

# Research Statement

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Castiel Chen Zhuang

<https://www.econcczhuang.com>

## 1. Introduction

The accumulation of human capital is generally believed to be the driver of economic growth, especially in developing and transition economies (Huang and Zhuang, 2021). I entered the field of economics compelled by an interest in investigating how human capital (e.g., health, educational attainment, job skill) can be affected. Particularly, my research focuses on households' and firms' decisions related to the investment of human capital and the effects of family planning policies and healthcare reforms on human capital. Additionally, I investigate how labor market conditions impact adults' and children's health and how poverty alleviation tools can be used to improve human capital and quality of life.

My research builds on theoretical models to study consumer choices under uncertainty and moral hazard, firm behaviors under productivity shocks, and intra-household decision-making in an overlapping-generations framework. To test these economic models, I use administrative data on demographics, medical claims, labor, firms, industries, and regional regulations. I run both reduced-form regressions and structural estimations to serve different purposes, such as identifying causal relationships and proposing counterfactual policies. My research is geographically diverse; while my projects emphasize populations in Asia, including rural households and manufacturing enterprises in China and a nationally representative cluster randomized controlled trial (RCT) in Malaysia, I also investigate research questions in the United States, with a focus on disadvantaged subgroups.

My research generates implications for policymakers seeking to facilitate the accumulation of human capital. One strand of my research aims to understand how healthcare systems and reforms influence people's health-care behaviors and advise policymakers to pay attention to the very poor and those who spend the least to improve their access to health care and social welfare. In a second strand of my research, my work suggests that relaxing households' financial constraints can ease the negative impact of a relaxation of birth control on education due to the quantity-quality (Q-Q)

trade-off (Qin, Zhuang, and Yang, 2018). In addition, my work suggests that government should encourage on-the-job employee training by bilateral trade liberalization to further accumulate human capital (Zhuang, Shao, and Chen, 2021). On the other hand, Qin, Wang, and Zhuang (2016) point out that health and education are intergenerational, and it is of vital importance to strengthen human capital investments among disadvantaged groups to promote equal opportunity. In a third strand of my research, building on Oddo et al. (2021), our work in progress finds that parents' multi-dimensional precarious employment negatively affects their own and their children's health, calling attention to non-wage employment benefits. Additional details about these already studied topics and my next-step research plans are given below.

## **2. How Healthcare Systems and Reforms Affect Health-Care Choices?**

In my job market paper titled “Understanding Deductible and Reimbursement Maximum: A Study of Rural China’s Tiered Medical System” (2021), we aim to study how patients’ hospital choices and spending decisions are affected by a hierarchical medical system in a rural area of China between 2012 and 2014, to explore how we can improve the healthcare systems. To achieve it, we structurally estimate a two-stage demand model using the medical claims data from all its hospitals. In the first stage, an inpatient chooses a hospital in a multi-tiered medical system; then, in the second stage, health-care utilization is decided. Our research suggests that, at the lower end of spending distribution, Chinese rural patients do not benefit much from price discount potentially due to a mistrust of quality. By increasing deductibles moderately in counterfactual analyses, social welfare can be improved by a larger gain from insurer cost saving. We therefore join a branch of literature that supports a high-deductible health plan (HDHP). Although the context of this study is rural China, the implications can be applied to other regions and countries, as the hierarchical medical system in my project is not unique to rural China, rather it has been implemented around the world (such as the United States). At the same time, the poorest can get hurt under a HDHP, especially in the developing world. In the paper “Income-Dependent Impacts of Health Insurance on Medical Expenditures: Theory and Evidence from China” (*China Economic Review*, 2019), Yi Chen, Julie Shi, and I study the heterogeneous impact of a health program, namely New Rural Cooperative Medical Scheme, on the out-of-pocket (OOP) medical spending of its enrollees. We find that theoretically and empirically being enrolled in the program would reduce participants’ OOP spending, but the percentage reduction for the rich is greater than that for the poor.

There are two hypothesized mechanisms of the income heterogeneity that I plan to test in my future work. First, the program's level of cost-sharing is high, so the health-care services may not be affordable to the poorest segments of the population, even after they get enrolled in the program. Second, poor individuals have a higher price elasticity of demand than do the rich, as their demand for health care is far from being satisfied before they get insured; thus, their total medical spending can increase dramatically, and the OOP spending may not necessarily decrease. Understanding the mechanism, and any potential heterogeneous effects, is of great importance for policymakers. If it is the latter, we may conclude that the health program has achieved its primary target of improving access to health care. However, if it is the former, the program might neither reduce the financial burden for the subgroups in most need nor promote the equality along income distribution. I hope to shed new light on whether the subpopulation in most need can benefit from welfare programs.

Understanding physicians' behaviors are also important when we consider the impacts of healthcare reforms. In the working paper "Vertical Separation and Price Negotiation: A Case Study of China's Lipid-Lowering Drug Industry" (2021), Qifan Huang, Zhentong Lu, and I investigate the impact of the Zero-Markup Drug Policy (ZMDP). In this work, we aim to understand patients' purchasing behaviors under the influence of physicians by estimating their bargaining power parameters in a physician-patient joint decision. We find that patients have less bargaining power than physicians do if there are drug markups and cost-sharing is high. In a counterfactual analysis, we also find that by forgoing the ZMDP (and adding back the drug profits that physicians care about) in the year of its initiation, patient welfare decreases by 12 percent. Thus, policymakers who intend to improve healthcare systems also need to consider physician incentives.

I plan to continue working on understanding how health-care choices are made in response to institutional features and policies. By learning about the underlying consumer incentives, I will be able to better inform policymakers about what works to improve health outcomes and in turn, facilitate human capital accumulation and economic development.

### **3. How Education and Skill-Upgrading Decisions Are Made?**

A second line of my research underlines how households and firms actively invest in human capital, such as school education and on-the-job training. In the paper "Does the One-Child Policy Improve Children's Human Capital in Urban China? A Regression Discontinuity Design" (*Journal of Comparative Economics*, 2017), Xuezheng Qin, Rudai Yang, and I point out that urban Chinese

parents are under a tight budget constraint when investing in children's education. Under such a constraint, parents may sacrifice each child's quality when there are more children (quantity). Our estimate indicates that, an average single child born around the initiation year of the One-Child Policy (OCP) has 5.6 more years of schooling compared to an average child born at around the same time but with siblings, among families complying with the OCP. This is known as the Q-Q trade-off well discussed in the human capital literature since the seminal papers of Becker (1960), Becker and Lewis (1973), and Becker and Tomes (1976). If the budget constraint is relaxed, the negative effect of the Q-Q trade-off can be eased. Thus, we suggest that policymakers who plan on population de-control should try to enhance the development of the credit markets in the underdeveloped regions to assist the parents to invest in their children's human capital. Commercial student loans and the government sponsored tuition subsidy programs, for example, can be established and promoted in these areas to help the poor families.

Additionally, in my recent project titled "Training, Productivity and Wages: An Investigation of China's Manufacturing Enterprises in a Privatization Era" (*Economics of Transition*, 2021) with Qifan Huang, we investigate how firms can be incentivized to invest in their employees' human capital. We find that firms can provide general training voluntarily when labor productivity increases faster than wages due to training. Nevertheless, in our context, there can still be underinvestment in human capital by firms. In turn, governments should consider prioritizing training resources to female, lower-educated, and junior workers to further improve productivity. In another working paper with Chujian Shao and Qiliang Chen titled "Trade Liberalization and Skill Upgrading: Evidence on the Impact of APTA on Chinese Manufacturers" (2021), we study the effect of trade liberalization on voluntary employee training by firms and conclude that on-the-job training of domestic firms is encouraged by lower trade barriers of a close trading partner. It suggests that, to facilitate human capital investment by firms, governments should promote trade liberalization.

In future research, as a part of my research pipeline, to understand how households and firms can be incentivized to improve education and skill levels, I plan to study the effect of training subsidies on skill upgrading using employer-employee pairwise data. I am also interested in exploring how a cash transfer to poor families can improve children's educational opportunities by conducting a large-scale RCT. The details of this RCT will be discussed in the next section.

## 4. Determinants of Human Capital

In addition to understanding decisions that lead to changes in human capital, I am interested in how these decisions affect human capital. Especially, I plan to investigate how much health can be improved by health insurance, and how the improvement varies along the wealth distribution. Understanding how the effect (of health insurance on health) depends on income can also help us understand the mechanisms of the above-mentioned income heterogeneity. If health is improved significantly among the poor as well, then the New Rural Cooperative Medical Scheme may indeed have achieved its primary objective of improving the population's access to health care. Otherwise, redesigns of the program may be needed.

I am also interested in how changes in environments and conditions (which are often not fully controlled by individuals) affect human capital. An example is employment precarity (including both low wages and adverse non-wage characteristics). In a recent article titled "Changes in Precarious Employment in the United States: A Longitudinal Analysis" (2021) published on the *Scandinavian Journal of Work, Environment & Health*, Vanessa Oddo and I suggest that workers are more and more precariously employed in the United States from 1988 to 2016, especially people of color and those with lower education and income. In research in progress, Vanessa Oddo and I are trying to find causal links between precarious employment and adults' and their children's health (e.g., weight gain). Preliminary results show that: if adults are more precariously employed, (i) adults gain weight, especially the ones who are already overweight/obese; (ii) their thin kids lose weight, but overweight/obese kids gain weight. Evidence points to a concern of the worsening (i.e., increasingly precarious) labor market conditions in the United States and perhaps other developed countries, especially among the disadvantaged groups of population.

In an RCT project that I am currently conducting with Sulaiman Mahbob, Saizi Xiao, Emma Riley, Rachel Heath, and some others in Malaysia, we plan to investigate how an unconditional cash transfer to different families can affect health and education. Particularly, we are interested in how the form of transfer (cash vs digital) and recipient's gender (male vs female) affect one's chances of being infected by COVID-19, getting the flu, and/or having any discomfort in the past month. We also plan to measure children's school performance, such as their class rankings or standardized test scores. A report by UNDP (2020) suggests that the introduction of a Temporary Basic Income (TBI), a continuous and unconditional cash assistance, could slow the current surge

in COVID-19 and enable close to three billion people to stay at home. It is thus promising to initiate a TBI project in an upper middle-income country such as Malaysia to increase evidence for a continuous and inclusive cash-based intervention to improve human capital and socio-economic security as well as provide a social protection intervention that governments can employ and replicate.

Finally, my research will try to understand the mechanisms of how changes in environments and conditions lead to changes in behaviors and eventually human capital, to discover the full story of human capital accumulation. Reduced-form regressions and structural estimations will both be conducted to identify and make use of the channels to produce policy implications.

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(Note: The corresponding author is marked by \*.)

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