Can income inequality explain China's saving puzzle?☆

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ABSTRACT

Since the beginning of 21st century, China has experienced increasing aggregate saving rates as well as increasing income inequality simultaneously. In this paper, we explore the possible linkage between rising saving rates and rising income inequality. We first characterize China's saving behavior using household survey data, finding that households with high income save at higher rates. We then derive analytically that the saving rate relates with income inequality index in a nonlinear way, in particular, the aggregate saving rate is a linear function of interaction term of the average income level and squared income inequality indicator, and the level value of average income. We conduct median regression analysis using community level data, finding that aggregate saving rates are increasing in income inequality, in particular, the higher the income inequality, the greater the marginal effect of income inequality on aggregate saving rates. This research has policy implication that the effective way to promote China's domestic demand is through promoting a more equal distribution of income.

1. Introduction

It is well known that China has shown amazing high level of saving rates and declining consumption demand. Since the beginning of 21st century, the aggregate saving rate has further increased dramatically, rising from 37.6% in 2000 to 49.7% in 2012, standing out among all world economies. This phenomena is referred as China's saving puzzle as this high rate is not consistent with the Life-Cycle hypothesis, which would imply that households postpone savings to the future when the growth rates are high, and it attracts researchers' attention in exploring the causes for this persistent high saving rates (Modigliani & Cao, 2004). Concurring with China's high saving rates is another phenomena, also been noticed by economists and policy makers, that income inequality in China rose dramatically. As shown in *The Chinese People's Livelihood Development Report 2014,* China's wealth Gini coefficient has reached to 0.73 in 2012, while this figure is only 0.45 in 1995 and 0.55 in 2002, China is now one of the most unequal countries around the world. Naturally, this poses a question worth exploration: are there linkages between the two concurring phenomena? What are possible policy implications regarding reviving domestic consumption and reducing the excessively high saving rates? Can income inequality be a critical factor?

We notice that existing literatures rarely examine China's saving and inequality simultaneously. For instance, China's saving puzzle is mainly explained by life-cycle/permanent income hypothesis (e.g., Curtis, Lugauer & Mark, 2015; Modigliani & Cao, 2004), precautionary saving motive (e.g., Chamon & Prasad, 2010; Chamon, Liu & Prasad, 2013; He, Huang, Liu & Zhu, 2014), sex imbalance (Du & Wei, 2013; Wei & Zhang, 2011), habit formation (e.g., Hang, 2009; Hang & Yan, 2013; Jia, Zhang & Gan, 2012)

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and rising housing price (e.g., Chen & Yang, 2013; Wang & Wen, 2012; Zhao, Liang & Li, 2014), whilst rising inequality is mainly explained by household register discrimination (e.g., Wan & Li, 2013) and city-biased policy (e.g., Chen & Lin, 2013; Lu & Chen, 2004), and research on the impact of inequality mainly focus on economic growth (e.g., Chao & Shen, 2014) and social instability (e.g., Zhang, Liu & Liu, 2011).

Among the limited researches studying the impact of income inequality on aggregate saving in China, Jin, Li and Wu (2011) show that inequality prompted households to pursue higher social status, which leads to higher household saving rate, finding that the saving rate of high income households is increasing over time. In this paper, we document the saving pattern according to households income level, finding that the saving rate of high income households is increasing over time, which is consistent with Jin et al. (2011)'s result. However, the saving rate of low income households is relatively stable, which contradicts Jin et al. (2011)'s result. Wang and Guo (2011) build a two period OLG model that the consumption decision for both periods is determined at the beginning of the first period. To achieve a given goal of consumption at the second period, households must save in the first period. Even though this model explains that households must save, however, the model predicts that low-middle income households will save at higher rate than high income households, which contradicts the observation that high income households have higher saving rates (e.g., Chamon & Prasad, 2010). In our study of household saving pattern, we also find that high income households tend to save at a higher rate, which is consistent with Chamon and Prasad (2010)[1].

In this paper, we paid special attention in examining data, finding that saving rates differ according to household income levels. Base on this observation, we explore the question that whether the rising income inequality explains China's saving puzzle. We start by documenting the stylized facts of China's savings. We analyze systematically China's *Flow of Funds Table* and summary statistics from *China's Household Survey*, and we find that:

- China has experienced a remarkable increase in the aggregate saving rate since the beginning of 2000s. In particular, China's aggregate saving rate has increased up to 49.7% in 2012 from 37.6% in 2000;
- Household sector is the principal contributor of aggregate savings since 2000s. For instance, China's aggregate saving rate has rose by 14.2% during the period of 2003–2012, while household sector contributed to this figure more than 114%, this result is consistent with Chen, Chen & Tan (2014) and Yang et al. (2012);
- Household sector savings were mainly accumulated by high income (rich) households. Specifically, both urban and rural households show rising saving rates along with income quantiles, and our median regression using household survey raw data validates this observation.

Observing the heterogeneous household saving behavior corresponding to the income level, we conjecture that China's rising income inequality has a positive impact on the aggregate saving rate. We make an assumption that households' propensity to consume is a linear function of the disposable income, which is based on results mentioned above that the saving rate is increasing in income level. From this assumption, we derive analytically that the aggregate saving rate is jointly determined by the level of household income and its corresponding coefficient of variation of disposable income (income inequality), and the impact of income inequality on aggregate saving rates depend on the marginal effect of income on consumption propensity. In particular, the aggregate saving rate is a linear function of interaction term of the average income level and squared income inequality indicator and the level value of average income. We find that this result is important that it provides an answer to the phenomenon that consensus is lacking in the empirical literatures regarding the impact of income inequality on aggregate savings.

There exists cross-country and theoretical literatures on the impact of income inequality on aggregate savings, however, no consensus is reached on this relationship. Theoretically, the impact of income inequality on aggregate savings is ambiguous. Neoclassical theory indicates that the saving rate is constant, and be independent of the economic growth, while political-economy research brings out negative indirect links from inequality through investment, growth, or public savings to aggregate savings (e.g., Alesina & Perotti, 1996; Persson & Tabellini, 1994). Empirically, the impact of income inequality on aggregate saving is not consistent either. Schmidt-Hebbel and Serven (2000) empirically test the relationship between income distribution and aggregate savings based on a new and improved income distribution database for both industrial and developing countries, and find no support for the notion that income inequality has any systematic effect on aggregate savings. Li and Zou (2004) use a panel of 49 industrial and developing countries to trace the impact of income distribution on saving rates, and they find that a negative and significant relationship exists between the gross national (or private) saving rates and the Gini coefficient with the complete sample, although this finding is not very robust. Moreover, with the subsamples of OECD countries and Asian countries, income inequality and the saving rates can even be positively and significantly associated. Leigh and Posso (2009) use the income share of the richest 10 percent and the richest 1 percent to measure income inequality, and investigate the relationship between income inequality and national saving for 11 developed countries over the period of 1921–2002, and find no consistent relationship between lagged top income shares and current saving rates.

The literatures' lacking of consensus motivates us to inquire this question: why there are no consistent theory and evidence regarding the relationship between income inequality and aggregate savings. We investigate this question and obtain an important finding, which comes from one of the major contribution of the paper, our analytical result on the relationship between income inequality and aggregate savings. According to our analysis mentioned above that the aggregate saving rate is a linear function of the

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[1] The pattern that the rich does save more is general in United States (Dynan, Skinner & Zeldes, 2004), United Kingdom (Bozio, Emmerson, O'Dea and Tetlow, 2013), Canada (Alan, Atalay & Crossley, 2015) and Latin America (Gandelman, 2015).