Assessing household financial positions – an Asian perspective

Overview of the IFC Satellite meeting

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A full-day IFC satellite meeting on "*Is the household sector in Asia overleveraged: what do the data say?*" took place in Kuala Lumpur, Malaysia, on 15 November 2014 on the occasion of the first ISI Regional Statistics Conference organised by the International Statistical Institute (ISI) and its South East Asia Regional Network, in collaboration with the Central Bank of Malaysia (BNM), Department of Statistics, Malaysia (DOSM) and the Malaysia Institute of Statistics (ISM). As emphasised by the IFC Chair in his *Opening remarks*, the topic of this meeting proved to be very timely. The financial importance of the household sector has developed markedly in Asia since the 1990s, reflecting the combination of several factors – including rapid economic growth, high personal savings, urbanisation, and ageing.

In addition, the accumulation of household debt has been facilitated in recent years by financial liberalisation, increased competition in the financial industry, lower interest rates, and the shift of banks away from corporate credit risk after the Asian financial crisis. The result has been a marked expansion in credit to households over the past decade, particularly in Malaysia and Thailand. Household debt has reached high levels relative to disposable incomes, especially in Korea since the beginning of the 2000s.[2] Certainly, this financial deepening has been accompanied by stronger domestic demand, suggesting increased resilience to external shocks in the Asian region. But higher leverage also involves risk and is posing new challenges, especially for policymakers.

The meeting highlighted five key dimensions when analysing these issues from a data perspective:

– the availability of statistics on household financial positions;

– the specific role played by housing;

– the assessment of risks and vulnerabilities;

– the granularity of the information to be used; and

– the use of this information, especially for policy purposes.

[1] Central Bank of Malaysia (Statistical Services Department), Bank for International Settlements (BIS, Monetary and Economic Department) and IFC Secretariat, respectively.

[2] BIS statistics on debt by country and sector are available on www.bis.org/statistics/index.htm; for an introduction, see C Dembiermont, M Scatigna, R Szemere and B Tissot, "A new database on general government debt", *BIS Quarterly Review*, September 2015, pp 69–87.

1. Limited data availability

The starting point, as argued by Sayako Konno and Masahiro Higo (Bank of Japan) in their presentation on "*How to quantitatively capture the state of the household sector in Asia?*", is to comprehensively assess household balance sheets, by covering both sides, ie assets and liabilities. But the availability and quality of such data is often limited in Asia, as significant data gaps remain.[3] In particular, while liabilities can be relatively easy to measure, this is less the case for household assets.

The need for a comprehensive assessment puts a premium on the compilation of "integrated sectoral financial accounts", which are still underdeveloped in the region, with a few exceptions. They complete the traditional system of national accounts (SNA) framework by presenting information on financial flows and positions and on a sectoral basis.[4] An important feature is that the financial assets and liabilities of a specific sector are broken down by main instruments and counterparty sectors. This constitutes the so-called *from-whom-to-whom* tables, which provide information on who is financing whom, in what amount and with which type of financial instrument.[5]

Many projects are under way in Asia to develop these financial accounts, with the support in particular of the IFC. For instance, the IFC had organised in 2014 a workshop for central banks in Asia, in cooperation with the South East Asian Central Banks (SEACEN) and the Central Bank of Malaysia, to promote knowledge-sharing and identify best practices. A key outcome of this meeting was that financial accounts can be instrumental in supporting financial stability analyses, for instance, to understand how and why a sector borrows from (or lends to) another sector, as well as to analyse financial interconnections.

However, the compilation of financial accounts requires a wealth of statistics: first, the breakdown of flows and positions by borrowing as well as lending sectors; second, a decomposition by type of instruments, ideally including information on original and/or remaining maturity. How should statisticians proceed when these data are not available? The first step is to set up a comprehensive framework for integrating in a structured, consistent way all the various data available. This should typically include administrative data and other "micro-data sources" (see below). Public authorities may wish to take a more active role, for instance, to set up public credit registries on individual loans data as a service provided to the financial system, as argued by João Cadete de Matos (Bank of Portugal) in his discussion remarks in Session 3, which was chaired by Robert Kirchner (Bundesbank). The second step is to identify the data gaps to be filled. Experience suggests that this

[3] One issue highlighted by João Cadete de Matos (Bank of Portugal) in his discussion remarks is the need to differentiate the sector of households and the one of non-profit institutions serving households (NPISH), which are often combined due to insufficient data.

[4] See eg B Tissot, "Development of financial sectoral accounts: progress and challenges", International Statistics Institute Regional Statistics Conference, 16–19 November 2014 (forthcoming).

[5] The SNA's three-dimensional "from-whom-to-whom" tables presentation is sometimes referred to as a "flow of funds matrix"; see European Commission, International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations and World Bank, *System of National Accounts 2008*.

integration should be implemented progressively and loosely, in "a weak sense", instead of embarking on overly ambitious new data collection exercises to fill all the gaps. This means that some of the data will simply be estimated, so that the precision of the exercise will vary significantly depending on each lender/borrower sector. The third step is that new data collection should be prioritised. The objective is to focus on the selected subsectors and/or instruments that are key from a financial stability perspective. One example of such prioritisation is provided by the Bank of Japan, which is currently focusing on covering three areas of particular relevance for Japan: from whom-to-whom tables; remaining maturity information for assets and liabilities; and securitised products.[6] Similarly, the Bank of Korea has decided to pay particular attention to household debt statistics in the recent past (eg surveys on loan maturity and repayments).

In practice, experience at country level suggests that a good starting point is to collect the statistics reported by financial institutions. One problem, however, is that the data may be available only from the banking sector. This is a clear limitation given the increasing importance of non-bank financing (eg shadow banking) in several Asian jurisdictions.[7] For instance, the growth in Malaysian household debt has been driven in recent years by the rapid expansion of non-bank lending. In addition, the financial landscape is constantly changing, as seen recently in Japan, where under its new quantitative easing policy the central bank has become an important holder of securities. Yet another difficulty relates to the measurement of cross-border positions and flows.

Sometimes, partial statistics can be mobilised effectively to facilitate estimations.[8] Household surveys are interesting in this context because they are less costly to collect and can be useful for distributional analysis (see below). But there are a number of limitations, regarding the limited timeliness and comprehensiveness of the information collected; the lack of international harmonisation; and their irregular updating (household surveys being typically not conducted every year, and the data collected may vary from one survey to another). Moreover, survey data tend to provide information that is not fully consistent with national accounts aggregates due to the concepts, definitions and statistical practices employed. For instance, financial accounts are relatively well developed in Australia, Japan and Korea, and the picture they provide is quite different from the one derived from household surveys, especially for stock variables.

In the specific case of Australia, indeed, the presentation by Giancarlo La Cava (Reserve Bank of Australia) on "*The development of databases linking micro and macro data – an Australian perspective*" showed that the household survey's "coverage rate" of national accounts estimates can be quite low. This is due mainly to missing data items (eg imputed rents for owner-occupied houses) or a different representation of the whole population. Coverage rates also vary significantly both over time and across the different components of household income, spending and

[6] See S Konno and M Higo, "Enhancement and expansion of Japan's flow of funds accounts in response to international recommendations after the financial crisis", International Statistics Institute Regional Statistics Conference, 16-19 November 2014 (forthcoming).

[7] See Financial Stability Board Regional Consultative Group for Asia, *Report on Shadow Banking in Asia*, August 2014.

[8] See "The use of surveys by central banks", IFC Bulletin, no 30, July 2009.

wealth. Australian aggregated survey-based data underestimate disposable income as measured by the national accounts by about 85% on average (and less for particular income segments). Survey-based coverage of other national accounts aggregates, such as consumption and even more so wealth, is lower.

One important outcome of the meeting is that assessing household financial positions requires putting data in perspective. In his discussion remarks in Session 1, chaired by Katherine Hennings (Central Bank of Brazil), Bruno Tissot (BIS) underlined the importance of the concept of the "financial cycle", which reflects the self-reinforcing interactions between perceptions of risk, risk-taking and financing constraints.[9] All these elements (and not just separate balance sheet data) are relevant for financial stability and have to be considered together for financial stability assessments. The BIS has therefore undertaken significant efforts in recent years to facilitate analyses on, eg, asset prices – including residential property prices;[10] total credit aggregates – comprising bank lending but also securities lending, and including their domestic and cross-border components;[11] and the influence of global liquidity conditions on domestic developments and especially on risk appetite – a major driver of leverage and investors' willingness to provide funding.[12] Several participants emphasised, in addition, the need to mobilise non-quantified information.

2. Importance of the housing sector

As emphasised by Konno and Higo in their presentation, assessing household financial positions requires the role played by the housing sector to be carefully taken into consideration. Housing represents the bulk of household assets as well as liabilities (mortgages); and rising house prices often play a key role in driving up household debt. This reflects the usual procyclicality of lending behaviour, as rising asset prices tend to be associated with a relaxation of lending standards, thereby fuelling credit expansion and in turn reinforcing upward pressure on asset prices. Symmetrically, any correction in housing markets can have severe implications for household balance sheets: lower house prices reduce the value of collateral, raising the risk of default in the non-financial sector, thereby leading to a tightening in lending standards and precipitating the unwinding of the credit cycle.[13] As highlighted by Jacques Fournier (Bank of France) in his discussion remarks in

[9] For an introduction on the financial cycle, see Bank for International Settlements, *84th Annual Report*, June 2014 (eg Chapter IV: *Debt and the financial cycle: domestic and global*).

[10] M Scatigna, R Szemere and K Tsatsaronis, "Residential property price statistics across the globe", *BIS Quarterly Review*, September 2014.

[11] C Dembiermont, M Drehmann and S Muksakunratana, "How much does the private sector really borrow – a new database for total credit to the private non-financial sector", *BIS Quarterly Review*, March 2013.

[12] R McCauley, P McGuire and V Sushko, "Global dollar credit: links to US monetary policy and leverage", *BIS Working Papers*, no 483, January 2015.

[13] See for instance B Tissot, "Monitoring house prices from a financial stability perspective – the BIS experience", International Statistics Institute Regional Statistics Conference, 16–19 November 2014 (forthcoming).

Session 5, chaired by Aurel Schubert (European Central Bank), high household debt-to-GDP ratios are often associated with dramatic corrections in property prices. Hence, the housing market is an important area to monitor for financial stability purposes.

All this puts a premium on reliable data for house prices and housing wealth. One recent important step, endorsed by the G20, was the central bank community's efforts to disseminate, through the BIS, indicators on house prices covering a large sample of countries.[14] Moreover, important international methodological guidance has been developed with the publication of the *Handbook of residential property prices*.[15] However, the measurement of property prices remains challenging, and further research and development is obviously needed on this front. As indicated by Raymond Yuen (Hong Kong Monetary Authority) in his discussion remarks in Session 2, chaired by Eugeniusz Gatnar (National Bank of Poland), there are several indicators of housing prices even for a small jurisdiction such as Hong Kong SAR. These may show divergent patterns, reflecting in particular different ways for adjusting for quality effects (eg use of hedonic treatments, appraisal-based methods and repeated sales models). Another issue is the development of non-price indicators that can be useful for assessing the property cycle, such as diffusion indexes, home ownership rates, measures of housing affordability, and web-based indicators of supply and demand. A final issue is the variability of house prices within a country: for instance, they have increased significantly and more rapidly in Kuala Lumpur than on average in Malaysia, over the recent decade. This would require an adequate geographical breakdown of housing data.

The meeting therefore highlighted the importance of considering the wide range of housing indicators available to address the variety of analysis needs and policy questions. This was emphasised in the area of property prices by Jens Mehrhoff in his presentation on "*How should we measure residential property prices to inform policy makers?*". From a macroeconomic perspective, identifying housing-related price pressures is indeed important for monetary policy purposes, while adequate deflators for housing activity are also essential to correctly assess economic growth. From a financial stability perspective, in contrast, the focus of attention will be on the build-up of risks in banks' mortgage portfolios, and thereby on the financial soundness of private households in case of potential corrections in asset prices. Prudential authorities will thus monitor various indicators such as the price-to-rent, price-to-income and income-gearing ratios (ie mortgage repayments and servicing related to income).

One issue is that the evolution of these various indicators may differ, providing conflicting messages.[16] For instance, the value of housing depends on the evolution of three factors, ie the real stock of housing, its "quality", and its quality-adjusted

[14] BIS statistics on property prices are available on www.bis.org/statistics/index.htm; for an introduction, see M Scatigna and R Szemere, "BIS collection and publication of residential property prices", Proceedings of the seventh IFC Conference on "Indicators to support monetary and financial stability analysis: data sources and statistical methodologies", *IFC Bulletin*, no 39, 2015.

[15] Eurostat, *Handbook on Residential Property Prices Indices*, 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/methodology/hps/rppi_handbook.

[16] See for instance M Scatigna, R Szemere and K Tsatsaronis, "Residential property price statistics across the globe", *BIS Quarterly Review*, September 2014 – especially the box on "Diversity of residential property price statistics: the German case".

price. This can have different implications for policy purposes. Inflationary pressures will be monitored by following a housing price index measured at constant quality. Economic "wealth effects" will be analysed by looking at the impact of the total value of the real housing stock (adjusted for price changes) on real demand. And banks' credit exposures will be assessed based on the evolution of housing nominal values: if the debtor defaults, what matters is the residual value of the property compared to the part of the loan that remains to be reimbursed. Since the composition of bank's credit portfolios changes over time due to new loans and repayments, their monitoring requires the accessing of institution-specific, contract-by-contract information.

A multivariate approach is therefore required, as it is impossible to reconcile all these aspects in a single, one-size-fits-all indicator: as argued by Jens Mehrhoff in his presentation, "*there is no simple answer to a complicated policy question*". Hence, any rise in house prices can reflect specific factors that call for a particular policy responses. For instance, in recent years Malaysia has experienced speculative housing activity, as reflected in the increasing number of borrowers having several outstanding home loans, and the authorities decided to target this particular market segment. Another example is that, if prices as well as rents rise substantially, price-to-rent ratios may remain largely unchanged, but price-to-income ratios may go up dangerously, as well as debt service ratios (especially if interest rates are adjustable). A last example highlighted by Giancarlo La Cava in his contribution is that housing statistics may depend on the macro or micro approach retained for their compilation. Macro estimates of housing wealth are typically based on the market value of dwellings, while micro estimates often rely on self-reported assessments by homeowners or creditors (eg appraisals). These indicators may substantially diverge, and such differences can in turn entail valuable information content about the characteristics of the housing market.

3. Assessing risks and vulnerabilities

As argued in the contribution by Konno and Higo, financial stability analyses should focus on the three dimensions highlighted in the Data Gap Initiatives endorsed by the G20: the build-up of risk in the financial sectors (eg measures of aggregate leverage and maturity mismatches, coverage of risk transfer instruments); international spillovers and network connections; and balance sheet vulnerabilities to potential shocks, in particular sudden movements in asset prices.[17] Household financial positions are, indeed, a key element to consider when focusing on these three areas.

The experience of Asia shows that various indicators can be used to assess the risk of financial distress and vulnerabilities. This variety implies that financial stability monitoring may be quite a burdensome task. However, BIS research suggests that, in general, a first step can be to focus on simple macro indicators such as the

[17] International Monetary Fund and Financial Stability Board, *The Financial Crisis and Information Gaps, Report to the G20 Finance Ministers and Central Bank Governors*, October 2009.

evolution of credit-to-GDP ratios and asset (including housing asset) prices.[18] This is useful in assessing the state of the financial cycle and the risks of emerging vulnerabilities that will manifest themselves at a more micro level, sometimes with considerable lags, as argued by Bruno Tissot in his discussion remarks.

One promising avenue developed by the BIS,[19] and recalled by Jooyung Lee (Bank of Korea) in his presentation "*Development of statistics for aggregate household debt service ratio in Korea*", is to monitor repayment capacities at the aggregated level in the economy, especially for households. This approach can be quite useful in monitoring financial stability risks: the so-called debt service ratios, calculated as the ratio of household debt payments (interest and principal) to income, will reflect debt burdens more accurately than the "traditional" indicators of debt-to-income ratios that are usually looked at. When the debt service ratio is high, households can spend less; domestic demand is constrained and the risk of default rises, making credit in turn more difficult to obtain. From this perspective, debt service ratios can be useful early indicators of episodes of financial stress. However, their calculation requires detailed statistical information: types of loan (eg amortised repayment loans, single repayment loans, revolving debt); loan characteristics (eg remaining maturity, interest rates) etc. Korea's experience is that these data can be easily obtained from banks but need to be complemented with other sources, especially from non-bank credit institutions and credit bureaus. Moreover, this may be difficult in practice due to confidentiality constraints.

The meeting highlighted other important avenues for improving risk analyses at a macro level. One is to assess the financial soundness of households' positions by considering all the assets and liabilities in gross terms: looking only at net debt ratios may be misleading since what matters is how gross positions evolve in case of shocks (eg exchange rate movements, corrections in asset prices, increases in interest rates). Attention should thus focus on so-called mismatch effects, reflecting different maturities, currency compositions, and degrees of liquidity between the stocks of assets and liabilities in any specific sector. Moreover, one should also keep an eye on the implications for counterparty sectors, since the issues encountered by those agents in a specific sector will in turn have an impact on the risk exposures of creditor sectors and/or on the funding conditions of debtor sectors.

While those "macro approaches" avoid being overwhelmed by a wide range of indicators to be analysed, aggregated data is not enough: once potential fragilities are detected at the country level, it is important to complement this assessment and dig into the data in a more detailed way, as argued by João Cadete de Matos (Bank of Portugal) in his discussion remarks. This is particularly the case for micro supervision, since financial instruments' characteristics (eg loan-to-value ratios, financing rates, default risk) may differ significantly across lenders both at a point in time as a well as over time. Another important point to focus on is whether the loans have variable rates, as sudden changes in interest rates may rapidly impact household balance sheets. At the end of the day, the array of micro information to be considered can be quite large, with the risk of missing the forest for trees.

[18] M Drehmann, "Total credit as an early warning indicator for systemic banking crises", *BIS Quarterly Review*, June 2013.

[19] M Drehmann, A Illes, M Juselius and M Santos, "How much income is used for debt payments? A new database for debt service ratios", *BIS Quarterly Review*, September 2015.

One middle way between the aggregate view and a granular approach is to analyse how the economic indicators at stake are distributed depending on various groups' characteristics. The G20 Data Gaps Initiative has indeed called for a more detailed knowledge of the distribution of household balance sheet positions.[20] For instance, financial stability risks may still be high if debt is concentrated on a very limited type of borrowers. Thus, one has to consider the situation and/or behaviour of certain groups, such as low-income households (eg the role played by the subprime mortgages granted to poorer US households in the run-up to the Great Financial Crisis), speculative borrowers (defined for instance as those with multiple housing loans), or new homeowners relying extensively on bank financing. For instance, delinquencies rates may vary across those groups even in case of similar "objective" characteristics such as loan-to-value ratios. In any case, capturing distributional information requires a better understanding of the links between the "macro" national accounts-based world, and the "micro" world based on granular information. A telling example was provided in the presentation by Giancarlo La Cava, focusing on indicators such as income, wealth and debt for Australia. Low-income households are often characterised by a relatively high home ownership rate, so that they differ from the group of low-(housing) wealth households; how assets and incomes are distributed within the population is thus key to assessing the "macro" impact of a financial shock (eg house price correction, increase in interest rates).

This view was echoed by Fabrizio Zampolli (BIS) in his discussion remarks in Session 4, chaired by Gülbin Şahinbeyoğlu (Central Bank of the Republic of Turkey). Not only can distributional data help to answer "old" questions for central banks such as how the distribution of debt and wealth can affect the monetary transmission mechanism.[21] But these data may also prove particularly useful in the post-crisis environment to answer "new" questions, such as the limits of conventional monetary policy and the impact of unconventional tools or very low interest rates on the distribution of wealth and income.

4. Mobilising granular, micro data

As explained above, macro assessment of vulnerabilities and risks can be usefully complemented by micro analyses. This puts a premium on accessing data at a sufficiently granular level, for instance individual loan databases maintained by financial institutions and which are accessible to public authorities in the context of their supervisory activities. In his presentation on "*The information model at Banco de Portugal – using micro-data to face central banks' challenges*", João Cadete de

[20] See International Monetary Fund and Financial Stability Board, *The Financial Crisis and Information Gaps – Sixth Implementation Progress Report of the G20 Data Gaps Initiative*, September 2015 – especially its Recommendation II.9 on *Household Distributional Information* which requests *"The IAG, in close collaboration with the G-20 economies, to encourage the production and dissemination of distributional information on income, consumption, saving, and wealth, for the household sector*".

[21] For an analysis of how the understanding of the impact of monetary policy requires an appreciation of heterogeneity across households, see for instance the Andrew Crockett Memorial Lecture by Amir Sufi on "Out of many, one? Household debt, redistribution and monetary policy during the economic slump", BIS, June 2015.

Matos (Bank of Portugal) recalled that micro-databases are already very relevant for many central banks' statistical systems. Among the various advantages brought by granular information, he emphasised the good coverage of the relevant population, the increased flexibility as regards the compilation of new statistics, the relatively low reporting costs and the more rapid responses to ad hoc data requirements and policy questions. Most importantly, micro data allows one to explore the heterogeneity hidden behind aggregate numbers and the analysis of the tails of distributions. This has become particularly important for financial stability purposes, while "traditional" national accounts-based statistics provide little information on how general aggregates are distributed.

In the case of Portugal, the data mobilised cover a wide range of domains, including the Bank's own collection of securities statistics, the Central Credit Register (CCR) which contains granular loans data, the central balance sheet database, which encompasses non-financial sector assets and liabilities, financial corporations' balance sheet information, and assets and liabilities of the Rest-of-the-World sector collected in the context of balance of payment statistics. Additional steps are being taken to complement these data with inputs on additional sectors including the general government.

A key lesson is that a proper information governance structure should be designed to organise the collection of micro data encompassing all institutional sectors and financial instruments and to ensure a good relationship among the various actors involved. To this end, the fully fledged integrated system developed by the Central Bank of Portugal relies on five layers: three for information management per se (acquisition of databases; operational data store; data warehouse), and two for analytic activities (exploration of information; dissemination). The key is to ensure the adequate documentation of this system, eg up-to-data metadata and catalogues.

The various country experiences reported at the meeting showed that capturing the micro situation of individual economic agents can have several benefits, such as enhanced analytical capabilities, greater flexibility, and a reduced reporting burden, at least in the long run. However, the collection of large micro data sets also brings with it acute challenges, namely legal and confidentiality aspects; costs and complexity of granular data collection; associated quality issues; and, last but not least, the challenge of making use of detailed granular information in a comprehensive yet straightforward way, especially for policymakers.

One way of addressing such issues is to ensure that the granular data collected are consistent or "matched" with the macro framework. The experience of Australia as analysed in Giancarlo La Cava's presentation is that this approach can facilitate the consistency of the granular information collected (with the national accounts-based framework, over time, and internationally), its complementarity (allowing both "top-down" and "bottom-up" types of analysis) and its adaptability. For instance, it allows understanding how the rise observed in the household saving rate in Australia after the Great Financial Crisis of 2007–09 reflected specific developments across income groups. It also helps to analyse the rise in income and wealth inequality and the particular impact of house prices in this respect – for instance by showing how a rise in housing prices would typically cause wealth inequality to rise but income inequality to fall, all other things being equal.

Other avenues can be explored too. According to Giancarlo La Cava, attention should focus on developing panel databases based on administrative data sets, with

the same households sampled each period so as to better understand the macro impact of distributional changes over time (instead of cross-sectional surveys with different households sampled each period). In practice this would mean setting up specific household panel data sets that are sufficiently rich at the micro level, available in a timely manner, and regularly updated over time.

5. Using data

Adequate data on household financial positions is not a goal in itself: what is important is to mobilise such data to support macroeconomic analyses and thereby influence policy decisions, as emphasised by Jacques Fournier in his discussion remarks. "*Good policies require good statistics*" was indeed the buzzword of the meeting. From this perspective, data have multiple usages.

First, data are indispensable for the supervisory surveillance of financial institutions. As highlighted by João Cadete de Matos, the importance of good micro data is obvious in this area, since supervisory monitoring tasks basically need to be conducted at the institution level. Second, data have to be summarised for macro analyses. The challenge, however, is to use detailed information on household financial positions and possible vulnerabilities and translate it into policy assessments, especially as regards financial stability risks; a clear communication strategy thus has to be followed. Third, data will guide the implementation of policy actions. For instance, the design, calibration and implementation of macroprudential tools (eg loan-to-value limits, debt servicing limits) require close monitoring of available data. This is often further complicated by policies that are targeted at specific segments of the household sector or housing market.[22] Fourth, data are needed to assess the effectiveness of such policies over time and mitigate possible unintended consequences (eg agent behaviours in response to these policies, overall impact on the economy). Lastly, data are needed to decide when, and how, to reverse previous policy decisions.

What is the experience of Asia from this perspective? Participants emphasised that the Asian region has gained an unequalled amount of experience in recent years in mobilising data on household balance sheets to design and implement macroprudential actions in addition to more "traditional" micro supervision tasks. As highlighted in the case of Hong Kong SAR by Raymond Yuen in his discussion remarks, a wide variety of potential macroprudential measures have been taken, focused on specific instruments (eg underwriting standards for mortgages, with explicit loan-to-value and/or debt service ratios), creditor sectors (eg capital buffers for banks), and borrowers (eg taxation of property sales, structural measures addressed to specific housing market segments, for instance related to foreign income sources). Another growing area of interest relates to monetary policy: the assessment of credit risk is instrumental in determining the quality and conditions of assets that can be used as collateral in monetary policy operations, and which have been in increasing demand in the aftermath of the Great Financial Crisis with

[22] For an analysis of macroprudential policies and housing market issues, see for instance K Kuttner and I Shim, "Can non-interest rate policies stabilise housing markets? Evidence from a panel of 57 economies", *BIS Working Papers*, no 433, November 2013.

the development of quantitative easing policies. Lastly, the Asian region has also witnessed a number of fiscal policy actions taken in response to developments in household financial positions, especially in the area of property markets.

As explained in the presentation by Chin Ching Lau on "*Using household balance sheet and housing data for systemic risk assessment and policy formulation – Malaysia's experienc*e", Malaysia also appears to be an interesting case study of how data can be used for various policy purposes (ie macro- and microprudential, fiscal, structural and monetary policies). The first lesson is that authorities may have multiple, possibly conflicting, targets: for instance, they may focus on ensuring sound lending practices while encouraging competition among finance providers; or they may promote financial deepening while seeking to prevent credit-fuelled speculative booms; or they may foster the opening of the economy while managing the impact of potential capital inflows etc. The second lesson is that the impact of these measures may differ, depending on the targeted variables. The experience of Hong Kong, as reported by Raymond Yuen, is that macroprudential measures have been helpful in dampening mortgage loan growth and transaction volume but less so in moderating property prices. The impact of tax measures has been different, depending on the variables considered. The third lesson is to ensure some coordination across the various policy tools that can be deployed and therefore to promote information exchanges between authorities. This is particularly important for preventing "arbitrage" behaviour (as agents react to one policy measure in a given sector by changing their behaviour in another sector). The fourth lesson is that data should be mobilised in a forward-looking manner, since financial stability risks have to be addressed in a pre-emptive way (especially when seeking to mitigate financial procyclicality and financial boom/bust episodes). The final lesson is that the data need to be complemented with non-quantified judgment-based information, for instance to gauge the degree of risk appetite in the economy or ongoing changes in financial industry practices.