

## UNIVERSITY OF CHICAGO

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### Placement Directors:

Professor Ufuk Akcigit  
University of Chicago Economics  
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University of Chicago Economics  
[herbst@uchicago.edu](mailto:herbst@uchicago.edu)

**Personal Information:** Dual Citizen: USA/UK

### Education

The University of Chicago, 2014 to present  
Ph.D. Candidate in Economics  
Expected Completion Date: June 2020

#### References:

Professor Erik Hurst  
Univ. of Chicago Booth School of Business  
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Professor Ufuk Akcigit  
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Professor Greg Kaplan  
University of Chicago Economics  
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Professor Robert Shimer  
University of Chicago Economics  
[shimer@uchicago.edu](mailto:shimer@uchicago.edu)

Washington and Lee University,  
BA (Honors): Economics, Mathematics, and Russian Language, *summa cum laude*, 2012

### Teaching and Research Fields:

Primary fields: Macroeconomics  
Secondary fields: Labor Economics, Productivity

### Teaching Experience:

Fall, 2016, 2017 Microdata for Macroeconomics (PhD), University of Chicago, TA for Professors Erik Hurst and Thomas Winberry

Winter, 2017 Elements of Economic Analysis III (BA), University of Chicago, Lecturer  
Spring, 2017 Applied Macroeconomics (PhD), University of Chicago, TA for Professor Joseph Vavra

### **Research Experience and Other Employment:**

2017 NBER Entrepreneurship Research Bootcamp  
2012-2014 Federal Reserve Bank of New York, Senior Research Analyst  
2011 Credit Suisse Equities Sales Summer Intern, London

### **Honors, Scholarships, and Awards:**

2014-Present Social Science Department Scholarship, University of Chicago  
2015-2016 Roswell Hartson and Mary McKeon Whitman Scholarship, University of Chicago  
2011 *Phi Beta Kappa*  
2008-2012 Johnson Scholarship, Washington and Lee University

### **Professional Activities:**

#### Referee:

*American Economic Review, American Economic Review: Insights, Economics of Transition, Journal of the European Economic Association, Journal of Political Economy, Quarterly Journal of Economics*

#### Conference and Seminar Presentations (including scheduled):

2019 American Economic Association Meetings (Industrial Organization of Financial Markets); ADP Research Institute; Boston University; Federal Reserve Bank of Chicago; University of Chicago Applications of Economics Workshop  
2018 NBER Summer Institute (Monetary Economics); Federal Reserve Bank of San Francisco; ADP Research Institute; HEC Paris Workshop on Entrepreneurship  
2017 London School of Economics Summer Conference on Entrepreneurship; Society for Economic Dynamics; ADP Research Institute; Washington & Lee University  
2016 Collège de France Symposium of Innovation, Growth and Firm Dynamics.

### **Job Market Paper**

“Skill Heterogeneity and Aggregate Labor Market Dynamics”

*Abstract:* What determines the joint dynamics of aggregate employment and wages over the medium run? This classic question in macroeconomics has received renewed attention since the Great Recession, when real wages did not fall despite a crash in employment. This paper proposes a microfoundation for the medium-run dynamics of aggregate labor markets which relies on worker heterogeneity. I develop a model in which workers differ in their skills for various occupations, sectors employ occupations with different weights in production, and skills are imperfectly transferable. When shocks are concentrated in particular industries, the extent to which workers can reallocate across the economy determines aggregate labor market dynamics. I apply the model to study the recessions of 2008-09 and 1990-91. I estimate the distribution of worker skills using two-period panel data prior to each of these recessions and find that skills became less transferable between the 1980s and 2000s. Shocking the estimated model with industry-level TFP series replicates the increase in aggregate wages in 2008-09, and decline in

1990-91. The model implies that if either the composition of industry shocks or the distribution of skills in the economy had been the same in the 2008-09 recession as in the 1990-91 recession, real wages would have fallen, while employment would have declined less. The declining industries during 2008-09 all employed a similar mix of skills, which induced many low-skill workers to leave the labor force and limited downward wage pressure on the rest of the economy. Finally, the model inspires a novel reduced form method to correct aggregate wages for selection in the human capital of workers, which accounts for cyclical job downgrading by focusing on the wage movements of occupation-stayers. This correction recovers pro-cyclical wages, suggesting the changing composition of the workforce was crucial for aggregate wage dynamics during the Great Recession.

### **Working Papers:**

“Aggregate Nominal Wage Adjustments: New Evidence from Administrative Payroll Data” with Erik Hurst and Ahu Yildirmaz. *NBER Working Paper #25628* (2019), *Revise and Resubmit at the American Economic Review*

*Abstract:* Using administrative payroll data from the largest U.S. payroll processing company, we document a series of new facts about nominal wage adjustments in the United States. The data allow us to define a worker's per-period base contract wage separately from other forms of compensation such as bonuses. We provide evidence that the extent to which base wages adjust is likely the appropriate concept of wage stickiness in many macro models. Nominal base wage declines are much rarer than previously thought with only 2% of job-stayers receiving a nominal base wage cut during a given year. However, accounting for shifts in nominal base wages of job-changers implies that aggregate nominal wages are more flexible than the nominal wages of job-stayers. In addition, we provide evidence that the flexibility of new hire base wages is similar to that of existing workers. Finally, nominal base wage adjustments are state-dependent: downward aggregate nominal wage adjustments were much more common during the Great Recession than in the subsequent recovery period. Throughout, we highlight differences in the adjustment patterns of base wages and of broader wage measures that include bonuses. Collectively, our results can be used to discipline models of nominal wage rigidity.

“Taxation and Innovation in the 20<sup>th</sup> Century” with Ufuk Akcigit, Tom Nicholas, and Stefanie Stantcheva. *NBER Working Paper #24982* (2018), *Revise and Resubmit at the Quarterly Journal of Economics*

*Abstract:* This paper studies the effect of corporate and personal taxes on innovation in the United States over the twentieth century. We use three new datasets: a panel of the universe of inventors who patent since 1920; a dataset of the employment, location and patents of firms active in R&D since 1921; and a historical state-level corporate tax database since 1900, which we link to an existing database on state-level personal income taxes. Our analysis focuses on the impact of taxes on individual inventors and firms (the micro level) and on states over time (the macro level). We propose several identification strategies, all of which yield consistent results: i) OLS with fixed effects, including inventor and state-times-year fixed effects, which make use of differences between tax brackets within a state-year cell and which absorb heterogeneity and contemporaneous changes in economic conditions; ii) an instrumental variable approach, which predicts changes in an individual or firm's total tax rate with changes in the federal tax rate only; iii) a border county strategy, which exploits tax variation across neighboring counties in different states. We find that taxes matter for innovation: higher personal and corporate income taxes negatively affect the quantity, quality, and location of inventive activity at the macro and micro levels. At the macro level, cross-state spillovers or business-stealing from one state to another are important, but do not account for all of the effect. Agglomeration effects from local innovation clusters tend to weaken responsiveness to taxation. Corporate inventors respond more strongly to taxes than their non-corporate counterparts.

“The Rise of American Ingenuity: Innovation and Inventors of the Golden Age” with Ufuk Akcigit, and Tom Nicholas. *NBER Working Paper #23047* (2017)

*Abstract:* We examine the golden age of U.S. innovation by undertaking a major data collection exercise linking historical U.S. patents to state and county-level aggregates and matching inventors to Federal Censuses between 1880 and 1940. We identify a causal relationship between patented inventions and long-run economic growth and outline a basic framework for analyzing key macro and micro-level determinants. We find a positive relationship between innovation and drivers of regional performance including population density, financial development and geographic connectedness. We also explore the impact of social structure measured by slavery and religion. We then profile the characteristics of inventors and their life cycle finding that inventors were highly educated, positively selected through exit early in their careers, made time allocation decisions such as delayed marriage, and tended to migrate to places that were conducive to innovation. Father's income was positively correlated with becoming an inventor, though not when controlling for the child's education. We show there were strong financial returns to technological development. Finally, we document an inverted-U shaped relationship between inequality and innovation but also show that innovative places tended to be more socially mobile. Our new data help to address important questions related to innovation and long-run growth dynamics.

“Searching for Approval” with Sumit Agarwal, Ali Hortaçsu, Gregor Matvos, Amit Seru, and Vincent Yao. (2019)

*Abstract:* We study the interaction of search and application approval in credit markets. We combine a unique dataset, which details search behavior for a large sample of mortgage borrowers, with loan application and rejection decisions. Our data reveal substantial dispersion in mortgage rates and search intensity, conditional on observables. However, in contrast to predictions of standard search models, we find a novel non-monotonic relationship between search and realized prices: borrowers, who search a lot, obtain more expensive mortgages than borrowers with less frequent search. The evidence suggests that this occurs because lenders screen borrowers' creditworthiness, rejecting unworthy borrowers, which differentiates consumer credit markets from other search markets. Based on these insights, we build a model that combines search and screening in presence of asymmetric information. Risky borrowers internalize the probability that their application is rejected, and behave as if they had higher search costs. The model rationalizes the positive relationship between search and interest rates, and highlights the tight link between credit standards and pricing. We estimate the parameters of the model and study several counterfactuals. The model suggests that “overpayment” may be a poor proxy for consumer unsophistication since it partly represents rational search in presence of rejections. Moreover, the development of improved screening technologies from an abundance of data endogenously leads to more severe adverse selection in credit markets. Finally, place-based policies, such as the Community Reinvestment Act, may affect equilibrium prices through endogenous search responses rather than increased credit risk.

## **Publications:**

“Immigration and the Rise of American Ingenuity” with Ufuk Akcigit, and Tom Nicholas. *American Economic Review: Papers and Proceedings* (2017). 107(5): 327-331.

*Abstract:* This paper builds on the analysis in Akcigit, Grigsby, and Nicholas (2017) by using U.S. patent and Census data to examine macro and micro-level aspects of the relationship between immigration and innovation. We construct a measure of "foreign born expertise" and show that technology areas where immigrant inventors were prevalent between 1880 and 1940 experienced more patenting and citations between 1940 and 2000. We also show that immigrant inventors were more

productive during their life cycle than native born inventors, although they received significantly lower levels of labor income than their native-born counterparts. Overall, the contribution of foreign born inventors to US innovation was substantial, but we also find evidence of an immigrant inventor wage-gap that cannot be explained by differentials in productivity.

“Financial Education and the Debt Behavior of the Young” with Meta Brown, Wilbert van der Klaauw, Jaya Wen, and Basit Zafar. *Review of Financial Studies* (2016). 29(9): 2490-2522.

*Abstract:* Young Americans are heavily reliant on debt and have clear financial literacy shortcomings. In this paper, we study the effects of exposure to financial training on debt outcomes in early adulthood among a large and representative sample of young Americans. Variation in exposure to financial training comes from statewide changes in high school graduation requirements. Using a flexible event study approach, we find that both mathematics and financial education, by and large, decrease reliance on nonstudent debt and improve repayment behavior. Economics training, on the other hand, increases both the likelihood of holding outstanding debt and the prevalence of repayment difficulties.

### **Technical Skills**

*Proficient:* Stata, R, Matlab, LaTeX, Microsoft Office

*Experienced:* SAS, Python, ArcGIS, Mathematica, C++

### **Language Skills**

*Native:* English

*Conversational:* French, Russian

*Basic:* Spanish