Household credit, growth and inequality in Malaysia: does the type of credit matter? [1]

Jiaming Soh, Amanda Chong and Kue-Peng Chuah[2]

Abstract

Do different types of household credit affect income growth and income inequality differently? This empirical paper investigates this question by employing both macro-level data and micro-level household survey data, covering the period since 1997. We find that the different types of household credit matter, and our contributions are twofold. First, on income growth, both macro- and micro-analyses consistently find housing credit to be positively associated with future income growth, while consumption credit shows no significant evidence. Second, on income inequality, the results are more nuanced. At the macro-level, housing credit in terms of total net disbursements is positively related to income inequality. However, the micro-level data, which investigate the proportion of households with housing loans, find a negative relationship with income inequality. We interpret these two sets of empirical results for housing credit to imply that financial inclusion that improves access to housing credit for more households would likely reduce income inequality. Meanwhile, further accumulation of housing credit for existing borrowers may worsen income inequality given the likely concentration of housing wealth among richer households. The findings in our paper fill a research gap for the Malaysian economy and could serve to inform policies, especially in relation to the broader discussion of household indebtedness.

Keywords: Household credit, housing and consumption credit, income growth, income inequality

JEL classification: E44, E50, E51

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[2] The authors are from Bank Negara Malaysia. The views expressed in this paper are those of the authors and do not necessarily reflect the official views of Bank Negara Malaysia. Corresponding author: Jiaming Soh; Email: jsoh@bnm.gov.my.

1. Introduction

Since 1997, Malaysia's household debt as a percentage of GDP has doubled from 43% to 89%, and is currently among the highest in the Asia region. In terms of composition, there has been a gradual shift over the years away from consumption credit towards housing credit. To date, housing credit has taken up the largest proportion of total banking system household loans, and its share has persistently increased from 36% in 1997 to 51% in the first half of 2016. Given these developments, a meaningful assessment of the relationships between household credit and income growth and income inequality would necessitate differentiation between the types of credit. For instance, housing credit, in addition to its direct impact on real sector growth through housing-related consumption and investment, has an indirect influence through households' accumulation of assets. This added layer of influence would affect not only households' current balance sheet position, but their future flow of income and wealth depending on asset price movements. Consumption credit, such as personal and passenger vehicle loans, on the other hand, would facilitate households' current expenditure more directly, with less of the accompanying influence through asset accumulation.

In this paper, we therefore distinguish between housing and consumption credit and investigate their varying effects on future income growth and income inequality. We find that the type of household credit matters, and our contributions are twofold. First, on future income growth, both macro- and micro-analyses show consistent results to highlight the significance of housing credit:

- At the macro level, household credit net disbursements are positively associated with future GDP per capita growth, with housing credit accounting for most of the positive effects. In addition, we show that this positive impact of housing credit is likely driven by housing wealth. We note, however, that the positive effect of housing credit may not be linear and could diminish at higher levels of net disbursements.
- Similarly, at the micro level, a higher proportion of households with housing loans is positively associated with a higher increase in future household disposable income.
- In both cases, consumption credit has no significant impact on future income growth.

Second, on future income inequality, the results are more nuanced:

- From the macro level-study, housing credit in terms of total net disbursements is positively related to income inequality.
- However, the micro-level study, which investigates the proportion of households with housing loans, finds a negative relationship with income inequality.
- In both cases, consumption credit has no impact on income inequality.

On income inequality, we reconcile the two sets of findings for housing credit in Section 6. We interpret the findings to suggest that the distribution of housing credit matters for income inequality. Financial inclusion that improves access to housing credit for a larger proportion of households would likely reduce income inequality. In contrast, further accumulation of housing credit for existing borrowers may worsen income inequality given the likely concentration of housing wealth

among richer households. Taken together, the positive association that we find at the macro-level between housing credit and income inequality would suggest that the net effect is driven by the latter. This interpretation is further supported by insights derived from the micro-level data in Section 6, which show the distribution of housing credit among Malaysian households across different income groups. In fact, we find that the disparity in housing credit across the different income groups is striking and that housing credit is mostly concentrated in the top 20% of the income distribution.

The rest of the paper is organised as follows. The literature review in Section 2 discusses how our paper fits into the empirical literature of finance and growth as well as finance and inequality. Section 3 provides a descriptive background of household debt in Malaysia between 1997 and the first half of 2016. Section 4 describes the data that we use for the macro- and micro-level analyses. Section 5 presents the regression estimations and results. Section 6 proposes a conceptual framework on the channels through which housing loans can affect income growth and income inequality. Section 7 concludes.

2. Literature review

In this section, we discuss how our paper fits into the broader empirical literature that relates finance to growth and income inequality.[3] We offer a general discussion on the literature, since to our knowledge there are currently no empirical paper on Malaysia that is directly comparable to the research carried out in this paper.

The positive effect of finance on economic growth is supported extensively in the empirical literature (Garcia-Escribano and Han (2015), Levine (2005), Levine et al (2000) and King and Levine (1993)). Most papers are cross-country studies, and finance is commonly measured as the stock of debt at the aggregate level.[4]

A smaller set of papers examines disaggregate data to estimate how different types of credit impact growth, particularly focusing on the distinction between corporate and household credit given that firms and households have strikingly different behaviour such that they impact growth differently in terms of size and channels. This, in turn, would inform policymakers in terms of promoting investment-led growth, consumption-led growth or both. Such papers tend to find that the composition of credit matters, with corporate credit having a larger impact in fostering growth through the productive channel (Angeles (2015), Garcia-Escribano and Han (2015) and Beck et al (2012)). For instance, Beck et al (2012) investigate a panel dataset of 45 advanced and developing countries, which includes Malaysia, and find that corporate debt has a positive impact on growth in real GDP per capita and helps to reduce income inequality, while household debt has no significant impact. More recently, Angeles (2015) uses a new BIS panel dataset to conclude that corporate debt is beneficial for growth, while the effects of

[3] For the theoretical literature on finance, growth and inequality, see Demirguc-Kunt and Levine (2009), Levine (2005) and Harrison et al (1999).

[4] Our paper abstracts from the literature on the threshold effect of debt on growth, although some preliminary estimations on non-linear effects are carried out using a simple quadratic specification and discussed in Section 5.1.

household debt can be detrimental as it can often lead to unproductive activities. However, most studies focus on cross-country comparisons with more attention on advanced countries.

Of note, even fewer papers focus on the different types of household debt, particularly differentiating between housing and consumption credit, which is where our paper makes a contribution. For Malaysia, we point out the significance of housing credit. Using a different approach, Garcia-Escribano and Han (2015) investigate a dynamic panel dataset of 31 emerging markets, which includes Malaysia, and find evidence that both housing and consumer credit contribute positively to GDP growth and private consumption. They also suggest that housing credit affects growth through the housing wealth channel, in line with the findings in the literature (Mian and Sufi (2016), Muellbauer (2008) and Campbell and Cocco (2005)). Meanwhile, for Malaysia, a paper by Murugasu et al (2015) finds varying impacts of housing wealth and consumption credit on private consumption growth.

In addition, examining the composition of household credit allows us to extend the research to cover income inequality and the progress of financial inclusion in Malaysia over the recent years. Compared to the finance and growth literature, there are a limited number of papers on finance and income inequality. Nonetheless, there are increasingly more papers that study the impact of debt on income inequality, and evidence tends to support its positive impact in reducing inequality (Demirguc-Kunt and Levine (2009) and Beck et al (2007)). We contribute to this area by identifying the type of household credit that matters for income inequality in Malaysia.

3. Background on household debt in Malaysia

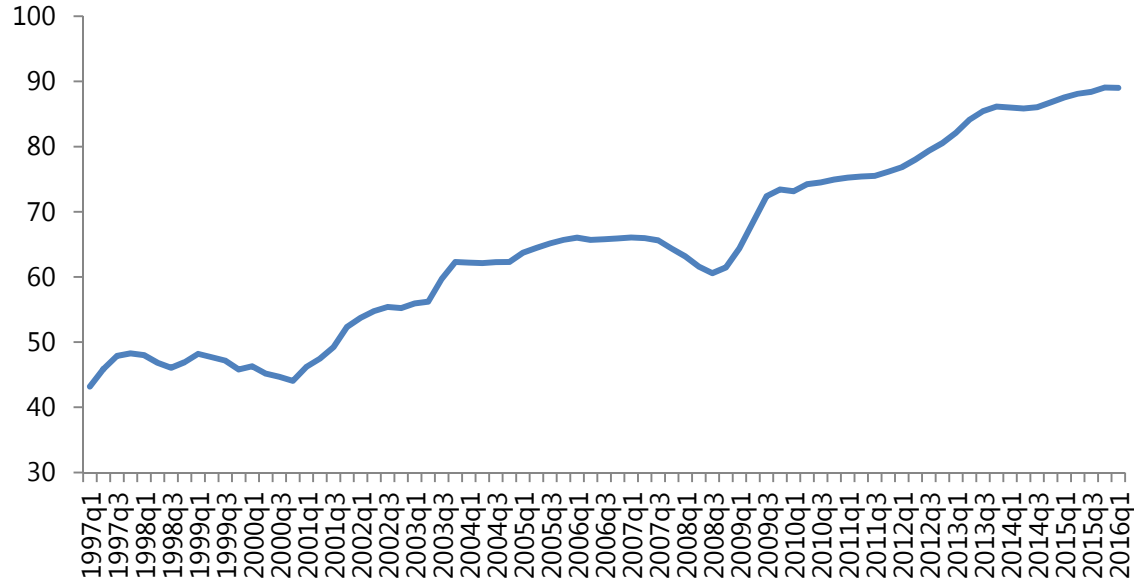
Over the past two decades, Malaysia's household debt, both in absolute terms and as a share of GDP, has generally been on a rising trend (Graph 1). Since 1997, the level of household debt increased more than sevenfold, registering on average a double-digit growth of 11% per annum to reach RM1.1 trillion in the first half of 2016.

Correspondingly, household debt doubled from 43% of GDP in 1997 to 89% of GDP in the first half of 2016. With the persistent increase in lending to the household sector, household credit now accounts for more than 60% of total bank and non-bank lending, surpassing corporate credit since 2004.

Households' decision to accumulate debt can be ascribed to several factors. As highlighted in Endut and Toh (2009), the three key factors that underpin the increase in Malaysia's household debt are: 1) macroeconomic stability, with sustained economic growth contributing to rising household incomes; 2) financial sector development promoting financial inclusion; and 3) government policies promoting home ownership and the development of the housing market.

Household debt as a share of GDP, 1997-2016

As a percentage of GDP Graph 1



Sources: Bank Negara Malaysia; authors' estimates.

Beyond these factors, housing as a whole is crucial in understanding the accumulation of household debt. As experienced in other countries, rising household indebtedness in the past decade has often been tied to the developments in the housing market (Mian and Sufi (2016)). Similarly, the increase in household debt in Malaysia over this period stemmed mainly from housing credit.[5] The stock of housing credit as a share of GDP has consistently been higher than that for consumption credit, and has increased by about 20 percentage points from 1997 to the first half of 2016 (Graph 2). In level terms, housing credit expanded on average by 11% per annum to account for more than 50% of household debt in the first half of 2016. In contrast, consumption credit as a share of GDP only increased by 8 percentage points, and constituted about 35% of household debt in the first half of 2016.

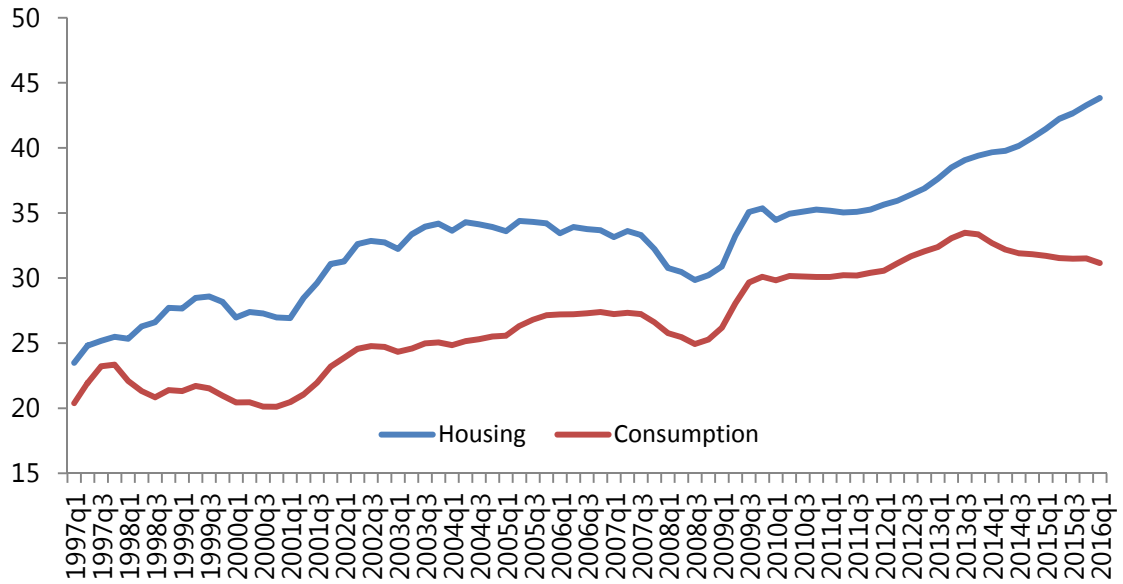
The shift in lending towards housing is also evident from the flow perspective. Housing credit net disbursements[6] as a share of GDP have been higher, on average, than consumption credit net disbursements, and the gap between these two types of credit has in fact widened since 2010 (Graph 3).

[5] A housing loan is a residential property loan given to households.

[6] Net disbursements are the difference between total loans disbursed and total loans repaid.

Housing and consumption debt as a share of GDP, 1997-2016

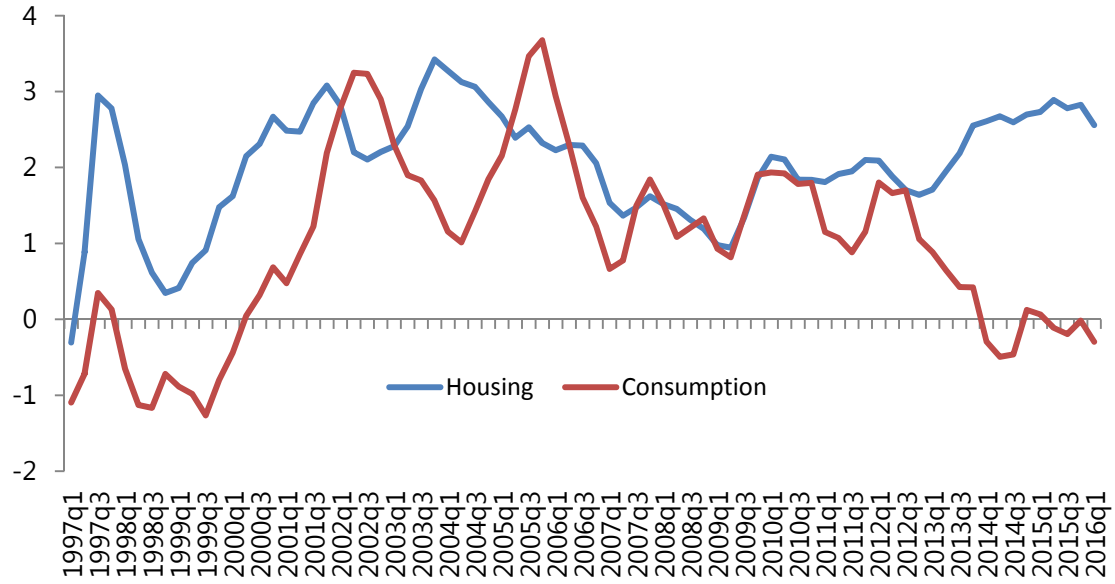
As a percentage of GDP Graph 2



Sources: Bank Negara Malaysia; authors' estimates.

Housing and consumption net disbursements as a share of GDP, 1997–2016

As a percentage of GDP Graph 3



Sources: Bank Negara Malaysia; authors' estimates.

4. Description of data

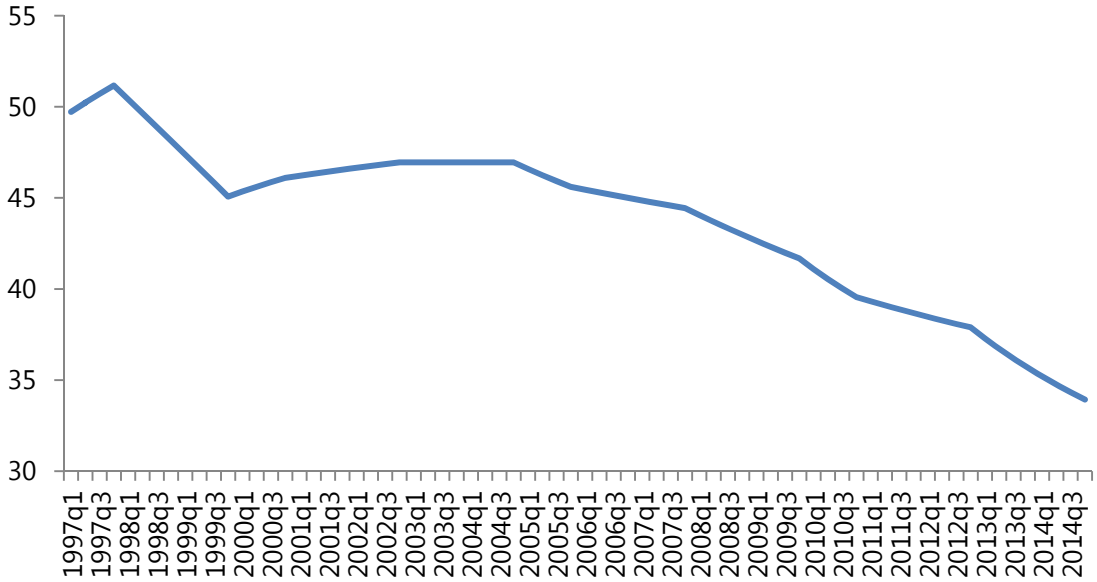
This paper draws on both macro-level and micro-level datasets for Malaysia. For the macro-level analyses, the sample period spans from 1997Q1 to 2015Q2. Income growth in terms of GDP per capita is constructed using real GDP[7] and population data from the Department of Statistics Malaysia. Income inequality is defined to be the gap between mean and median real household income, as a share of median income. A positive income inequality gap (ie mean ≥ median) implies a greater concentration of income among the higher-income households (right-skewed distribution). Based on this definition, the level of income inequality has seen a notable decline since 1997 (Graph 4).[8]

Gap between mean and median income, 1997–2014

As a percentage of median income — Graph 4

[7] Real GDP is constructed by deflating nominal GDP data using the Consumer Price Index (CPI) with 2010 as the base year.

[8] Similarly, the Gini coefficient for Malaysia declined from 0.459 in 1997 to 0.401 in 2014 (source: Department of Statistics Malaysia). In this paper, we use the gap between mean and median income as a proxy for income inequality, instead of the conventional Gini coefficient, as it is more parsimonious when computing inequality with the micro-level dataset.



Sources: HIES 2009 and 2014, Department of Statistics; authors' estimates.

For the credit variables, we use net disbursements, which are a flow variable that captures the net effect of credit disbursed to and repaid by households during the quarter. The data include credit extended by the banking system and development financial institutions (DFIs), and are obtained internally from Bank Negara Malaysia. Housing credit refers to credit extended to households for the purchase of residential property. Consumption credit comprises personal, credit card, passenger vehicles and consumer durable loans. All credit variables are deflated by CPI with 2010 as the base year to obtain the real values.

To explore the channels through which housing credit may affect future GDP per capita growth, we also construct a housing wealth indicator for Malaysia based on Murugasu et al (2015). Specifically, housing wealth is constructed using Equation (1), by multiplying the total number of owner-occupied units in the economy with the average house price:

$$HW_t = ((HS_t - HU_t) * HP_t). \quad (1)$$

At time *t*, HW_t is the housing wealth, HS_t is the housing stock, HU_t is the total number of unsold units, and HP_t is the average house price. This indicator captures the amount of housing wealth for all owner-occupied units in the economy at a point in time.

The data for the control variables are obtained from the Department of Statistics Malaysia. The dependency ratio is defined as the total number of dependants as a proportion of the working age population. Openness to trade refers to the sum of exports and imports as a share of GDP, and saving rate refers to gross saving as a share of GDP. When estimating the regressions for income

inequality, we proxy the effects of human capital accumulation on future inequality by using the total secondary enrolment ratio[9] as an additional control variable.[10]

For the micro-level analyses, the sample period covers 2009 and 2014. The micro-level dataset draws from the recently released 2014 Household Income and Expenditure Survey (HIES), and is constructed by combining data from the 2009 HIES dataset. Both surveys of households in Malaysia are carried out using a personal interview approach, covering urban and rural areas for all states in Malaysia. The surveys are carried out by probability sampling that represents all households in Malaysia, and contains detailed information on households' income, types of loans and number of loans.[11]

Of note, we merge the two HIES datasets using three common characteristics that are available in both surveys: state, education level, and age group for the head of household. We call this the combined HIES dataset. Specifically, the state refers to the 15 states in Malaysia[12]; the education level is split into four categories that cover no formal education, primary education, secondary education and tertiary education; and there are nine categories for age group, starting from 10–20 and ending at 90–100.

Once the households from both datasets are grouped according to the three common characteristics, we compute, for each respective group, the median and mean levels of disposable income. This allows us to construct two new dependent variables for each household group: *income growth* as the change in median household disposable income between 2009 and 2014, and the *change in income inequality* as the change in the mean and median disposable income gap between 2009 and 2014. As for the explanatory variable of interest, we construct the credit variable as the percentage of households in each group with at least one loan facility.

5. Estimations and results

5.1. Household credit and future income growth

5.1.1. Macro-level income growth analysis

In this section, we explore the macro-level relationship between household credit and future GDP per capita growth. Our empirical strategy follows closely the growth equations in Cecchetti et al (2011), which are derived from the neoclassical Solow growth model. In this specification, the rate of convergence of GDP per capita growth depends on the initial level of GDP per capita and other commonly used

[9] The ratio refers to the total number of enrolled secondary students as a share of the official population for secondary-education age.

[10] We carried out an augmented Dicker-Fuller test on the main macro variables to check for non-stationarity. The results are displayed in Table 10. Based on all the p-values, we reject the null hypothesis that the macro variables have a unit root.

[11] The survey in 2009 covers 21,641 households, whereas the 2014 survey covers 49,862 households.

[12] The states in Malaysia are Johor, Kedah, Melaka, Negeri Sembilan, Pahang, Pulau Pinang, Perak, Perlis, Selangor, Terengganu, Sabah, Sarawak, Kuala Lumpur, Labuan and Putrajaya.

determinants, including the saving ratio, dependency ratio and openness to trade. Building upon this standard model, we then augment this specification with various types of household credit to capture the impact of credit on future GDP per capita growth. We further disaggregate household credit into housing and consumption credit to distinguish their respective effects on growth.

To minimise the reverse causality from growth to credit, we define future income growth as the average of four-quarter ahead GDP per capita growth. In all the growth regressions, we include the vector of regressors *X* to control for potential endogeneity of our estimates, with *X* containing the following variables: the saving-to-GDP ratio, the dependency ratio, openness to trade, log GDP per capita at time *t*, two crisis dummies to control for the Asian Financial Crisis (1997–1999) and the Global Financial Crisis (2007–2009), and time-specific and seasonal dummies to control for the seasonal effects across time.

We first estimate the growth regression in Equation (2), where HC_t refers to the net disbursements of total household credit as a share of GDP. The coefficient β_1 captures the correlation between household credit and future income growth:

$$Y_t = \beta_0 + \beta_1 HC_t + \beta_2 X_t + \epsilon_t. \quad (2)$$

Table 1 presents the baseline estimation results for Equation (2). We find that household credit is positively correlated with future growth, whereby a 1% increase in HC_t is associated with a 0.185% increase in future GDP per capita growth.

We then disaggregate household credit into housing and consumption credit in Equation (3), in which HOC_t and COC_t refer to net disbursements of housing and consumption credit, respectively. Correspondingly, β_1 and β_2 capture the different effects of housing and consumption credit on future income growth:

$$Y_t = \beta_0 + \beta_1 (HOC_t) + \beta_2 (COC_t) + \beta_3 (X_t) + \epsilon_t. \quad (3)$$

The estimation results in Table 2 indicate that different types of household credit have varying impacts on income growth. Importantly, the positive effect of household credit seems to stem from housing credit, with a 1% increase in housing net disbursements associated with a 0.647% increase in future GDP per capita growth. We do not find a significant effect for consumption credit.

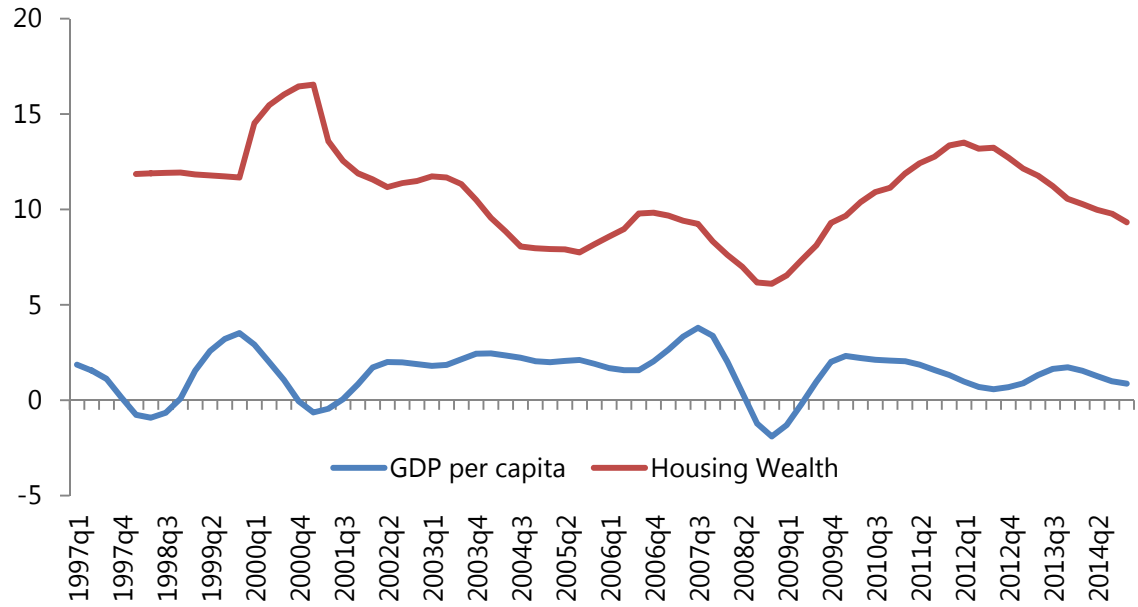
Given the positive association between housing credit and future income growth, we extend the specification to examine the significance of future housing wealth[13] as a potential channel for this positive effect, motivated by existing studies that have documented the importance of housing wealth in explaining growth (Garcia-Escribano and Han (2015) and Mian and Sufi (2016)). Similarly, in Malaysia's case, both the growth of housing wealth and GDP per capita demonstrate close co-movements (Graph 5). As seen in Table 3, once housing wealth is controlled for, the positive effect of housing net disbursements is attenuated. This suggests a non-trivial role of housing credit in affecting future income growth through the accumulation of housing wealth.[14]

[13] Similar to the future GDP per capita growth, future growth of housing wealth is calculated as the average of four-quarter ahead growth.

[14] For robustness, we examine whether the effect of housing wealth remains significant after investment in housing is accounted for, given the direct impact of investment on GDP growth. Table 9 shows the estimation results. Due to the unavailability of data for investment in housing, we use the value of new residential properties that are under construction as a proxy for investment in housing. From the estimation, the effect of housing wealth on GDP per capita growth

Growth of GDP per capita vs growth of housing wealth, 1997-2014

Annual growth in per cent Graph 5



Sources: Bank Negara Malaysia; authors' estimates.

In the final part of the macro-level study on income growth, we augment the linear regression in Equation (3) to examine non-linear e□ects of housing credit using a simple quadratic specification. Table 4 presents the results, which show a negative and statistically significant coe□cient on the quadratic term of housing net disbursements, suggesting a diminishing positive e□ect at higher levels of housing credit.

In sum, the macro analyses point to household credit having a positive influence on future GDP per capita growth, with most of the e□ect accounted for by housing credit. It is also worth emphasising housing wealth as a channel through which housing credit a□ects future income growth. These results are broadly in line with the findings for Malaysia by Murugasu et al (2015). Akin to our study, the authors find that housing wealth played a significant supportive role for private consumption and contributed to 16% of private consumption growth from 2005 to 2013. In contrast, consumption credit only had a small influence on private consumption growth, which was limited to the short-run period. We note, however, that the positive e□ect of housing credit may be non-linear and could diminish at higher levels of net disbursements.

5.1.2. Micro-level income growth analysis

Building upon the macro-level findings on income growth, we proceed to examine the effects of household credit using the combined HIES dataset. Income growth,

remains significant even after the inclusion of housing investment, suggesting a non-trivial role of housing wealth.

$Y_{I09,I14}$, is represented by the change in household disposable income between 2009 and 2014. As for the credit variable, PL_{I09} refers to the percentage of households with at least one loan facility in 2009. V_I is the vector comprising a set of household characteristics that could be endogenous to income and loan-taking behaviour, including state, education level, age group and income in 2009 as a proxy for initial conditions:

$$Y_{I09,I14} = \beta_0 + \beta_1(PL_{I09}) + \beta_2(V_I) + \epsilon_t. \quad (4)$$

Similar to the macro analyses, we find a positive correlation between household credit and future income growth (Table 5). For a given group, a 10% increase in the proportion of households with a loan in 2009 is associated with a RM162 increase in the disposable income over the period of 2009–2014.

Next, we further distinguish between the two types of household credit in Equation (5). In this specification, PHL_{I09} and PCL_{I09} refer to the percentage of households with a housing loan and a consumption loan facility, respectively. The coefficients β_1 and β_2 capture the different effects of housing and consumption credit on future income growth.

$$Y_{I09,I14} = \beta_0 + \beta_1(PHL_{I09}) + \beta_2(PCL_{I09}) + \beta_3(V_I) + \epsilon_t. \quad (5)$$

The results presented in Table 6 are consistent with the macro analyses, with a significantly positive effect for housing credit and an insignificant effect for consumption credit. For a given group, a 10% increase in the proportion of households which have a housing loan in 2009 is associated with a RM273 increase in disposable income over the period of 2009–2014.

Taken together, the macro and micro analyses are consistent. While household credit has a positive effect on future income growth, distinguishing the types of credit is crucial as most of the positive effects are accounted for by housing credit.

5.2 Household credit and future income inequality

5.2.1. Macro-level income inequality analysis

We study the distributional effect of credit using a similar framework to the analyses in Section 5.1. In Equation (6), $w_{t,t+4}$ denotes the change in income inequality between t and t+4, which as earlier defined, is calculated as the gap between the mean and median real household income as a share of median income. Vector X_t is a set of controls similar to the one for the income growth specification, with an additional control variable for human capital using the secondary education enrolment:

$$w_{t,t+4} = \beta_0 + \beta_1(HOC_t) + \beta_2(COC_t) + \beta_3(X_t) + \epsilon_t. \quad (6)$$

Table 7 demonstrates the positive relationship between housing credit and future income inequality, with a 1% increase in housing net disbursements associated with a 0.406% increase in income inequality four quarters ahead. The effect of consumption credit on future inequality is insignificant, similar to the findings on income growth.

5.2.2. Micro-level income inequality analysis

In the micro-level study, based on Equation (7), $W_{I09,I14}$ represents the change in inequality over the period of 2009–2014 for each group of households:

$$W_{I09,I14} = \beta_0 + \beta_1(PHL_{I09}) + \beta_2(PCL_{I09}) + \beta_3(V_I) + \epsilon_t. \quad (7)$$

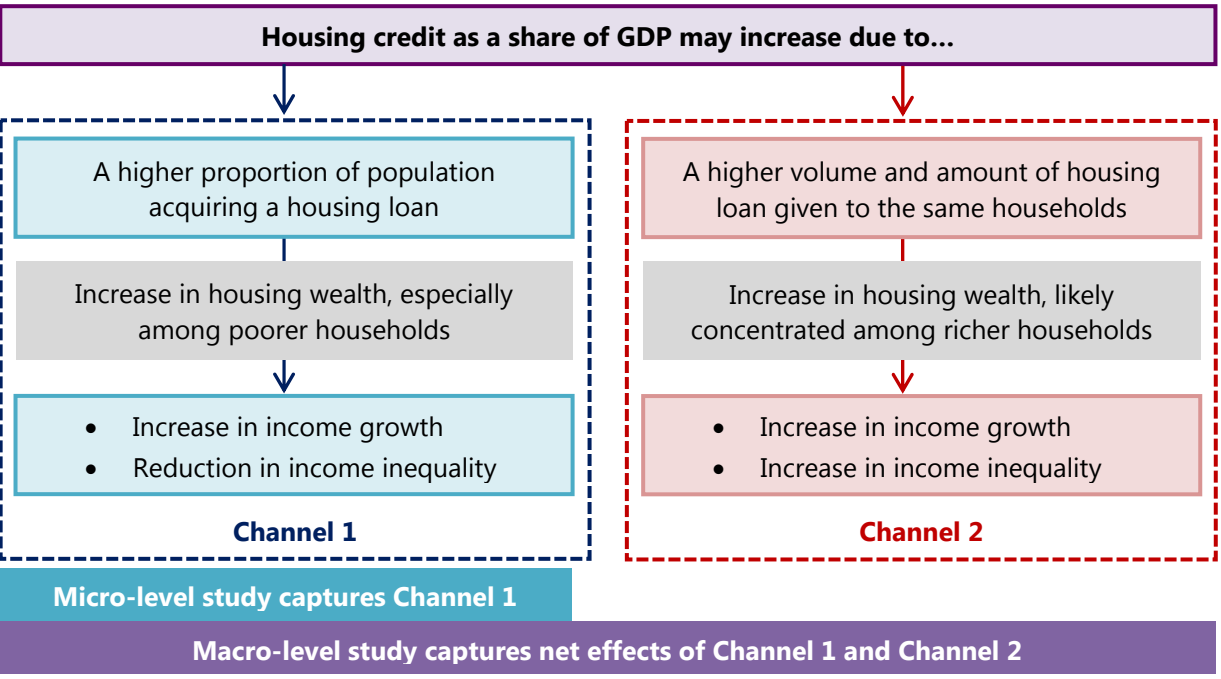
Unlike the results in the macro analysis (Table 7), here we find the effect of housing credit on future income inequality to be negative (Table 8). For a given group, a 10% increase in the proportion of households with a housing loan in 2009 is associated with a 2.8% decline in income inequality over the period of 2009–2014. On consumption credit, the estimate is again insignificant. We reconcile these two different results for housing credit in the following section.

6. Linking the empirical results

Primarily, the analyses on both income growth and income inequality highlight that different types of credit matter. For income growth, both the aggregate and household-level datasets find consistent results, with a significantly positive effect for housing credit and insignificant estimates for consumption credit.

The findings on income inequality are, however, less straightforward. Although we observe a similar case of insignificant estimates for consumption credit, the influence of housing credit differs in both datasets. At the macro level, housing credit in terms of total net disbursements is positively related to increasing income inequality. However, the micro-level analysis, which investigates the proportion of households with housing loans, finds a negative relationship with income inequality. The flow diagram in Graph 6 illustrates our interpretation regarding reconciling these two different results. The distinguishing variable is housing credit. It refers to aggregate net disbursements at the macro level, and the proportion of households with housing credit at the micro level.

Channels linking housing credit with growth and inequality — Graph 6



Housing disbursements can increase due to the following two channels: a higher proportion of the population acquiring a housing loan (Channel 1) and a higher volume and amount of housing loan given to a particular household (Channel 2). Both channels of financing will increase the income of the agents who benefit from having access to housing wealth. We postulate that financial inclusion, which allows more households to gain access to housing credit, would likely reduce income inequality, as supported by the micro-level analysis in Section 5.2 (Channel 1). This form of credit allocation implies a greater outreach of credit, which tends to favour households in the lower income distribution and enables them to accumulate housing wealth. However, this channel can be outweighed by further accumulation of housing credit by existing borrowers, which worsens income inequality (Channel 2). The second channel would likely benefit richer households, given their ability to take on more and larger housing credit. The concentration of housing wealth among these households would in turn worsen income inequality. The macro-data analysis in Sections 5.1 and 5.2 captures both channels such that the net positive association of housing credit with income inequality indicates the prevalence of the second channel in the economy.[15]

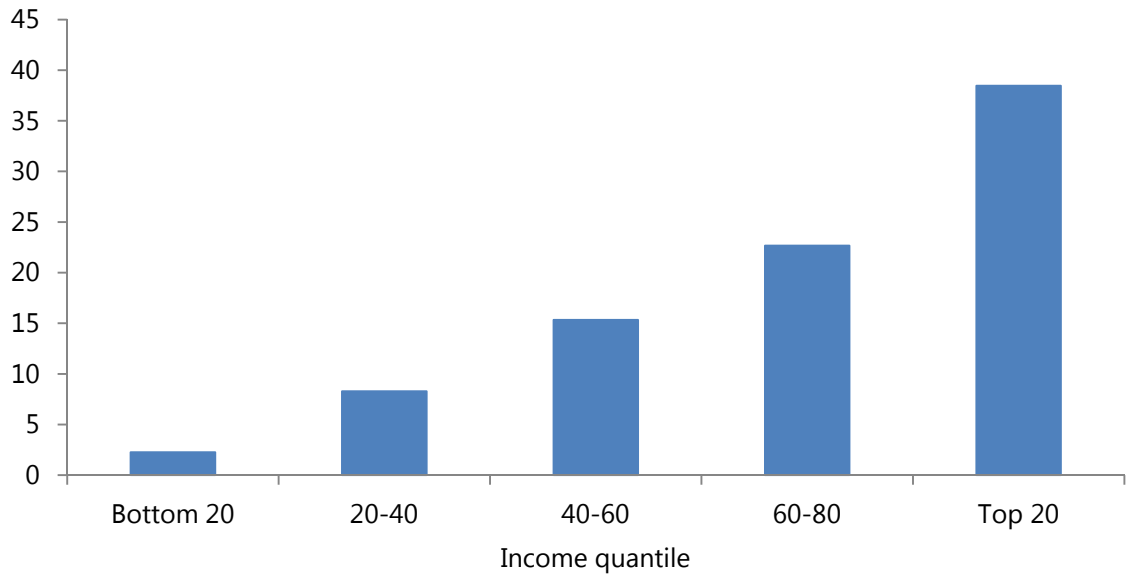
Last, as a way to further validate our interpretation of the two channels and our inference that housing credit in aggregate is extended more to richer households, we leverage on the 2014 HIES dataset to examine the distribution of housing credit among Malaysian households across different income groups in Graph 7.

[15] Another possible explanation for the difference between the micro-level and macro-level findings is the distinct indicators of credit that are used in each analysis. We are most likely capturing the intensive margin effect in the macro-level analysis, and the extensive margin effect in the micro-level analysis. However, due to data constraints, we are unable to investigate both the intensive and extensive margins at the macro- and micro-level analyses, respectively. This is left for future research.

Across the different income groups, the disparity is striking. At the lowest end of the spectrum, less than 5% of the households in the bottom 20 income quantile have at least one housing credit facility. Meanwhile, 15 to 25% of households within the 40–80 income quantile have housing credit. At the opposite end of the spectrum, almost 45% of the households in the top 20 income quantile have access to housing credit. This skewed distribution of housing credit lends support to our interpretation that, in aggregate, Channel 2 is stronger than Channel 1 given that housing credit in Malaysia is concentrated among the high-income households.[16]

Distribution of households with at least one housing loan facility, 2014

As a percentage of households — Graph 7



Sources: HIES 2014, Department of Statistics; authors' estimates.

7. Conclusion

Our study emphasises the importance in recognising the different types of household credit and their varying impacts on future income growth and income inequality. For Malaysia, housing credit seems to play a more significant role in the real economy compared to consumption credit.

Of note, our study provides, in retrospect, some additional insights into the measures undertaken by Bank Negara Malaysia and the government since 2010 to

[16] For future research, a more thorough study could be conducted to discern the supply and demand factors driving the varying levels of housing credit across different income groups.

contain the risks of financial imbalances[17] and manage household indebtedness. First, our findings on housing credit lend weight to the targeted measures that were implemented to rein in excesses in the property market. These measures, including the maximum loan-to-value ratio for borrowers with more than two housing loans as well as the higher real property gains tax, were intended to reduce housing credit for borrowers with multiple housing loans and discourage speculative activity in the property market. Second, the measures were also supplemented by efforts to ensure continued access to financing for eligible first-time home buyers. For instance, the My First Home Scheme and 1Malaysia People's Housing Scheme (PR1MA) were introduced to encourage affordable home ownership for lower- to middle-income groups.

In addition, our findings of an insignificant impact of consumption credit on future income growth and income inequality also correspond to policies beyond the housing market. With the purpose of ensuring prudent retail financing practices and mitigating unsustainable expansion in consumption credit, measures including the implementation of maximum loan tenure for personal financing and the Guidelines on Responsible Financing were put in place. Such measures have contributed to significant moderation in personal financing loan growth.

Overall, the findings in our paper fill a research gap for the Malaysian economy by identifying the type of household credit that matters for income growth and income inequality in Malaysia. Our empirical findings and the observations from the housing credit distribution could serve to inform the calibration of policies, especially those in relation to the broader discussion of household indebtedness and developments in the housing market.

[17] For a more comprehensive discussion, refer to the Box Article "Financial imbalances and policy responses in Malaysia" in Bank Negara Malaysia's 2014 Annual Report.

Effect of household disbursements on GDP per capita growth

Table 1

	Future GDP per capita growth (4-quarter ahead average)
Household net disbursements (% of GDP)	0.185**
	(0.089)
Dependency ratio	0.435
	(0.354)
Saving (% of GDP)	0.358**
	(0.085)
Openness to trade	–1.443
	(1.591)
Log GDP per capita	–24.355**
	(4.217)
Observations	72
Sample period	1997Q1–2014Q4

Notes: GDP per capita growth is the average of the 4-quarter ahead growth. Net disbursements as a share of GDP is the total net disbursed by the banking system and development financial institutions (DFI) to households. Newey-West standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Effect of housing and consumption disbursements on GDP per capita growth

Table 2

	Future GDP per capita growth (4-quarter ahead average)
Housing net disbursements (% of GDP)	0.647**
	(0.219)
Consumption net disbursements (% of GDP)	–0.094
	(0.086)
Dependency ratio	–0.289
	(0.295)
Saving (% of GDP)	0.341**
	(0.078)
Openness to trade	–1.929
	(1.562)
Log GDP per capita	–26.513**
	(3.780)
Observations	72
Sample period	1997Q1–2014Q4

Notes: GDP per capita growth is the average of the 4-quarter ahead growth. Net disbursements as a share of GDP is the total net disbursed by the banking system and development financial institutions (DFI) to households. Newey-West standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Housing wealth channel for housing net disbursements

Table 3

	Future GDP per capita growth (4-quarter ahead average)
Housing net disbursements (% of GDP)	0.177**
	(0.088)
Growth in housing wealth	0.132**
	(0.028)
Consumption net disbursements (% of GDP)	–0.074
	(0.048)
Dependency ratio	–0.426**
	(0.178)
Saving (% of GDP)	0.283**
	(0.057)
Openness to trade	2.015**
	(0.630)
Log GDP per capita	–32.34**
	(2.348)
Observations	72
Sample period	1997Q1–2014Q4

Notes: GDP per capita growth is the average of the 4-quarter ahead growth. Net disbursements as a share of GDP is the total net disbursed by the banking system and development financial institutions (DFI) to households. Newey-West standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Effect of housing disbursements (quadratic) on GDP per capita growth

Table 4

	Future GDP per capita growth (4-quarter ahead average)
Housing net disbursements (% of GDP)	3.026**
	(0.399)
Housing net disbursements (Squared)	–0.573**
	(0.085)
Dependency ratio	–0.014
	(0.245)
Saving (% of GDP)	0.389**
	(0.071)
Openness to trade	–2.417**
	(1.091)
Log GDP per capita	–28.59**
	(2.955)
Observations	72
Sample period	1997Q1–2014Q4

Notes: GDP per capita growth is the average of the 4-quarter ahead growth. Net disbursements as a share of GDP is the total net disbursed by the banking system and development financial institutions (DFI) to households. Newey-West standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Effect of household loan inclusion on change in disposable income

Table 5

	Change in disposable income (2009–2014)
% of population with loan 2009	16.158**
	(5.829)
State	47.388
	(42.914)
Education	698.484**
	(151.469)
Age group	4.726
	(53.737)
Disposable income 2009	–0.559**
	(0.189)
Observations	412
Sample period	2009–2014

Notes: The change in disposable income is the difference between the median income in 2014 and 2009 for each household group. Household groups are constructed using the head of household's state location, education level, and age group in the 2014 and 2009 HIES datasets. Clustered standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Effect of housing and consumption loan inclusion on change in disposable income

Table 6

	Change in disposable income (2009–2014)
% of population with housing loan 2009	27.283**
	(8.461)
% of population with consumption loan 2009	9.764
	(6.082)
State	57.273
	(45.281)
Education	706.111**
	(138.026)
Age group	5.727
	(53.530)
Disposable income 2009	–0.593**
	(0.191)
Observations	412
Sample period	2009–2014

Notes: The change in disposable income is the difference between the median income in 2014 and 2009 for each household group. Household groups are constructed using the head of household's state location, education level, and age group in the 2014 and 2009 HIES datasets. Clustered standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Effect of housing and consumption disbursements on income inequality

Table 7

	Increase in future income gap (4 quarters ahead)
Housing net disbursements (% of GDP)	0.406**
	(0.076)
Consumption net disbursements (% of GDP)	0.027
	(0.074)
Dependency ratio	1.185**
	(0.366)
% of enrolment in secondary education	–0.053**
	(0.021)
Saving (% of GDP)	0.094
	(0.075)
Openness to trade	–0.393
	(1.516)
Log GDP per capita	1.534
	(2.666)
Observations	72
Sample period	1997Q1–2014Q4

Notes: Inequality is defined as the gap between mean and median income as a share of the median income. The dependent variable is the change in the gap over a period of four quarters. Net disbursements as a share of GDP is the total net disbursed by the banking system and development financial institutions (DFI) to households. Newey-West standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Effect of housing and consumption loan inclusion on income inequality

Table 8

	Increase in income gap (2009–2014)
% of population with housing loan in 2009	–0.281**
	(0.092)
% of population with consumption loan in 2009	0.078
	(0.101)
State	–0.013
	(0.336)
Education	0.324*
	(2.811)
Age group	1.136
	(1.106)
Disposable income, 2009	0.002
	(0.001)
Observations	412
Sample period	2009–2014

Notes: Income gap is defined as the gap between mean and median income, as a share of median income, for each household group. The dependent variable is the difference between the income gap in 2014 and 2009 for each household group. Household groups are constructed using the head of household's state location, education level, and age group in 2014 and 2009 HIES datasets. Clustered standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Housing wealth channel for housing net disbursements (robustness) Table 9

	Future GDP per capita growth (4-quarter ahead average)
Housing net disbursements (% of GDP)	0.125*
	(0.062)
Growth in housing wealth	0.101**
	(0.030)
Growth in construction starts (residential property value)	–0.001
	(0.002)
Consumption net disbursements (% of GDP)	–0.011
	(0.059)
Dependency ratio	–0.484**
	(0.175)
Saving (% of GDP)	0.293**
	(0.059)
Openness to Trade	1.774**
	(0.758)
Log GDP per capita	–36.807**
	(2.430)
Observations	72
Sample period	1997Q1–2014Q4

Notes: GDP per capita growth is the average of 4-quarter ahead growth. Net disbursements as a share of GDP is the total net disbursed by the banking system and development financial institutions (DFI) to households. Newey-West standard errors are reported in parentheses. ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Unit root test for selected macro-variables Table 10

	p-value
GDP per capita growth	0.001
Household net disbursements (% of GDP)	0.000
Housing net disbursements (% of GDP)	0.000
Consumption net disbursements (% of GDP)	0.004
Growth in housing wealth	0.039
Increase in income gap	0.068
Sample period	1997Q1–2014Q4

Notes: Augmented Dicker-Fuller test is conducted on the main macro-level variables to check for possible non-stationarity. The optimal lag for each variable is chosen based on the modified Akaike information criterion. Based on the *p*-values of all the variables, we can reject the null hypothesis of a unit root at 10% significance level.

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