Dynamics of Household Income and its Linkages with Private Consumption

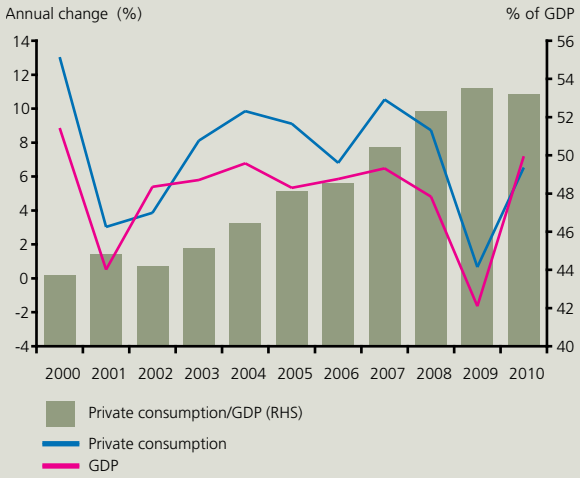
Private consumption is increasingly becoming an important driver of growth in the Malaysian economy. This is reflected in its growing share of GDP, as growth in private consumption has outpaced overall GDP growth over the recent decade (Chart 1). Theoretical and empirical findings across countries consistently highlight the importance of income in determining private consumption[1]. This article explores the dynamics of household income and its linkages with private consumption for Malaysia. The analysis provides two key findings. First, the services sector plays a large role in driving overall income, while income from commodities is also important especially during periods of large commodity price increases. Second, econometric evidence suggests that income has a strong and positive causal relationship with private consumption. Shocks to income are found to have large and persistent effects on private consumption.

Estimating Household Income from a Bottom-Up Approach

The analysis first involves deriving an estimate of household income that encompasses all sectors of the economy. Existing estimates of household income tend to be constrained by data coverage and periodic frequency. For example, income in the construction and some services sub-sectors are not available on at least a quarterly basis. A commonly-used proxy of income is manufacturing sector wages due to its frequent availability. Wages in the manufacturing sector, however, are an imperfect proxy for overall income within the economy since wages in different sectors tend to be influenced by sector-specific factors. For instance, wages in the construction and services sectors are likely to be influenced more by domestic demand considerations, while manufacturing wages are influenced more by external factors.

Chart 1

Private Consumption and GDP



Source: Department of Statistics, Malaysia

To construct a more representative estimate of household income, a quarterly wage series is estimated for each sector where wage statistics are unavailable. This methodology involves estimating the long-run relationship between the wage and labour productivity of the sector, and is premised on the view that wages are primarily a reflection of labour productivity[2]. First, the ratio between wage per worker and value-added per worker of the sector is established using the annual or biannual frequency data from the Department of Statistics Malaysia's survey of companies and the National Accounts. This is done to capture the sectoral variation in the wage-productivity profile. Second, the annual/biannual ratio is interpolated to form a quarterly series. This series is then multiplied by the value-added from the sector to derive quarterly sectoral estimates of gross income. This approach is applied to all sectors except for crude palm oil. This is because wages in the primary commodity sectors are found to be determined more by prices rather than labour productivity due to yield constraints (Chart 2). As such, the price-income relationship that is observed at an annual frequency is utilised to estimate a quarterly series of gross income for the palm oil sector.

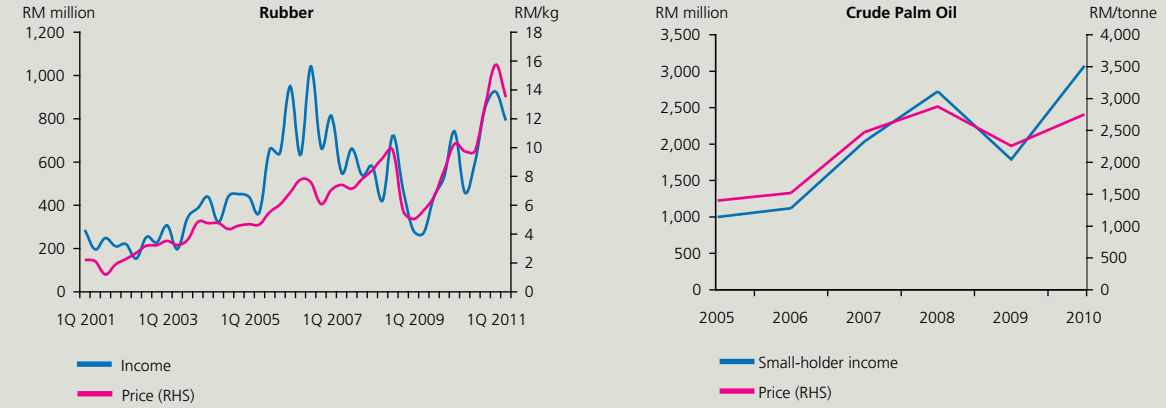
[1] Theoretical examples are Carroll (2001) for a partial equilibrium analysis of the aggregate consumption function and Kydland and Prescott (1980) within a general equilibrium framework. Bacchetta and Gerlach (1997) and Case, Quigley and Shiller (2006) are selected recent papers that empirically find income to have the largest impact on consumption across a sample of countries.

[2] Wages in certain sectors were found to occasionally deviate from their associated productivity levels, but this deviation was found to be only temporary.

Finally, the observed and estimated income series of all sectors are aggregated to arrive at an estimate of overall household income. An advantage of this approach is that the resulting estimates reflect household income at the overall level from a sectoral perspective.

Chart 2

Price-Income Relationship in the Rubber and Crude Palm Oil Sectors



Source: Department of Statistics, Malaysia and Malaysian Palm Oil Board

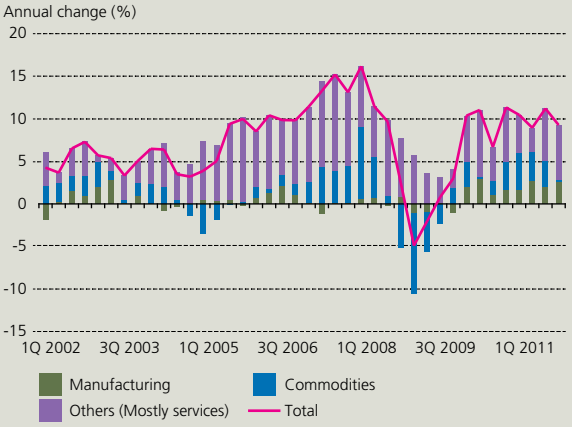
The Evolution of Household Income

Chart 3 shows nominal income growth and its decomposition across the major sectors from 2002 to 2011. Overall household income grew at an average year-on-year rate of 7.4% per quarter during this period. Household income advanced at a steadily increasing pace from 2005 to 2008, with the highest growth of 16.1% registered in 1Q 2008, the eve of the crisis in the advanced economies.

Two key trends about household income can be observed. First, a large component of overall income growth can be attributed to income from the services sector, with its share of total income growing steadily from 55.7% in 1Q 2001 to 64.6% in 3Q 2011. Chart 3 shows, in particular, that the robust income growth during the 2005-2008 period, as well as its recovery after the crisis in the advanced economies, was attributable to the services sector. This development can be explained by the rise in the share of employment in the services sector to total employment and by higher wage growth in the sector. The share of employment in the services sector rose from 51.1% in 1Q 2001 to 61.5% in 3Q 2011, while wages in major services sub-sectors outpaced overall income growth. For instance, wages in the wholesale and retail, and financial intermediation sub-sectors grew at average rates of 11.1% and 7.7% per quarter respectively, higher than the national average income growth of 7.4%.

Chart 3

Nominal Income Growth Across Major Sectors



Source: Department of Statistics, Malaysia and Bank Negara Malaysia

The second important finding is that income from the primary commodity sector plays a crucial role in driving the growth of overall income, despite

constituting only a relatively small share of total employment. This is because income from commodities is driven significantly by prices, as supply is typically constrained over short- to medium-term horizons. Since commodity prices have been volatile in recent years, income from the sector has also exhibited a similar behaviour. This aspect of income was clearly illustrated during the commodity price cycle from 2008-2009. At the peak of the cycle during the first half of 2008, palm oil prices increased by 64.5% annually, and constituted 48.9% of the 13.8% growth in overall income. Conversely, the subsequent sharp decline in prices, at an average rate of -37%, in the first half of 2009 contributed over 44.1% of the 3.5% decline in overall income.

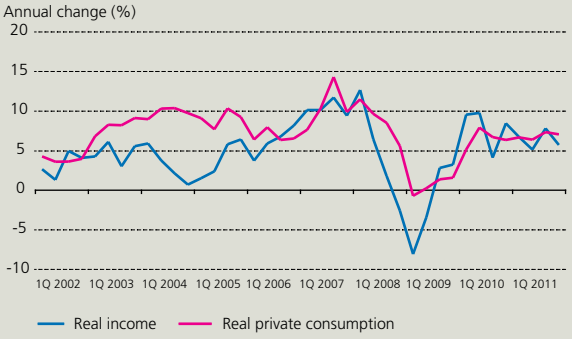
The Linkages between Household Income and Private Consumption

Chart 4 illustrates the relationship between real private consumption and real household income. Nominal income has been deflated using the implicit consumption deflator to facilitate an appropriate comparison with real private consumption. It is evident that income growth is a coincident and highly correlated indicator of the growth of private consumption, with a correlation coefficient between both series of 0.6. Income growth was also more volatile compared to private consumption, with standard deviations of 4.1 and 3.1, respectively.

The co-movement between the growth in private consumption and income growth has been particularly visible since 2006, where private consumption expanded in tandem with robust income growth from 2006 to 2008. When overall income contracted briefly in 2009, as income from commodities and exports declined along with commodity prices and exports, private consumption moderated as well, although by a smaller magnitude. Private consumption subsequently recovered in the second half of 2009, in tandem with the recovery in income.

Chart 4

The Relationship between Real Income and Private Consumption



Source: Department of Statistics, Malaysia and Bank Negara Malaysia

A Vector Auto-regression (VAR) was estimated to further investigate the causal link between income and private consumption[3]. Household credit was also included as a variable to differentiate between the income and credit channels. First, multivariate Granger causality tests were conducted to test if income and credit help to predict future movements in private consumption. The results show that income has a statistically significant positive causal relationship with private consumption. Credit, on the other hand, is not found to have an econometric link with consumption, although the coefficient on the lag of credit shows the expected positive sign. Impulse response analysis was also conducted to estimate the profile of the response of private consumption from shocks to income and household credit (Chart 5). In both cases, their effects on private consumption are positive and statistically significant, especially during the first year after the shock.

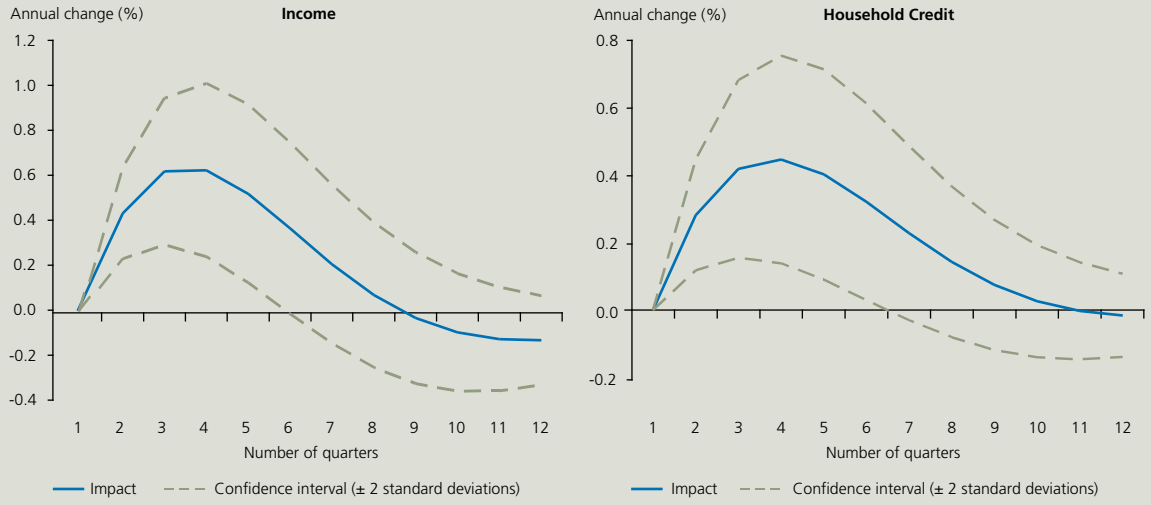
These results illustrate the distinct relationships that income and credit have with private consumption. The Granger causality test results indicate that households tend to rely more on their incomes than on credit for their expenditures on consumption goods. Nonetheless, the impulse response analysis demonstrates that credit also has a positive impact on household expenditure.

[3] A one quarter lag was chosen as selected by the Schwartz criterion. The variables were transformed to year-on-year percentage terms. The estimation period ranges from 2002-2011.

These findings suggest that households access credit markets not only to smooth expenditures on durable items, but also to temporarily support expenditures when they experience adverse income shocks. This was observed in 2009. Private consumption continued to register positive growth of 0.7% despite the estimated -1.3% contraction in income. Household credit grew by 9.3% (2008: 9.1%) as a consequence of households using credit to partially compensate for the loss of income during this period.

Chart 5

Responses of Private Consumption to Income and Household Credit Shocks



Source: Bank Negara Malaysia

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