"Fundamentally Reforming the Public DI System: Evidence from German Notch Cohorts"

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Abstract/Specific Aims: This project will comprehensively evaluate a reform of the public Disability Insurance (DI) system in Germany. Effective 2001, cohorts born after 1960 are no longer eligible for "occupational DI." Occupational DI (ODI) implies benefit eligibility if employees are no longer able to work in their *previous occupation*. For the affected notch cohorts, the new DI eligibility rules require that their reduced work capacity must prevent them from working in *any* job. The existing literature has primarily analyzed labor supply effects of marginal DI applicants (e.g. Maestas et al. 2013). However, the broader consequences of reducing public DI generosity for (i) intensive labor supply effects, (ii) possible program substitution via early retirement, unemployment insurance or medical leave, (iv) household income and (v) possible interaction effects with private insurance demand are poorly understood. As DI systems are relatively similar across OECD countries, experiences from countries like Norway, the Netherlands or Germany hold important lessons for the U.S. (Kostøl and Mogstad 2014; Koning and Lindeboom 2015; Burkhauser et al. 2016, Coile and Börsch-Supan 2021).

This project will use several administrative and representative survey datasets to estimate the impact of the 2001 reform on public DI inflows and specific labor supply effects of the notch cohorts. Further, it will assess how the well-being of older employees with work limitations changed as a consequence, and whether they compensated economic shortfalls through program substitution (early retirement, UI, medical leave) or an increased demand for private insurance. It will also study the overall impact of a less generous public DI system on household income. Naturally, a particular focus is on the economic and household consequences for older workers and how they manage to bridge the years until the official retirement age at age 63 or 65.

To achieve these goals, we will focus on older workers and

- Estimate the casual impact of reduced public DI on the inflow of DI recipients.
- Estimate the casual impact of reduced public DI on earnings, labor supply and well-being.
- Estimate the causal impact of reduced public DI on alternative social insurance routes like early retirement, unemployment insurance or medical leave.
- Empirically the causal impact of reduced public DI on the demand for private DI.
- Analyze the German private individual ODI market theoretically and empirically.

Significance: This project will illuminate the U.S. discussion about possible reforms of the public DI system. Given high recipiency rates, economists have long proposed more restrictive eligibility criteria to reduce the inflow of SSDI beneficiaries (Autor and Duggan, 2003; Burkhauser and Daly 2012). The German experience holds important lessons as to what type of effects a substantial reform of the public DI system could trigger. Further, our comprehensive analysis of the biggest private individual DI market in the world will hold important lessons for U.S. market regulation and how to enable more private coverage. To do so, we will use several high quality administrative and survey datasets. They allow us to study the reform consequences along several margins and differentiate between short- and long-term effects. A particular focus is on the economic and household consequences for older and lower-income workers who are at the highest risk of work disability.

Given data limitations, most published SSDI research in economics has focused on labor supply effects of marginally rejected applicants and concluded that employment rates among marginally rejected applicants are 10 to 30 percentage points higher compared to marginally accepted applicants (Bound 1989; Chen and van der Klaauw 2008; von Wachter et al. 2011, Maestas et al. 2013; French and Song 2014). At the same time, it is a consensus among DI researchers that experiences from other OECD countries hold crucial lessons for the United States; several influential studies have analyzed reforms in the Netherlands, Norway, Sweden or Australia (de Jong 2011; Borghans et al. 2014; Dahl et al. 2014; Autor et al. 2019; McVicar et al. 2022).

So far, no study has comprehensively evaluated the consequences of a fundamental reform of the DI system on a rich set of outcome margins as proposed here. Specifically, the context and data allow us to

causally identify the effects of tightening eligibility criteria on inflows, labor supply, well-being, household income as well as program substitution and demand for private insurance. These elements contribute to the NBER's research initiative "Economics of Working Longer and an Aging Workforce." In particular, our research will enrich our knowledge of how the design of public and private DI markets affects older workers' labor supply and decision to use possible alternative social insurance routes until reaching the official retirement age. A particular focus will be on the ability of the modern welfare state to maintain work capacity into old age. Specifically, as Germany has a robust medical leave, medical rehabilitation and workplace accommodation system, a crucial question is whether reduced public DI inflow may in fact help to support frail employees and increase the years of part-time or full-time work until retirement.

Data: We are planning to use two administrative and three representative survey datasets along with data from the private insurance industry to answer the questions described above. In particular, we will use:

1. **Administrative DI inflow data from the German Statutory Pension Insurance (SPI)**, separately by year, age and cohort. We will normalize the number of inflows by cohort population size in each year.[1] Using data from 1995 to 2018, we will then study whether the 2001 reform reduced public DI inflow rates for the notch cohorts whose public DI was downgraded. We received these data and have first promising results. Accordingly, the reform reduced inflows by 25% in the long-run.
2. **Administrative panel data from a stratified random 5% sample of all insurance accounts from the SPI**. These data include the complete work histories of all Germans as well as a monthly account of their type of pension. These data will allow us to test the impact of the 2001 reform on the likelihood to receive DI. Further, it will allow us to study program interaction effects with unemployment insurance, medical leave and other social insurance programs.
3. **Representative survey data from the German Socio-Economic Household Panel (SOEP);** see Goebel et al. (2019). Specifically, we will focus on the years 1995 to 2016, those below the age of 60, and birth cohorts from 1950 to 1970. The SOEP contains rich socio-demographic, health and labor market information including DI receipt. These data consist of the universe of the underlying

[1] We use aggregate population data from the Genesis database of the Federal Statistical Office (*Statistisches Bundesamt*): https://www-genesis.destatis.de/genesis/online (last accessed March 15, 2022).

population and not just select DI inflows as in 1. It will allow us to study the impact of the 2001 reform on public DI receipt using an RD framework as in equation (2) below. Further it will allow us to study the consequences of a health shock that triggers work limitations on a range of outcomes, including life satisfaction, post-tax household income, and labor supply.

4. **Official aggregated private insurance policy data** by the *German Association of Insurers (*GDV) by year and type of policy, derived from the accounting systems of all insurers licensed to sell policies in Germany. Specifically, they measure the inflow of new policies by year and type of insurance. We focus on the market for private ODI, which is one of the biggest markets worldwide. It is almost entirely an individual private market with risk-rated policies and no guaranteed issue. Today, about 35% hold an individual private DI policy (Statistisches Bundesamt 2018).
5. **Representative survey data from SAVE** ("Saving for Old Age in Germany"*)* from 2001 to 2010, see Coppola and Lamla (2013). The SAVE data include a rich set of questions regarding risk aversion, expectations about individual life expectancy, health, and saving for old age attitudes. These are the predictors of insurance demand that are typically unobserved, resulting in asymmetric information. Importantly, SAVE include public DI receipt and private DI coverage, allowing us to study the impact of public DI reforms on the demand for private DI. We will (a) model the risk classification system of private DI insurers to identify households for whom private policies are unaffordable, or whom insurers entirely deny coverage. Moreover, we will (b) use private information to study insurance selection in the spirit of Hendren (2017).
6. **Representative cross-sectional consumption and spending data** from the German Statistical Office (2018) for the years 1993, 1998, 2003, 2008, 2013, 2018. These household data contain detailed measures of household spending and consumption also with information on private ODI policies. They will allow us to study the impact of the 2001 reform on household spending and private ODI demand.

We already have access to datasets 1, 3 -6 and applied for access to datasets 2.

Methods: The main methods of this project will be empirical reduced-form methods, specifically Difference-in-Differences (DD) models and Regression Discontinuity Designs (RD).

In the first part, we use 1. above on the inflow of public DI beneficiaries to study whether the 2001 reform reduced public DI inflow rates for the notch cohorts who experienced a downgrading of their policies. To recall, these were all cohorts born after 1960, that is, those who were 40 years of age on January 1, 2001. Consequently, we will run the following DD model:

$$y_{ct} = \alpha + \beta D_c \times T_t + \delta_t + \rho_c + e_{ct} \quad (1)$$

where y_{ct} denotes the share of new public DI recipients of cohort *c* in year *t*; D_c is a dummy that identifies notch cohorts, that is, people younger than 40 as of January 1, 2001; T_t is a post-reform indicator that turns on 1 after 2000, δ_t are year fixed effects and ρ_c are cohort fixed effects. e_c denotes the error terms, which we cluster at the cohort level. The main identification assumption implies that, absent the reform, the inflow of new public DI beneficiaries in the notch cohorts would have developed in the same manner than the non-notch cohorts. Preliminary results in form on an event study show sharp reductions in inflows and a long-term decrease of about 25%.

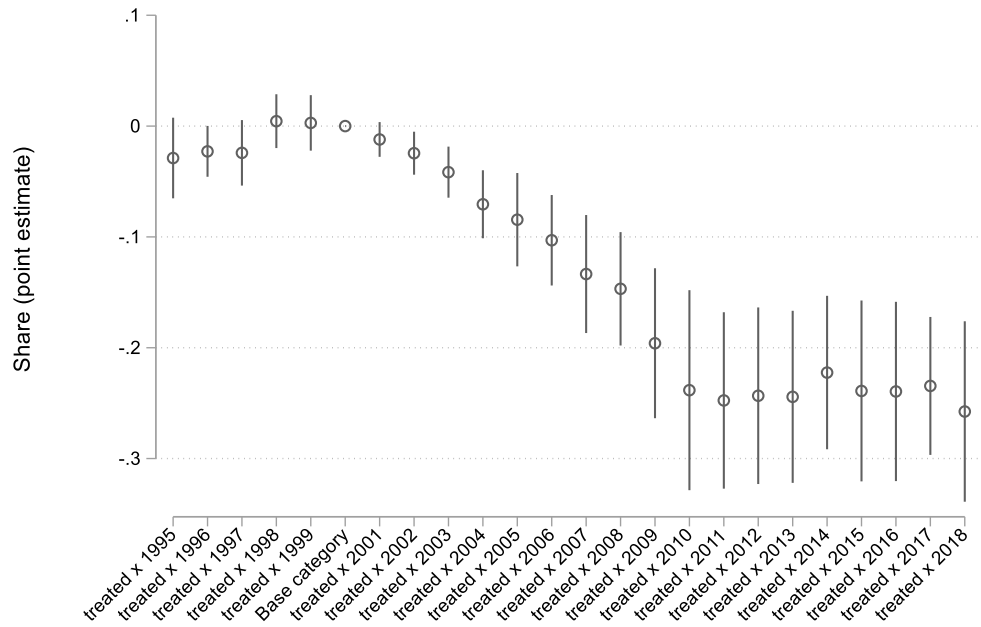


Figure 1: Effect of 2001 Reform on Public DI Inflows Using Administrative Data—Event Study All

In the second part, we use several datasets 2- 6 that include the universe of the underlying population and birth cohorts from 1950 to 1970. That allows us to run a standard RD model of the form:

$$y_{it} = \alpha + \beta D_i + \gamma_0(1 - D_i)f(z_i - c) + \gamma_1 D_i f(z_i - c)T_t + X'_{it}\tau + \delta_t + \rho_s + e_{it} \quad (2)$$

where y_{it} stands for the outcome of individual i and D_i is one if the respondent belongs to the notch cohorts. We will consider a rich set of outcomes from administrative and survey data, such as public DI receipt, use of unemployment or medical leave benefits, household income, well-being or demand for private DI.

The cohort measure z_i enters the empirical model in difference to the reform cutoff c, which is 1961. In our baseline specifications, we include a linear and cubic trend in the running variable $f(z_i - c) = z_i - c$ which allows for different slopes before and after the cutoff. We will also estimate standard local polynomial RD regression models along with models for discrete running variables following the state-of-the art literature (Calonico et al. 2014, 2017, 2018, 2019, 2020; Kolesár and Rothe, 2018).

All regressions include year (δ_t) and state (ρ_s) fixed effects. X'_{it} is a rich set of socio-demographic, educational and job-related controls. The standard errors e_{it} are clustered at the cohort level. The main RD identification assumption implies that no other factor that would affect public DI caseloads trends discontinuously at the birth-cohort level. We are not aware of another reform or factor that could invalidate this assumption.

Statement of Complementarity: There are no relationships to other projects funded by NBER and any other external funding source.

Project Timeline	
Activity	**Completion Date**
Complete forms, acquire and clean data, run descriptive analyses	May 2022
Conduct main regression analyses and robustness checks	July 2022
Solicit feedback/conference presentation	October 2022
Draft final paper and non-technical report	March 2023

Budget

1) Data

   We have already purchased several datasets through other grants but would they only provide data access for three years and one year is already over---hence would budget a second three years to ensure that the paper will be published by then.

   Estimated total: €6500 ~ $8000

2) Investigator Salary:
   It is not clear if Dr. Geyer who is employed by the German Institute for Economic Research would be eligible to budget time and receive extra salary. Currently we only put one effort for Dr. Ziebarth on the wish list but if it turns out that Dr. Geyer could budget time (would need to be approved by his employer) we'd reduce Dr. Ziebarth's effort 1:1. Two months of investigator salary for Dr. Nicolas Ziebarth (nrz2@cornell.edu), Cornell University

   Estimated 2021-2022 9-month salary for Dr. Ziebarth: $184,750

Estimated total: $41,056 + fringe

3) Research Assistant Salary:
We plan to hire a master or undergraduate hourly Research Assistant who receives about $20/per hour for 400 hours: $8000

Estimated total: $8000

4) Travel and Conference Participation
To present the work in Europe and the US, get feedback and revise it.

Estimated total: $10000

5) Other
Submission fees, software ($1000 each)

Estimated total: $2000

Total budget: ~$75,000

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