

## Research Statement

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My main field of interests is applied microeconometrics focusing on labor economics and development economics. I study socio-economic issues related with poverty, income dynamics, economic mobility, human capital, health, and aging. I develop and apply microeconometrics techniques in using household- or individual- level panel data. In particular, I consider identification issues related with both causality and data issues. My works have been published in top field journals such as *Journal of Econometrics* and *Journal of Applied Econometrics*.

Understanding poverty dynamics and economic mobility has always been of great concern for policies related to poverty reduction and inequality. Income inequality has risen sharply in almost all societies over the decades. Great economic disparities have brought a wide range of economic and social issues. Economic mobility, which refers to the ability to change the economic status, is then closely related to inequality. The demand for redistribution to reduce inequality greatly depends on the level of economic mobility. As long as people believe that there are economic ladders, people tend to tolerate economic inequality at some degree. This is mainly because people also value hard work, patience, determination, and other individual characteristics as the source of income inequality. Greater income inequality, on the other hand, tend to undercut the equal opportunities and lower economic mobility.

To this extent, measuring economic mobility has been particularly important. Economic mobility is often measured by the change in income or income quintiles based on reported income. However, reported income often has substantial measurement error. This measurement error may bias the estimated degree of income mobility and lead to inappropriate policy conclusions. Some studies thus use administrative data to deal with measurement error and explore the role of measurement error in estimating economic mobility. However, administrative data are limited and unavailable in most countries except for few developed countries. My study thus develops methodologies to examine the existence of measurement error in survey data when a direct comparison of administrative versus surveyed values is impossible.

My study requires advanced econometrics techniques regarding estimating income dynamics and economic mobility because false specifications and estimations can lead to

completely different conclusions. The use of advanced econometrics techniques, however, has been more important in this area of studies, not just for mine. Recent studies in the field have focused on developing and applying new econometrics techniques since recent seminal papers show that the previous methodologies had led to biased conclusions regarding the subject. In particular, the literature usually allows for only classical (or random) measurement error to study economic mobility because non-classical measurement error is notoriously difficult to be addressed. However, in conducting my research, I relax the assumption of classical measurement error.

My paper (joint with Geert Ridder and John Strauss) entitled, “Estimation of Poverty Transition Matrices with Noisy Data (2017)”, is published in the *Journal of Applied Econometrics*. This paper constructs a panel data model of consumption dynamics to estimate the error-free predicted consumption and then adds the simulated consumption shocks based on the estimated variances of consumption to the error-free consumption. Poverty transition matrices based on survey consumption and model-based simulated error-free consumption are then compared. My study shows that the poverty transition matrices based on survey data are biased due to measurement error. Time-varying measurement makes the estimate of economic mobility in and out of poverty bigger.

I also consider more sophisticated specifications for a dynamic panel data model allowing for measurement error. In particular, my study allows for individual effect to take an interactive form instead of time-invariant form. Then, measurement error is additionally allowed in the dynamics panel data model with the interactive fixed effect. My paper (joint with Roger Moon and Martin Weidner) entitled “Analysis of Interactive Fixed Effects Dynamic Linear Panel Regression with Measurement Error (2012)” is published in *Economics Letters*.

With my coauthors, Roger Moon and Qiankun Zhou, I also investigate the biases generated by using many instrumental variables (IV) when estimating a dynamic panel data model allowing for measurement error. In particular, a linear measurement error model is used to relax the traditional assumption of classical measurement error and to allow for mean-reverting measurement error. Then, my study proposes the jackknife IV estimator (JIVE) as a bias reduction method to estimate dynamic panel data models with measurement error. My paper entitled, “Many IVs Estimation of Dynamic Panel Regression Models with Measurement Error (2017)”, is published in the *Journal of Econometrics*.

I also propose a method to test the presence of measurement error in survey data and apply the method to examine whether or not measurement error in self-reported income generates biases for estimating income dynamics to measure the persistence of income. For this, I again combine a general dynamics panel data model and a linear measurement error model to capture mean-reverting measurement error. I then use different sets of internal instrumental variables to examine whether reported income generate biases in the estimate of income persistence. Regarding this work, my paper entitled “Measurement Error and Its Impact on Estimates of Income Dynamics” is published in *Empirical Economics* (2022).

I also develop a methodology to estimate a heterogeneous income profiles (HIP) model which allows each individual to have their own income growth rate. The ultimate goal of my study is to measure the persistence and variances of transitory and permanent income shocks that are parameters widely used for the studies in macroeconomics and labor economics. My study then relaxes the traditional assumption in the literature and allows the unobserved individual deterministic income trend coefficients to be correlated with individual’s observed and unobserved characteristics. This work (with Roger Moon) entitled “Heterogeneous Income Profiles Model with Fixed Effects: Incorporating Labor Income Shocks (2021)” is published in *Oxford Bulletin of Economics and Statistics*.

All of my studies described above have contributed to the methodological development in the estimations of different panel data models. Combining my specialty in the panel data estimation with my coauthors’ specialty in finance and in the threshold model estimations, I also study the size-performance relation in the US mutual fund industry. The existing studies have found diseconomies scale of industry on fund returns, and we add our contribution to the literature by considering possible non-linear decreasing returns to scale caused by fund age and managers’ tenure. My work with Terence Chong and Chan-Ip Sio, entitled “Threshold Effect of Scale and Skill in Active Mutual Fund Management (2020)”, is published in *North American Journal of Economics and Finance*.

I am now working on several other projects. Some are extensions of my income dynamics studies, while the others are not. One of my great interests regarding income dynamics is the role of non-cognitive skills on the mitigation of individuals’ labor income shocks. I thus analyze the long-term impact of job displacement for the U.S. workers, that possibly vary by a specific personality trait, locus of control. An internal locus of control, which is one’s belief to

control their own life against fate or luck, possibly mitigates job displacement shocks, as being internal is important for one's economic success (see a review by Cobb-Clark (2015)). However, some studies in psychology also suggest that discrepancy between one's internal locus of control and their competence can lead to being neurotic, anxious, and depressed. Job displacement can oppose to one's internal locus of control and so possibly lead to discrepancy further hindering the opportunity to recover from the shock. It is thus an empirical question whether one's internal locus of control indeed helps when the one faces an exactly opposite shock against their belief.

Some educational programs have been found to enhance one's internal locus of control (Hattie et al., 1997; Hans, 2000). My study would also emphasize the importance of public policies enhancing the internal locus of control in the case that it indeed helps mitigating job displacement shock. However, using the National Longitudinal Survey of Youth 1979 (NLSY79), my study finds that individuals who had a greater ex-ante belief in their ability to control their lives had greater scarring effects from job displacement. I employ an event study model, which was first introduced to the job displacement literature by Jacobson *et al* (1993). I also consider a more recent econometrics issue called staggered treatment effect (Goodman-Bacon, 2021; Callaway and Sant' Anna, 2021; Sun and Abraham, 2021). My finding is also robust to the estimations by employing a propensity matching, which was first used by Couch and Placzek (2010) in the job displacement literature to additionally control for selection into job displacement. The propensity matching may not be an ideal method for my study given my sample size is relatively small, but it provides suggestive evidence to confirm my results.

My finding is against the widespread belief in the power of optimism, but it is worth noting that academic research tends to find little evidence on the role of an internal locus of control to mitigate negative shocks (Buddelmeyer and Powdthavee, 2016; Seim, 2019). My study also confirms the existing findings. As a next step, I am investigating why an internal locus of control negatively works and what policies can help people mitigate their job displacement shocks.

I am also working with Rene Saran and Sachin Sisodiya to investigate the impact of pre-adult initiation of pain-reliever misuse on later life economic outcomes. According to the Substance Abuse and Mental Health Administration (SAMHSA), pain-relievers became the most commonly misused prescription in 2021 in the United States; 3% of the US population misused the prescription pain relievers. Compared to other substance use such as alcohol, cigarette, and

marijuana, the initiation of pain-reliever misuse in pre-adulthood was traditionally low, and so its impact on later life has not yet taken much attention. However, recent studies show that pain-reliever misuse are mostly initiated during adolescence and young adulthood (Rigg et al, 2018). Then, pain-reliever misuse can lead to the opioid abuse and other illicit drug use (Lankenau et al., 2012; Vadivelu et al., 2018). The increasing misuse of prescription pain-relievers has been accompanied with an increasing number of deaths due to opioids overdose (Rudd et al, 2016). It is thus very important to investigate the impact of pain-reliever misuse, especially initiated in pre-adulthood.

As economists, we mainly focus on the impact of pain-reliever misuse on the later-life socioeconomic outcomes such as living in poverty, being in government assistance programs, being unemployed, and attaining low education, but we also investigate the associated health outcome and other substance use dependence. Our study hypothesizes that an earlier initiation of pain-reliever misuse is associated with worse socioeconomic/health outcomes and that this negative association is larger if misuse is initiated in pre-adulthood instead of adulthood. We use the National Survey on Drug Use and Health (NSDUH) data to examine our hypotheses. We create two pain-reliever misuse groups: those who start to misuse pain-reliever in pre-adulthood and those who misuse pain-reliever only in adulthood. Our study estimates a logistic model with an interaction term to allow that the impact of pain-reliever misuse can possibly differ by these two groups. Then, our empirical works show that any pain-reliever misuse in pre-adulthood results in significantly higher odds of having bad socioeconomic and health outcomes in later life. Our study conveys an important message that pre-adult initiation of pain-reliever misuse is particularly harmful. We are in the final stage of writing a working paper, and our work will be soon presented and circulated.

The other two projects stem from the studies of old age support in Asia. First, I have been working with Yin-Chi Wang to theoretically and empirically investigate economic slowdown as one of the key channels through which son preference has weakened. The idea is that son preference had stemmed from the traditional old age support by sons in Asia. However, when the economic growth slows down, sons make less transfer to parents; parents thus do not need sons over daughters anymore.

I also investigate the reporting gaps of the inter-vivos transfers between adult children and old parents. Public pension or social security net could not yet be established to support the

elderly in many developing countries, while social security or pension income helps smoothing consumption for the elderly in developed nations. Instead, the elderly in developing countries often relies on adult children's support as a traditional old age support system. The investigations of the elderly welfare in developing countries thus often involve the surveyed monetary transfers among the adult children and old parents. Yet, no study investigates the accuracy of such surveyed transfer and time use data. I have been working on the Korean Labor and Income Panel Study (KLIPS) data because the data have a unique dyadic survey structure to investigate the accuracy of the inter-vivo transfers and time use variables.