

# **Disability Benefits and Household Labor Supply**

Evidence from Judicial Variation in Brazil's BPC Program

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## Motivation

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# The Big Picture

## Disability programs are huge but poorly understood

- Major expenditure in most countries (1-2% of GDP)
- Key tension: insurance provision vs. work disincentives
- Most causal evidence from US/Norway contributory systems

## The gap:

- Almost no rigorous causal evidence from developing countries
- Nothing on non-contributory disability programs
- Limited understanding of informal sector responses

**This project:** Use judge IV to study Brazil's BPC disability program



## Literature & Contribution

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## The Judge IV Literature

Paper	Setting	Outcomes	Key Finding
Maestas et al. (2013)	US SSDI	Own employment	-28pp employment
French & Song (2014)	US SSDI	Own labor supply	-26pp LFP
Autor et al. (2019)	Norway DI	Household comprehensive	Spousal offset, consumption smoothing

### Common features:

- Exploit quasi-random variation in approval (judges, examiners, etc.)
- Contributory disability insurance systems
- Developed country labor markets

### Alternative identification strategies:

- Gruber (2000): Benefit generosity variation (Canada)
- Moore (2015): Policy-induced terminations (1996 welfare reform)
- Autor, Duggan & Lyle (2011): Draft lottery IV for VA disability
- Von Wachter et al. (2011): Trends comparing allowed vs. rejected
- Dahl et al. (2014): RD in eligibility:

### Key finding across methods:

- DI substantially reduces labor supply
- But provides valuable consumption insurance
- Trade-offs depend on context and design

# Developing Country Context

## Informality and social programs:

- Gerard & Gonzaga (2021): Social programs affect formal/informal choice in Brazil
- Almeida & Carneiro (2012): Labor regulation enforcement and informality

## Non-contributory pensions:

- Case & Deaton (1998): South Africa old-age pensions
  - Positive effects on household welfare, children's health
- **Carvalho Filho (2008): Brazil's rural pensions/BPC old-age**
  - Workers receiving benefits work 22.6 hours less per week
  - 38pp more likely to quit working
  - Uses age discontinuity design

**Key difference:** These study old-age pensions, not disability

## How This Project Differs (1/2)

### 1. Institutional Context

- **Non-contributory** vs. contributory
  - No work history requirement → different population
  - Means-tested (25% minimum wage) → different margins
  - Pure redistribution, not insurance

### 2. Labor Market Context

- High informality (~40%)
- Extended family structures more common

### 3. Disability vs. old-age

- Carvalho Filho (2008) studies BPC old-age component
- **This is first causal study of BPC disability**

## How This Project Differs (2/2)

### What We Can Study

Outcome	US/Norway Papers	This Project
Formal employment	Y	Y
<b>Informal employment</b>	N	Y
<b>Sector choice</b>	N	Y
Household labor supply	Y	Y
Consumption	Y	?
Program substitution	Y	Y

**Key advantage:** Can study formal/informal sector responses

**Our contribution:** Judge IV for non-contributory disability in developing country, with informal sector analysis

# Why Informal Employment Matters

The policy question in developing countries isn't just:

- “Do benefits reduce work?”

But also:

- “Do benefits push workers into informality?”

Implications:

- Fiscal costs (lost tax revenue)
- Social security coverage
- Labor market structure
- Program design (how to treat informal income?)

No other judge IV paper can study this

## Potential Extension: Optimal Design

### If data permits, estimate Marginal Treatment Effects (MTE)

- Effects vary by disability severity (unobservable)
- Use observables (diagnosis, work history, demographics) to construct “predicted approval” index
- Characterize heterogeneity along this distribution

### Policy question:

- Given tradeoffs (insurance vs. fiscal cost), where should eligibility threshold be set?
- Show effects of moving threshold

Would move paper from descriptive to prescriptive

## Conservative scenario (basic LATE):

- Novel setting, important program
- Clear contribution vs. US/Norway papers and Carvalho Filho (2008)
- First causal evidence on BPC disability

## Optimistic scenario (with MTE + optimal design):

- Methodology + policy counterfactuals
- Contribution: “Optimal disability program design in resource-constrained settings”



## **Institutional Context**

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## Benefício de Prestação Continuada (BPC)

- Constitutional right established 1988, implemented 1993
- Two components: old-age (65+) and **disability** (any age)

### Eligibility for disability BPC:

- Long-term disability preventing work participation
- Household per capita income <  $\frac{1}{4}$  minimum wage
- Must be registered in Cadastro Único
- Medical and social evaluation by INSS

### Benefits:

- One minimum wage per month (~R\$1,400 / ~\$280)
- No work history requirement (non-contributory)
- Does not leave pension upon death

# The Appeals Process

## Initial application:

1. Registration in Cadastro Único (if not already)
2. Apply through INSS
3. Medical evaluation by INSS doctors
4. Social evaluation

## If denied → Judicial appeal:

- Case goes to federal court
- Assigned to a judge
- Judge reviews case, may request additional medical evidence
- Judge makes final determination

**Key for identification:** Judge assignment plausibly random

# Why Judge IV Should Work Here

## Assignment mechanism:

- Cases assigned to judges within court by rotation/caseload
- Conditional on court  $\times$  time, should be as-good-as-random
- **Testable:** balance on observables

## Judge discretion:

- Disability assessment inherently subjective
- “Unable to participate fully in society”
- Judges have latitude in weighing evidence
- Expected variation in leniency

Similar to US/Norway settings where method has worked

# Key Contextual Differences

## Why effects might differ from US/Norway:

1. **Means test:** Income threshold creates additional margin
  - Can work informally below threshold
  - Household income pooling strategies
2. **No work requirement:** Different population
  - Less labor market attachment
  - Poorer, more vulnerable
3. **Informality:** Can exit formal sector
  - Maintain some work while on benefits
  - Harder to detect/enforce

**These differences make the study valuable!**



## **Research Design**

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## Judge IV Approach

Standard two-stage setup:

$$Y_i = \alpha + \beta \cdot BPC_i + X'_i \gamma + \epsilon_i$$

$$BPC_i = \delta + \lambda \cdot JudgeLeniency_j + X'_i \theta + \nu_i$$

Where:

- $Y_i$  = outcome (employment, household labor supply, etc.)
- $BPC_i$  = received BPC disability benefits
- $JudgeLeniency_j$  = judge j's leave-one-out approval rate
- $X_i$  = controls (court  $\times$  time FE, case characteristics)

**Interpretation:** LATE for marginal appellants (compliers)

# Outcomes of Interest

## Primary outcomes:

### 1. Own labor supply

- Formal employment (RAIS)
- Informal employment (Cadastro self-report)
- Total labor supply (formal + informal)
- Sector choice (formal → informal)

### 2. Household labor supply

- Spouse/partner employment and earnings
- Other working-age household members
- Intensive and extensive margins

# **Outcomes of Interest (cont.)**

## **Secondary outcomes:**

### **3. Program interactions**

- Bolsa Família receipt/amounts
- Other BPC awards in household (old-age, other disabilities)

### **4. Household structure**

- Household size and composition
- Multi-generational household formation
- Living arrangements

### **5. Consumption (if feasible)**

- Basic expenditure categories from Cadastro
- Housing, food, transportation, medicine

# Data Linkage Strategy

## Three administrative datasets:

### 1. Judicial records (to be obtained)

- Case characteristics, judge assignment, decision
- Hopefully: diagnosis, disability type, severity
- CPF (national ID) for linkage

### 2. Cadastro Único (Social Registry)

- All household members, demographics
- Self-reported employment status (formal/informal)
- Income, expenditures, program participation
- Updated every ~2 years or when changes

### 3. RAIS (Formal employment records)

- Universe of formal employment spells

Monthly earnings, occupation, industry

## Extension 1: Marginal Treatment Effects

Beyond average effects: how do impacts vary across compliers?

Standard LATE tells us:

- Average effect for marginal appellants (those swayed by judge leniency)

MTE tells us:

- How effects vary along the distribution of unobserved resistance
- Selection patterns: who is most/least responsive to benefits?
- Welfare-relevant heterogeneity

Example insights:

- Effects largest for least disabled (moral hazard)
- Or: effects similar across distribution (uniform response)

# MTE: What It Requires

## Technical requirements:

- Variation in judge leniency (discrete instrument)
- Strong first stage across the distribution
- Sufficient sample size at tails

## Methodological approach:

- Brinch, Mogstad & Wiswall (2017) / Mogstad, Santos & Torgovitsky (2018)
- Designed for discrete instruments like judge assignment

## Data requirements:

- Same as basic judge IV
- No additional observables strictly needed

**Deliverable:** MTE( $u$ ) curve showing how effects vary with unobserved propensity to be 23

# What MTE Would Add

## Policy-relevant insights on selection:

### 1. Who responds most to benefits?

- Do least disabled reduce work more? (moral hazard story)
- Or similar responses across severity? (uniform insurance needs)

### 2. Heterogeneous fiscal implications

- Marginal entrants vs. inframarginal recipients
- Cost-effectiveness varies along distribution

### 3. Connection to policy parameters

- Welfare analysis requires understanding heterogeneity
- Average effects can be misleading for policy design

Still descriptive, but richer characterization than LATE alone

## Extension 2: Mapping MTE to Policy

**More ambitious:** connect MTE to observable characteristics

**Construct predicted approval index:**

$$\hat{P}(\text{Approved}|X) = f(\text{disability type, age, education, work history, ...})$$

**Then show:**

- How MTE varies with observables:  $\text{MTE}(\hat{P}(X))$
- “Effects are largest for applicants with [characteristics]”

**Enables policy simulations:**

- Change eligibility threshold (tighten/loosen)
- Show effects on: coverage, fiscal cost, labor supply, welfare
- Answer: “Where should we draw the line?”

## Extension 2: Requirements

### Critical data requirements:

#### Need:

- Rich observables in judicial records (especially disability diagnosis/severity)
- These must predict approval with reasonable accuracy
- Check: Can we construct an index with  $\text{pseudo-}R^2 > 0.10$ ?

#### If yes:

- Map  $\text{MTE}(u)$  to  $\text{MTE}(P(X))$
- Simulate policy counterfactuals
- Provide optimal design analysis

#### If no:

- Still have basic MTE (Extension 1)  
But can't move to specific policy recommendations

## Two-Stage Decision Process

### Phase 2 Decision Point 1: Is judge IV feasible?

- Do we have data access?
- Is judge assignment random?
- Is first stage strong?

→ If NO: Project ends → If YES: Proceed to basic LATE analysis

### Phase 2 Decision Point 2: Is MTE feasible?

- Strong first stage across distribution?
- Sufficient sample size?

→ If NO: Stick with LATE (still publishable) → If YES: Add Extension 1 (MTE heterogeneity)

### Phase 3 Decision Point: Is policy simulation feasible?



## Data Challenges

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## Challenge 1: Accessing Judicial Records

### Current plan

- Collaboration with a Brazilian coauthor with Econ/Law background.

### Key questions:

- What information is available?
- Can the cases be linked to RAIS/Cadun?
- How many cases?
- Is there enough variation in judge leniency?

**Need to:** Map out access strategy soon

## Challenge 2: Data Content

### Best case scenario:

- ICD diagnosis codes or detailed categories
- Severity measures (mobility, ADL limitations)
- Medical reports/documentation quality
- Reason for initial denial

### Realistic scenario:

- Broad disability categories (mental, musculoskeletal, etc.)
- Basic demographics
- Some work history info

### Worst case:

- Only administrative basics
- No disability specifics

## Challenge 3: Linkage Quality

### Potential issues:

#### 1. CPF availability/quality in judicial records

- Older records might not have CPF
- Transcription errors

#### 2. Cadastro coverage

- Should be universal for applicants (required for BPC)
- But: timing issues, missing recertifications

#### 3. Match rates

- Need >80% to be confident
- Missing not random → selection issues

**Need to:** Test with sample data early

## What We Know Works

### From prior experience with Brazilian administrative data:

- Cadastro employment status gives sensible results
  - Not perfect, but detectable patterns
  - Updated at recertification (~2 years) or major changes
- Pre-period should exist
  - Must be in Cadastro before BPC application
  - Gives baseline measures

**Cautiously optimistic about data quality**



## Conclusion

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# Summary

## Core contribution:

- First rigorous causal evidence on non-contributory disability in developing country
- Novel angle: formal/informal sector responses
- Important policy question: how do these programs affect labor markets?

## Upside potential:

- If MTE works: can speak to optimal program design
- Unique contribution given developing country context

## Main uncertainty:

- Data access and quality
- But: promising signs from institutional setup and prior experience

**Next step:** Data reconnaissance to assess feasibility

**Thank You**