NBER Pre-Doctoral Fellowship Application

Jacob Berman

December 16, 2017

Social Security is the largest transfer program in the United States and a vast literature across several disciplines studies how its features impact workers and retirees. Research attempting to find causal relationships has focused on the Social Security Notch – a large discontinuity in benefits for those born before or after January 2, 1917. Beyond the Notch, credible identification strategies are rare since benefit rules apply uniformly to nearly every worker, and there is little variation across space or time. In this proposal, I will describe a new source of exogenous variation in Social Security benefit levels and explore how regression discontinuity methods can use this variation to identify the causal impact of benefits on mortality and retirement behavior. The size of these effects could have implications for policymakers debating how to best reform the program.

As a retirement insurance program, Social Security computes a worker's benefit level based on his or her history of earnings. Previous wages (up to the taxable maximum) are deflated using an average wage index, and then the highest 35 years of earnings are used to compute the average indexed monthly earnings (AIME). A worker's full benefit is a kinked, continuous function of the AIME. The marginal replacement rate starts at 90% of AIME, then declines to 32%, 15%, and, finally 0% when the worker hits the maximum benefit threshold. Workers retiring before (or after) their full retirement age receive a permanent, actuarial reduction (credit) in their benefit level so that lifetime benefits are roughly constant. The benefit is computed at the date of first eligibility, and then increased every December by the growth in the CPI to keep real benefits constant over time.

While the structure of this computation is the same for all workers, there are three sets

of parameters which vary discontinuously by date of birth. First, as is well-known, the full retirement age varies by birth cohort. For the affected birth cohorts (1937–1943 and 1954–1960) it increases at a rate of 2 months per year – a change equivalent to nearly a 1 percentage point reduction in benefits. Second, delayed retirement credits vary in a similar way. Finally, there is a less well-known discontinuity that arises from the wage deflator. Workers are first eligible for benefits at age 62, and the base year used to deflate their past earnings depends on their exact date of birth. Earnings for workers born in December 1936 use 1993 as the base year, while earnings for workers born on January 1937 use 1994 as their base year. For workers with identical earnings histories, the change in base years leads an increase in the AIME equal to the rate of change of nominal wages in the previous year. The positive change is then offset by the automatic December cost of living adjustment which is based on the CPI. In short, for workers with birthdays near January 2nd, there is an exogenous change in benefits roughly equal to the rate of increase of average nominal wages minus the growth in CPI. Other policy discontinuities change benefit levels by the same amount for a handful of cohorts. In contrast, the wage deflator discontinuity affects every cohort but by different magnitudes.

Figure 1 illustrates the discontinuity more clearly. The series in blue plots the principle insurance amount for hypothetical workers with identical earnings histories who retire at their 65th birthday. I compare workers at the bottom, middle, top, and maximum of the insured earnings distribution, and I assume all workers are employed continuously from 1960 to 1994. Benefits are computed using the Batch Detailed Calculator provided by the Office of the Chief Actuary of the Social Security Administration (SSA). The red series shows a similar calculation, but includes the effect of the rising retirement age. Note that for those near the cutoff, the change in the wage deflator is more than enough to offset the decline in benefits due to the actuarial reduction. Table 1 shows that the size of the benefit change ranges from a 4% increase to a 2% decrease. This provides an opportunity to test if effects are symmetric around zero. Additionally, the years when the change is near zero allow for a compelling placebo test.

The primary outcome I will focus on is male retirement age. Specifically, I want to measure the elasticity of months worked with respect to benefits. Using the 1937–1943

cohort discontinuities, Mastrobunoi (2009) finds that raising the retirement age by 2 months leads workers to postpone retirement by about 1 month. Similarly Gelber, Isen, and Song (2016) exploit the Notch discontinuity to find that the elasticity of benefits with respect to earnings is about 0.5. Both of these papers, however, fail to account for the large changes due to the wage deflator described above. My setting makes it possible to test if these effects are consistent across cohorts, as well as how they interact with changing retirement ages and delayed retirement credits.

A secondary outcome I will explore is mortality. Snyder and Evans (2006) argue that the reduction in benefits from the Notch discontinuity led to a *decrease* in mortality rates. I will test if that result can be replicated in a new context, and also explore heterogenous treatment effects. The extent to which the mortality effect varies by income groups will help clarify the mechanism at work.

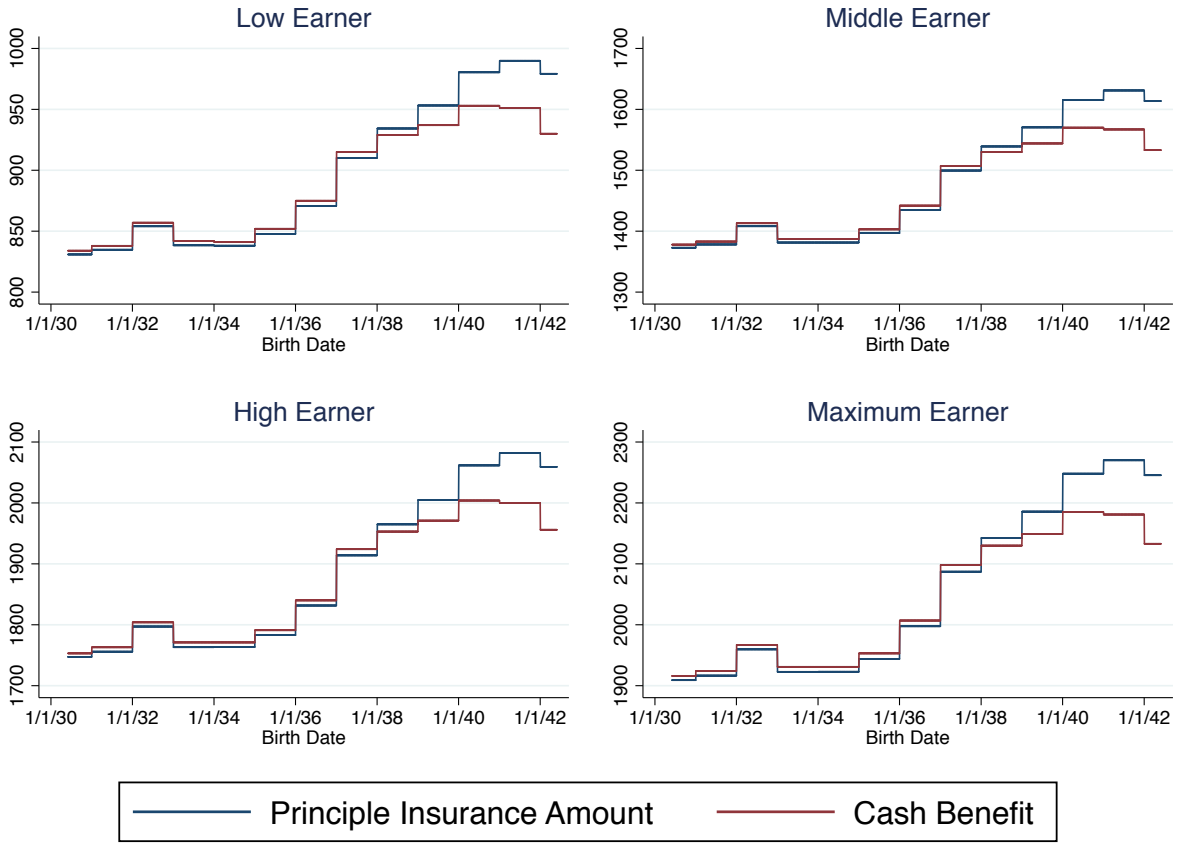
Because my identification strategy depends on observing a worker's exact date of birth, it is not possible to estimate a model using publicly available data. Moreover, for some years the change in benefits is quite small, so I will need the entire population of beneficiaries to maximize statistical power. Under the supervision of Prof. Lleras-Muney, I am preparing an application for access to three SSA administrative datasets: the Social Security Master Earnings File, the Master Beneficiary Record, and the Death Master File. In addition, I am also preparing an application for the restricted access version of the Health and Retirement Study (HRS). The HRS contains many fewer observations, but has a rich set of covariates which will be useful for confirming that no other relevant variables move discontinuously at the January 2 cutoff. For simplicity I will start by focusing only on male earnings and retirement behavior, but plan to include females at a later date.

This NBER Fellowship would provide me with extraordinary support to help measure well-identified causal effects in the nation's largest transfer program. Please feel free to get in touch by email if you have any questions or comments about my proposal.

Table 1: The Impact of Deflators for Workers with Identical Earnings Histories

Birthdate Discontinuity	Change in Entitlement	Change in Cash Benefit
Dec 1930 – Jan 1931	0.4%	0.4%
Dec 1931 – Jan 1932	2.3%	2.3%
Dec 1932 – Jan 1933	-1.8%	-1.8%
Dec 1933 – Jan 1934	0.0%	0.0%
Dec 1934 – Jan 1935	1.2 %	1.2 %
Dec 1935 – Jan 1936	2.7 %	2.7 %
Dec 1936 – Jan 1937	4.5 %	4.5 %
Dec 1937 – Jan 1938	2.6 %	1.5%
Dec 1938 – Jan 1939	2.0 %	0.9%
Dec 1939 – Jan 1940	2.8 %	1.7%
Dec 1940 – Jan 1941	1.0%	-0.2%
Dec 1941 – Jan 1942	-1.1%	- 2.2%

Figure 1: 2016 Social Security Benefits for Workers Retiring at Age 65



Jacob Berman

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Education

- **University of California, Los Angeles** — **Los Angeles, CA**
  Ph.D. Economics — *Expected, June 2020*
  M.A. Economics — *December 2016*

- **University of Chicago** — **Chicago, IL**
  B.A. Economics with honors — *June 2013*
  - Thesis Project: Optimal Maturity Structure for Sovereign Debt

Publications

- Measuring Fiscal Impetus: The Great Recession in Historical Context (with Leslie McGranahan), *Economic Perspectives*, 2014
- The Maturity Structure of Treasury Debt: How Costly is Mismanagement? *Yale Journal of Economics*, 2013

Employment

- **Congressional Budget Office** — **Washington, DC**
  Summer Research Associate — *June 2017-September 2017*
- **Federal Reserve Bank of Chicago** — **Chicago, IL**
  Associate Economist — *June 2013-July 2015*
- **Center on Budget and Policy Priorities** — **Washington, DC**
  Federal Fiscal Policy Intern — *June 2012-August 2012*
- **Booth School of Business, Professor Steven Levitt** — **Chicago, IL**
  Research Assistant — *September 2011 – June 2012*

Awards and Fellowships

- Graduate Research Mentorship, UCLA *(Fall 2017)*
- Graduate Summer Research Mentorship, UCLA *(Summer 2017)*
- David Hu Award for Outstanding Undergraduate Thesis *(Spring 2013)*

Teaching

- TA – Intermediate Microeconomics I, Ed McDevitt *(Winter 2017)*
- TA – Intermediate Microeconomics II, Troy Smith *(Spring 2017)*
- TA – Public Finance, Adriana Lleras-Muney *(Fall 2016, Fall 2017)*

Software

Stata, MATLAB, SAS, Mathematica, ArcGIS

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To whom it may concern,

I am writing to enthusiastically recommend Jacob Berman for the NBER's Pre-Doctoral Fellowship Program on Aging. Jacob is a talented young researcher, and I am convinced that he will make excellent use of the support provided by this program.

Jacob is a third-year in our department studying public finance and labor economics. I met Jacob last year as a student in my graduate course in Population Economics. He proved to be a diligent worker, so I hired him as research assistant to help improve the solutions for the class problem sets given in this applied graduate course where we cover reduced form empirical methods.

I also hired Jacob to work for me as my teaching assistant for my undergraduate course in Public Finance. This was a difficult course that involved teaching both economic theory and applied data analysis. It also required support organizing policy debates and large class simulations. Despite having no previous teaching experience, Jacob did an excellent job and received strong evaluations. He has a clear passion for using the tools of economics to help understand public policy challenges. He has been my TA for two years in a row.

Jacob proposes to investigate the effect of income on retirement ages among men. More specifically he wants to look at the effect of Social Security benefits on the decision to retire, and on the subsequent well-being of retirees including their mortality. This is a question of extreme interest to policy makers, but one for which the empirical evidence is limited.

The existing literature is the heavily focused on the 1917 Social Security "Notch": scholars make use of the fact that the benefits decreased arbitrarily for cohorts born after 1917 relative to those born before because of an unanticipated policy change in 1977. This change in benefits is therefore seen as exogenous to individuals' lifetime choices. By comparing cohorts right before and right after the notch one can identify the effect of larger benefits on retirement and post retirement outcomes.

Jacob's proposal provides a chance to test if the "Notch" results hold in a different context. Specifically there are in fact many different changes in policy that have resulted in arbitrary changes in benefits. These include additional "Notches" (for example driven by changes in the wage deflator used to compute benefits) and the increase in the retirement ages. Together these provide many opportunities to investigate the elasticity of retirement with respect to retirement benefits. This will allow Jacob to estimate this elasticity for many different levels of benefits and

for different cohorts. This approach can also be used to investigate income effects on mortality—another very controversial topic.

I have never seen a paper on Social Security which accounts for these changes. If, as I expect, these discontinuities emerge in the data, it would suggest that existing papers are failing to account for an important program feature. For all of these reasons, I think his project has the potential to be a major contribution to our understanding of retirement behavior.

Jacob and I have spent the past several weeks discussing his research project involving cohort discontinuities in the Social Security retirement benefits formula. Although the idea is still in its early stages, I think it shows enormous promise. The discontinuities he has identified are large enough to observe clear effects and provide a clean identification strategy with easily testable assumptions. For a program as large and well-known as Social Security, such opportunities are rare.

In order to correctly estimate his model, Jacob will require access to restricted administrative data. Jacob will apply for access to the Social Security Administration through the NBER's annual application. While access is difficult to obtain, I have some experience obtaining access and I hope I can help him. I also think that this project will be of interest to the Social Security Administration and thus I think they will be amenable to working with him. I plan on meeting with him regularly to check in on his progress and help him with the details of the application process.

I have no doubt that with my guidance, and the assistance of this fellowship, Jacob will be able to produce excellent work. Please do not hesitate to contact me if you have any questions.



Adriana Lleras-Muney
Professor of Economics