/Labor Workshop

September 26, 2016

After:

The Duration and Wage Effects
of Long-Term Unemployment Benefits:
Evidence from Germany's Hartz IV Reform

Brendan Price

MIT

January 18, 2017

Before:

A major experiment in social insurance

- Germany once had wage-indexed, long-term unemployment benefits
 - "Short term": 60-67 percent of prior net earnings
 - "Long term": up to 53-57 percent *indefinitely*
- Steady rise in long-term benefit caseload
 - July 2004: 2.2 million long-term claimants
- Culminated in "Hartz IV", effective January 2005
 - Reduced the generosity of long-term benefits for most claimants
 - "Germany's most important labour-market reform since the war" (*The Economist*, 2004)
- Flashpoint in debates about the welfare state . . . but little evidence

This paper's contributions:

1. First quasi-experimental evidence on the micro effects of Hartz IV
2. Causal effects of long-term benefit generosity on worker outcomes

◀ Unemployment ▶ UI caseload ▶ Quotes

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"Germany's most important labor-market reform since the war"—*The Economist*

- **Hartz IV reform** of January 2005
 - Long-term benefits lowered
 - Short-term benefits unaffected
- Much debate—little evidence—no consensus
- This paper: **first quasi-experimental evaluation**
 - Exploit the *timing* of when cuts bind
 - Rich administrative data

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Boy was I longwinded back then

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Before:

Research design

- Hartz IV is challenging to analyze
 - National rollout, no grandfathering
 - Part of a broader package of "Hartz reforms"
 - Prior work has not addressed these challenges
- Novel design to isolate the effect of benefit cuts
 - Exploit worker-level variation in exposure to long-term UI cuts based on the timing of when they bind
 - Timing of entry into UI \times potential *short-term* UI duration
 - Greater short-term duration \implies long-term cuts occur later on
- Embed this idea in a proportional hazards model
 - Separate *time since UI entry* from *time until benefit cuts*
 - Start with job-finding, extend to look at wages and job types
- Administrative data on a large sample of displaced workers
 - Precise causal effects
 - Qualitatively and quantitatively robust

Before:

Research design

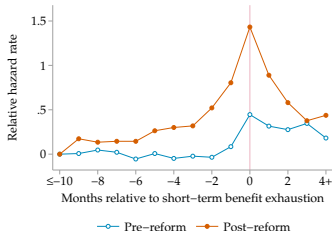
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Literature

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After:

Initial evidence of rising job-finding hazards



5

Visualization often beats explanation

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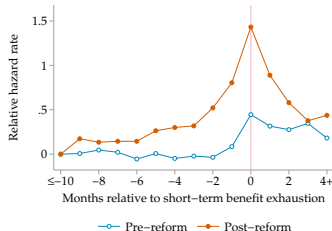
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Before:

Preview of results

1. Job-finding hazard rises by ~50 percent as workers approach cuts
 - 12–13 percent reduction in likelihood of a jobless spell exceeding 1 year
2. Lower monthly earnings on the first post-UI job
 - Jobs accepted just after benefit cuts pay 4–8 percent lower wages
 - Offsetting wage gains due to shorter durations—but small
 - Net decline: 1.2 percentage points (men), 2.1 points (women)
3. Employment gains driven by full-time jobs
 - No evidence that earnings decline is due to part-time jobs
 - Fewer transitions into “mini-jobs” often held alongside UI receipt
 - Increases in both new-job and recall hazards

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After:

Preview of results

1. **Increased job-finding** as workers approach cuts
 - o Probability of 1-year jobless spell falls by 12.4%
 - o Unemployment rate falls by ~1 percentage point
2. Workers **earn 1.9% less** on first post-UI job
 - o Lower reservation wages
3. Employment gains **driven by full-time jobs**

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Better use of emphasis

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Before:

Claimant characteristics

	<u>Men</u>	<u>Women</u>		<u>Men</u>	<u>Women</u>
East German	35.7	32.7	Initial Monthly UI Benefit (2005 EUR)	898.2 (294.8)	655.7 (255.0)
Ages 25-34	35.8	31.7			
Ages 35-44	37.5	38.0	Reemployed within ...		
Ages 45-54	26.7	30.2	6 Months	52.3	37.9
			12 Months	67.1	53.3
Worked 4+ of Last 7 Years	74.3	59.5	18 Months	73.8	61.4
			24 Months	77.6	66.1
Unmarried	48.4	47.5			
Married without Children	24.3	28.6	Monthly Wage Prior to Job Loss	2,050.9 (870.7)	1,546.1 (804.3)
Married with Children	27.3	23.9			
German Native	88.4	91.5	Monthly Wage Upon Reemployment	1,935.8 (795.1)	1,465.2 (776.3)
Low Skill	7.8	9.1			
Medium Skill	80.4	72.3	Number of UI Claims	209,896	126,738
High Skill	11.8	18.6	Number of Distinct Individuals	143,629	101,037

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After:

Claimants are adversely selected on observables

	A. Estimation sample		B. Average worker	
	Men	Women	Men	Women
East German resident	35.7	32.7	18.6	22.5
Non-German native	11.6	8.5	9.4	6.6
Age 25-34	35.8	31.7	28.8	27.2
Age 35-44	37.5	38.0	41.1	39.1
Age 45-54	26.7	30.2	30.2	33.8
No apprenticeship/Abitur	7.8	9.1	7.1	8.4
Apprenticeship or Abitur	80.4	72.3	75.6	77.4
University degree	11.8	18.6	17.3	14.2
Employed 4+ of last 7 years	74.3	59.5	87.0	79.4
Monthly wage at baseline	€2050.9 (870.7)	€1546.1 (804.3)	€2904.3 (1,149.0)	€2029.8 (1,026.4)

• Compositional changes

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Let titles play a rhetorical role

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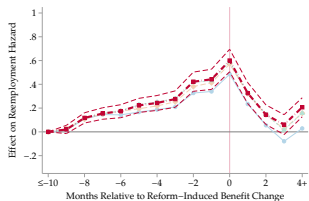
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Robustness of Hartz IV effects



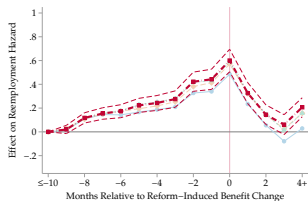
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- 2. Quarter-of-Entry FEs
- 3. Age/Work History x Post-July 2004
- 4. Time-Varying Duration Effects
- 5. Select One UI Spell Per Worker
- 6. Enter UI Prior to July 2004

Women

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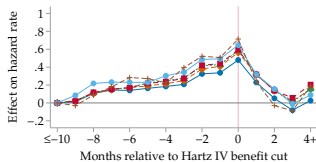
Women

33

After:

Hartz IV effects are highly robust

Results for men (similar for women)

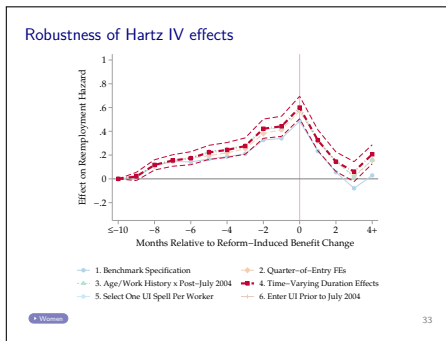


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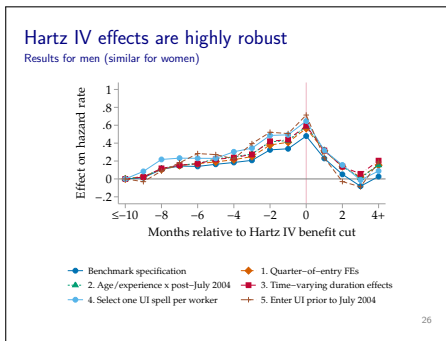
26

Going spec-by-spec took too much time

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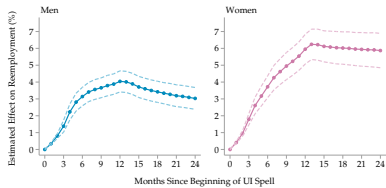


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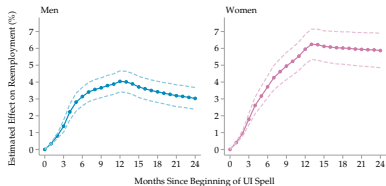
Reemployment effects for the fully exposed 2005 cohort



31

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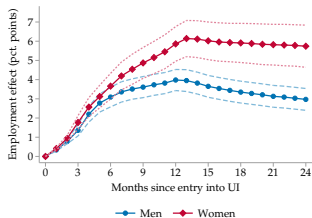
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31

After:

Cumulative effects for the first post-reform cohort

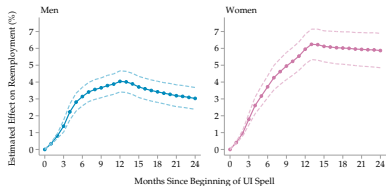


19

1 panel was enough; pink was gendered

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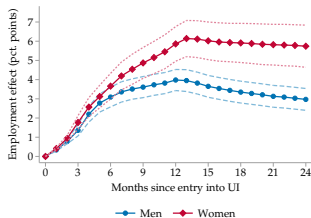
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Before:

What we've learned

- Identify the effects of a major experiment in social insurance
 - Isolate within-cohort exposure to long-run benefit changes
 - Administrative data on UI receipt, durations, wages, and job types
- First credible evidence on the micro effects of Hartz IV
 - Shortened jobless durations
 - Depressed reemployment wages
 - Net gains in full-time jobs, net declines in mini-jobs
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 - Reservation wage effect dominates duration effect
 - Workers more likely to exercise recall options
 - Suggests liquidity is important for extended job searches

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Takeaways

- Two-tiered UI has important incentive effects
- Strong responses to long-term benefit cuts
 - Forward-looking behavior
 - Lower reservation wages
 - Returns to "gainful" employment
- Part—not all—of the "employment miracle"

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Don't try the audience's patience

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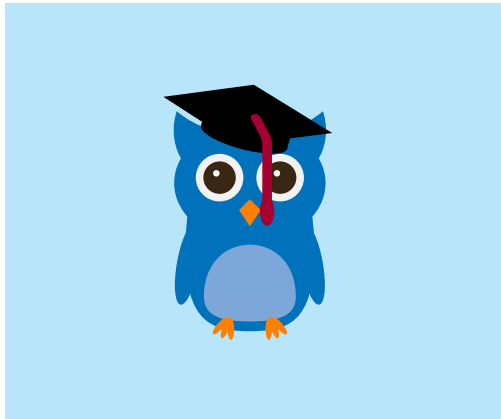
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concluding thoughts



Epilogue

Premise: big returns to better data organization

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- Save time
- Avoid mistakes
- Dress to impress

Epilogue

Premise: big returns to better data organization

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- Avoid mistakes
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Never too late to start!

- Greenfield projects
- Major overhauls
- Incremental tweaks

The path forward

Eventual plan: lots of stuff [on my webpage](#)

The path forward

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- Updated slides
- Sample codebase
- Template `.scheme` files
- Template `beamer` deck

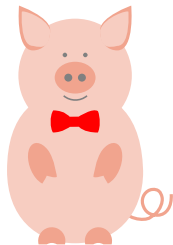
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Moving to [Federal Reserve Board](#) in January

that's all, folks!



Let's give it up for the tikzlings