

## Credit Expansion and Implications on Financial Stability

A well-functioning financial system, through its role in maturity and liquidity transformation, risk diversification and the payment systems, enables the efficient intermediation of funds which supports economic activity. The expansion of credit to businesses and households contributes to financial deepening and facilitates growth-enhancing investment and consumption activities. However, excessive credit expansion that outstrips economic fundamentals and output potential can pose destabilising risks to the economy and financial system. Prolonged periods of such rapid credit growth have generally been seen to precede banking crises and tend to be associated with increased macroeconomic and financial fragility. While excessive credit growth is widely seen as a useful indicator of potential systemic vulnerability, studies have also shown that a sustained period of high credit growth is more likely to amplify the likelihood or severity of systemic distress if the financial system is characterised by other structural fragilities or financial imbalances.

Credit conditions in Malaysia have been conducive to the financing needs of the economy and reflect greater financial deepening in Malaysia. In the more recent period, credit growth has also been driven by ample liquidity conditions in the domestic financial system. Since 2001, credit expansion has averaged around 9.2%. This period of strong credit expansion coincides with a period of wide ranging reforms undertaken to strengthen the banking sector following the Asian Financial Crisis (AFC). Against this backdrop, this article identifies the determinants of credit expansion in Malaysia and examines whether there are signs of excessive credit growth based on an analysis of common metrics of credit growth against long-term trends. The article also discusses the limitations associated with the use of common methodologies to determine excessive credit growth. These limitations imply that it is relevant to also pay attention to characteristics of the domestic financial system which can either amplify or reduce risks to financial stability in an environment of sustained high credit growth.

### Determinants of Credit Expansion

In ascertaining the key drivers of credit growth, total private sector credit (both loans and private sector debt securities) was regressed against a set of independent variables<sup>1</sup> influencing the demand and supply of credit using an Error Correction Model (ECM)<sup>2</sup>. Three statistically significant variables were found to influence credit expansion over the long-term, namely total deposits, GDP and the Malaysian House Price Index (MHPI). Customer deposits have consistently been the dominant funding source for major credit providers in Malaysia. The continued expansion of the deposit base of banks (CAGR of 9.4% from 2001 to 2013) is therefore a key driver of financing activities by banks (CAGR of 9.1% for the same period), effectively enlarging the supply of loanable funds. The demand for credit by households and businesses also typically rises in tandem with higher consumption and investment activities on the back of an expanding economy. Combined with the ongoing process of financial deepening in Malaysia, this increases both the demand for and supply of credit which in turn supports economic activity and growth. Finally, property prices are an important determinant of the private sector's borrowing capacity, reflecting its common use as collateral for financing. Property prices also influence credit providers' willingness to lend as changes in prices can have a material impact on banks' balance sheets through holdings of property-related assets or higher potential losses on loans secured by property. In Malaysia, 28.1% of total banking system loans were extended to finance the purchase of residential properties and another 12.6% for the purchase of non-residential properties. Including loans extended for other purposes, approximately RM587.1 billion (or 47.9%) of outstanding loans are secured by properties. It is therefore not surprising that the MHPI which grew by a CAGR of 5.5% since 2001 emerged as a significant factor influencing both credit supply and demand.

<sup>1</sup> Factors influencing credit demand and supply that were considered include the nominal and real GDP, average lending rate, average 10-year yields for AAA-rated private debt securities (PDS), Consumer Price Index (CPI), MHPI, average house transaction value, FBM Kuala Lumpur Composite Index (FBM KLCI), working population, total domestic deposits, portfolio capital flows, stock market capitalisation, savings rate, money supply, US policy rate, and return on assets and equity of banks.

<sup>2</sup> The ECM enables estimations of both the long-run relationship between cointegrated variables and the potential short-run deviations from the long-run relationship.

## Trend Estimations of Credit Growth and Related Limitations

A major challenge in constructing a reliable indicator for excessive credit<sup>3</sup> growth is determining the threshold level that may pose significant risks to the stability of the financial system. For the purpose of this study, a routinely used method in literature that applies the statistical Hodrick-Prescott (HP) filter was employed to derive a trend from a time series of credit-to-GDP (CTG) ratios. This method is also proposed by the Basel Committee on Banking Supervision (BCBS) for the purpose of setting the 'countercyclical capital buffer', a macroprudential tool aimed at protecting the banking sector from periods of excessive credit growth<sup>4</sup>. Deviations between the actual values and the underlying long-term trend (CTG gaps) were compared with commonly used thresholds in literature to ascertain periods of credit growth excessiveness (Table 1).

**Table 1**  
Common Thresholds Used in Literature

Threshold <sup>5</sup>	Definition
A	CTG gap >1.5 times its standard deviation
B	Annual growth rate of CTG ratio >10%

The study suggested that there were no strong indicative signs of credit excessiveness based on the abovementioned thresholds. The CTG ratios in the past 7 quarters moved above the long-term trend but remained within threshold A (Chart 1). Compared to the 1994-1998 period where the above-trend credit growth was observed for a period of 13 consecutive quarters prior to the AFC, the CTG ratio in the recent three years has increased at a much slower and more gradual pace. The level also remains well below the peak recorded in 1997. Turning to threshold B (Chart 2), the annual growth of the CTG ratio and credit has remained below the levels seen prior to the AFC over the past 14 years. The threshold was exceeded temporarily during the 2008-09 Global Financial Crisis, but this was driven largely by changes in the denominator (GDP) resulting from external shocks to the economy, while domestic conditions continued to support the demand for and supply of credit. The annual growth of the CTG ratio fell quickly below the threshold as the economy recovered. This contrasts with the period prior to the AFC which saw a prolonged and rapid acceleration of credit expansion (where credit growth grew by more than 20% and threshold B was exceeded for more than 3 years consecutively), combined with weaker underwriting standards.

While the HP filter is often used to determine trends in macroeconomic variables and provides effective means to capture structural breaks, the methodology has several limitations. The trend estimation of a time series to a large extent is highly dependent on the length of series used, and therefore produces varying estimations of CTG gaps and thresholds as illustrated using two sets of time series (Chart 3). This study used a 20-year horizon<sup>6</sup> given that a longer time series

<sup>3</sup> Data on credit includes (i) those provided by Malaysian banks and other sectors of the economy; (ii) credit to non-financial corporations, households and non-profit institutions serving households; and (iii) loans and debt securities.

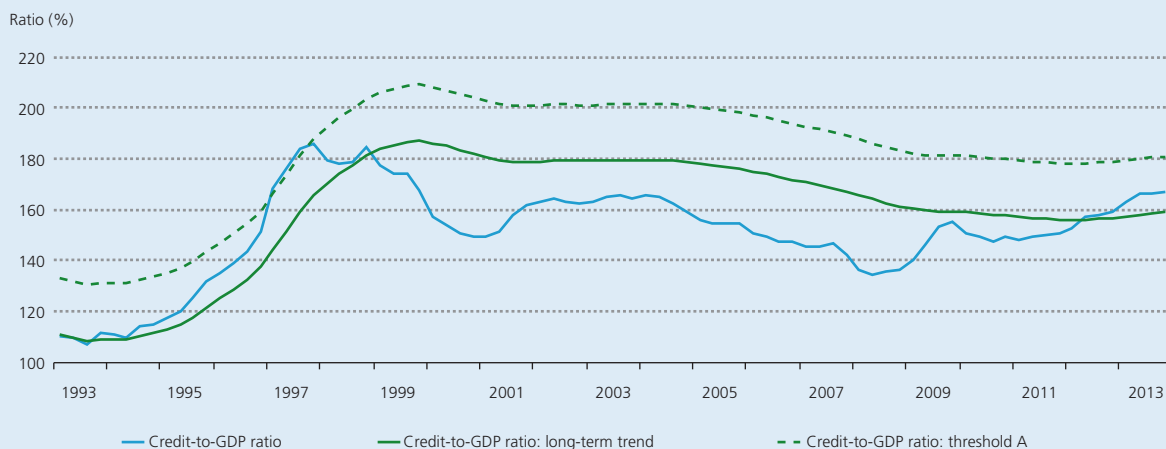
<sup>4</sup> BCBS (2010a) proposed that the primary aim is to use a buffer of capital to achieve the macroprudential goal of protecting the banking sector from periods of excess credit growth by ensuring adequate capital to help maintain the flow of credit in the economy, when the broader financial system experiences stress after a period of excess credit growth. In addressing the aim of protecting the banking sector, the capital buffer may also help to lean against the build-up of financial imbalances by raising the cost of credit and dampening its demand.

<sup>5</sup> Dell' Ariccia et al (IMF, 2012) classified an episode of credit boom if either of the following two conditions is satisfied: (i) the deviation from trend is greater than 1.5 times its standard deviation and the annual growth rate of the credit-to-GDP ratio >10%; or (ii) the annual growth rate of the credit-to-GDP ratio exceeds 20%. The second condition is introduced to capture episodes in which aggregate credit accelerates very gradually but credit growth reaches levels that are well above those previously observed in the country.

<sup>6</sup> BCBS recommended a minimum of 20-year period in the context of countercyclical capital buffer.

Chart 1

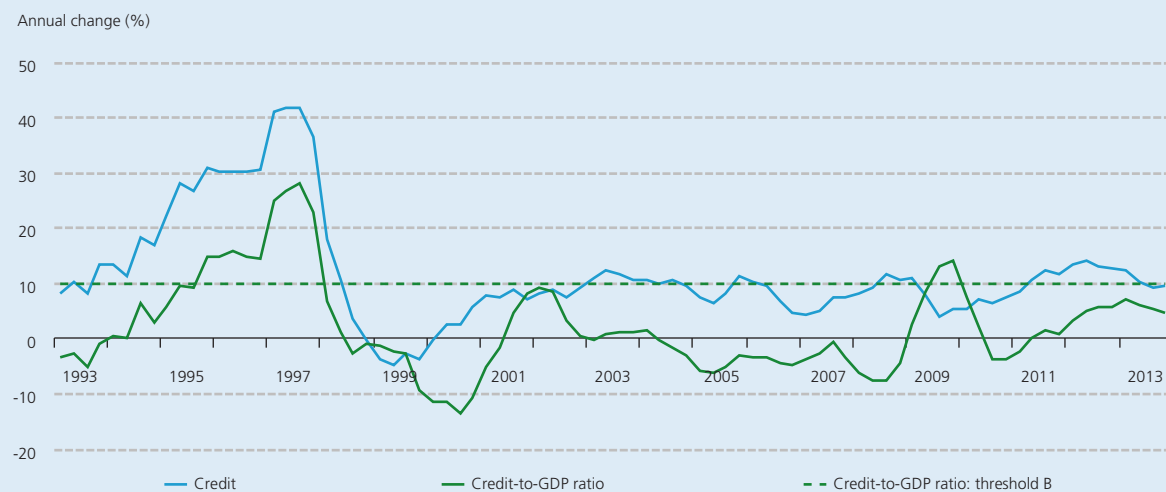
## Credit-to-GDP Ratio



Source: Bank Negara Malaysia, Department of Statistics, Malaysia, Bank for International Settlements and internal computation

Chart 2

## Credit and Credit-to-GDP Ratio: Annual Growth



Source: Bank Negara Malaysia, Department of Statistics, Malaysia, Bank for International Settlements and internal computation

provides a more reflective estimation of a country's position in a credit cycle<sup>7</sup>. Another drawback relates to the sensitivity of trend estimations to the smoothing parameter ( $\lambda$ )<sup>8</sup> (Chart 4). Further, differing signals to policymakers may arise by applying the HP filter recursively to determine the trend based on current available data at each quarter (a one-sided filter, as recommended by BCBS and used in this study), instead of the entire time series (two-sided filter) (Chart 5). This can pose

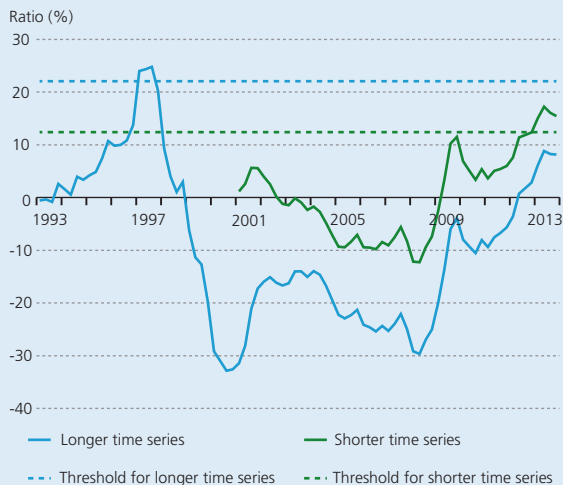
<sup>7</sup> Drehman et al (2012) study on financial cycle observed that assessment using longer time series will better capture medium-term component of fluctuations in credit cycle.

<sup>8</sup> Empirical analysis by Drehman et al (2010) revealed that the trend component calculated using a  $\lambda$  of 400,000 (as adopted in this study) performs well in picking up the long-term trend in private sector indebtedness. Similarly, Ravn et al (2002) suggested a  $\lambda$  of 1600 for the business cycle and quarterly observations. For cycles with longer duration such as the credit cycle, a higher value is considered appropriate.

some challenges for determining if policy responses are required to control excessive credit growth and if so, the intensity of those responses. Another relevant consideration relates to the use of other denominators besides GDP such as financial and non-financial assets of the private sector which are relevant to the evaluation of debt servicing capacity and credit excessiveness (Chart 6).

**Chart 3**

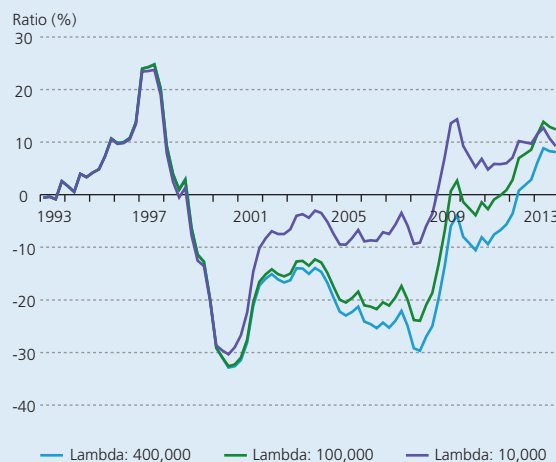
**Credit-to-GDP Ratio Gap: Comparison between Lengths of Time Series**



Source: Bank Negara Malaysia, Department of Statistics, Malaysia, Bank for International Settlements and internal computation

**Chart 4**

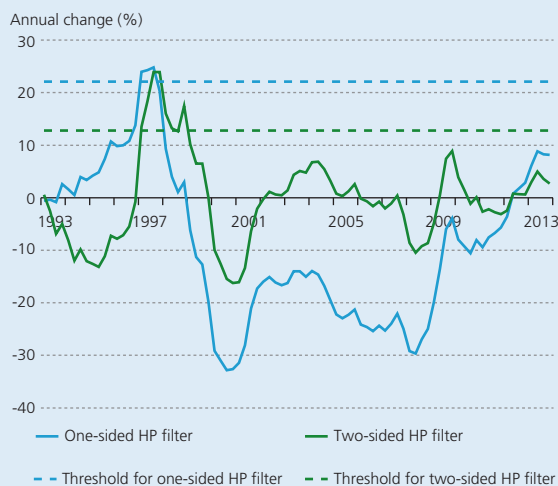
**Credit-to-GDP Ratio Gap: Comparison between Smoothing Parameters**



Source: Bank Negara Malaysia, Department of Statistics, Malaysia, Bank for International Settlements and internal computation

**Chart 5**

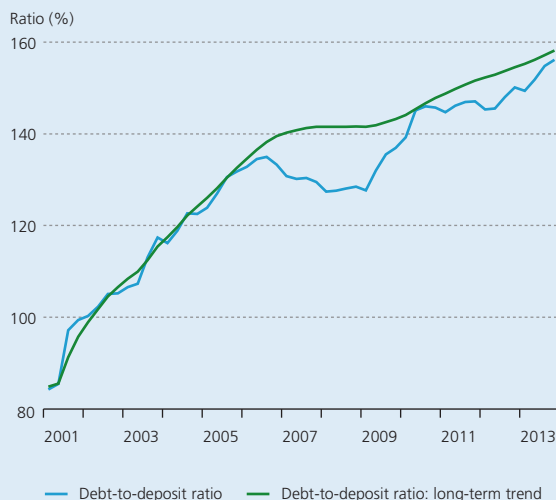
**Credit-to-GDP Ratio Gap: Comparison between One-Sided and Two-Sided HP Filters**



Source: Bank Negara Malaysia, Department of Statistics, Malaysia, Bank for International Settlements and internal computation

**Chart 6**

**Household Sector: Debt-to-deposit Ratio**



Source: Bank Negara Malaysia and Treasury Housing Loan Division

### Assessing Factors Influencing Vulnerabilities in an Environment of Higher Credit Growth

The limitations of current methodologies used to assess if credit growth is excessive imply that any conclusions drawn must also take into account other relevant and important factors. As noted earlier, these factors should include inherent strengths or fragilities in the financial system that can amplify or reduce risks to financial and macroeconomic stability. For emerging market or transition economies, studies have suggested that rapid credit growth may also signify a convergence towards the average credit level in advanced economies<sup>9</sup>, and not necessarily excessive borrowing.

There are a number of factors that can indicate fragility within the financial system, which combined with a protracted, brisk pace of credit expansion, could lead to destabilising threats to financial stability if left unattended. These include (i) imprudent underwriting practices and mispricing of risk; (ii) inadequate financial buffers to absorb temporary shocks; (iii) weak supervision of major credit providers that may include non-bank financial intermediaries; (iv) high proportion of externally sourced foreign currency loans that are vulnerable to foreign exchange and roll-over risks; (v) credit-fuelled asset price distortions; and (vi) high and increasing leverage positions of households and businesses.

The Bank has been closely monitoring developments in domestic credit growth, particularly in light of ample liquidity conditions, low borrowing costs and rising property prices. The Bank assesses that at present, risks to financial stability are well-contained. Notwithstanding this, the Bank has taken a series of measures since 2010 to pre-emptively address potential weaknesses that could increase risks to financial stability in the longer term. These measures reflect a targeted and incremental approach which aims to avoid unintended consequences that could result in an over-adjustment in the economy, while allowing market participants, including households and businesses, to gradually adjust their expectations, behaviour and risk appetite, and thus ensure that these risks continue to be well-managed.

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<sup>9</sup> For this reason, the existing literature suggests using the out-of-sample panel estimation to better estimate the correct equilibrium relationships between economic fundamentals and private credit using a suitable set of countries.