

Research agenda

UNDERSTANDING INCOME AND WEALTH INEQUALITY

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Income and wealth inequality are at historical highs. 1.5 million sold copies of Thomas Piketty's book "Capital in the 21st century" have demonstrated that inequality is the defining issue of our time. Today, economists, policymakers, and the general public are actively engaged in a discussion about the causes and consequences of high and rising inequality and its implications for reforming the tax and social security system, as well as labor and financial market institutions. Although the debate is often coined in economic terms, it touches very fundamental issues like social cohesion in democratic societies.

But our understanding of the driving forces of inequality is still hazy. Why do some people earn so much more than others? Why do some people possess fortunes while others have barely any wealth? Does income inequality lead to wealth inequality, or vice versa? More generally, what determines the joint distribution of income and wealth? Answering these pivotal questions about inequality in contemporary societies is paramount to understand its consequences and constitutes the focus of my research agenda. I approach these questions by exploring existing datasets but also compile new ones. Newly-compiled data allows me to adopt new perspectives on inequality. In existing data, I take a more granular view at differences along the income and wealth distribution. I use the resulting evidence to inform my model-building. While traditional work studied wealth inequality as the result of an exogenous stochastic income process, the guiding idea of my work is that the income and wealth distribution are determined jointly so that policy changes reshape both. Based on this idea, I develop new models to study policy reforms in unequal societies.

My research agenda builds on a long tradition in modern economic research. 100 years ago, at the 31st annual meeting of the American Economic Association, the then-president Irving Fisher said that "the causes and cures for the actual distribution of capital and income among real persons" is a subject that needs "our best efforts as scientific students of society." This is the goal I have set myself, and it is a great pleasure for me to present my research agenda in this newsletter. Let me add at the beginning that my research relies on an extensive and invaluable collaboration with coauthors in Bonn and elsewhere.

In my discussion, I will focus on three specific topics. The first topic addresses the connections between income and wealth inequality. I will start with a brief discussion of my recent paper

(Kuhn, Schularick and Steins, 2017a) in which we compile and analyze a new micro-level dataset spanning seven decades of U.S. economic history. Using this data, we document strongly diverging trends between income and wealth inequality. We demonstrate that house price dynamics and portfolio heterogeneity of households explain these diverging trends. Second, I will discuss my recent work on the sources of earnings inequality. In Bayer and Kuhn (2017a), we explore a unique matched employer-employee dataset from Germany to revisit a key question from human capital theory about the importance of employers, education, experience, and job characteristics in determining wage differences. We find that a job's hierarchy level encoding responsibilities and independent decision making required in the job is the most important driver of wage differences. Third, I will discuss my work to develop models to explore how policy changes affect earnings dynamics and the distribution of earnings. I will focus on a life-cycle labor market model developed in Jung and Kuhn (2016) that is jointly consistent with facts on worker mobility and earnings dynamics, focusing in particular on large and persistent earnings losses after worker displacement. At the end of the discussion of each of the three main topics, I will briefly touch upon companion works that explores the link between rising inequality and household debt (Kuhn, Schularick and Steins, 2017b), heterogeneity in earnings dynamics (Bayer and Kuhn, 2017b), and the effects of changes in the unemployment insurance system on labor market dynamics (Hartung, Jung and Kuhn, 2017). I will also take the opportunity to briefly talk about related work with José-Víctor Ríos-Rull (Kuhn and Ríos-Rull, 2016) providing a comprehensive reference on facts of U.S. earnings, income, and wealth inequality, and with Tom Krebs and Mark Wright (Krebs, Kuhn and Wright, forthcoming in the RED special issue on human capital and inequality) exploring the interaction of human capital accumulation, financial markets, and inequality.

1. Connections between income and wealth inequality

In Kuhn, Schularick and Steins (2017a), we provide newly compiled micro data for the income and wealth distribution of U.S. households over the entire post-World War II period. Despite the popular perception that inequality is the defining issue of our time, the existing micro data to study inequality trends spanning several decades remains very limited.

The newly compiled data is based on historical waves of the Survey of Consumer Finances (SCF) going back to 1949. We cleaned and harmonized the historical data to build a new dataset that we refer to as harmonized historical Survey of Consumer Finances (HHSCF). We expect that this new micro data will offer also other researchers the opportunity to address important questions with respect to changes in the financial situation of U.S. households since WW2.

In Kuhn, Schularick and Steins (2017a), we use this data to complement existing evidence on long-run trends in inequality discussed by Saez and Zucman (2016) and Piketty and Saez

(2003). Most of the debate about rising inequality focused -mainly due to data limitations- at income and wealth concentration among the richest households. HHSCF data allows us to complete the existing picture on rising inequality by providing a granular picture of inequality trends among the large group of the bottom 90% of households. Existing tax data can only draw the rough contours of the developments in these strata. The paper demonstrates a strong hollowing out of the middle class. The much-debated income and wealth concentration at the top was accompanied by losses concentrated among the middle 50% of the income and wealth distribution. In other words, the middle classes lost out.

We then contrast the evolution of income inequality to the evolution of wealth inequality over time. Conceptually such a comparison of changes in income and wealth inequality is intricate because changes in inequality measures like the Gini coefficient are hard to compare if wealth inequality exceeds income inequality initially. We construct what we call the "inequality gradient". The inequality gradient measures growth differences along the distribution relative to a distribution of inequality-neutral growth, i.e. a situation when all groups grow at the same rate. When we compare changes of income and wealth inequality over time, we find an asynchronous and asymmetric increase. Income inequality increased earlier than wealth inequality and more so. We find the strongest increase of income concentration between 1970 and 1990; over most of this time period, wealth concentration decreased. We find almost the mirror image during the financial crisis and its aftermath when wealth concentration strongly increased while income concentration increased only little. Exploring the joint evolution of income and wealth inequality has the potential for important new theoretical insights. The canonical consumption-savings model keeps a tight grip on their joint evolution. It is therefore an open question if and in how far the trends we discuss pose a challenge to recent attempts to model trends in wealth inequality (Kaymak and Poschke, 2016, Hubmer, Krusell and Smith, 2016). At the very least, in Kuhn, Schularick and Steins (2017a) we provide an explanation for the documented asymmetric increase of income and wealth inequality that is not present in the canonical macroeconomic models of wealth inequality. We document substantial differences in household portfolios along the wealth distribution. The middle class holds most of its assets in housing (non-diversified portfolios) with substantial mortgage debt against this housing (leveraged portfolios). We also demonstrate that diverging trends between income and wealth inequality can be traced back to particular historical episodes when house price booms hit these highly non-diversified and leveraged household portfolios and led to large and concentrated wealth gains in the middle class. These in turn mitigated the rise of wealth inequality relative to the rise in income inequality. Put differently, rising house prices slowed down the increase in wealth inequality. Our results highlight the importance of asset price changes and differences in portfolio composition to understand trends in wealth inequality.

Companion and related work

In a companion paper (Kuhn, Schularick and Steins, 2017b), we provide new evidence on the distribution of household debt and its changes over time. Household debt is rarely studied by macroeconomists but has recently received increasing attention after the financial turmoil of the Great Recession. We use the HHSCF data to explore the changes in the distribution of debt underlying the six-fold increase in household debt relative to income in the U.S. since World War II. The causes and consequences of this phenomenon are much debated across the social sciences. We show that debt-to-income ratios have risen at approximately the same rate across all income groups and that the aggregate increase in household debt is predominantly linked to the accumulation of housing debt. Middle-class and upper-middle class households mainly accounted for the massive rise in aggregate debt--and not poor households financing additional consumption in the absence of income growth, as is often assumed.

In related work with José-Víctor Ríos-Rull (Kuhn and Ríos-Rull, 2016), we provide a comprehensive description of income and wealth inequality based on U.S. SCF data that we hope will serve as reference for other researchers. We provide most results from the paper for download at <https://sites.google.com/site/kuhnecon/home/us-inequality>. In the paper, we also address a recurring topic in the discussion of the sources of wealth inequality, namely, the intergenerational transmission of wealth through bequests. It is a widely-held belief that a lot of wealth is transmitted across generations through inheritance, yet, when looking at the micro data from the SCF, we find that in 2013, 80% of wealth in the U.S. economy is not inherited but acquired over a person's lifetime. We show that this even holds for the wealthiest households. If anything, the share of inherited wealth is decreasing towards the top of the wealth distribution. A simple sanity check of this finding can be done by looking at the richest Americans from the Forbes 500 list. In 2015, 8 out of the Top 10 wealthiest Americans did not inherit their wealth but built it within their life-time. Most of them are entrepreneurs who created wealth through inventions or new ideas that they turned into fortunes by selling shares in financial markets.

2. Sources of earnings inequality

Understanding the sources of earnings inequality is the goal of an ongoing research project with Christian Bayer (Bayer and Kuhn, 2017a). We use data from the German Structure of Earnings Survey (SES), an administrative linked employer-employee survey, which provides exceptionally detailed information on job characteristics, employers, employees, their earnings and hours. In this data, observables can explain more than 80 percent of cross-sectional wage variation. Such an amount of explained cross-sectional variation is unheard of in existing data on individual earnings. The reason for this explanatory power is not that overall earnings variation is small but it is the unique information about job characteristics that delivers this result.

The data allows us to shed light on a key question in human capital theory because we can quantify how important employers, education, experience, jobs and their characteristics are in determining wages.

We decompose cross-sectional wage inequality into an individual, a plant, and a job component. Among the three, the job component explains 40% of the age difference of average wages and almost all of the rise in wage inequality by age. The hierarchy level of workers is the most important information within the job component. Hierarchy encodes responsibility and independent decision making connected with a job. It captures therefore a functional concept and not a qualification concept so that hierarchy is correlated with formal education but is inherently job specific. In fact, we show that a substantial fraction of workers is employed on all hierarchy levels for virtually any level of formal education (with the exception maybe of extreme combinations) and that workers progress along the "hierarchy ladder" as they get older. Both results clearly indicate that formal education and hierarchy measure two distinct concepts. The plant component, differences between low-paying and high-paying plants, by contrast accounts for only 20% of the age variation of wage inequality. We interpret these results as showing that the ability to take responsibilities and to work independently are skills that are highly valued in the labor market and are required to climb the "hierarchy ladder" with large returns on wages.

The information on hierarchy (job responsibility) that we bring to speak is critical for the decomposition of earnings inequality. We show that when job characteristics are ignored, plant differences appear to be more important both in explaining average wage differences by age as well as the increase of wage inequality by age. In other words, high-paying plants are high-paying because of their job composition rather than some other intrinsic characteristics of the plant. Hence, the average human capital in the plant determines its average wage level. On top comes that even fundamentally high-paying plants have a larger fraction of jobs on higher levels of hierarchy, i.e. there is a positive correlation between plant effects in pay and the job composition of a plant.

Companion and related work

In ongoing companion work with Christian Bayer, we are compiling a long-run dataset on the evolution of the German wage and employment structure. The data has information on employment and wages across hierarchy groups, different industries and employment types, and by gender. The data is compiled from archived historical tabulations of the German Statistical Office. Comparing these detailed historical tabulations to microdata from the 2001 Structure of Earnings Survey (SES), we find that the tabulated characteristics explain 2/3 of the earnings variation in the cross-section. Our data digitalization effort is still ongoing. Once our data is complete, it will cover the entire time period from 1957 until today. The data will be pivotal for

exploring the transformation of the German labor market over the past six decades. We will use the data to explore if changes in the employment structure ("quantities") or in the wage structure ("prices") are more important in accounting for the observed increase in earnings inequality over time. A related question is explored in Song, Price, Guvenen, Bloom and von Wachter (2015). They ask if changes in the wage structure within or between firms contributed to the rise in U.S. earnings inequality over the past decades. Yet in their dataset it is not possible to observe changes in the composition of jobs that explains most of wage differences between plants in the German data.

In other related work with Christian Bayer (Bayer and Kuhn, 2017b), we exploit high-quality administrative data from social security records of the German old-age pension scheme to explore how unequally distributed labor market risks are. The data has the unique feature that it is administrative and covers entire employment histories of workers from age 14 to 65. Using this data, we document a high concentration of unemployment and sickness episodes within worker cohorts, low-pay no-pay cycles for the typical unemployed, and stable employment with very low unemployment risk for the typical employed. While unemployment risk is prominently studied as a source of earnings risk, we document that also earnings risk on the job is highly concentrated among few workers. These results scrutinize the assumption of a homogeneous risk process and suggest that besides widely-documented and widely-studied earnings inequality, there is also large "inequality in earnings risk". We are exploring the consequences of risk heterogeneity for the design of public insurance and transfer systems as part of this project.

3. Theoretical models of earnings dynamics and the distribution of earnings

Most macroeconomic models of inequality follow the path-breaking work of Aiyagari (1994), Huggett (1993), and Imrohroglu (1989) on heterogeneous agents incomplete markets models. These models treat income dynamics and income inequality as exogenous; a single, stochastic earnings process is the driver of all heterogeneity. Macroeconomists rely on this workhorse model to study the consequences of pension or tax reforms, financial market liberalization, or technological progress. The model assumes that labor market and earnings dynamics remain unaffected by changes in the macroeconomic environment so that income inequality constitutes a policy-invariant fundamental of the model. For policy analysis, this poses a severe limitation because changes in labor market institutions, retirement policy, tax policy, social security programs might as well affect individual labor market behavior. The third topic on my research agenda is the development of models of income dynamics that are shaped by individual behavior. Since most income comes from the labor market, my research focuses on earnings dynamics in the labor market.

In Jung and Kuhn (2016), we develop a life-cycle general equilibrium labor market model. The model is jointly consistent with facts on worker mobility and earnings dynamics documented in

the literature. The model can be seen as a human capital model with general and specific human capital accumulation where "human capital production" is the result of a frictional process that is explicitly modelled via labor market behavior. This implies that the human capital accumulation technology itself is endogenous to the labor market environment. With this model, we provide a new tool to study the effects of macroeconomic changes on earnings dynamics and close a gap in the existing literature. Existing labor market models provide very little guidance to explore earnings dynamics. They generate earnings dynamics that are highly transitory so that, for example, a job loss is a rather inconsequential event. By contrast, a large empirical literature following Jacobson, LaLonde and Sullivan (1993) has shown that workers who lose their stable job experience large and persistent earnings losses. Using our structural life-cycle model, we offer an explanation for the inability of existing models to account for the empirically observed earnings dynamics. Our model builds on the observation that an upward and a downward force prevent earnings shocks to loom large in existing models. The upward force is search. Workers who fall off the job ladder can search on and off the job trying to climb back up. Search frictions prevent an immediate catch-up, but, given the large job-to-job transition rates observed in the data, search is a powerful mean-reverting mechanism. The downward force is separations at the top of the job ladder. If separation rates are high even at the top of the job ladder, then the implied short job durations will make a worker, who is still at the top of the job ladder today, look quickly similar to a worker who just lost his job. These two forces governed by labor market mobility induce mean-reversion of earnings dynamics and make earnings shocks transitory and short lived in existing labor market models. Our paper is the first to uncover this tight link between labor market mobility and earnings dynamics. Put differently, existing labor market models provide little guidance to study earnings dynamics because they stay close to the representative-agent paradigm by imposing uniform exogenous separation rates across all jobs. Any differences from search wash out quickly in such models and all workers remain close to the average worker.

A further innovation of the paper is that we use information on worker mobility dynamics rather than wage dynamics to estimate the parameters of the skill accumulation process. Our model describes rich endogenous mobility dynamics over the life-cycle and in the cross-section conditional on age. Exploiting this variation, we develop a new approach based on ideas similar to Topel (1991) to estimate the skill accumulation process based on mobility differences of workers by age and job tenure.

We use the model to provide an explicit example of an investigation of changes in the labor market environment on earnings dynamics. We study the Dislocated Worker Program (DWP) and its effectiveness to mitigate earnings losses of displaced workers. We explore retraining and placement support as the two central pillars of the DWP. We find that the two policies are ineffective in reducing earnings losses. We explain this finding based on the insights from our

structural analysis. Active labor market policy might help to remove frictions and foster mean reversion by making displaced worker look more quickly like the average worker but there will remain the gap between the pre-displacement job at the top of the job ladder and the average job in the labor market.

Empirically, we provide new evidence on heterogeneity in job stability for the United States. Going back at least to Hall (1982), there exists evidence that despite high average worker mobility rates there is also a large share of very stable jobs. We document that mean and median tenure increase almost linearly with age, so that at age 60 the average U.S. worker has been with her/his employer for 14 years. Our life-cycle model captures this heterogeneity in job stability. Abstracting from such heterogeneity limits what labor market outcomes can be explored because it severely distorts the decision to invest in human capital and the returns from search on and off the job. We argue that a life-cycle structure is the natural setup to deal with the inherent non-stationarity of job stability, the rising tenure with age. While life-cycle models are by now a standard tool in the macroeconomic literature to study topics on wealth inequality, our model highlights the importance of life-cycle variation for the study of topics on earnings dynamics and inequality.

Related work

In related work (Hartung, Jung and Kuhn, 2017), we investigate the effects of policy reforms on labor market dynamics. We study the unprecedented overhaul of the German unemployment benefit system as part of the so-called "Hartz reforms" in the mid-2000s. Most scholars attribute the German labor market miracle after the Hartz reforms to the cut in UI benefits based on a mechanism by which the cut in benefits incentivized the (long-term) unemployed to search harder for jobs. We provide new evidence that challenges this narrative. We document based on micro data from the employment panel of integrated employment histories (SIAB) that the bulk of the decline in unemployment rates is due to a change in inflow rates into unemployment. The Hartz reforms have mainly operated by scaring employed workers to separate into unemployment, not by prompting unemployed workers to search harder. Our analysis focuses therefore on the effects of labor market institutions on job stability. Job stability is, as I discussed above, a critical determinant of earnings dynamics. We show that a search model with endogenous separations and heterogeneity in job stability can quantitatively explain the German experience. The highlighted channel implies a large (macro)-elasticity of unemployment rates with respect to benefit changes. Our findings thereby add a new aspect to the current debate on the role of UI benefits on unemployment rates by highlighting the effects on job stability and unemployment inflows. A mechanism that we argue is particularly relevant in the European context.

In related work with Tom Krebs and Mark Wright (Krebs, Kuhn and Wright, 2017), we explore a consumption-saving model with human capital accumulation but without frictions in the human capital accumulation technology. The friction we focus on in this paper is limited enforcement of financial contracts. Households have access to a complete set of credit and insurance contracts, but their ability to use the available financial instruments is limited by the possibility of default (limited contract enforcement). We demonstrate that the model calibrated to the U.S. yields substantial under-insurance of consumption against human capital risk. In Krebs, Kuhn, and Wright (2015), we show that the degree of under-insurance in the model is quantitatively consistent with under-insurance in the U.S. life-insurance market. Key to generate this result are age-dependent human capital returns. High returns at the beginning of working life lead to high human capital investment of young households that are traded off against a lack of insurance against shocks. We find that the welfare losses due to the lack of insurance are substantial. We explore how changes in the macroeconomic environment affect life-cycle earnings dynamics via human capital investment and the resulting consequences for inequality.

4. Future work

My ongoing work will already provide important answers to the key questions of my research agenda. A lot of work still lies ahead. Some of the next steps emerge already clearly. The obvious next step is to embed a version of the described labor market model in a consumption-saving framework. Such a model will provide the framework to study the joint determination of the income and wealth distribution. Ongoing work is at early stages. A second step is to explore how well existing models of wealth inequality match the joint distribution of income and wealth. Preliminary results suggest that existing models face difficulties. We are exploring in ongoing work if incorporating closer links between the current labor market situation and financial decisions helps in bringing model and data closer together.

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