Behavioral Economics and Public Policy
A Pragmatic Perspective

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The opinions expressed in this paper are those of the author alone and do not necessarily reflect the views of the Internal Revenue Service or the U.S. Treasury Department. A video of this lecture is available here.

Introduction

- Behavioral economics brings insights from psychology and other social sciences into economic models
  - Loss aversion, present bias, mental accounting, inattention, …
    [Kahneman and Tversky 1979, Thaler 1980, Rabin 1998, DellaVigna 2009]
- Behavioral economics has grown very rapidly as a subfield, but neoclassical model remains the benchmark in most applications

Debate About Behavioral Economics

- Debate about behavioral economics is often framed as a question about the foundational **assumptions** of economic models
  - Are people rational? Do they optimize in market settings?
  - Compelling arguments on both sides of this debate in different settings [List 2003, List 2004, DellaVigna 2009]

A Pragmatic Perspective

- This talk approaches this debate from a more pragmatic perspective
- Instead of defining central research question as “are the assumptions of the neoclassical model valid?”, start from a policy question
  - Ex: “How can we increase savings rates?”
  - Use behavioral economics to the extent it helps us make better empirical predictions and improve policy
- This approach follows the widely applied methodology of positive economics advocated by Friedman (1953)
  - Treat behavioral factors like any other modeling decision, such as assuming time-separable or quasi-linear utility

A Pragmatic Perspective

- From a pragmatic perspective, behavioral economics makes three contributions to public policy:

  1. New policy tools (e.g., defaults, framing)
  2. Better predictions of effects of existing policies (e.g., taxes)
  3. New welfare implications

- I illustrate these ideas using three applications focusing on major decisions: how much to save, how much to work, and where to live

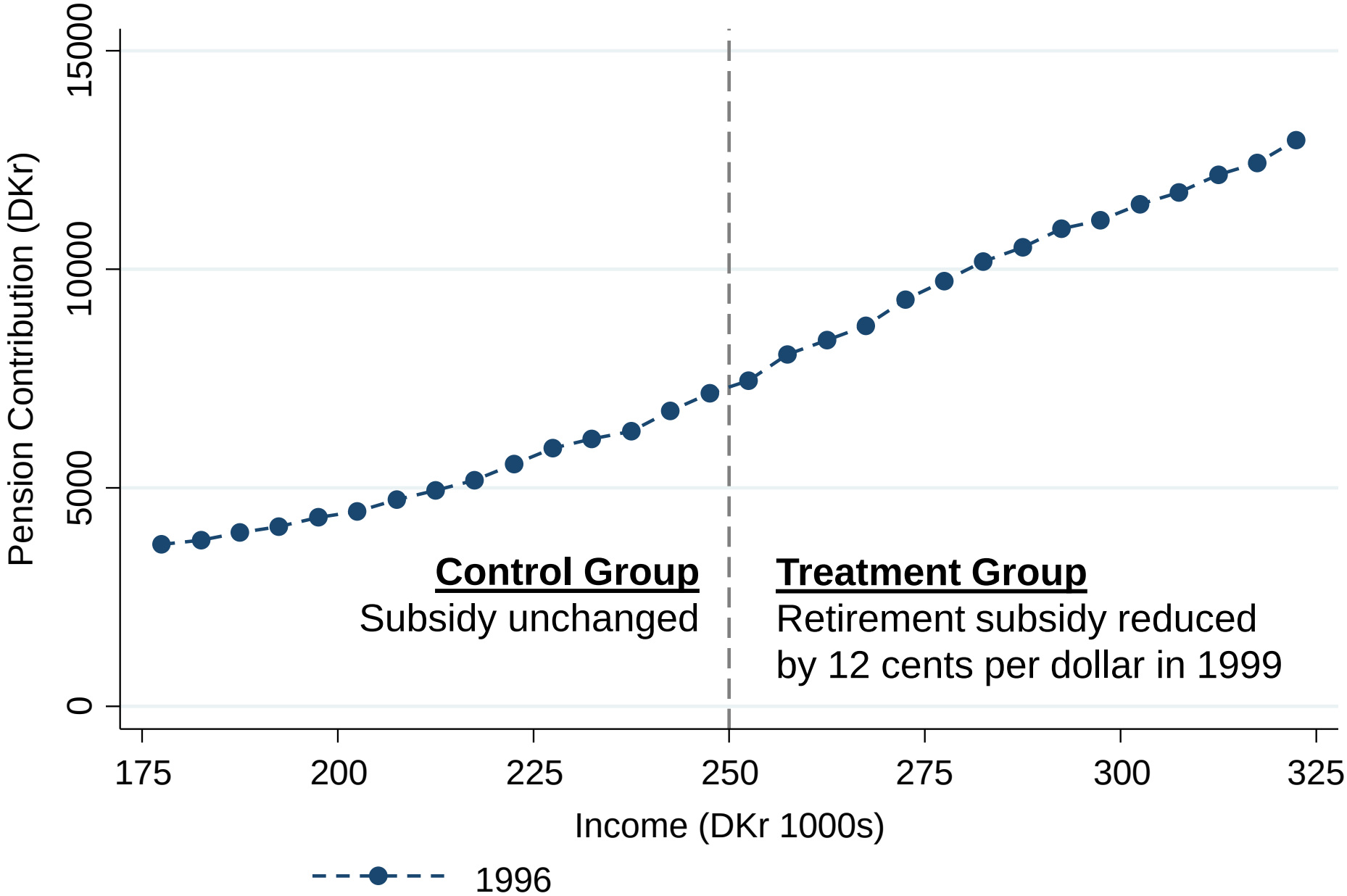
- See paper (AER P&P 2015) and recent surveys for more examples [Thaler and Sunstein 2008, Congdon, Kling, Mullainathan 2011, Madrian 2014]

Application 1
New Policy Tools: Increasing Retirement Saving

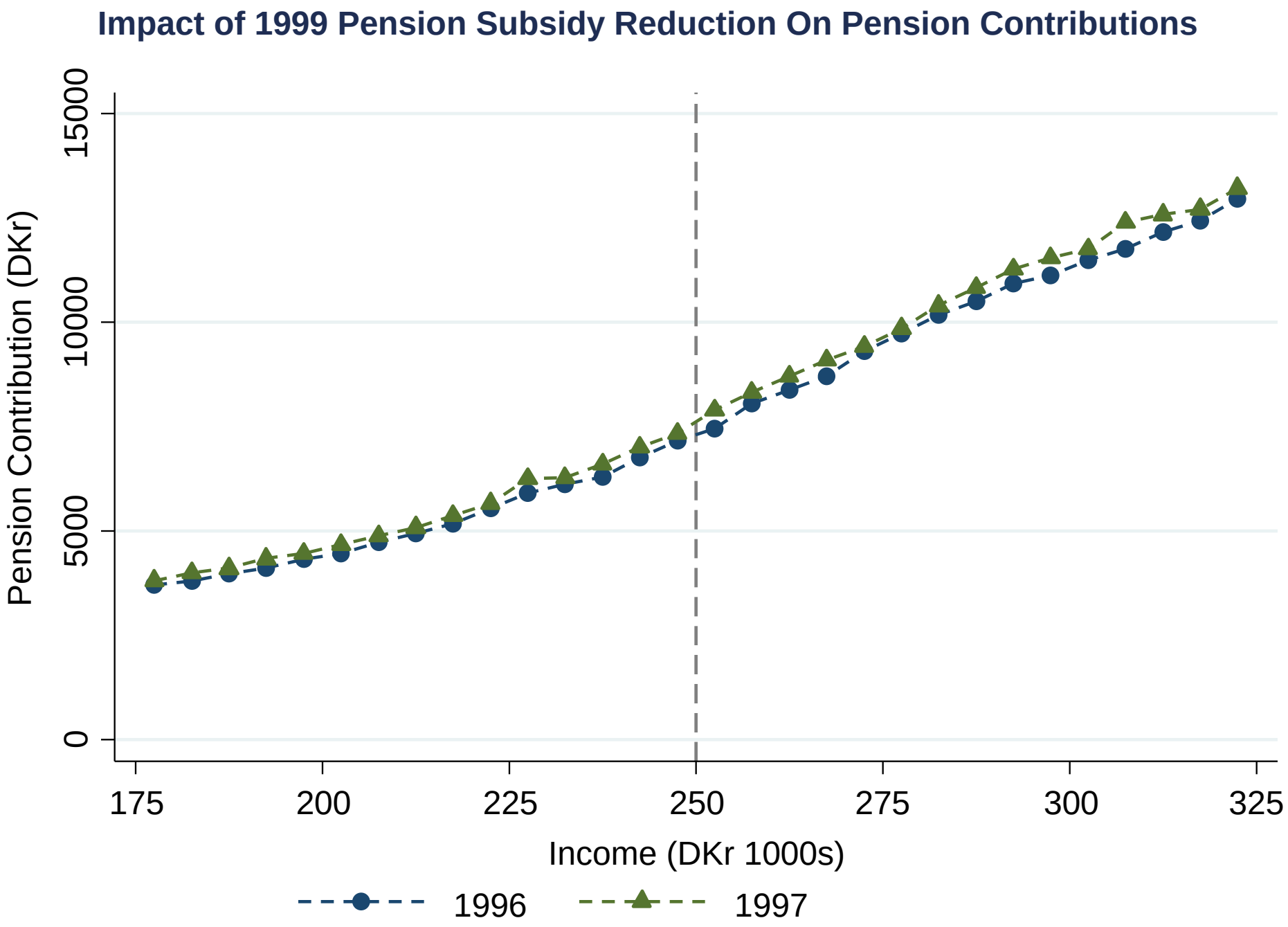
Policies to Increase Retirement Saving

- Growing concern that many people may not be saving adequately for retirement [e.g., Poterba 2014]
  - U.S. spends $100 billion per year on subsidies for retirement savings accounts such as 401(k)'s and IRA's [JCT 2012]
- Is this the best way to achieve policymakers' goal of increasing households savings rates?
- Study this question using administrative wealth data for all Danish households [Chetty, Friedman, Leth-Petersen, Nielsen, Olsen 2014]
  - Begin by analyzing the effects of a reduction in subsidy for retirement accounts (similar to IRA's) in 1999

Impact of 1999 Pension Subsidy Reduction On Pension Contributions



Note: $1 ≅ 6 DKr


Impact of 1999 Pension Subsidy Reduction On Pension Contributions
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Income (DKr 1000s)
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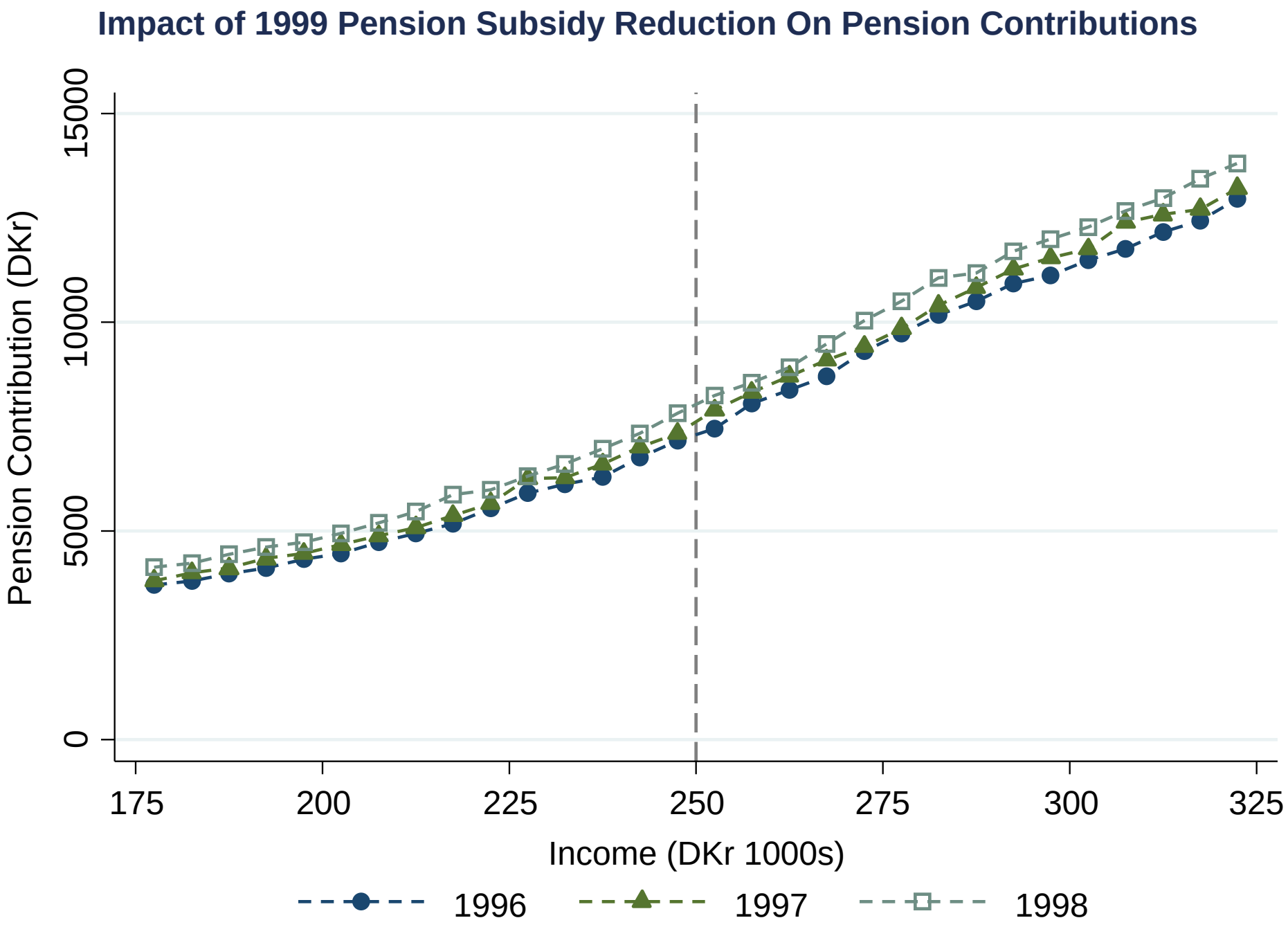
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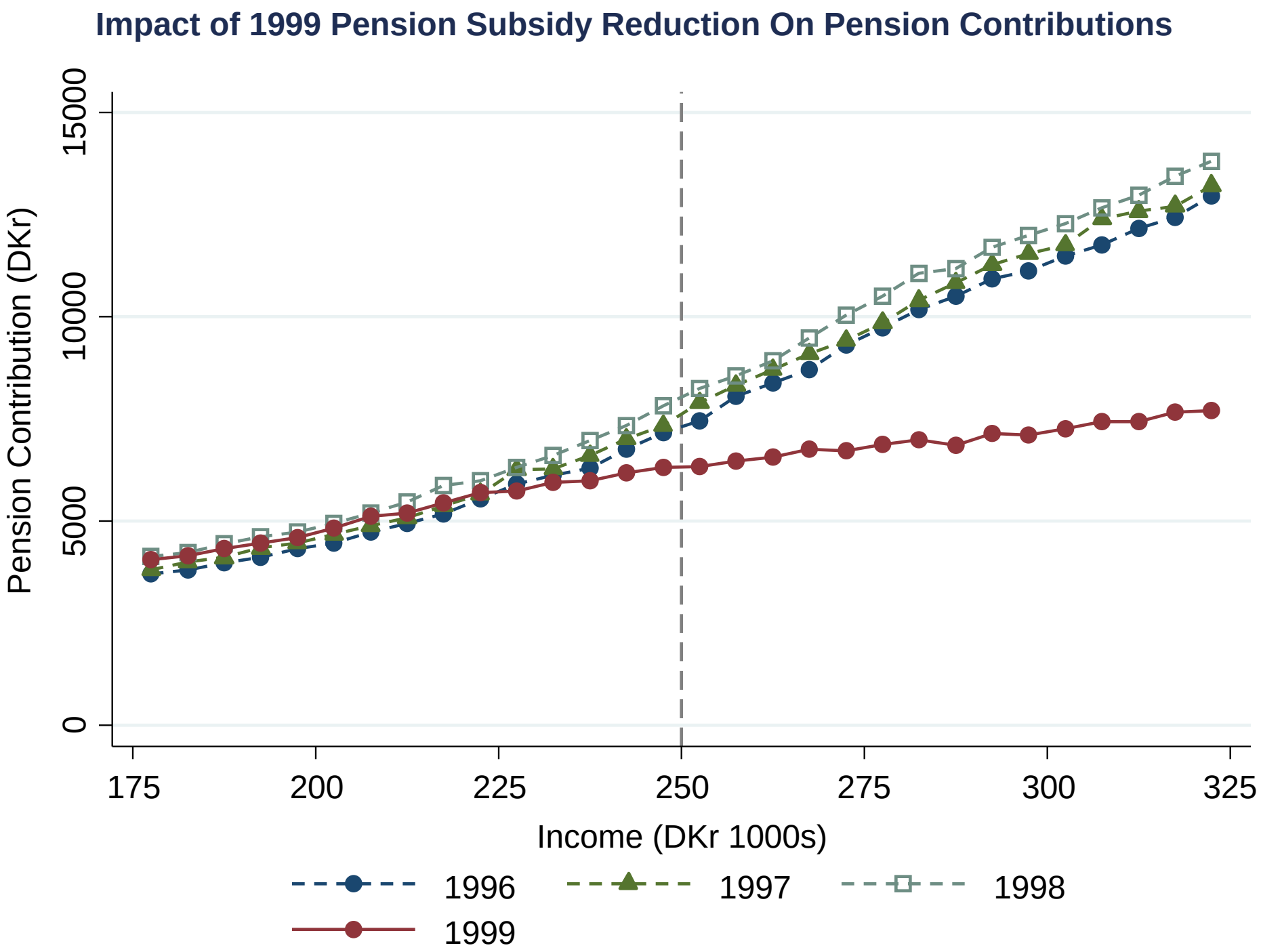
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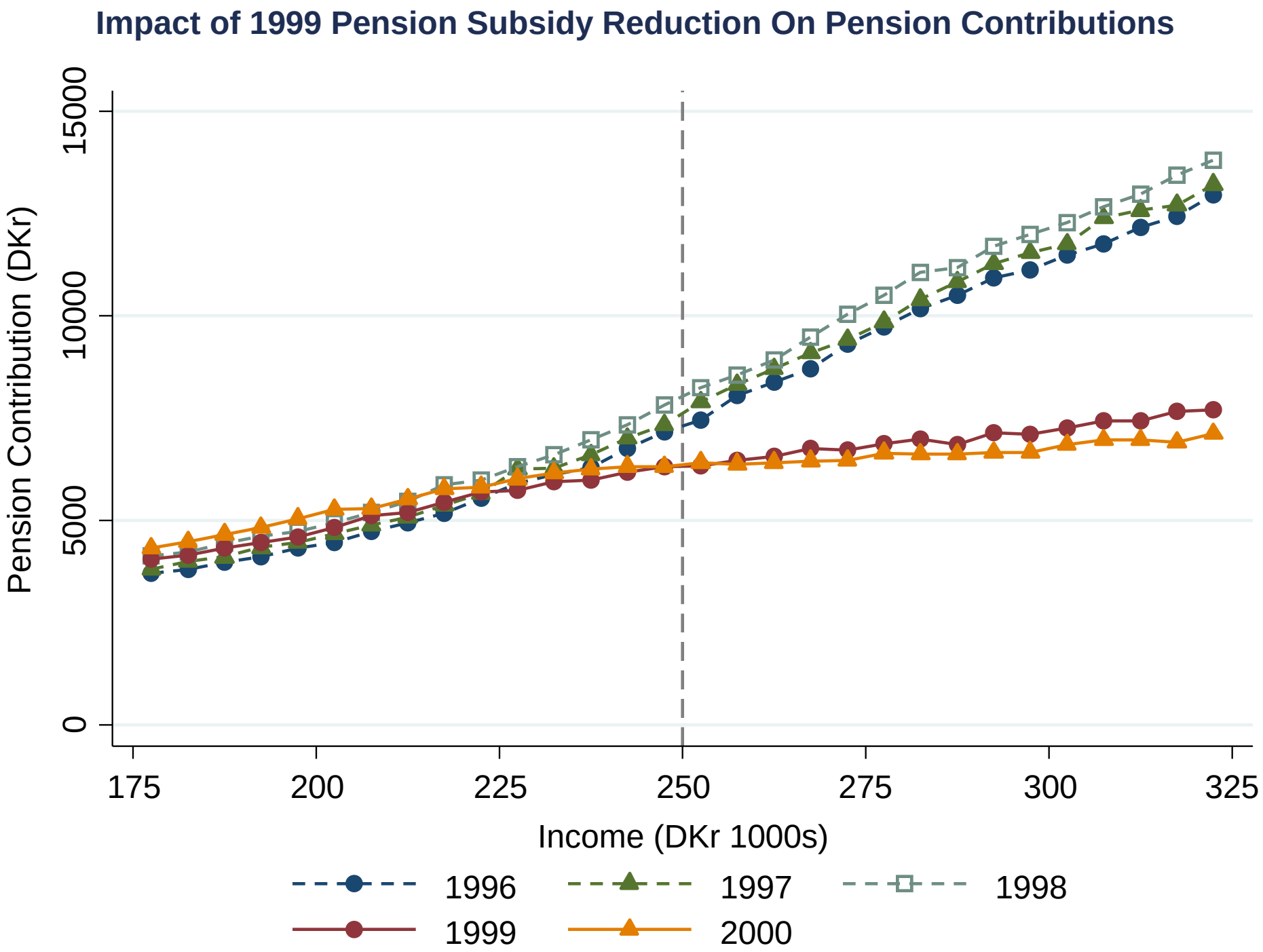
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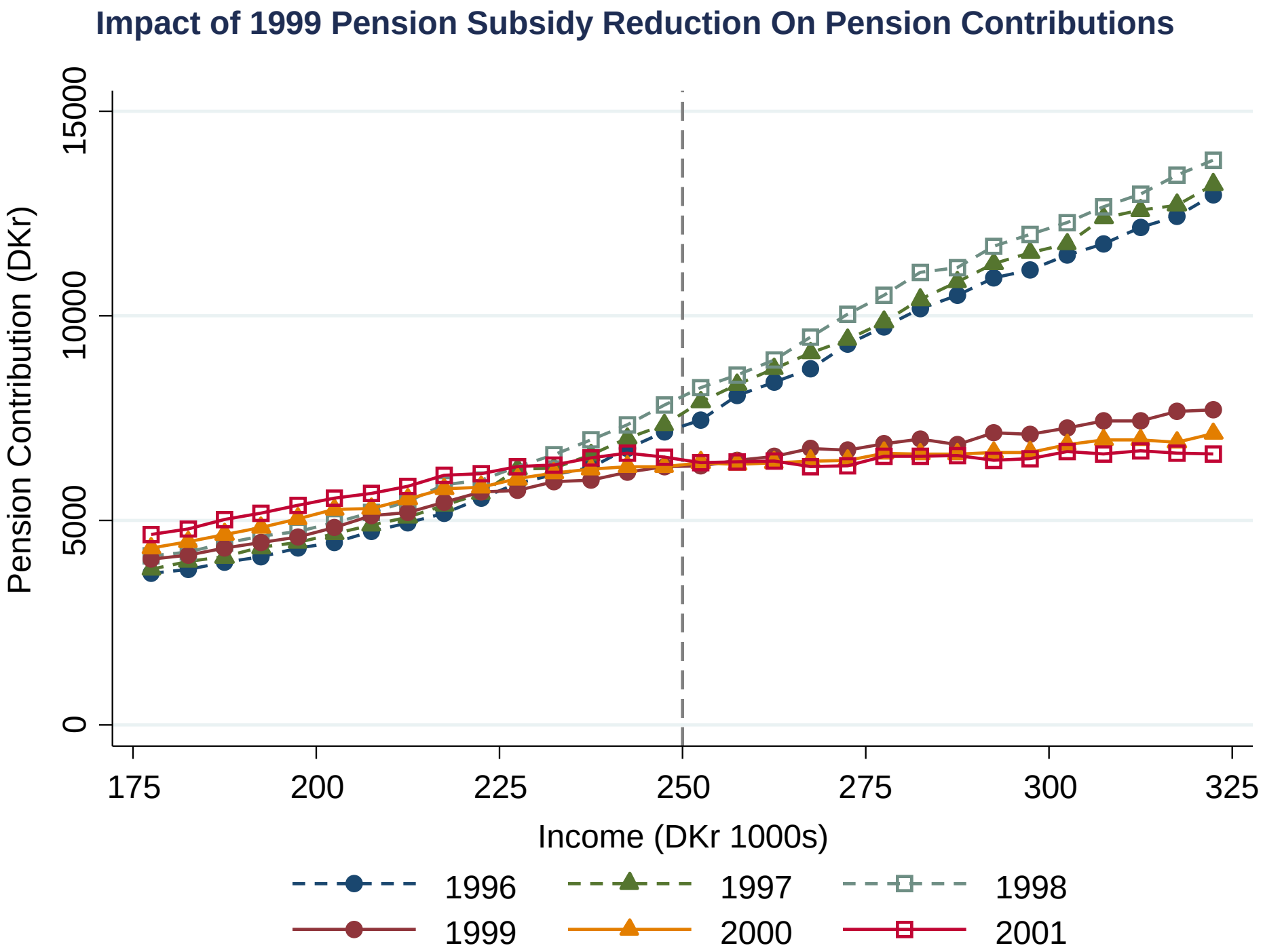
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Effects of Tax Subsidies

- Aggregate reduction is entirely driven by 19% of treated households who completely stop contributing to pensions
  - Remaining 81% do not change their retirement contributions at all
  - Points to a model in which most individuals are inattentive or procrastinate in planning for retirement [e.g., Carroll et al. 2009]
- Moreover, 90% of the reduction in retirement contributions is offset by **more** saving in non-retirement accounts ("crowd-out")

→ Each $1 of marginal expenditure on tax subsidies raises total personal saving by approximately 1 cent

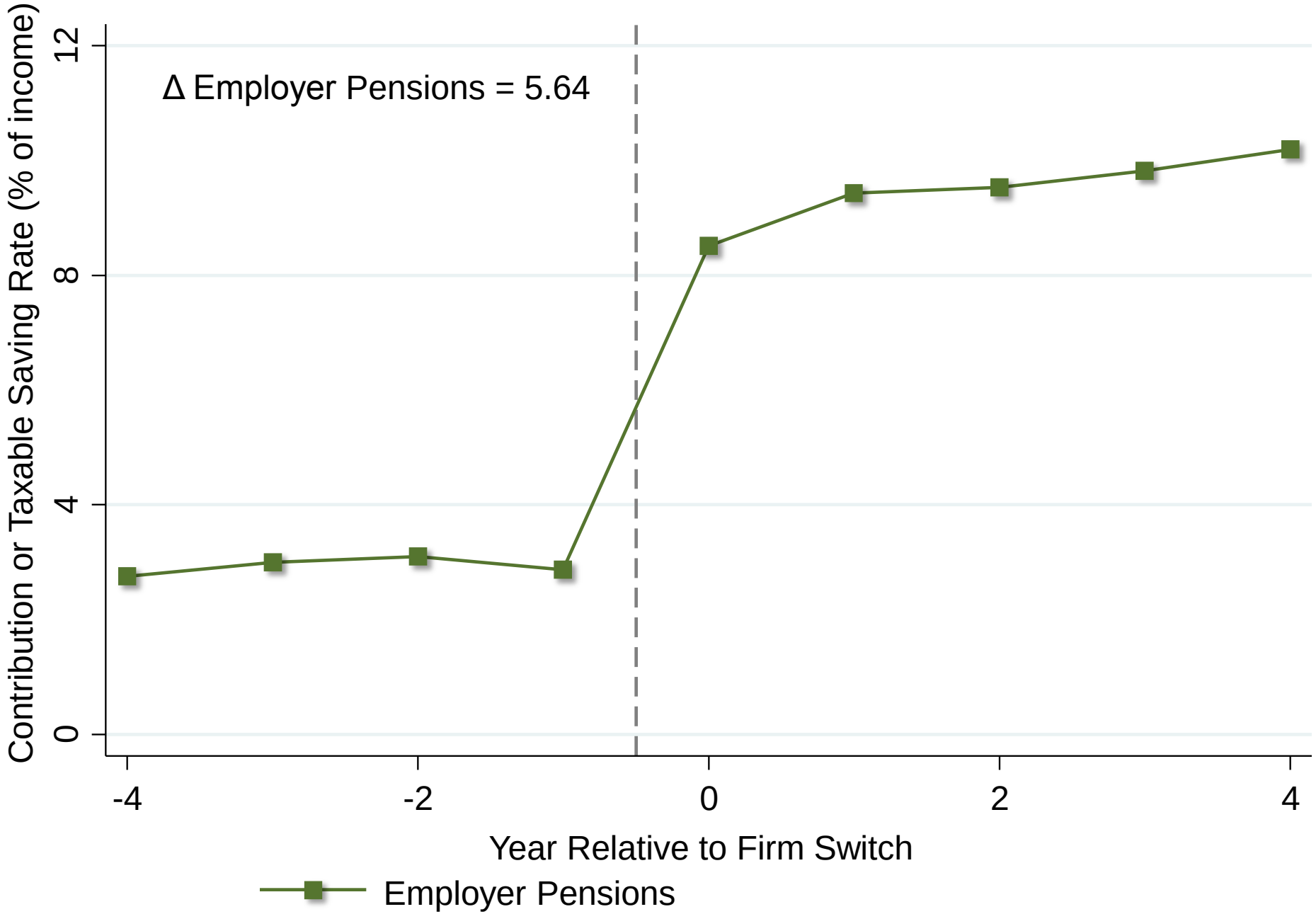
- Are there more effective policies to raise retirement saving?

Defaults

- Inattention/procrastination models point to different policy tools: defaults and automatic enrollment
  - Switching to an **opt-out** system increases participation rate in 401(k) plans from 20% to 80% at point of hire
    [Madrian and Shea 2001, Choi, Laibson, Madrian, Metrick 2004]
- Do defaults raise total saving or do they also just shift assets?
  - Study this question in Denmark by tracking savings around job changes, exploiting variation in employers' retirement plans
  - Employers and individuals contribute to the same accounts → employer contribution is a perfect substitute for individual saving

Event Study around Switches to Firm with >3% Increase in Employer Pension Rate

Individuals with Positive Pension Contributions or Savings Prior to Switch



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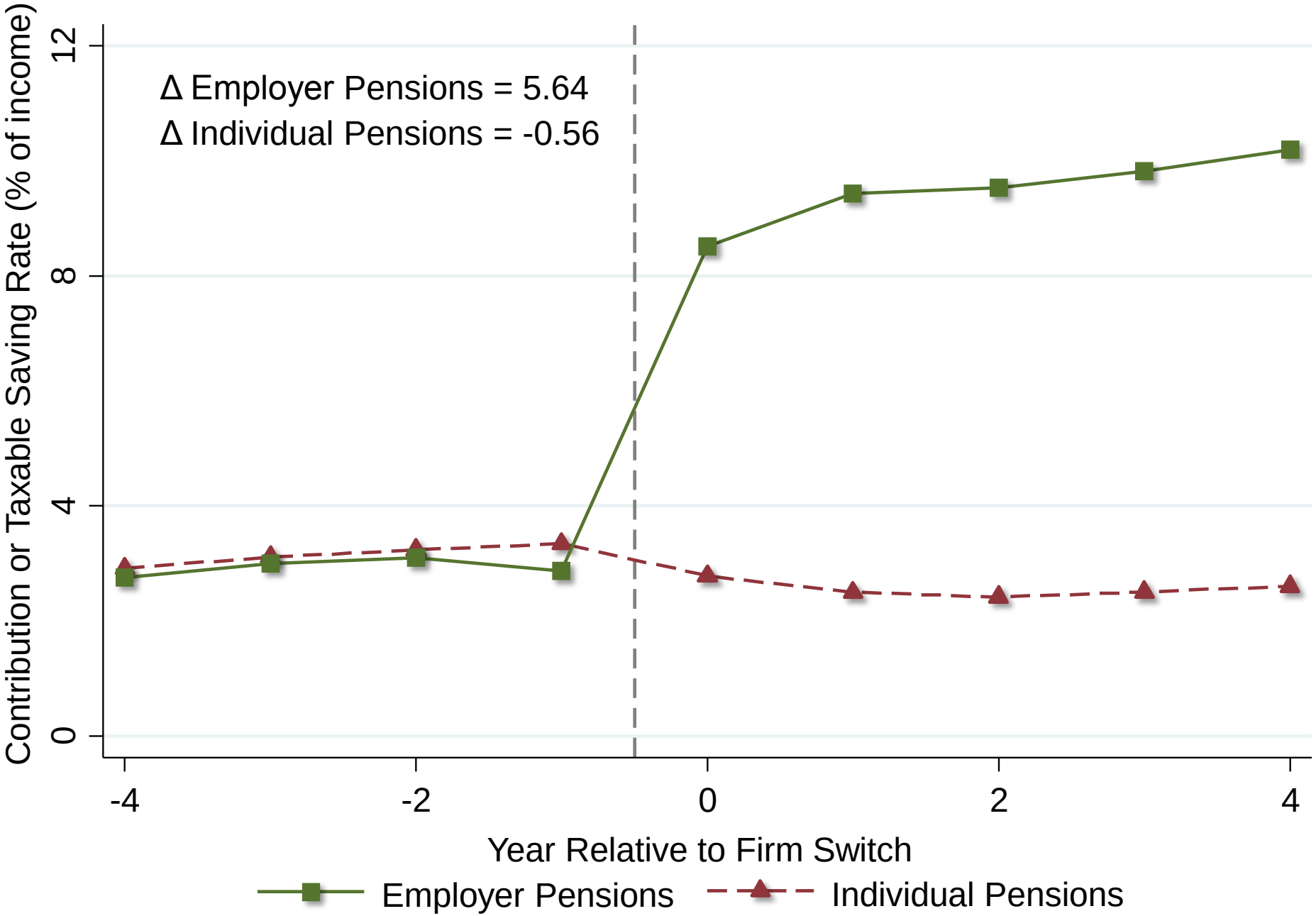

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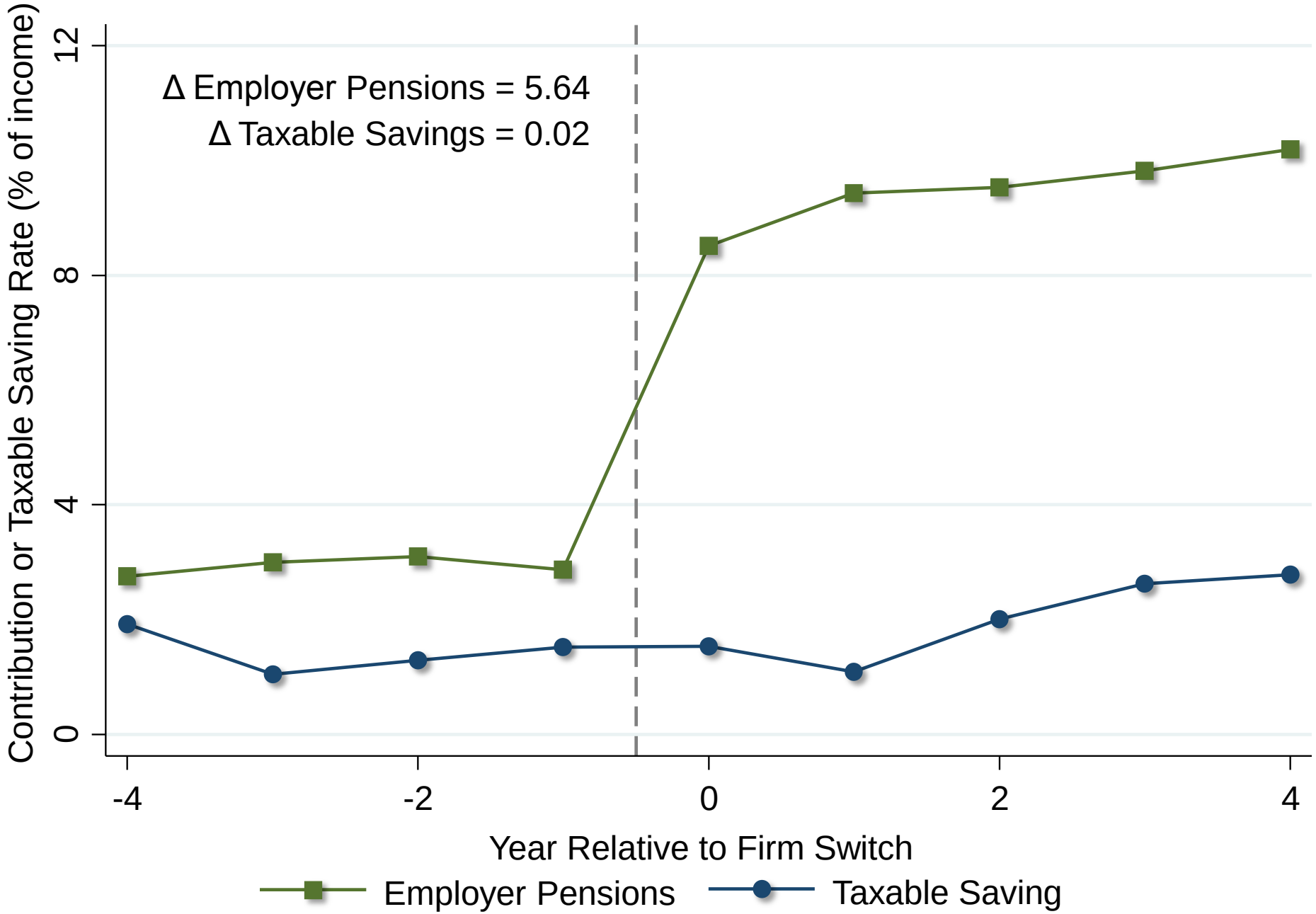


Impacts of Employer Contributions

- Approximately 85% of individuals respond passively to changes in employer contributions and increase total saving
  - Savings increases persist for more than a decade and lead to greater wealth at retirement

→ Defaults are a much more effective way to increase savings rates than changes in tax subsidies

Expanding the Set of Policy Tools

- Broader lesson: defaults make it feasible to achieve outcomes that cannot be achieved with existing policy tools
  - Given an exogenous policy objective of increasing saving, this is useful even if underlying behavioral assumptions are debated
- But theory still essential for:
  1. Extrapolation: predicting effects of policies in other contexts
  2. Welfare analysis: should we be trying to make people save more? What is the optimal savings rate and default?

Expanding the Set of Policy Tools

- Other examples of expanding the set of policy tools:
  - Simplification: Limiting menu of options in health insurance plans [Bhargava, Loewenstein, and Sydnor 2014]
  - Social comparisons: Sending households information about their energy usage relative to neighbors [Alcott 2011]
  - Loss framing: framing teacher incentives as losses relative to a higher salary rather than bonuses [Fryer, Levitt, List, Sadoff 2012]

Application 2
Better Predictions: The Effects of Income Taxation

Predicting the Effects of Existing Policies

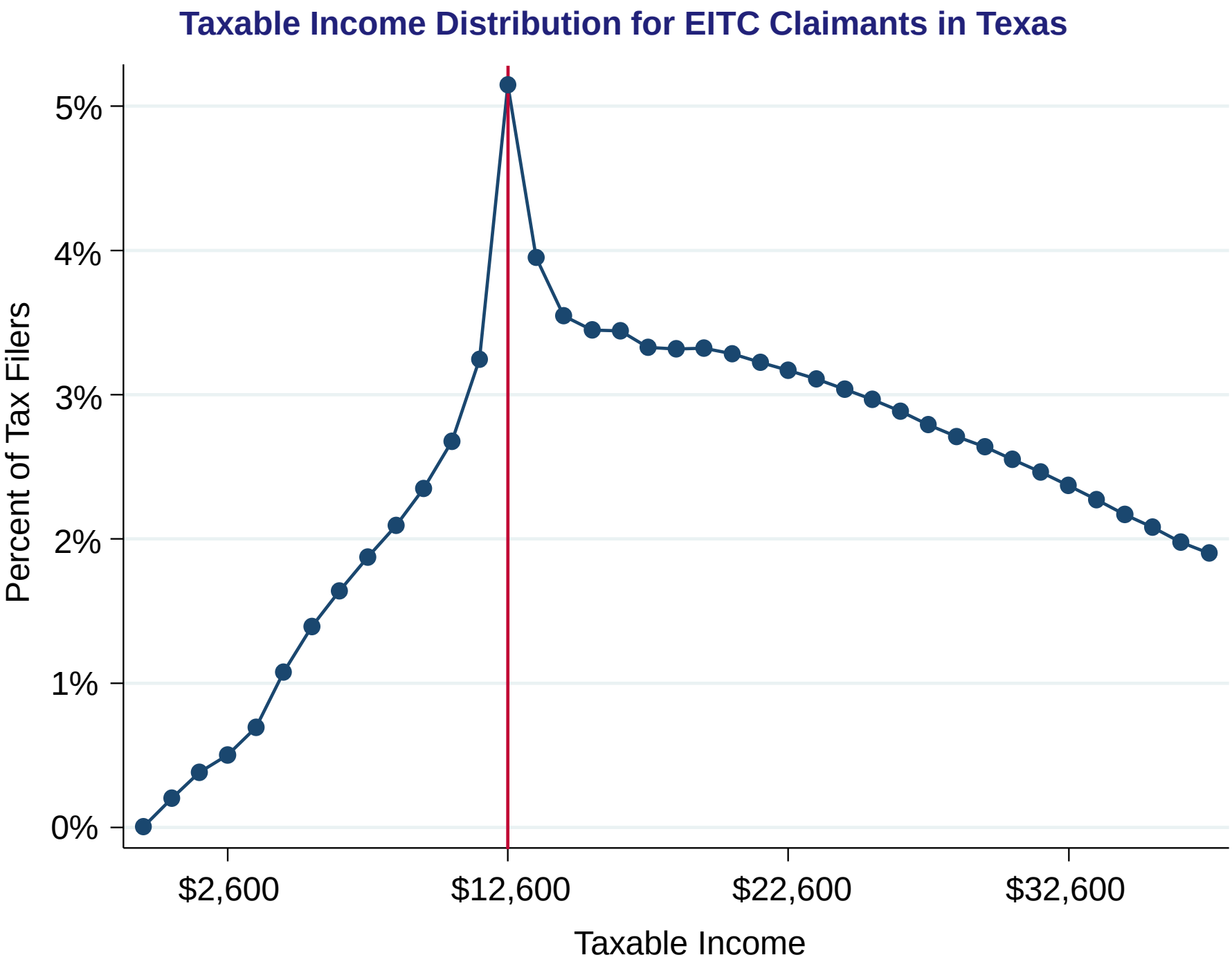
- Even if one does not have new policy instruments, behavioral models can still be useful in predicting impacts of existing policies
- Illustrate by characterizing effects of Earned Income Tax Credit on labor supply decisions

Earned Income Tax Credit

- Federal government spends $60 billion per year on EITC
- 40% subsidy for earnings up to an income of $12,600 (varies with number of children)
  - EITC amount is reduced as income rises further
- Program expanded to current form in 1996 as part of effort to increase return to working for low-income families

Studying Impacts of the EITC

- How has the EITC affected earnings behavior of low income families?
- Use de-identified federal income tax returns covering U.S. population, 1996-2009 [Chetty, Friedman, Saez 2013]
  - 78 million taxpayers, 1.1 billion observations on income
- Initial research plan: exploit differences in state EITC “top up” policies
  - Start by examining how income distributions vary across states


Taxable Income Distribution for EITC Claimants in Texas
5%
4%
3%
2%
1%
0%
Percent of Tax Filers
$2,600
$12,600
$22,600
$32,600
Taxable Income

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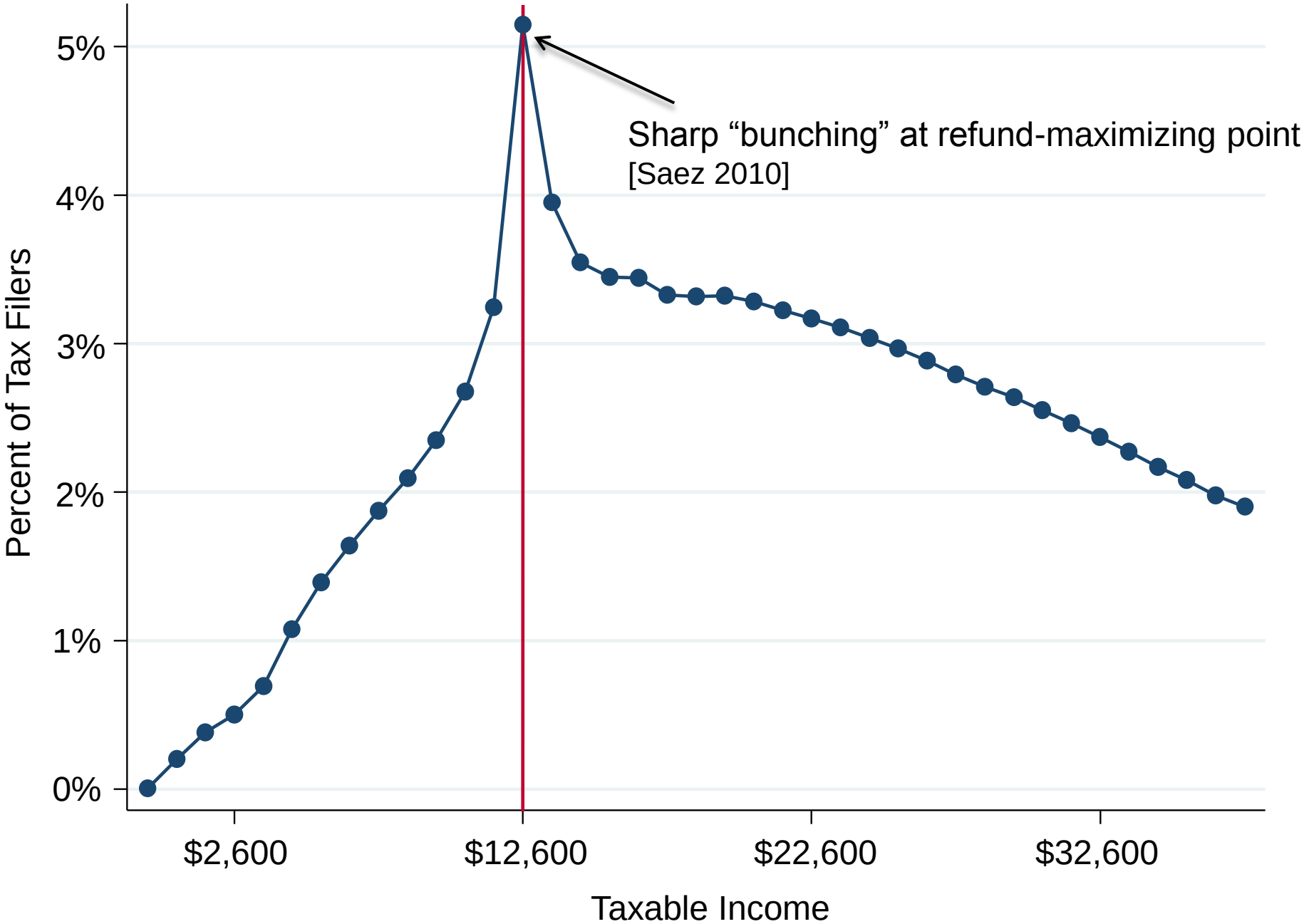

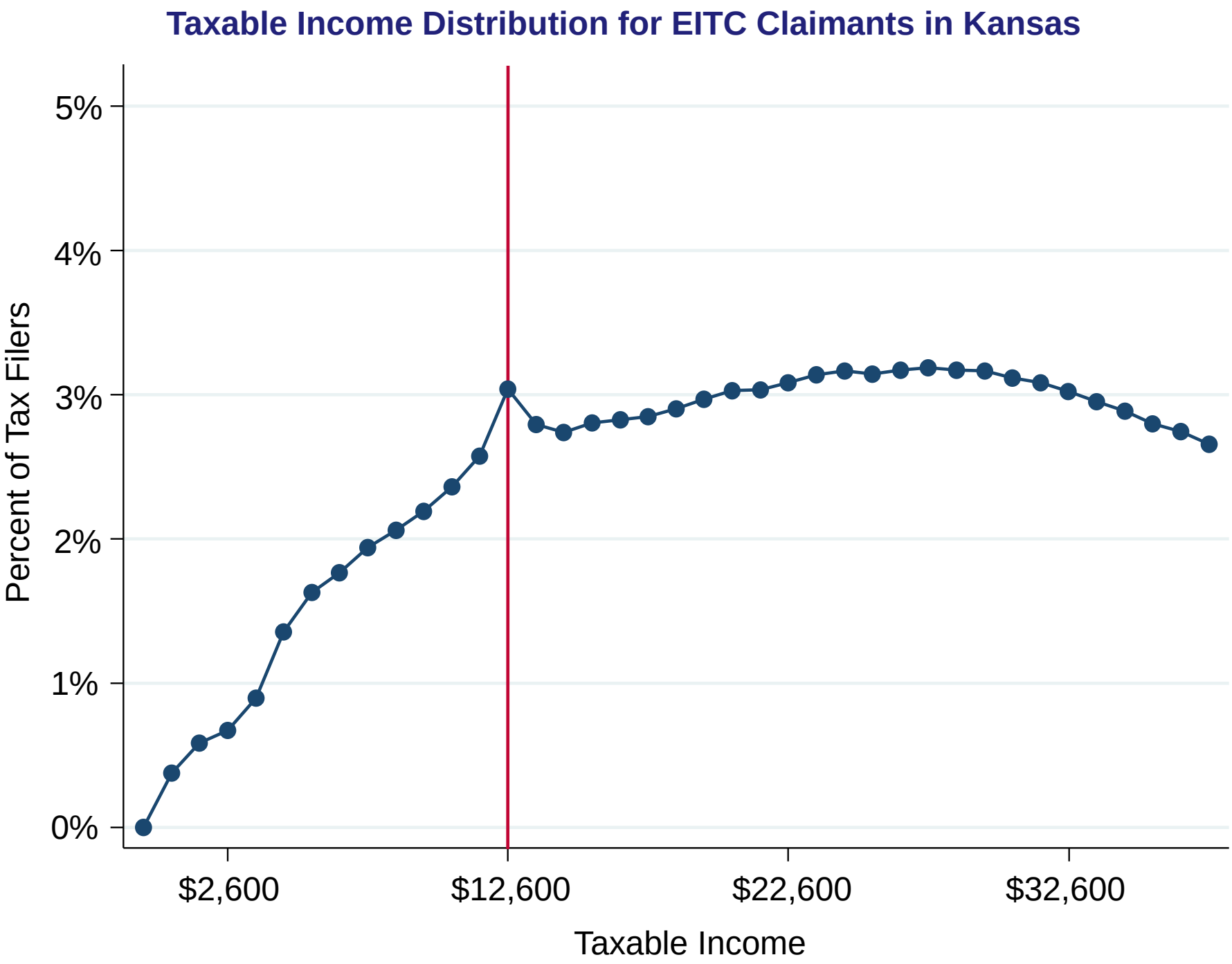
Taxable Income Distribution for EITC Claimants in Kansas
5%
4%
3%
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1%
0%
Percent of Tax Filers
$2,600
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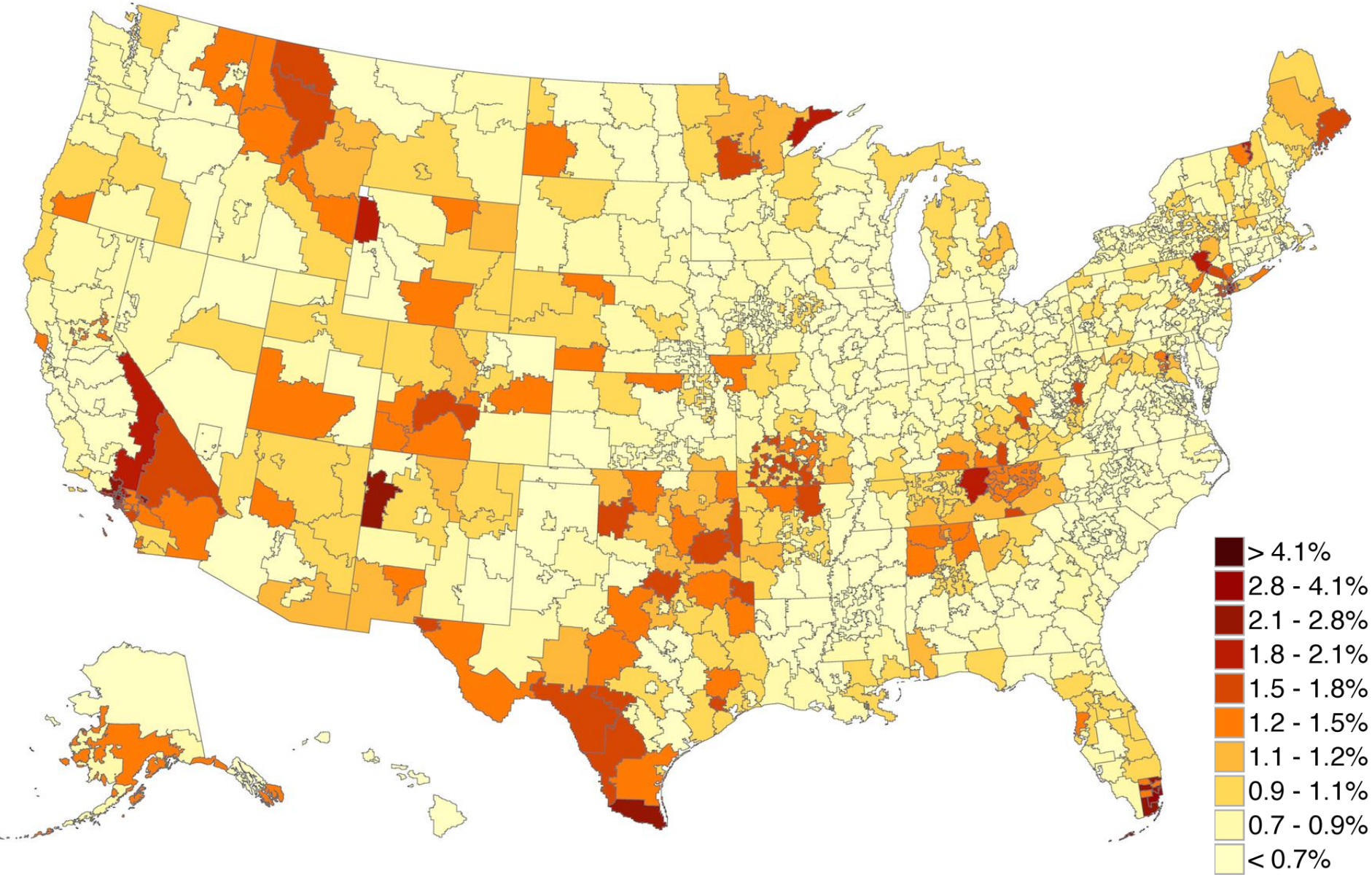
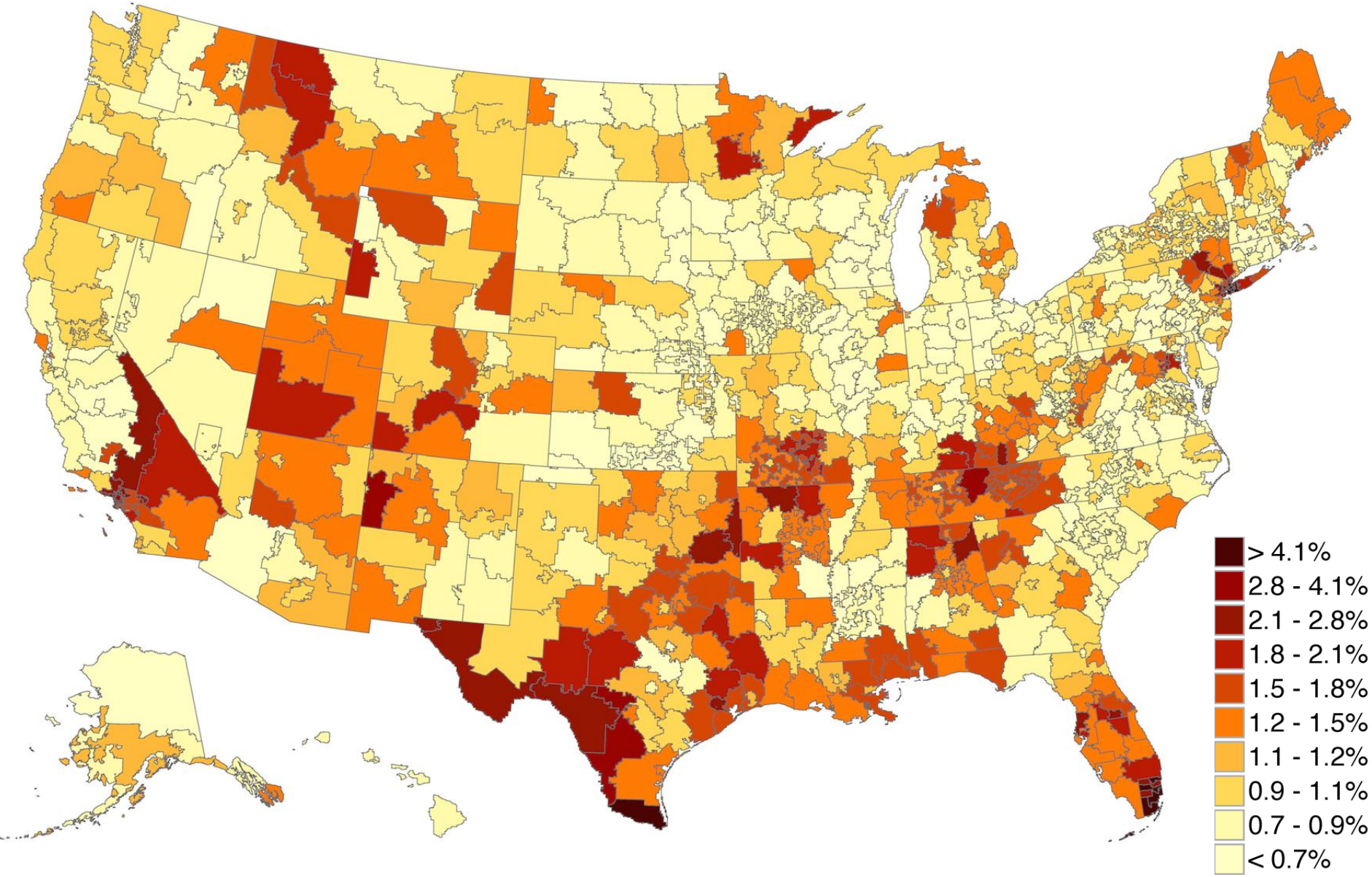
$32,600
Taxable Income

Fraction of Tax Filers Who Report Income that Maximizes EITC Refund in 1996



Note: Darker Color = More EITC Sharp Bunching

Fraction of Tax Filers Who Report Income that Maximizes EITC Refund in 1999



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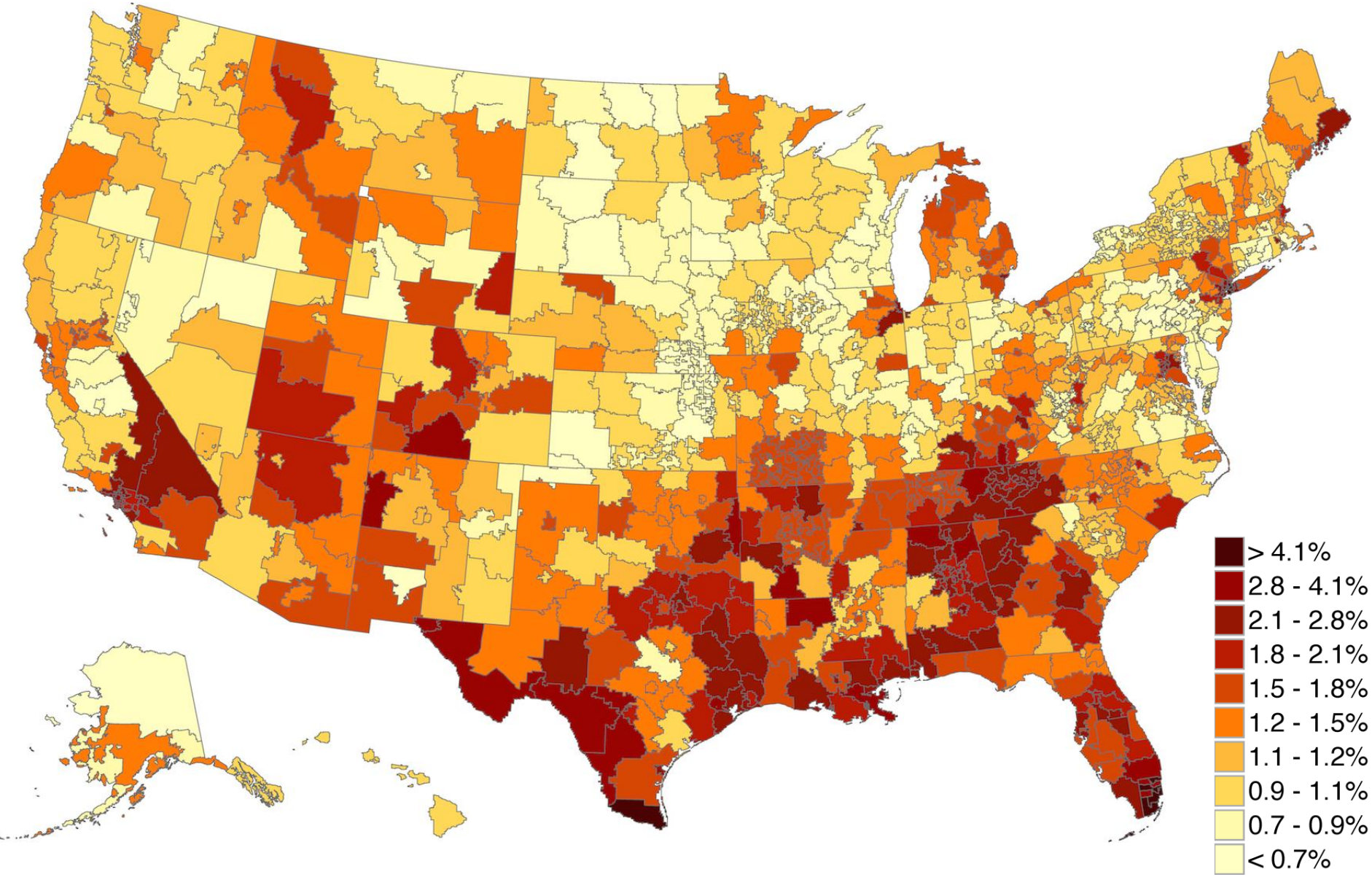
Fraction of Tax Filers Who Report Income that Maximizes EITC Refund in 2002



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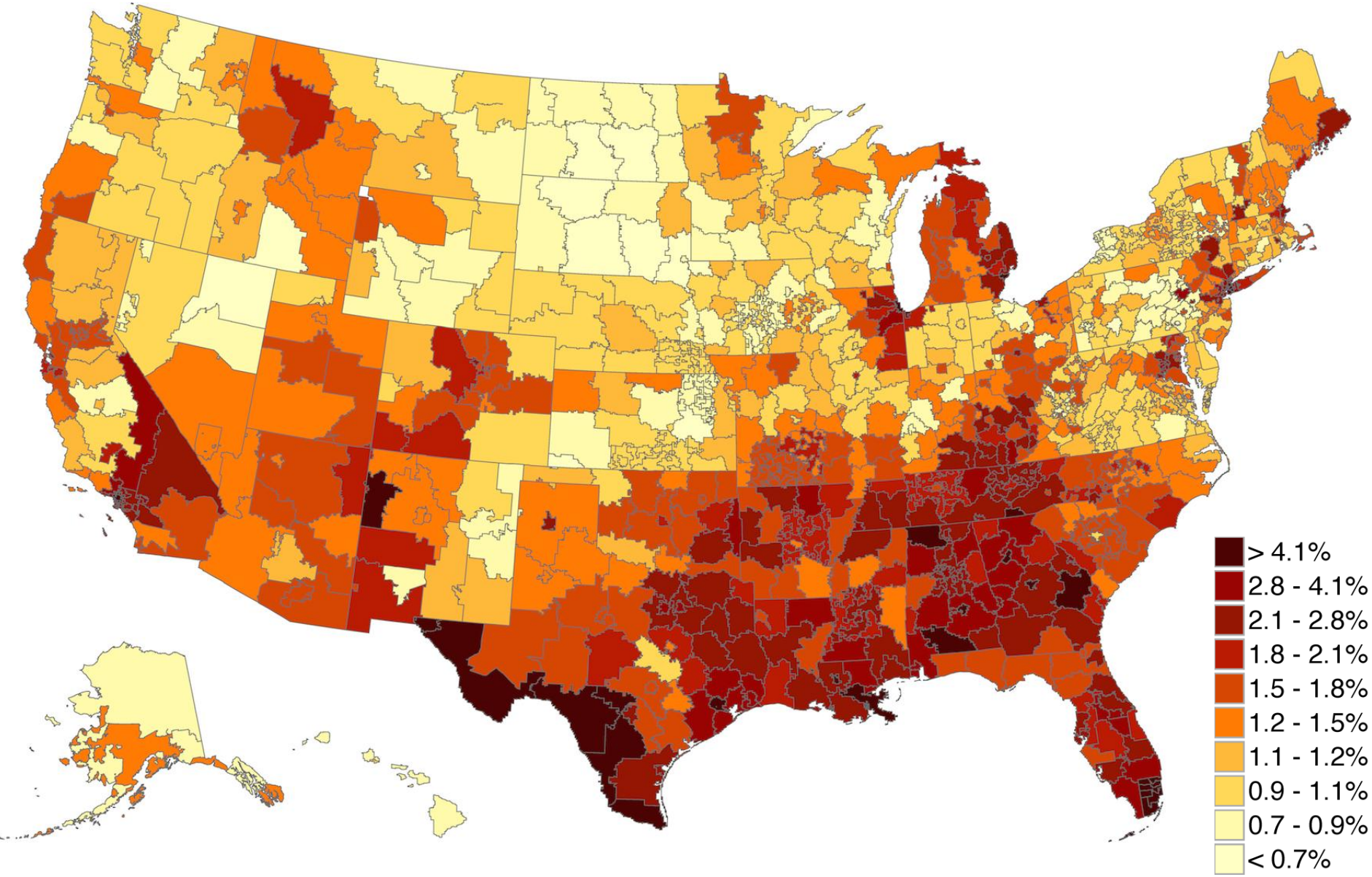
Fraction of Tax Filers Who Report Income that Maximizes EITC Refund in 2005



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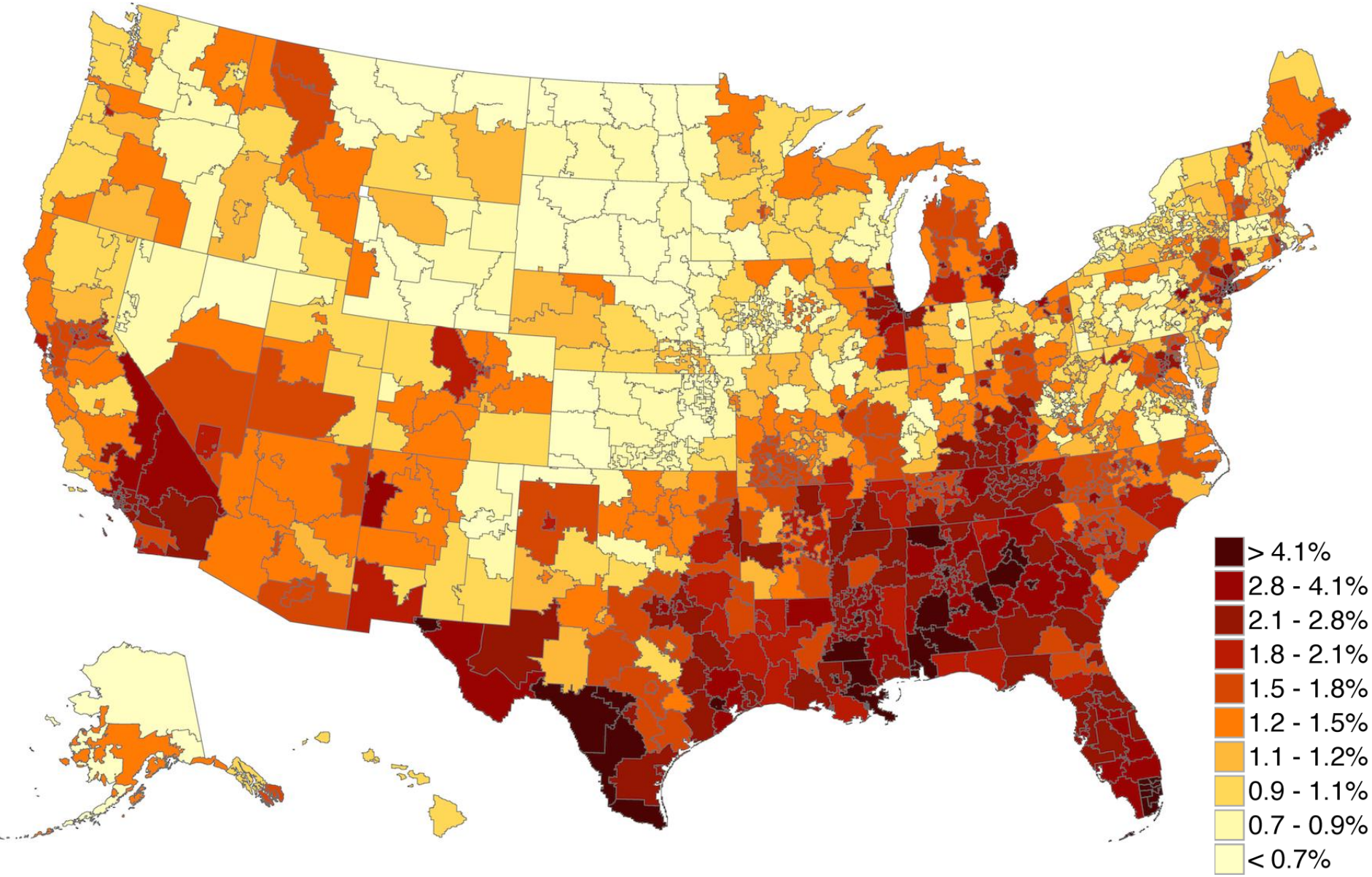
Fraction of Tax Filers Who Report Income that Maximizes EITC Refund in 2008

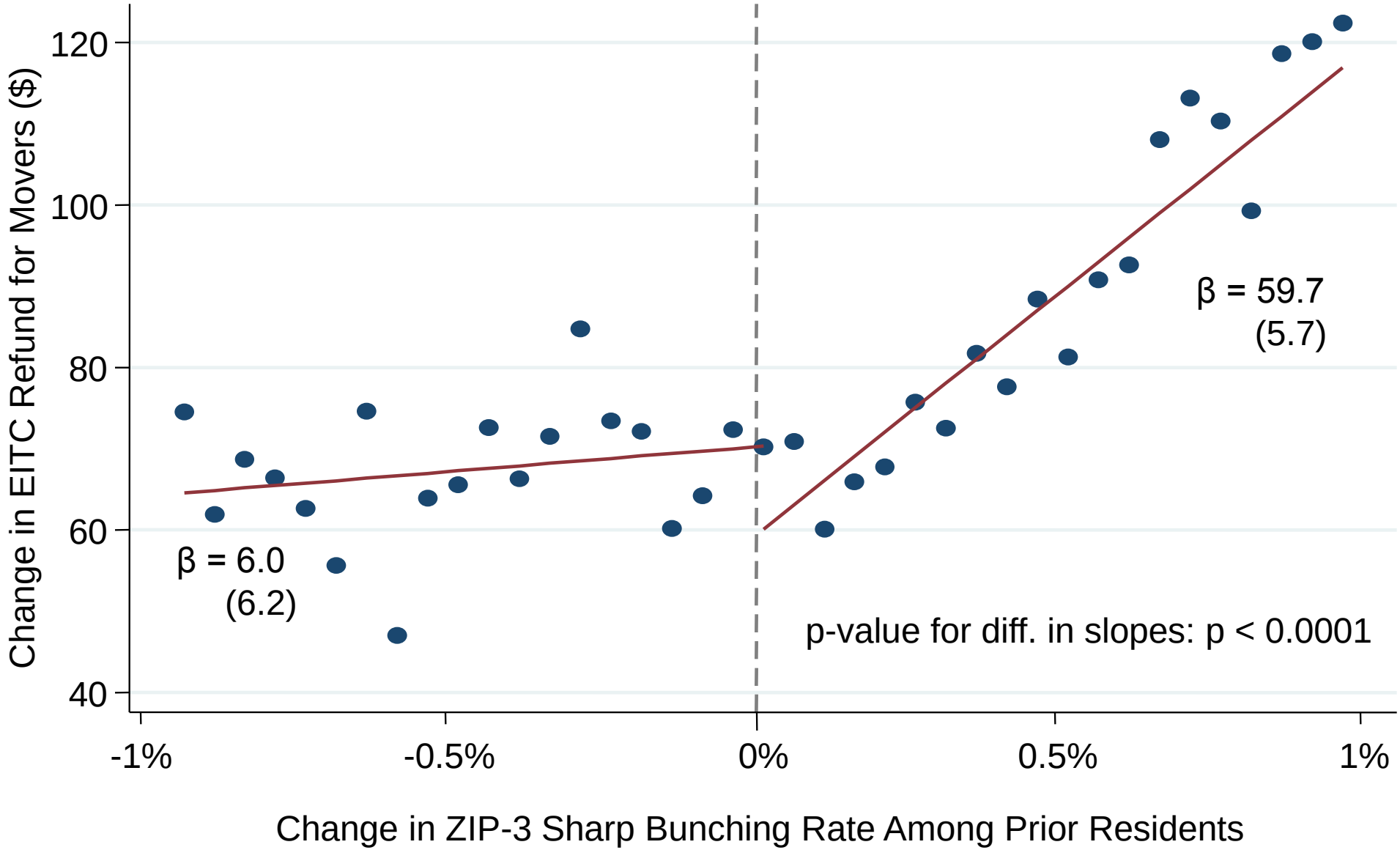


Note: Darker Color = More EITC Sharp Bunching

Differences in Knowledge about the EITC?

- Why does impact of EITC on income vary so much across areas?
- Plausible behavioral model: differences in knowledge about EITC
- To test this explanation, consider individuals who move
- Knowledge model predicts asymmetric impact of moving:
  - Moving to a higher-bunching area should raise EITC refund
  - Moving to a lower-bunching area should not affect EITC refund

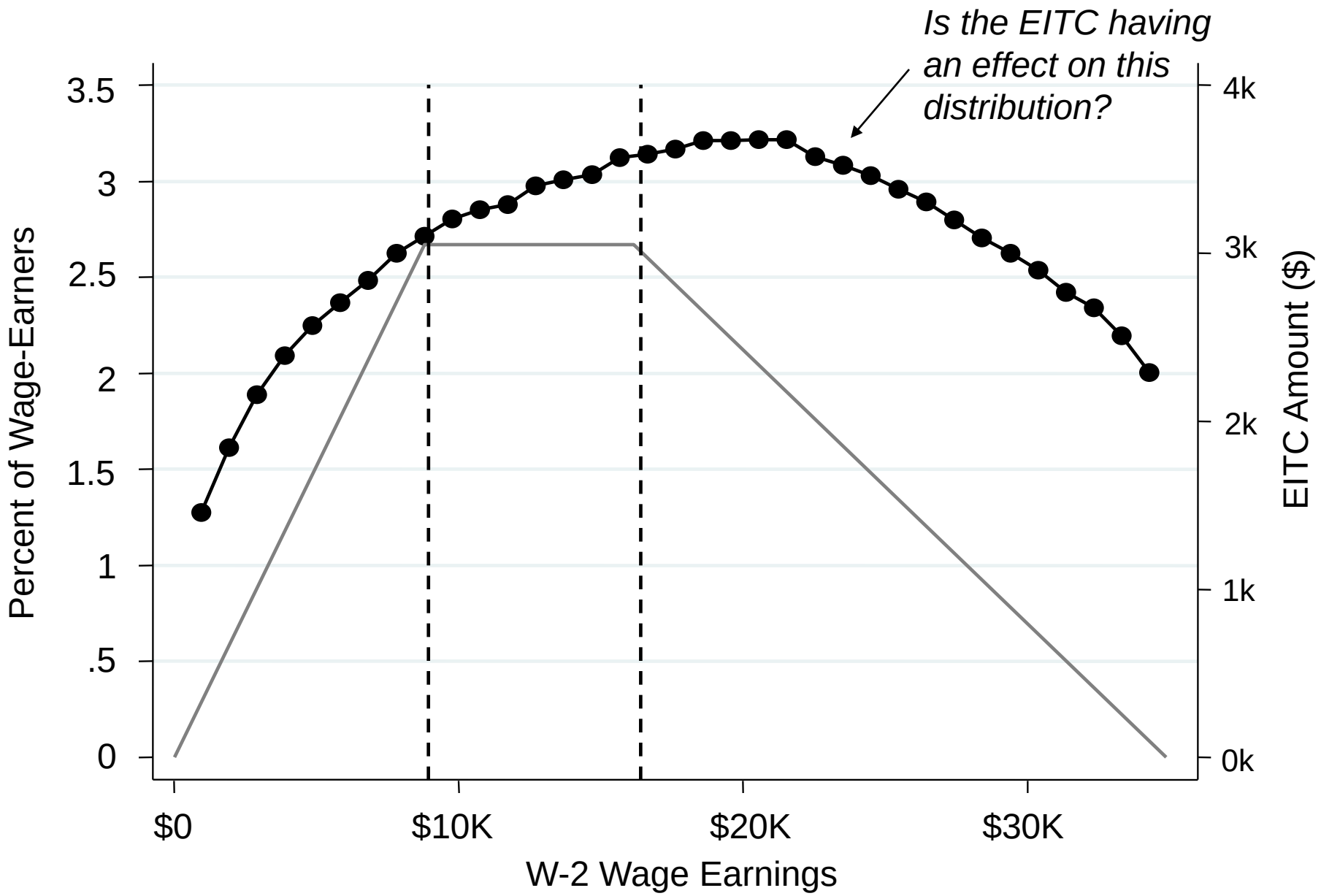
Effects of Moving to Higher vs. Lower Bunching Areas on EITC Refund Amounts



Effects of EITC on Labor Supply

- Sharp bunching at refund-maximizing kink is driven primarily by self-employed individuals who manipulate reported income [Saez 2010]
  - Self-employment income is self-reported to the IRS → easy to manipulate reported income to get a larger refund
- Deeper question: how does EITC affect real labor supply behavior?
  - To study this, analyze impacts on wage earnings, excluding self-employment income
  - Wage earnings directly reported to IRS by employers (on W-2 forms) → little scope for misreporting
  - Begin by examining distribution of wage earnings in U.S. as a whole

Income Distribution For Single Wage Earners with One Child



Impacts of EITC on Wage Earners

- Effects of EITC on real wage earnings are too diffuse to detect without a counterfactual

- Knowledge model is very useful here
  - Use low-information areas as a **counterfactual**
  - No knowledge about EITC = no response to EITC
  - Proxy for information using level of self-emp. sharp bunching

- Broader lesson: behavioral models can be used to generate counterfactuals to estimate policy impacts
  - Ex: exploit inertia in health plan choice to obtain control groups [Handel 2013]

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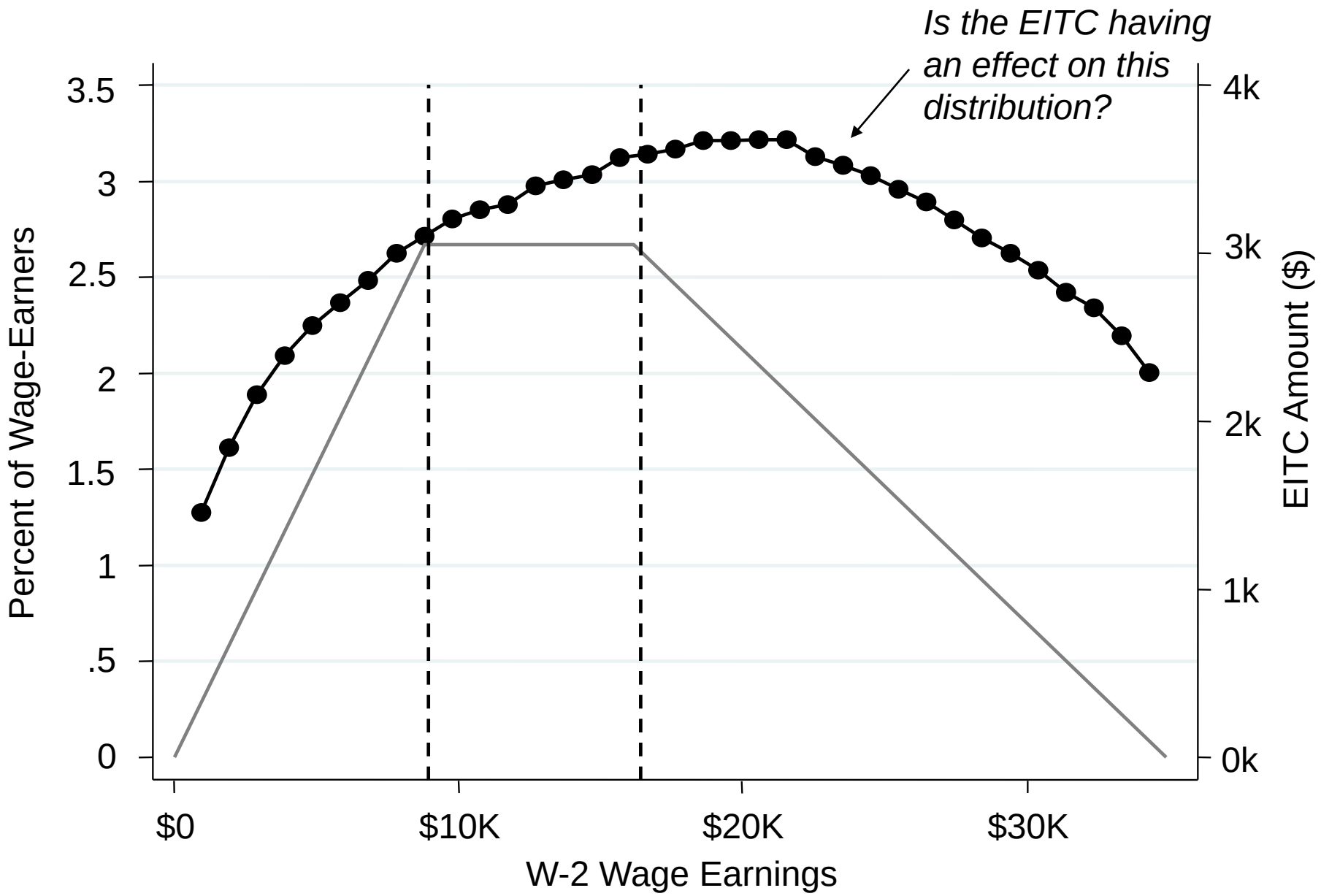
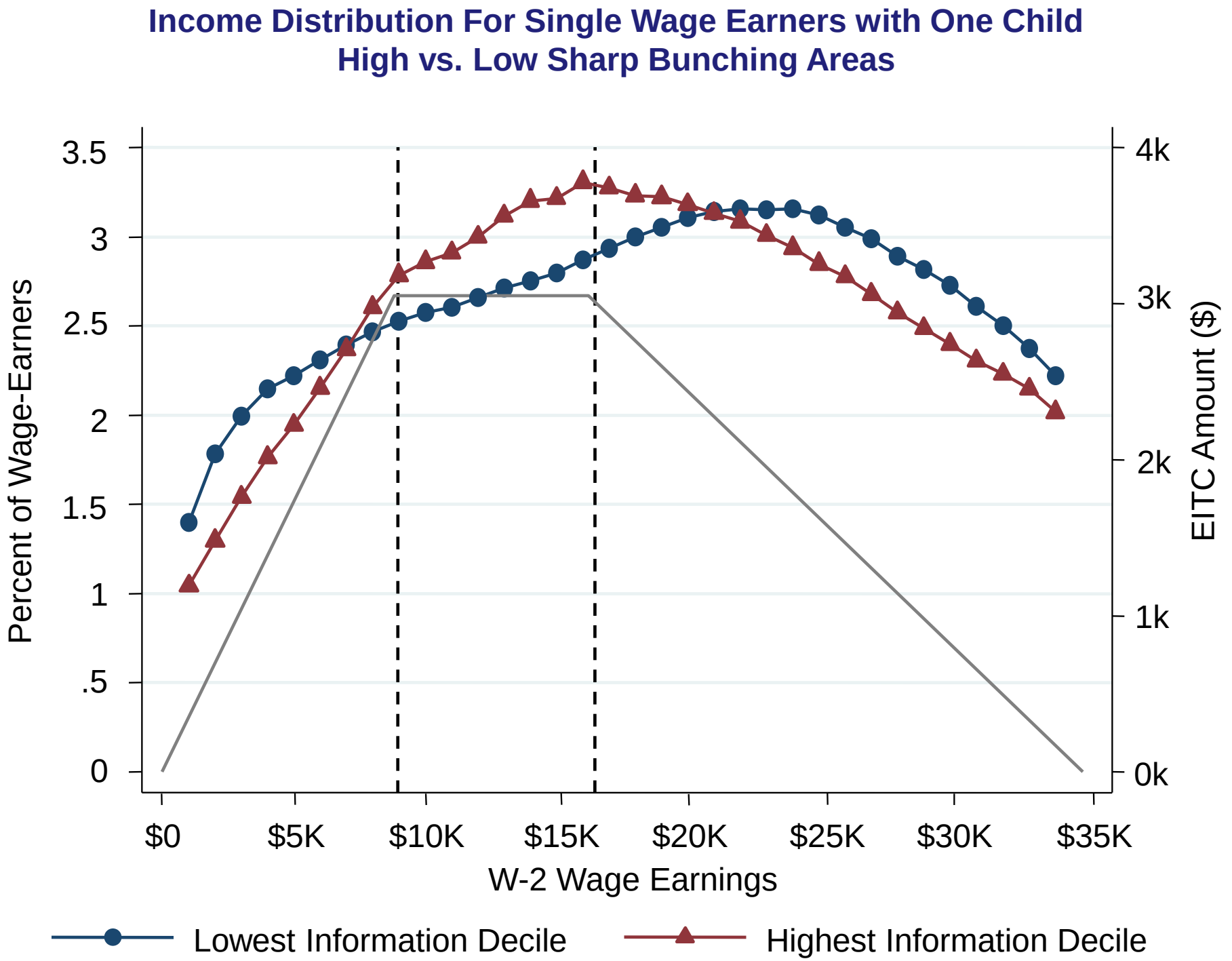
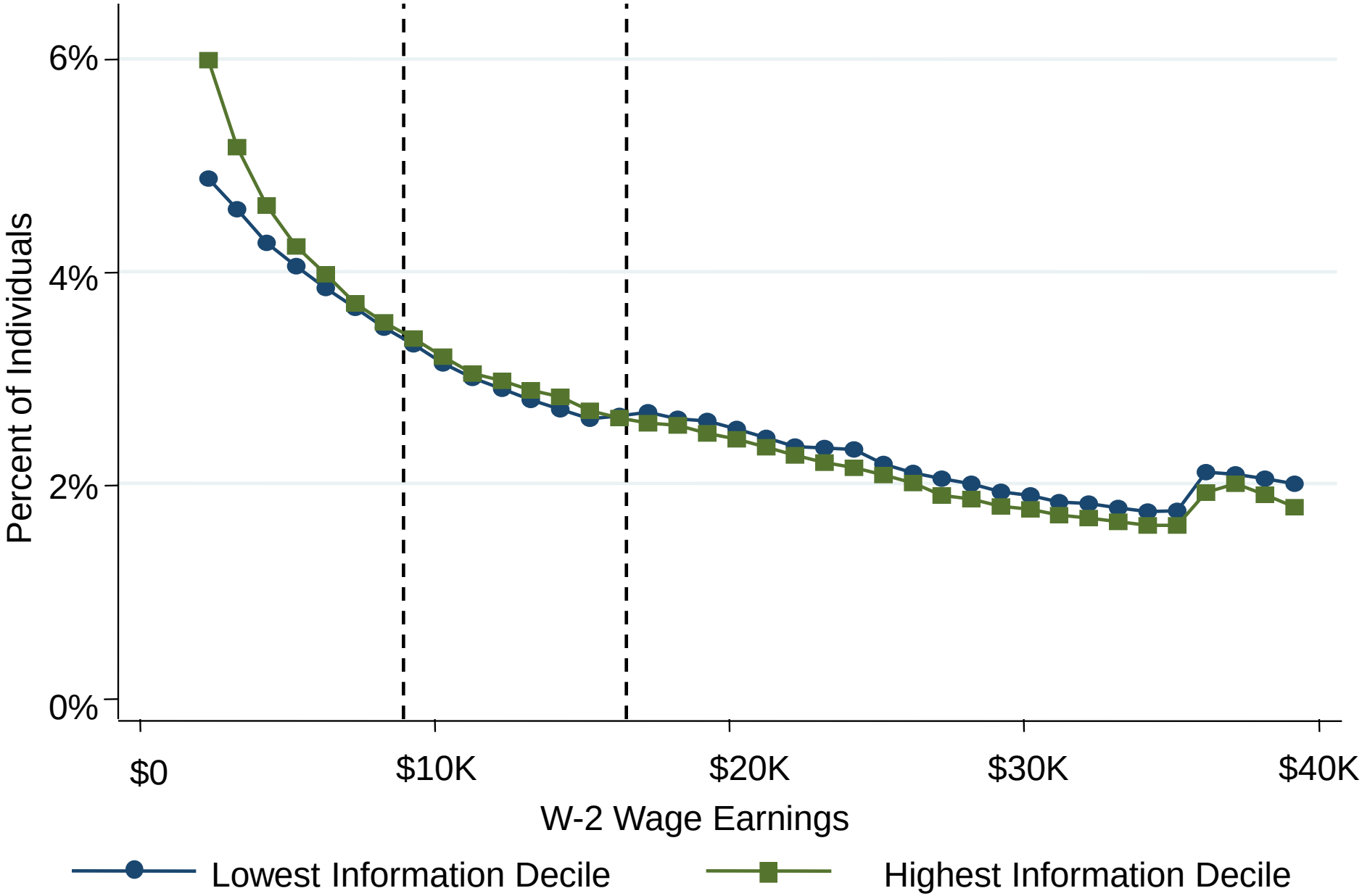



Income Distribution For Single Wage Earners with One Child
High vs. Low Sharp Bunching Areas
Percent of Wage-Earners
3.5
3
2.5
2
1.5
1
.5
0
EITC Amount ($)
4k
3k
2k
1k
0k
$0
$5K
$10K
$15K
$20K
$25K
$30K
$35K
W-2 Wage Earnings
Lowest Information Decile
Highest Information Decile

Child Birth Research Design

- Comparisons across areas could be biased by omitted variables
- Study changes in earnings around childbirth to address this concern
  - Individuals without children are essentially ineligible for the EITC
  - Birth of a child generates sharp variation in marginal incentives

Earnings Distribution in the Year Before First Child Birth for Wage Earners



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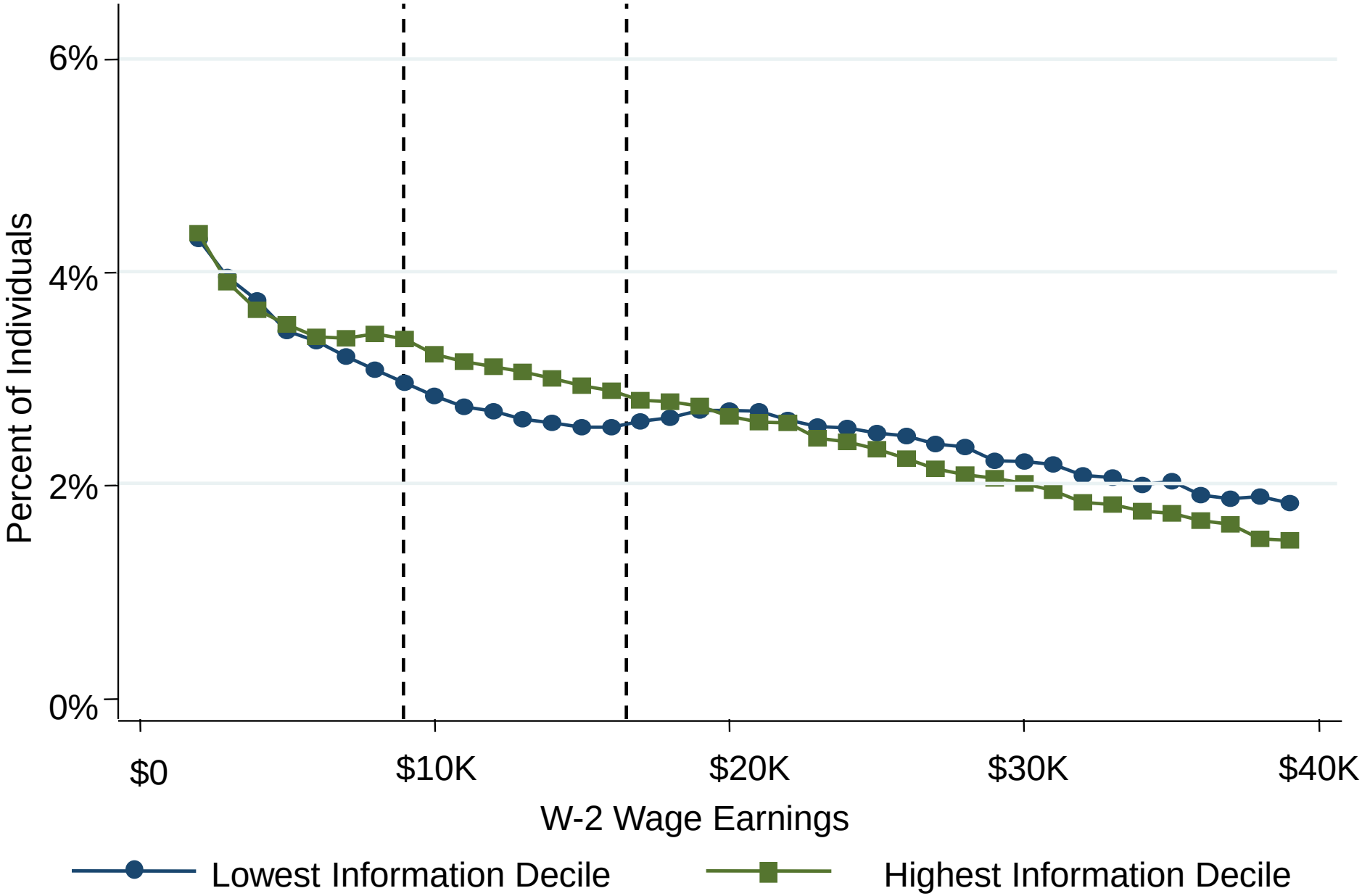


Summary: Predicting the Effects of the EITC

- Further analysis reveals that EITC primarily induces increases in earnings in phase-in region rather than reductions in phase-out

  → EITC is effective in increasing labor supply

- Responses are largest in areas with dense EITC populations, where knowledge is more likely to spread

- Broader lesson: incorporating behavioral features into model helps us better predict impacts of tax policies on earnings behavior

Application 3
Welfare Analysis of Neighborhood Choices

Implications for Welfare Analysis

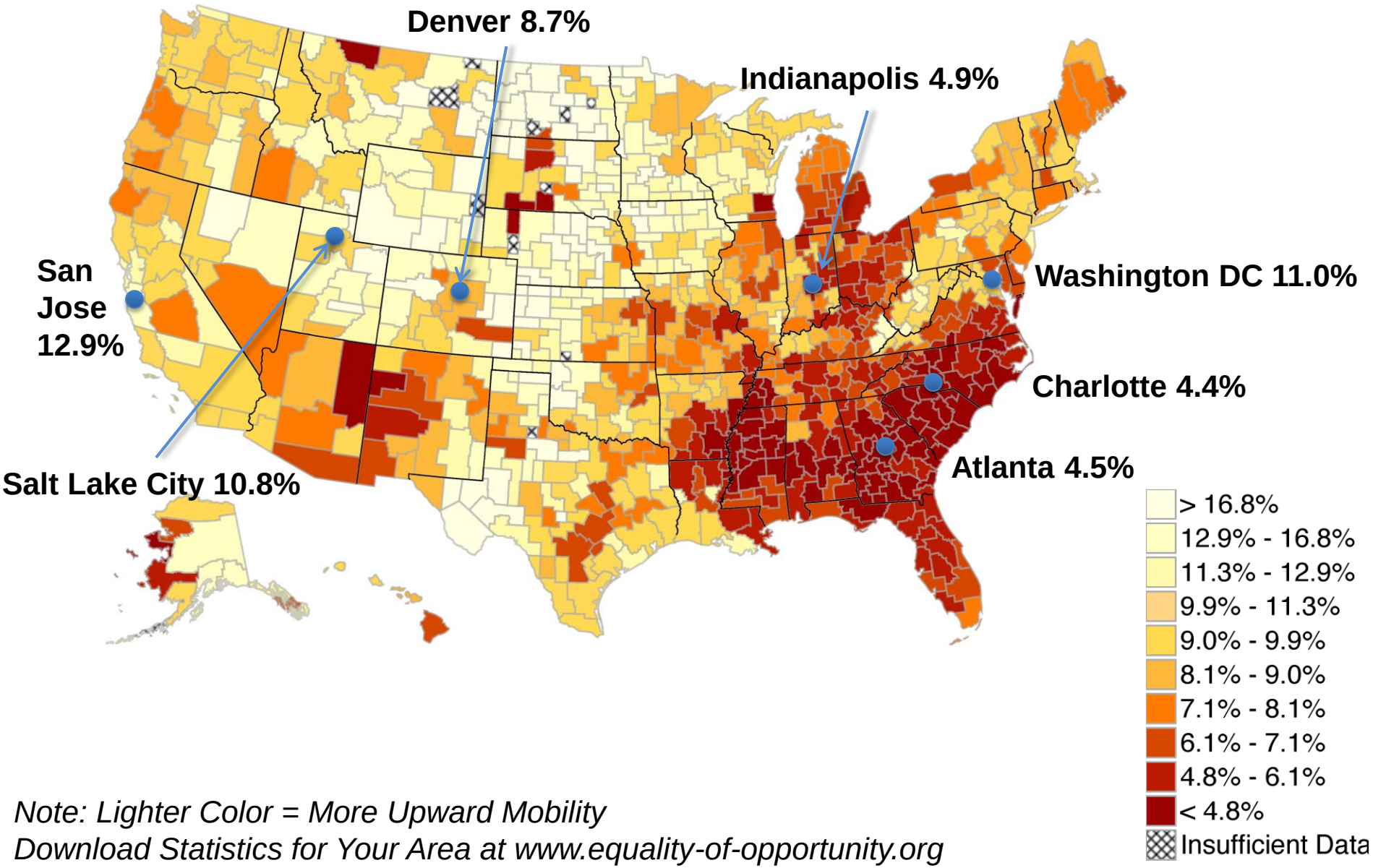
- Thus far, we have focused on positive analysis: predicting policy impacts
- Behavioral models also lead to new normative implications, i.e. new prescriptions for optimal policy
  - Key challenge: how to characterize normative implications in a *non-paternalistic* manner?
- Illustrate these issues by focusing on neighborhood effects and housing voucher policies
  - Start by summarizing a set of empirical results on neighborhood effects

Neighborhood Effects: Three Empirical Results

1. Children's outcomes vary significantly across neighborhoods conditional on parent income [Chetty, Hendren, Kline, Saez 2014]

The Geography of Intergenerational Mobility in the United States

Probability Child is in Top Income Quintile at Age 30 Given Parents in Bottom Quintile



Note: Lighter Color = More Upward Mobility

Download Statistics for Your Area at www.equality-of-opportunity.org

Neighborhood Effects: Three Empirical Results

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   - Differences are primarily due to causal effects of place [Chetty and Hendren 2015, Chetty, Hendren, Katz 2015]

   - Moving to Opportunity experiment: moving to low-poverty census tract at young age (<13) increases earnings in adulthood by 30%

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   - Moving to Opportunity experiment: moving to low-poverty census tract at young age (<13) increases earnings in adulthood by 30%

2. Moving to a low-poverty area has no impact on adults' earnings

3. Many neighborhoods offer better outcomes for children without significantly higher house prices or rents

Models of Neighborhood Choice

- Why don't families move to areas where children do much better?

- Neoclassical model: utility from other amenities, low weight placed on children's long-term outcomes

- Behavioral economics suggests different models

  1. Status-quo and present bias: gains for children realized 10-20 years later, but costs of moving paid up front [Laibson 1997]

  2. Poverty amplifies focus on immediate needs [Mullainathan and Shafir 2013, Haushofer and Fehr 2014]

  3. Lack of information about long-term neighborhood effects [Hastings and Weinstein 2007]

Policy Implications

- Policy question: should we encourage low-income families to move to lower-poverty areas?

- Behavioral models: moving families to lower-poverty areas improves their welfare
  - Use subsidies (housing vouchers) or nudges (counseling) to encourage such moves

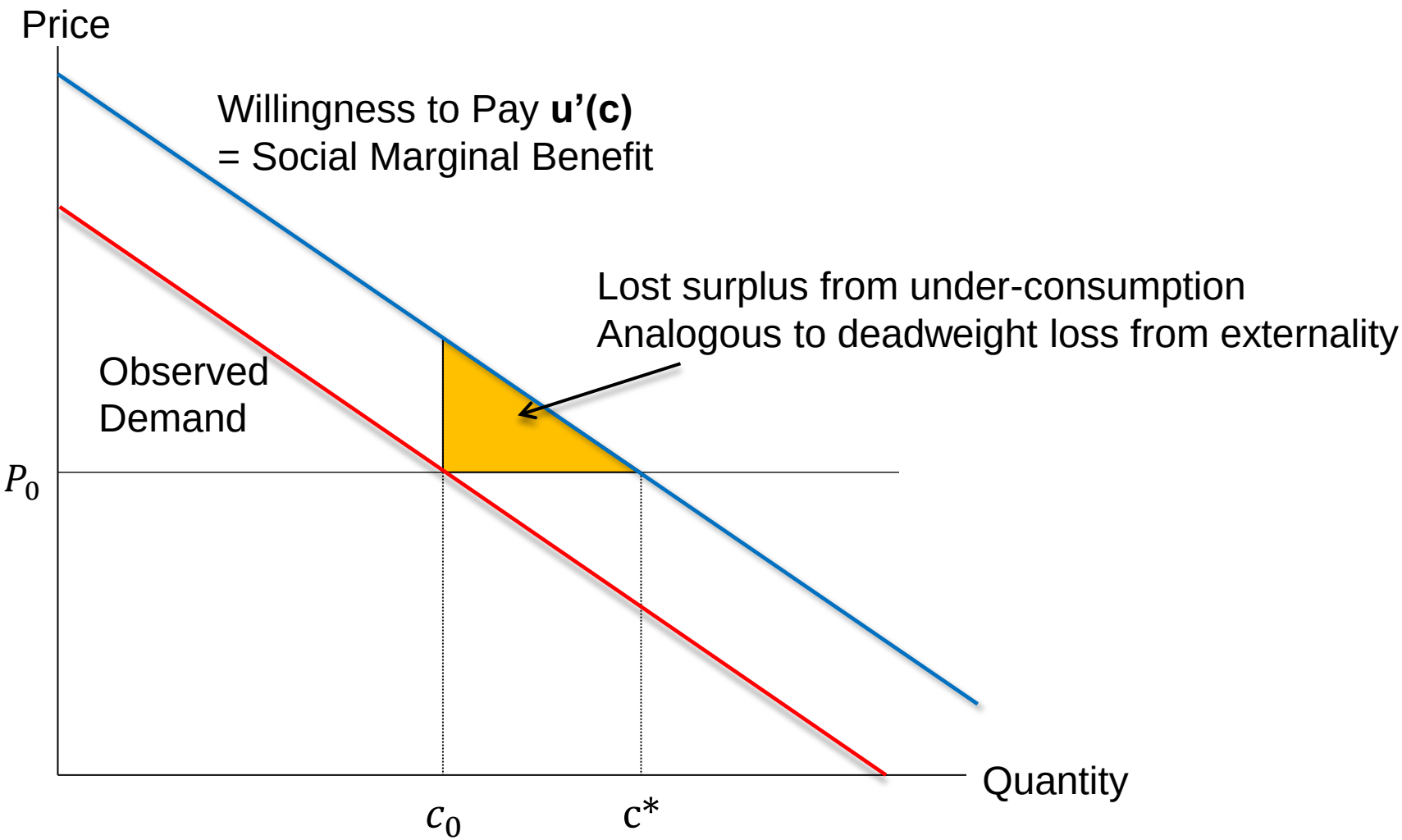
- Neoclassical model: do not intervene unless there are externalities
  - May include intergenerational externalities if parents underinvest in children [Lazear 1983]

Welfare Analysis in Behavioral Models

- How to determine optimal policy if we allow for the possibility of behavioral biases?

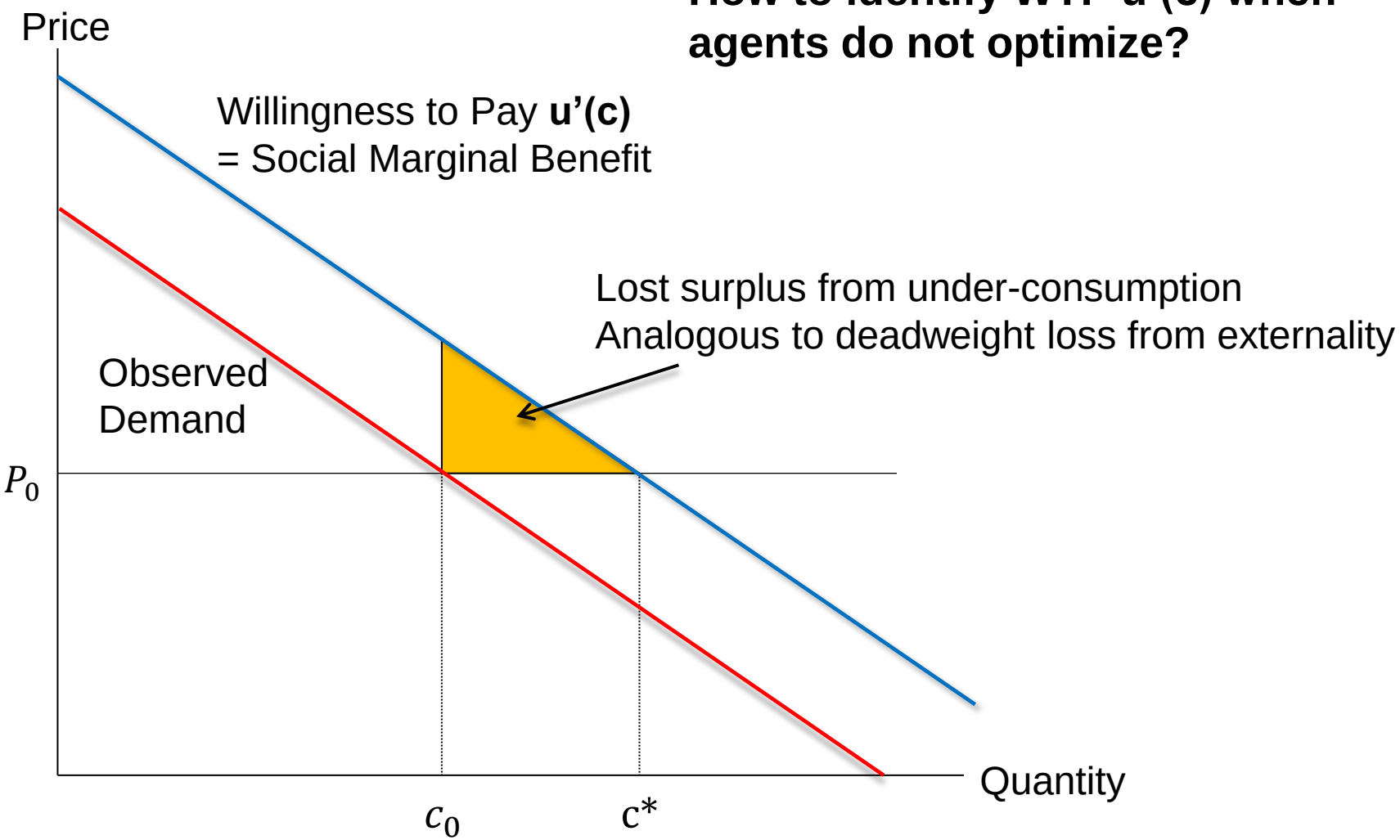
- Challenge: social welfare depends on **experienced** utility, which differs from individuals' decision utility
  - Cannot use revealed preference to identify experienced utility
  - But still feasible to make progress in a non-paternalistic manner, following methods used in literature on externalities

Welfare Analysis in Behavioral Models



Welfare Analysis in Behavioral Models

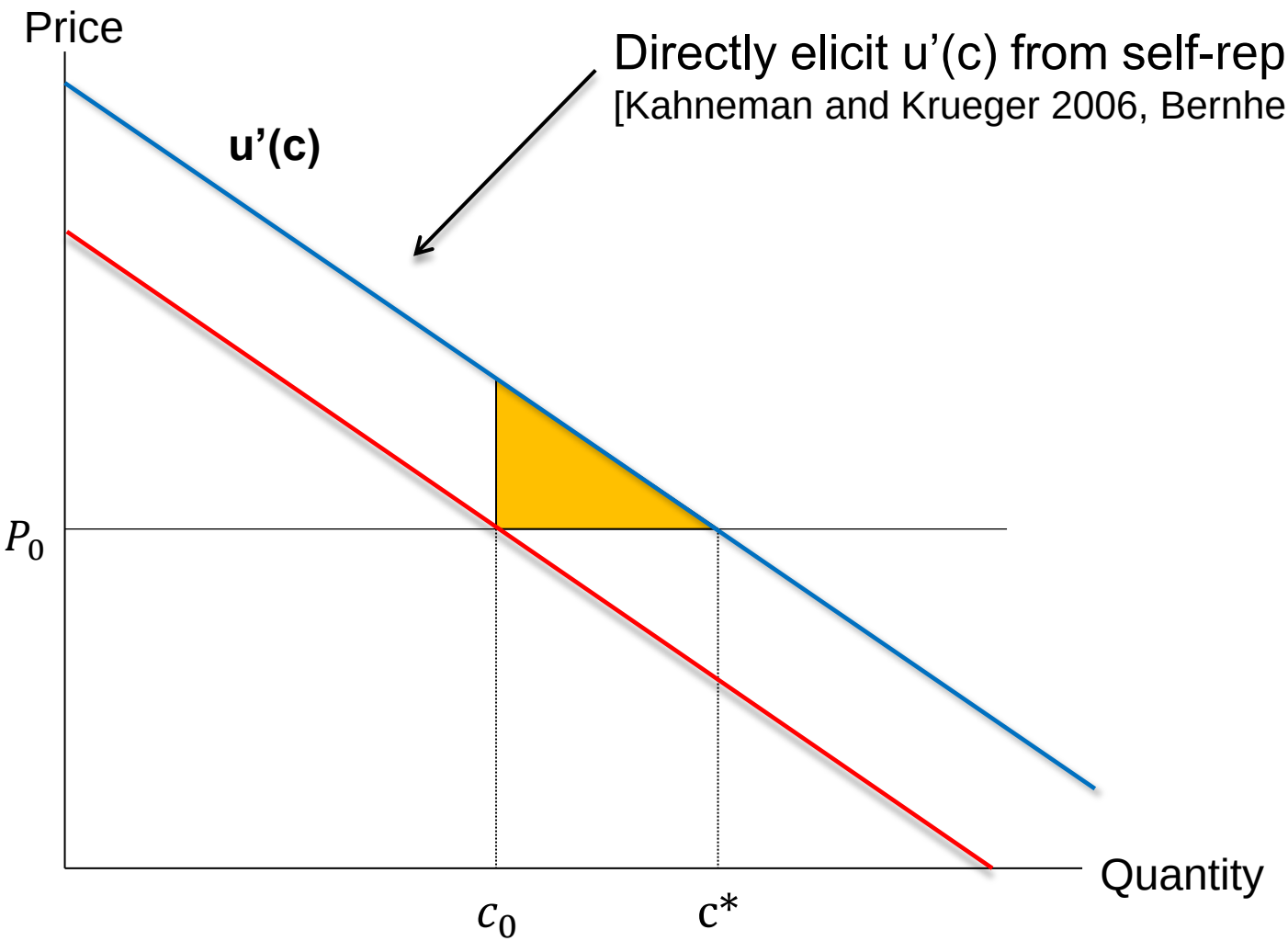
How to identify WTP u'(c) when agents do not optimize?



Three Methods of Identifying Experienced Utility

Method 1: Measure Utility Directly

Directly elicit u'(c) from self-reported happiness
[Kahneman and Krueger 2006, Bernheim et al. 2013]



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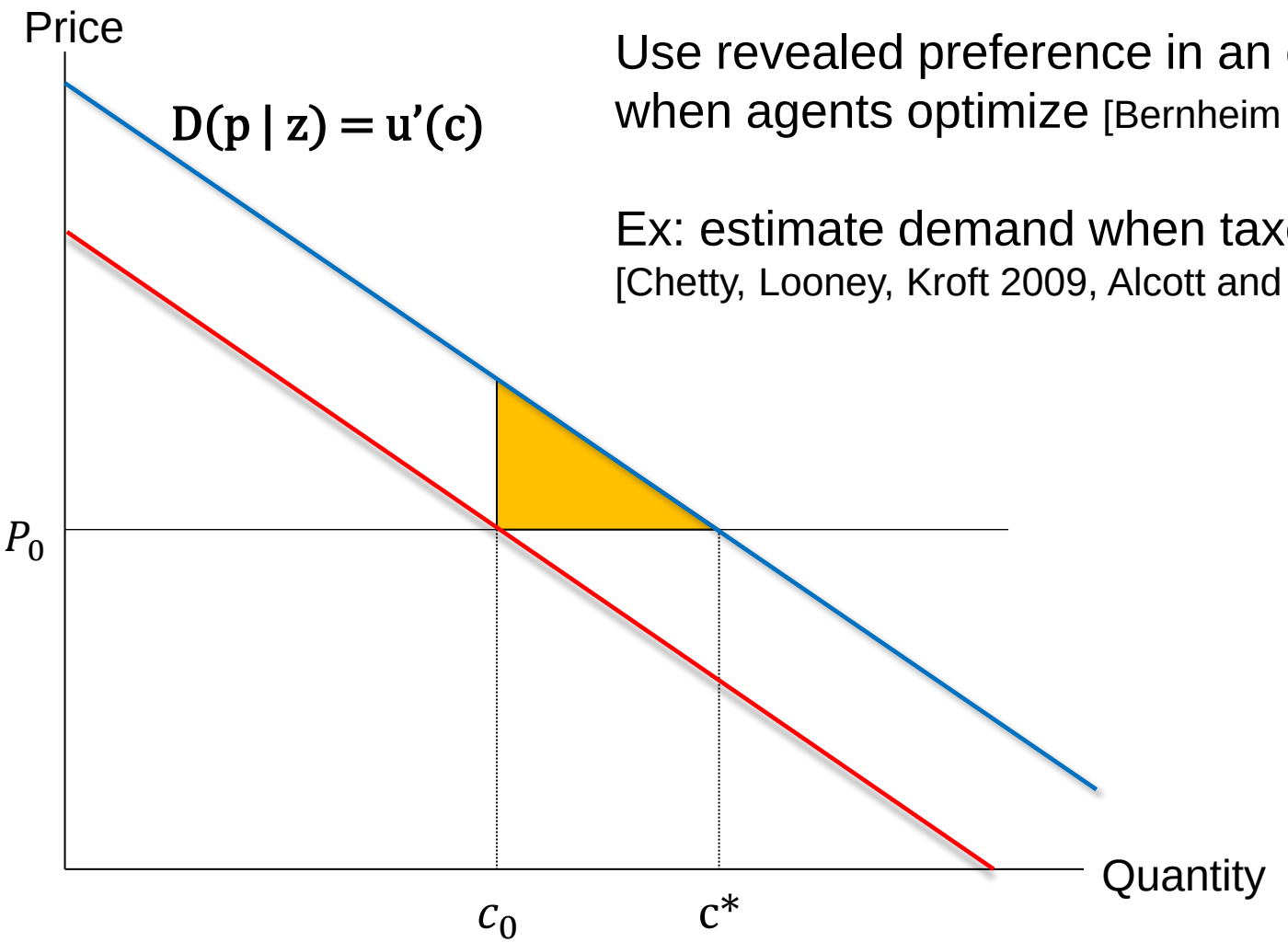


Method 2: Sufficient Statistics

Use revealed preference in an environment when agents optimize [Bernheim and Rangel 2008]

Ex: estimate demand when taxes are salient [Chetty, Looney, Kroft 2009, Alcott and Taubinsky 2013]

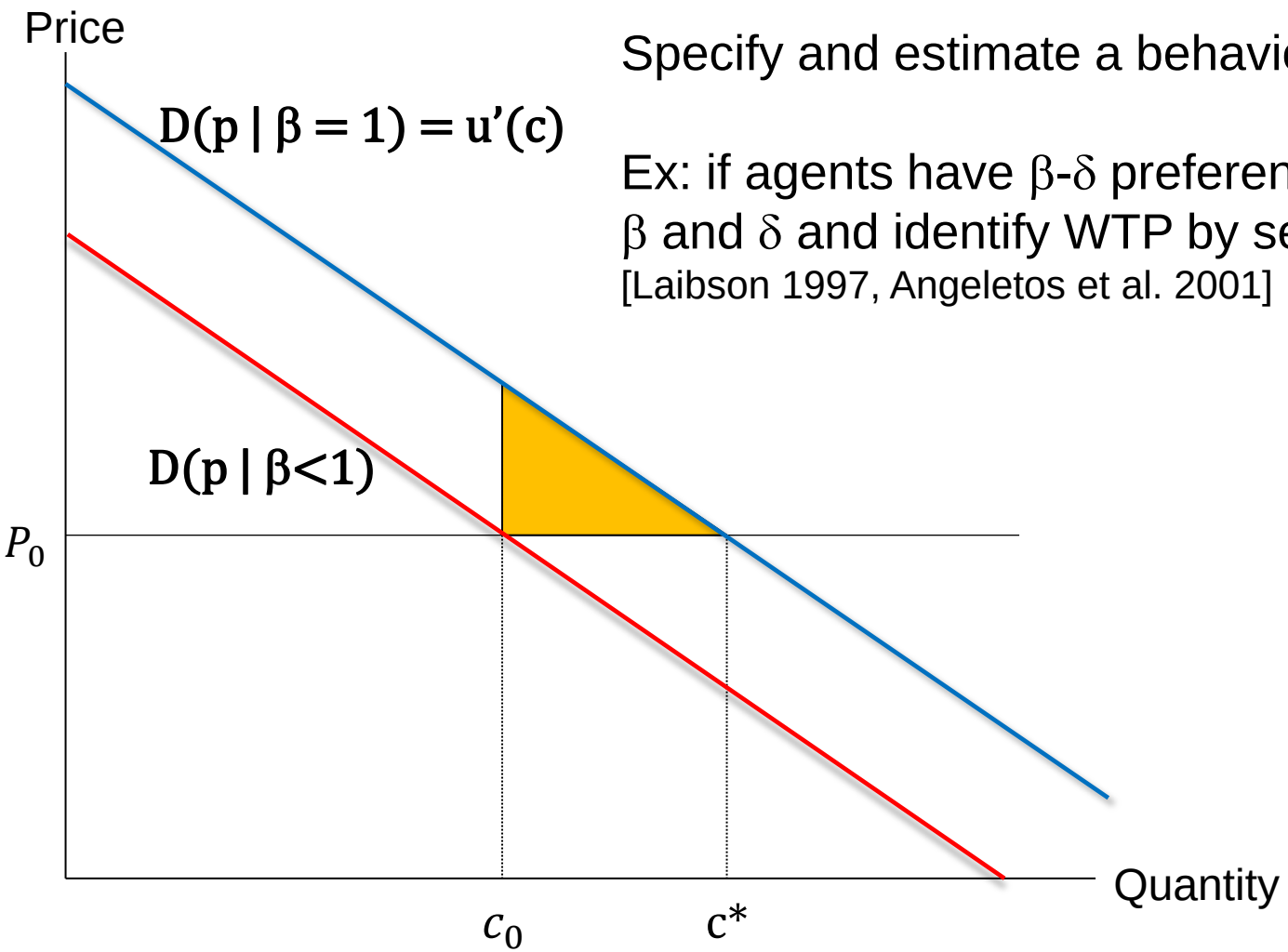
Identifying True Willingness to Pay by Making Taxes Salient

Original tag

Experimental tag to make sales tax salient

Chetty, Looney, Kroft (2009)

Three Methods of Identifying Experienced Utility



Method 3: Structural Modelling

Specify and estimate a behavioral model

Ex: if agents have β-δ preferences, estimate β and δ and identify WTP by setting β=1
[Laibson 1997, Angeletos et al. 2001]

Optimal Policy with Model Uncertainty

- In many applications, we may be uncertain about the underlying positive model given current evidence
  - Both neoclassical and behavioral models can fit the three facts about neighborhood effects
- Given uncertainty about true model, one may be inclined to use the neoclassical model as the default
- A more principled approach is to explicitly account for model uncertainty, as in literature on robust control [Hansen and Sargent 2007]

Optimal Policy with Model Uncertainty

- Two-state example: families either optimize when choosing neighborhoods or are biased toward staying in worse areas
- Suppose optimizers are insensitive to nudges such as framing
  - But behavioral agents are influenced by nudges
- Then optimal policy is to follow behavioral model and nudge agents toward moving to better (e.g., lower-poverty) areas
  - No loss in optimizing state, increase welfare in behavioral state
- Illustrates that neoclassical model should not necessarily be given priority when we are uncertain about the true model

Conclusion: A Pragmatic View of Behavioral Economics

- Central message: view decision to include behavioral factors as a pragmatic rather than philosophical choice
  - Behavioral factors are critical in some applications, but might be safely ignored in others
  - Just like deciding whether to assume quasi-linear utility or time separability for a given application
  - Dividing field into “behavioral” and “neoclassical” economics is akin to distinguishing “time separable” economists from others
- This pragmatic approach follows naturally from widely accepted methodological traditions in our profession [Friedman 1953]
  - More importantly, it can help us answer critical policy questions, from childhood to retirement