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# The Social Science Journal

journal homepage: [www.elsevier.com/locate/soscij](http://www.elsevier.com/locate/soscij)

## Theorizing income inequality in the face of financial globalization



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### ARTICLE INFO

#### Article history:

Received 25 November 2013

Received in revised form 6 June 2014

Accepted 6 June 2014

Available online 2 July 2014

#### JEL classification:

F63

G01

O14

#### Keywords:

Savings rate

Income inequality

Financial globalization

Global imbalances

### ABSTRACT

Based on an extended post-Keynesian model, we find that the association between the savings rate and income inequality is negative if savers' funds are borrowed by spending households for consumption but positive if savings are channeled to investing firms for production. A negative association, such as the one that exists in the U.S., hinges on an income illusion created by an asset bubble and cheap credit. Thus, financial globalization leads consumption and income inequality to diverge, and the divergence is more extreme if lower-income groups have higher debt ratios. A positive association, such as the one that exists in China, relates to liquidity constraints faced by consumers such that consumption inequality closely follows income inequality. Our results imply that income inequality must be reduced in both types of countries to increase savings in deficit economies with negative associations and to reduce savings in surplus economies with positive associations.

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### 1. Introduction

The 2008 financial meltdown continues to have a major effect on the world economy and certain economic factors are believed to be associated with what was the largest financial crisis since the 1929–1933 Great Depression. These factors include rising income inequality in both emerging and advanced countries, which has weakened effective demand and consumption spending (Sheng, 2014). Furthermore, a savings glut has occurred in Asian countries, primarily in China, and a savings deficiency has occurred in Western nations, primarily in the U.S. (Broome, 2009; Gu & Sheng, 2010). Relaxed monetary policies and low interest rates are utilized in many economies, which have caused a large asset bubble and rampant financial speculation (Peterson & Venteicher, 2013; Seabrooke &

Tsingou, 2010). Additionally, overdeveloped capital markets in the West and underdeveloped financial systems in Asia have driven Asian savings into Western markets and led to even lower interest rates, a fueling of consumer credit, and an exacerbation of bubble speculation (Lambie, 2009; Sheng, 2011a, 2011b). At a global level, financial, physical and knowledge infrastructure is poorly integrated, which is a concern in the face of the globalization of financial capital and Internet communication. Traditional industrial policies based on closed national economies and partnerships between national governments and local multinational corporations have failed, and a new policy focused on institutional infrastructures is needed (Choi, Berger, & Kim, 2010). At a micro level, moral hazards lie at the core of many of the causes of financial turbulence; at a macro level, inadequacies of political institutions bear the majority of the blame (Hou, 2011). Benefits from foreign financial resources may not outweigh the costs of destabilizing speculation. The real appreciation of currency may

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be a major determinant of the deterioration of the current account imbalances. Hence, rapid disinflation policies are necessary to avoid financial crises (Dropsy, 1995).

Previous studies have provided competing explanations for the causes and effects of the global crisis. The present study offers a concise explanation by integrating the main themes of other studies that have evolved separately. Whereas some studies claim the importance of the relationship among income inequalities, credit booms, and financial crises, other studies invalidate this inequality-credit-crisis nexus by highlighting the importance of low interest rates and typical business cycles. Nevertheless, recent studies continue to emphasize the adverse effects of inequality on current accounts, government debt, and aggregate savings. This study focuses on international differences in the association between inequality and savings for three reasons. First, many authors view income inequality as one of the most important global economic problems, and these authors connect inequality with savings. Second, high public and household debt or low aggregate savings contribute to account deteriorations, which is implied by the national accounts identity (Ang, 2011). Third, the root causes of large global imbalances coincide with those of the financial crisis. Thus, studies should focus on inter-country differences in the association between inequality and savings to determine how these factors are involved in economic globalization (Sheng, 2010, 2013).

The negative savings rate in the U.S. plays an important role in the development of global imbalances because of the effect of savings on the current U.S. account deficit. The term global imbalances refers to the fundamental imbalance in global payments; a widening U.S. current account deficit is associated with surpluses in a number of countries. According to simple accounting identities, a current account deficit necessarily equals capital inflows to the country. Therefore, a current account deficit equals the negative difference between domestic savings and investments. Hence, global imbalances have often been studied by analyzing savings and investments from both a global and U.S. perspective (Salotti, 2010).

Although inequality is generally increasing in many places, national savings rates have increasingly diverged across countries. This recent phenomenon implies the development of a new association between inequality and savings that merits further study, as the associations directly implicates global imbalances. The association between inequality and savings is negative in most OECD countries but positive in some Asian economies (Mah-Hui & Ee, 2011). Global imbalances can be epitomized by comparing the U.S. and China. Because they are perceived to be major sources of the global imbalances, as their large account imbalances have global impacts, the differences between the U.S. and China are a focal point in this study. This study offers an explanation for the differences in the association between inequality and savings between the U.S. and China.

Finance may play an important role in determining what type of association between inequality and savings prevails in an economy. This study develops a theory that suggests that income inequality is positively associated with the savings rate if savers' funds are allocated to investing firms for

production in the financial sector, which occurs in China; however, the theory also suggests that income inequality is negatively associated with the savings rate if savers' funds are lent to spending households via financial intermediation for consumption, which occurs in the U.S. Our theory is based on an extended post-Keynesian model that introduces household leverage because modern credit facilities and lending offers constrained spending via liquidity rather than income. Furthermore, when foreign savings are available at low cost, domestic spending is no longer constrained by national income (Hamouda & Harcourt, 1988). Our extension has a critical impact on our understanding of the association between inequality and savings. The traditional Cambridge approach predicts a positive association because spending is subject to income, but our model accounts for a negative association that is caused by habitual consumer credit use for deficit spending, and there is no need to resort to complicated inter-temporal calculations.

The fundamental change to the Cambridge model is that our extension incorporates the fact that sophisticated finance and marketing services create income illusion as a long-term effect on spending behavior. Individuals in the U.S. can use their credit limits as a way of forecasting incomes; in particular, with access to a large amount of credit for a long period of time, individuals are likely to infer that their lifetime incomes are permanently higher. In this situation, individuals' willingness to use credit for spending is also higher. This income illusion is reinforced by financial globalization and enters into our definition of borrowing households' consumption propensity in the U.S. but not in China. In China, individuals could not previously borrow against future income growth and now only have a limited capacity to do so. Instead, individuals in China must save to make large purchases.

With regard to the income illusion, Kumhof and Ranciere (2010) point out that much of the increased aggregate income in the past three decades was distributed to the top income group, so the group of households with stagnant real wages created political pressure to improve their living standards. Policymakers responded to this pressure by providing easy access to mortgage finance for which these households would not have otherwise qualified. Eased housing financing allowed millions of workers to buy new homes and receive cheap credit for increased consumption through the equity in their homes, the prices of which rose rapidly with the resultant lending boom, which generated a long-held income illusion. Liberalizing loans to workers without addressing inequality itself would only increase household indebtedness and postpone the costs of the inequality problem. Rising inequality leads workers to borrow to maintain their consumption as their real incomes decline relative to those of the wealthy. This cycle leads workers to borrow more as they become increasingly indebted. The trigger for a financial crisis occurs when their leverage begins to be perceived as unsustainable. Because rising household leverage caused by income inequality in the U.S. has been built on housing bubbles, the sudden burst in 2007 led to a negative net worth in household balance sheets. This drastic change led to enormous loan losses that exceeded bank capital reserves, and many banks were forced into insolvency or mergers. The consequence

was that a systemic financial crisis began in 2008. In fact, over-indebtedness caused by inequality may arise as people on the losing side of the income distribution emulate the consumption habits of their wealthier peers, thereby, triggering expenditure cascades and further deteriorating household balance sheets.

We provide an aggregate theory to account for the role of financial depth in shaping international differences in the association between savings and inequality. After decades of research, the effect of inequality on savings remains unresolved as a result of analytical ambiguity and mixed empirical findings. While some studies find no systematic effect, others identify a positive or negative effect. This issue has attracted renewed attention because of the worsening global imbalances and the resulting financial crisis that has aroused widespread social tension. Our study contributes to this literature by emphasizing both the differing effects of income inequality on the savings rate between surplus and deficit economies and the implications of savings or leverage for global imbalances and financial crises.

## 2. Literature review

The relationship between savings and inequality has been studied extensively. A brief review of the associations between savings and inequality is provided in the context of global imbalances and financial crises. Although studies of these topics have evolved separately, we attempt to connect them to recent events in a logical and orderly manner. We first consider the following issues that apply to countries with account deficits:

- (1) Since the 1980s, employment protection in OECD countries has decreased in favor of financial development, which causes an unequal income distribution and a declining wage share in GDP (Palma, 2011).
- (2) Consumer credit is expanded through financial liberalization to replace reduced wages and prevent worker consumption from contracting so that the drop in worker consumption does not exceed the reduction in wages (Stiglitz, 2011).
- (3) Credit consumption based on asset bubbles leads to a high and rising household debt-to-income ratio, a sharp decline in aggregate savings, and financial fragility and crisis when the household debt-to-income ratio becomes unsustainable (Eichler & Sobanski, 2012).
- (4) Soaring profits that are made possible by falling wages are not extensively used as real savings for producible investment; rather, these profits are primarily recycled as interest-bearing liquid assets that are backed by loans to workers for consumption, thereby, depressing savings rates and exacerbating current account deficits (Palley, 2012).
- (5) Rising income inequality is followed by political interventions that do not address the sources and delay the consequences of the inequality by promoting cheap credit for workers, which protects their living standards from the stagnating real wages. Legislators who represent areas with higher inequality are more likely to vote

for policies that increase credit availability or reduce lending rates (Dixon & Rimmer, 2001).

- (6) As complementary measures to financialization, relaxed monetary policies or the associated low interest rates create asset bubbles and encourage speculative trading, which makes savers prefer financial over real assets, ignoring the future consequences (Sheng, 2012a, 2012b).
- (7) Economic growth is thus primarily driven by credit consumption and related financial services but not by real investment or producible capital accumulation, which further depresses current accounts and increases the risk of financial crises (Love & Zaidi, 2010).
- (8) Rising current account deficits are increasingly financed through foreign savings by promoting free capital mobility and taking advantage of the problematic international monetary system (Hung & Gamber, 2010).
- (9) Piketty (2014) focuses on income inequality in Western countries since the 18th century. He finds that wealth will concentrate if the rate of return on capital is greater than the rate of economic growth, as wealth tends to accumulate more quickly from profits, dividends, interests and rents than from labor, and tends to accumulate more among the top centile, increasing inequality. This, however, will lead to financial instability as evident in the face of the ongoing financial crisis. The central thesis of his book is that inequality is not an accident, but rather a feature of capitalism, and can only be reversed through state interventions. Piketty proposes a global wealth tax combined with a progressive national income tax up to 80% in order to avoid a society that has a rigid class structure based on accumulated savings.

The literature also discusses the following issues that apply to countries with account surpluses:

- (1) Despite rapidly rising labor productivity, income inequality is caused by low real wages. Income inequality directly contributes to low and falling consumption relative to quickly growing national income. High and rising savings cannot be fully absorbed by domestic investment and must flow out for “reliable” stores of value abroad (Fails, 2012).
- (2) During global underinvestment, savings outflows help to lower global interest rates and fuel financial bubble speculation. For example, China's high savings rate is said to be responsible for cheap debts, housing bubbles, and financial crises elsewhere in the world (Ma, McCauley, & Lam, 2013). China is the world's largest trade nation, with diverse trading partners, and is an emerging international financial hub, able to project its domestic issues on the global economy. In fact, China's large savings and foreign exchange reserve, monetary expansion and real estate bubble have increased financial volatility around the globe through asset price channel as well as other indirect channels. Moreover, expectations of an economic hard landing in China are

threats to global economic recovery from the crisis (Zhang, Song, & Brecece, 2013).

- (3) Persistent trade imbalances that hinge on large differences in savings rates between Asia and the West, primarily between China and the U.S., have triggered trade protectionism and disagreements about the exchange rate. The problem of imbalances is widely attributed to the currency misalignment, but some authors highlight economic fundamentals, such as savings and productivity, as the cause (Benassy-Quere, Lahreche-Revil, & Mignon, 2008).
- (4) Salotti (2010) finds that wealth does not negatively affect U.S. household savings; rather, government savings better explain the decline in household savings. By not saving, the state household influences the current account deficit, thereby helping to create and sustain global imbalances.

This literature review demonstrates the importance of understanding the causes and effects of the relationships between savings and inequality. Weak labor protection causes income inequality in both deficit and surplus countries in relation to their finance-led and export-based growth, respectively. Inequality affects savings in various ways in those economies, depending on the degree of financial development, and has different implications for the trade balance and financial risk. Rising inequalities cause global imbalances through international differences in savings, and global financial crises emerge as consequences. Therefore, our study concentrates on the inter-country differences in the associations between savings and inequality.

The term global imbalances can be misleading, as the term actually refers to national imbalances. These imbalances occur for many reasons. For example, using capital flows, a savings deficiency in one country can be balanced by a savings glut in another. In the case of China and the U.S., the borrowing needs for deficit spending in the U.S. are matched by the lending willingness of China, which is a result of depressed consumption. Another example occurs when a country's liberal cost outsourcing policy is accommodated by another country's support for foreign investment at the expense of low-skilled labor in both countries, with rising income inequality as a direct consequence. For example, worker dislocation in the former country and low wages in the latter. One country's financial underdevelopment can also be compensated for by another country's overdevelopment until the surplus savings from the former country are channeled through markets for long-term cheap use by the latter country. Alternately, high wages in one country's service sector with low productivity can be made possible by low wages in another country's manufacturing sector with high productivity. Another example is that the borrowing needs of some countries with generous social welfare spending can be met by the lending willingness of other countries with high savings that is partially a result of inadequate social security. Additionally, one country's capital gains from financial speculation can be implied by another country's

capital losses in international markets, or one country's issuance of the world's reserve currency can be matched by another country's accumulation of forex reserves. Finally, one country's rising demand for consumption goods under deindustrialization can be satisfied by another country's manufacturing export growth, so the former provides business services that are absorbed by the latter.

Normally, national imbalances merge into a globally balanced economy through international integration, as the world economy has maintained output growth even in the midst of enlarging national imbalances. The real question is either "To what extent can various deficit countries tolerate their respective national imbalances?" or "In the context of rising national imbalances, can the globally balanced economy continue to grow without culminating in a global crisis?" Addressing these questions requires academic research and policy design to focus on the role of financial development in the association between inequality and savings.

### 3. Differing associations between inequality and savings under different financial systems

Different financial systems have different influences on the association between inequality and savings across advanced and emerging economies. This observation can be explained by a new theory, proposed below, that extends the Cambridge model to credit consumption and aggressive financialization in advanced countries. Global imbalances are affected by international differences in aggregate savings, including public and private savings. In the absence of Ricardian equivalence, higher taxes increase public and aggregate savings. Private savings are firm savings plus household savings. Studies disagree about the determinants of firm savings. A number of hypotheses exist to explain how household savings account for the overwhelming share of private savings, but the results from the hypothesis testing are far from conclusive. These hypotheses include Keynes's absolute-income hypothesis (AIH), Duesenberry's relative-income hypothesis (RIH), Friedman's permanent-income hypothesis (PIH), Modigliani's life-cycle hypothesis (LCH), Kaldor's class-savings hypothesis (CSH), and other hypotheses as well, such as credit unavailability, missing markets, and precautionary motives (Khor & Pencavel, 2006).

By focusing on the aggregate, our model does not distinguish among various savings categories. Instead, we are concerned with different patterns of saving behavior related to income inequality under three financial circumstances: a liquidity constraint, the presence of domestic credit, and the presence of foreign financing. We use a unified framework to address international differences in the associations between aggregate savings and income inequality. Our framework extends Keynes's hypothesis by embracing useful elements from the other savings hypotheses described above and by stressing the role of different financial systems in shaping particular associations between savings and inequality.

### 3.1. A positive savings-inequality association under a liquidity constraint

A positive association is derived below from the traditional Cambridge model with changes that better describe the saving behavior observed in China and other East Asian economies. Consider two income groups:  $B$  for bottom and  $T$  for top. Group  $B$  is composed of workers with stable, low labor income. Group  $T$  comprises individuals with variable, high non-labor income or high executive pay, such as property income and capital gains earned by capitalists, tax revenue collected by governments, and illegal income extracted by public and corporate officials, which is widely observed in developing or transition economies. We establish the savings-inequality association by analyzing the differing patterns of saving behavior between these two groups.

In emerging Asian economies, consumption is constrained by income. Few borrowing opportunities exist for households, as there is limited or nonexistent consumer credit and most savings are allocated by the financial sector for real investments. Much of income  $Y_B$  in Group  $B$  is permanent income that is used for consumption  $C_B$ . Because wage earners rarely receive transitory income, they will be unable to save much but will have a high propensity to consume:  $\alpha_B = C_B/Y_B$ . Most of income  $Y_T$  in Group  $T$  is transitory income ready for saving. This income largely carries a variable yield, as its sources include previous investments with volatile market values; pro-cyclical tax collections; uncertain firm performances; or secret, dishonest, and risky channels. The recipients of this yield have high savings and a low consumption propensity:  $\alpha_T = C_T/Y_T$ , where  $C_T$  is their consumption. Normally,  $\alpha_B > \alpha_T$  is postulated to reflect differences in the long-term behavioral patterns between the two groups; consumption habits are persistent under behavioral inertia.

Given the aggregate income  $Y = Y_B + Y_T$ , the income share  $Y_T/Y$  is used as a proxy for income inequality. Analyzing the ratio of aggregate consumption  $C = C_B + C_T$  to aggregate income yields the Cambridge model:

$$\frac{C}{Y} = \alpha_B + (\alpha_T - \alpha_B) \frac{Y_T}{Y} \quad (1)$$

Clearly,  $Y_T/Y$  affects  $C/Y$  negatively under  $\alpha_B > \alpha_T$ . Thus, we derive the following:

*In the absence of consumer credit, the rate  $s$  ( $=S/Y$ ) of aggregate savings  $S$  ( $=Y - C$ ) increases with higher income inequality.*

This result applies to emerging Asian economies. Later, this approach is extended to include consumer credit and foreign financing. The theoretical result from Eq. (1) relies on the assumption that  $\alpha_B > \alpha_T$ , which can be validated by combining useful elements from the main hypotheses regarding savings in the literature. Wealthy individuals have low normal labor incomes relative to their total incomes, and their non-labor or abnormal labor incomes are substantial but fluctuating. Moreover, the yields from their invested savings can partially or fully cover the expenses of their future consumption. Typically, individuals in Group  $T$  are powerful at dictating an unequal income distribution, and there are strong incentives to perpetuate

the income distribution in their own favor. These factors account for why wealthier people have persistently lower consumption or a higher savings propensity after synthesizing the AIH, RIH, PIH, and CSH. These factors also explain why the established upper income class with high yields from accumulated savings may not reduce its savings as much as the LCH suggests.

The positive association between inequality and savings is confirmed by China's time-series data that span from 1952 to 2009 (Prasad, 2011). There is a clear financial reason behind this positive association. The savings of wealthy individuals in China are used by the public and corporate sectors for investment rather than by poor households for consumption through borrowing. High amounts of savings in China relate not only to the comparatively stronger habits of thrift that prevail in China but also to the underdeveloped financial system and the lack of consumer credit. Individuals must save for large purchases, as they lack opportunities to borrow against future income growth.

Additionally, in China and other emerging Asian economies, directing national savings via the financial sector to manufacturing investments for trade expansion is an important aspect of industrial policies and growth strategies. As a result of reductions in economic equality, China's aggregate savings has recently exceeded 50% of its GDP, whereas domestic investment has used more than 40% of the GDP to build huge capacities for trade expansion (Prasad, 2011). However, such massive investment still cannot productively absorb all of China's savings. Therefore, the excess of savings over investments has long constituted a substantial surplus of current accounts and a direct source of trade frictions with the U.S. and other OECD countries. China's exportation of surplus savings is blamed for the prolonged economic problems in other countries.

### 3.2. A negative savings-inequality association caused by consumer credit

A negative savings-inequality association occurs when the savings of the wealthy are used by poor households for increased consumption through deficit spending instead of by investing firms for output growth. This negative association exists in the U.S. The savings of the rich, after becoming consumer credit for the poor, should be viewed in the national income account as consumption spending rather than domestic saving (Alvarez-Cuadrado & Long, 2012). As in many OECD countries, spending is constrained not by income but by liquidity. The Cambridge model is modified below in accordance with this fundamental observation.

Consider a closed economy in which the top group lends to the bottom group, and both sides of credit are domestic residents. Consumption propensity is defined as  $\alpha'_T = C'_T/Y_T$  for Group  $T$  as usual but as  $\alpha'_B = C'_B/(Y_B + D'_d)$  for Group  $B$  by taking into account the income illusion that is backed by asset bubbles, where debt  $D'_d$  is taken as permanent income. Aggregate consumption is now  $C' = C'_B + C'_T$ . As a rule, Group  $B$ 's propensity to spend is greater than that of Group  $T$ ; that is,  $\alpha'_B > \alpha'_T$ . Furthermore,  $D'_d/Y_T = \beta'_T$

and  $D'_d/Y_B = \beta'_B$  denote the lending and debt ratios, respectively. Note that the debt ratio may be higher than the lending ratio under inequality  $\beta'_B > \beta'_T$  if  $Y_B < Y_T$ . Combining the above descriptions yields our extended Cambridge model:

$$\frac{C'}{Y} = \alpha'_B + [\alpha'_T - (1 - \beta'_T)\alpha'_B] \frac{Y_T}{Y} \quad (2)$$

Clearly,  $C'/Y$  increases with a higher ratio  $Y_T/Y$  if  $\beta'_T > 1 - \alpha'_T/\alpha'_B$ . Thus, we arrive at the following:

*Higher inequality lowers the savings rate  $S'/Y$  with consumer credit if the lending ratio is high enough that a sufficient portion of the savings of the rich is lent to the poor for consumption rather than to firms for investment.*

If  $\beta'_T = 0$  in Eq. (2), the model reduces to Eq. (1), which was derived in the absence of consumer credit. Working with  $\alpha_B = \alpha'_B$  yields  $C_B < C'_B$ , indicating that consumption is increased with borrowing opportunities, although borrowers' consumption propensity remains unchanged. In fact, this propensity is likely heightened by consumer credit, further expanding the consumption-to-GDP ratio.

The long-term negative savings-inequality association in the U.S. can be seen using time-series data for 1980–2009, with the Gini index characterizing the extent of inequality (Nocetti & Smith, 2011). This important association was jointly driven by both sides of the U.S. financial market. On the lending side, investors prefer more liquid assets backed by consumer loans to workers as stores of value in a transmutable reality. Non-producible assets result in no job creation for indebted workers, thereby heightening inequality. On the borrowing side, many households borrowing against the increased value of their homes are subject to the income illusion from asset bubbles under persuasive but misleading advertisements. Even poor people who are optimistic about future income or job security have developed habitual profligacy through the use of cheap credit under strong consumerism coupled with an ignorance of future consequences. Under these circumstances, spending is constrained not by income but by liquidity.

As indicated by Eq. (2), causalities from surging inequality to declining savings have substantially influenced policy responses in OECD countries, and the painful consequences are exemplified by the spread of the “Occupy Wall Street” movement to many other places. Income inequality leads to social pressure to address the issue, but no intervention has been attempted to reverse income inequality. Instead, political efforts often increase the living standards of the bottom group by encouraging easy credit and ensuring demand for the credit despite this group's falling income share. With increased savings at the top and increased borrowing at the bottom, consumption inequality has increased substantially less than income inequality, but the domestic indebtedness of the poor and middle class has increased substantially. Thus, the savings rate has entered a freefall as a result of financial markets directing domestic lending toward consumption rather than investment.

### 3.3. The negative savings-inequality association strengthened by foreign financing

The policy response to income inequality has led to expanded credit use for spending growth and, hence, to a savings decline in the U.S. Moreover, the resultant negative savings-inequality association is strengthened by the cross-border mobility of savings under financial globalization. Domestic spending is no longer constrained by national income, as foreign savings are easily available at low costs. The Cambridge model is further modified below by incorporating foreign financing into consumer credit. We demonstrate that declining national savings in OECD economies should be interpreted as an effect of rising income inequality in association with widened credit availability in the context of international financial integration.

The availability of foreign savings for domestic use has three economic effects. First, consumers with certain credit scores are likely to borrow more at lower costs, which is made possible by global markets, as evidenced by the steeply rising debt-to-income ratio in the U.S. since 1989 (Quercia, Pennington-Cross, & Tian, 2012). Second, compared with a more equitable distribution of income, achieving a given rise in living standards requires more borrowing relative to consumption, which can be accommodated by foreign savings inflows but further increases the debt ratio. Third, expanded credit access to foreign and domestic savings enables individuals to maintain a habitual standard of living even when their real incomes decline. This allows individuals on the losing side of the income distribution to engage in deficit spending to reduce the lifestyle gap that separates them from more affluent groups. This practice of “keeping up with the Joneses” makes poorer households borrow more relative to their incomes.

In an open economy with foreign financing of domestic credit, income recipients are divided into low-, middle-, and high-income groups, indexed by  $i = \{L, M\}$  and  $H$  or  $T$ . For expository convenience, Group  $T$ , defined above, is the same as Group  $H$ , and Group  $B$  consists of subgroups  $L$  and  $M$ . Income  $Y_i$  and consumption  $C_i$  for group  $i$  are such that  $Y_L + Y_M = Y_B$ ,  $Y_B + Y_T = Y$ ,  $C_L + C_M = C'_B$ , and  $C'_B + C'_T = C'$ . Let  $\eta_i (= Y_i/Y_B)$  be Group  $i$ 's share in Group  $B$ 's income so that  $Y_i = \eta_i(Y - Y_T)$  and  $\eta_L + \eta_M = 1$ . Consumption propensity is specified as  $\alpha''_T = C'_T/Y_T$  for Group  $T$  and  $\alpha_i = C_i/(Y_i + D_i)$  for Group  $i$ , where debt  $D_i$  is treated as the “illusive income.” Assume  $\alpha''_T < \alpha_M < \alpha_L$ , as usual.

Foreign savings can now be borrowed to help finance domestic consumption; thus, a distinction should be made between foreign and domestic debts.  $D''_d$  denotes the debt lent by domestic savers, and  $D_f$  denotes the debt financed from foreign sources, with their total being  $D''_d + D_f = D = D_L + D_M$ . The lending ratio is  $D''_d/Y_T = \beta'_T$  for Group  $T$ , and the debt ratio is  $D_i/Y_i = \beta_i$  for Group  $i$ . Assume  $\beta_M < \beta_L$  to reflect the real world. Denote by  $\lambda (= D/D''_d \geq 1)$  the ratio of total debt to domestic debt (as an index for financial openness) so that  $D = \lambda \beta'_T Y_T$ , with a higher ratio  $\lambda$  indicating more foreign financing given  $D''_d$ . Let  $\zeta_i (= D_i/D)$  be the Group  $i$  share in total debt so that  $\zeta_L + \zeta_M = 1$ . Because  $\beta_L(Y_L/Y_H) + \beta_M(Y_M/Y_H) = \lambda \beta'_T$ , more foreign and

domestic lending is needed for financial balance as the debt ratios increase for the given income shares.

Substituting the above specifications into the ratio of aggregate consumption to national income yields a further extended Cambridge model:

$$\frac{C}{Y} = \alpha_B^y + (\alpha_H + \lambda\beta_H\alpha_B^b - \alpha_B^y)\frac{Y_H}{Y} \quad (3)$$

where  $\alpha_B^y = \eta_L\alpha_L + \eta_M\alpha_M$  and  $\alpha_B^b = \zeta_L\alpha_L + \zeta_M\alpha_M$  are two differently weighted averages of consumption propensities between the two bottom subgroups. If Group B is not divided into subgroups L and M, one can set  $\eta_L = 1$  and  $\zeta_L = 1$  to reduce Eq. (3) to the following:

$$\frac{C}{Y} = \alpha_B + (\alpha_H + (\lambda\beta_H - 1)\alpha_B)\frac{Y_H}{Y} \quad (4)$$

In this special case,  $\alpha_B^y = \alpha_B^b + \alpha_B''$  [=  $C_B''/Y_B + D$ ] for Group B]. If we set  $\lambda = 1$ , our Eq. (4) model will be reduced to Eq. (2), which was obtained under consumer credit but with no foreign financing. Eq. (3) indicates that the inequality index  $Y_T/Y$  positively affects the consumption ratio,  $C/Y$ , and negatively affects the savings rate,  $s' = S''/Y$ , if  $\beta_T'' > (\alpha_B^y - \alpha_B'')/(\alpha_B^b\lambda)$ . Because  $\beta_M < D/Y_B < \beta_L$ , we know  $\zeta_L > \eta_L$ , and hence,  $\zeta_M < \eta_M$ . Given that  $\alpha_L > \alpha_M$ ,  $\alpha_B^y < \alpha_B^b$ . With  $\lambda > 1$  and  $\alpha_T'' < \alpha_M$ , one can also observe that  $0 < \kappa_f < 1$  and that the condition of  $\beta_T'' > \kappa_f$  for the open economy is easier to satisfy than that of  $\beta_T'' > \kappa_d$  for the closed economy. All else being equal, this closed-open comparison can be clarified in the special case of  $\eta_L = 1 = \zeta_L$ . The economic intuition of such a comparison is that the rich do not need to raise their lending ratio because the poor can borrow foreign savings to increase their consumption. Thus, we establish the following:

*The negative savings-inequality association can be further strengthened when consumer credit is covered by additional foreign savings.*

The negative savings-inequality (or positive indebtedness-inequality) nexus in the U.S. is attributable to the swelling of the domestic financial services sector, which was facilitated by international capital flows. This issue received scant attention before the recent global crisis, but recent studies have begun to establish the direct relationship between increases in income inequality and rises in household leverage. This issue is important for the following four reasons: First, as savers' desire to lend and households' need to borrow simultaneously increase regardless of national boundaries, so do the flow of funds between the two income groups and the size of the financial sector, as indicated by several measures. Second, although intermediating foreign savings make the top fraction of the population increasingly richer, the bottom fraction has become increasingly more indebted, thus heightening economic inequality. Third, widespread consumer credit with foreign financing is responsible for decreased savings as well as rising inequality, as is seen from  $\partial s''/\partial \lambda = -\beta_T''\alpha_B^b Y_T/Y < 0$ , implied by Eq. (3). When this inequality-induced indebtedness began to be perceived as unsustainable, the financial crisis that occurred in the U.S. and spread to the rest of the world was triggered. Fourth, surging inequality renders the economy more dependent on household leverage for consumption

growth, which drives savings below investments. Trade deficits inevitably follow and must be financed by net borrowing from foreign sources. If this situation persists, current account imbalances will worsen. Although a more competitive dollar is increasingly needed to reduce the U.S. trade deficit, the fundamental requirement for curbing the imbalance problem is an increase in the U.S. national savings rate.

#### 4. Different relationships between consumption and income inequality arising from different financial systems

Another important difference that exists between the U.S. and China is the relationship between consumption and income inequality. This relationship appears weak in the U.S. and strong in China. The increase in income inequality in the U.S. has not been accompanied by a corresponding rise in consumption inequality, but the two inequalities remained close in China before 2003 and remain similar today (Chen & Yao, 2011). The literature has provided several explanations for the different relationships between consumption and income inequality in the U.S. and China. Our model integrates various studies into a unified post-Keynesian framework by attributing differences in the Sino-U.S. consumption and income inequality to factors of consumer credit and financial globalization. Based on the Cambridge tradition, such a framework addresses the issue clearly and concisely.

With two extensions, the Cambridge tradition allows us to provide a compelling explanation for why consumption and income inequalities diverge in the U.S. but remain close in China, and the explanation is based on differences in the countries' financial systems. The expansion of global markets has enabled poorer U.S. households to borrow more relative to their incomes. On the contrary, even though China has been deeply involved in financial globalization, poor Chinese households lack this privilege because of the previous absence of consumer credit and the current limited availability of consumer credit under China's less developed financial system. In the context of our extended Cambridge models [relating to Eqs. (2) and (3)], we next demonstrate how different levels of financial development yield different relationships between consumption and income inequality.

$C_T/C_B$  and  $Y_T/Y_B$  mirror the consumption and income disparities between the top and bottom groups, respectively. Applying algebra to  $\alpha_T < \alpha_B$  yields  $C_T/C_B < Y_T/Y_B$ , implying that consumption inequality is inherently lower than income inequality because the consumption propensity is lower for the top than for the bottom group. Simple algebra reveals that a complex model is not needed to derive this inherent phenomenon. Instead, proving why this phenomenon is reinforced by widespread consumer credit is relatively straightforward: combining  $\alpha_B'$  and  $D'_d/Y_B = \beta_B'$  (i.e., Group B's debt ratio) yields  $(1 + \beta_B')\alpha_B' = C_B'/Y_B$ . This expression, along with  $\alpha'T = C_T'/Y_T$  and  $\alpha'T < \alpha_B'$ , leads to  $C_T'/C_B' < Y_T/Y_B$ , indicating that consumer credit allows inequality to become much less serious for consumption spending than for the income distribution. This

phenomenon occurs when income imposes a softer constraint on spending with more consumer credit.

The result that consumer credit makes inequality much less serious for consumption than for income holds to a greater extent if the credit can be expanded through foreign financing and if the debt-to-income ratio is higher for poorer households (i.e.,  $\beta_M < \beta_L$ ), which describes the situation in the U.S. This result applies to the two bottom subgroups  $\{L, M\}$  and to the bottom versus the top groups  $\{B, T\}$ , in the sense that  $C_M/C_L \ll Y_M/Y_L$  and  $C_T/C_B \ll Y_T/Y_B$ , with the openness index  $\lambda$  affecting the result. To demonstrate this relationship, we use  $\alpha_i^o = C_i^o/Y_i$  to denote Group  $i$ 's propensity to consume  $C_i^o$  out of its own income for  $i = \{L, M\}$ . Setting  $\alpha_i^o = \alpha_i$  yields  $C_i^o < C_i$  (i.e., consumption increases with more borrowing opportunities) and  $C_i = C_i^o(1 + \beta_i)$ , where  $\beta_i = \zeta_i \lambda \beta_i^o Y_T/Y_i$ . In  $\varphi(\lambda) = (1 + \beta_M)/(1 + \beta_L)$ , we also have  $C_M/C_L = (C_M^o/C_L^o)\varphi(\lambda)$ . Thus,  $\varphi'(\lambda) = (\beta_M - \beta_L)\beta_i^o Y_T/D < 0$  because  $\beta_M < \beta_L$ . Therefore,  $C_M/C_L$  declines with a higher  $\lambda$  for a given  $Y_M/Y_L$  if  $\alpha_i$ s are fixed, suggesting that consumption inequality shrinks relative to income inequality with more foreign financing under constant consumption propensities.

If such propensities  $\alpha_i$  increase more quickly in poorer groups under foreign financing (i.e.,  $0 < d\alpha_M/\alpha_M < d\alpha_L/\alpha_L$ ), we can demonstrate that consumption inequality will shrink further for the given degree of income inequality. For example, we can denote  $\alpha_i = C_i/(Y_i + D_i)$  as  $C_i = \alpha_i Y_i^a$ , where  $Y_i^a = Y_i + D_i$  is the available income for consumption use and  $D_i = \zeta_i \lambda \beta_i^o Y_T$ . If  $\beta_M < \beta_L$  and  $\alpha_M$  increases less rapidly than  $\alpha_L$  following a rise in  $\lambda$ , then

$$\frac{d}{d\lambda} \cdot \frac{C_M}{C_L} = \frac{Y_{Ma}}{Y_{La}} \cdot \frac{d}{d\lambda} \cdot \frac{\alpha_M}{\alpha_L} + \beta_H Y_H \frac{\alpha_M}{\alpha_L} \left( \frac{\zeta_M}{Y_{La}} - \frac{Y_{Ma}}{Y_{La}} \cdot \frac{\zeta_L}{Y_{La}} \right) \tag{5}$$

indicating that the ratio of  $C_M/C_L$  decreases with a higher  $\lambda$  given the income distribution  $\{Y_L, Y_M, Y_{T \text{ or } H}\}$ . The condition for this result can be checked by setting  $\zeta_M < \zeta_L Y_M^a/Y_L^a$ , which gives  $\beta_M < \beta_L$ , and by making  $d(\alpha_M/\alpha_L)/d\lambda < 0$ ,  $d\alpha_M/\alpha_M < d\alpha_L/\alpha_L$  under  $d\lambda > 0$ . Thus, we reach the following proposition:

*Consumption and income inequalities may diverge if capital markets are well developed, as in the U.S., or they may remain together if consumer credit is absent or limited, as in China. Financial globalization plays a larger role in making the two inequalities diverge in the former case.*

The result from Eq. (5) is largely consistent with evidence observed over a long period of financial globalization in the U.S. Clearly, both income and consumption inequalities in the U.S. have been increasing at different paces over time. The problem of inequality has become much less serious for consumption than for income, as consumer credit growth has been made possible by financial globalization. Both types of inequalities have become increasingly severe in China since 1992 with the accelerated market reform, and consumption inequality has diverged from income inequality since 2003 with the initiation of consumer credit experiments under limited financial development (Chen & Yao, 2011). However, in contrast to the U.S. situation, consumption and income inequality in China have remained close to each other. The difference between the U.S. and

China is that China's financial liberalization has been more gradual, which has resulted in less divergence between the two types of inequalities.

### 5. Conclusion

This study provides a theoretical examination of the role of financial development in determining the differing associations between savings and inequality in OECD versus emerging Asian countries. Our model extends the traditional Cambridge approach by incorporating the income illusion created by finance-led speculative growth. The findings from this study and their policy implications for global imbalances and crises are summarized below.

The current global crisis is perceived to hinge on deteriorating global imbalances that were caused by large savings differences between deficit and surplus economies. The savings rate is negatively related to income inequality in deficit economies, as overdeveloped capital markets are able to finance substantial credit consumption. Conversely, the savings rate is positively linked to inequality in surplus economies with weak financial systems that provide limited or no consumer credit. Income inequality has the same root causes in both types of economies: workers' bargaining power for income sharing is weaker than that of investors. The economies in the U.S. and China have applied different policy responses to this problem. Political interventions in deficit countries expanded consumer credit to prevent workers' living standards from falling. In contrast, state policies in surplus countries allowed consumption relative to GDP to decline, ignoring credit constraints on workers and acting in favor of manufacturing expansion and export growth. As a direct result of these differing policy orientations, China's household consumption fell to only 35% of GDP in 2011, roughly half of the U.S. level (Chen & Yao, 2011).

Differing consequences have emerged from the two policies. In deficit countries, financial liberalization succeeds in keeping workers' living standards from declining so that consumption inequality can remain low despite high income inequality. However, this aggressive liberalization has transformed greater income inequality into higher domestic indebtedness and larger external deficits. Whereas artificial aggregate demand is stimulated, real aggregate supply has been restricted by a slower accumulation of producible capital, as investors prefer portfolio investments to direct investments. When these problems became perceived as unsustainable, the global financial crisis was triggered. In surplus countries, greater inequality lowers workers' income share and decreases their consumption relative to income growth, as workers cannot borrow from investors against future income in situations of limited financial development. Consequently, rising income inequality is followed by a corresponding increase in consumption inequality. The result is that the domestic wealthy must export their goods and deploy their increased income in financial assets abroad, resulting in a current account surplus and strong foreign protectionism against fixing the surplus.

Choi et al. (2010) provide a conceptual analysis of the role of institutions in the face of a global financial crisis.



They suggest that a new industrial policy is needed to successfully create and interconnect financial, physical and knowledge infrastructures in a national economy. In particular, ongoing global liberalization requires government intervention that focuses on institutional infrastructure. From the perspective of the current global financial crisis, increased regulation and scrutiny will undoubtedly raise the transmission costs. However, if increased regulation reduces moral hazards, lowers long-term risk, and reduces the probability of another crisis, economic costs can still be decreased over time (Hou, 2011). Therefore, a serious long-term industrial policy must be developed to alleviate income inequality in both deficit and surplus countries. Only such an industrial policy can cultivate institutional infrastructure to stop growth in global imbalances and reduce future vulnerability to global crises. The theory established in our study implies that income inequality must be reduced to increase the savings rate for smaller deficits in financially advanced countries and reduce the savings rate for smaller surpluses in less financially developed countries. There is no long-term alternative to directly addressing the problem of income inequality. The lesson learned from the 30-year OECD experience is that financial liberalization only buys time and accumulates a larger debt problem for later. Many options for reducing income inequality exist in deficit countries, but there are no easy solutions to the inequality problem. Strengthening employment protection legislation or adjusting tax codes for the benefit of labor at the expense of capital would drive away investments under competition from emerging markets. A more realistic reform would restrain capital markets from excessive risk-taking by stepping back from financial deregulation. In surplus countries, reducing the financial market imperfections is correctly regarded as a shortsighted policy response to global imbalances. Liberalizing loans to workers without addressing the inequality problem itself would only increase domestic indebtedness and could heighten global financial fragilities, although doing so could mitigate cross-border financial imbalances.

As emergency measures to prevent global imbalances from deteriorating, five policy reforms should be carried out in a serious and quick manner. First, in deficit countries such as the U.S., an ex-ante redistribution policy should be utilized to reduce inequality, indebtedness, and crisis risk; such a policy can be more desirable than ex-post policies of direct bailouts or debt restructurings. Second, financial regulation should be tightened in the U.S. to reduce income illusion and profligate consumer spending habits by discouraging the financial sector from engaging in asset bubbles and market excesses. Third, in surplus countries such as China, the state sector, including governments and enterprises at the central and local levels, has captured too much of the national income while being reluctant to provide adequate social security for the general public. Such a distortion in the income distribution must be reduced to lower public and firm savings, and this can be accomplished easily by allocating more wealth to the vast numbers of poor people for consumption use. Once sufficient financial resources are directed for meaningful spending, economic growth can move on a sensible, sustainable path. Fourth, the government sector in China can

no longer operate in the manner of a business corporation but must become a social service provider, with a substantial share of its abundant revenue devoted to the variety of welfare programs that are urgently needed by ordinary people. This reform can effectively mitigate the precautionary motive for saving. Fifth, people in China, who are subject to liquidity constraints because of China's underdeveloped financial system, cannot borrow against future income growth but must save for large purchases. This situation needs to be swiftly changed to accommodate adequate expansion in consumer credit and to effectively reduce household savings.

Economic growth has a strong bearing on the trade balance, which, in turn, relates to aggregate savings. Trade imbalances are rooted in savings disparities between some OECD and East Asian countries. Savings disparities are attributable to inequality differences between the two country groups. Inequality differences may hinge on different wage levels or differing labor income shares in GDP. When relatively poor countries with surplus savings lend to relatively rich countries with savings deficiencies, financial losses from capital outflows in international markets are the price that must be paid for the global imbalances. However, large benefits would arise if the savings and inequality problems could be solved in the surplus countries. Raising wages for the working class will substantially decrease income inequality and social unrest, and the resultant higher consumption will directly increase the public's utility and increase imports. Furthermore, providing adequate social security for ordinary people will substantially alleviate the pressure to involuntarily save for precautionary purposes, and lower savings will effectively reduce trade surpluses and mitigate financial losses as a result of reduced lending to foreign economies.

Growth based on trade and investments by emerging economies cannot be sustained indefinitely for two reasons. First, foreign demand is limited and will shrink in advanced countries that are constrained by debt burdens. Second, trade frictions and currency wars will be intensified as a result of the prolonged existence of large imbalances. Because severe inequality leads to high savings that make growth rely on investment and exportation in emerging economies, the inequality problems in these countries must be solved to lower their savings and embark on consumption-led growth. In deficit countries, consumption that is financed by foreign borrowing cannot continue indefinitely. Services have limited potential to generate export receipts to reduce trade deficits, and their role for further development should not continue to be exaggerated. Although an advanced financial sector can channel foreign savings for domestic use, services may need to be regulated to increase domestic savings and to encourage recovery and future growth.

Real economies are increasingly dominated by financial markets that are constrained by globalization. In major economies, financial systems are becoming more market-based and less bank-based, and capital outflows are more interested in portfolio investments than in direct investments, even though the latter is widely welcome in developing countries. Many people talk about capital freedom, but few pay attention to labor mobility, which

indicates that we are still far from a borderless global economy. Emerging economies should not abruptly shift to market-based financial systems under poor legal infrastructures or widely open their premature capital markets when seeking exchange rate stability. This policy inconsistency with economic fundamentals can be easily used by domestic and foreign interest groups for financial speculation. Globalization causes a variety of conflicts of interest among countries, but Pareto improvements remain possible if international relationships are promoted. Healthy relationships are only possible if dominant powers refrain from forcing financially underdeveloped foreign countries to fully float their exchange rates or dismantle their limited capital controls. Focusing on the alleged currency misalignments may temporarily increase the exorbitant privilege but will likely cause the privilege to shrink or even reverse in the long run, especially if the currency disputes are prolonged and increasingly hurt other economies.

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