Disability Benefits and Household Labor Supply

Evidence from Judicial Variation in Brazil's BPC Program

Joao Garcia

Motivation

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

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

Broader DI Literature

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 $\rightarrow$ different population
    - Means-tested (25% minimum wage) $\rightarrow$ 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
Informal employment	N	**Y**
Sector choice	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

Publication Positioning

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

Brazil's BPC Program

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 < ¼ 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

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:

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

Then show:

- How MTE varies with observables: $MTE(\hat{P}(X))$
- "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 pseudo-$R^2 > 0.10$?

If yes:

- Map MTE(u) to MTE(P(X))
- Simulate policy counterfactuals
- Provide optimal design analysis

If no:

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

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?

$\rightarrow$ If NO: Project ends $\rightarrow$ If YES: Proceed to basic LATE analysis

Phase 2 Decision Point 2: Is MTE feasible?

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

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

Phase 3 Decision Point: Is policy simulation feasible?

Data Challenges

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

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