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Research Statement

I am an empirical development economist and my research mainly explores the misallocation of resources in the markets of developing countries. My primary area of interest is in **internal migration**, with the goal of understanding its effect on human capital accumulation of the later generations. My second line of research focuses on the **measurement of poverty**, looking for interpreting the low-cost measures of poverty.

My main research seeks to understand the mechanisms in which parents in **internal migration** affect the human capital accumulation of their children. In my job market paper, "**How Does Parental Out-Migration Affect Left-behind Children's Schooling Outcomes?**", I investigate the mechanisms through which parental migration affects the schooling outcomes of children left behind in rural China, an issue that affects 61 million children. Previous literature on this topic focuses on estimating the net effect of migration, whereas this paper disentangles the net effect into different mechanisms of policy interests. I establish a theoretical framework to incorporate three important and widely-studied mechanisms that migration could affect left-behind children's school performance: parental accompaniment, child's study time, and investment in children. Motivated by the solution of the theoretical model, I apply the structural equation model to estimate the influence through different mechanisms. I propose an identification strategy based on instrumental variables and the Heckman selection model. Applying the model on rural household survey data from nine provinces, I find that the effects through parental absence and investment are both significantly negative with large sizes, while the effect through child's study time is insignificant with a negligible size. The surprising negative effect through investment is mainly driven by reduced nutrition investment by the de facto custodians, who may not have compatible incentives to allocate the remittances on the child. Through a refined subgroup analysis, I find that girls are suffering ten times more from the underinvestment than boys, revealing a shocking gender inequality in rural China.

The analysis in this paper studies the effect of parent on child performance. Currently, I am working on extending this analysis to the reverse direction of influence - the effect of child performance on parent's migration decisions. In addition, I am extending the current analysis to migrant households, so I can compare the performance of children migrating with parents and children left behind in rural areas. Accounting for the interaction between parent migration decisions and child performance, this analysis will shed light on policy interventions that address the most effective mechanisms to mitigate the harms that children experience in migration. This also helps dealing with the tradeoff between better job opportunities and limited educational resources in urban areas for rural migrants.

My second line of research aims to understand measures of poverty. For under-developed countries, poverty measures are important for measuring economic growth, policy design, and

setting development goals. In particular, I focus on the use of night light data. Unlike common poverty measures based on national accounts or expenditure surveys, night light data has advantages of high frequency, low cost, and precision over small geographic units. These advantages make it an ideal substitute for in-person surveys, such as during the COVID19 pandemic. Night light data has been a popular poverty measure in recent years, and previous papers largely argue that night light intensity and gross domestic production levels are highly correlated globally. However, in the ongoing work "**What Do We See in the Lights? Lights at Night and Measures of National Growth**" with Ashish Shenoy, we delve into the relationship between night light growth and economic growth, and find that the correlation between growth rates is not universally high - the high correlation mainly exists in middle income countries. We propose a weighted least squares estimator, which is a prespecified weighted average of the individual correlations, and the weight can be determined by relevant research interests, such as by population. For the next step, we plan to incorporate the association between night light intensity and expenditure-based measures to construct a more reliable index for economic activities. I also contributed to an ongoing work by J. Edward Taylor by testing the robustness of their findings using night light intensity as an indicator of local economic development in Uganda.

Methodological contributions. Finally, I aim to make contributions to methodology in order to improve empirical analysis in applied microeconomics. The identification and estimation of causal effects in panel data settings has received much attention in the recent econometrics literature. In an ongoing paper "**Double Robust Two-way Fixed Effect Regression for Panel Data**" with Dmitry Arkhangelsky, Guido W. Imbens, and Lihua Lei, we develop a novel method for causal inference with observational panel data, which overcomes the limitations of existing methods. Cross-sectional models account for treatment assignment using methods such as inverse probability weighting. We extend this approach to panel data. Take the case of staggered adoption as an example, we model the adoption time with duration models such as the Cox hazards model. As long as the information about the assignment mechanism is accurate, our method works under substantially weaker assumptions than the traditional methods. As a byproduct, we characterize the class of experimental designs under which the traditional methods are guaranteed to produce consistent estimates of the causal effects. The method from our paper can be widely applied to empirical analysis such as program evaluation.