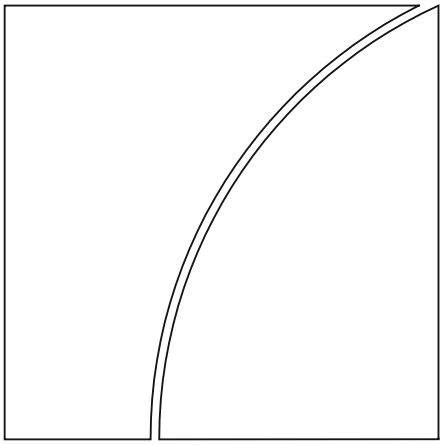
Irving Fisher Committee on Central Bank Statistics



IFC Bulletin

No 40

Assessing household financial positions in Asia

Proceedings of the Kuala Lumpur Satellite meeting at the ISI Regional Statistics Conference 2014 on *"Is the household sector in Asia overleveraged: what do the data say?"*

November 2015

BANK FOR INTERNATIONAL SETTLEMENTS

Contributions in this volume were prepared for the Satellite meeting organised by the IFC in Kuala Lumpur, Malaysia, on 15 November 2014. The views expressed are those of the authors and do not necessarily reflect the views of the IFC, its members, the BIS and the institutions represented at the meeting.

This publication is available on the BIS website (www.bis.org).

ISSN 1991-7511 (online)

ISBN 978-92-9197-287-6 (online)

Proceedings of the IFC Satellite meeting at the ISI Regional Statistics Conference on
"Is the household sector in Asia overleveraged: what do the data say?"
Kuala Lumpur, Malaysia, 15 November 2014

IFC Bulletin No 40
November 2015

Contents

Satellite meeting of the IFC at the ISI Asian Regional Conference

"Is the household sector in Asia overleveraged: what do the data say?"

Sasana Kijang, Kuala Lumpur, Saturday 15 November 2014

Programme

9:00 am **Opening Remarks**

Muhammad Ibrahim, Deputy Governor, Bank Negara Malaysia, and Chairman of the Irving Fisher Committee on Central Bank Statistics (IFC).

ISI/IFC cooperation, Vijay Nair, President, International Statistical Institute (ISI).

9:30 am **Session 1: How Good Are Data on Household Balance Sheets?**

The starting point for any analysis of the financial position of the households is the sectoral accounts (financial and non-financial). How well developed are these statistics, in particular in Asia? What are their strengths and weakness, both with respect to assets and liabilities? What projects are underway to develop and improve such data? Can other sources shed light on the developments in households' overall financial positions (eg mortgage credit registers, surveys on income and wealth)?

Chairperson	:	Katherine Hennings, Central Bank of Brazil
Presentation	:	*How to Quantitatively Capture the State of the Household Sector in Asia?*, Bank of Japan, Sayako Konno & Masahiro Higo
Discussant	:	Bruno Tissot, Bank for International Settlements

11:00 am **Session 2: How Reliable Are Data on Housing Prices and Wealth?**

Housing wealth is a key variable to assess the household sector's financial position. How good and reliable are such data, in particular in Asia? Is there a measure of the value of the housing stock? What about residential property prices: how good are they to track housing market developments?

Chairperson	:	Eugeniusz Gatnar, National Bank of Poland
Presentation	:	*How Should We Measure Residential Property Prices to Inform Policy Makers?,* Jens Mehrhoff, Bundesbank
Discussant	:	Raymond Yuen, Hong Kong Monetary Authority (*Hong Kong's Property Market Developments and the Impact of Macro-Prudential Policies*)

Luncheon talk: *What is the Big Deal about BIG DATA?* Vijay Nair, President of the ISI.

1:45 pm **Session 3: How Do We Measure Household Financial Soundness and Assess the Impact of House Prices?**

A key variable to assess the household sector's financial position is to estimate Debt Service Ratios, which will depend on the data available in a country. Measuring housing wealth is also an issue in terms of data availability.

Chairperson : Robert Kirchner, Bundesbank

Presentation : *Development of Statistics for Aggregate Household Debt Service Ratio in Korea,* Jooyung Lee, Bank of Korea

Discussant : João Cadete de Matos, Banco de Portugal

3:00 pm **Session 4: What Do We Know About the Distribution of Households' Balance Sheet Positions?**

Aggregate ratios based on sectoral data can be misleading and need to be complemented by distributional information. How can links be established between national accounts concepts and micro data and information on income, wealth and debt? Of recent interest are also data and analyses of the distribution of income and wealth. What kind of data is available? Are there projects to collect additional information in this area?

Chairperson : Gülbin Şahinbeyoğlu, Central Bank of the Republic of Turkey

Presentation : *The Development of Databases Linking Micro and Macro Data – An Australian Perspective,* Giancarlo La Cava, Reserve Bank of Australia

Discussant : Fabrizio Zampolli, Bank for International Settlements

4:30 pm **Session 5: How Can We Use Household Balance Sheet and Housing Data for Policy Formulation and Assessment of Risks to Financial Stability?**

Assuming that data on household balance sheet positions and housing are available, how can they be utilised to assess risks to financial stability? How should policies be formulated to address such risks? In particular, the design and implementation of macroprudential policies (eg loan-to-value limits, debt service ratios) require the 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. Lastly, how can we assess the effectiveness of such policies over time? This is critical to ensure their timely calibration (and their upliftment) and minimise unintended consequences on agent behaviours and the broader economy.

Chairperson : Aurel Schubert, European Central Bank

Presentation : *Using Household Balance Sheet and Housing Data for Systemic Risk Assessment and Policy Formulation,* Lau Chin Ching, Bank Negara Malaysia

Discussant : Jacques Fournier, Banque de France

5:45 pm **Closing Remarks**

Assessing household financial positions – an Asian perspective

Overview of the IFC Satellite meeting

Ummil Aminudin and Bruno Tissot[1]

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.

IFC Satellite Seminar at the ISI Regional Statistics Conference 2014
Kuala Lumpur, 15 November 2014

Opening remarks by Muhammad Ibrahim, IFC Chairman and Deputy Governor, Central Bank of Malaysia

Good morning ladies and gentlemen,

Welcome to the IFC Satellite Seminar on "Is the household sector in Asia overleveraged: what do the data say?". Bank Negara Malaysia is honoured to jointly organise this event with the Irving Fisher Committee on Central Bank Statistics (IFC).

On behalf of the IFC, I would like to thank Bank Negara Malaysia for organising and hosting this event. There are about 80 participants with us today, and I would like to extend my appreciation to all of those – IFC Executives and members, distinguished guests, speakers and participants – who are contributing to this IFC Seminar and taking part.

As you know, the Seminar is held in conjunction with the 2014 International Statistical Institute (ISI) Regional Statistics Conference, which will be held on 16–19 November at Sasana Kijang. This first regional conference of the ISI is organised with its South East Asia Network and in collaboration with Bank Negara Malaysia, the Department of Statistics, Malaysia, and the Malaysia Institute of Statistics. We have a very stimulating programme lined up for the coming days, which I am positive will prompt very rich discussions and exchanges of views. I would therefore like to warmly thank all those who will be contributing to and taking part in the ISI regional conference.

I would like to make a special mention of Vijay Nair, the President of the ISI, who has kindly agreed to attend today's IFC Seminar. Vijay, Malaysia is very proud to organise the first regional conference of the ISI, and to welcome all the statistical experts of the world in Kuala Lumpur. Your presence with us today underlines the importance of the relationship between the ISI and the IFC, and with the central bank community more generally. Indeed, last year the IFC became an affiliated member of the ISI. A Memorandum of Understanding between the ISI and the IFC was signed during the ISI World Statistics Congress in Hong Kong SAR, in August 2013. Since then, around 20 central banks have also become formal members of the ISI, reinforcing the cooperation between the central banking community and the international statistical community.

Many thanks, dear Vijay, for the ISI's strong cooperation with the IFC, and in particular, for attending today's Satellite Seminar and contributing actively to our discussions. We are very appreciative that you will share with us later today some views on ISI/IFC cooperation as well as on the topic of big data. Big data is indeed a very important aspect when considering statistics on the household sector, because much information can be derived from granular or micro data sources.

The topic of today's meeting, "household debt", is very timely. As some of the presenters will explain, the Asian Financial Crisis at the end of the 1990s was partly a consequence of weaknesses in the domestic financial sector, notably an inability by domestic borrowers to service their debts. Since then, the economic importance of the household sector has also developed markedly in Asia. The financial and non-financial assets held by households have risen significantly, and so have their liabilities. Let me illustrate my point with a few numbers for Japan. The wealth of Japanese households represents around 900% of their annual disposable income. Some 60% of this wealth comprises financial assets and the rest is non-financial assets. At the same time, household liabilities represent around 120% of their disposable income. These are very large numbers. Private wealth and debt are certainly lower elsewhere in Asia, but recent years have seen a sharp expansion in household assets and liabilities in many countries, for instance, in Korea, Malaysia and Thailand.

Arguably, the rise in household debt could also indicate growing strength in Asian domestic demand and, thereby, increasing resilience to potential external economic shocks. But debt is a two-edged sword. Research has shown that, at moderate levels, debt is a source of economic growth and stability but, when excessive, debt increases volatility and becomes detrimental to growth. Hence, the accumulation of debt involves risk. Indeed, as leverage increases, borrowers' ability to repay becomes progressively more sensitive to variation in their sources of income as well as to interest rate changes. So, while financial deepening can help improve economic well-being, high and rising debt is also a justifiable source of concern. And, in particular, the growing importance of household debt is posing new challenges.

This seminar has therefore been structured along five main questions that reflect the key challenges faced by Asian policymakers when looking at the household sector. We are very happy to have today so many distinguished speakers who can share with us their knowledge and experience in managing these challenges.

The first challenge is the data itself. Good policies require good statistics, and Session 1 will help us to assess the quality of data on household balance sheets in Asia. Improving on this front requires further development of the financial sector accounts, in line with the recommendations of the Data Gap Initiatives endorsed by the G20. It is reassuring that many projects are being initiated in the region to develop these accounts and also to mobilise other data sources on households' overall financial positions, as Sayako Konno and Masahiro Higo from the Bank of Japan will tell us.

The second challenge is the particular role played by housing, which often represents the bulk of household assets. Sometimes, the only significant asset held by a household is its house. But, as houses are expensive, housing also incurs important liabilities (mortgages). This puts a premium on reliable data for house prices and housing wealth as a basis for the evaluation of the household sector's financial position. But, as Jens Merhoff from the Bundesbank will tell us during Session 2, the measurement of residential property prices remains challenging. Moreover, the choice of adequate indicators may depend on the analysis conducted and on the policy questions being asked. Indeed, a recent BIS study showed that, in Germany, the rise in nominal house prices between 2008 and 2014 was between 10% and 40%, depending on the data source used! I am also very happy that

Raymond Yuen from the Hong Kong Monetary Authority will be able to present Hong Kong's experience in this respect, especially on how to properly measure house prices, and in particular, how to adjust for quality effects.

A third challenge is how to move beyond the simple measurement of assets and liabilities to get a sense of the financial soundness of households' positions. Various indicators can be used to assess the risk of financial distress and vulnerabilities to sudden movements in asset prices, especially house prices. In its 2014 Annual Report, the BIS looked at the various indicators that can be used to assess the risk of financial distress. A main finding was that the evolution of credit-to-GDP ratios, property prices and households' repayment capacities (eg the debt service ratios) can be very useful for debt sustainability analysis. I am pleased that Jooyung Lee from the Bank of Korea will focus in Session 3 on the household debt service ratio as a key indicator for debt sustainability analysis.

A fourth challenge is that aggregate data are not enough. The G20 Data Gaps Initiative has highlighted the importance of knowing more about the distribution of households' balance sheet positions. Total household debt may be low in aggregate in a country, but this can be misleading. For instance, financial stability risks may still be high if debt is concentrated on a very specific group of households, eg new homeowners who rely extensively on bank financing. But 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, especially on income, wealth and debt. Gianni La Cava from the Reserve Bank of Australia will share with us in Session 4 Australia's experience in this area. He will help us understand how to develop databases linking micro and macro data. He will also show how granular information can be useful to better understand macroeconomic developments such as the evolution of household savings and inequalities.

And then there is a fifth challenge, which is perhaps the greatest. Once we have all the statistical information on household financial positions and possible vulnerabilities – and this is already a big challenge – how should we translate it into policy recommendations, especially to mitigate financial stability risks? For instance, the design and implementation of macroprudential policies (eg loan-to-value ratios, 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. And of course, assessing the effectiveness of such policies over time is critical in ensuring their timely calibration and, at some point, their removal. It will also help to mitigate possible unintended consequences, especially as regards agent behaviour in response to these policies and the overall impact on the economy. Asia is, perhaps, the best place to look when considering this last challenge. The region has gained a lot of experience in recent years with regard to the design and the use of the macroprudential tools that have become a buzzword in today's policy agendas. Lau Chin Ching, from Bank Negara Malaysia, will present in Session 5 how household data can be mobilised effectively to assess systemic risk and to guide policy actions.

The theme for today's Satellite Seminar has proved to be a very timely topic for all of us in the central banking community. As you know, the IFC is an important forum in providing a global platform for the exchange of views amongst central bank economists, statisticians and policymakers on statistical issues that are of interest to central banks. The IFC is therefore rightly looking into the issue of

household leverage so as to make appropriate recommendations and messages for central bank Governors, not only in Asia but also in other regions. And I am very pleased to note that the ISI is with us in this endeavour.

With this, ladies and gentlemen, I conclude my opening remarks. I wish all of you a productive and engaging seminar. Thank you.

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

How to quantitatively capture the state of the household sector in Asia?[1]

Sayako Konno and Masahiro Higo, Bank of Japan

[1] This presentation was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

日本銀行
BANK OF JAPAN

“How to quantitatively capture the state of the household sector in Asia?”

IFC Satellite Seminar
November 15,2014
in Kuala Lumpur

Sayako Konno

Masahiro Higo

Research and Statistics Department
Bank of Japan

Outline of Presentation

1. Growing Importance of the Household Sector in Asia
   - 1.1 Role of Households in Asia
   - 1.2 Issues of Households Debt
   - 1.3 Important Role of Statistics
2. Current Development of Statistics in Asia
   - 2.1 What kind of statistics are needed?
   - 2.2 Financial Accounts in Asia
   - 2.3 Residential Property Prices
   - 2.4 Distributional Information on Households
   - 2.5 Summary
3. Needs to Develop the Financial Accounts
   - 3.1 The Importance of FFA to Compile the HHs Balance Sheet
   - 3.2 What is J-FFA?
   - 3.3 Analyses of J-FFA
   - 3.4 The Future Revision of J-FFA

1. Growing Importance of the Household Sector in Asia
1.1 Role of Households in Asia

- In Asian countries (presumed East and Southeast Asia),the role of the household sector is gaining importance in both financial and economic aspects.

  (1) High economic growth and saving rate give rise to a build-up of the households' financial assets.

  (2) Rapid urbanization causes an increase of both real assets and indebtedness of households with the continuous rise of house prices.

  (3) Aging society also contributes to the rise of the financial assets. As the social security system is not sufficiently developed, dependence on the households savings is high.

  (4) Financial liberalization leads to an increase in housing loans and an increase in investment into more varieties of financial assets as well.

1.2 Issues of Household Debt

- As the house prices increased rapidly in some Asian countries, household indebtedness especially in cities became big issues. There is a concern about the question of whether the household sector is overleveraged or not.
- A sharp decline in house prices would damage the household balance sheet.

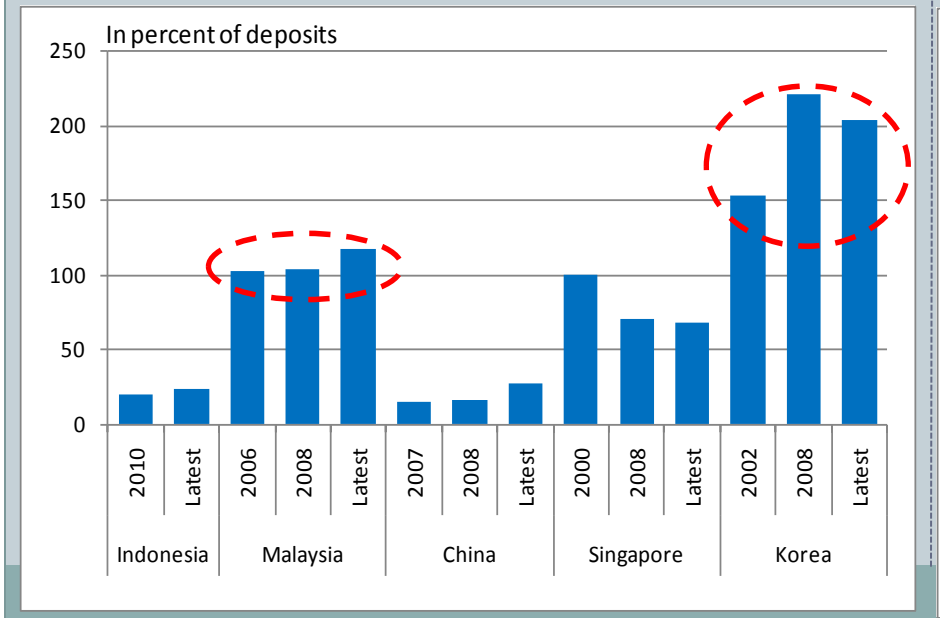
"Regional Economic Outlook," April 2014 by the IMF, introduced analyses of rising household debt and house prices in Asia.

Household Debt in Asia

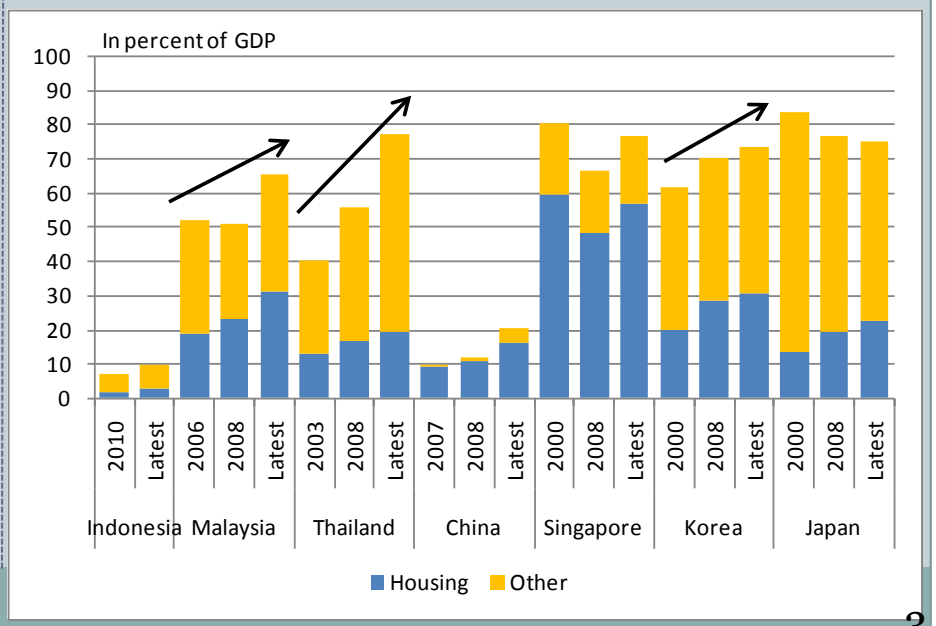
IMF *Regional Economic Outlook*;

- How "indebted" are households in Asia?
- ✓ "Rapid credit growth has also fueled growing household indebtedness across parts of Asia."
- ✓ " Mortgage credit accounts for a significant share of total credit to households in many Asian economies."

Households debt



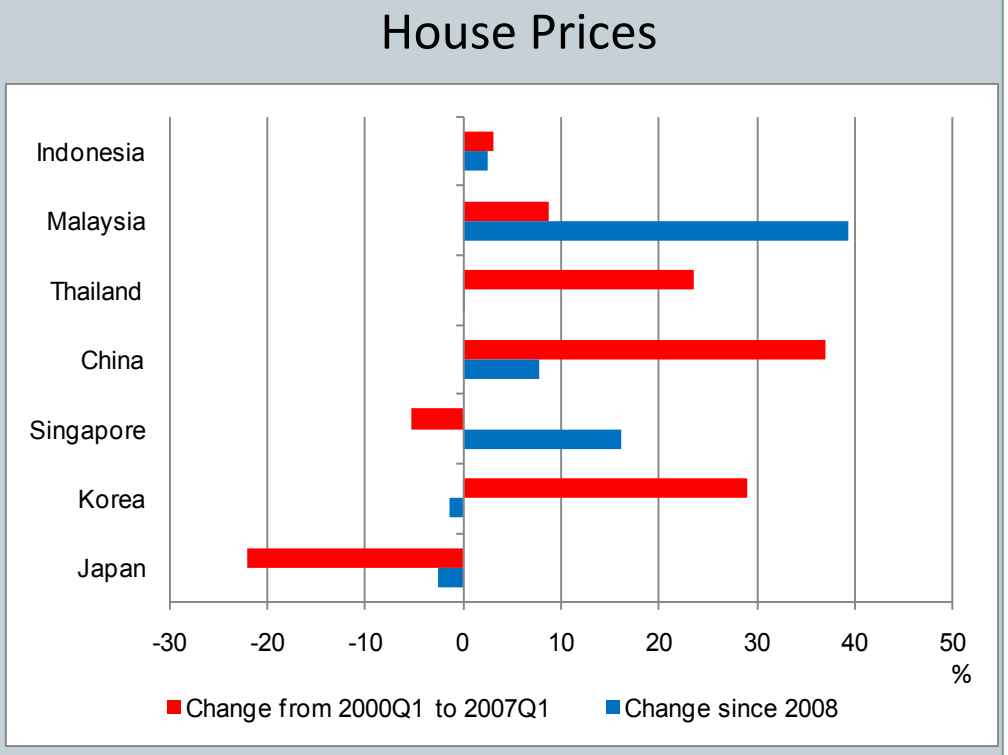
Total credit to households



House Prices in Asia

IMF *Regional Economic Outlook* (Cont.);

- House prices rose rapidly across most of Asia during the last decade.
  - "Given that rapidly rising credit has often been associated with an upward cycle in house prices, there is a potential for the housing-credit cycle to unwind in some countries."
  - "A decline in housing prices would lower the value of collateral and tighten credit availability, creating an adverse financial accelerator effect."



Measures on Household Debt

- Financial authorities in Asia responded to household debt problems with a series of prudential policy measures, such as strengthening loan regulations, as follows.

Country	Measures
Korea	• "Comprehensive Measures on Household Debt" in June 2011 A. For the banking sector: ➢ Application of higher BIS risk weights to high-risk mortgage loans, etc. ➢ Shortening of a deadline for banks to meet the 100% cap of loan-to-deposit ratio. B. For the non-banking sector: ➢ Introduction of leverage regulations for credit business companies. ➢ Gradual strengthening of the loan-loss reserve requirements for card loans and other credit loans extended by. •"Measures on non-banking sector's household lending" in Feb. 2012

Measures on Household Debt

Country	Measures
Malaysia	• Increasing the RPGT rate from 5% to 10% for properties held and disposed within 2 years. (Jan. 2011) • Initiation of new regulation on credit cards. (Mar. 2011) • Increasing the minimum values of properties that foreigners are allowed to buy. (Apr. 2014) • Limit the repayment period for the purchase of properties to 35 years and personal financing to 10 years. (July 2013) • Increasing the RPGT rate to further curb speculative activities (Oct. 2013).
Thailand	• Tightening the rules on mortgage lending in Jan. 2011. ➢ Increasing from 35% to 75% the risk weight for banks exposure to mortgages on condominiums and detached houses.

1.3 Important Role of Statistics

- Good statistics are indispensable for effective surveillance and policy responses.

(E.g.) Evaluate the risk of a housing bubble.

- How accurately can we capture the pictures of the household balance sheet with the current financial statistics?
- What are our tasks as statistical experts of central banks?

2. Current Development of Statistics in Asia
2.1 What kind of statistics are needed?

1. It is desirable to compile financial accounts (Flow of Funds Accounts) on an SNA basis in order to capture a comprehensive picture of households' financial assets and liabilities.
2. Detailed information on house prices are important in order to determine the accurate values of real assets.
3. The distribution of households' assets and liabilities shows a dispersion. Statistics on the distributions compiled with micro data are required for a better policy.

2.2 Financial Accounts in Asia

- There are a few countries in Asia that compile quarterly financial accounts.

Availability in Credit Statistics

	Indonesia	Malaysia	Thailand	Singapore	Hong Kong	China	Korea	Japan
Bank Credit	1976～	1964～	1957～	1963～	1978～	1985～	1960～	1963～
Total Credit [Financial account: Quarterly]							1962*～	1964～
Credit to non-financial corporations and credit to households	2001～		1991～	1991～	1990～	2006～	1962～	1964～

Note: Total credit of Korea is available only on an annual basis for the period from 1962 to 1974.

Source: BIS Documentation on Data of total credit and domestic bank credit to the private non-financial sector

Statistical Development in Central Banks

- Financial Accounts (Flow of Funds Accounts) on an SNA basis:

  Korea, Australia and Japan

- Outstanding of Households' Financial Assets and Liabilities (not on an SNA basis):

  China, Malaysia, and Singapore

- Many Asian countries do not grasp the whole pictures of households' financial assets and liabilities.

  e.g. Thailand and Indonesia conducted only irregular household surveys.

Analyses of Households under Limited Availability of Data

IMF *Regional Economic Outlook: Asia and Pacific* April 2014

- Broad coverage over countries
- Insufficient coverage over financial assets and liabilities--limited to the banking sector

BIS Credit Statistics

- BIS encourages members to provide total credit
- In reality, many members report only bank credit; some do not report credit to households.

Nomura (Japanese think-tank) Report

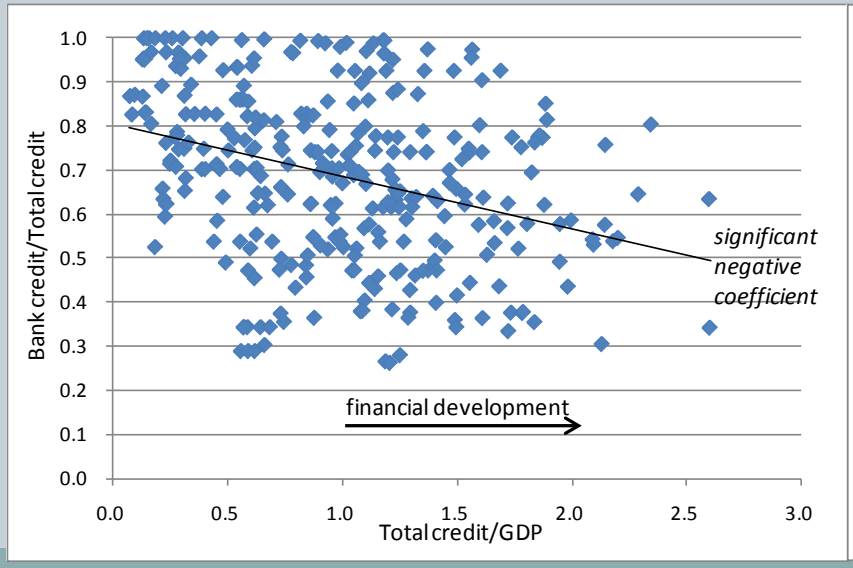
- Analyze the balance sheet structures in East Asian countries
- Due to a lack of data, analyses are limited to Japan, China, Korea, Singapore, and Malaysia.

Needs to Develop Broader Credit Data

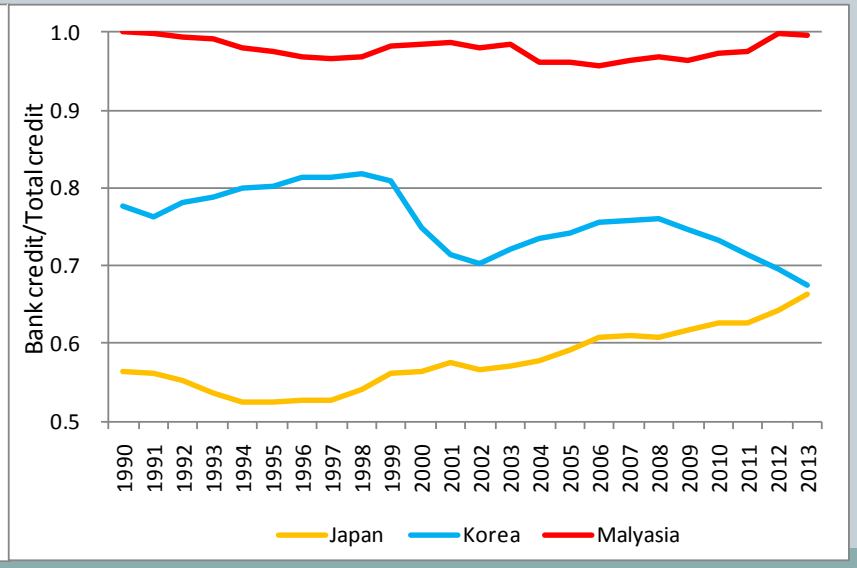
BIS *Quarterly Review*, March 2013;

1. Due to a lack of time-series data for total credit, even in countries that compile financial accounts, well established statistics on bank credit are broadly used.
2. As financial liberalization advances in Asia, households invests their assets into more varieties of financial products.
3. The analyses with bank credit data may be misleading regarding the real issues on balance sheets. Therefore, we are urged to develop credit data with broader coverage.

Bank Credit to Total Credit



Source: BIS *Quarterly Review* March 2013



Source: BIS Total credit and bank credit to the private nonfinancial sector

2.3 Residential Property Prices

- The BIS has published three data sets of residential property prices, currently covering 55 countries.
  - ① Detailed data: includes all the original series collected for each country
  - ② Selected series: includes one representative price series per country
  - ③ Long series: satisfies some minimum comparability criteria across countries.
- The data sets are aimed at filling the data gaps and demonstrating the important role of house price statistics.

Characteristics of series included in the three data sets

	Geographical Coverage		Source of price information			Quality adjustment			Starting years	
	All	Cities	Trans-actions	Appraisal	Adver-tised	None	Size only	Sophis-ticated	Selected series	Long series
Indonesia		✓	✓	✓	✓	✓			2002	
Malaysia	✓	✓	✓			✓		✓	1999	
Thailand		✓		✓				✓	2008	
Korea	✓		✓					✓	1986	
Japan	✓	✓	✓	✓	✓		✓	✓	1955	1970

Note: Selected series data set is one representative price series per country. Long series data set is a price series with a long time span which also satisfies some minimum comparability criteria across countries.

Source: BIS *Quarterly Review* September 2014

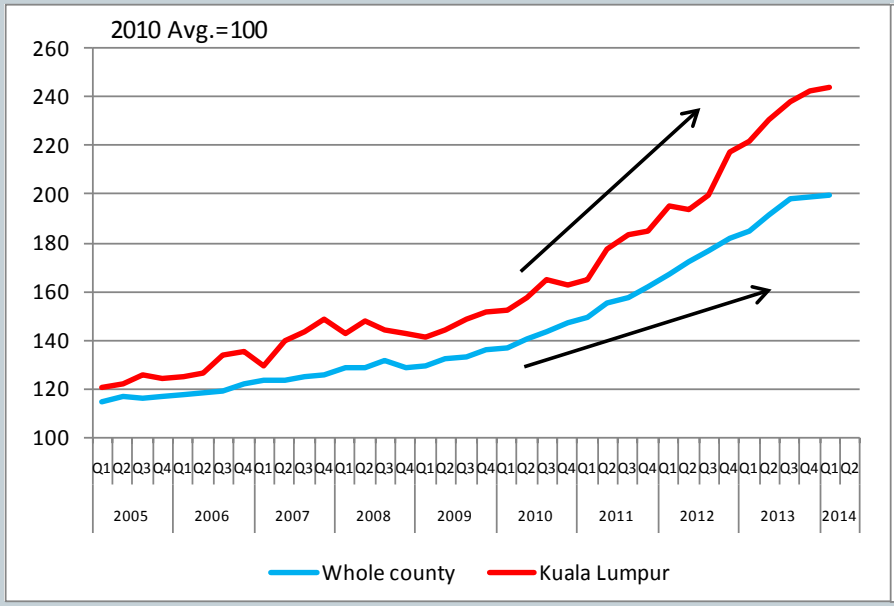
Initiative by Overseas

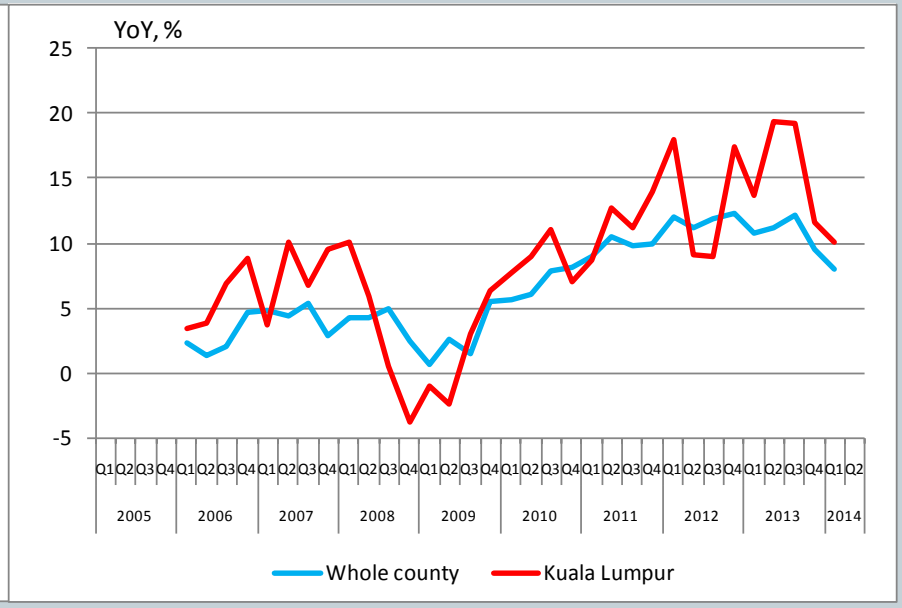
- With the aim to present an international standard for house prices, Eurostat, in collaboration with other international organizations, released "Handbook on Residential Property Prices Indices (RPPIs)" in 2013.
  - The handbook introduces a conceptual framework, several different methods such as hedonic regression methods and appraisal-based methods, and empirical examples, etc..

Issues concerning House Prices

- While the statistical developments of house prices based on a macro-level basis conducted by BIS and others are important, house prices with more detailed data are also needed in order to detect any discrepancy in trends among the regions.

Capital city v.s Whole country: Malaysian case





Source: BIS Housing Property Price Series

Case of Japan

- In Japan, there are several kinds of statistics on house prices.
- “Published Land Price Survey” (PLPS) contributes to estimating the residential value in the SNA.
- MLIT has been working on creating a commercial property price index.

Types and qualities of property price information

Statistics	Organization	Data	Frequency	Subject Areas/Sites	Starting date
Published Land Price Survey	MLIT	Appraisal Value	Annual	26,000 (as of 2013)	1970
Land Price Survey	Each prefecture	Appraisal Value	Annual	22,264 (as of 2012)	1975
Land Value for Inheritance Tax	National Tax Agency	Appraisal Value	Annual	Prices along selected streets across Japan	1963
Residential Property Price Index	MLIT	Hedonic Approach	Monthly	•All Japan •Regions •Metropolitan Areas	2008

2.4 Distributional Information on Households

- What is the G-20 recommendations?
- #16 says….

"As the recommended improvements to data sources and categories are implemented, statistical experts to seek to compile distributional information (such as ranges and quartile information) alongside aggregate figures, wherever this is relevant. The IAG is encouraged to promote production and dissemination of these data in a frequent and timely manner. The OECD is encouraged to continue in its efforts to link national accounts data with distributional information."

What statistics provide distributional information?

The Financial Crisis and Information Gaps by the IMF and FSB;

- National accounts data on household income, consumption, and wealth provide little if any information on how income, consumption, and wealth are distributed across sub-sectors of households.
- Other sources, in particular household surveys and administrative data have discrepancies and inconsistencies from SNA. Moreover, household micro statistics are less timely, less frequent and in general less internationally harmonized than SNA data.

Case of Japan

1. The family Income and Expenditure Survey (FIES)

- Conducted every month since 1950.
- Obtaining comprehensive data on income and expenditure of households.
- About 9,000 households are surveyed.
- Covers financial assets and liabilities.

2.“National Survey of Family Income and Expenditure”

- Conducted every five years since 1959.
- Designed to sample about 57,000 households.
- Covered real asset at market values in addition to financial assets and liabilities.

- The two surveys are inconsistent with the financial accounts based on the SNA, often the survey is underestimated.

Case of Japan

- The Cabinet Office made a trial estimation of distribution based on the household survey and in accordance with SNA.
- While the deviation between the SNA after the conceptual adjustments and statistics based on the household survey is relatively small for the flow data, it remains large for the stock data.

Discrepancies between distributional statistics and adjusted SNA

%

Flow: Use of Disposable Income Account	Percentage of deviation
1. Final consumption expenditure	-1.8
2. Saving (gross)	4.1
3. Disposable income (gross)	-1.4
Saving ratio (%)	5.5

Stock: Financial Assets and Liabilities	Percentage of deviation
1. Financial Assets	-42.6
Deposits	-41.8
Securities other than shares	-54.2
Shares	-68.1
Insurance and pension reserves	-29.2
2. Financial Liabilities	-36.4
Loans	-36.4

(data sources) Annual estimation of SNA distributional statistics by the Cabinet Office

Initiatives by Overseas

- Some European countries have been developing micro data base with sources data such as the banking supervision's information in order to encounter the issues on the distributional statistics.

Country	Data
Portugal	CCR (The Central Credit Register) ➢ This is the data related to credit information such as loans with regard to non-financial corporations and households. CBSD (The Central Balance Sheet Database) ➢ This is the data related to financial statement information (B/S, P/L) with regard to non-financial institutions.
ECCBSO	➢ Micro-data base (BACH: Bank for Accounts Companies Harmonized) on the ECB level. Currently, 13 countries (Germany, France, Italy, Portugal, Spain, Australia) have reported the data on non-financial corporations.
Norway	➢ Tax Register includes detailed information on most financial assets held by Norwegian households, as well as total liabilities. Tax data even includes information on non-financial assets ,such as a private dwelling.

2.5 Summary

- Sufficient data are not available to capture the comprehensive picture of the households balance sheet in many Asian countries.
- The authorities need to make a further effort to develop:
  1. Quarterly financial accounts
  2. House prices based on the detailed source data
  3. Distributional information on households

3. Needs to Develop Financial Accounts

3.1 The importance of FFA to compile the HHs balance sheet

- It is difficult to compile the household balance sheet directly from the data sources.
- The most effective way to compile the household balance sheet is to estimate the figures with the data sources provided from the financial institutions. The development of the household balance sheet based on the macro data basis is the first priority, and then compilation of distributional information for the household will follow.
- The data sources provided by financial institutions are not often sufficient to compile the household balance sheet. Therefore, some estimations are often used to compile the transaction data, and to keep the sufficient accuracy.

3.2 What is J-FFA?

Japan's Flow of Funds Accounts…

- Records outstanding balances of financial assets and liabilities (stock), financial transactions (flow), and the difference between stock and flow (reconciliation) in each sector
- Comprises of matrices of 43 sectors and 51 transaction items

  (cf., 31 sectors for US, 8 sectors of EA)
- Is compiled in accordance with the System of National Accounts (SNA)

  (currently with SNA 1993, but will be with SNA 2008 in 2016)
- Makes data available from 1980 annually; from 1998Q1 quarterly

FFA: A Snapshot Example

- Stock table (major sectors and transaction items)

Sectors

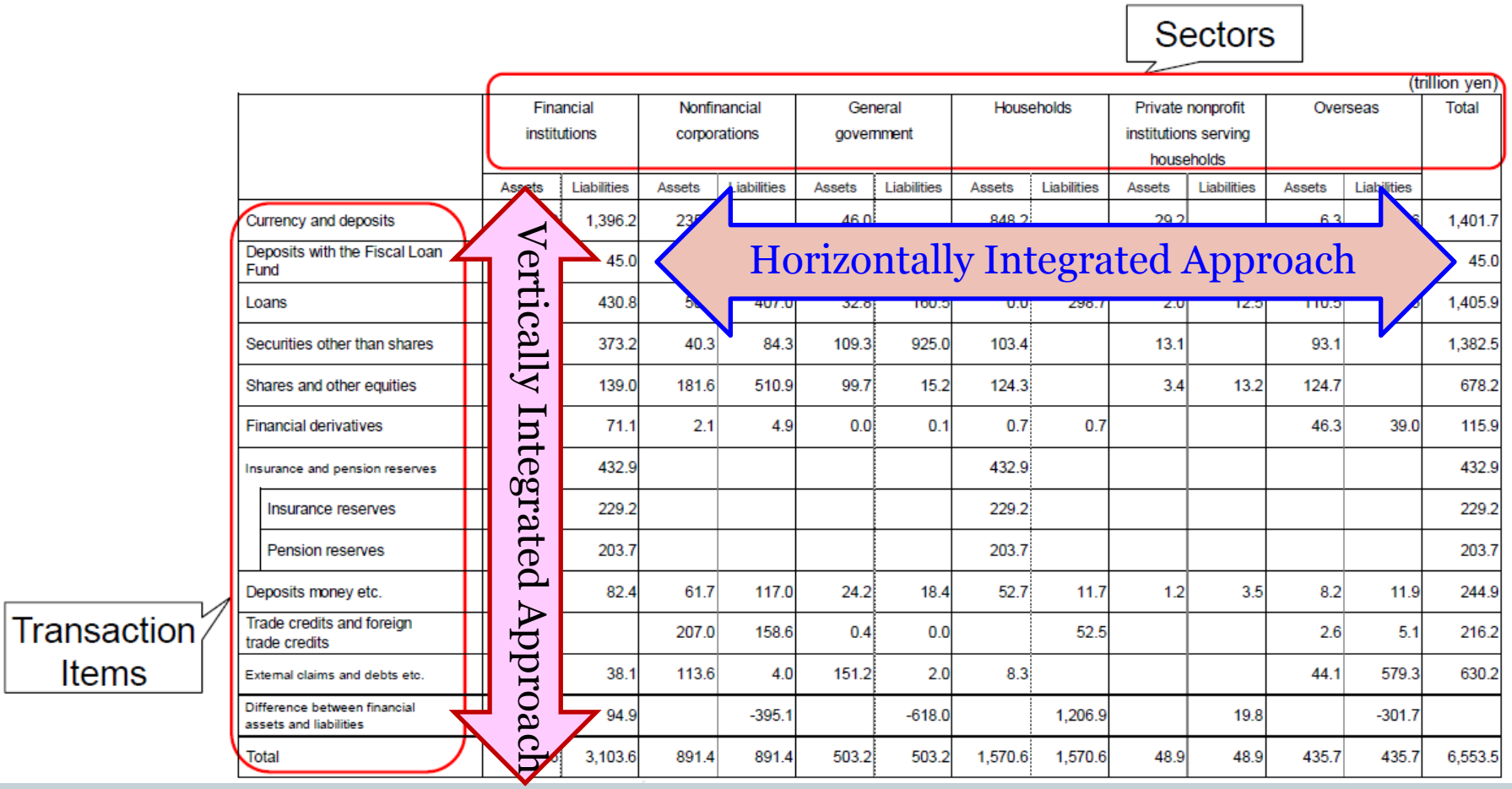
(trillion yen)

	Financial institutions		Nonfinancial corporations		General government		Households		Private nonprofit institutions serving households		Overseas		Total
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	
Currency and deposits	236.8	1,396.2	235.2		46.0		848.2		29.2		6.3	5.6	1,401.7
Deposits with the Fiscal Loan Fund	5.5	45.0	0.0		39.5								45.0
Loans	1,210.6	430.8	50.0	407.0	32.8	160.5	0.0	298.7	2.0	12.5	110.5	96.5	1,405.9
Securities other than shares	1,023.2	373.2	40.3	84.3	109.3	925.0	103.4		13.1		93.1		1,382.5
Shares and other equities	144.4	139.0	181.6	510.9	99.7	15.2	124.3		3.4	13.2	124.7		678.2
Financial derivatives	66.9	71.1	2.1	4.9	0.0	0.1	0.7	0.7			46.3	39.0	115.9
Insurance and pension reserves		432.9					432.9						432.9
Insurance reserves		229.2					229.2						229.2
Pension reserves		203.7					203.7						203.7
Deposits money etc.	96.9	82.4	61.7	117.0	24.2	18.4	52.7	11.7	1.2	3.5	8.2	11.9	244.9
Trade credits and foreign trade credits	6.3		207.0	158.6	0.4	0.0		52.5			2.6	5.1	216.2
External claims and debts etc.	313.0	38.1	113.6	4.0	151.2	2.0	8.3				44.1	579.3	630.2
Difference between financial assets and liabilities		94.9		-395.1		-618.0		1,206.9		19.8		-301.7	
Total	3,103.6	3,103.6	891.4	891.4	503.2	503.2	1,570.6	1,570.6	48.9	48.9	435.7	435.7	6,553.5

Transaction Items

Note: Japan's Nominal GDP = 473 trillion yen (2012FY)

Methodological Framework of FFA



(trillion yen)

	Financial institutions		Nonfinancial corporations		General government		Households		Private nonprofit institutions serving households		Overseas		Total
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	
Currency and deposits		1,396.2	23		46.0		848.2		29.2		6.3	6	1,401.7
Deposits with the Fiscal Loan Fund		45.0											45.0
Loans		430.8	5		407.0	32.8	160.5	0.0	298.7	2.0	12.5	110.5	1,405.9
Securities other than shares		373.2	40.3	84.3	109.3	925.0	103.4		13.1		93.1		1,382.5
Shares and other equities		139.0	181.6	510.9	99.7	15.2	124.3		3.4	13.2	124.7		678.2
Financial derivatives		71.1	2.1	4.9	0.0	0.1	0.7	0.7			46.3	39.0	115.9
Insurance and pension reserves		432.9					432.9						432.9
Insurance reserves		229.2					229.2						229.2
Pension reserves		203.7					203.7						203.7
Deposits money etc.		82.4	61.7	117.0	24.2	18.4	52.7	11.7	1.2	3.5	8.2	11.9	244.9
Trade credits and foreign trade credits			207.0	158.6	0.4	0.0		52.5			2.6	5.1	216.2
External claims and debts etc.		38.1	113.6	4.0	151.2	2.0	8.3				44.1	579.3	630.2
Difference between financial assets and liabilities		94.9		-395.1		-618.0		1,206.9		19.8		-301.7	
Total		3,103.6	891.4	891.4	503.2	503.2	1,570.6	1,570.6	48.9	48.9	435.7	435.7	6,553.5

Illustration: VIA and HIA

Vertically Integrated Approach

Identifying each sector by its own financial statements

Financial Institutions	Financial Statements
Public NFCs	Financial Statements
Social Security Fund	Financial Statements

High accuracy

Complementary

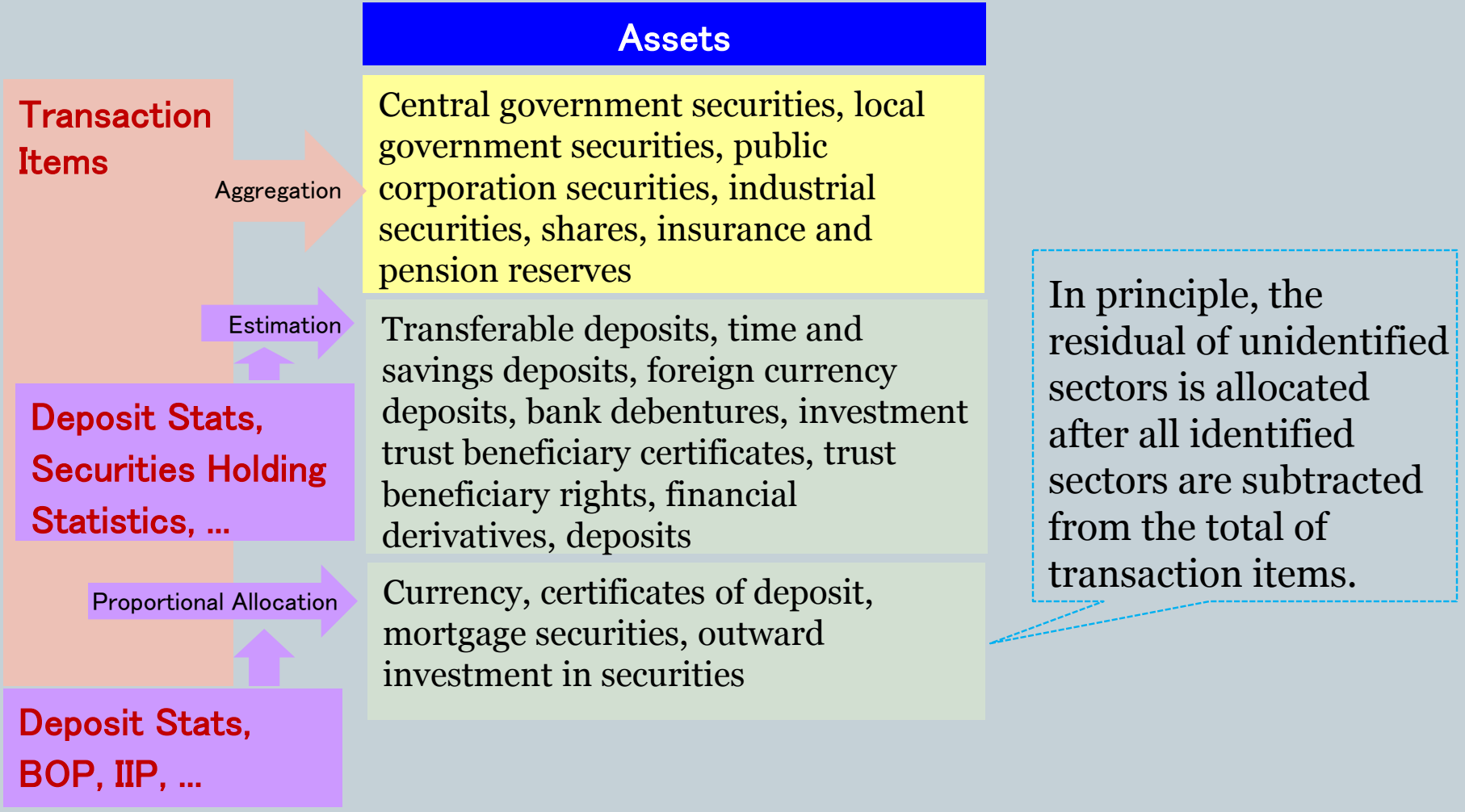
Horizontally Integrated Approach

Identifying each transaction item by allocating its aggregated value through all sectors to individual sectors' holdings of assets/liabilities

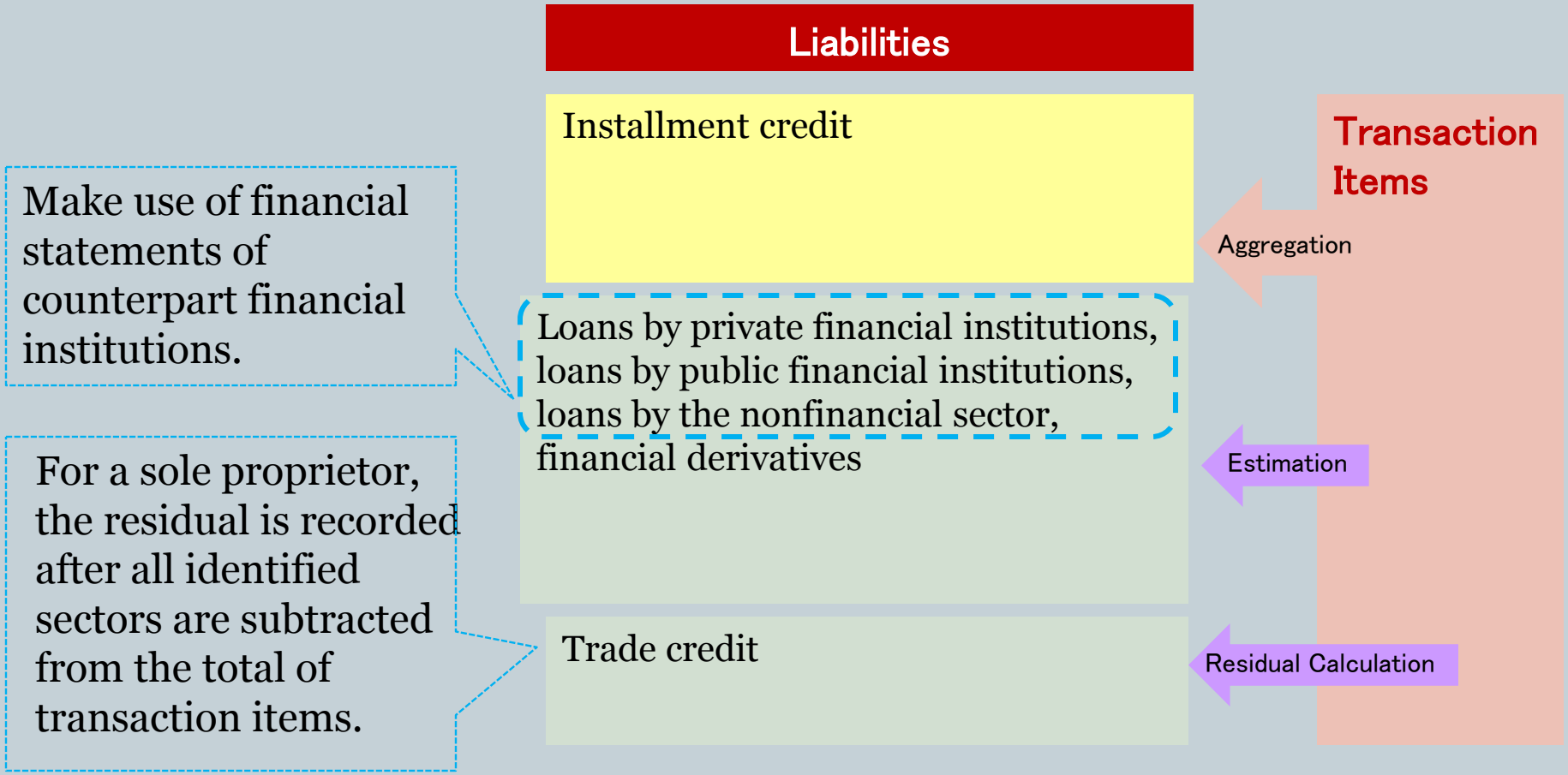
Private NFCs	Statistics, Market Data – Deposits – Loans –Securities Holding/Issue Statistics – Market Exchange Data …
Households	
NPISHs	

Low accuracy

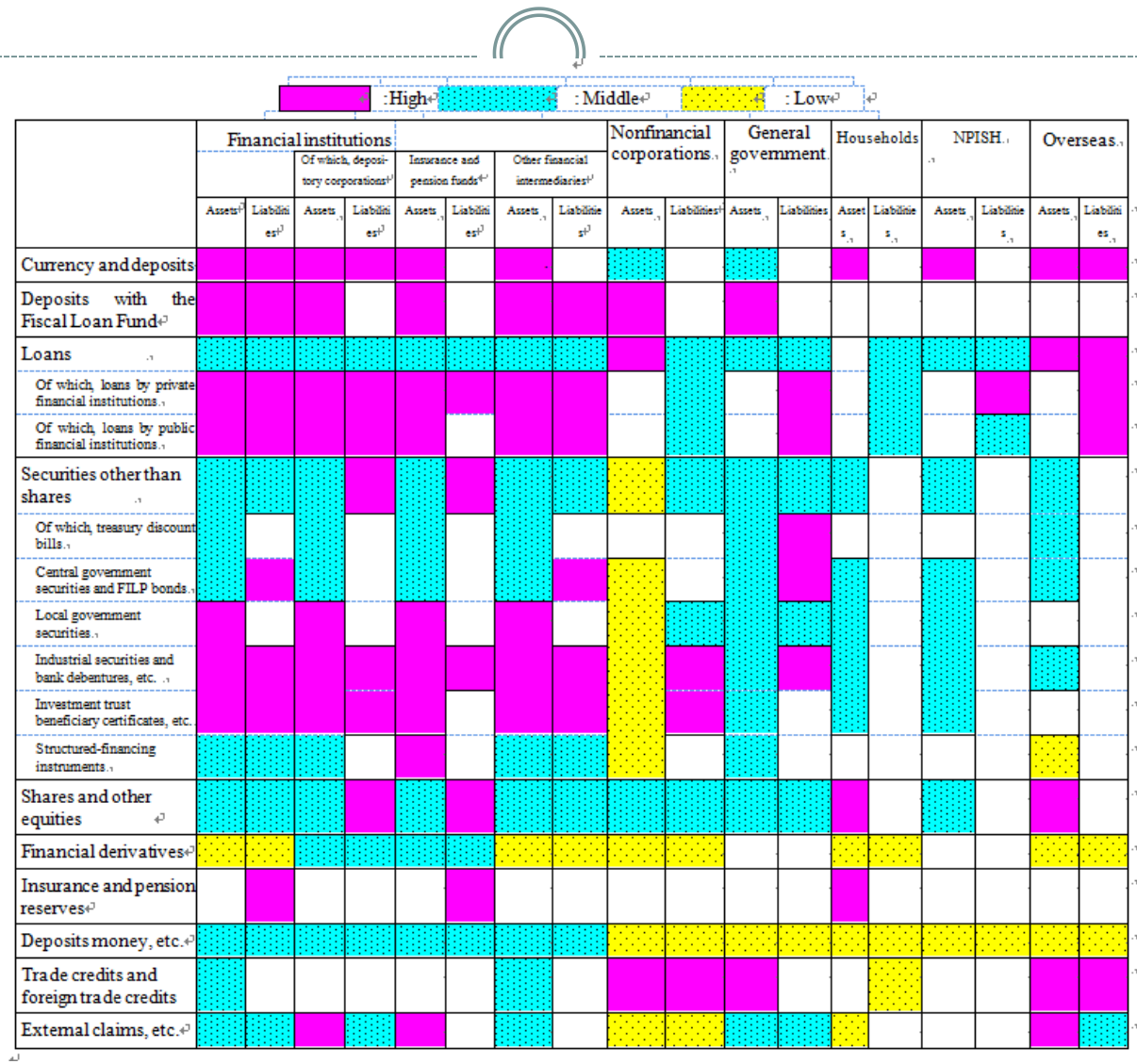
Households: Assets



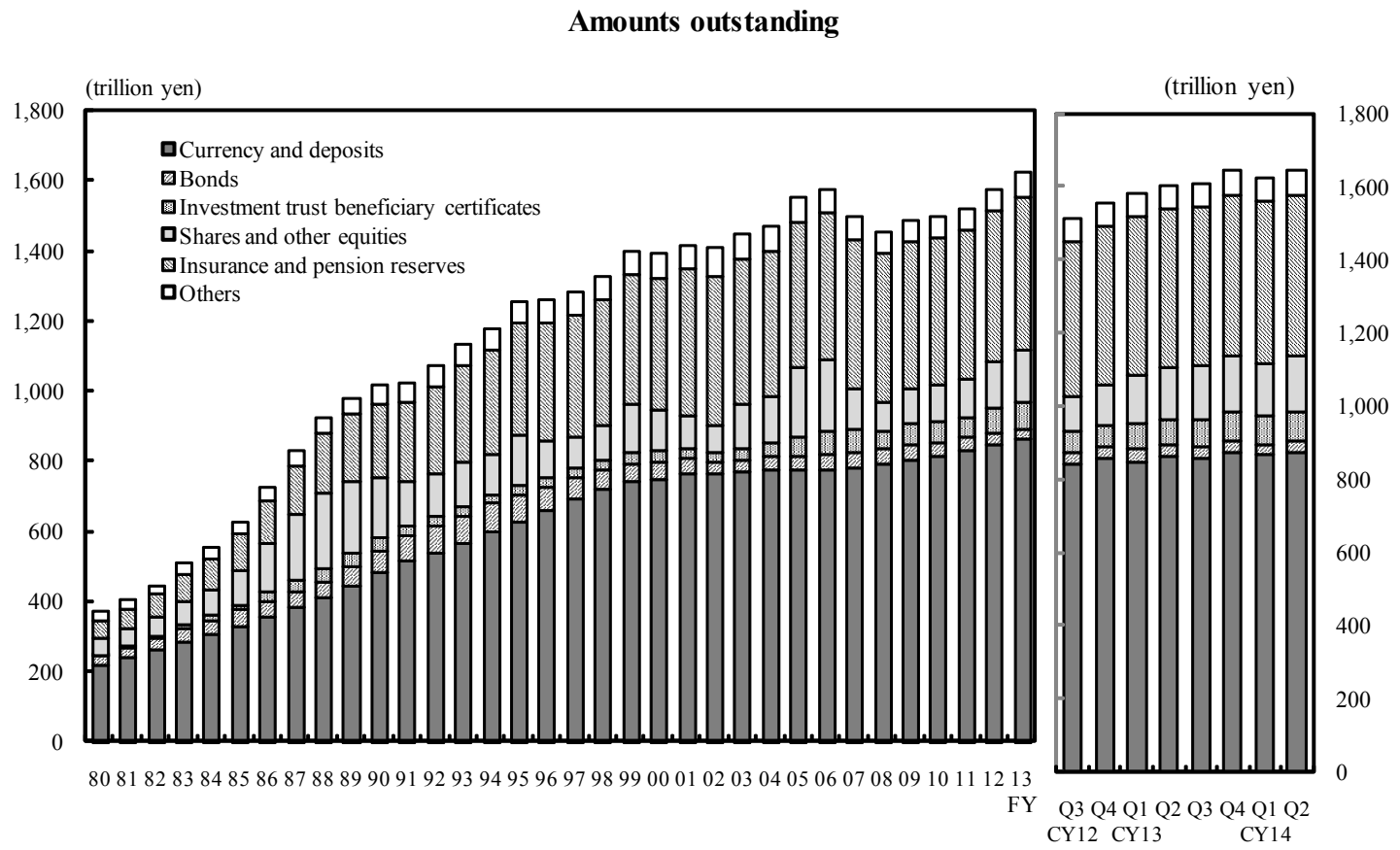
Households: Liabilities



Estimation Accuracy of Assets/Liabilities Table



3.3 Analyses of J-FFA
Households: Composition of Financial Assets



Note: Japan's Nominal GDP = 473 trillion yen (2012FY)

3.4 The Future Revision of J-FFA

- The BOJ is planning to revise the J-FFA in the first half of 2016 with the implementation of the new statistical standard (2008SNA).
- The main financial revisions of 2008 SNA related to the household sector are:

1. Pension benefit obligations of corporate pensions
2. Flow data of investment funds and pension reserves
3. Employee stock options (ESO)
4. Provisions for calls under standardized guarantees

Preliminary Assessment of Quantitative Impact

Pension benefit obligations of corporate pensions	Amounts outstanding: 10 to 20 trillion yen.
Transactions of investment funds and pension reserves	• The transaction of investment funds by the households: ▲5 trillion yen or less for FY2012. • The transaction flow of the pension entitlements: ▲several trillion yen per year ➢ reduce financial surplus of the household sector by the same amount.
Employee stock options (ESO)	The amount outstanding: + around hundreds of billions of yen for FY2012.
Provisions for calls under standardized guarantees	Provisions for calls: + 3 to 4 trillion yen.

(Reference) Total assets of households and net surplus for FY2012 amounts to 1,579 trillion yen and +23 trillion yen respectively.

The End

Thank you for your attention.

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Assessing balance sheets - some remarks from Basel[1]

Bruno Tissot, Bank for International Settlements

[1] Discussion of the presentation *"How to quantitatively capture the state of the household sector in Asia?" by Sayako Konno and Masahiro Higo, Bank of Japan*. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

Assessing balance sheets - some remarks from Basel

Bruno Tissot

Head of Statistics and Research Support, BIS

& Head of Secretariat, Irving Fisher Committee on Central Bank Statistics (IFC)

Satellite meeting of the IFC at the ISI Asian Regional Conference on "*Is the household sector in Asia overleveraged: what do the data say?*" - Session 1 on "*How good are data on household balance sheets?*"

Sasana Kijang, Kuala Lumpur, Saturday 15 November 2014

Presentation by Sayako Konno and Masahiro Higo (BoJ) - Highlights

1. Importance of the household sector in Asia

2. Significant but imperfect development of statistics in Asia

3. Need to develop financial accounts

(1) Importance of the household sector in Asia

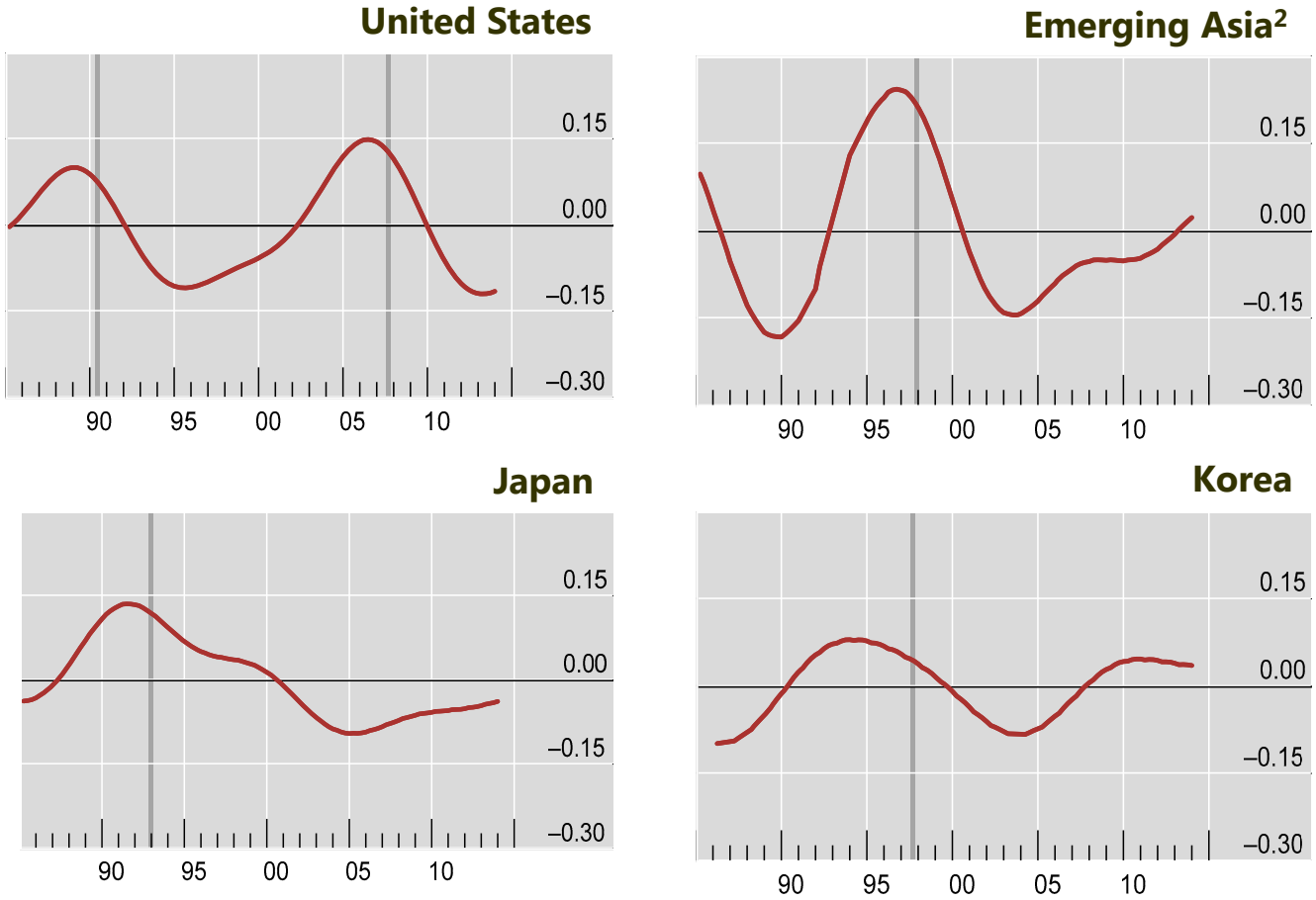
Main points:

- Shift towards household demand after the Asian crisis
- Higher household debt
- Financial stability risks if asset prices correct
- Emphasis on macro prudential measures

☞ *A few BIS views on financial cycles, asset prices and macro prudential tools*

➔ Financial cycles: peaks tend to coincide with crises[1]

- *Financial cycle : self-reinforcing interactions between perceptions of risk, risk-taking and financing constraints.*
- *Booms and busts span ordinary business cycles.*

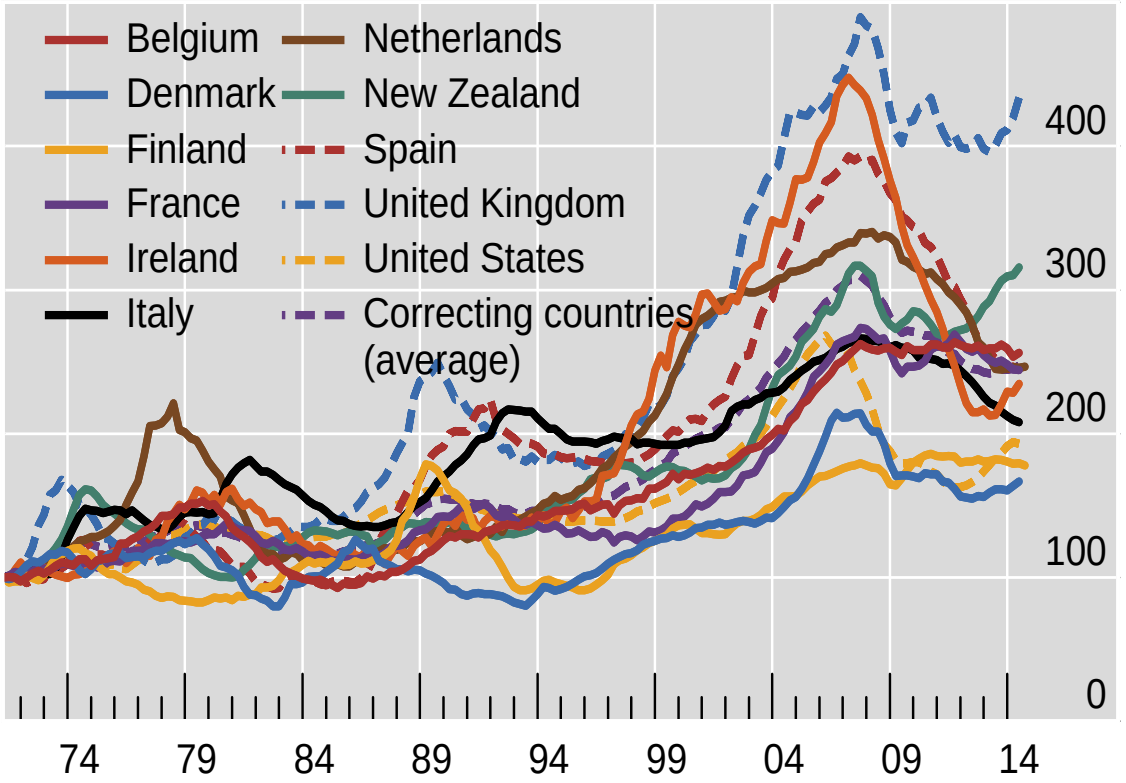


[1]The financial cycle as measured by frequency-based (bandpass) filters capturing medium-term cycles in real credit, the credit-to-GDP ratio and real house prices. Vertical lines indicate financial crises emerging from domestic vulnerabilities. [2] Indonesia, Hong Kong SAR and Singapore. Sources: National data; BIS; BIS calculations.

➔ Role of asset prices

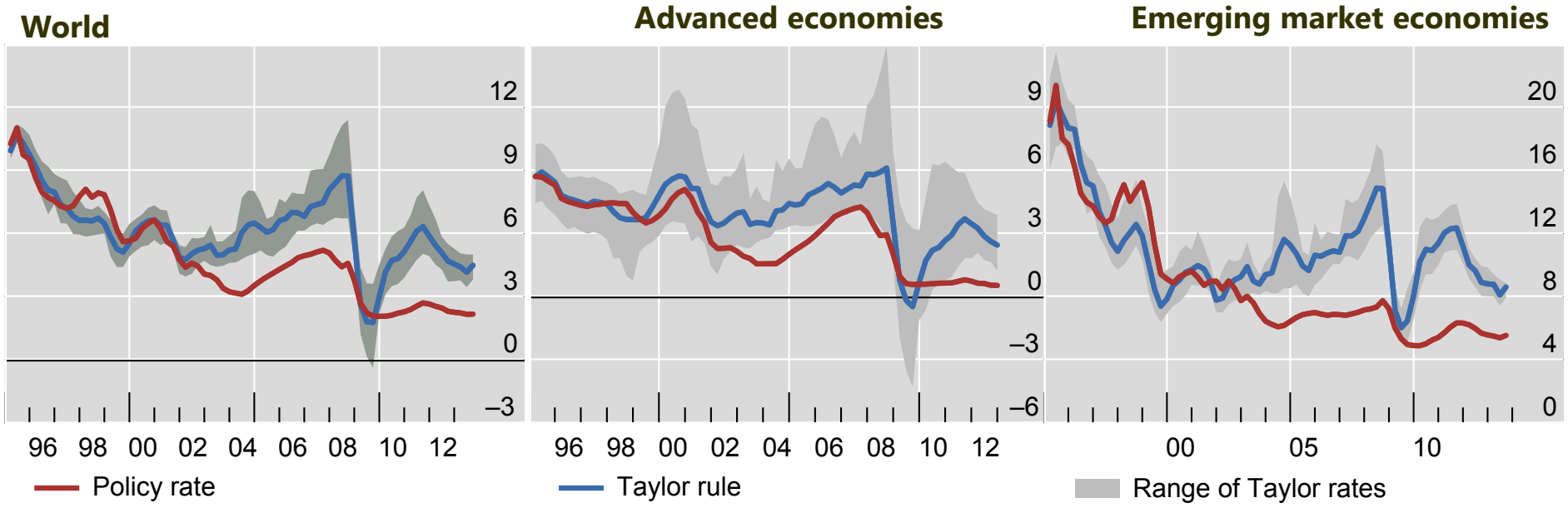
- *Property prices play a role in determining the value of collateral mobilised by agents to access finance.*
- *Can have a self-reinforcing effect and is typically an important driver of financial bubbles.*

Countries where house prices corrected downwards after the 2007/08 crisis (1971 = 100, real terms)



➔Are macro prudential measures sufficient?

- *BIS advocates a macro prudential approach to banking supervision and regulation to lessen procyclicality and mitigate systemic risk.*
- *Can be a complement to, rather than a substitute of, other economy policy actions during financial booms.*



Sources: *BIS Quarterly Review*, September 2012, pp 37–49.

(2) Significant but imperfect development of statistics in Asia

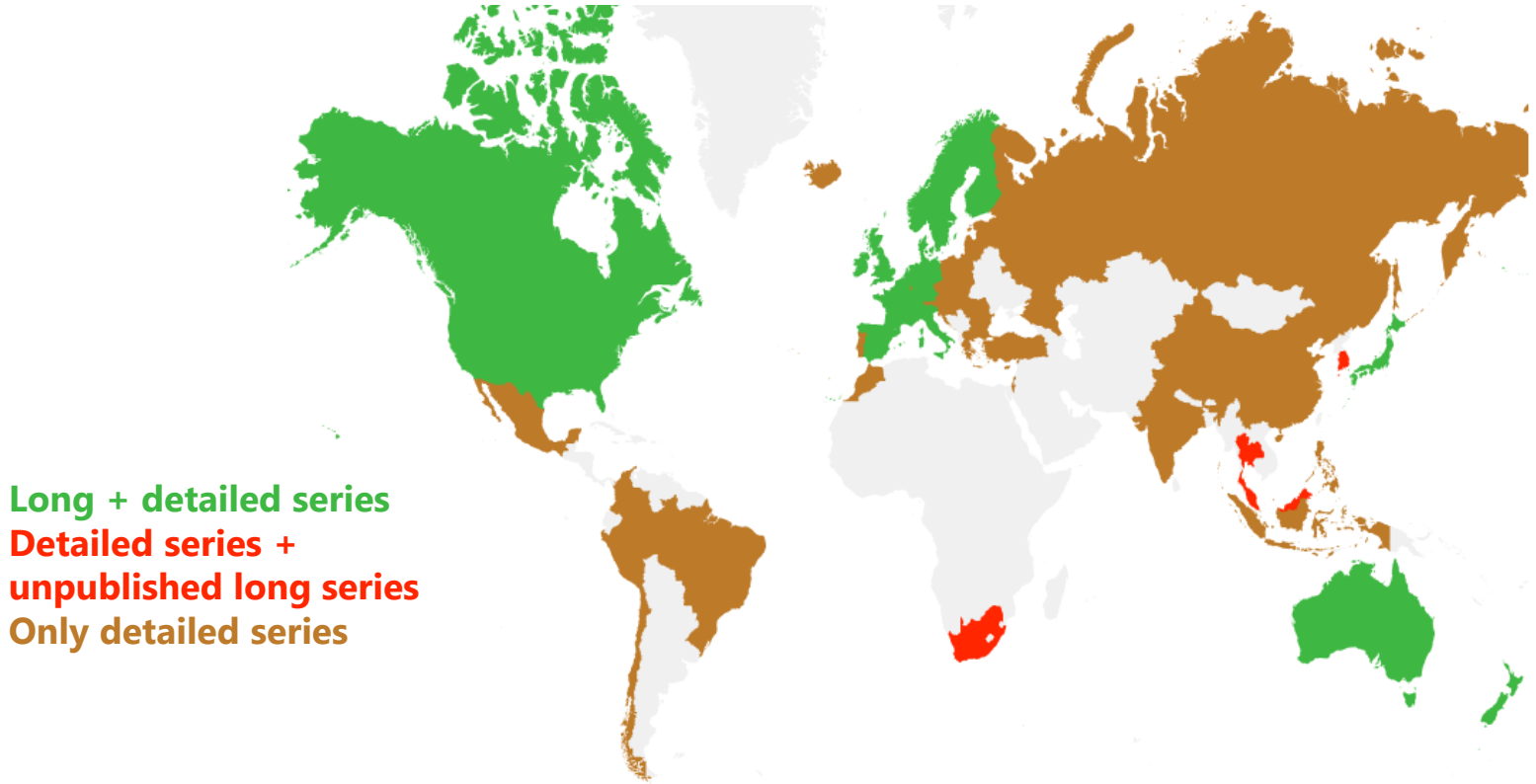
Main points:

- Insufficient data available
- Too much focus on bank credit
- Role & limitations of house prices
- Pros (distribution information) and cons (macro consistency) of survey/micro data

☞ *Recent BIS statistical initiatives (house prices, total credit, global liquidity)*

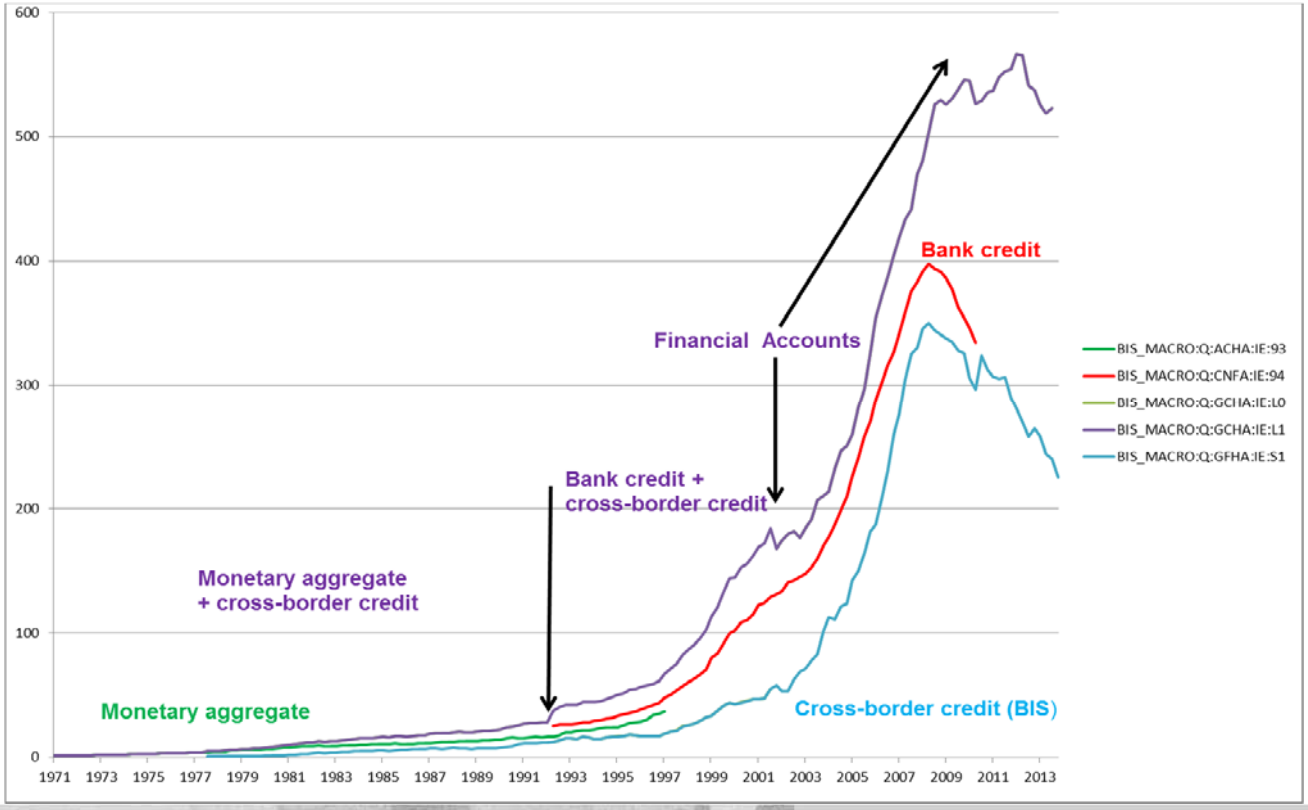
➔BIS dissemination work on house prices

- *19th Data Gaps Initiative (DGI) recommendation to improve the availability and dissemination of country data on property prices.*
- *BIS long-term data set to support financial stability analyses.*



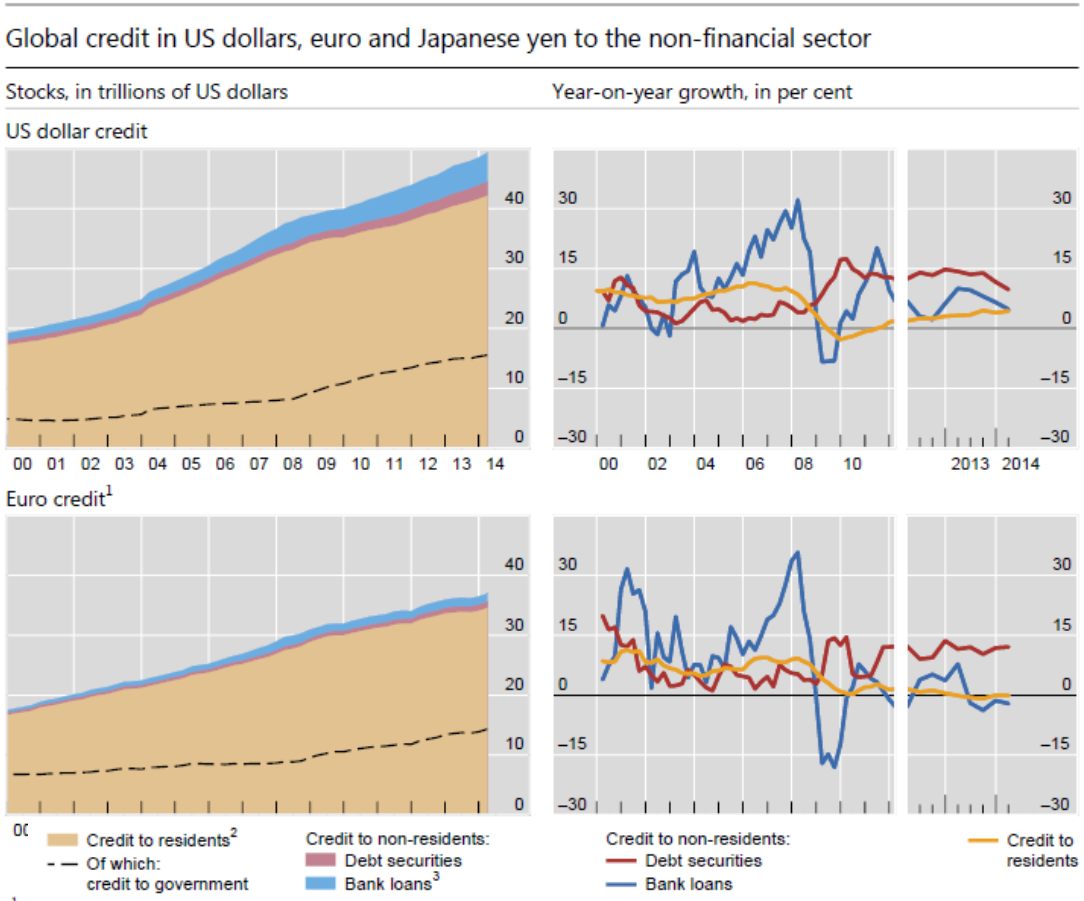
➔Credit to the private sector

- *BIS total credit to private non-financial sector: all loans, foreign & domestic, plus corporate debt securities.*
- *Extension of total credit series using domestic bank credit and BIS cross-border bank credit.*



➔The importance of global liquidity

- *BIS Global Liquidity Indicators.*
- *Residence-based "national accounts views" miss the impact of bank credit to non-residents as well as of international debt issuance - the second phase of global liquidity.*



[1] At constant end-Q1 2014 exchange rates. [2] Credit to the non-financial sector in the United States/euro area/Japan from national flow of funds, excluding identified credit to borrowers in non-domestic currencies (ie cross-border and locally-extended loans and outstanding international bonds in non-domestic currencies). [3] Cross-border and locally extended loans to non-banks outside the United States/euro area/Japan. For China and Hong Kong SAR, locally extended loans are derived from national data on total local lending in foreign currencies on the assumption that 80% are denominated in US dollars. For other non-BIS reporting countries, local US dollar/euro/Japanese yen loans to non-banks are proxied by all BIS reporting banks' gross cross-border US dollar/euro/Japanese yen loans to banks in the country, on the assumption that these funds are then extended to non-banks.

Sources: IMF, *International Financial Statistics*; Datastream; BIS international debt statistics and locational banking statistics by residence.

(3) *Need to develop financial accounts*

Main points:

- Key for compiling households balance sheet
- Stock / flow consistency of the Flow of funds
- Approach by sector (vertical) / by instrument (horizontal)
- The new SNA – treatment of corporate pension funds

☞ *Ongoing improvements*

➔ International initiatives on financial accounts

- G20 DGI recommendation # 15: *"… to promote the compilation and dissemination of the balance-sheet approach, flow-of-funds, and sectoral data more generally … data on nonbank financial institutions should be a particular priority."*

- *Irving Fisher Committee on Central Bank Statistics (IFC), the forum of central bank economists and statisticians: regional workshops on financial accounts.*

➔ Consistency with the SNA framework

- *Matrix showing financial flows and positions (assets & liabilities) within the economy.*
- *Financial accounts consistent with the national accounts framework…*
- *…at least in a weak sense.*

		Goods and services account **Production account** Value added/GDP		
		Generation of income account Operating surplus **Distribution of income account** National income		
		Secondary distribution of income account Disposable income		
		Use of income account Saving		
	Opening balance sheet: Net worth Non-financial assets	**Accumulation acconts:** **Capital account** Net lending / net borrowing	Other changes in non-financial assets	**Closing balance sheet:** Net worth Non-financial assets
FINANCIAL POSITIONS AND FLOWS ➔	Financial assets and liabilities	**Financial account** Net lending / net borrowing	Other changes in financial assets and liabilites Net other changes	Financial assets and liabilities

➔ From-whom-to-whom accounts

- *Financial assets and liabilities of institutional sectors broken down by counterparty sector: who is financing whom, for how much, and with which instrument?*
- *Integrated sectoral financial accounts with three-dimension tables: by type of asset-liability / creditor sector / debtor sector.*

Lending sector	Financial corporations		Non-financial corporations		Households		Government		Rest of world	
Borrowing sector	A	L	A	L	A	L	A	L	A	L
Financial corporations - Instruments										
Non-financial corporations - Instruments										
Households - Instruments										
Government - Instruments										
Rest or world - Instruments										

➔ Remaining issues from a BIS perspective

- *Decomposing the "Rest Of the World " – cf insights of the BIS international banking statistics*
- *Cross-border operations controlled by home country entities (eg corporate group, consolidated bank)*
- *Using data reported by non-resident entities*

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

How should we measure residential property prices to inform policy makers?[1]

Jens Mehrhoff, Deutsche Bundesbank

[1] This presentation was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

DEUTSCHE BUNDESBANK
EUROSYSTEM

How should we measure residential property prices to inform policy makers?

Dr Jens Mehrhoff*, Head of Section Business Cycle, Price and Property Market Statistics

* This presentation represents the author's personal opinions and does not necessarily reflect the views of the Deutsche Bundesbank or its staff.

Structure of the presentation

1. Motivation and introduction

2. Conceptual and methodological framework

3. The Bundesbank's dashboard

4. Spatial dependencies

"*Real estate prices (residential and commercial)*" (Recommendation 19 of the G20 Data Gaps Initiative)

1. Motivation and introduction

– Four stylised facts about the **German residential property market**:

- About **every third euro spent** in Germany for private consumption purposes is spent **on housing**, including imputed rentals for homeowners.
- Owner-occupied properties constitute the most significant asset of German households; the **rate of home ownership in Germany equates to just 44 %.**
- Hence, more than half of the German households are renters. **Among the homeowners, two out of five have a mortgage**.
- The value of the property stock is an important part of the wealth of the German economy: **gross fixed assets in housing stand at 267 % of GDP**.

1. Motivation and introduction

- The **various motivations for the analysis of house prices** call for **alternative measures** to be applied.

  - **Macroeconomic**: identification of price signals, evaluation of monetary policy channels, volume measurement in National Accounts.

  - **Macroprudential**: assessment of asset price bubbles, build-up of risks in banks‘ credit exposures, financial soundness of private households.

  - However, these **indicators** can give **different results**, which could **undermine their credibility for many users**.

  - Yet, there should be **no unique indicator**. In order to determine whether threats to the economy or financial stability emanate from the housing market, the **analyses should be based on a broad set of indicators**.

1. Motivation and introduction

- The **diverse uses and associated methods of residential property price indices**, the **statistical framework for the compilation of such indices**, as well as a **dashboard comprising the three dimensions price, financial and real sector variables** will be discussed.

1. **Price and valuation indicators**: E.g. price-to-rent, price-to-income and annuity-to-income ratios.
2. **Loans to and debt of households**: E.g. banks' loans and interest payments.
3. **Construction and activity indicators**: E.g. completed housing units and transactions.

- Empirical results for the German residential property market will exemplify the **usefulness of a multi-indicator approach** in times of strong upward movements of price indicators.

2. Conceptual and methodological framework
2.0 Composite indicators

- **Composite indicators**, on the other hand, aim to combine **numerous, diverse indicators** in a **single number**.

- They claim to **reduce complex relationships** to a **supposedly simple measure**.

- For aggregating base variables to a composite indicators one has to **select suitable data** first and, then, to **derive the respective weights**.

- It is **not straightforward at all** how the **selection and weighting** of the base variables should be performed:
  - **Factor analysis** maximises the explained variance of all base variables, the **thus derived weights do not**, however, **represent relative importance**.
  - **Regression analysis** minimises squared error to a **given target indicator**, whose existence makes the **whole exercise somewhat obsolete**.

2. Conceptual and methodological framework
2.0 Composite indicators

- Hence, **generally accepted and obvious selection procedures** as well as **weighting schemes cannot possibly exist**.

- One composite indicator could use **different base variables** than another one; a third one could use the same base variables but apply a **different weighting scheme**.

- What is more, a **composite indicator suggests substitutability** between different base variables such that one would be **indifferent between certain combinations**.

- When the **composite indicator** is **not constructed adequately** or is **not used so**, the **conclusions derived** on that basis might be **misleading and costly**.

- Particularly with **many base variables**, their **interpretation** will be **in conflict**.

2. Conceptual and methodological framework
2.0 Composite indicators

- The high dimensionality of a **complex and diffuse phenomenon** such as **„the residential property market“ cannot adequately be reproduced** by a **composite indicator**.

- Quite the contrary, the **joint distribution of price, financial and real economic indicators** seems to be at the centre of the current discussion.

- There is **no simple answer** to a **complicated question**; it might, thus, be better to **look at a dashboard of indicators rather than to dissolve existing conflicts** between base variables.

- Last but not least, **statistics has a consulting function for policy makers** – this makes it **even more important to produce unbiased, easily interpretable and manageable measures**.

2. Conceptual and methodological framework
2.1 Setting the stage

- Despite the quest for swiftly disseminated indicators, it is of **utmost importance to set up a valid and reliable statistical framework** first. The **various data users make substantially different demands** on the index concepts. These, in turn, **need to be tailored for the distinctive purposes**.

- The observation of **values and prices generally yields different results**. The change in market values between two consecutive periods does not necessarily reflect the **pure, i.e. quality-adjusted, change in prices**. It is rather a *mixtum compositum* of **quality changes** due to depreciation and renovation as well as the **quality-adjusted change in prices**; if quantities remain the same.

- Let, for example, the **population be equal in the two periods** under consideration. **Due to depreciation the quality of all buildings will be lower** on average. *Ceteris paribus*, it follows that in such a situation **values decrease although quality-adjusted prices have remained constant**.

2. Conceptual and methodological framework
2.1 Setting the stage

- The **market value provides a nominal measure** for residential property. If quantities (floor space or lot size in square metres, say) are available, dividing the value in euro by that quantity yields a so-called **unit value in euro per square metre**. Thus, the value can be split up as follows:

(1) Value = Unit Value x Quantity.

- However, the unit value in Equation (1) **depends on the quality of the building and not just on floor space, or the location of the lot and not only its size**.

2. Conceptual and methodological framework
2.1 Setting the stage

- Since price indices aim for a quality-adjusted indicator **prices here denote a constant quality *numéraire***.

- With a hedonic quality adjustment, say, it is possible to decompose the value into a **constant-quality price** and a volume measure that inherits quality changes (e.g. through modernisation):

(2) $\text{Value} = \text{Price} \times \text{Volume}.$

- Therefore, an index for property prices in its pure form will reflect **movements in prices that are stripped of quality changes**. The latter are included in the volume as shown in Equation (2).

2. Conceptual and methodological framework
2.1 Setting the stage

- Eventually, the ultimate statistical goal is splitting up the value into a **quality-adjusted price**, the quality component itself and a quantity measure independent of quality:

$$\text{(3)} \qquad \text{Value} = \underbrace{\text{Price} \times \text{Quality}}_{\text{Unit Value}} \times \overbrace{\text{Quantity}}^{\text{Volume}}$$

- Following Equation (3), the value is obtained via **multiplying the constant-quality price of a unit by a dimensionless mark-up (or mark-down) for the desired level of quality and the nominal quantity** of the structure or the land. This **mark-up can reflect characteristics such as the age of the building or its year of construction**.

2. Conceptual and methodological framework
2.2.1 Macroeconomic identification of price signals

- In a market economy, **prices give signals about relative scarcities** through equilibria between supply and demand.

- In this way, both enterprises and consumers gain important insights into their production and consumption decisions, respectively, so that **scarce resources are allocated to where they are most efficiently used**.

- Real estate prices are a significant economic indicator and **rising house prices are often associated with economic growth**.

- They **stimulate construction activity and promote house sales**. Not least, price increases **support private consumption via the wealth effect** (more on the measurement of “The Wealth of Nations” shortly).

2. Conceptual and methodological framework
2.2.1 Macroeconomic identification of price signals

- For **monetary policy making**, **house price indices** are an **integral part of inflation measurement**.

- In the near future, **owner-occupied housing** should become **part of the European Harmonised Indices of Consumer Prices** – as with other durable consumer goods, the **net acquisitions approach** will be applied.

- For the **identification of pure price signals**, a **price index at constant quality is a condition *sine qua non*.**

- Since for **short-term business cycle analysis**, the most recent developments are at the centre of attention, **aggregation** should be performed **using transactions only** (albeit not necessarily in terms of chain-linked indices).

2. Conceptual and methodological framework
2.2.2 Uses in National Accounts

- In addition, figures on residential property are needed in **National Accounts**:

  - **Converting nominal to real figures (deflationing)**: The calculation of the volume as shown in Equation (2) requires a pure price index for this asset class (of course, nominal values have a right in their own as an indicator).

  - Neglecting the issue of land-structure spilt, the **measurement of the value of the entire housing stock** calls for **stock-weighted indices**, which would also be appropriate for the **assessment of households‘ wealth effects**.

  - Furthermore, **deflators** are needed to estimate the **real output of the services of the real estate industry** as well as **gross (fixed) capital formation in new dwellings** – in both cases, a **transaction-based price index** would be needed, which must cover new dwellings only in the latter case.

2. Conceptual and methodological framework
2.3 Financial stability

- Apart from the **potential build-up of asset price bubbles**, the **risks of banks' credit exposures** associated to the **financial soundness of private households** are most relevant.

- Here, the **change in values of financed objects** needs to be tracked over time.

- This has **two dimensions**:

1. **Hazards emerging from newly granted loans**, and

2. **value changes of properties in the credit stock**.

2. Conceptual and methodological framework
2.3.1 Evaluation of build-up of housing bubbles at the current end

- The **build-up of asset price bubbles frequently comes with misallocations**, a strong surge in housing investment, say. In case of an adjustment, this bears the **risk of higher probabilities of default in the non-financial corporations sector**.

- Focussing on the homebuying of **private households**, the **initial ratio of the loan to the value of the property** is of special interest for **macroprudential authorities**.

- Price dynamics have to be seen here in conjunction with further indicators on the financing; **particularly risky** is the **typical coincidence of housing booms and a credit expansion with lower lending standards**.

2. Conceptual and methodological framework
2.3.1 Evaluation of build-up of housing bubbles at the current end

- Much like in short-term business cycle analyses, **transactions** can be used as a **proxy for financings** in order to provide valuable clues on the build-up of risks in banks‘ new business.

- On the other hand, **through aggregation important information on the regional heterogeneity is lost**.

- Empirical evidence in other countries with **overheated housing markets** has shown that **regional developments can develop systemic relevance**.

- This means that, **at first, isolated undesired developments eventually gain breadth**; a deeper investigation of **spatial transmission channels** necessitates a **geographical breakdown**.

2. Conceptual and methodological framework
2.3.2 Valuation of financed objects in the course of time

- Another important indicator is the **change in values – price changes including quality changes – of financed objects over time**.

- This is because, from the banks‘ perspective, the **residual value of a home is of interest only should the debtor default**, since then the bank would have to sell the home on the market (possibly in a forced sale).

- Since the quantity, i.e. floor space or number of bedrooms, is constant in general, the **change in the property‘s value between the time of purchase and a potential foreclosure** is:

(4) Value change = Price change + Quality change.

2. Conceptual and methodological framework
2.3.2 Valuation of financed objects in the course of time

- The **quality of the house**, however, is not fixed but it is assumed to be **subject to a constant annual depreciation rate**.

- The **sole exogenous variable in the model** then would be the **quality-adjusted price**.

- Still, it is **not the absolute residual value of the house** that matters **but its ratio to the residual mortgage in the event of credit default**.

- In the **first years of the life of the loan**, though, the **amortisation rate of the annuity is rather low**, so that the **loan-to-value ratio worsens initially**.

2. Conceptual and methodological framework
2.3.2 Valuation of financed objects in the course of time

- From a macroprudential view, **only prices of financed objects** would be relevant.

- A **bank‘s credit portfolio** would, furthermore, have a **changing composition**; newly financed objects enter, others exit due to repayments of the loans.

- For financial stability purposes, additionally, **institution-specific figures are indispensable** for the identification of risk potentials.

- The **tails of the distribution need close examination** as do **credit vintages which reflect then-effective lending standards**.

3. The Bundesbank's dashboard

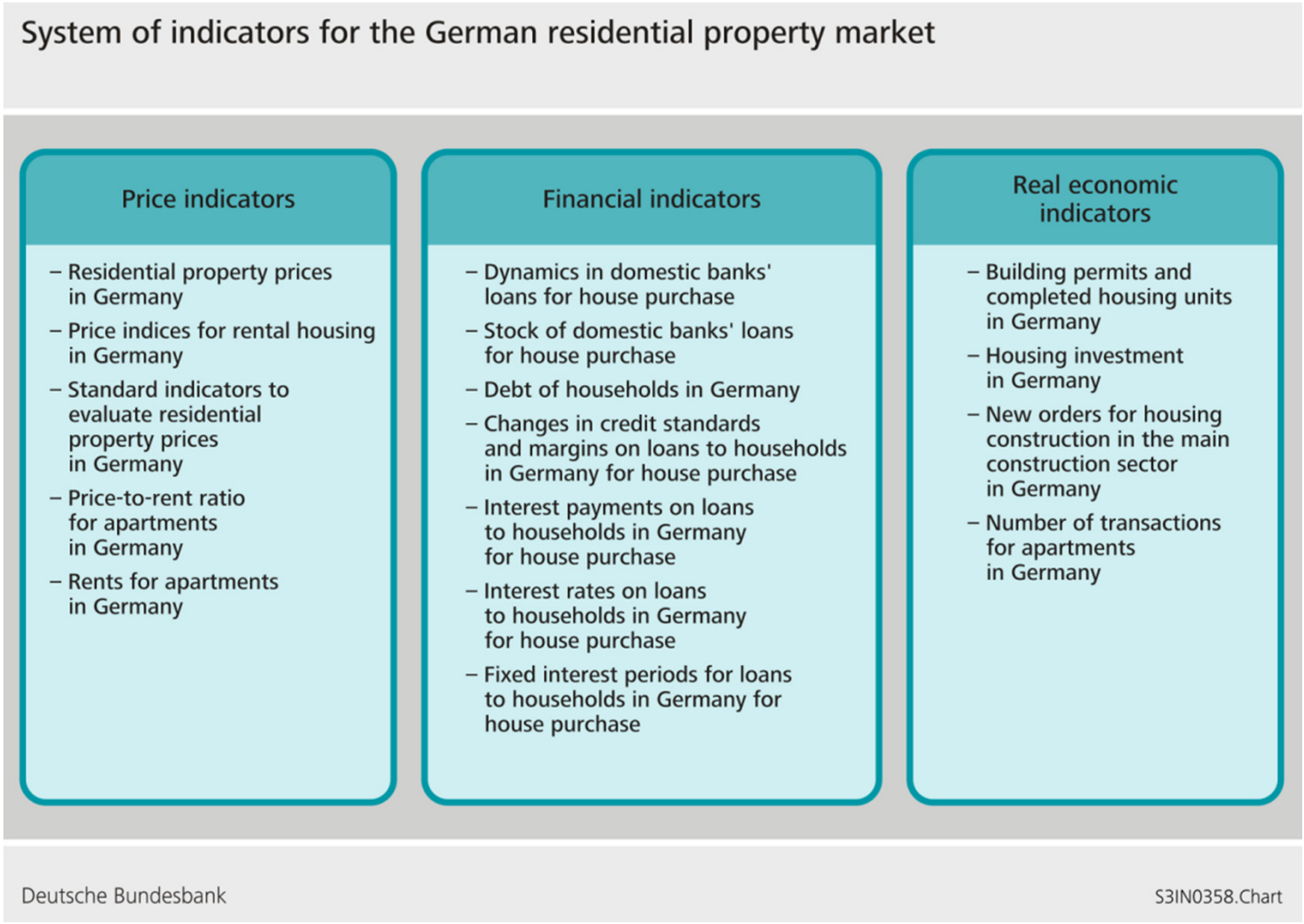
- The **year 2010** saw a **trend reversal in the German housing market**, which was reflected in a **sharp rise in prices**.

- This situation needs to be addressed in light of the **ongoing low-interest-rate environment**.

- In order to determine whether **threats to the economy or financial stability** emanate from the housing market, the Bundesbank based its analyses on a **broad set of indicators**.

- This clearly shows that **no statistical one-size-fits-all approach** exists but that each subject matter has to be considered separately.

3. The Bundesbank's dashboard

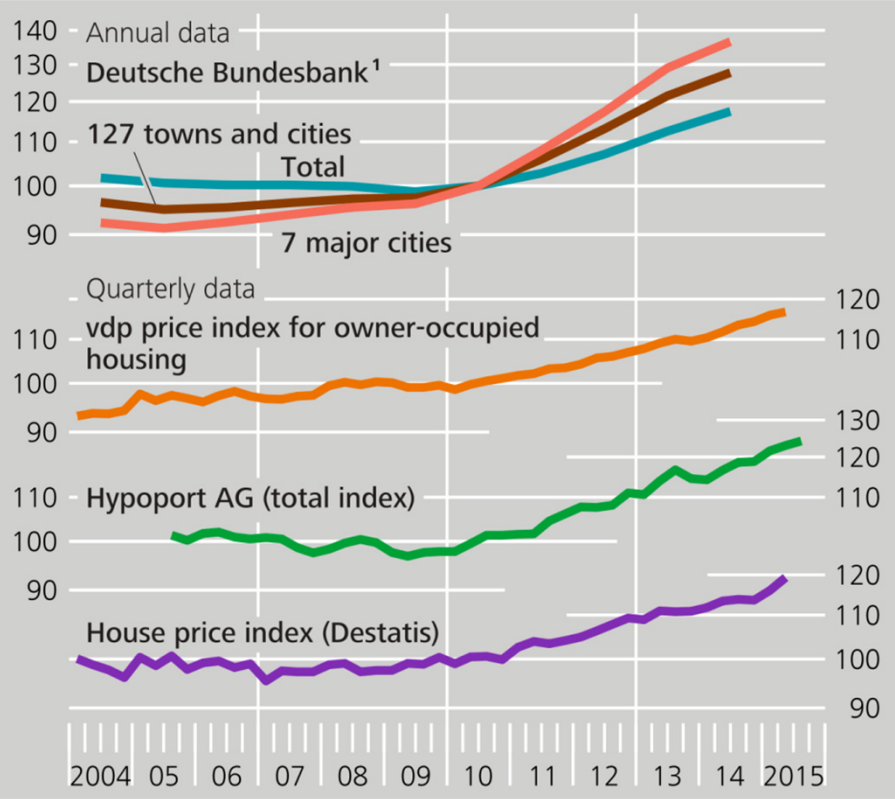


3. The Bundesbank's dashboard

Prices have been rising since 2010, albeit with no acceleration recently.

Residential property prices in Germany

2010 = 100, log scale



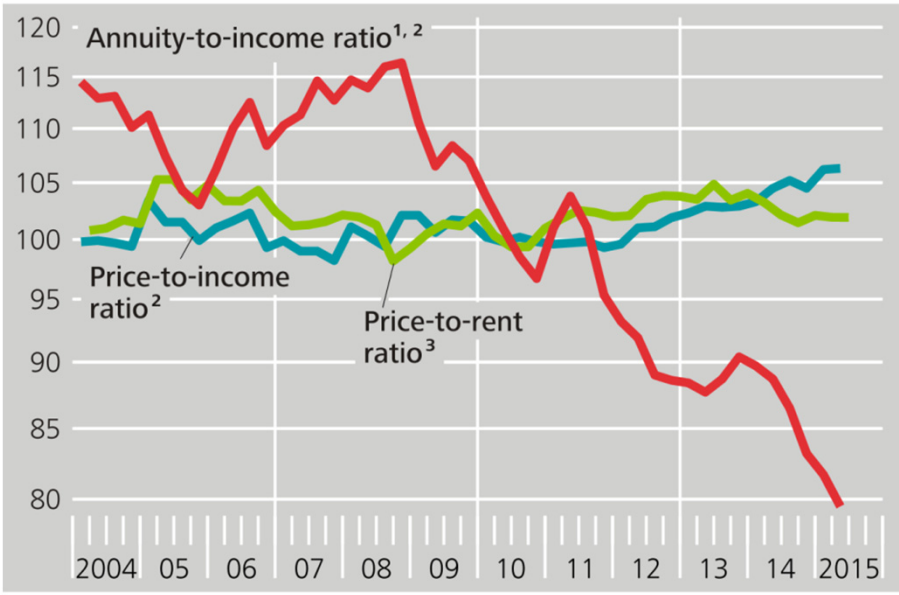
1 Transaction-weighted. Bundesbank calculations based on price data provided by bulwiengesa AG.

Deutsche Bundesbank

2 Nov 2015, 09:23:57, S3PR0110D.Chart

Standard indicators to evaluate residential property prices in Germany

2010 = 100, log scale



Source: Bundesbank calculations based on data provided by the Association of German Pfandbrief Banks (vdp). **1** Annuity of a mortage loan with a fixed interest rate (between five and ten years) and a hypothetical term of 30 years in relation to household income. **2** Disposable income per household in Germany, nominal. An increase represents a rise in the purchase price in relation to disposable income. **3** Prices and rents of apartments.

Deutsche Bundesbank

2 Nov 2015, 09:45:52, S3PR0182.Chart

3. The Bundesbank's dashboard

- The observed price movements do not, on their own, make it possible to derive any **potential overvaluation or undervaluation**. A **benchmark** would be required, but it **cannot be specified unambiguously** from a conceptual point of view, **nor can it be observed directly**.

- Price data going far back into the past contain **statistical breaks**. Averages of the standard indicators do not take account of **medium and long-term trends**.

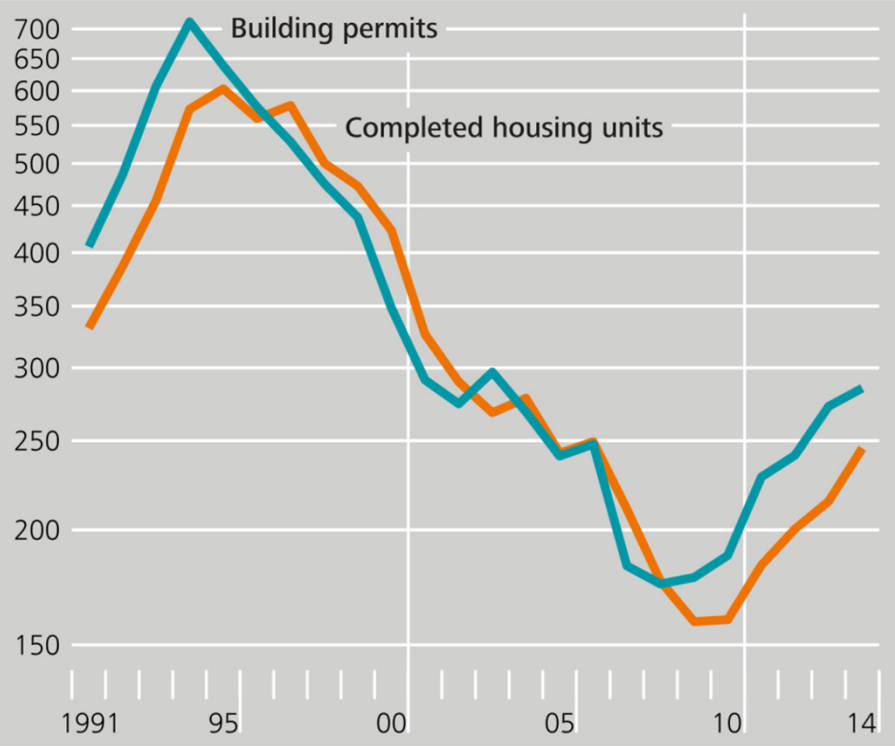
- If prices as well as rents rise substantially, the **price-to-rent ratio** may remain **largely unchanged**. Conversely, the **price-to-income ratio** would **shoot upwards**.

- If the **interest rate conditions** for new mortgage loans are taken into account, a **substantial improvement of affordability** can be observed since the outbreak of the financial crisis.

3. The Bundesbank's dashboard
Price movements reflect the lagged expansion of the housing supply.

Building permits and completed housing units in Germany*

Thousand apartments, log scale



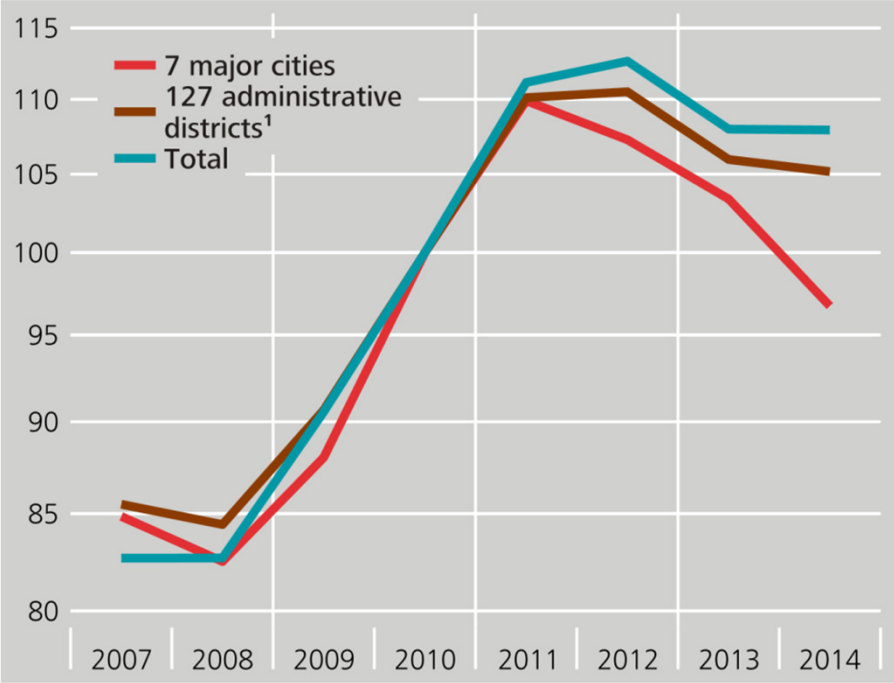
* In residential and non-residential buildings. Including construction work on existing buildings.

Deutsche Bundesbank

2 Nov 2015, 09:26:22, S3PR0112.Chart

Number of transactions for apartments in Germany

2010 = 100, log scale



Source: Extrapolation provided by vdpResearch GmbH on the basis of data from surveyor committees. **1** Regional coverage not entirely comparable with residential property prices for 127 towns and cities from bulwiengesa AG.

Deutsche Bundesbank

2 Nov 2015, 09:27:40, S3PR0114.Chart

3. The Bundesbank's dashboard

- Since 2010, **only the price indicators for Germany** demonstrated **strong upward movements**.

- The Bundesbank could **not**, on the basis of model-based analyses of the valuation situation in the housing market, detect **any notable deviations from fundamentally justified housing prices** throughout Germany.

- Hence, at present, **no substantial macroeconomic risks** are arising from the price structure on the housing market.

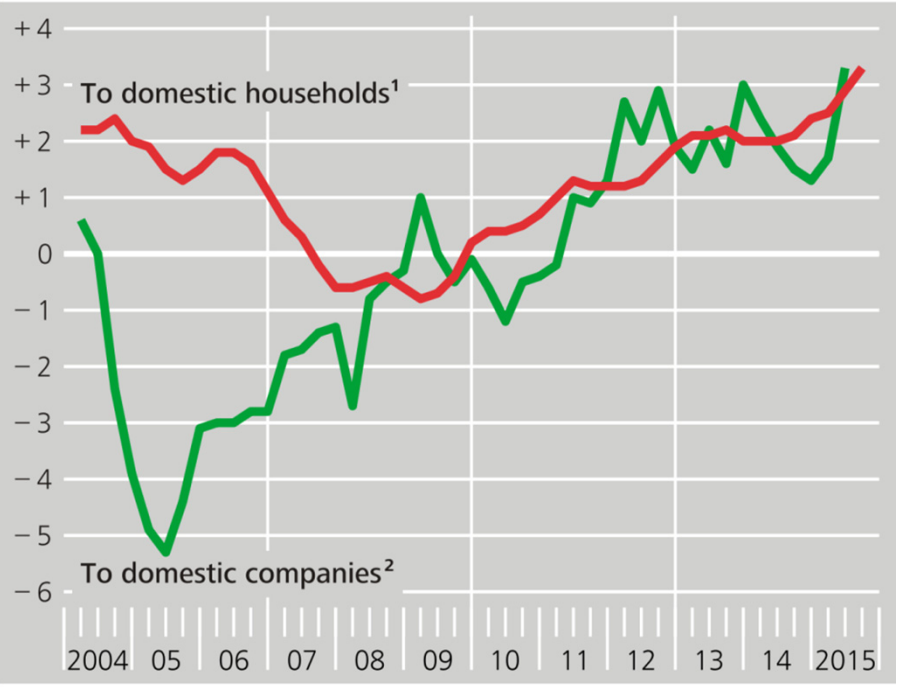
- In the **127 cities** studied, current estimates put **upward price deviations at between 10% and 20%**, measured in terms of the longer-term demographic and economic variables; with **freehold apartments in major cities** showing the **strongest overvaluations**.

3. The Bundesbank's dashboard

Despite the low interest rates, growth in mortgage loans is still sluggish.

Dynamics in domestic banks' loans for house purchase*

Year-on-year rate of change as a percentage, end-of-quarter data, seasonally adjusted

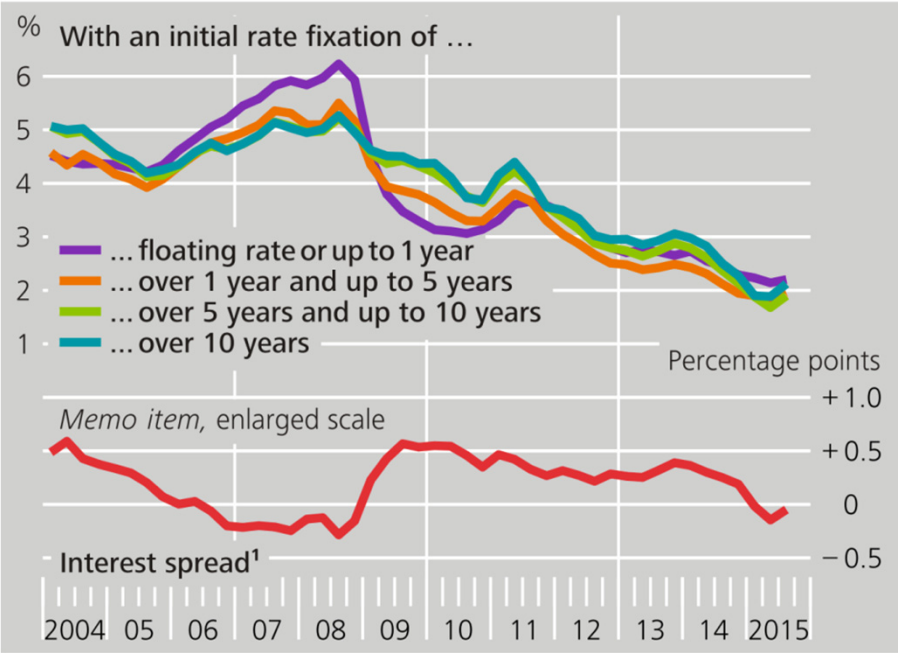


* Data for MFIs adjusted for statistical changes. **1** Including self-employed persons and sole traders. **2** Excluding self-employed persons and sole traders.

Deutsche Bundesbank

2 Nov 2015, 09:33:56, S3PR0120B.Chart

Interest rates on loans to households in Germany for house purchase*



* Data based on the monthly new business of the MFI interest rate statistics for secured and unsecured loans, excluding overdraft loans. **1** Calculated as the difference between the interest rate with an initial rate fixation of over 5 years and up to 10 years and the interest rate with an initial rate fixation of over 1 year and up to 5 years.

Deutsche Bundesbank

2 Nov 2015, 09:36:39, S3PR0123.Chart

3. The Bundesbank's dashboard

- The **other indicators** mentioned above **did not reach critical levels**.

- However, **studies of averages throughout Germany** have **limited value**, as moderate rates of increase in housing loans for the whole of Germany could **obscure a heterogeneous regional distribution of lending growth**.

- The Bundesbank's analyses show **very few signs of procyclical behaviour** by banks **or of a destabilising nexus between mortgage lending and property prices**. However, it is striking that, in the **towns and cities under consideration with sharply rising housing prices**, a **large share of mortgages** have a German sustainable **loan-to-value ratio (*Beleihungsauslauf*) of over 100%**.

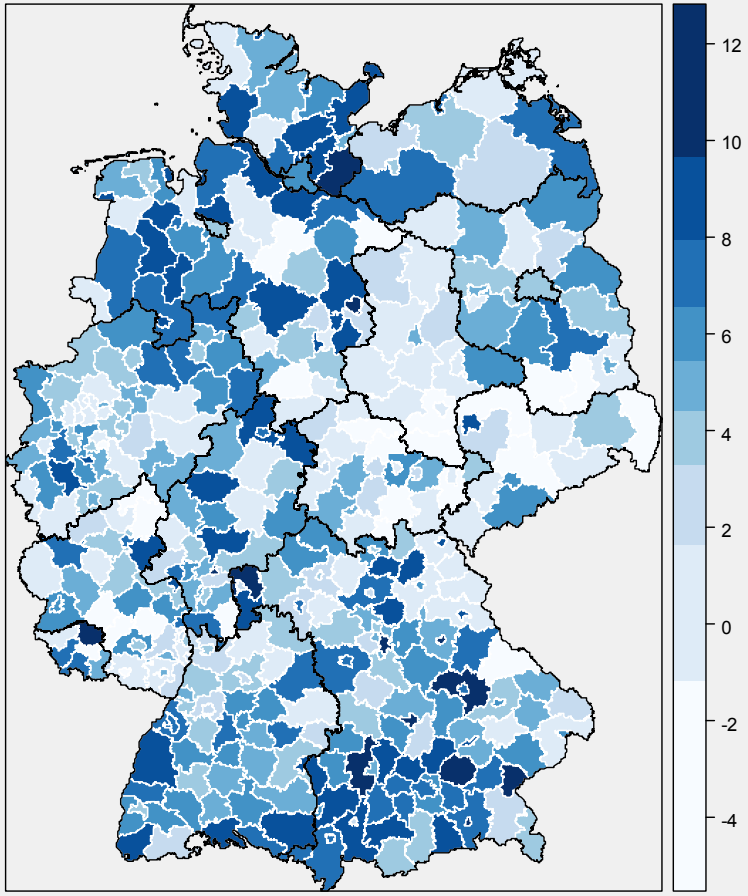
- This points to **structural vulnerabilities in the German banking system** to urban real estate market risks.

3. The Bundesbank's dashboard

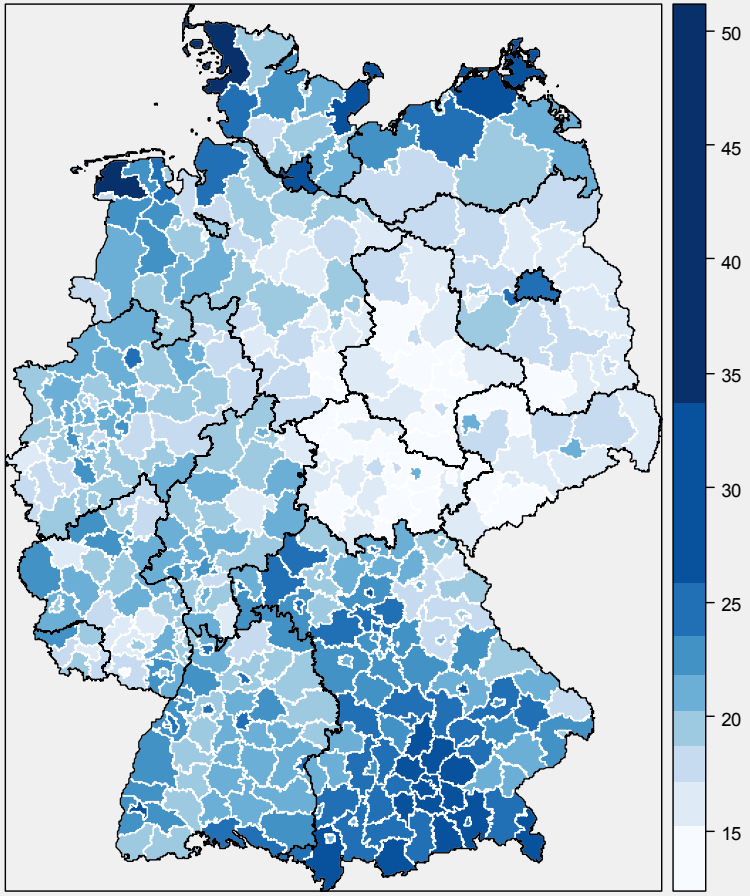
http://www.bundesbank.de/Navigation/EN/Statistics/Enterprises_and_households/System_of_indicators/system_of_indicators.html

4. Spatial dependencies

Price changes from 2013 to 2014, in %



Price-to-rent ratio in 2014



Bundesbank calculations based on price data provided by bulwiengesa AG.

4. Spatial dependencies

- Although the **differences in price rises** between the regions **diminished** again in 2014, **waning price dynamics** did not reduce **existing gaps** between Southern and Northern Germany as well as Western and Eastern Germany.

- **Special effects in prices** are **attributable to tourism**, particularly at the North Sea and Baltic coasts.

- The **steep rise in prices** has so far been **largely confined to regions with an urban character**.

- With regard to the future stability of the residential property market as a whole, it is therefore of **key importance to investigate the spatial transmission channels of price impulses in greater depth**.

Contact

Dr Jens Mehrhoff
Head of Section Business Cycle, Price and Property Market Statistics
Deutsche Bundesbank
Central Office
General Economic Statistics

Wilhelm-Epstein-Strasse 14
60431 Frankfurt am Main, Germany

Tel: +49 69 9566 3417
Mobile: +49 172 7950739
Fax: +49 69 9566 2941
E-mail: jens.mehrhoff@bundesbank.de
www.bundesbank.de

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Measuring property prices: the experience of property markets in Hong Kong[1]

Raymond Yuen, Hong Kong Monetary Authority

[1] Discussion of the presentation "*How should we measure residential property prices to inform policy makers?*" *by Jens Mehrhoff, Deutsche Bundesbank*. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

Session 2
Discussion of "How should we measure residential property prices to inform policy makers?" by Jens Mehrhoff & property market developments in Hong Kong

Raymond Yuen
Senior Manager (Economic Research)
Hong Kong Monetary Authority

Presentation at the Satellite Meeting of the IFC ISI Asian Regional Conference

Kuala Lumpur, 15 November 2014

Introduction

- Mr. Mehrhoff's paper provides a careful study of residential property price data and their usage for different analytical and policy objectives, such as monetary policy making and financial stability assessment
- He also discusses the recent developments in the German residential property market using a dashboard with geographical breakdown. Given the diversity from region to region and city to city, he calls for a spatial study
- In my presentation, I will give a summary of his paper and discuss the case of Hong Kong, focusing on the key property market data and their recent developments, and also the implementation of macro-prudential measures and other tax measures

Summary of paper (1)

- There requires a constant quality residential property price index to allow us to make like-with-like comparisons
- There are several distinct purposes for which a residential property price index is required. Different purposes require different indices, particularly in terms of aggregation using either flows or stock data
  - Short-term business cycle analysis: flows
  - National accounts and CPI: flows and stock
  - Macro-prudential concerns: flows and stock

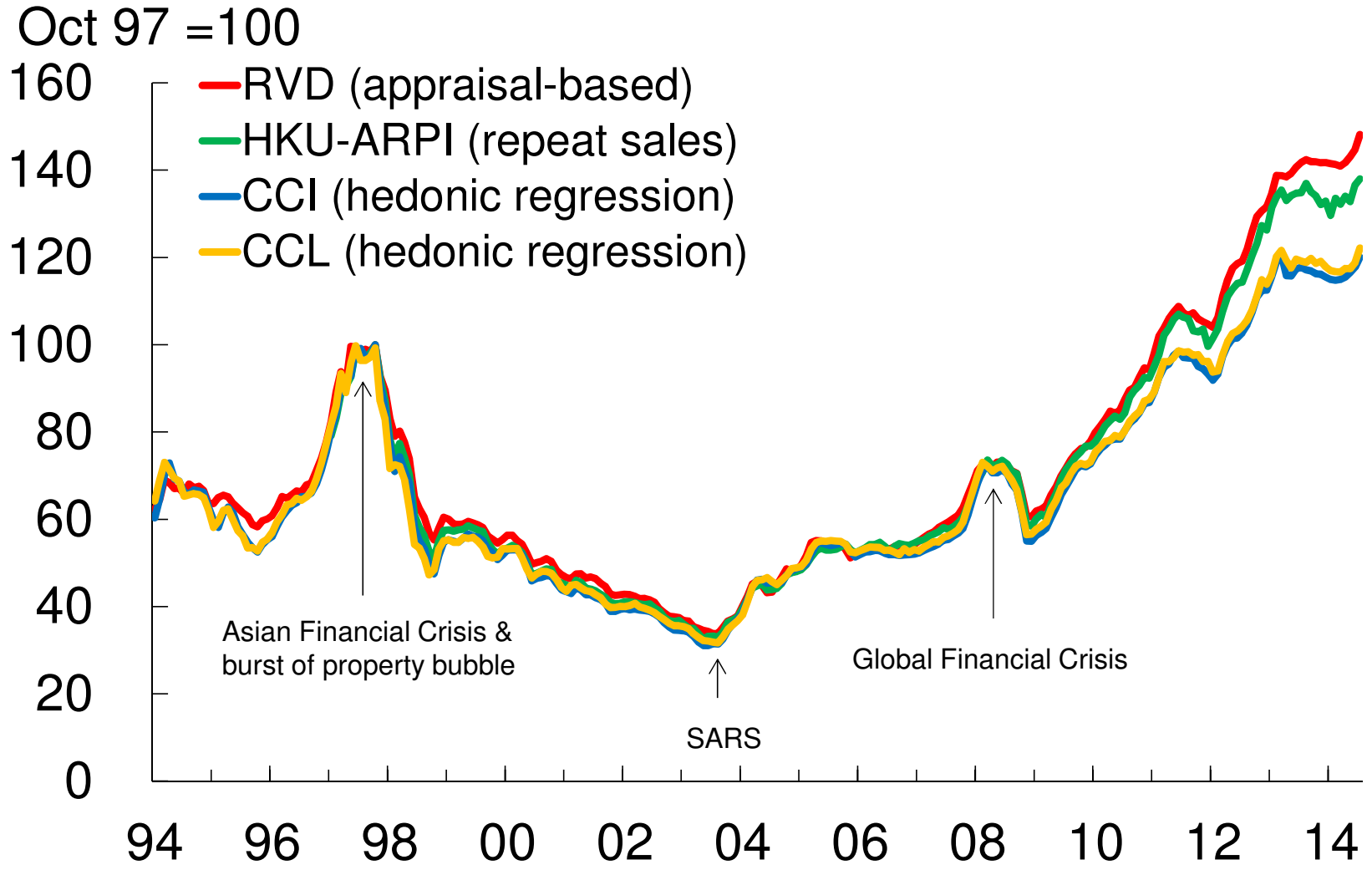
Summary of paper (2)

- A dashboard approach (with geographical breakdown) is used to assess residential property market developments in Germany
  - Price and valuation indicators: price-to-rent, price-to-income, household debt, credit exposure of banks
  - Construction and activity indicators: completed housing units
- Spatial diversity makes nationwide average not useful for analysis and policy design

Residential property price indices: the case of Hong Kong

Compiling institution	Sector of compiler	Data coverage	Quality adjustment	Starting date	Reporting lag
Rating and Valuation Department (RVD)	Public	All transacted dwellings	Appraisal-based & stratified by flat size	January 1986	1½ months
Centaline Real Estate Agency (CCI)	Private	transacted dwellings in 118 pre-selected popular estates (35% of total transactions)	Hedonic regression & stratified by estate and region	January 1994	1½ months
Centaline Real Estate Agency (CCL)	Private	transacted dwellings in 118 pre-selected popular estates (through Centaline)		1st week 1994	1 week
University of Hong Kong (HKU-ARPI)	Academic	All transacted dwellings with a repeat sales pair	Repeat sales & stratified by region	July 1991	2½ months

Residential property price developments in Hong Kong

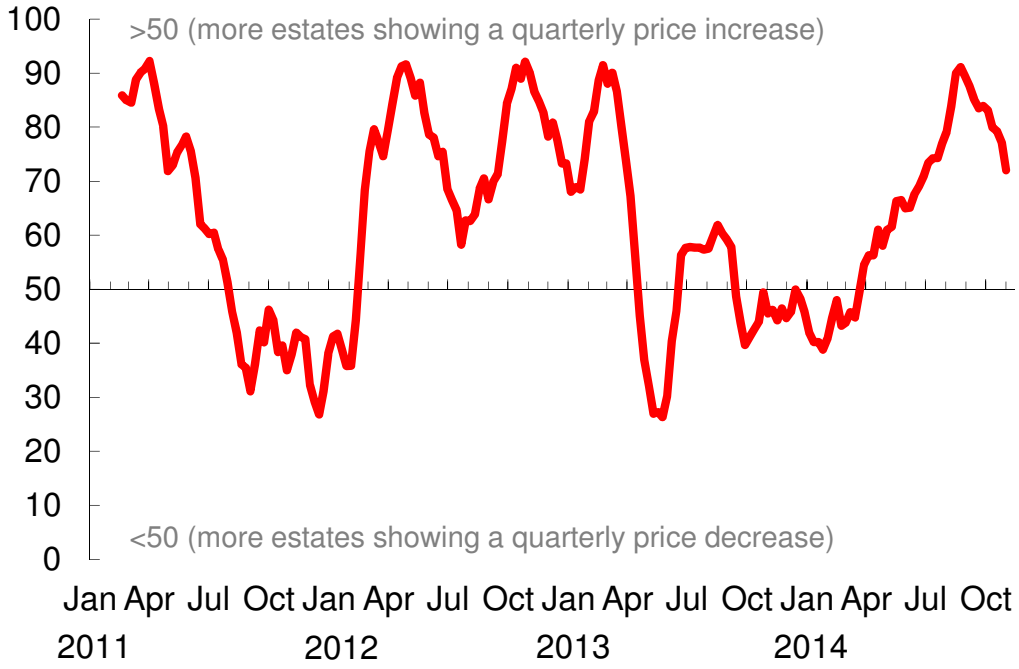


Sources: Rating and Valuation Department, Centaline Real Estate Agency, and University of Hong Kong.

Alternative indicators of residential property price dynamics

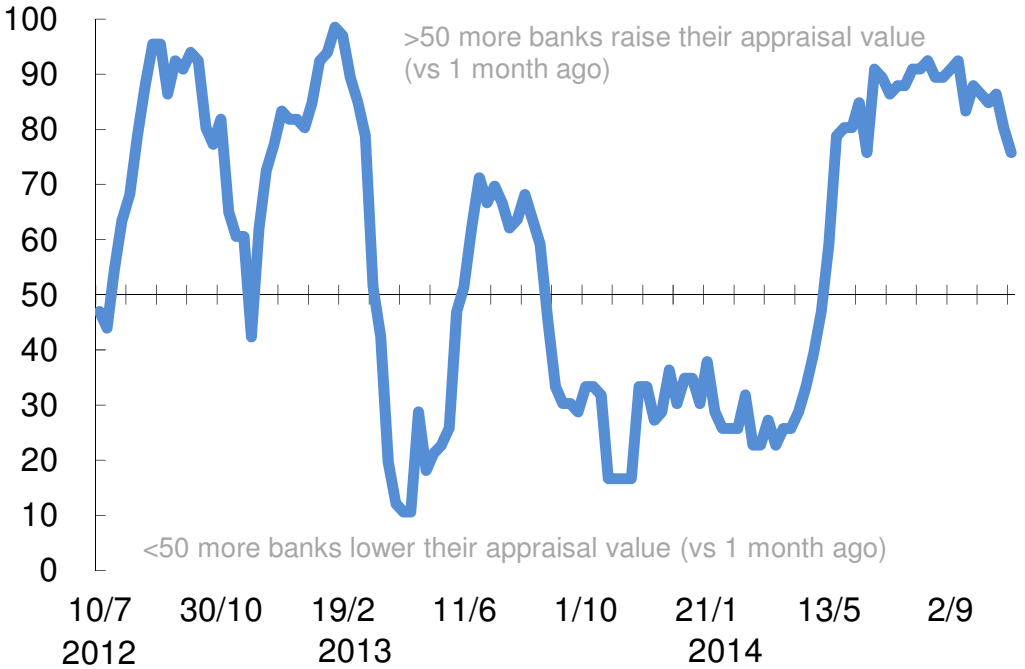
- Diffusion index = (% increase - % decrease) + 50
- DIs are not precise measures but timely and somewhat indicative of turns
- DI of bank appraisals provides additional information about credit stance

Diffusion index of transacted prices in 35 popular estates



Source: HKMA staff estimates.

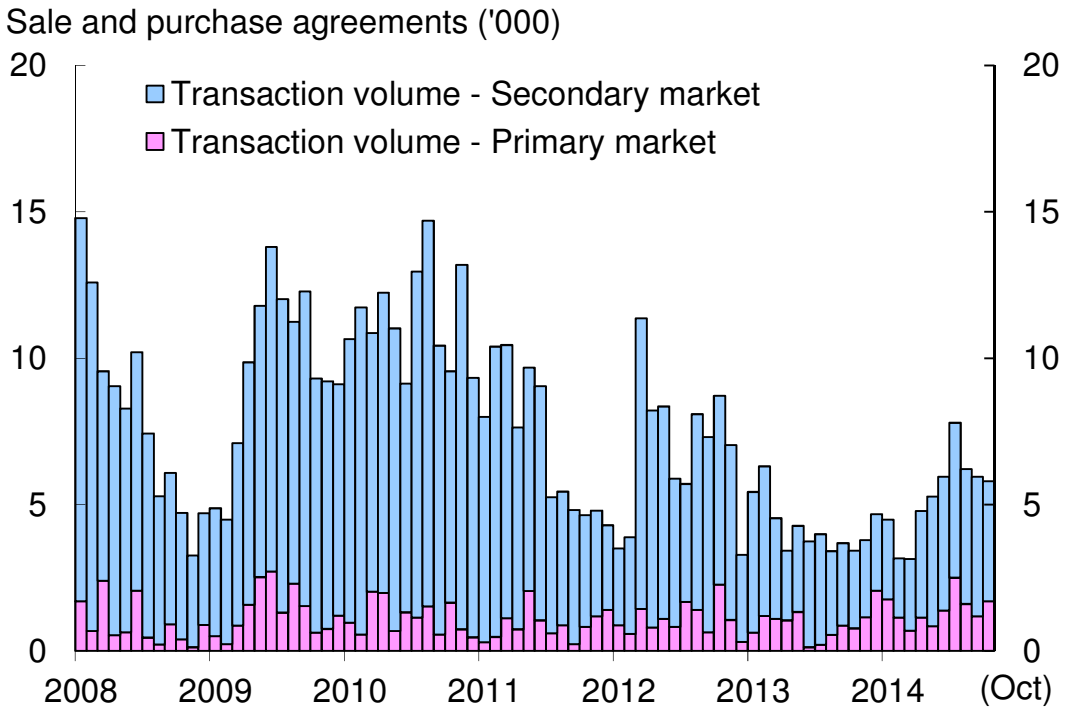
Diffusion index of bank appraisals (50 as cutoff)



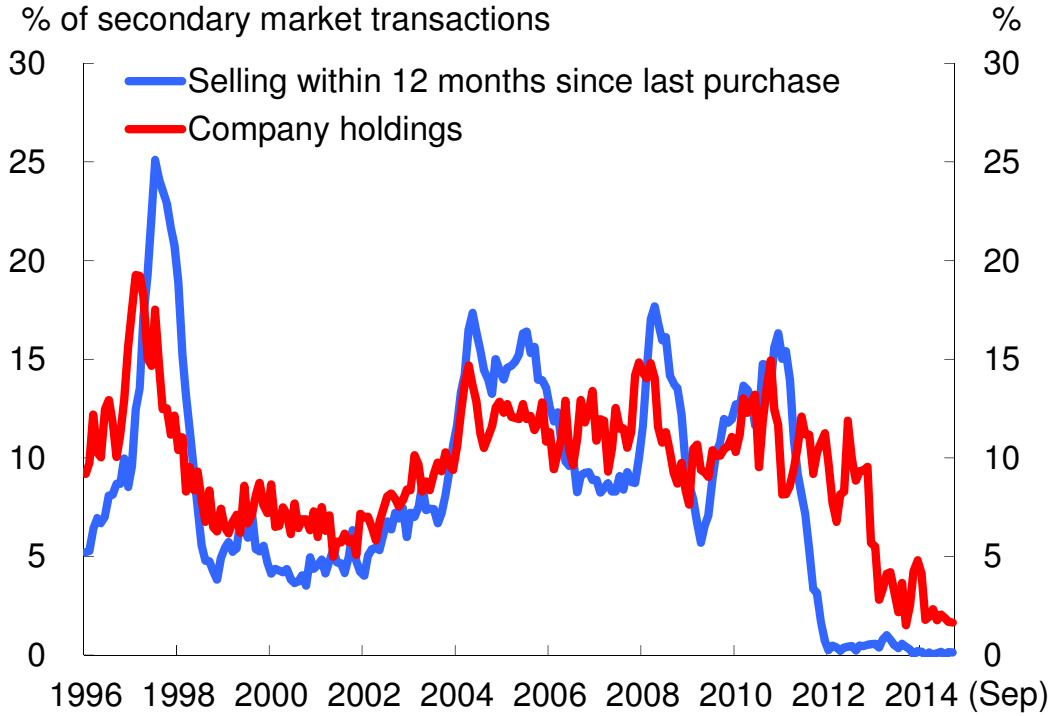
Source: HKMA staff estimates.

Transaction data

- Property price-trading volume correlation
  - Stein (1995), Berkovec & Goodman (1996), Leung, Lau & Leong (2012)
- Flipping trade and company purchase can show speculative and investment demand



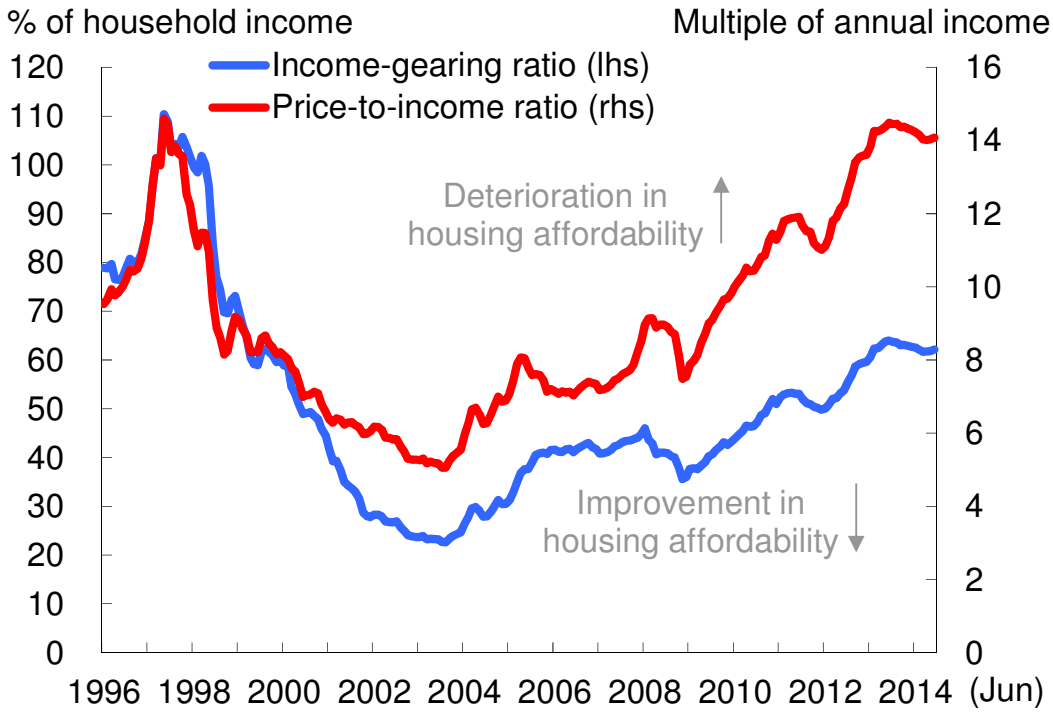
Source: Land Registry.



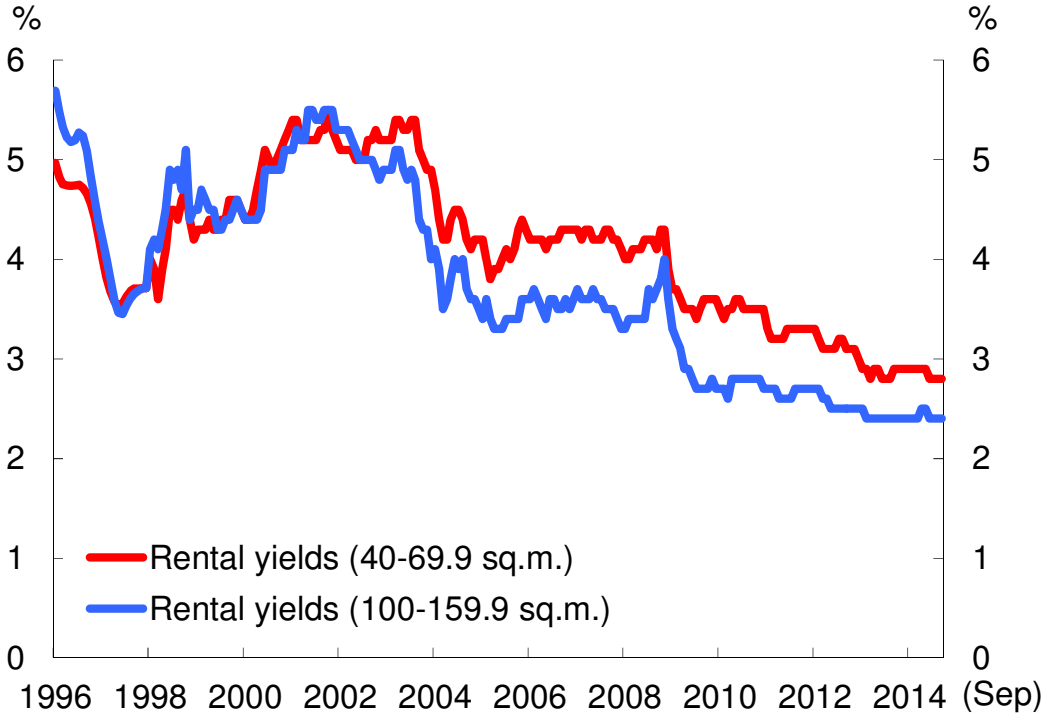
Source: Centaline Real Estate Agency.

Affordability measures and rental yields (inverted price-to-rent ratio)

- Price-to-income ratio is a key valuation indicator
- Income-gearing ratio shows mortgage repayment and servicing ability
- Rental yields are compared with risk-free interest rate and capital return



Source: HKMA staff estimates.



Source: Rating and Valuation Department.

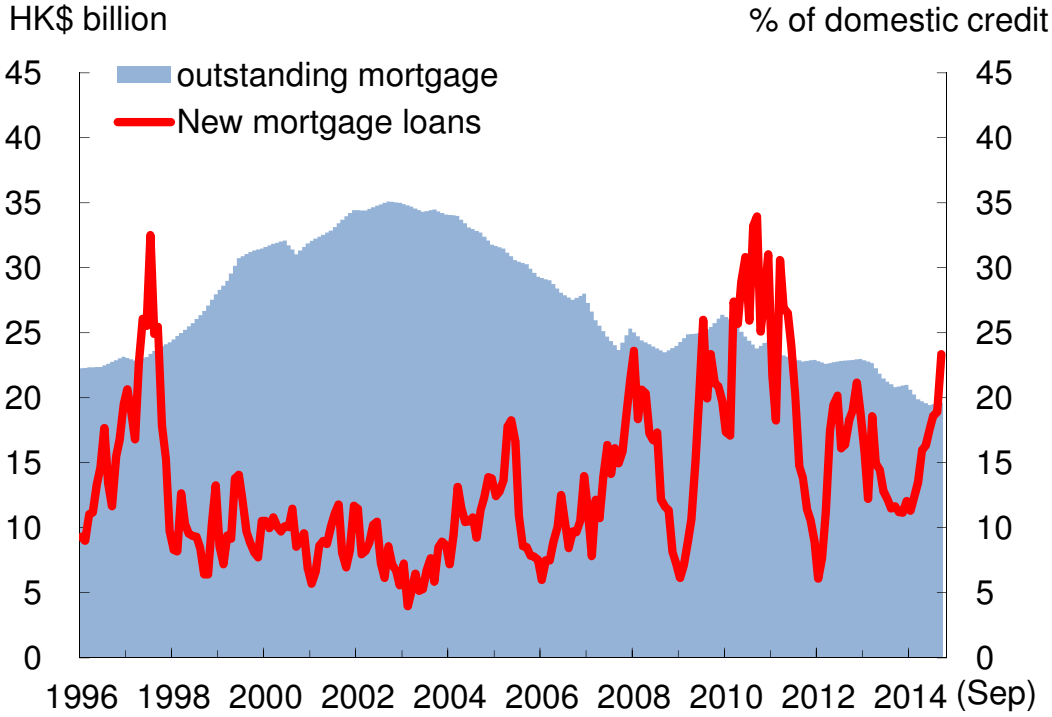
Macro-prudential measures on banks' mortgage lending business

- HKMA introduced six rounds of macro-prudential measures since October 2009
  - Policy objective: banking and financial stability
    - Creating buffers for banks and households against price correction, not targeting at property price level
  - Tightened underwriting standards
    - Loan-to-value ratios (LTV)
    - Debt-serving ratios (DSR) and stress-testing
  - Targeted at luxury homes, investment properties, multiple mortgages, and mortgage repayment by foreign income sources
  - Close supervision and more on-site examinations

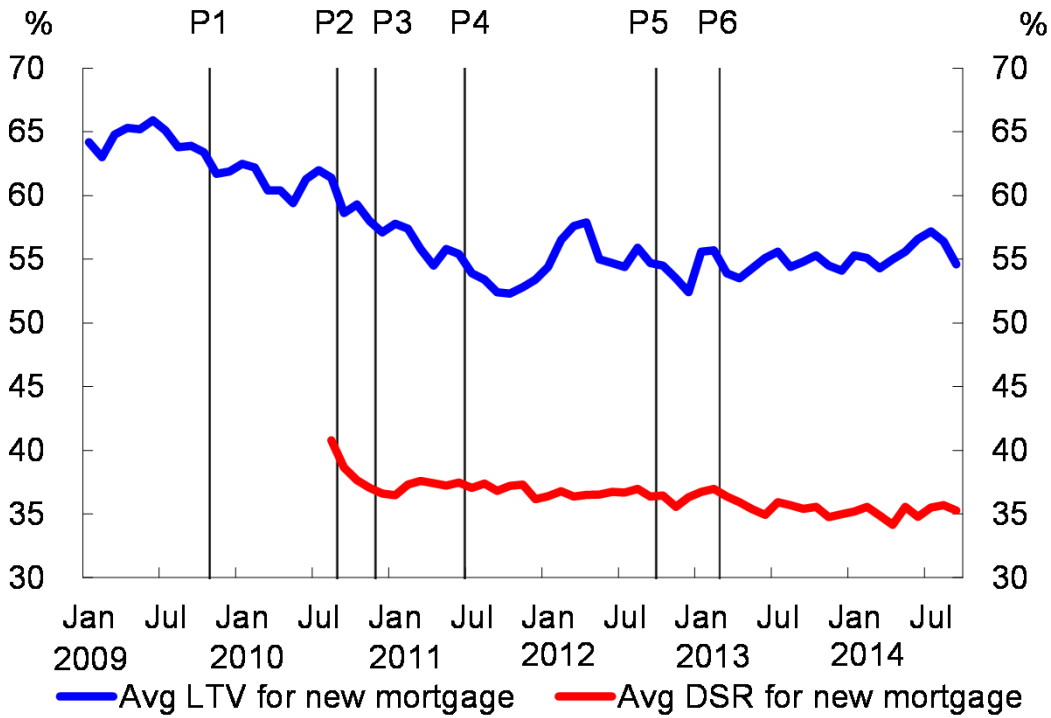
For details of the measures, refer to the Annex of He, Dong (2014) "The effects of macro-prudential policies on housing market risks: evidence from Hong Kong", *Banque de France Financial Stability Review* (April).

Impact on borrowers' leverage and banks' credit exposure (1)

- Banks' exposure to mortgage business decreased
- Bank specific information on LTV and DSR distribution
  - Average LTV fell from about 65% in early 2009 to 55% recently
  - Average DSR declined from 42% to 35%



Source: HKMA.



Source: HKMA.

Impact on borrowers' leverage and banks' credit exposure (2)

- Wong, Tsang and Kong (2014)
  - Borrowers' leverage has decreased, as LTV cap is found to be a binding factor on the actual LTV ratio in the market
  - Credit growth has moderated
  - Banking sector resilience to property price shocks has increased, mainly through reducing borrowers' leverage
    - Counterfactual study shows that the non-performing loan ratio would increase significantly should there be a property price shock
  - Loan market disequilibrium could contribute to a state-dependent effect of LTV policy on credit growth
    - Calibrating the LTV tool to target credit growth requires an accurate estimate of both loan demand and supply, but these are not observable.
    - Operationally, the modelling risks could pose challenges for policymakers

For details, refer to Wong, Eric, Andrew Tsang and Steven Kong (2014), "How does loan-to-value policy strengthen banks' resilience to property price shocks – evidence from Hong Kong", HKIMR Working Paper No.03/2014.

Tax measures

- Special stamp duties (SSD)
  - 10-20% tax if a buyer resells within 3 years
- Buyer's stamp duties (BSD)
  - 15% tax if purchased by non-locals
- Doubling of the *ad valorem* stamp duty rates DSD
  - Except first-time home buyers

Impact of macro-prudential and tax measures on housing market

- HKMA (2014)
  - We construct a vector auto-regression (VAR) model to study the impact of these measures on residential property prices, transaction volume and mortgage loans while controlling for other economic and financial factors.
  - There are two policy variables in the model, representing the prudential measures and demand-management measures respectively. They are constructed as step function variables, equal to zero when no measures are in place, and increasing by one for each new "count" of tightening
  - Findings:
    - Macro-prudential measures help dampen mortgage loan growth and transaction volume but do not appear to have a direct impact on residential property prices
    - Tax measures have dampened transaction volume and growth in residential property prices, while the impact on mortgage loan growth is indirect through dampening transaction volume and prices

For details, refer to "Box 5: The impact of counter-cyclical prudential and demand-management measures on Hong Kong's housing market", *HKMA Half-Yearly Monetary & Financial Stability Report* (September 2014).

Concluding remarks

- Macro-prudential measures can be useful to mitigate leverage build-up of and contain credit growth, but have limited effect on property prices
- Effective macro-prudential policy requires the ability to assess systemic risk, deploy and calibrate the tools, and close the regulatory gaps
- For the communication strategy, it is necessary to state clearly the policy intent of the macro-prudential measures
- It is important to think ahead about when and how to exit from the macro-prudential measures.

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Development of statistics for aggregate household debt service ratio in Korea[1]

Jooyung Lee, Bank of Korea

[1] This presentation was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

Development of Statistics for Aggregate Household Debt Service Ratio in Korea

15 Nov 2014

Jooyung LEE

Statistics Department

Bank of Korea

한국은행

THE BANK OF KOREA

Contents

Ⅰ. Aggregate Household DSR

Trends in Household Debt

- Households' debt-to-income ratio has risen at a fast pace since 2002 in Korea

  - Korean banks which were wary of corporate credit risk after 1997 Asian foreign exchange crisis, focused their business on the expansion of loans to households, whose credit risk is lower than that of enterprises

  - Generally favorable income growth and low interest rates have made mortgages more affordable, supporting significant increases in mortgage debt

	2002	…	2006	2007	2008	…	2012	2013
Households and NPISHs Debt-to-Income ratio(%)	121	…	129	136	140	…	159	161

Sources: Flow of funds statistics

Expanding & Supplementing Household Debt Statistics

- There is an increasing need for more extensive household debt data for policy formulation as the household debt problem is likely to worsen

- The Bank of Korea undertook the task of expanding household debt statistics

  - Pilot surveys on maturity and repayment type of banks' loan have been conducted

  - Aggregate household debt service ratio has been calculated to assess debt burden more accurately

Concept of Aggregate Household DSR

- Debt service ratio is calculated as the ratio of required debt payments (interest and principal) to maximum disposable income

  - An often-used summary measure of household debt is the household debt to income ratio. But the household debt to income ratio does not express the debt burden accurately

  - Household DSR is one of the encouraged indicators in the current IMF Financial Soundness Indicators datasets

► $DSR = \sum DS_i \; / \; I$

DS_i : debt payment for loan type i

I : disposable income

DSR : debt service ratio

Use of Household DSR Data

- An increase in Aggregate Household DSR could have a negative effect on both the real economy and the financial system

  - From a macroeconomic perspective
    : When the DSR is high, it is very likely to constrain household consumption activities.

  - From a macroprudential perspective
    : A deterioration in household DSR is expected to increase defaults and could impair banks' asset soundness

Use of Household DSR Data – (continued)

- The DSR produces a very reliable early warning signal ahead of systemic banking crises

  ► This is based on Drehmann & Juselius(BIS, 2012)

  • DSRs tend to peak just before crises materialize, reaching levels that are surprisingly similar across countries

  • At horizons of around one year before crises, the quality of the early warning signal given by the DSR is more accurate than that provided by the credit-to-GDP gap

Limitations of Household DSR Data

► This is based on Dynan, Johnson, and Pence(FRB, 2003)

- This ratio expresses the debt service obligations of the population as a whole but not necessarily the obligations of the typical household

- It treats financial activities with similar economic substance differently

  • For example, automobile loans are within the scope of the DSR while automobile leases are not. The concept of debt repayment in the DSR is more restricted than the general concept of debt repayment

Ⅱ. Estimation Method

Estimation Method

- Payments of principal and interest are estimated separately

- Estimation methods differ according to the type of loan and repayment

  - Banks, Mutual savings banks, Credit cooperatives, Insurance companies, Credit-specialized financial companies

  - Residential mortgages, Other loans

  - Amortized repayment loan, Single repayment loan, Revolving debt

Amortized Repayment Loan

- The following formula for principal and interest payments is applied for each type of amortized repayment loan

  - Principal payment
    - ► $PP_i = \frac{r_i d_i}{(1+r_i)^{m_i}-1}$
  - Interest payment
    - ► $IP_i = r_i d_i$

$\Rightarrow DSi = PP_i + IP_i = \frac{r_i d_i}{1-(1+r_i)^{-m_i}}$

DS_i : debt payment for loan type i

d_i : average stock of debt

r_i : average interest rate on the stock

m_i : average remaining maturity

I : disposable income

Single Repayment Loan

- Single repayment loans or bullet repayment loans are quite common in Korea
- When the single repayment falls due, some loans are not rolled over, but paid off with a large single payment

• Principal payment

► $PP_i = d_i(\frac{1}{om_i})(1\text{-}\, ro_i)$

• Interest payment

► $IP_i = r_i d_i$

$\Rightarrow DSi = PP_i + IP_i$

DS_i : debt payment for loan type i

d_i : average stock of debt

r_i : average interest rate on the stock

om_i : the average original maturity

ro_i : ratio of roll-overs

Revolving Debt

- Revolving debt is composed of credit card debt only
- Principal payment is calculated by multiplying the minimum required payment rate by the stock of revolving debt

• Principal payment

► $PP_i = (d_i)(mp_i)$

• Interest payment

► $IP_i = r_i d_i$

$\Rightarrow DSi = PP_i + IP_i$

DS_i : debt payment for loan type i

d_i : average stock of debt

r_i : average interest rate on the stock

mp_i : minimum required payment rate

Disposable Income

- Disposable income is disposable income before interest payments as calculated in US
- Household disposable income includes the income of non-profit institutions serving households, which is still difficult to estimate
- Disposable income data are currently published annually

Ⅲ. Data Sources

Repayment Type Data

- Need information on repayment type to calculate principal repayment

  - Banks : from reporting institutions
  - Other institutions : from Credit bureaus

- Information on other financial institutions' repayment type is received from credit bureaus because it is difficult to get data directly from other financial institutions for various reasons

Maturity Data

- Need information on Original and Remaining Maturity to assess the household debt structure
  - Banks : from reporting institutions
  - Other institutions : from credit bureaus
- Financial institutions sometimes confuse their reporting of two completely different sets of data (Original and Remaining Maturities)

Interest Rate Data

- Need interest rate data on outstanding loans

- Difficult to get data from credit bureaus because they tend to consider information on interest rates as highly confidential

  - Banks : from reporting institutions

  - Credit cooperatives : from federations of credit cooperatives

  - Credit-specialized financial institutions
    : calculated from financial statements

Ⅳ. Way Forward

Data Collection

- Some institutions such as public financial corporations are reluctant to report raw data for reasons of non-disclosure of confidential information

- Private credit bureaus are reluctant to give detailed information to central bank

- Need to promote this type of data sharing as much as possible

A Broad Measure

- Research on a broader measure of household liabilities, the Financial Obligations Ratio is on progress

- The Financial Obligations Ratio (FOR) as published in US adds recurring obligations that has not traditionally been included in the calculation of the DSR

  - Rent
  - Automobile leases
  - Property taxes

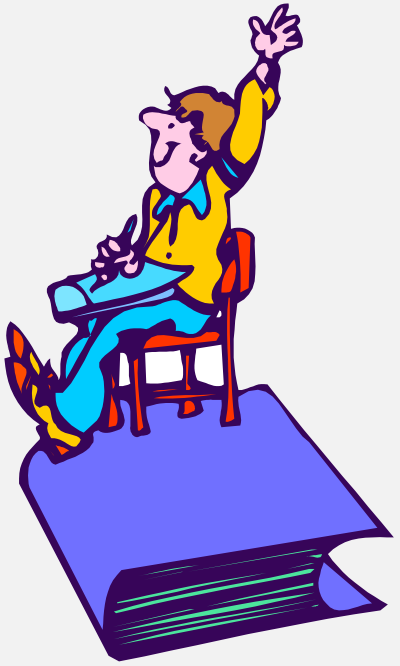
References

- Dey, S., R. Djoudad, and Y. Terajima, “A Tool for Assessing Financial Vulnerabilities in the Household Sector,” Bank of Canada Review, Summer 2008, pp45−54.
- Drehmann, M. and M. Juselius, “Do debt service costs affect macroeconomic and financial stability?”, BIS Quarterly Review, September 2012, pp21-35.
- Dynan, K., K. Johnson, and K. Pence, “Recent Changes to a Measure of U.S. Household Debt Service,” Federal Reserve Bulletin, vol. 89, October 2003, pp417-26.
- Faruqui, U., “Indebtedness and the Household Financial Health: An Examination of the Canadian Debt Service Ratio Distribution,” Bank of Canada Working Paper 2008-46, December 2008.
- IMF, “The Financial Crisis and Information Gaps: Progress Report,” May 2010.

Q&A

Question

Answer



Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Household debt service ratio in Korea – some comments[1]

João Cadete de Matos, Bank of Portugal

[1] Discussion of the presentation *"Development of statistics for aggregate household debt service ratio in Korea"* by Jooyung Lee, Bank of Korea. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

Discussing the paper "Development of statistics for aggregate household debt service ratio in Korea" by Jooyung Lee

BANCO DE PORTUGAL
EUROSYSTEM

João Cadete de Matos • Director, Statistics Department

15 November 2014

IFC Satellite Seminar
Kuala Lumpur

Introductory remarks

- Debt service ratios have become increasingly important, as they enable tracking how much of their income households devote to principal and interest payments on their debts.

- This is more so the case at the current juncture, where we are experiencing a combination of both
  - high levels of private sector indebtedness across both advanced and emerging economies and
  - a subdued and stagnating growth outlook.

Introductory remarks

- Against this background, the initiative to develop a measure of aggregate household debt service ratio for Korea is particularly relevant, in order to monitor adverse possible consequences for the household budget.
- The latter could materialize in unfavourable macroeconomic impacts – via a drop in household consumption – as well as, from the financial stability perspective, they can result in lower loan quality standards, directly affecting banks' portfolios.
- It is also interesting that the measure is calculated for different debt purposes, such as residential mortgages, as well as repayment modalities – amortized repayment, single repayment and revolving debt.

Aggregate figures should be complemented with micro-data

- My main comment with respect to this indicator regards the fact that it is aggregate. Of course, aggregate figures provide a clear and concise overall picture of the reality they intend to portray.
- However, one thing that we have learned from recent economic events is that sometimes aggregate figures are not sufficient to fully grasp developments in economic variables as they refer to the average of distributions.
- Quite the contrary, these data should be complemented with micro-data, which enable exploring the heterogeneity hidden behind aggregate numbers. In fact, in many situations, the tails of the distribution provide the most important information.

Why is it important to have a better notion of the distribution in the case of households?

- On the one hand, low-income households typically tend to have higher portions of their income dedicated to debt servicing than high-income households. This is especially the case given one of the main characteristics of credit developments in the run up to the global financial crisis, i.e., the expansion of credit provided to lower credit-score households (the so-called subprime).
- On the other hand, low-income households also tend to be more exposed to adverse consequences once crises in fact take place, making them also in greater risk of being unable to fulfill their credit commitments.

Information needs

- Concerning information needs, some difficulties are also mentioned in getting detailed data on the debt service of households from some types of sources such as credit bureaus or credit institutions that are not banks.
- One could say that these difficulties are due to the non-existence of a public credit registry in Korea (the source of this information is the World Bank's "Doing Business" report).
- Public credit registries (CCRs) exist in several countries around the world and are typically managed by central banks as a service provided to the financial system. CCRs collect data on individual loans granted by credit institutions to their clients and deliver data on the aggregate credit liabilities of each borrower to the same credit institutions.

Input for the credit risk analysis of new credit applications

- In recent years, mainly after the global financial crisis, the information requirements on loans granted, on the cost of credit as well as other conditions to grant new loans, have increased dramatically and the existing CCRs went through important changes in order to respond to new statistical and analytical requirements.
- Against this background, countries that never had a public CCR before have plans to build one and there is a project to create a database containing data on individual loans at the European level, fed by data supplied by the National Central Banks of the Monetary Union (MU). This project, known as Anacredit, is being designed to fulfil the needs of detailed information on loans granted in MU countries both for financial supervision and stability evaluation purposes and for statistical and economic analysis needs.

Sectoral classification used

- It would be useful to have the split between households and non-profit institutions serving households (NPISH), as is foreseen in the SNA 2008 (as well as ESA 2010).
- Of course, whenever the split is not available, it is customary to use the aggregate sector comprising both subsectors. NPISH tend to have only a smaller weight in this aggregate, but it would however be interesting to isolate their impact on this measure.
- In fact, the motivation and needs that lead individuals and families to increase their debt are quite different from the NPISH.

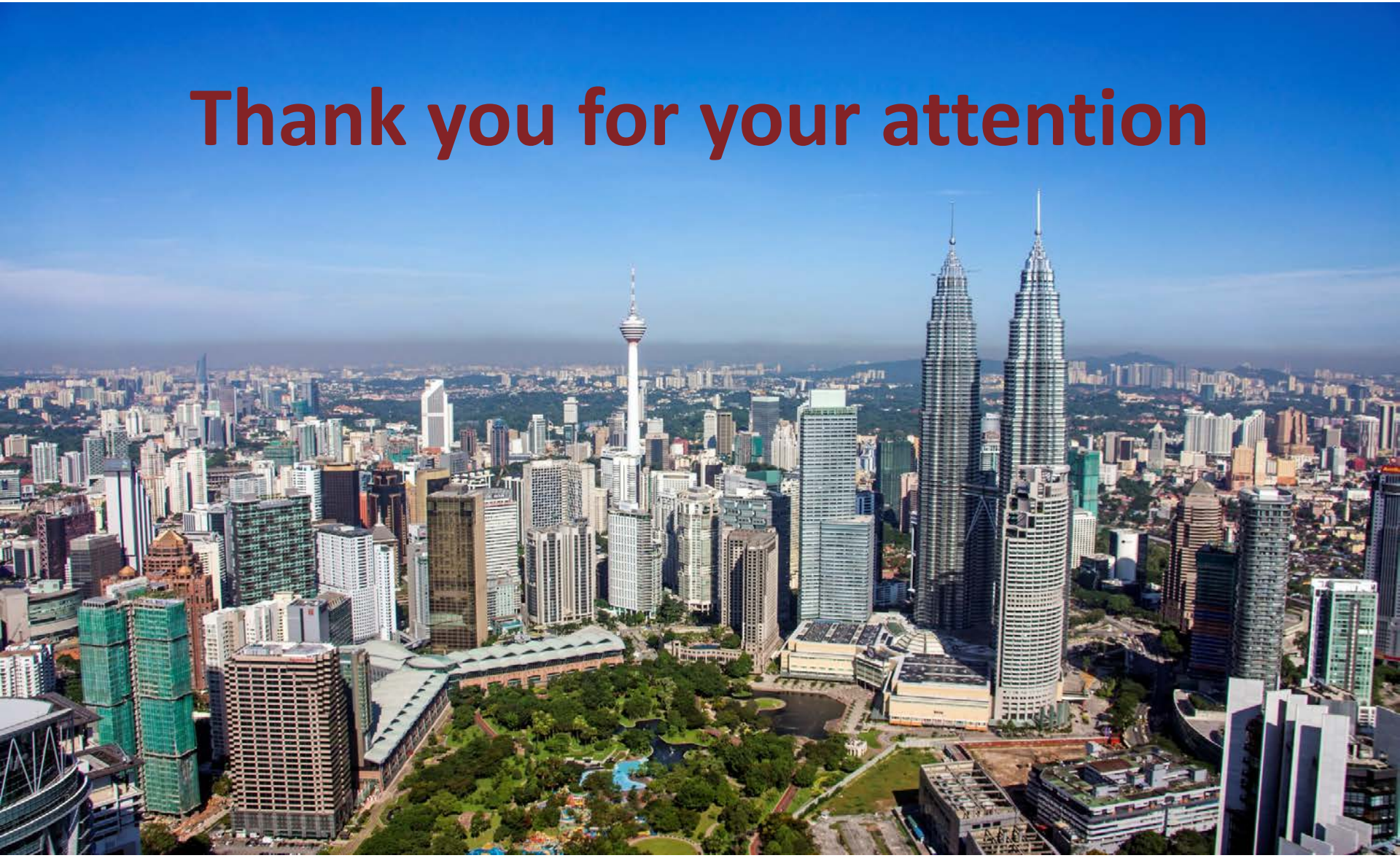
Sectoral classification used

- Furthermore, the level of risk associated with these types of borrowers is quite different: families or individuals have commonly a regular level of income, while NPISH, with some exceptions, tend to depend on public or private grants, which are typically uncertain and increase the credit risk of these institutions.
- For these reasons, it could be worthwhile calculating the DSR mostly for households in the strict sense.

Fixed versus variable-rate loans

- One final point concerns fixed versus variable-rate loans. In my country, most mortgage loans are variable-rate loans, i.e., households pay a spread over a given inter-bank reference rate such as the Euribor (the spread however is normally fixed over the life of the contract). The rates paid, as well as the respective interest instalments, are reviewed in pre-defined periods – six months, a year, etc. This means that, in periods where reference rates are going up, average interest payments will likely also rise in tandem, thus potentially generating financial strains.
- Therefore, it would also be interesting to have some sort of indication of the share of variable-rate loans in the total outstanding amount of loans, especially for housing purposes.

Thank you for your attention



Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Household debt service ratio in Korea – some comments[1]

João Cadete de Matos, Bank of Portugal

[1] Discussion of the presentation *"Development of statistics for aggregate household debt service ratio in Korea"* by Jooyung Lee, Bank of Korea. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

BANCO DE PORTUGAL
EUROSISTEMA

Session 3: How do we measure household financial soundness and assess the impact of house prices?

Discussing the paper "Development of statistics for aggregate household debt service ratio in Korea" by Jooyung Lee[1]

João Cadete de Matos
Director, Statistics Department

Debt service ratios have become increasingly important, as they enable tracking how much of their income households devote to principal and interest payments on their debts. This is more so the case at the current juncture, where we are experiencing a combination of both (i) high levels of private sector indebtedness across both advanced and emerging economies and (ii) a subdued and stagnating growth outlook.

Against this background, **the initiative to develop a measure of aggregate household debt service ratio for Korea is particularly relevant, in order to monitor adverse possible consequences for the household budget**. The latter could materialize in unfavourable macroeconomic impacts – via a drop in household consumption – as well as, from the financial stability perspective, they can result in lower loan quality standards, directly affecting banks' portfolios. It is also interesting that the measure is calculated for different debt purposes, such as residential mortgages, as well as repayment modalities – amortized repayment, single repayment and revolving debt.

My main comment with respect to this indicator regards the fact that it is aggregate. Of course, aggregate figures provide a clear and concise overall picture of the reality they intend to portray. However, one thing that we have learned from recent economic events is that sometimes aggregate figures are not sufficient to fully grasp developments in economic variables as they refer to the average of distributions. Quite the contrary, these data should be complemented with micro-data, which enable exploring the heterogeneity hidden behind aggregate numbers. In fact, in many situations, the tails of the distribution provide the most important information.

[1] I would like to thank Daniel Carvalho, Luís D'Aguiar and Luís Sobral, of the Statistics Department, for their contributions to these comments.

Why is it important to have a better notion of the distribution in the case of households? On the one hand, low-income households typically tend to have higher portions of their income dedicated to debt servicing than high-income households. This is especially the case given one of the main characteristics of credit developments in the run up to the global financial crisis, *i.e.*, the expansion of credit provided to lower credit-score households (the so-called subprime). On the other hand, low-income households also tend to be more exposed to adverse consequences once crises in fact take place, making them also in greater risk of being unable to fulfil their credit commitments.

Turning to information needs, some **difficulties** are also mentioned **in getting detailed data on the debt service of households from some types of sources such as credit bureaus or credit institutions that are not banks**. One could say that these difficulties are due to the non-existence of a public credit registry in Korea (the source of this information is the World Bank's "Doing Business" report). Public credit registries (CCRs) exist in several countries around the world and are typically managed by central banks as a service provided to the financial system. CCRs collect data on individual loans granted by credit institutions to their clients and deliver data on the aggregate credit liabilities of each borrower to the same credit institutions.

This information is a very important input for the credit risk analysis of new credit applications. In recent years, mainly after the global financial crisis, the information requirements on loans granted, on the cost of credit as well as other conditions to grant new loans, have increased dramatically and the existing CCRs went through important changes in order to respond to new statistical and analytical requirements. Against this background, countries that never had a public CCR before have plans to build one and there is a project to create a database containing data on individual loans at the European level, fed by data supplied by the National Central Banks of the Monetary Union (MU). This project, known as Anacredit, is being designed to fulfil the needs of detailed information on loans granted in MU countries both for financial supervision and stability evaluation purposes and for statistical and economic analysis needs.

An additional remark concerns the sectoral classification used. It would be useful to have the split between households and non-profit institutions serving households (NPISH), as is foreseen in the SNA 2008 (as well as ESA 2010). Of course, whenever the split is not available, it is customary to use the aggregate sector comprising both subsectors. NPISH tend to have only a smaller weight in this aggregate, but it would however be interesting to isolate their impact on this measure. In fact, the motivation and needs that lead individuals and families to increase their debt are quite different from the NPISH. Furthermore, the level of risk associated with these types of borrowers is quite different:

families or individuals have commonly a regular level of income, while NPISH, with some exceptions, tend to depend on public or private grants, which are typically uncertain and increase the credit risk of these institutions. For these reasons, it could be worthwhile calculating the DSR mostly for households in the strict sense.

One final point concerns fixed versus variable-rate loans. In my country, most mortgage loans are variable-rate loans, *i.e*., households pay a spread over a given inter-bank reference rate such as the Euribor (the spread however is normally fixed over the life of the contract). The rates paid, as well as the respective interest instalments, are reviewed in pre-defined periods – six months, a year, etc. This means that, in periods where reference rates are going up, average interest payments will likely also rise in tandem, thus potentially generating financial strains. Therefore, it would also be interesting to have some sort of indication of the share of variable-rate loans in the total outstanding amount of loans, especially for housing purposes.

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

The development of databases linking micro and macro data – an Australian perspective[1]

Giancarlo La Cava, Reserve Bank of Australia

[1] This presentatio was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

The Development of Databases Linking Micro and Macro Data: An Australian Perspective

Gianni La Cava

Reserve Bank of Australia

Irving Fisher Committee Satellite Seminar
November 15, 2014

Disclaimer: *The views expressed in this presentation are those of the author and not necessarily those of the Reserve Bank of Australia.*

Questions

- What are the challenges in linking national accounts data with micro data on household balance sheets, income and consumption?
- How has the Australian Bureau of Statistics (ABS) dealt with these challenges?

Questions

- What are the challenges in linking national accounts data with micro data on household balance sheets, income and consumption?
- How has the Australian Bureau of Statistics (ABS) dealt with these challenges?
- What does the distribution look like? Is the picture very different when consistent with the national accounts?

Questions

- What are the challenges in linking national accounts data with micro data on household balance sheets, income and consumption?
- How has the Australian Bureau of Statistics (ABS) dealt with these challenges?
- What does the distribution look like? Is the picture very different when consistent with the national accounts?
- Some uses and limitations of the data:
  - Why did the household saving rate rise sharply in the global financial crisis?
  - How has inequality evolved in Australia over the past decade?

Take-Home Messages

- Linking micro and macro data is difficult
- The ABS should be commended for taking on the challenge

Take-Home Messages

- Linking micro and macro data is difficult
- The ABS should be commended for taking on the challenge
- The new matched dataset allows for simultaneous analysis from both 'top-down' and 'bottom-up' perspectives

Take-Home Messages

- Linking micro and macro data is difficult
- The ABS should be commended for taking on the challenge
- The new matched dataset allows for simultaneous analysis from both 'top-down' and 'bottom-up' perspectives
- But there is little new information about distributional changes over time
- Not clear that we gain much over separate analysis of national accounts and unmatched survey data

The Challenges of Matching Micro and Macro Data: The Australian Solution

- Adjustments to existing micro data
- Estimating missing data items
- Irregular cross-sectional surveys
- Out-of-scope households

Data Availability

Table: Availability of Australian Micro and Macro Data

Year	**HH-level Income** Survey of Income and Housing (SIH)	**HH-level Wealth** Survey of Income and Housing (SIH)	**HH-level Consumption** Household Expenditure Survey (HES)	**Aggregate Income, Wealth and Consumption** National Accounts (ASNA)	**HH-level Income, Wealth and Consumption** Matched Micro-Macro Data
2003/04	X	X	X	X	X
2004/05				X	
2005/06	X	X		X	X
2006/07				X	
2007/08	X			X	X
2008/09				X	
2009/10	X	X	X	X	X
2010/11				X	
2011/12	X	X		X	X

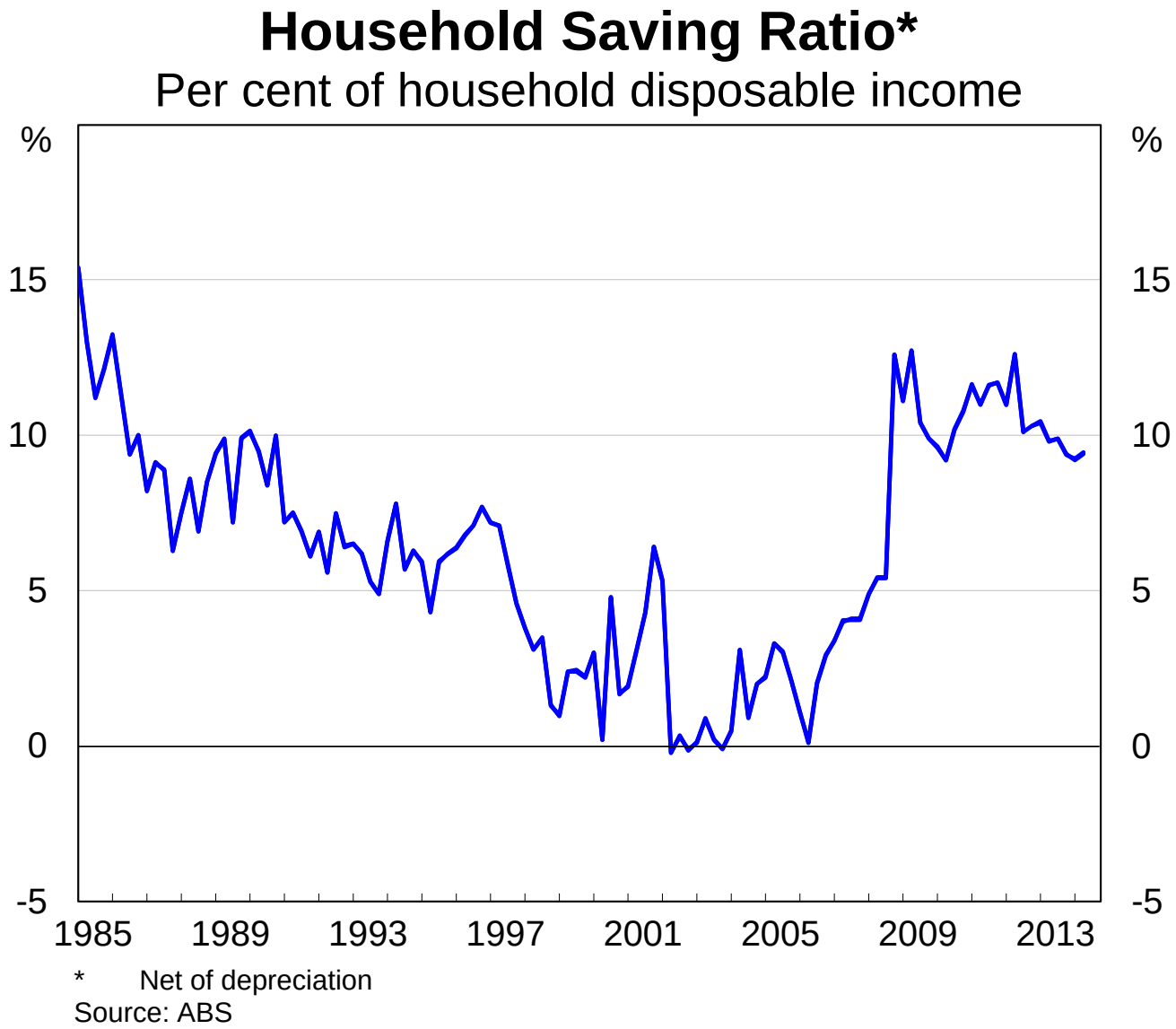
Sources: ABS; authors' calculations

Practical Uses and Limitations of Matched Data: A Central Banker's Perspective

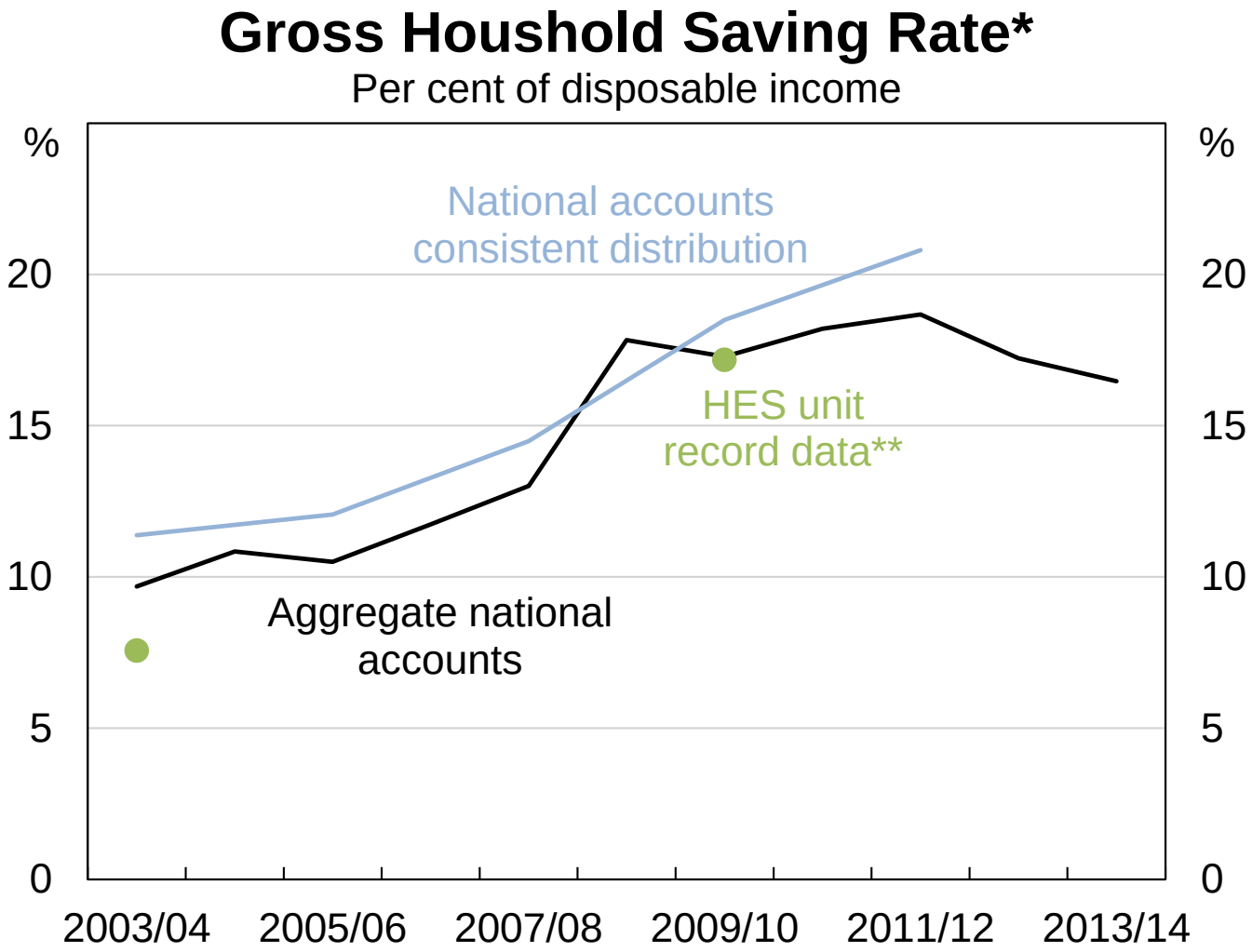
I consider two examples:

1. The rise in household saving in the global financial crisis
2. The evolution of household economic inequality in Australia

The Rise in Household Saving in Australia

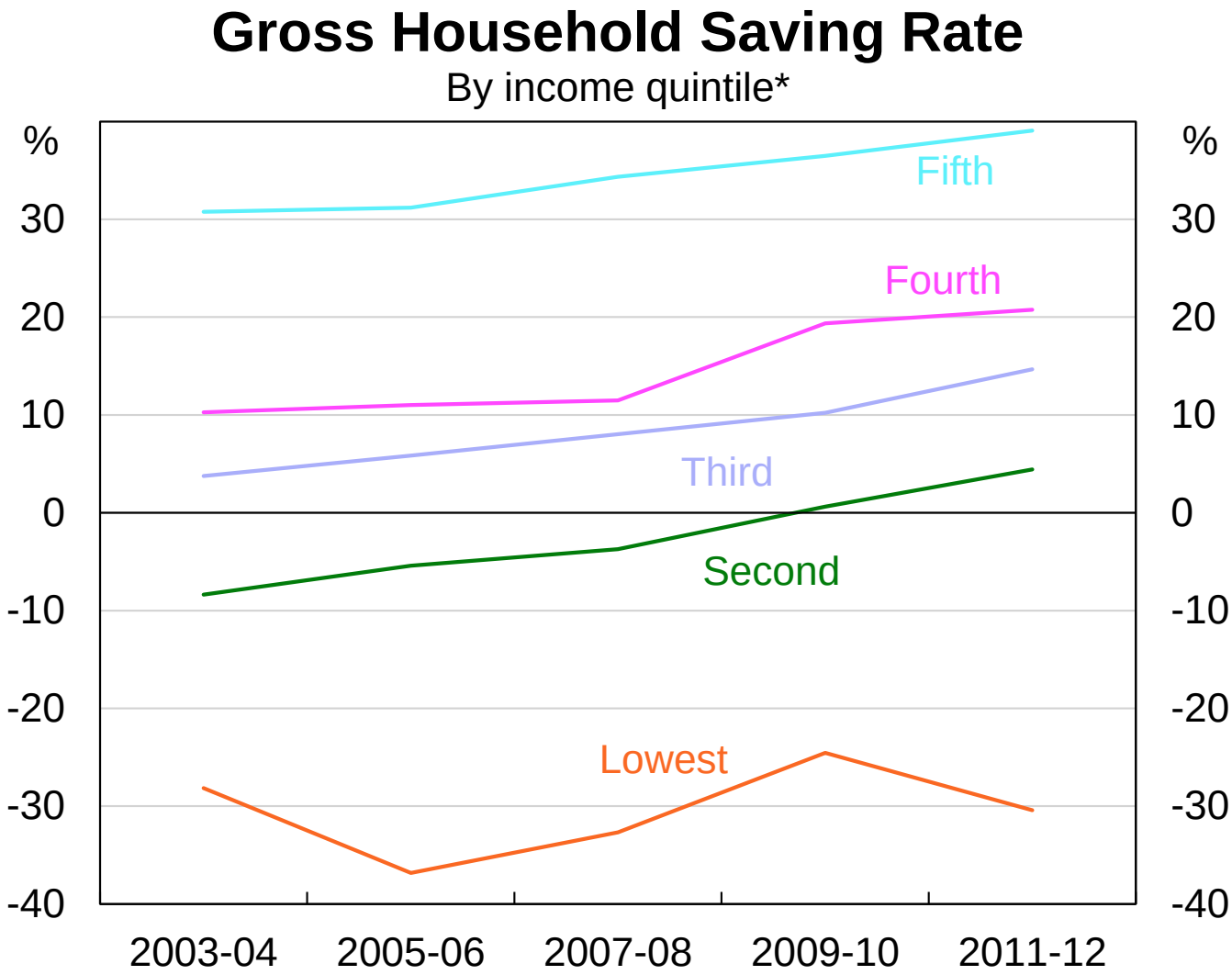


The Rise in Household Saving in Australia



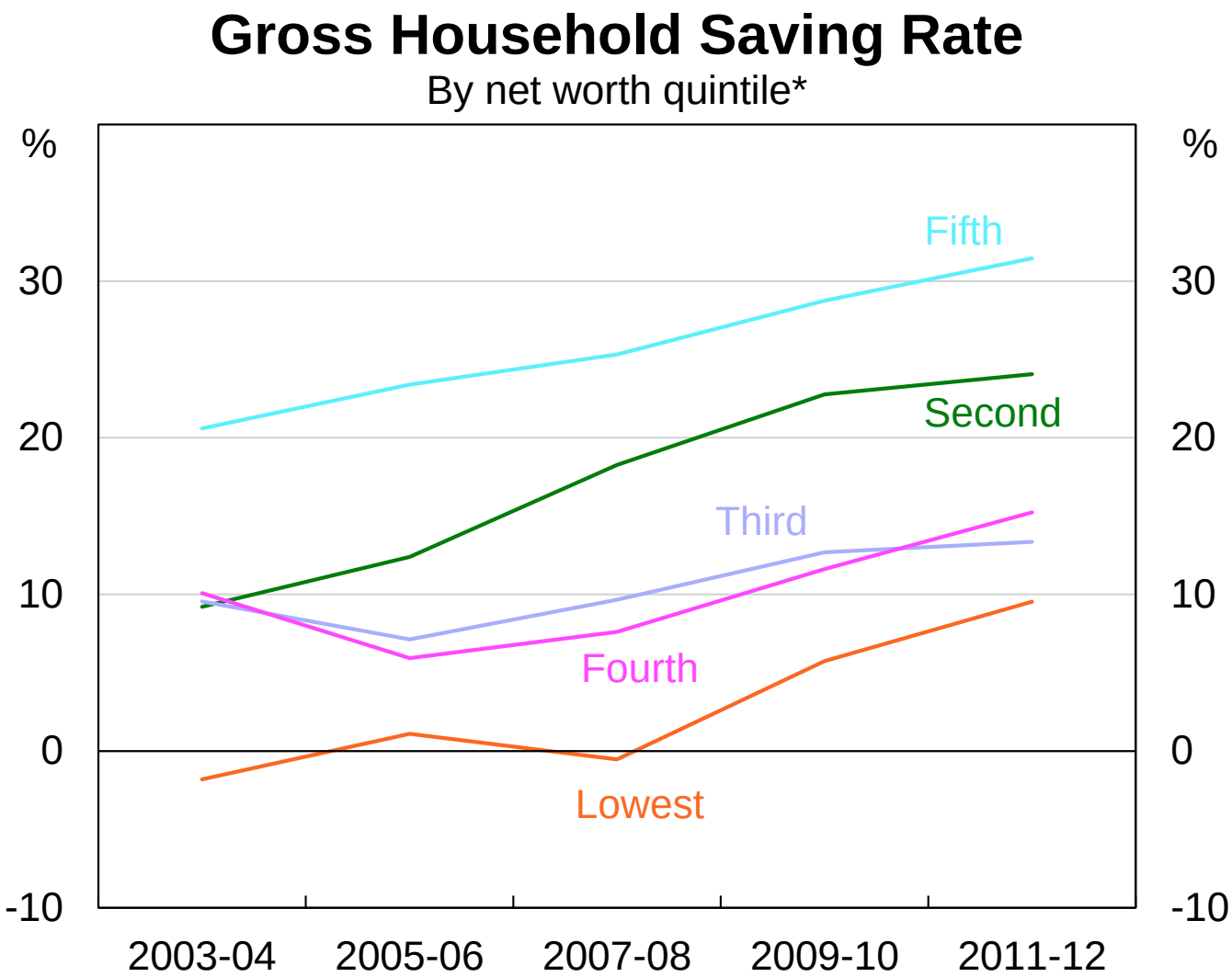
* Gross of consumption of fixed capital
Sources: ABS; RBA

Household Saving by Income Quintile

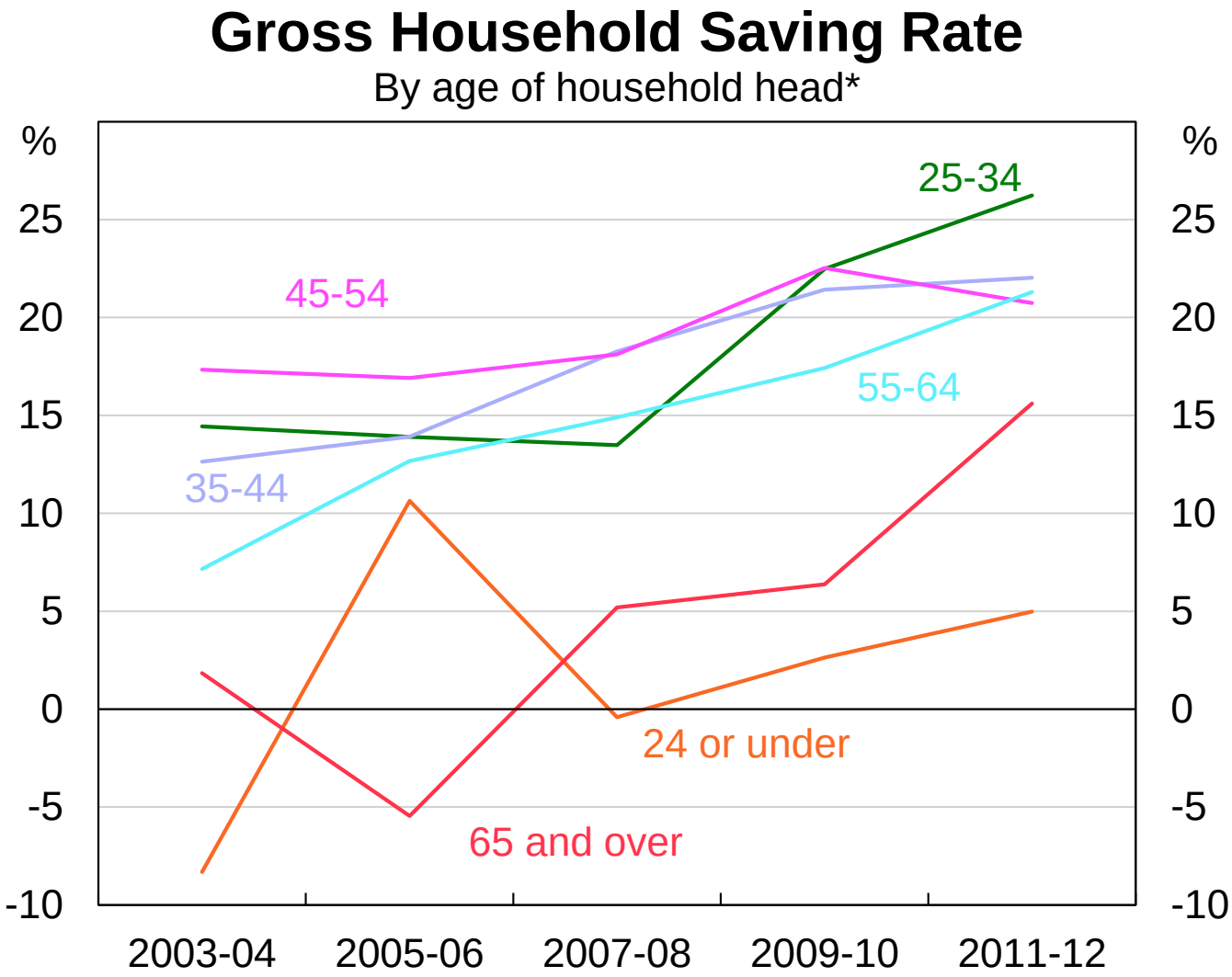


* Equivalised income and consumption, by household
Sources: ABS; RBA

Household Saving by Net Wealth Quintile

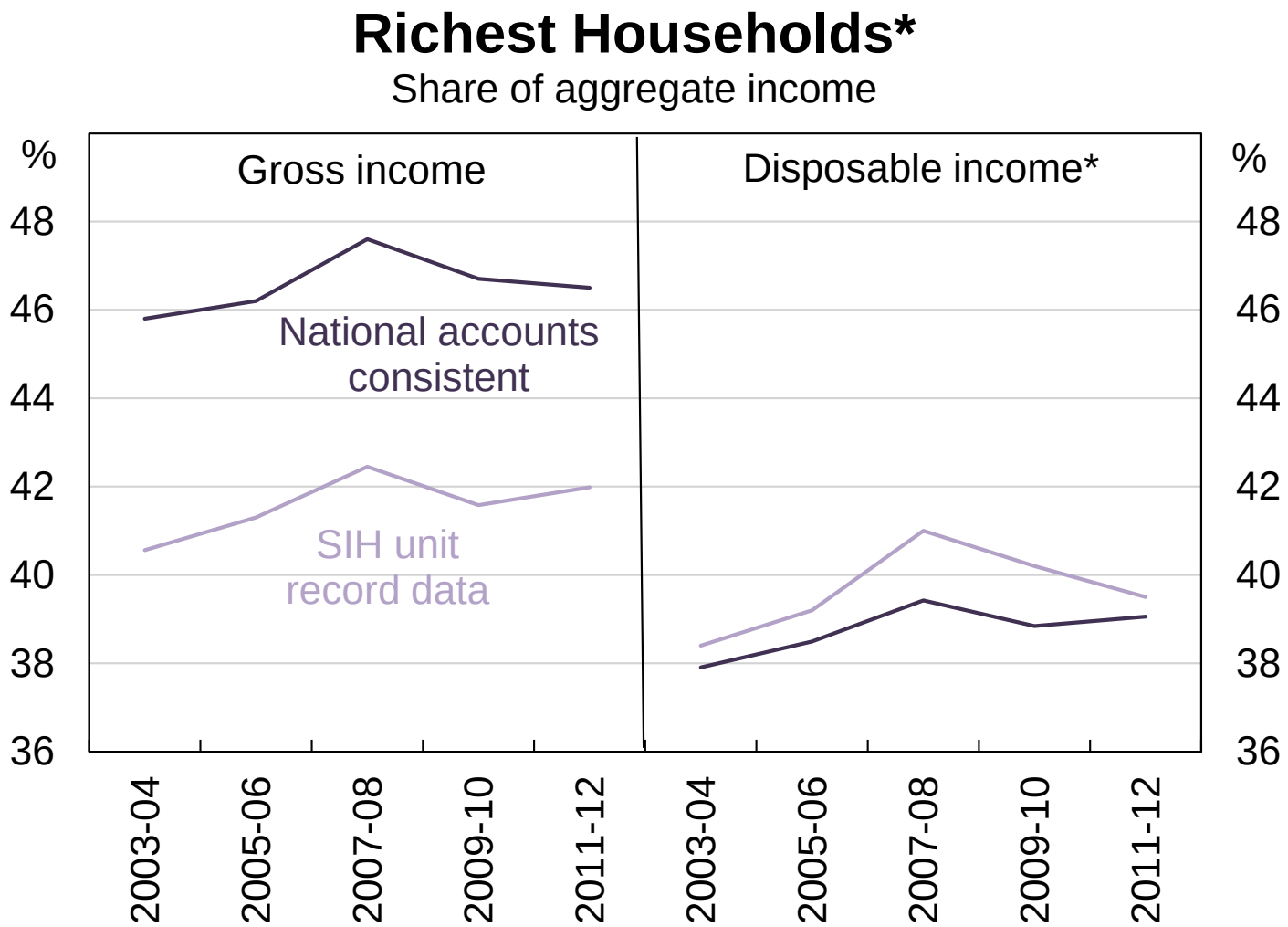


Household Saving by Age Group



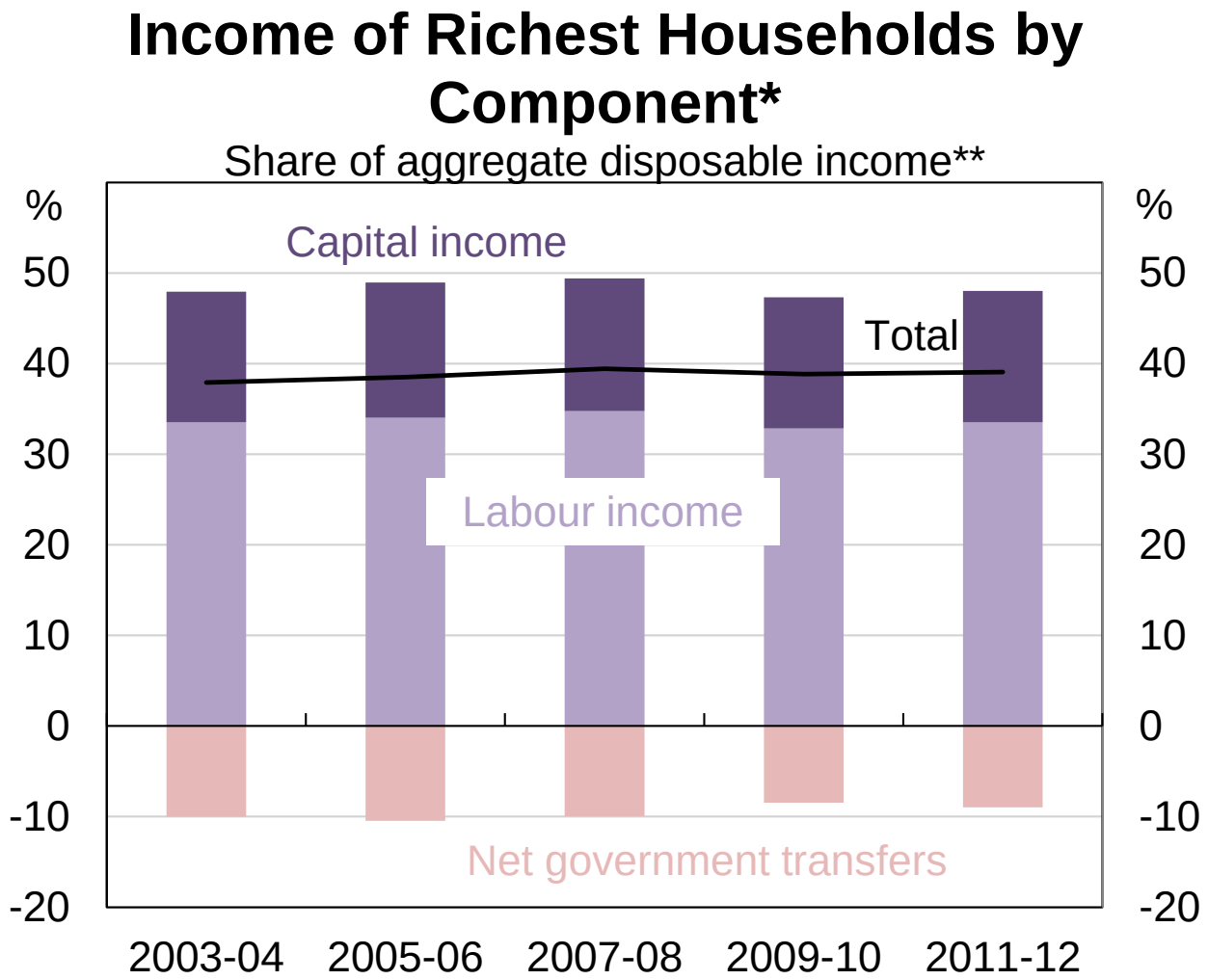
* Equivalised income and consumption, by household
Sources: ABS; RBA

Income Inequality



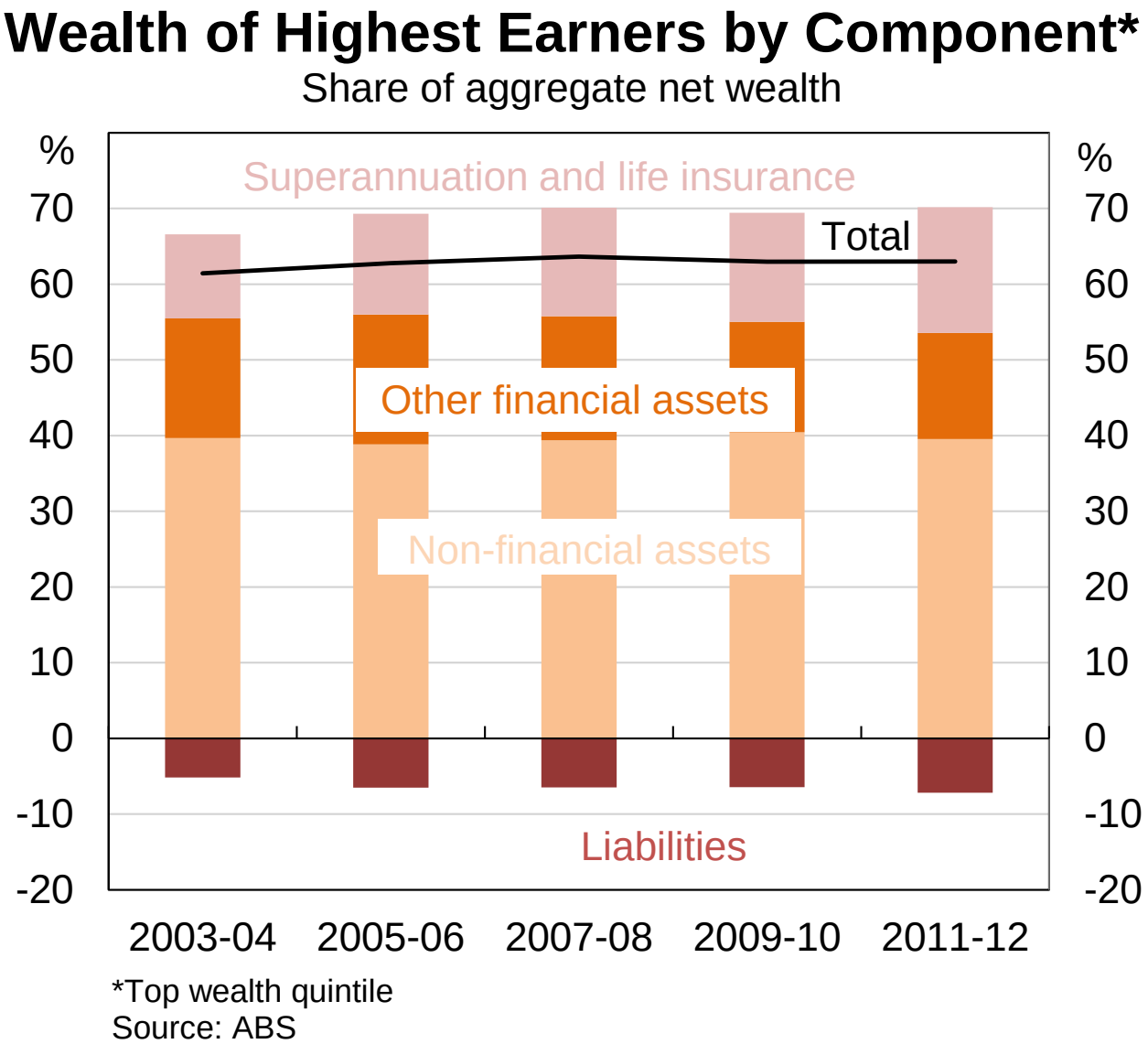
*Top income quintile
**Disposable income is gross income plus transfers less taxes
Source: ABS

Income Inequality

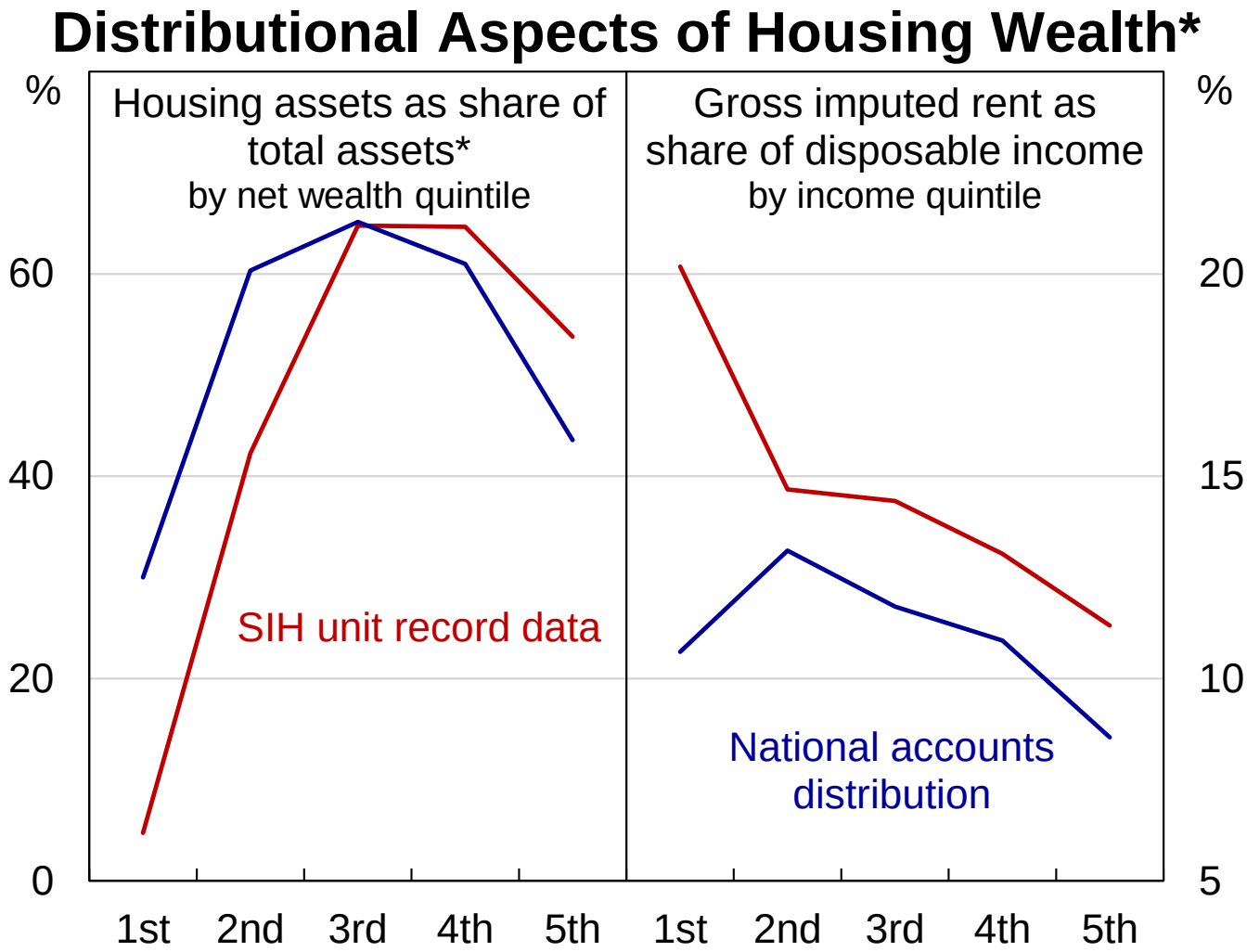


*Top income quintile
**Based on national accounts consistent data
Source: ABS

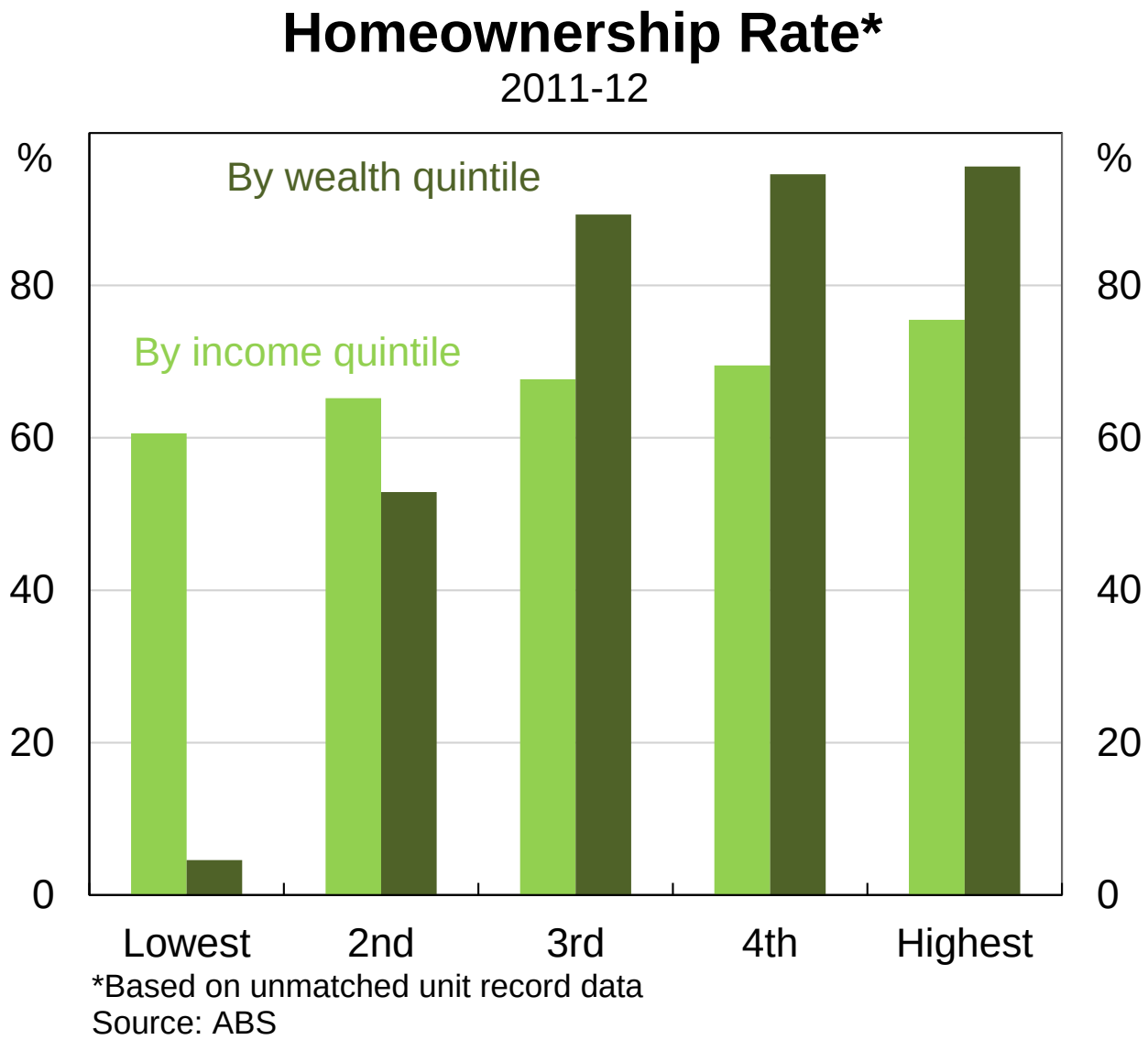
Wealth Inequality



Housing Prices and Inequality



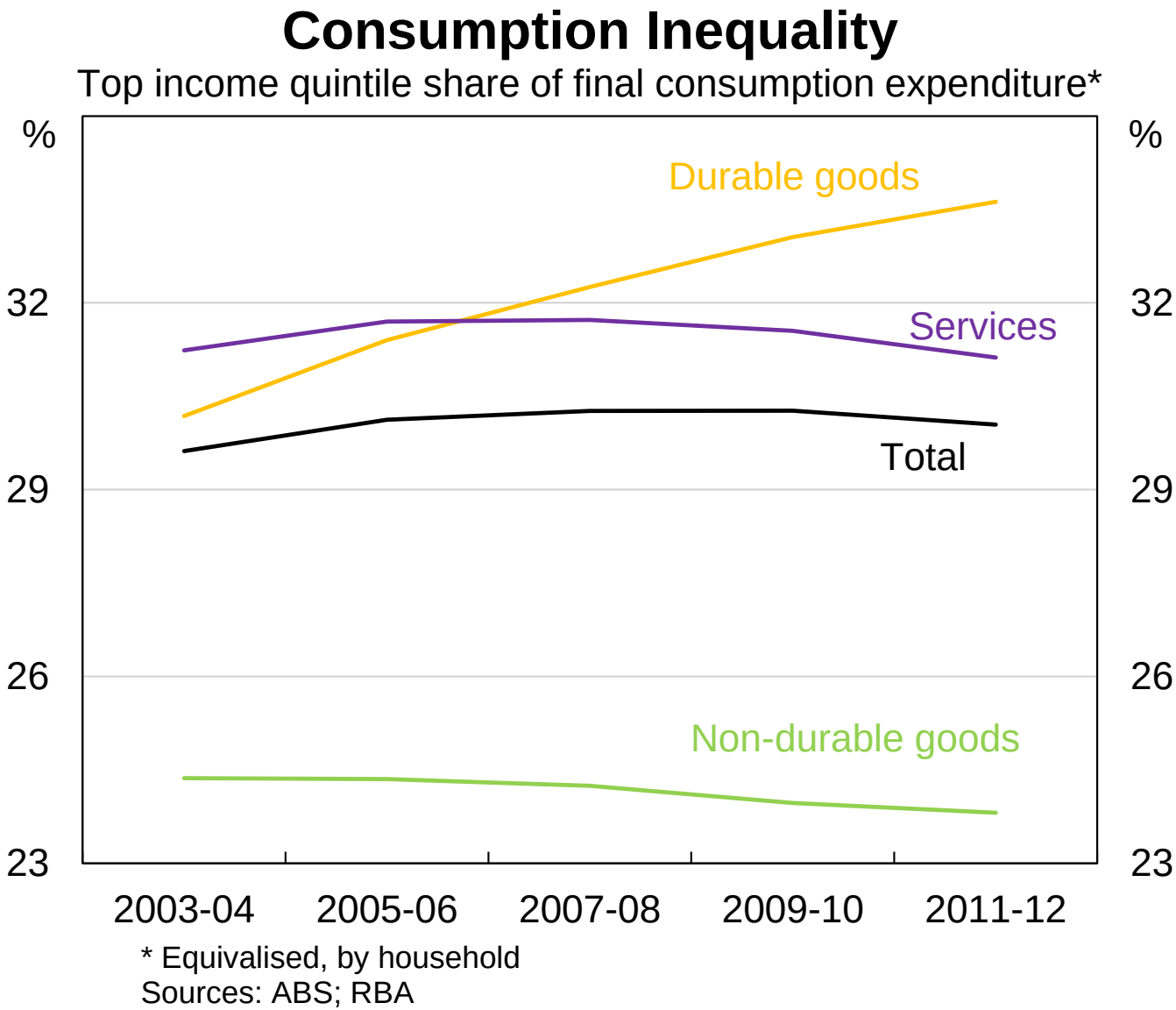
Housing Prices and Inequality



Consumption Inequality

*Highest income quintile based on national accounts-consistent data
Source: ABS

Consumption Inequality



Summary

Strengths of matched micro-macro data:

- Consistency
- Complementarity
- Adaptability

Summary

Strengths of matched micro-macro data:

- Consistency
- Complementarity
- Adaptability

Weaknesses of matched micro-macro data:

- Relative contribution
- Lack of longitudinal information
- Timeliness

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

The development of databases linking micro and macro data – an Australian perspective[1]

Giancarlo La Cava, Reserve Bank of Australia

[1] This paper was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

THE DEVELOPMENT OF DATABASES LINKING MICRO AND MACRO DATA – AN AUSTRALIAN PERSPECTIVE[1]

The Australian Bureau of Statistics (ABS) has, for the first time, recently released household survey data that are `matched' to national accounts aggregates. In this paper I discuss the conceptual and practical challenges in linking micro and macro household data and outline how the ABS has dealt with these challenges. I also consider the relative merits of the ABS matched data based on two practical examples of interest to Australian policymakers: the rise in household saving during the global financial crisis and the rise in household economic inequality over the past decade.

The new matched data are useful in that they are consistent with the national accounts and complement existing unit record data. In effect, users can simultaneously analyse the data from both `top-down' and `bottom-up' perspectives. However, the matched data do not appear to provide any new information about distributional changes over time and so are unlikely to provide many insights over and above the separate analysis of national accounts and unmatched survey data.

Introduction

The national accounts typically provide the most comprehensive information on the size and structure of the economy. However the national accounts rarely provide information on the distribution of household income, wealth and consumption. Distributional issues are very important to understanding living standards, and have been gaining more focus over recent years. These issues are also central to targeting, and improving the efficiency of, economic policies.

The Australian Bureau of Statistics (ABS) publishes both high-quality aggregate (macro) and distributional data (micro) on household economic well-being. The macro estimates are published in the Australian System of National Accounts (ASNA). The national accounts present estimates for the household sector as a whole but do not provide any information about how available resources are distributed. Instead, distributional estimates are derived from two household surveys – the ABS Survey of Income and Housing (SIH) and the Household Expenditure Survey (HES).

Due to differences in concepts, definitions and statistical practices, micro data may yield results that diverge from national accounts aggregates, and therefore distributional measures created using micro data sources may not be consistent with the aggregate national accounts estimates. To address this, the ABS has recently published results that integrate the ABS micro and macro sources. In essence, they have produced distributional data on household income, consumption and wealth that

1 The views expressed in this paper are those of the author and do not necessarily reflect the views of the Reserve Bank of Australia. This is a preliminary draft so please do not quote.

are consistent with the Australian System of National Accounts (ASNA) concepts and aggregates. I will refer to these distributional data as `matched micro-macro data'.

This matching allows researchers to undertake both top-down and bottom-up analyses on a consistent basis. But the matching also presents some conceptual and practical challenges. I am a central banker by trade and so, in assessing the relative merits of matched micro-macro data, I will take the perspective of a data user and, more specifically, a macroeconomist with a keen interest in micro data. I will address the following questions:

- What are some of the challenges in linking national accounts data with micro data on household balance sheets, income and consumption?
- How has the Australian Bureau of Statistics dealt with these challenges?
- What does the Australian distribution of household wealth, income and consumption look like? Is the picture very different when re-formulated to be consistent with the national accounts? Why or why not?
- What are some of the uses and limitations of these data (from the perspective of a central banker)? I consider two separate examples:
    - Why did the aggregate household saving rate rise sharply in the global financial crisis?
    - How has household economic inequality evolved in Australia over the past decade?

I will now discuss the challenges involved in the matching process, and how the ABS has dealt with them. And then I'll discuss some concrete examples of how the data are useful to policymakers. Along the way, I'll point out some of the pros and cons that I perceive with the matched data.

The Challenges of Matching Micro and Macro Data: The Australian Solution

Coverage Rates

To construct the matched micro-macro estimates, the ABS first compares the household national accounts estimates (macro) to the corresponding household survey estimates (micro).[2] More specifically, the ABS calculates a "coverage rate" for each income, consumption or wealth component. The coverage rate is the ratio of the value of the aggregated micro estimate (from the unmatched unit record data) to the corresponding value of the aggregate macro estimate from the national accounts.

2 My discussion of the challenges in linking micro and macro data borrows heavily from the ABS' recent publication entitled "Australian National Accounts: Distribution of Household Income, Consumption and Wealth, 2003-04 to 2011-12".

It is instructive to consider how coverage rates vary across different components of household income, spending and wealth. Fesseau, Wolff and Mattonetti (2013) provide estimated coverage rates as calculated by experts at various statistical agencies around the world.[3] Some specific estimates of Australian coverage rates can be obtained from an ABS (2013) information paper.

The cross-country estimates of income coverage rates suggest that the aggregated micro data underestimate disposable income as measured by the national accounts. The average coverage rate across all income sources is about 85 per cent. Across income components, the household survey and national accounts data are reasonably well aligned for wages and salaries (with a coverage rate of 93 per cent) and employees' social contributions (94 per cent). In contrast, coverage rates are low for dividend income (53 per cent) and income from self-employment (67 per cent).

The micro and macro estimates of household consumption are typically less closely aligned than household income, with an overall coverage rate of about 75 per cent. Across components, the micro and macro data appear to be relatively well-aligned for spending that is highly visible and frequently observed, such as actual rents paid (98 per cent). In contrast, the aggregate micro data significantly understate the national accounts estimates of spending on tobacco (40 per cent) and alcohol (51 per cent). According to the statistical agencies, the low coverage rates for alcohol and tobacco primarily reflects survey under-reporting.

For household wealth, the overall coverage rate is lower than both income and consumption at about 70 per cent. The most closely aligned wealth components include the value of mortgage debt (103 per cent) and holdings of equities (91 per cent). Notably, the coverage rate on the stock of equities is much higher than on the associated flow of dividend income, on average. In contrast, coverage rates are low for accounts receivable (37 per cent) and intangible fixed assets (48 per cent).

These differences in coverage rates across income, consumption and wealth items are interesting. It would also be informative to consider how the coverage rates vary over time for a given survey. However, these coverage issues are beyond the scope of this paper and I would refer the interested reader to Fesseau et al (2013). I will briefly discuss later some issues in comparing micro and macro estimates of housing wealth.

Adjustments to the Micro Data

Based on the estimated coverage rates, the macro and/or micro estimates for some items are adjusted to derive the most relevant common scope for comparison. To do this, the corresponding micro household items are divided into several household groups: main source of income;

3 It should be kept in mind that the coverage rate is not a measure of the (relative or absolute) quality of the micro estimates; the compilation methods followed by macro data producers may have different degrees of reliability and macro estimates are often subject to revisions. The estimated coverage rates can also differ a lot across countries. Furthermore, the coverage rate for some items is zero because the data are not collected at the micro level.

equivalised income quintiles; household composition (single parent versus couple households etc); age of household reference person; and equivalised net worth quintiles.

The Australian System of National Accounts (ASNA) household components and aggregates were distributed to the various household groups in several different ways depending on the estimated coverage rates:

- directly using the distribution of the equivalent micro component when the coverage rate was considered adequate (e.g. social assistance benefits);
- indirectly by a related micro distribution when there was no direct micro distribution information for the national accounts item (e.g. non-life insurance claims were distributed using the micro distribution for total insurance premiums paid);
- indirectly by creating a micro distribution ('synthesised') based on a related micro distribution (e.g. a synthesised micro distribution was created for financial intermediation services indirectly measured for consumer loans); and
- by the corresponding aggregate distribution for income, consumption, or wealth when micro distributions either directly or indirectly were not available (e.g. retained earnings on foreign investments).

Irregular Cross-sectional Surveys

This matching approach is suitable for the periods in which both micro and macro data are readily available. But, unlike the national accounts, the ABS does not conduct household cross-section surveys every year, nor does it collect information on household income, consumption and wealth in each survey. Over the past decade, the ABS has typically collected income and wealth data (from the SIH) every two years and consumption data (from the HES) every six years (Table 1).[4] In other words, the income and wealth data are more `complete' than the consumption data.

4 The ABS also conducted the Census in 2006 and 2011, which collects individual data for basically the entire population of Australia.

Table 1: Availability of Australian Micro and Macro Data					
	Household-level Income Survey of Income and Housing (SIH)	**Household-level Wealth** Survey of Income and Housing (SIH)	**Household-level Consumption** Household Expenditure Survey (HES)	**Aggregate Income, Wealth and Consumption** National Accounts (ASNA)	**Household-level Income, Wealth and Consumption** Matched micro-macro dataset
2003/04	X	X	X	X	X
2004/05				X	
2005/06	X	X		X	X
2006/07				X	
2007/08	X			X	X
2008/09				X	
2009/10	X	X	X	X	X
2010/11				X	
2011/12	X	X		X	X

This requires the ABS to `fill the gaps' in the survey data. The ABS investigated two options to model the distributional household indicators for the years that the source micro data were not available: 1) use the nearest available source data for the missing years and 2) linearly interpolate (or extrapolate) the data for the missing years. The ABS chose the second option given that the time in between surveys is quite long, especially for the consumption data collected in the HES.

The ABS outlines a simple example to explain the methodology used to linearly interpolate and extrapolate missing values. Let point A be a known value (V_A) at a known point in time (T_A) and let point B be another known value (V_B) at another known point in time (T_B) where $T_B > T_A$. Let point X be an unknown value (V_X) at a known point in time (T_X) that we want to estimate. Linear interpolation allows for the value of point X to be calculated based on the formula:

$$Vx = \frac{(Tx - Ta)\,Vb + (Tb - Tx)Va}{Tb - Ta}$$

To see how this applies, consider the hypothetical ABS example in Table 2 in which we have information on average clothing and footwear spending for each (equivalised) household income quintile in 2003/04 and 2009/10 but not in 2005/06.

Table 2: Household Spending on Clothing and Footwear by (Equivalised) Income Quintile Australian dollars						
Financial Year	**Numeric Year**	**1st Quintile**	**2nd Quintile**	**3rd Quintile**	**4th Quintile**	**5th Quintile**
2003/04	2003	1333	1950	2528	3305	4423
2005/06	**2005**	**1512**	**2089**	**2736**	**16962**	**5238**
2009/10	2009	1871	2366	3152	4277	6869

For the first quintile, using the formula, we would obtain an estimated average spending on clothing and footwear of $1512 for 2005/06. This is shown in the 2005/06 row of the table and below:

$$Vx = \frac{(2005 - 2003) * 1871 + (2009 - 2005) * 1333}{(2009 - 2003)} = 1512$$

This process is repeated to generate data for every other income quintile (and for other household groups, such as wealth quintiles and age groups) for all the survey years in which the consumption data are missing.

Estimating Missing Data Items

A key challenge in linking micro and macro data is dealing with missing components. Micro data sources often do not provide information for a number of national accounts components (Fesseau et al (2013)). Some examples include:

- Employers' imputed social contributions
- Financial Intermediation Services Indirectly Measured (FISIM)
- Reinvested earnings on foreign direct investment
- Property income attributed to insurance policy holders
- Social Transfers in Kind
- Imputed rents for owner-occupied housing

These components can be missing in micro sources for both conceptual and practical reasons. For example, the compilers of micro statistics may consider that some national accounts components that are useful for describing the economy as a whole are not relevant when the focus is the economic behaviour of households (e.g. FISIM). On the other hand, some components of national accounts aggregates may be missing for practical reasons because the information is difficult to collect or impute (e.g. imputed rent for owner-occupier households).

In the Australian case, the earlier household surveys (2003/04 and 2005/06) also did not include some balance sheet items that were collected in later surveys (2009/10 and 2011/12). This implies that the aggregated data from the earlier surveys underestimate the size of household balance sheets relative to later surveys. This is particularly problematic in the case of missing income and wealth data as these data are used to derive the income and wealth quintiles. The missing data items were estimated by applying `factors' to the earlier survey data.

To take an example, there is distributional information on Social Transfers In Kind (STIK) in the 2009/10 and 2011/12 surveys but not the 2005/06 or 2007/08 surveys. The later surveys can be used to estimate the relative contribution of income (and spending) that is due to STIK for each income quintile in the earlier surveys. In 2011/12 these transfers made up a relatively large share of income for poor households (in the bottom quintile) at 44 per cent and a low share of income for rich households (in the top quintile) at 8 per cent. These factors can be then applied to the earlier survey data depending on the relative position of each household in the income distribution. The ABS methodology paper is not clear on how these factors are calculated (or applied) but presumably the income of each household is scaled up by the proportion of STIK depending on their quintile. Regardless, the ABS indicates that relatively few items are affected by this procedure.[5]

Out of Scope Households

There is an additional practical challenge in incorporating information on people that are typically out of scope for micro surveys, such as those living in very remote communities and those living in non-private dwellings (e.g. prisons, hospitals, nursing homes). These people were excluded from the ASNA estimates and distributed separately using data from the 2006 and 2011 ABS Census of Population and Housing. These distributions were then added to the ASNA distributions based on the micro surveys to obtain the final distribution of the ASNA household balance sheet estimates.

Practical Uses and Limitations of Matched Data: A Central Banker's Perspective

Despite being a macroeconomist I am a strong advocate for micro data and analysis. In fact, I believe the future of applied macroeconomic research *is* micro data. So it's interesting to consider the types of policy questions that we can address with the matched micro-macro data. Based on my perspective as a macroeconomist I will now run through some examples that demonstrate the benefits and limitations of the matched distributional estimates.

5 It would seem possible to use more advanced econometric techniques to allow for changes in the distribution over time. For instance, there is detailed information on the characteristics of individual households in each survey year (e.g. income, education, age, migrant status). It should be possible to replace missing estimates of, say, household spending for each individual household using their observed characteristics and matching techniques. The resulting distribution could then be adjusted to be consistent with the national accounts aggregates.

The Rise in Household Saving in the Global Financial Crisis

Australia experienced a sharp rise in the household saving rate during the global financial crisis (Figure 1). In fact, the saving rate more than doubled within the space of just six months and has basically remained at an elevated level since then. Similar sharp increases in household saving occurred in other advanced economies (Mody, Ohnsorge and Sandri (2012)). Household saving has largely remained elevated since that time. This raises an obvious question: what caused the saving rate to rise? The distributional data are clearly suited to addressing this type of question as they allow us to dig deeper into the national accounts estimates, and examine *which* households are responsible for the change in saving behaviour.

Figure 1

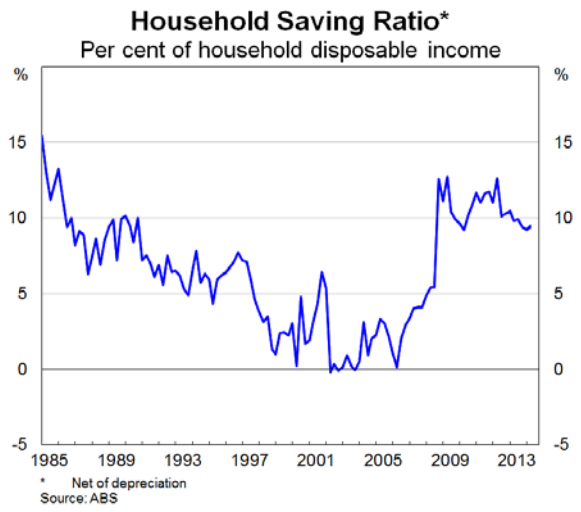
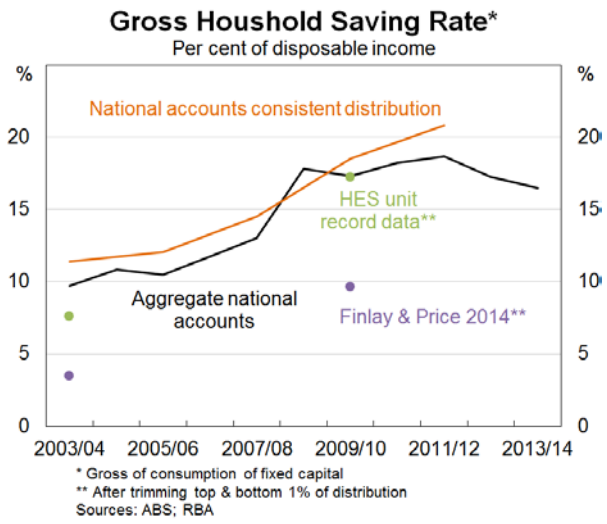


Figure 2



To begin, it is worth noting that the household saving rate implied by the matched data lines up slightly better with the national accounts than the estimate based on the unmatched unit record data (Figure 2). This is not surprising given the data are specifically designed to be consistent with the national accounts. More importantly, the *trends* in the matched and unmatched data are essentially the same, presumably due to the linear interpolation method. And this particular research question is about explaining the *change over time* in the saving rate. For this practical purpose, it appears that the matched data do not contribute much *over and above* the (aggregated) unmatched unit record data because they do not really allow for distributional changes over time.

Looking more closely at the disaggregated matched data, there is very wide dispersion in saving rates across income groups; the richest households save more than 30 per cent of their disposable income while the poorest households spend about 130 per cent of their disposable income, on average (Figure 3).

The matched data also indicate that the rise in saving over the decade was very broad-based; saving rates rose at a similar rate in each income quintile (Figure 3) wealth quintile (Figure 4) and age group (Figure 5).

Figure 3

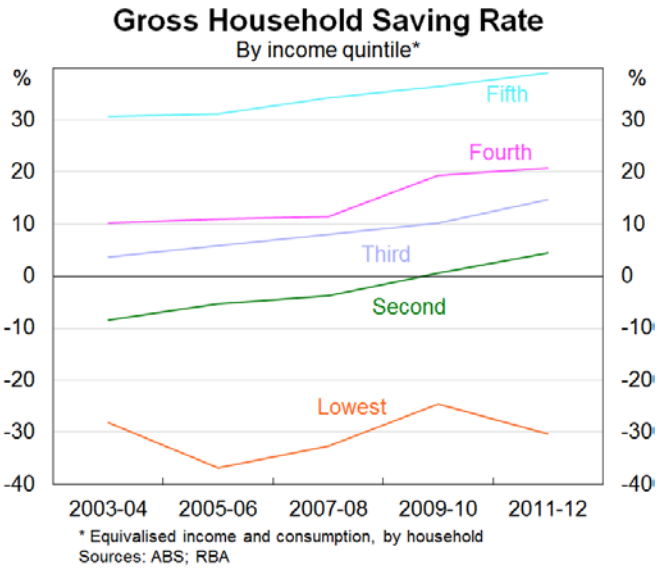


Figure 4

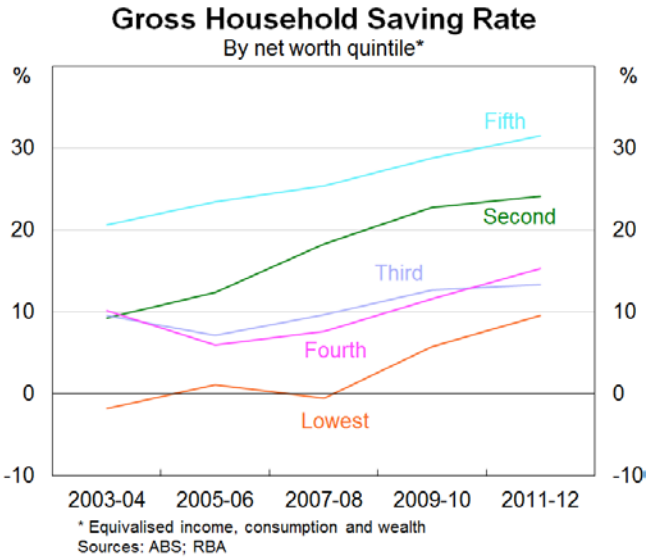
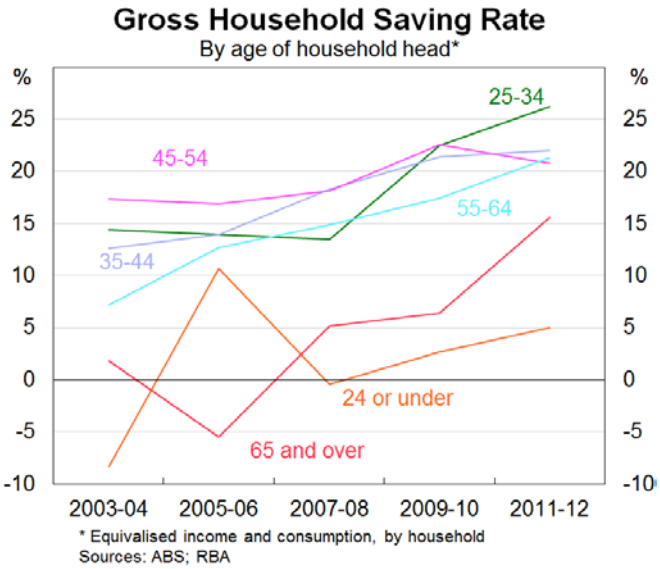


Figure 5



These decompositions illustrate a key limitation of the matched data in that they are only currently available on a univariate basis. More specifically, there is information on spending by income group *or* age group but not income *and* age group. And there is no information on the distribution of household spending and income across other important dimensions, such as the level of education of the household head. In contrast, the unit record data, even if unmatched, provide flexibility in allowing the user to explore the data in a multivariate fashion. Moreover, the unit record data can be used to estimate econometric models that control for a wide range of observed household characteristics that might explain household saving (see Finlay and Price (2014) for a more detailed analysis of the Australian case).

Taking this argument one step further, to properly model household saving behaviour, ideally we would have longitudinal household information (with the same households sampled each period) rather than repeated cross-sectional surveys (with different households sampled each period). There are significant benefits to having panel data on households as opposed to the repeated cross-sections available in the matched ABS data. For example, by allowing us to track the same individuals over time, panel data would allow us to control for unobservable characteristics that do not vary with time (e.g. a person's level of risk aversion). Therefore, as a user, I would argue that statistical authorities should focus more on building longitudinal panel datasets than on matching cross-sectional surveys to national accounts. I'll discuss this point in more detail in the next example.

In summary, the household saving rate example suggests that the matched data are consistent with the national accounts as the two aggregate estimates line up very well at a point in time. But the matched data do not really provide any new information about distributional changes over time. For this, we still need the unmatched unit record data. In other words, the matched data are a complement rather than a substitute for the unmatched unit record data.

The Evolution of Household Economic Inequality in Australia

The matched dataset can also be used to explore various dimensions of household economic inequality, including inequality in household income, wealth and consumption. I will consider each type of inequality in turn.

Income Inequality

Similar to several other advanced economies, Australia has experienced an increase in income inequality over the past decade (Piketty (2013)). However, the rise in inequality has been relatively modest compared to countries such as the United States. We can construct estimates of inequality using the share of aggregate income that flows to the richest households. According to the matched data, the share of total gross income accounted for by the richest households (in the top quintile) rose by 1.4 percentage points from about 40.6 per cent in 2003/04 to 42.0 per cent in 2011/12 (Figure 6, left-hand-side panel). The unmatched data suggest a relatively similar trend in inequality, although the level of inequality is lower by 5 percentage points on average. The estimates of disposable income inequality (which takes into account the effect of government taxes and transfers) display a similar time-series pattern (Figure 6, right-hand-side panel). Although, somewhat surprisingly, the matched estimates for disposable income inequality are lower than the corresponding unmatched estimates (which is the opposite pattern to gross income inequality).[6]

6 The inclusion of social transfers in kind (STIK) significantly affects the level of measured inequality but it appears to have little impact on the trend. When we adjust the income estimates to account of STIK, the share of disposable income accounted for by the top earners rose from about 33 per cent in 2003/04 to 34.5 per cent in 2011/12

Figure 6

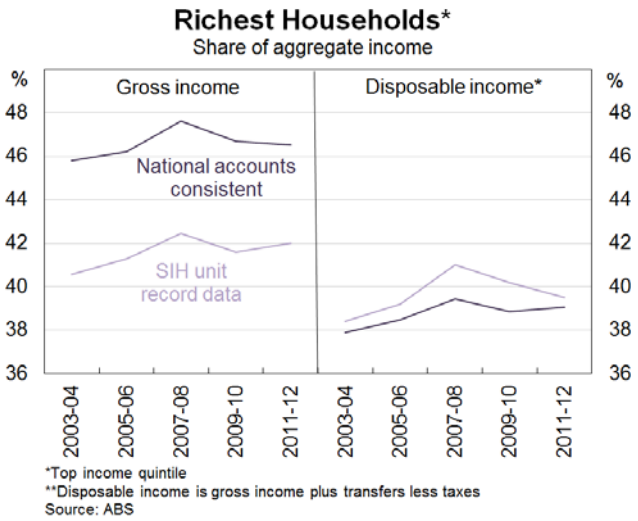
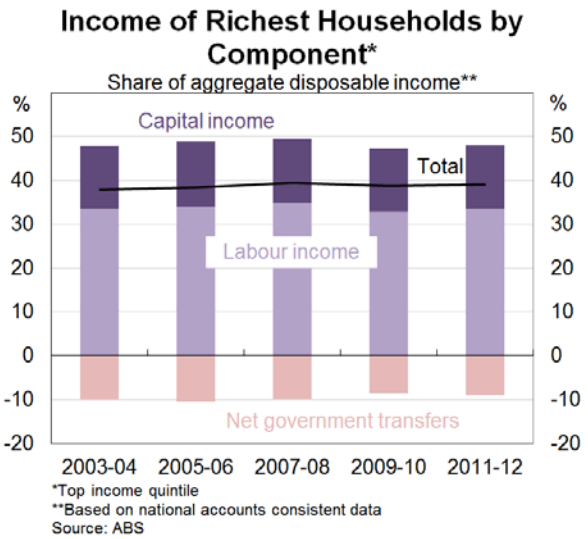


Figure 7



As in the saving rate example, the very similar trends in the unmatched and matched data should not be too surprising given the interpolation method used by the ABS. But, saying that, there are differences; for instance, between 2009/10 and 2011/12, the matched estimates suggest that disposable income inequality was rising, while the unmatched estimates imply that it was falling. The fact that there are some differences in the trends for disposable income inequality implies that there might be new information in the matched data.[7] But what factors are driving the differences?

The matched data allow us to decompose total gross disposable income into different components (e.g. labour and capital income, as well as net government transfers). This allows us to calculate, for aggregate disposable income, the individual contributions of the income components for rich households. This decomposition implies that the rise in income inequality between 2003/04 and 2007/08 was fully explained by an increase in labour income inequality (Figure 7). For the decade as a whole, a decline in income taxes on rich households appears to explain the slight rise in overall inequality in household disposable income.

We could perform a similar decomposition with the unmatched data and this might help to shed light on the different trends in inequality. But I suspect the slightly different trends between the matched and unmatched inequality estimates are due to different income definitions underpinning the quintile decompositions. More precisely, in any given survey year, a household in the top income quintile based on the matched estimates might be in a lower quintile based on the unmatched data due to, say, the inclusion of certain income items (e.g. FISIM) in only the matched estimates. However, as in the saving rate example, there is a limit to our ability to determine whether this is the case given the matched data are only available on a univariate basis.

7 It is likely that matched data would be very useful for understanding household spending patterns in the United States. Several papers document the fact that aggregate measures of expenditure from the US Consumer Expenditure Survey (CES) do a poor job of reproducing the level of expenditure in the national accounts data (e.g. Garner and Maki (2004), Attanasio, Hurst and Pistaferri (2012)).

Wealth Inequality

Wealth inequality has also risen in Australia over the past decade. The matched data indicate that the share of total net wealth accounted for by the wealthiest households rose from 61.4 per cent in 2003/04 to about 63 per cent in 2011/12 (Figure 8). The rise in wealth inequality actually occurred over the first half of the decade, with wealth inequality falling slightly since 2007/08.

As in most advanced economies, housing wealth is the largest component of aggregate household wealth in Australia. Somewhat surprisingly though, changes in housing prices do not appear to be the main determinants of changes in inequality over the past decade. Instead, the matched data suggest that the rise in wealth inequality has been due to a rise in inequality in financial asset holdings and, in particular, superannuation and insurance reserves (Figure 8).

Figure 8

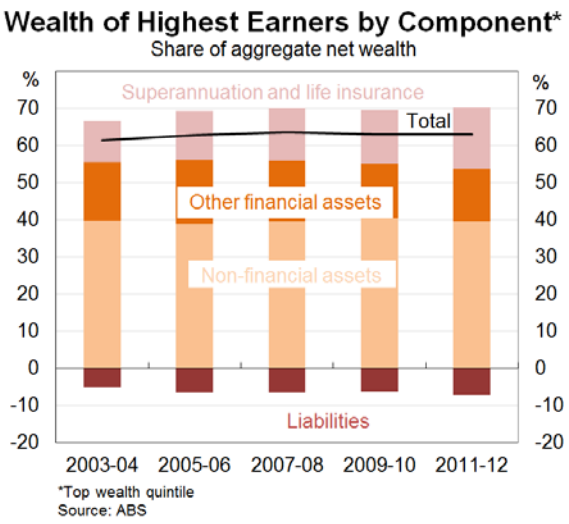
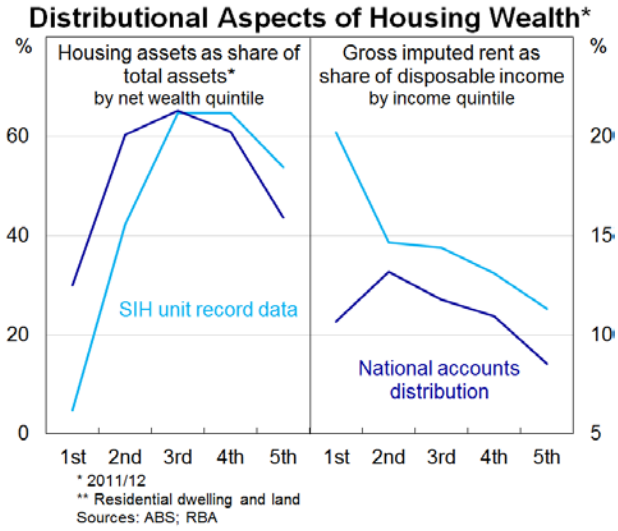


Figure 9



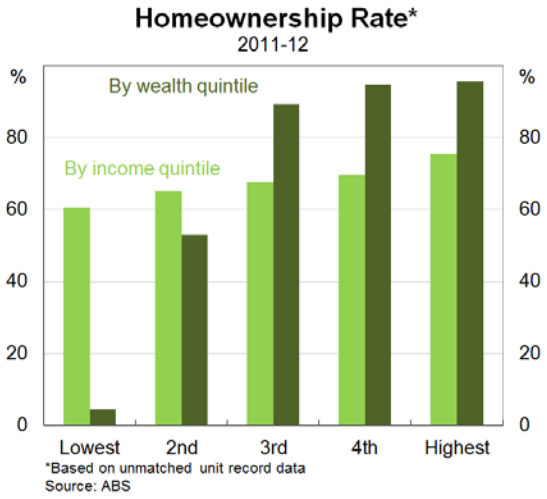
But that is not to say that housing does not matter for wealth inequality. According to the matched data, housing assets comprise a relatively small share of total assets for low-wealth households (at about 30 per cent), but close to 70 per cent of total assets for households in the middle wealth quintiles (Figure 9, left-hand side panel). The picture is very different when we look at the role of housing in income inequality. In this case, the imputed rent from housing makes up a relatively large share of income for low-income households (Figure 9, right-hand panel).

Interestingly, these differences in the income and wealth distributions suggest that changes in housing prices can have very different effects on income and wealth inequality. In particular, a rise in housing prices will typically cause wealth inequality to rise but income inequality to fall, all other things being equal.

This is because low-*income* households are not

Figure 10

the same as low-*wealth* households. Low-income households comprise a relatively large share of older retired households that own their own homes. Low-wealth households include a high share of young households that are credit-constrained and rent. In effect, the homeownership rate is much higher amongst low-income households than amongst low-wealth households (Figure 10). This difference in homeownership rates affects the sensitivity of inequality to housing prices.



This again demonstrates some of the limited capability of the matched dataset – the information about different homeownership rates within income and wealth quintiles (and hence the underlying cause of changes in inequality) can only be gleaned from the unmatched unit record data.

Given the potential sensitivity of the distributions of wealth and income to housing prices it is worthwhile considering how the ABS constructs its estimates of housing wealth on both a micro and macro basis. To obtain a macro estimate of the total value of the dwelling stock in Australia, the ABS uses information from home sale prices (with econometric adjustments made for the value of homes that are not sold). In other words, the macro estimate of housing wealth is based on the market value of the dwelling stock. In contrast, micro estimates of housing wealth are typically taken from household surveys and are based on self-reported assessments by surveyed homeowners.

The discrepancies between the micro and macro estimates might be quite informative about the state of the economy and, in some cases, macroeconomists might find it useful to preserve these differences. For instance, there may be differences between how much individual homeowners believe their homes are worth (as implied by the survey responses) and how much the market thinks they are worth (as implied by market valuations). In fact, Windsor, La Cava and Hansen (2014) use household-level panel data to show that the differences between homeowner beliefs and market valuations (`home valuation differences') are useful for predicting household consumption, leverage and wealth portfolio allocations. By attempting to reconcile these separate estimates we may be `throwing away' valuable information about the state of the housing market. In effect, we should again think of the matched and unmatched estimates as being complementary.

Consumption Inequality

Inequality studies typically focus on income and, to a lesser extent, wealth inequality. But there are several reasons why it is useful to also examine consumption inequality. First, some economists

consider consumption to be a more appropriate measure of household wellbeing than income. If some households smooth temporary fluctuations in income by borrowing and saving, then income will be more variable than expenditure at a point in time and hence income will overstate the level of inequality in household welfare. Second, estimates of inequality based on consumption can be a useful cross-check if income estimates are affected by measurement error. Third, examining changes in the distribution of consumption relative to income can shed light on household saving and borrowing patterns (Beech, Dollman, Finlay and La Cava (2014)).

Unfortunately, the ABS matched dataset does not provide enough information on the household consumption distribution to be able to split households into consumption quintiles. However, the ABS does provide consumption data divided by income quintiles. So we can proxy for consumption inequality by looking at the share of total household expenditure accounted for by the richest households (i.e. consumption can be divided by *income* quintiles).

These estimates indicate that consumption inequality is lower than income and wealth inequality (Figure 11). This suggests that households are able to smooth fluctuations in income through borrowing and saving. Moreover, consumption inequality has been unchanged over the past decade; the richest households accounted for about 30 per cent of household consumption each year.

Figure 11

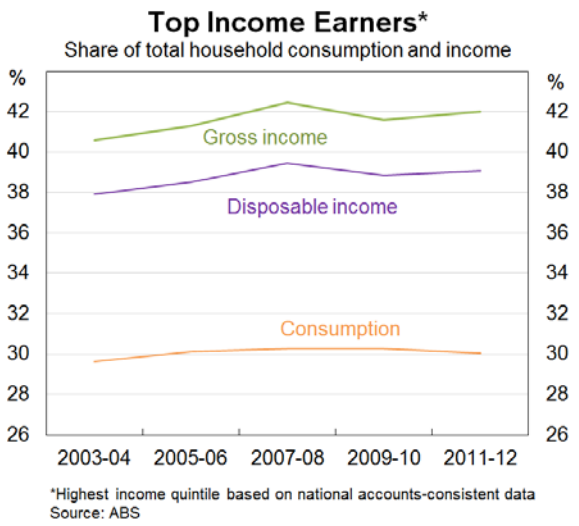
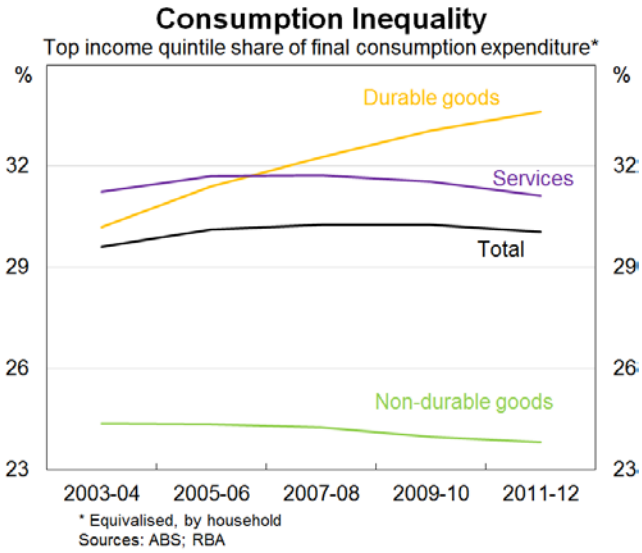


Figure 12



The lack of a trend in the overall consumption inequality estimates disguises different trends in the underlying spending components. For instance, the matched estimates imply that the richest households are increasingly accounting for a larger share of durable goods spending (especially on clothing and footwear) while services and non-durable goods spending have become more equally distributed across the household population (Figure 12).

Ideally, we would be able to examine the joint behaviour of the distributions of income and consumption in the matched dataset. But the data do not allow this. This is similar to the previous

example – the general lack of longitudinal information makes it difficult to properly model the determinants of household economic inequality. Again, panel data are really needed to model income dynamics and be able to distinguish between permanent and temporary income shocks (e.g. Blundell (2014)). So, as a data user, I would again argue that statistical authorities should focus less on matching surveys to national accounts and more on building databases that exploit existing longitudinal administrative data (e.g. tax records, medical records).

Summary

The matched data produced by the ABS has a number of advantages over previously separate distributional and aggregate datasets:

Strengths

1) Consistency

The main strength of the matched data is its consistency along several dimensions. First, the data are *consistent with aggregate benchmarks*; the distributional data are benchmarked to the national accounts enabling users to interpret household distributional data within the broader context of published estimates on the Australian economy. Second, there is a *consistent time-series* with linear interpolation (and other modelling techniques) implemented where data were missing. Third, the data are *consistent with international standards*; the dataset is based on work undertaken in an Organisation for Economic Cooperation and Development and Eurostat expert group for measuring disparities in the national accounts. As a result, the ABS data are comparable with any time-series analysis on the distribution of household income, consumption and wealth in a national accounts framework performed by members of the expert group.

2) Complementarity

The construction of matched datasets allows users to separately undertake both top-down and bottom-up approaches, while also allowing them to directly reconcile the two sets of estimates through the matched data. To achieve this, it will be important to ensure users can always access the unit record data. The matched data are a complement (and not a substitute) for unmatched unit record data.

3) Adaptability

The existing matched dataset can be extended with future data points and revised with new source data, enabling a more accurate and longer time series. The time-series is based on a methodology

formulated through an international expert group, and new source data from micro surveys or the national accounts can be used to easily revise and update the current data with future data points.

Weaknesses

The ABS has identified some limitations of the current matching approach – the long time between surveys and the lack of data on remote communities. From the perspective of a data user, I believe there are a few other limitations of the matched data:

1) Relative Contribution

In the Australian case at least, we already have micro data that is reasonably consistent with the national accounts. For example, the aggregate household saving rate follows basically the same trend in the national accounts and aggregated unit record data even *prior to* matching. And, in cases where there are different trends in the matched and unmatched data, such as disposable income inequality, there is currently insufficient information in the matched dataset to determine the factors that might be driving these differences.

2) Lack of Longitudinal Information

There are significant benefits to having panel data on households as opposed to repeated cross-sections (as represented by the matched ABS data). I would argue that statistical agencies should focus more on developing databases based on existing longitudinal administrative data and less on databases that link micro and macro data.

3) Timeliness

The matched Australian data currently has a two-year publication lag, with the latest available data for 2011/12. As a result, the matched data enable us to better analyse past events, but the data are less useful for understanding recent developments in the economy. So it might be worth considering whether it makes sense to collect a more narrow set of micro data to increase timeliness. Again, existing administrative datasets, such as tax records, are reasonably timely and could be useful for this purpose.

Gianni La Cava
Reserve Bank of Australia
30 October 2014

References

Attanasio O, E Hurst and L Pistaferri (2012), 'The Evolution of Income, Consumption and Leisure Inequality in the US, 1980-2010', National Bureau of Economic Research (NBER) Working Paper No 17982

Australian Bureau of Statistics (2013), 'Information Paper: Australian National Accounts, Distribution of Household Income, Consumption and Wealth, 2009-10', Cat No 5204.0.55.009, Canberra.

Australian Bureau of Statistics (2014), 'Australian National Accounts: Distribution of Household Income, Consumption and Wealth, 2003-04 to 2011-12', Cat No 5204.0.55.011, Canberra.

Beech A, R Dollman, R Finlay and G La Cava (2014), 'The Distribution of Household Spending in Australia', RBA Bulletin, March 2014

Blundell R (2014), Income Dynamics and Life-cycle Inequality: Mechanisms and Controversies, The Economic Journal, 124 (576), May 2014, pp 289-318.

Fesseau M, F Wolff and ML Mattonetti (2013), 'A Cross-Country Comparison of Household Income, Consumption and Wealth Between Micro Sources and National Accounts Aggregates,' November 2013

Finlay R and F Price (2014), 'Household Saving in Australia', RBA Research Discussion Paper No 2014-03.

Garner TL and A Maki (2004), 'The Gap Between Macro and Micro Economic Statistics: Estimation of the Misreporting Model using Micro-data Sets Derived from the Consumer Expenditure Survey', mimeo

Mody A, F Ohnsorge and D Sandri (2012), 'Precautionary Saving in the Great Recession', IMF Economic Review, 60, pp 114-138

Piketty T (2013), 'Capital in the Twenty-First Century', Harvard University Press

Windsor C, G La Cava and J Hansen (2014), 'Home Price Beliefs in Australia', RBA Research Discussion Paper No 2014-04.

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Linking micro and macro data – old and new questions for central banks[1]

Fabrizio Zampolli, Bank for International Settlements

[1] Discussion of the presentation *"The development of databases linking micro and macro data – an Australian perspective"* by Giancarlo La Cava, Reserve Bank of Australia. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

BANK FOR INTERNATIONAL SETTLEMENTS

Discussion:
The development of databases linking micro and macro data – An Australian perspective
by Giancarlo La Cava

Fabrizio Zampolli
Bank for International Settlements

Satellite meeting of the IFC at the ISI Asian Regional Conference
«Is the household sector in Asia overleveraged? What do the data say?»
Kuala Lumpur, 15 November 2014

The views expressed here are may own and do not necessarily reflect those of the BIS

My discussion

1. Overview of the paper
2. Further examples / questions

Overview of the paper

- Describe method adopted by the ASB for matching micro and macro data
  - Coverage rate? Time variation?
  - Linear interpolation? Is there a better method exploiting unit micro data?
- Overall, I agree with the main conclusion of the paper:
  - Statistical agencies should focus more on making micro data set richer and more timely than on matching micro & macro data
  - At the same time, the disaggregate matched data may perhaps provide more insights than what the examples of the author suggest

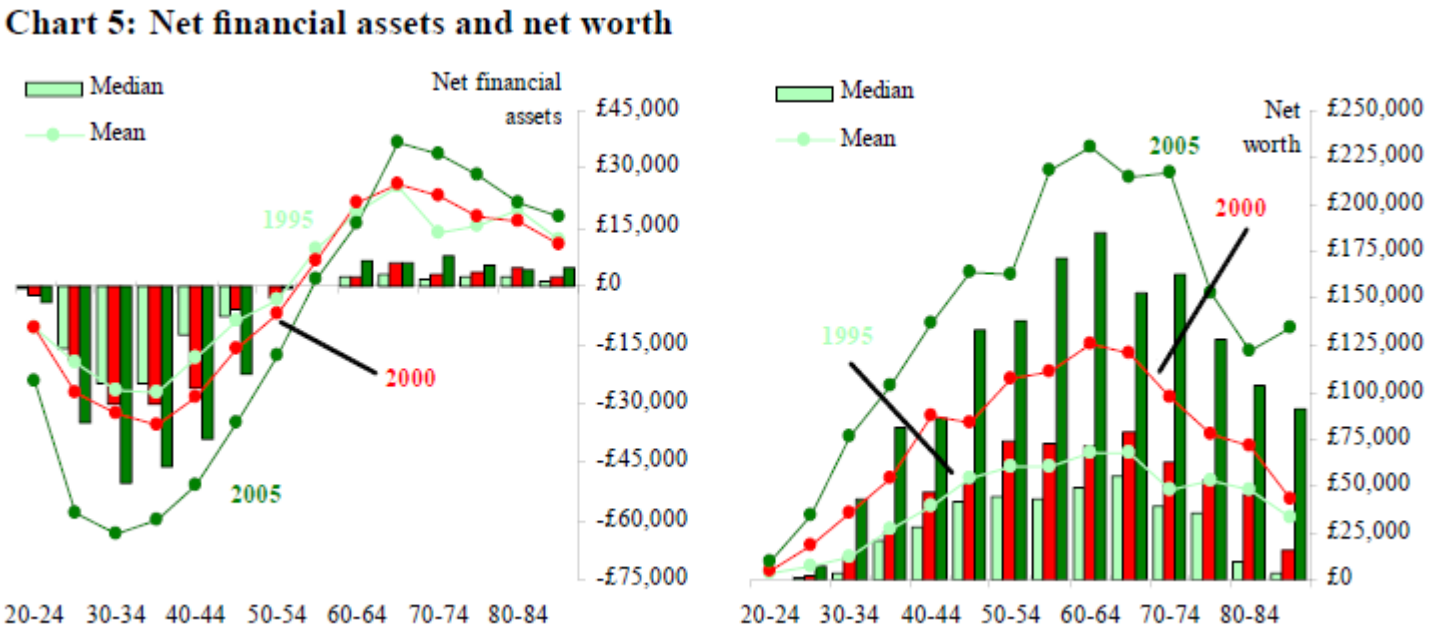
Rise in saving rate since 2007

- Matched and unmatched data show a similar time trend
- Rise is broad-based across income, net worth and age distribution
  - However, the rise in the saving rate for +65 is steeper!
  - Rise in saving rates may be a response to a change in net worth / net housing wealth / income
    - Even if univariate, matched data when looked at jointly may provide more information
    - Enough data to calibrate a life cycle model of saving…
- Do disaggregated matched data provide more information than in the example?
  - Use of pseudo cohorts? Deaton (1985): error-in-variable / heteroskedasticity / necessarily inferior to panel data (eg attrition)?

Rise in inequality?

- Matched and unmatched data show similar trends in income inequality (disposable income), although diverging since 2009
  - Possible reason is differences in income definitions
- Wealth inequality:
  - Rise in wealth inequality due to a rise in financial wealth inequality
    - Not surprising as housing generally represents smaller share for top earners than average earner
  - Has the housing boom increased inter-generational inequality?
    - Benefited the old more than the young?

Example: Debt and housing boom in the UK



- One of the drivers is a declining real interest rate
- It may sound counter-intuitive but lower interest rates may have benefited the old more than the young…
- Do matched data for Australia show a similar pattern?

Old and new questions for central banks requires distributional data

- **Old Q: How does the distribution of wealth & debt affect the monetary transmission mechanism?**
  - Aggregate debt not enough. Useful to know about:
    - the distribution of debt / wealth across age groups (MPC varies across the life cycle and depends on the amount of debt / net worth)
    - Characteristics of contracts (fixed vs variable rate; period of fix rates, etc)
  - Econometric model estimates based on long sample may not be reliable when there are sharp changes in distribution
  - Eg debate at the BoE in 2005-2006 about the size of the monetary policy multiplier: higher debt offset by longer maturities?

Old and new questions for central banks requires distributional data

- **Negative equity?**
  - UK and other countries' household debt larger than US but less negative equity after the bust (and less than in 1992 bust)

- **Level of debt or its rate of increase?**
  - Fast credit growth may be associated with misallocation of resources or concentration of risk
  - Important to understand who is borrowing and contract characteristics (teaser, discount rates, etc)
  - eg US subprime

New key questions for central banks

- **Q1: Limits of monetary policy in the post crisis environment?**
  - Low interest rates should provide a cash flow boost to debtors, helping them to deleverage
  - Low interest rate should encourage savers to save less…
  - … but their effectiveness depends on relative strength of substitution and income effects
  - Households (especially middle age / pre-retirement) may have life-cycle saving objectives: they may save more, not less if confronted with persistently or permanently low interest rates
- **Q2: What is the impact of unconventional monetary policy OR very low interest rates on the distribution of wealth and income?**
  - First round distributive effects involve substantial transfers from creditor to debtors
  - But ultimate effects very complex (eg housing is boosted by low interest rate and may favour the old) … and largely unknown.

Thanks

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Using household balance sheet and housing data for systemic risk assessment and policy formulation – Malaysia's experience[1]

Chin Ching Lau, Central Bank of Malaysia

[1] This presentation was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

IFC Satellite Seminar
"Is the household sector in Asia overleveraged: what do the data say?"

Session 5: Using household balance sheet and housing data for systemic risk assessment and policy formulation – Malaysia's experience

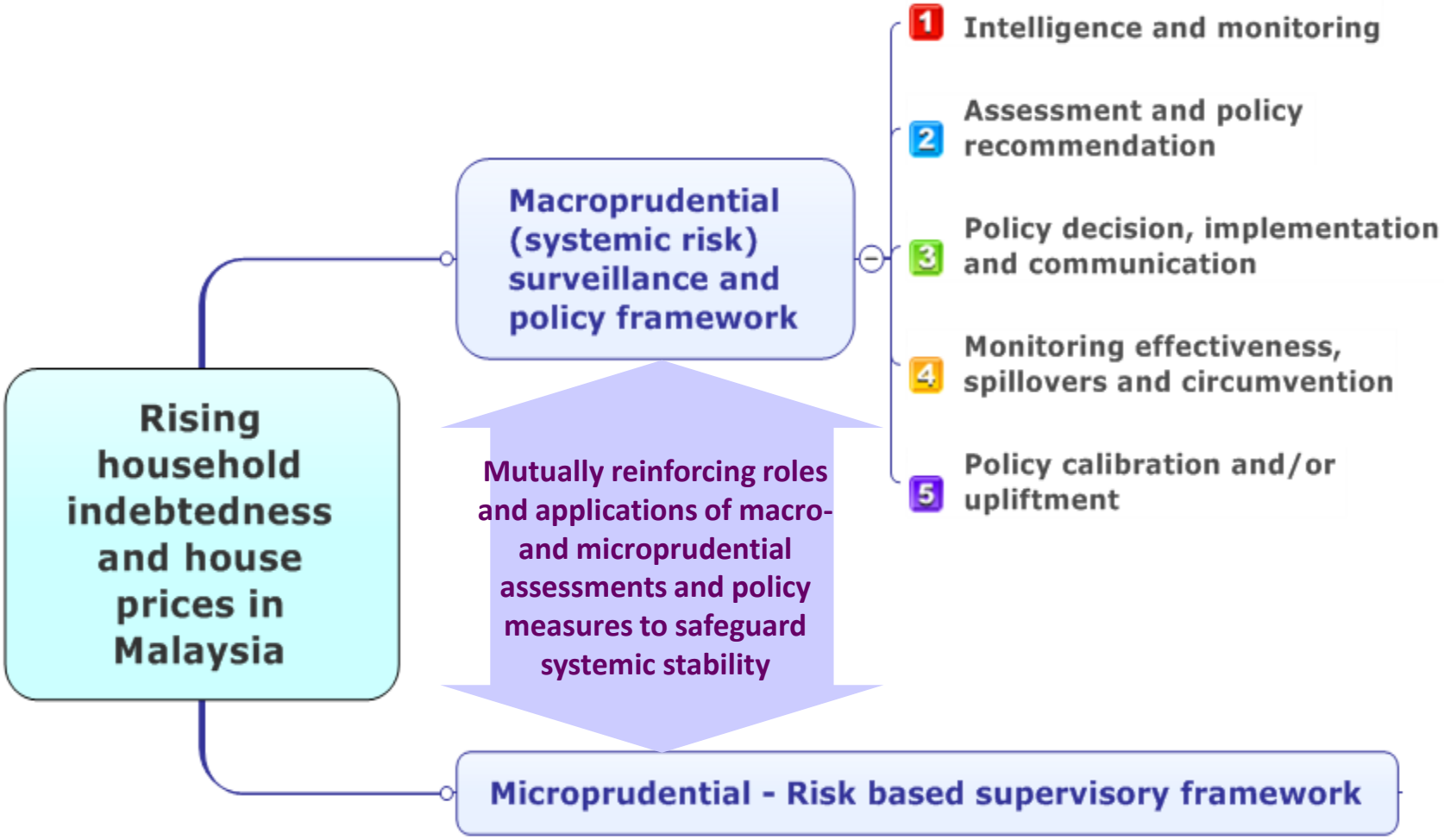
Chin Ching Lau, Bank Negara Malaysia

15 November 2014

“If you can’t explain it simply, you don’t understand it well enough.”

Albert Einstein, Physicist

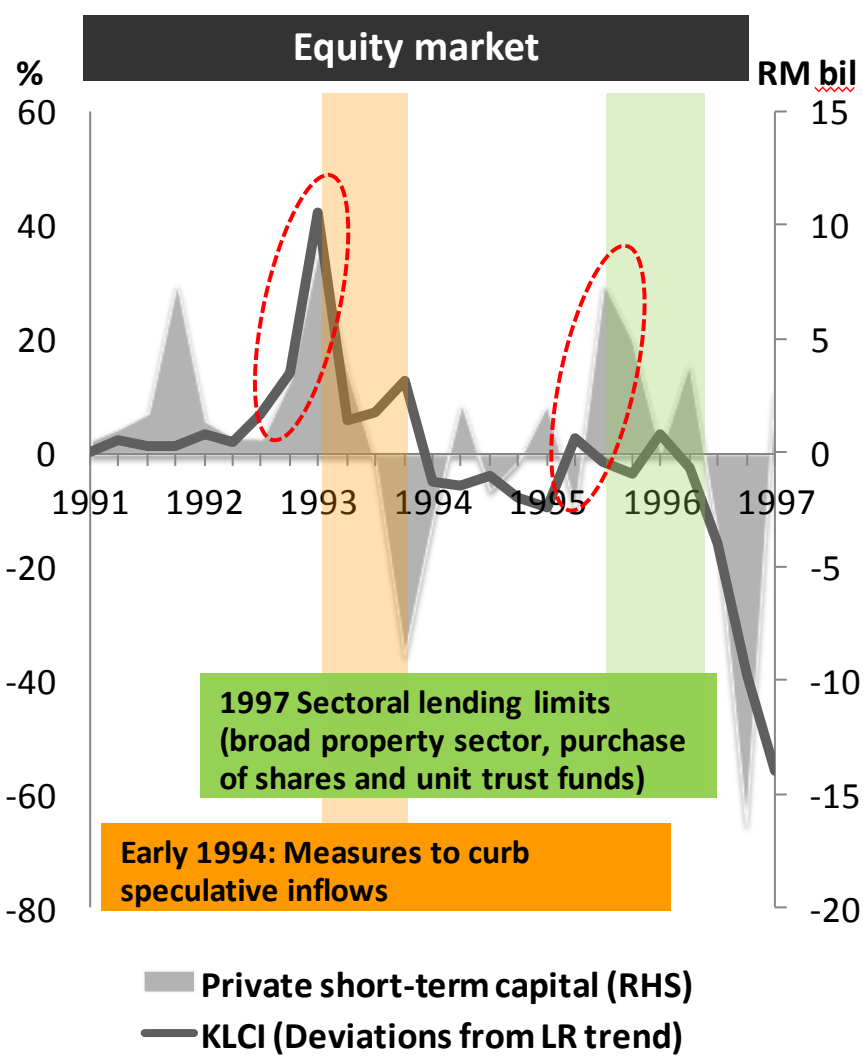
Systemic risk assessment and mitigation measures in Malaysia – *case study*

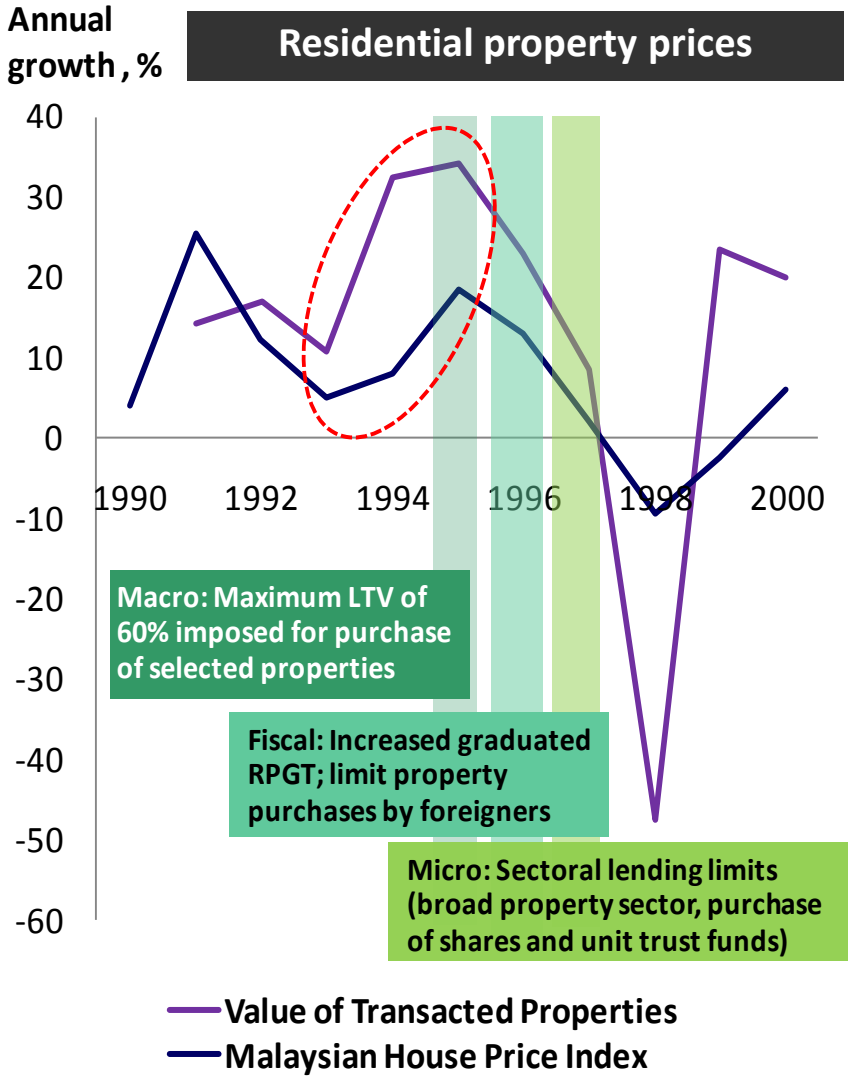


“Those who do not remember the past are condemned to repeat it.”

George Santayana, Philosopher and Writer

In the 1990s, excessive asset price build-up coincided with surges in capital inflows





“I never guess. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.”

Sir Arthur Conan Doyle, Author of Sherlock Holmes stories

“The temptation to form premature theories upon insufficient data is the bane of our profession.”

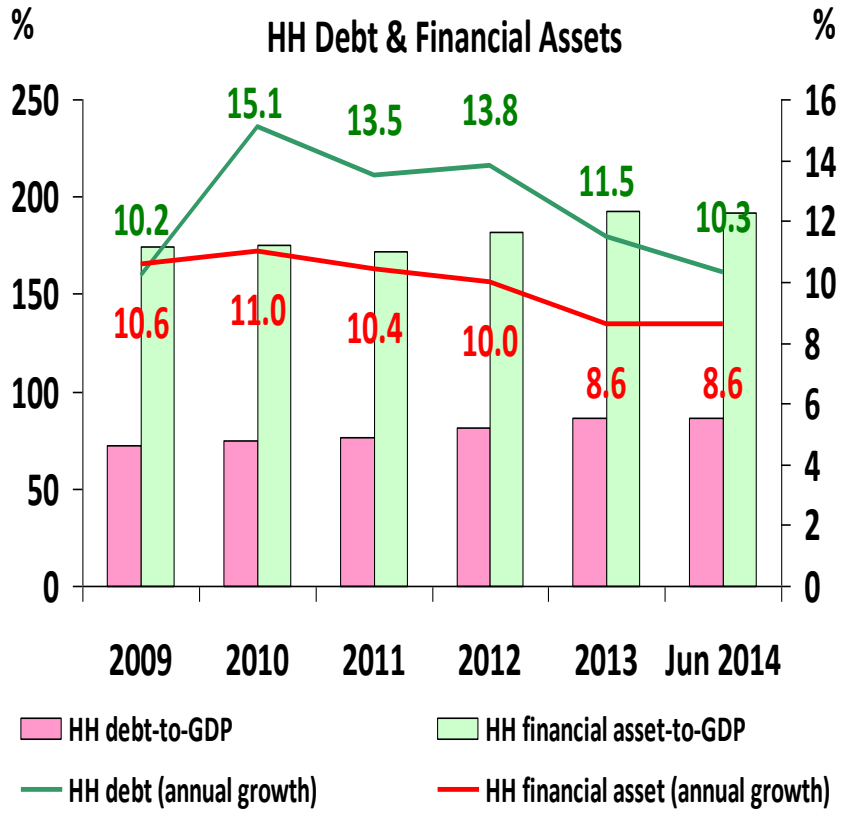
Sherlock Holmes, Fictional detective

Intelligence and monitoring

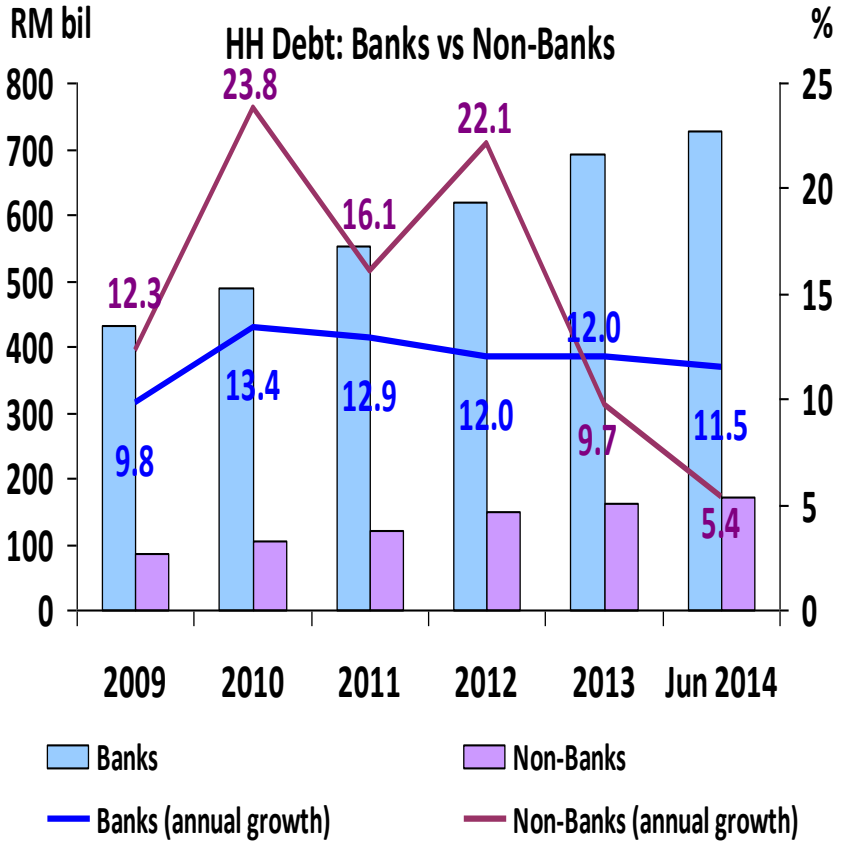
1 Growth in household (HH) debt reached 15.1% in 2010, amid rapid expansion by non-bank lenders

HH debt CAGR 2007-09: +9%

High leverage of lower income group (~7 times)



Non-banks: 19% of total HH debt (2009: 16.4%)



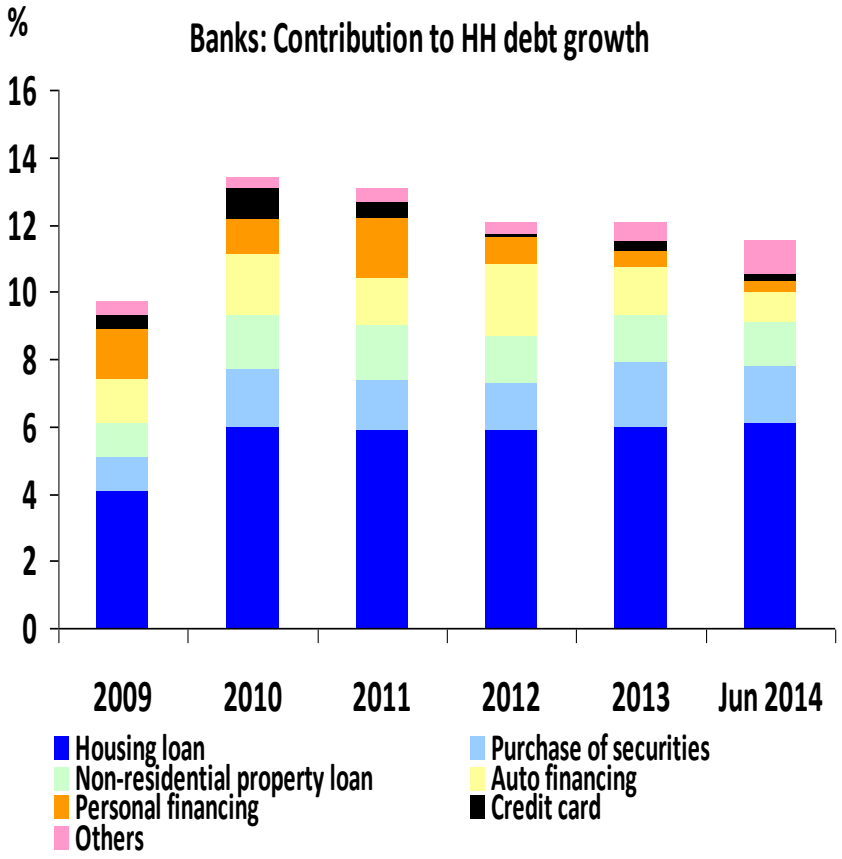
Source: BNM estimates

Intelligence and monitoring

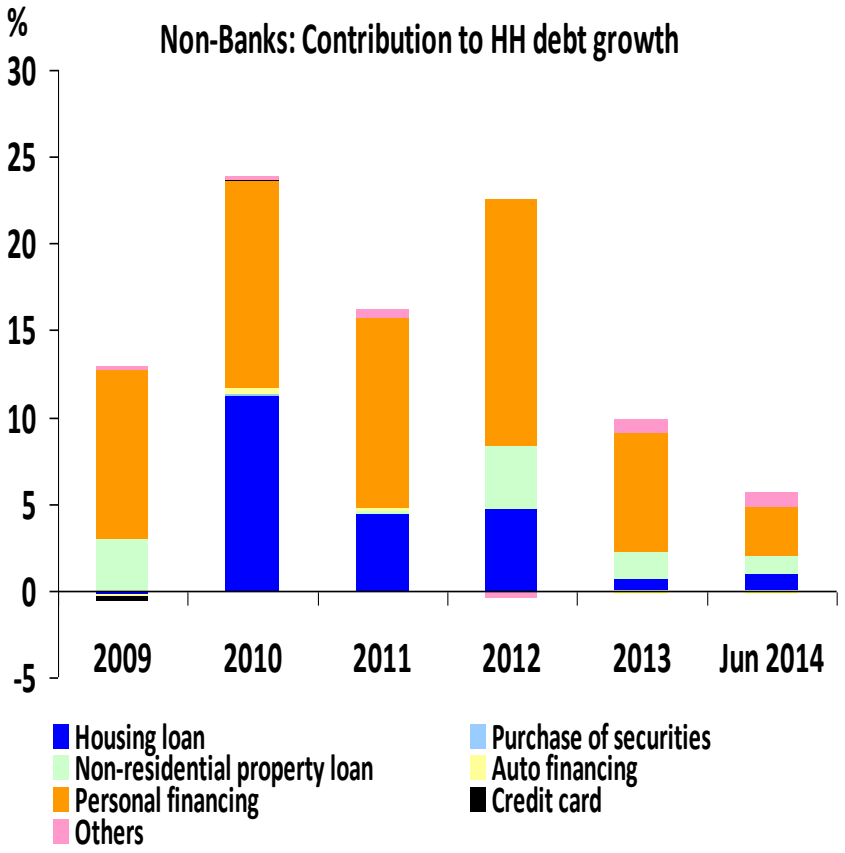
1

Expansion in HH debt driven by housing loans by banks and personal financing by non-bank lenders

Banks: 47.5% of HH lending for housing (2009: 46.7%)



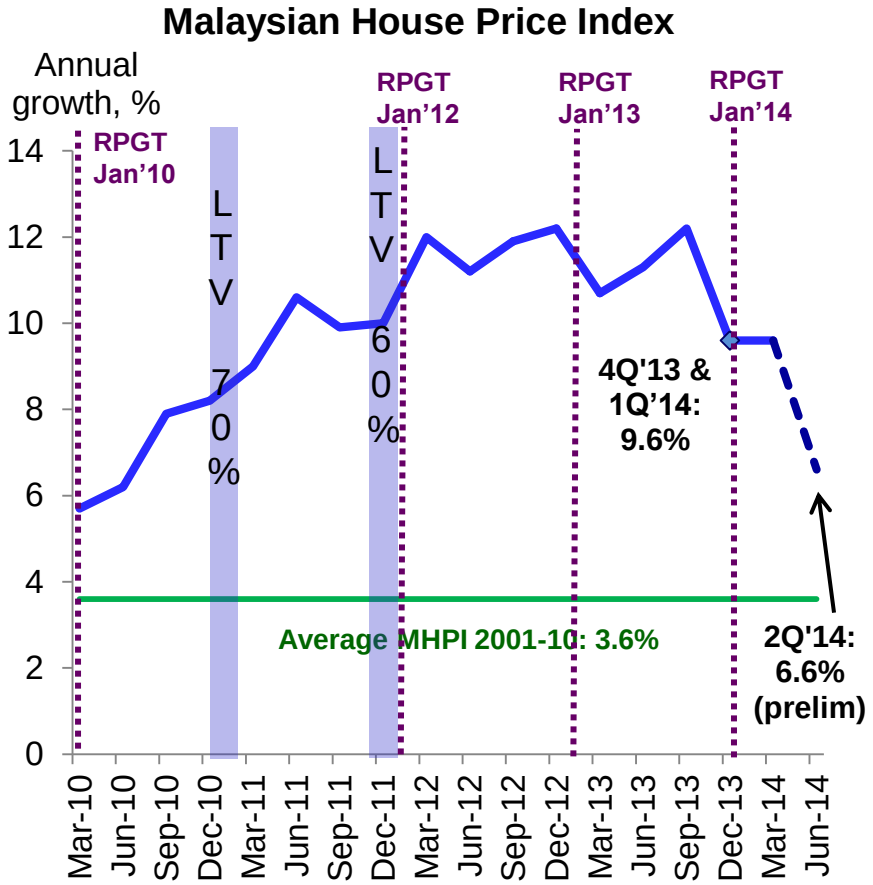
Non-banks: 50.6% of HH lending for personal finance (2009: 42.1%)



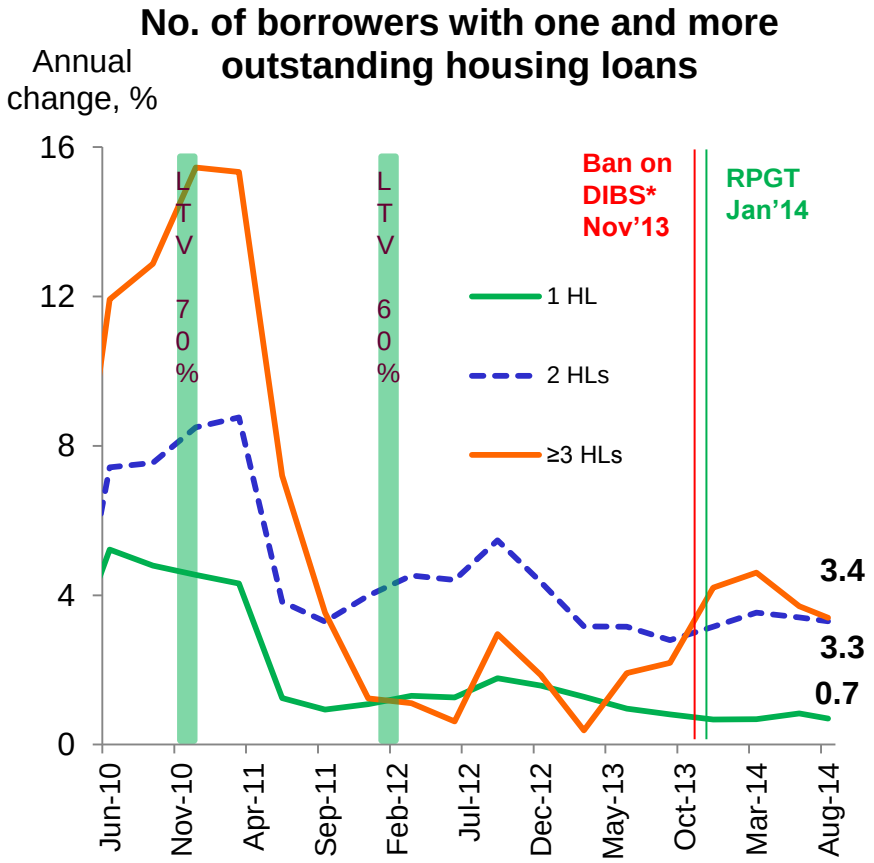
Source: BNM estimates

Intelligence and monitoring

1 Growth in Malaysian House Price Index (MHPI) above long-term trend, partly due to credit-fuelled speculative purchases



Source: National Property Information Centre (NAPIC)



*DIBS = Developer Interest Bearing Scheme

Source: BNM estimates

1

Intelligence and monitoring

"Not everything that can be counted counts, and not everything that counts can be counted" – Albert Einstein

Lending practices also provide telling signs of potential risk build-up

- High housing loan-to-value (LTV) ratio of up to 95-100%
- Long financing tenures
  - Non-banks – Personal Financing up to 25 years
  - Banks – Housing loans up to 45 years
- Highly competitive financing rates, particularly for housing loans
- Differences in definition of debt coverage and income source for computation of debt service ratio (DSR) across banks and non-banks
  - Similar DSR threshold for different income groups
- Bundling of overdraft and/or PF facilities with housing loans
- Growing housing and property development projects with interest capitalisation scheme (ICS) including developer interest bearing schemes (DIBS) and permutations thereof

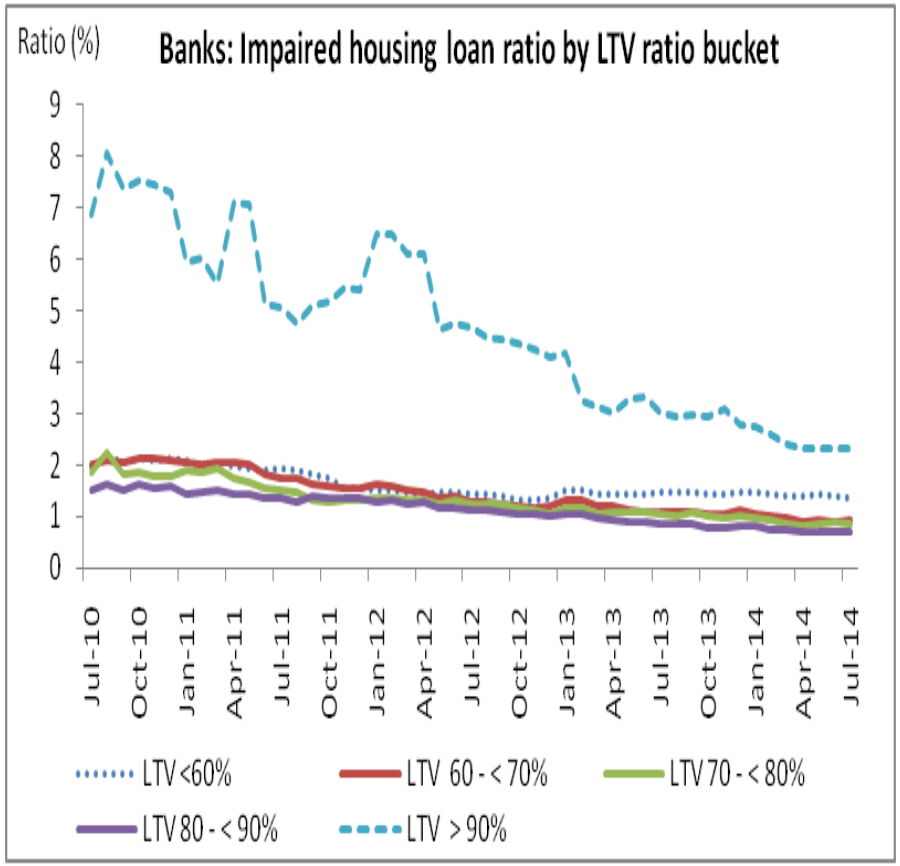
“War is ninety percent information.”

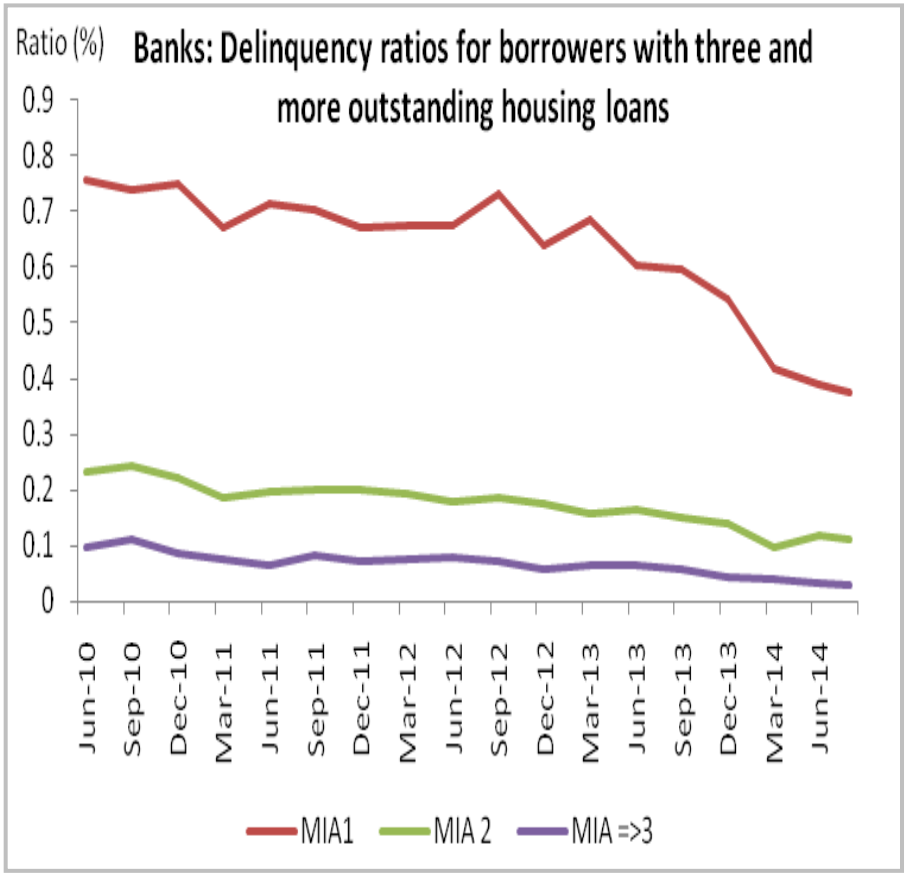
Napoleon Bonaparte, French Military and Political Leader

Assessment and policy recommendation

2

Higher delinquencies associated with borrowers with multiple housing loans and higher LTV ratio





Source: BNM estimates

2

Assessment and policy recommendation

Data shows no immediate risks to domestic financial stability

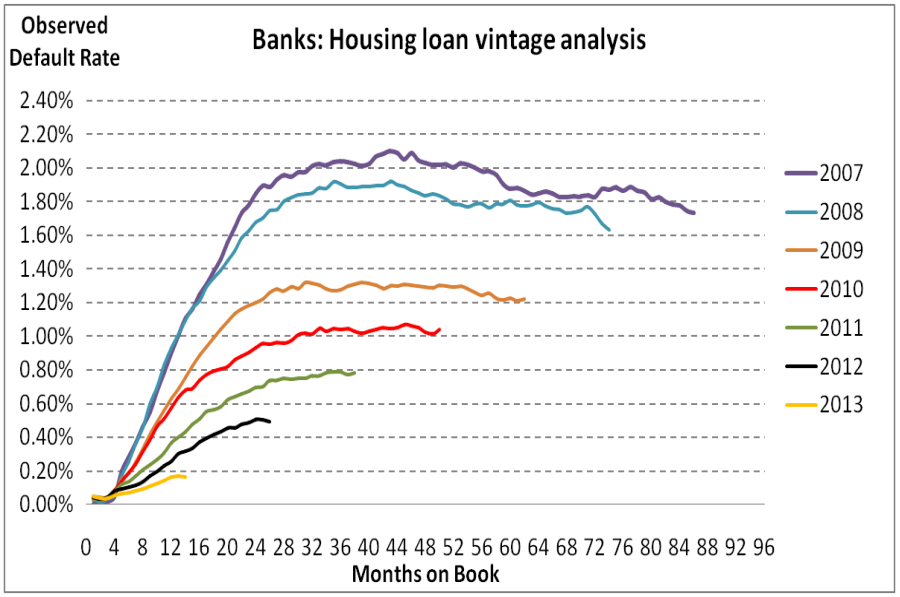
Household Sector, Banking System: Potential Losses Based on Severe Assumptions on Household Default Incidences and Loss Given Default

	Housing loan	Vehicle hire purchase	Personal financing	Credit cards	Total[1]
Probability of default (%)	7.2	7.2	10.5	10.5	
Loss given default (%)	40	75	95	95	
Potential losses (RM bil)					
- Borrowers earning RM3,000 or less per month	1.5	2.8	2.2	0.8	8.4
- Borrowers earning RM5,000 or less per month	3.4	4.6	3.6	1.7	15.3
- All borrowers	9.4	7.5	5.7	3.5	30.5

[1] Includes other household loans such as financing for the purchase of non-residential properties and consumer durables

Source: Bank Negara Malaysia

Source: BNM Financial Stability & Payment Systems Report 2013



Source: BNM estimates

- But, need to:
  - Enhance responsible financing practices and risk pricing by lenders
  - Curb growth in credit-fuelled speculative house purchases
  - Reduce excessive increase in house prices not supported by fundamentals
  - Promote financial education particularly among new borrowers

2

Assessment and policy recommendation

Considerations for policy design based on domestic context

- Targeted, but need to minimise unintended cross-sectional spillovers
  - Sustain access to financing by first time house buyers
  - Applicable to all key lenders (banks, DFIs, selected NBFIs)
- Discretionary
  - Timing and quantum of measures not rule-based
  - Prevent sudden build-up in systemic risk particularly right before implementation – prior engagement with stakeholders need to be managed carefully
- Progressive
  - Allows calibration and avoid "overshooting" or over-correction
- Complemented with other policies (monetary, fiscal, structural and supervisory)
- Enforceable

Assessment and policy recommendation

2 Combination of policies in place to address HH indebtedness and rising house prices

Sound and sustainable household sector	Responsible behaviour by borrowers and financial institutions	Sound and sustainable housing market	Increase supply of affordable housing
Stricter credit card requirements (particularly for cardholders earning <RM36k per annum)		LTV ratio limit 70% on 3rd outstanding housing loan by individuals (Nov 2010) LTV ratio limit 60% on housing loan by non-individual (Dec 2011)	
Prohibition on offering of pre-approved products			
Guidelines on Responsible Financing, including guidance on debt service ratio and reporting requirements		Prohibition of housing development projects and housing loans with ICS and/or DIBS	
Capped tenure of personal use and property financing		• Tighter real property gains tax (RPGT) • National Housing Council • Increase supply of affordable housing • Ban on ICS and/or DIBS • House price transparency • Price floor for purchase of homes by foreigners	
Intensified financial education outreach			
Financial and debt management services provided by Credit Counselling and Debt Management Agency			

Consistent application on all major credit providers, in coordination with relevant authorities

"…it is people that bring the art and the insight to the science of (data) analysis..."

Source: http://makingdatameaningful.com/2012/12/12/data-driven-decision-making/

"Statistics are no substitute for judgment."

Henry Clay, Former US senator

Policy decision, implementation and communication

3

Enhanced legislative framework to address systemic risks and institutional vulnerability, incl. non BNM-regulated entities

Central Bank of Malaysia Act 2009

Ex-ante surveillance powers for timely risk identification	*Power to enter into arrangements, advise and make recommendations to other supervisory authorities*	*Pre-emptive powers to avert or mitigate systemic risks*	*Ex-post powers to minimise impact of instability*
• Access to information either directly or indirectly via relevant authorities	• Co-operate and coordinate financial stability measures • Promote laws & policies that are consistent with financial stability	• Macroprudential measures • Order for financial stability • Liquidity assistance • Capital support	• Order for compulsory transfers (part or whole of business, shares, assets and liabilities) • Bridge institution

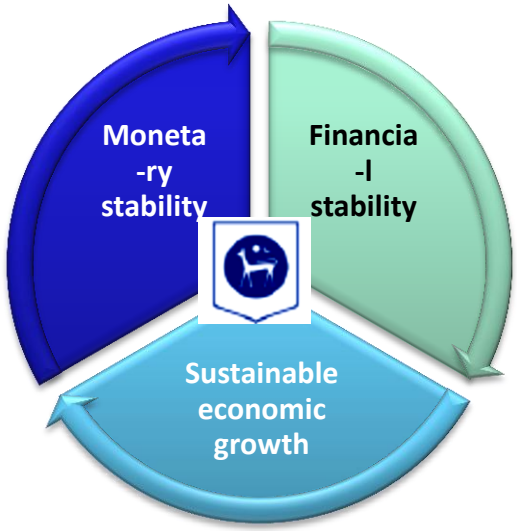
- **Power to prescribe financial institutions for purposes of ongoing regulation & supervision under Financial Services Act 2013 and Islamic Financial Services Act 2013**
  - **If such entity poses or is likely to pose a risk to financial stability arising from its**
    - **Financial intermediation activities** *(e.g. maturity/liquidity transformation, imperfect credit risk transfers, facilitate excessive leverage or raise regulatory arbitrage concerns)*
    - **Nature, scope, size, concentration or interconnectedness of its activities**

Policy decision, implementation and communication

3 Strengthened BNM institutional and governance arrangements

Joint Policy Committee (JPC)

- Responsible for deliberations & decisions on appropriate macroprudential policy response(s) to address risks concerning build-up of systemic risk & financial imbalances, *which may or are likely to have wider implications on macroeconomy*
- Consist of members from both FSC & MPC



Identification of systemic risks or financial imbalances that require financial stability response(s) may originate from FSC or MPC, and referred to FSC

Financial Stability Committee (FSC)

Financial Stability Executive Committee

Macroprudential responses *extended to entities other than those regulated by the Bank*

Microprudential/supervisory responses

Macroprudential responses *without wider implications on macroeconomy*

3

Policy decision, implementation and communication

Ensuring robust policy deliberation, effective coordination and independence of decision making

Financial Stability Executive Committee

- Ensure comprehensive policy consideration & effective coordination across relevant authorities
- Clear majority of non-executives reinforce the element of independent external oversight
- Supported by Assessor Committee for appeals on transacted price arising from compulsory transfer

Governor, & named Deputy Governor

- Lead authority for macroprudential policy & overall financial stability

Secretary-General to the Treasury

- Implications on public funds
- Interactions with fiscal policy

CEO of Malaysian Deposit Insurance Corporation

- Resolution expertise for non-viable member institutions

Chairman of the Securities Commission

- Role in averting reducing systemic risk in the capital markets

Private sector experts in legal, accounting or financial matters

- Implication on property rights
- Contribute to independent oversight

Heads of other relevant supervisory authorities

- For measures affecting persons/entities under their purview

3

Policy decision, implementation and communication

Example: July 2013 measures on lending to HHs

- Effective collaboration across authorities to minimise regulatory arbitrage or shifts to informal sectors
- Effective communication strategy, including engagements with relevant stakeholders (players, borrowers, agencies, etc)
- Improvements in data collection and management for analyses

Policy formulation stage

Consumer & industry associations – to reinforce policy clarity & objectives, secure support & seek feedback

Focus group sessions with selected institutions – to identify & address specific concerns & implementation issues

Cooperatives Commission Malaysia (SKM) – early engagement to coordinate implementation of similar requirements on responsible practices for credit cooperatives

Issuance stage

Coordinated press release by BNM & SKM – consistent implementation ensures level playing field

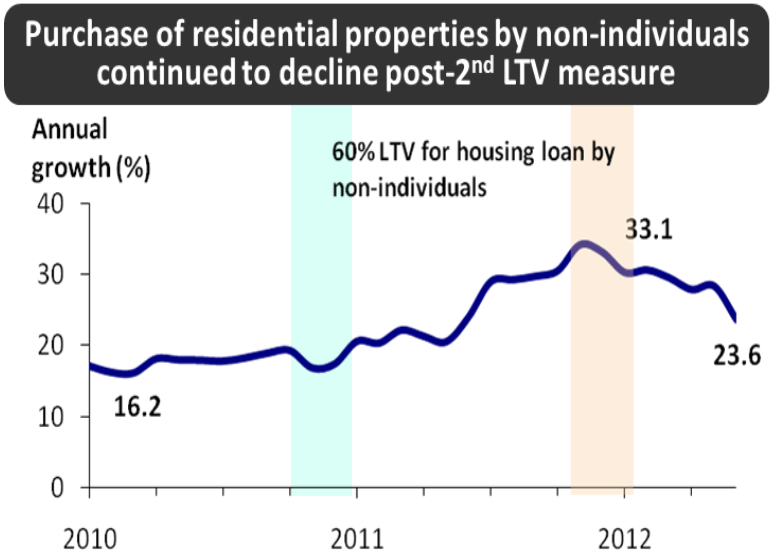
Media & briefing sessions – to create public awareness & promote understanding of policy rationale

“Statistics are like bikinis. What they reveal is suggestive, but what they conceal is vital. ”

Aaron Levenstein, former Business Professor
at Baruch College New York

4 & 5 - Monitoring effectiveness, spillovers and circumvention - Policy calibration and/or upliftment

- Circumvention
  - Post implementation of LTV limit of 70% on 3rd outstanding housing loan per individual (Nov 2010), BNM observed rising trend of housing loans obtained by non-individuals
  - In Dec 2011, BNM introduced LTV limit of 60% on all housing loans by non-individuals



- Spillovers
  - On-going monitoring of potential shift towards lending by other non-banks such as moneylenders, pawnbrokers, etc
    - Collection of data and information on borrowings by these entities to fund lending, growth in lending portfolio and lending practices of these entities
- Monitor compliance
  - Joint on-site supervision on non-bank lenders with regulator

4 & 5 - Monitoring effectiveness, spillovers and circumvention - Policy calibration and/or upliftment

Slower pace of growth in HH debt

- Annual growth in HH debt moderated for 6th consecutive quarters since end-2012
  - HH debt-to-GDP remained stable at 86.7% since end-2013
- Annual growth in non-bank lending to HHs more than halved to 4.7% as at end-Aug 2014 (2013: +9.7%; 2012: +22.1%)
  - Driven by substantial decline in annual growth of personal financing to 5% (2013: +13.9%; 2012: +30.6%)

Sustained debt repayment capacity of HHs

- HH financial assets grew in tandem and remained stable at 2.2 times of HH debt
  - Stable HH liquid financial assets to debt at 1.6 times, with about 58% comprising deposits and deposit-like instruments
- Low and stable impaired bank loans to HHs ratio: 1.2%
- HH balance sheet supported by growth in income and low unemployment

4 & 5 - Monitoring effectiveness, spillovers and circumvention - Policy calibration and/or upliftment

Further strengthening of lending practices, particularly to vulnerable borrowers

- Proportion of borrowers with monthly earnings of <=RM3,000 accounted for a lower share of 27% of total HH debt (2012: 33%)
- Improved loan affordability assessment by lenders, where close to half of new loans were to borrowers with DSR of 40% and below since 2H 2013

Reduced credit-fuelled speculative purchases of residential properties

- Annual growth in no. of borrowers with 3 or more outstanding housing loans declined substantially to <4% (2010: >15%) to account for only 3% of housing loan borrowers

Slower growth in house prices, new launches and transactions in major states

- Annual growth in MHPI (prelim) slowed to 6.6% in 2Q 2014 (4Q 2013 & 1Q 2014: +9.6%)

Annual growth (%) (nominal)	2Q 2014	1Q 2014	4Q 2013	2013	2012	2011
MHPI	6.6*p*	9.6	9.6	11.6	11.8	9.9
Consumer price index	3.3	3.5	3.2	2.1	1.6	3.2

4 & 5

On-going BNM study on effectiveness of LTV ratio limits

LTV ratio limit dampened demand for credit-fuelled speculative housing loans as intended

- However, effects of the measure on house prices, transactions and growth in housing loans were only temporary

  Average house price
  - Slight increase in MHPI, both before the announcement was made – buyers could have brought forward purchases, encouraged by marketing by developers and banks
  - Negative impact on house price was only transitory

  Growth in housing loans
  - Slower growth leading up to the announcement was short-lived, as time dummy recorded positive values thereafter

  Number of transactions in the housing market
  - Seems immune to the measure, as impact seems transitory
  - Sustained demand likely from first-time buyers due to demographic and structural factors

Findings highlighted importance of:

- Other policy interventions (particularly fiscal measures) to provide holistic and long-term solution to address house price increases
- Timely and willingness to calibrate and/or uplift policies are critical

Main authors: Mr Muhamad Shukri Abdul Rani & Ms Chin Ching Lau (BNM, 2014)

Lessons learnt

- Granular data is important to enable targeted policies
  - "What gets measured, gets managed." – Peter Drucker, Management consultant and author
- Non-quantifiable data is similarly important
  - Industry practices, supervisory assessment, risk appetite
- Timely data for pre-emptive actions
  - Lagged data is better than none – but, overly late data may serve better for a post-mortem, rather than prevention or cure
- Expert judgment is just as important as reliable data
  - "If you do not know how to ask the right question, you discover nothing." – W Edward Deming, Engineer and statistician
- Exercise caution in data usage
  - "Torture the data, and it will confess anything." – Ronald Coase, Economics Nobel Prize Laureate

Thank You

Chin Ching Lau
Financial Surveillance Department
(Lau@bnm.gov.my)

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

The information model at Bank of Portugal – using micro data to face challenges for central banks[1]

João Cadete de Matos, Bank of Portugal

[1] This presentation was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

The information model at *Banco de Portugal*: using micro-data to face central banks' challenges

BANCO DE PORTUGAL
EUROSYSTEM

João Cadete de Matos • Director, Statistics Department

17 November 2014

ISI Regional Statistics Conference
Kuala Lumpur

Outline

1. Introduction
2. Integrated management of information
3. New responsibilities of the Statistics Department
4. Micro-databases for statistical purposes
5. The relevance of micro-data for users and for analytical purposes

Outline

1. **Introduction**
2. Integrated management of information
3. New responsibilities of the Statistics Department
4. Micro-databases for statistical purposes
5. The relevance of micro-data for users and for analytical purposes

Data acquisition model for statistical purposes typically relied on traditional aggregated reporting schemes

- Forms were designed to answer pre-defined requirements
- Lengthy preparation time
- Zero flexibility
- Heavy transformation rules imposed to respondents
- Classifications are “black boxes”
- Difficult to perform a reliable and efficient data quality management

Over the last 15 years significant changes were introduced in the statistical compilation processes at BdP

- Item-by-item reporting
- Approaching the granularity of the internal and external data at the respondents' level
- Multi-purpose reporting ("data reported only once")
- Use of administrative data
- Micro-databases
- Integration of data

A new paradigm

Integrated management of micro-databases

Outline

1. Introduction

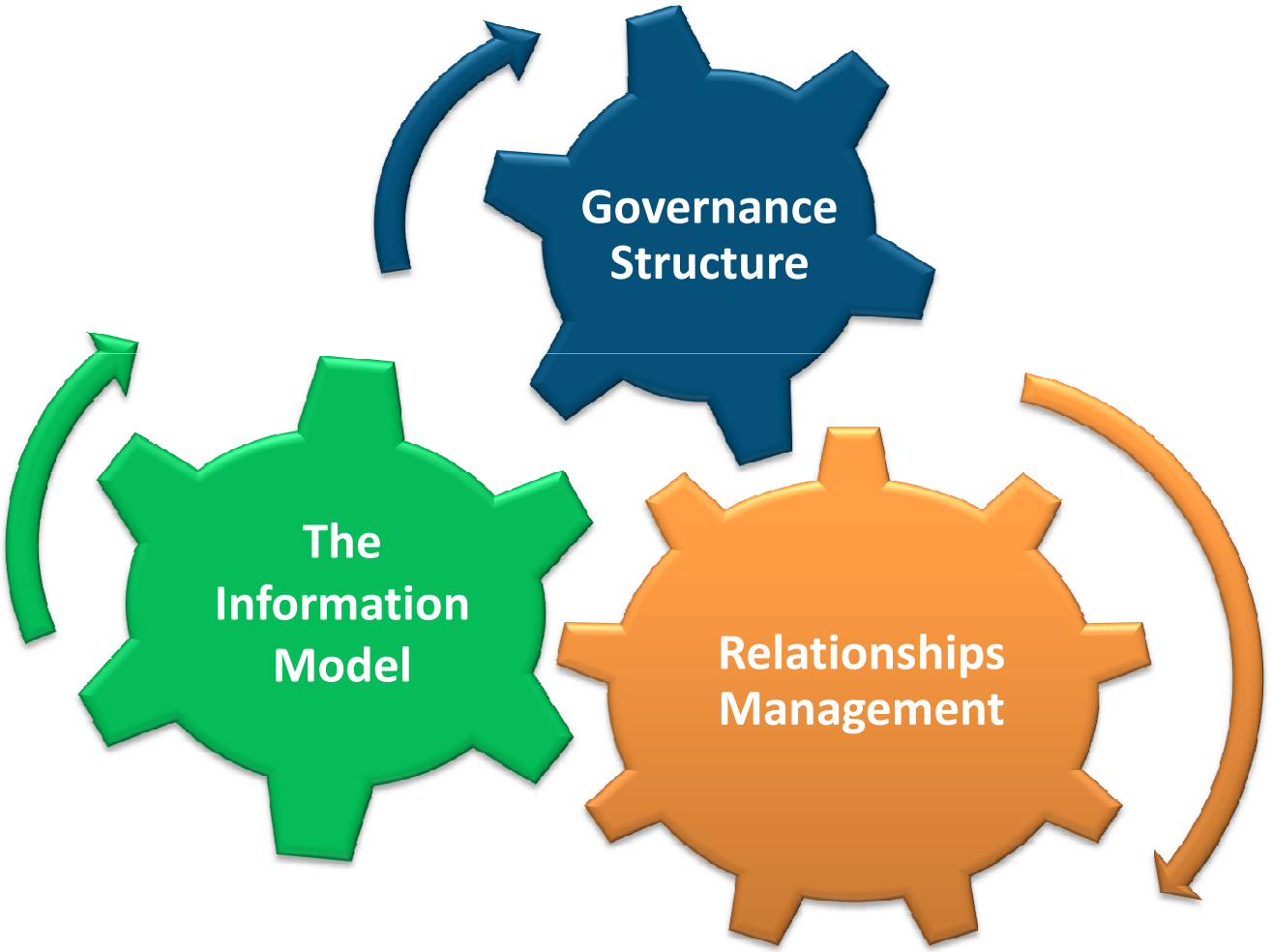
2. **Integrated management of information**

3. New responsibilities of the Statistics Department

4. Micro-databases for statistical purposes

5. The relevance of micro-data for users and for analytical purposes

The three dimensions of the model



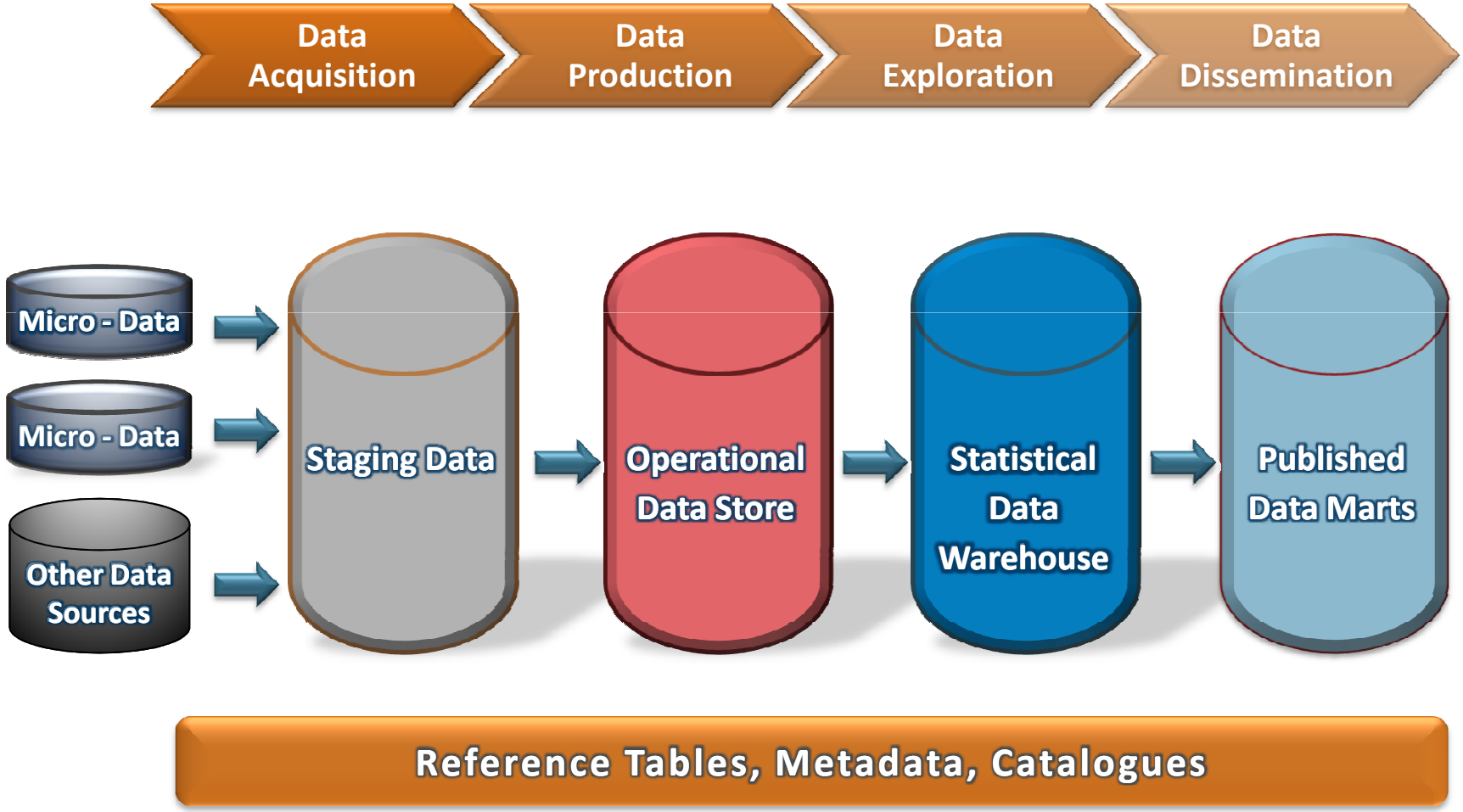
A governance structure to ensure a proper alignment between the strategic and operational levels of decision, which are mediated by the information management level

The relationships management to introduce greater efficiency in the internal communication process. Based on two principles:

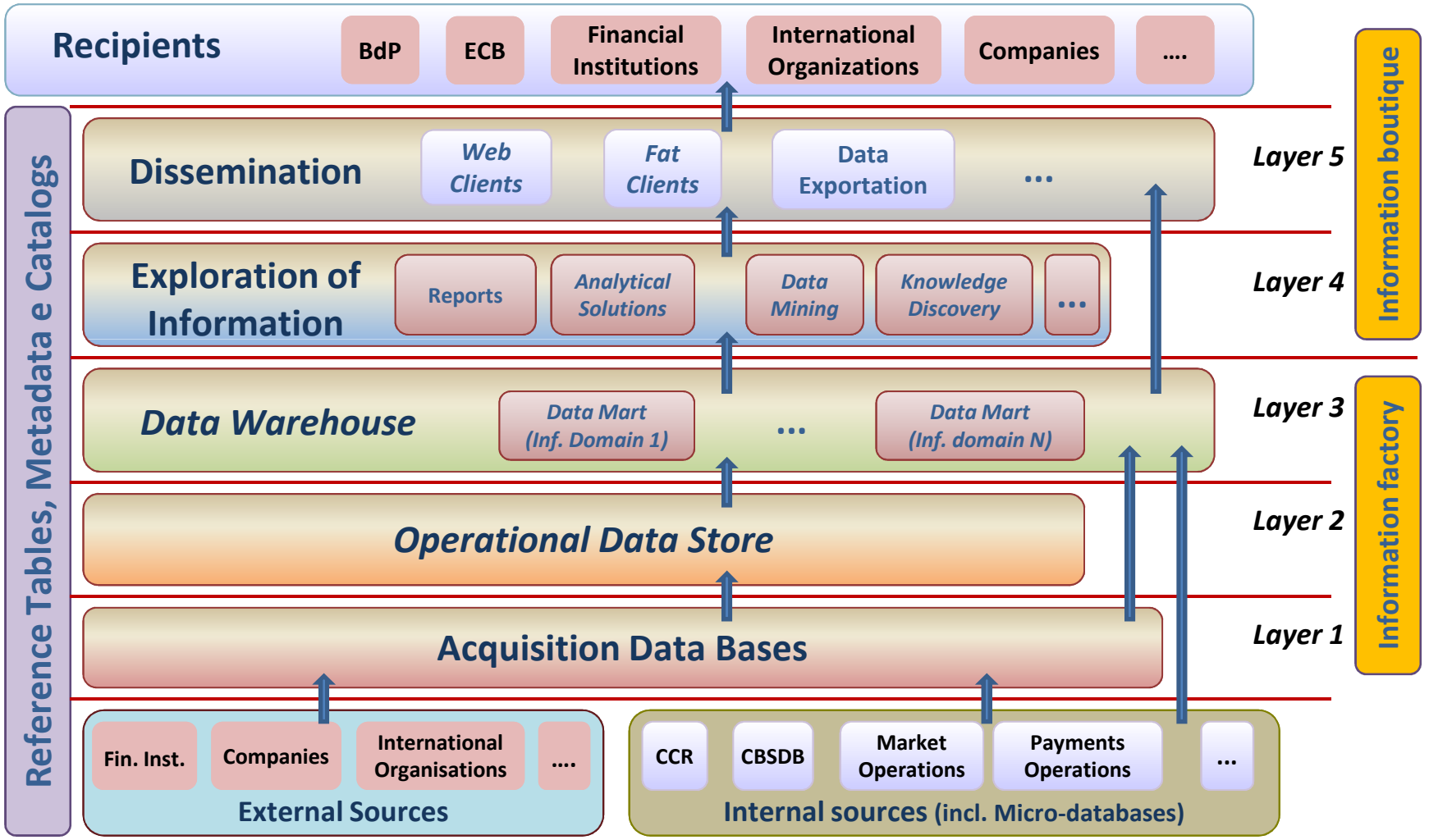
- Information is a fundamental asset of the Bank so it must be managed in an integrated way
- The exploration and analysis of data are distributed activities, typically related with the needs and tasks of each department

An information model based on the BI architecture for statistics

The Information Model



The Information Model



1. Introduction

2. Integrated management of information

3. New responsibilities of the Statistics Department

4. Micro-databases for statistical purposes

5. The relevance of micro-data for users and for analytical purposes

The Statistics Department will be in charge of the operational management of information

Expertise in managing data efficiently and performing reliable DQM

The Statistics Department will become a provider of information services to the Bank

A multi-step approach will be followed

The first phase will be integration of the regular reporting for Banking Supervision purposes

Operational management issues

- Coordinating and monitoring the process of collecting quantitative information from external entities
- Ensuring the central point of contact of the Bank with external entities on the reporting of quantitative information
- Monitoring the interaction and timely reporting of information to and from external entities
- Analysing the changing needs of quantitative information identified by other departments

3. New responsibilities of the Statistics Department

- **Ensuring the quality of information, defining indicators of their use and ensuring its relevance and auditability**
- **Promoting, in conjunction with the IT Department and the user departments:**
  - **The organisation of information architectures, namely by identifying objects, features and respective relationships and configuring the domains of integration to manage**
  - **The definition of concepts and creation of metadata associated with different information objects in order to avoid duplication and facilitate the understanding/utilization of information**
  - **The creation of catalogues / dictionaries / repositories of information available on particular operating systems**

1. Introduction

2. Integrated management of information

3. New responsibilities of the Statistics Department

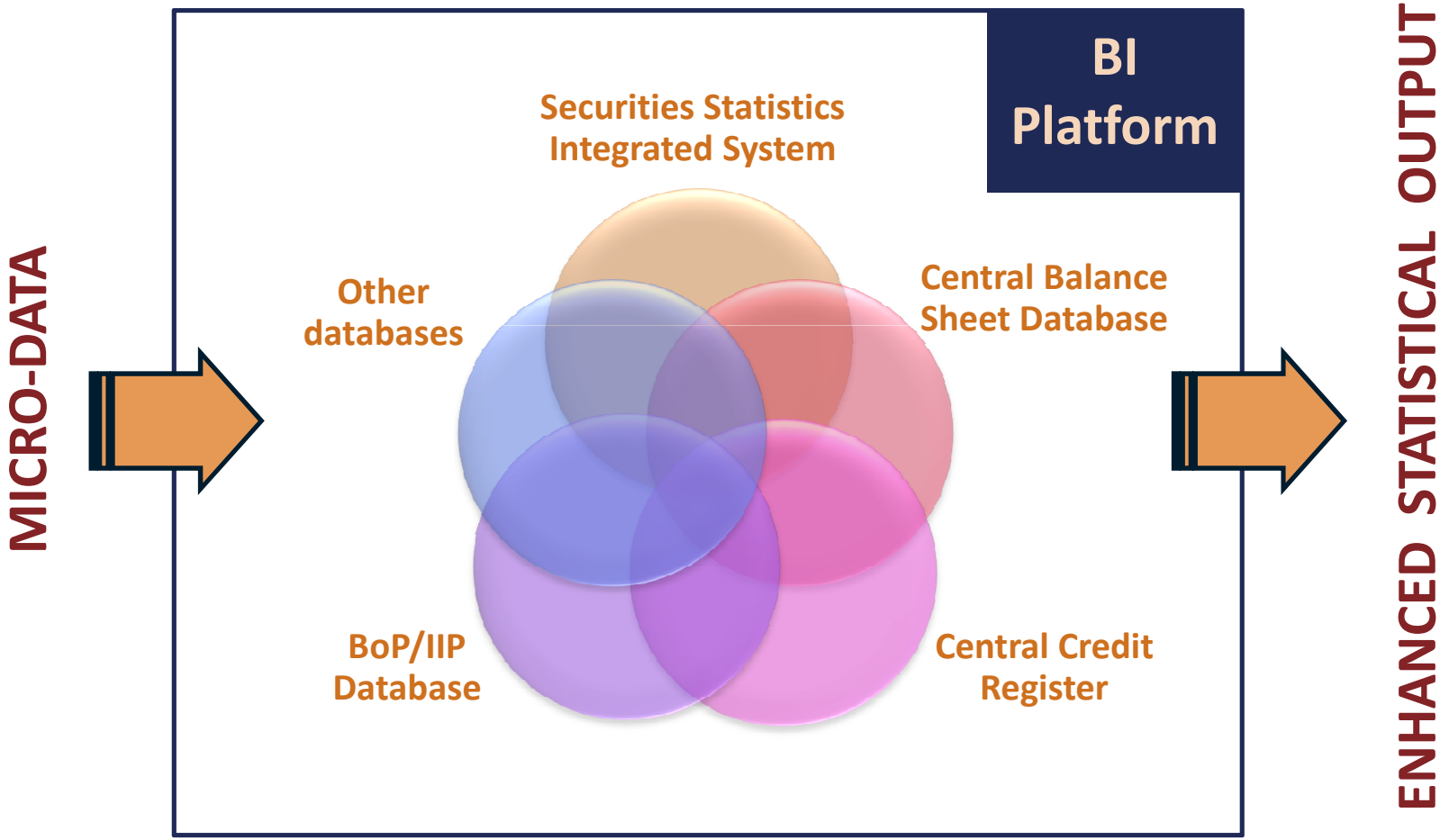
4. Micro-databases for statistical purposes

5. The relevance of micro-data for users and for analytical purposes

Statistics and IT Departments worked together to define a Business Intelligence (BI) architecture for statistics

- The BI architecture implied:
  - Defining the different layers of data according to the different levels of its usage
  - Building a robust ground layer with common reference data, metadata and catalogues
  - Choosing the appropriate tools to explore the data efficiently

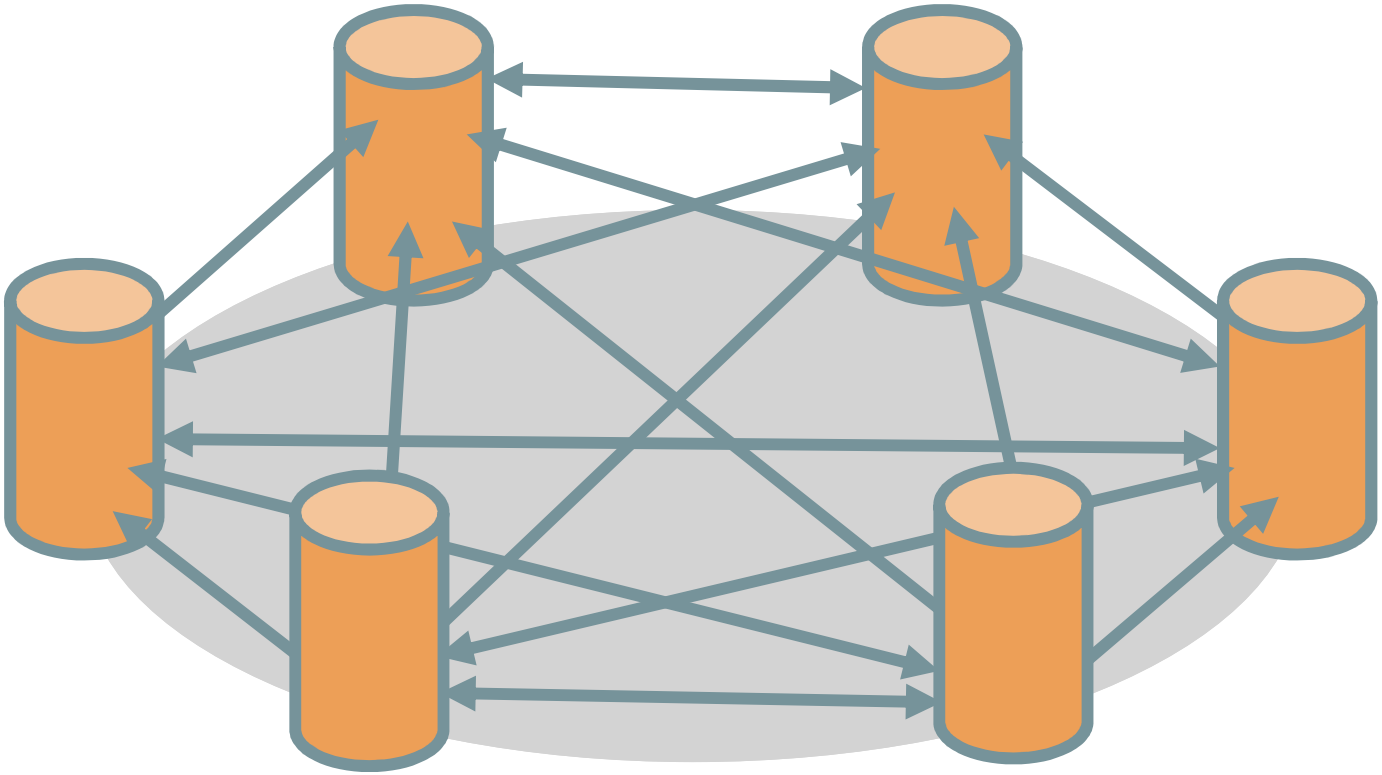
The BI architecture should be adopted by all statistical domains using an incremental approach


MICRO-DATA
BI Platform
Securities Statistics Integrated System
Other databases
Central Balance Sheet Database
BoP/IIP Database
Central Credit Register
ENHANCED STATISTICAL OUTPUT

Micro-data integration

Where do we come from?

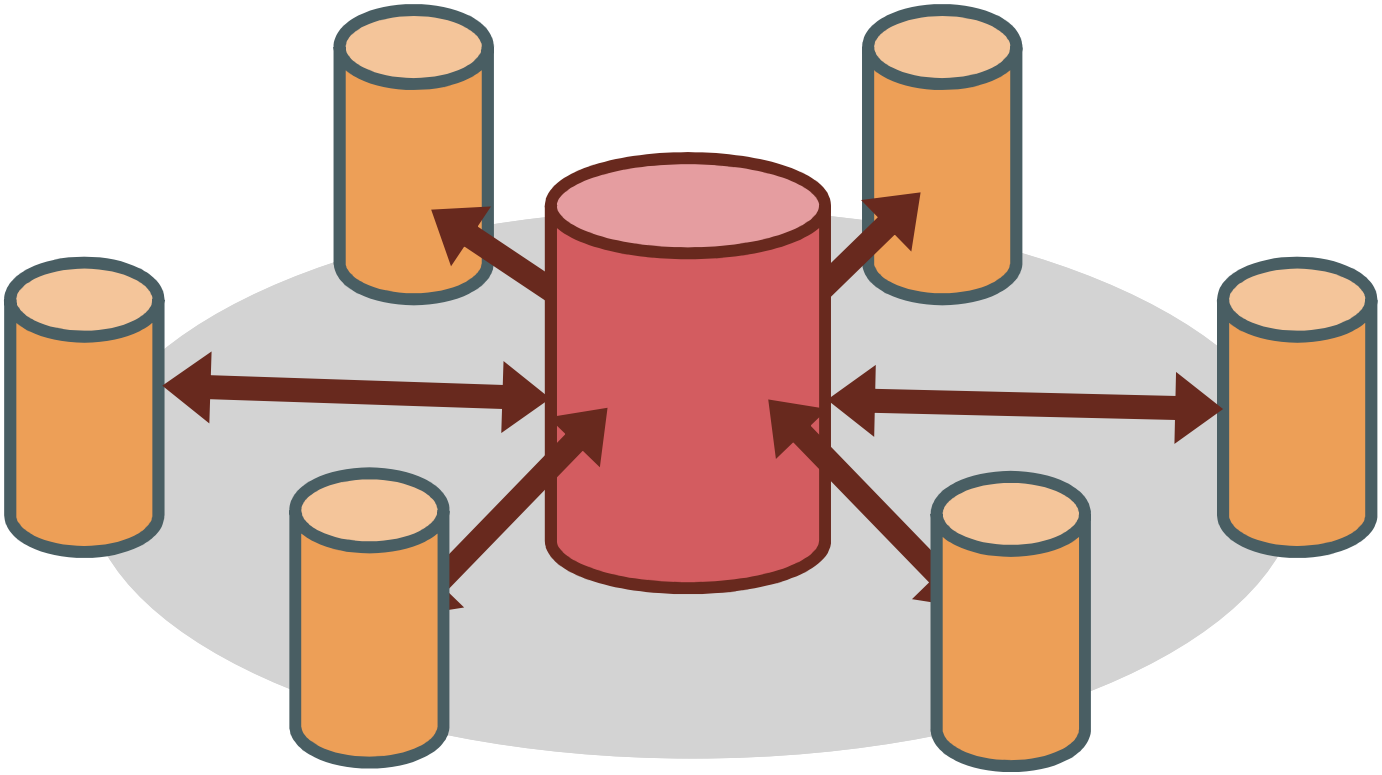
Direct data integration



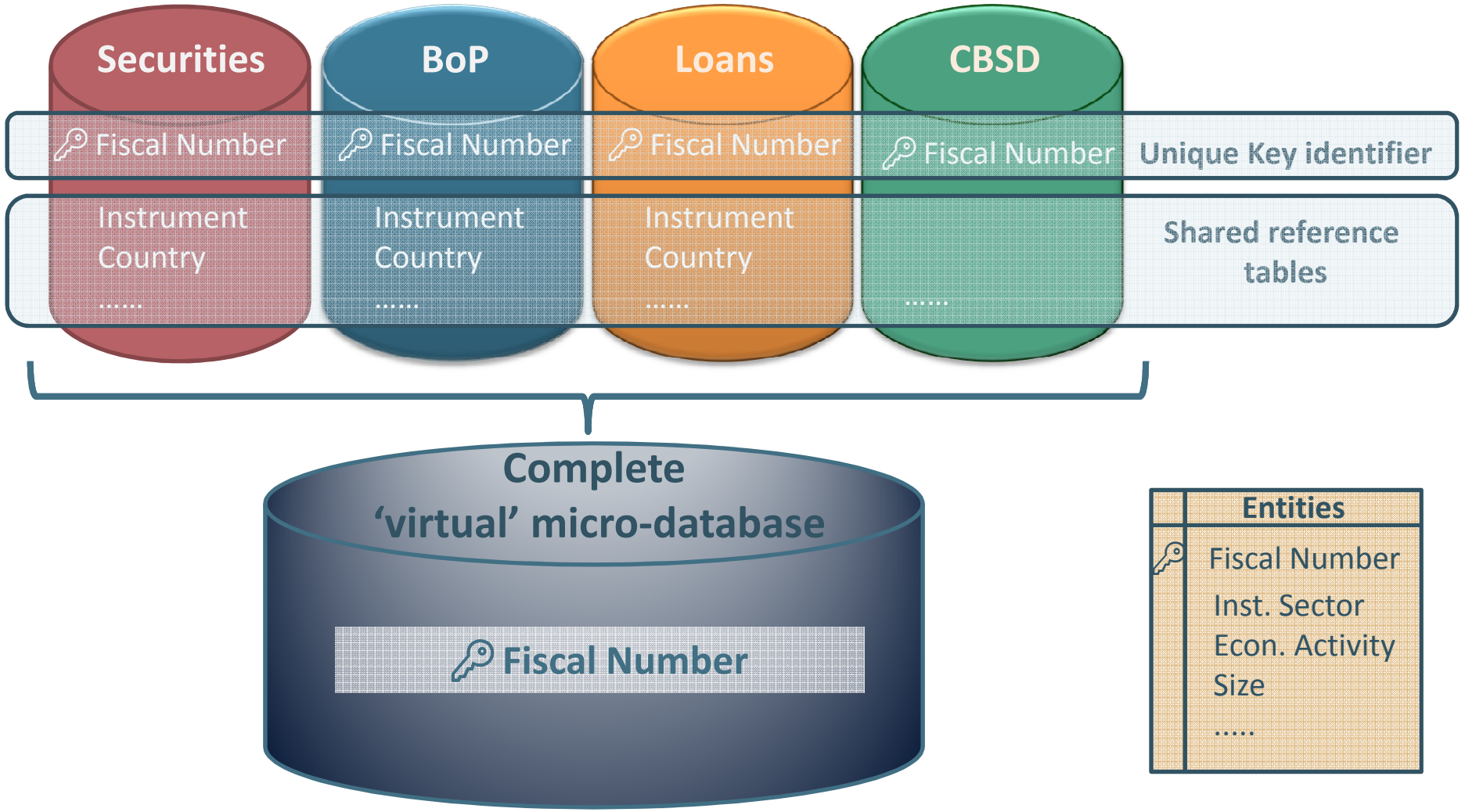
Micro-data integration

Where do we want to arrive at?

Fully integrated data warehouse



Pre-requisites

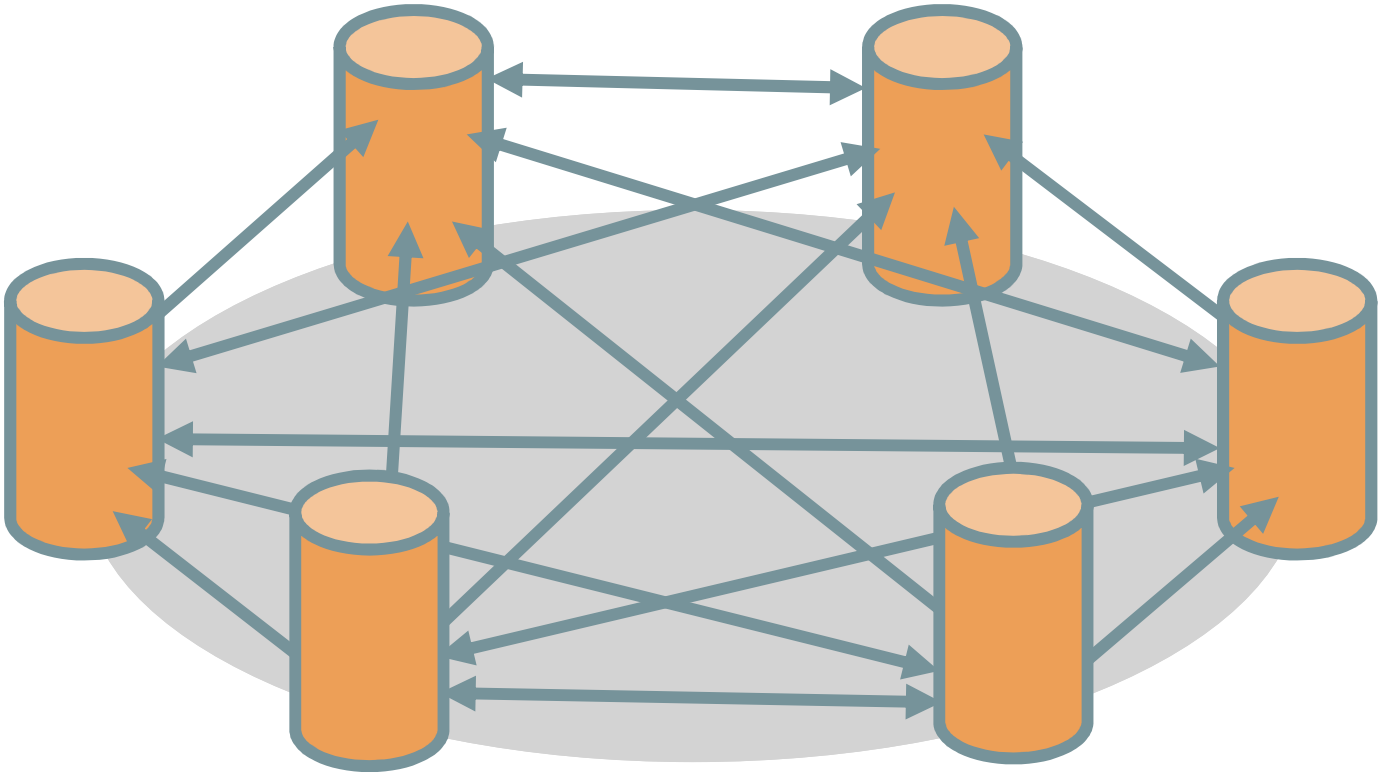


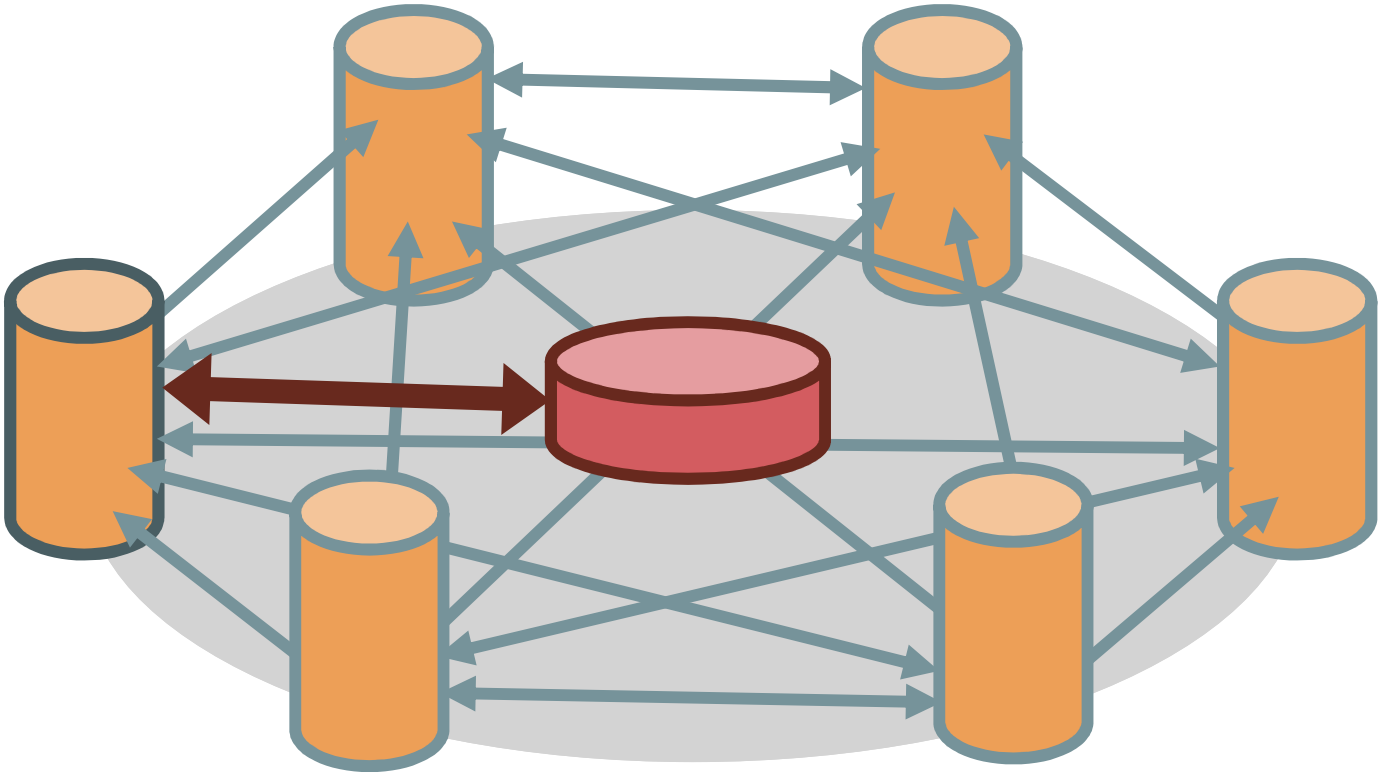
Micro-data integration

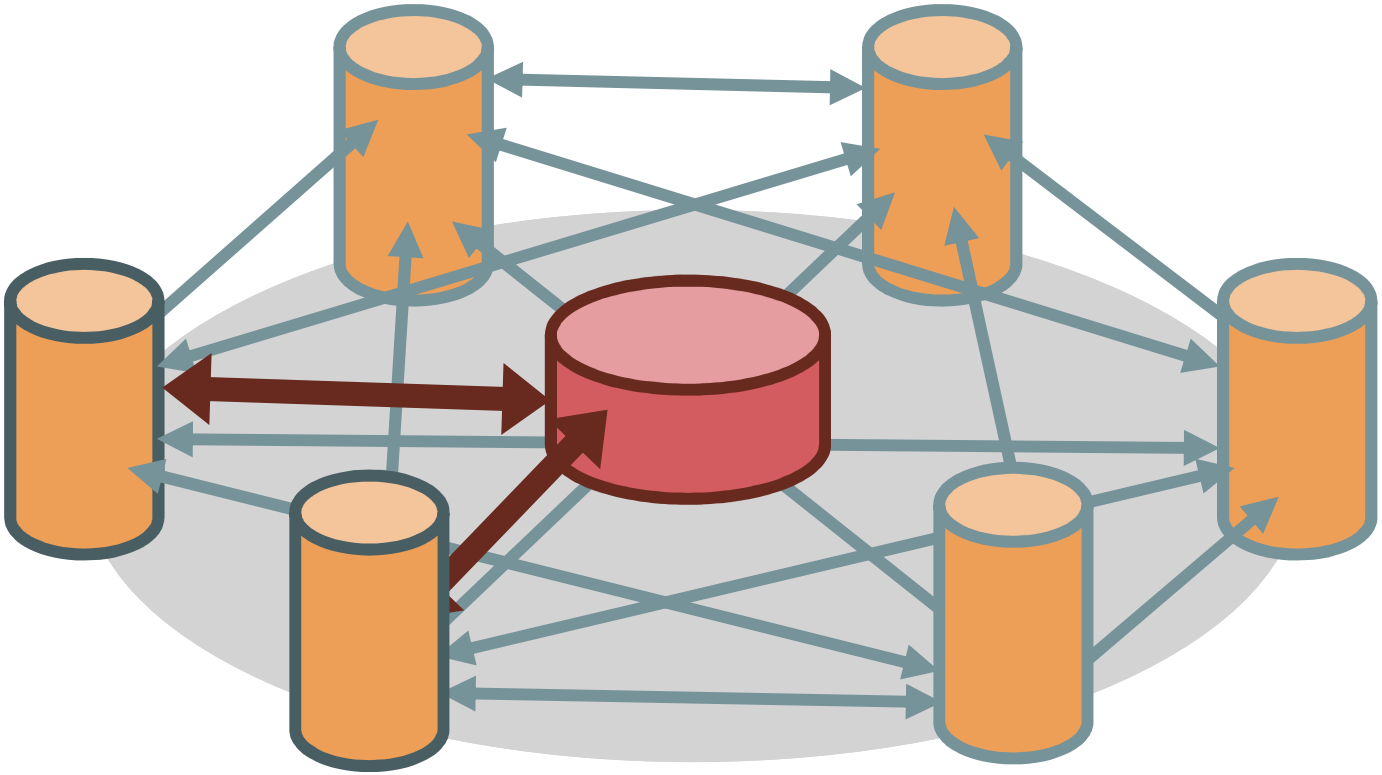
How to proceed?

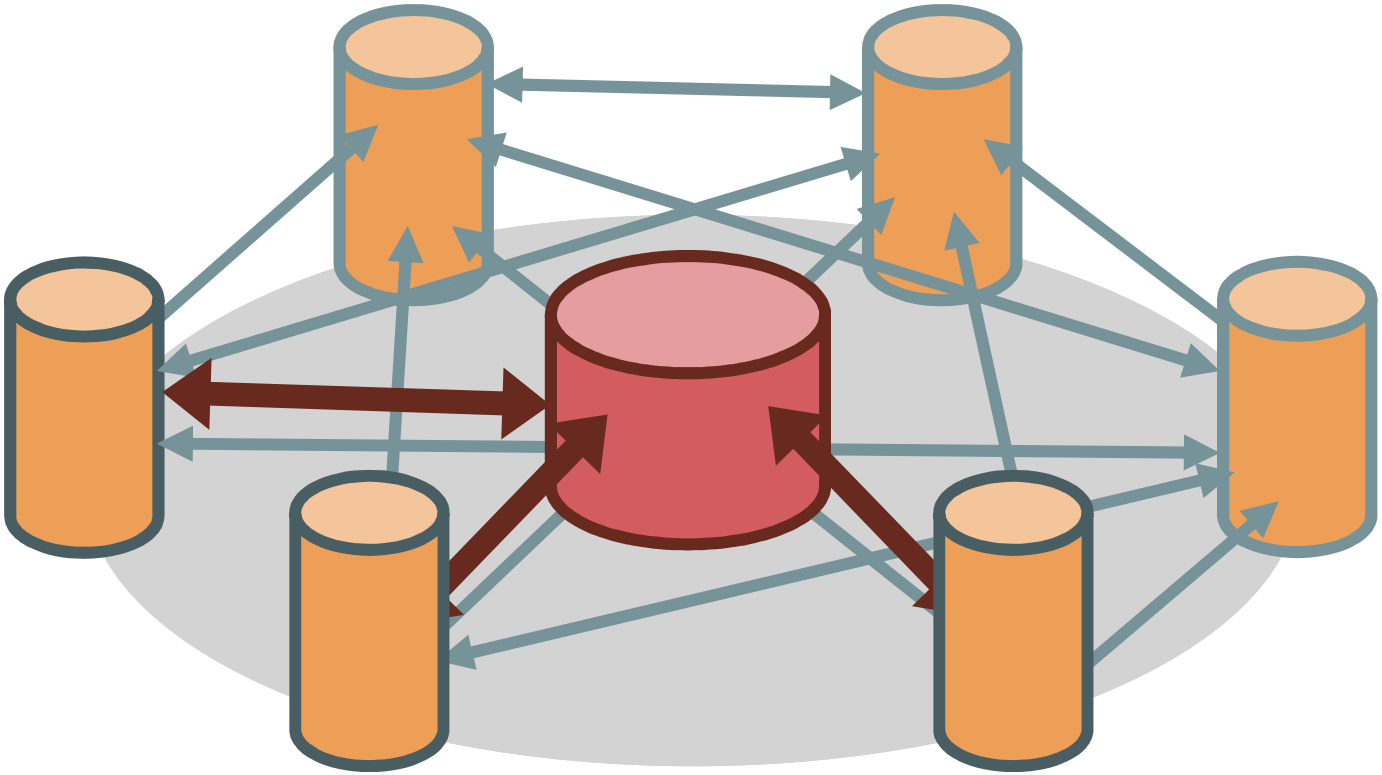
Incremental approach

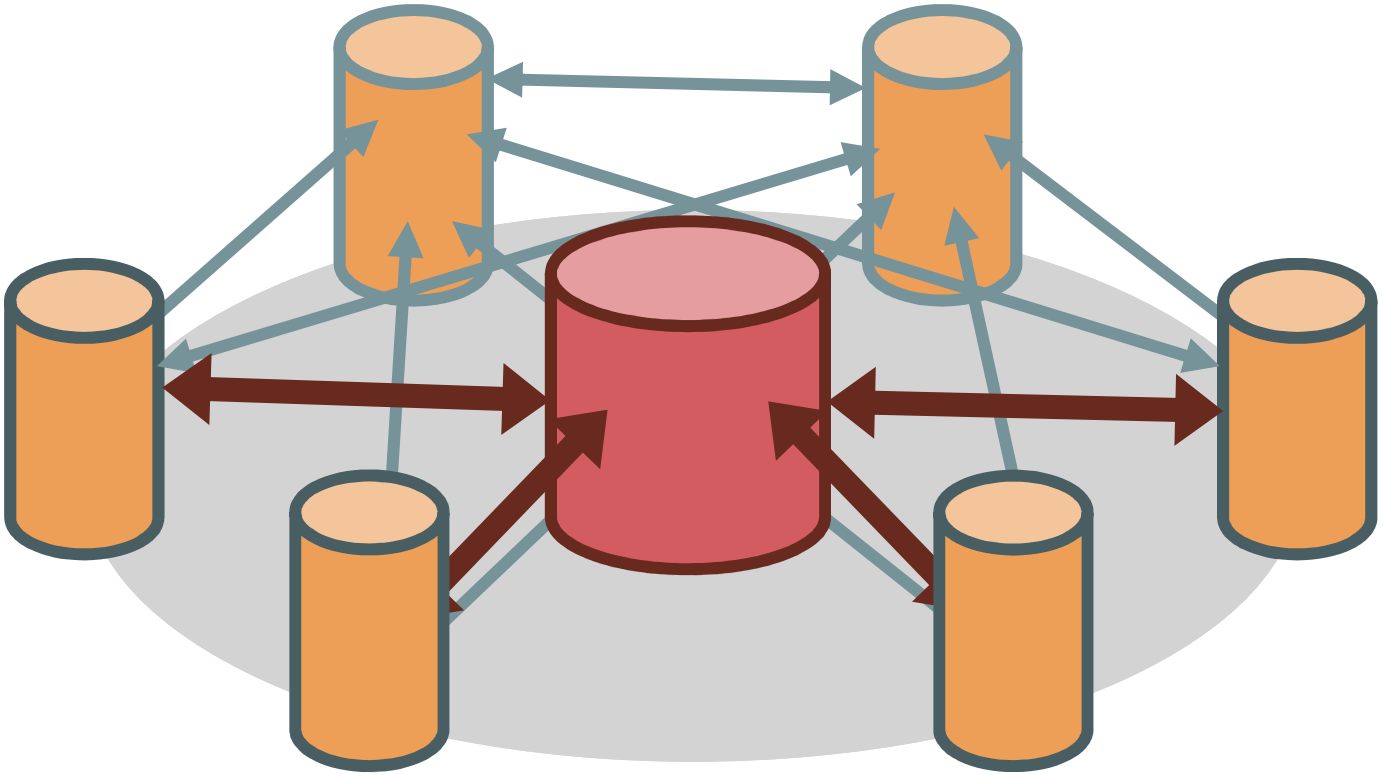
From direct data integration ...

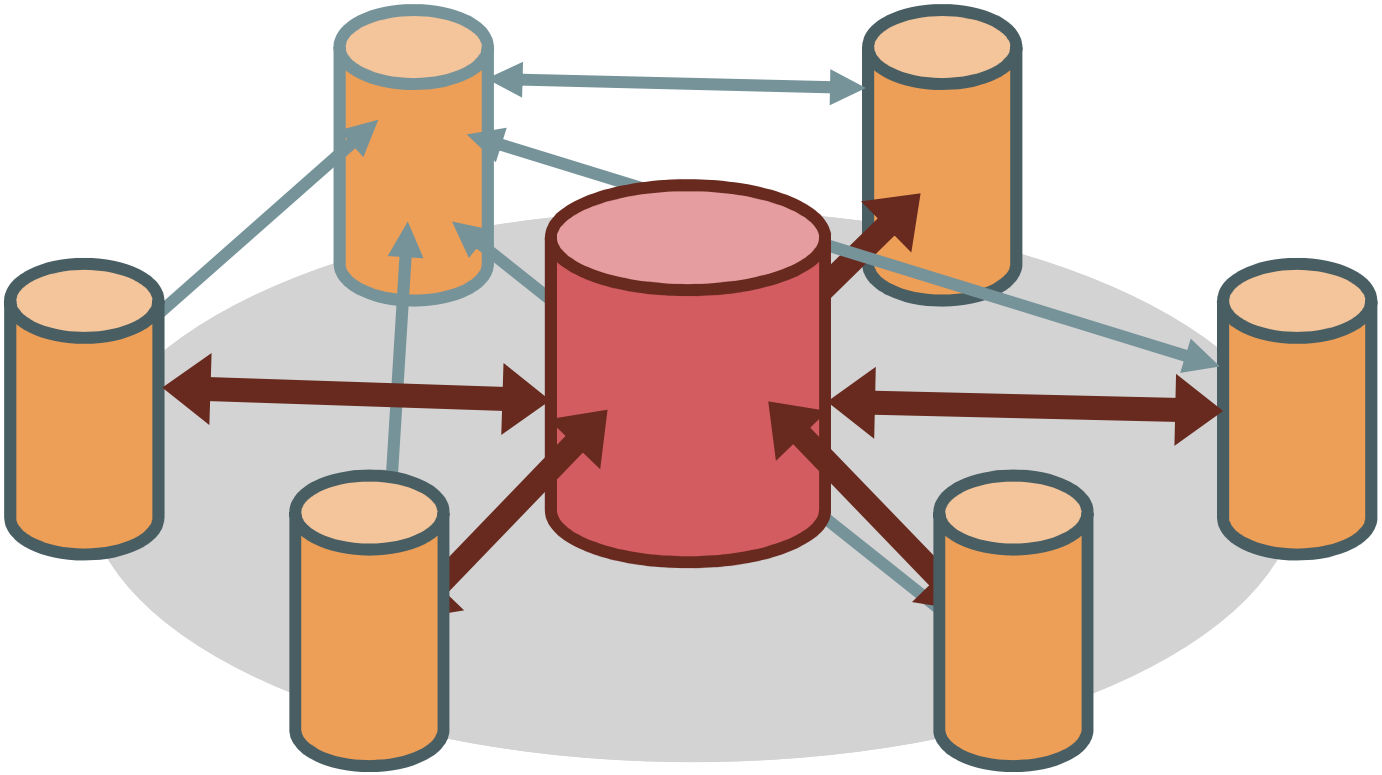




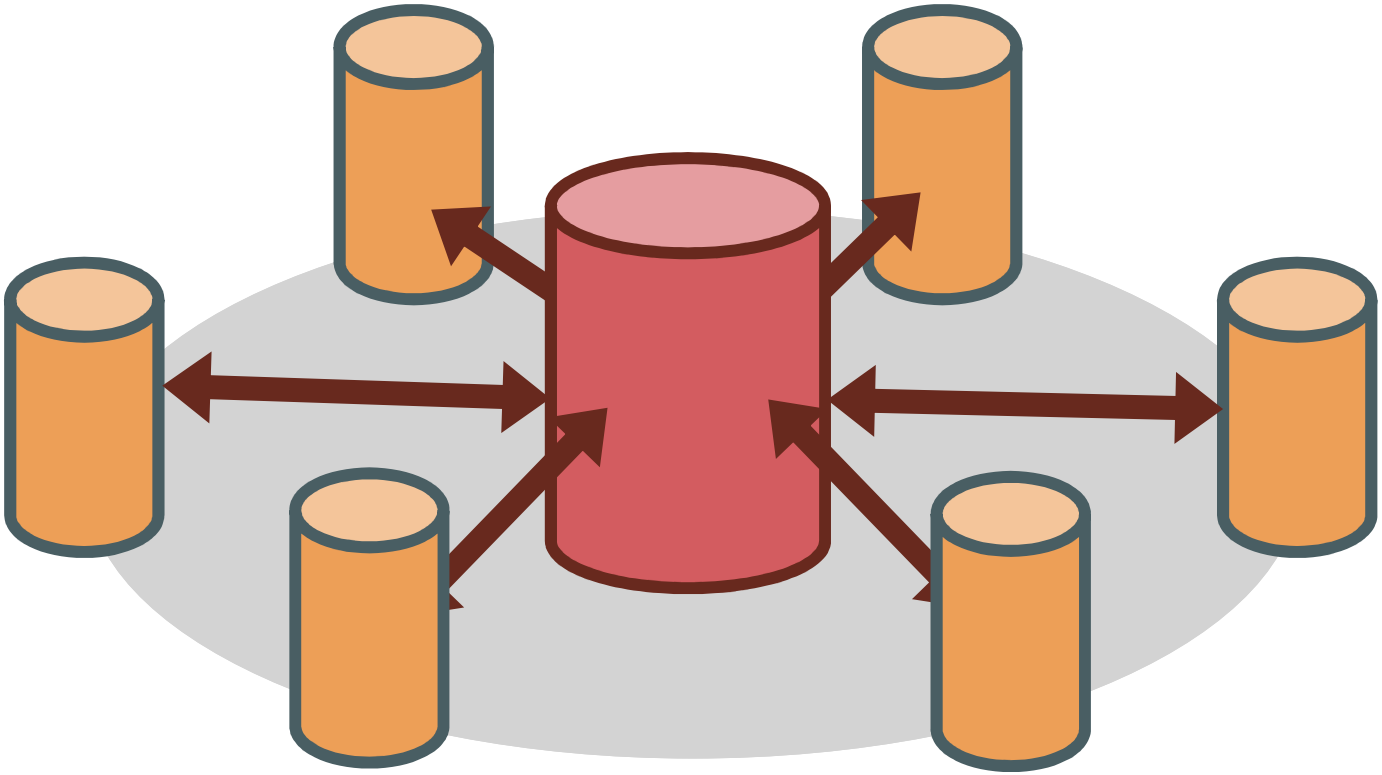




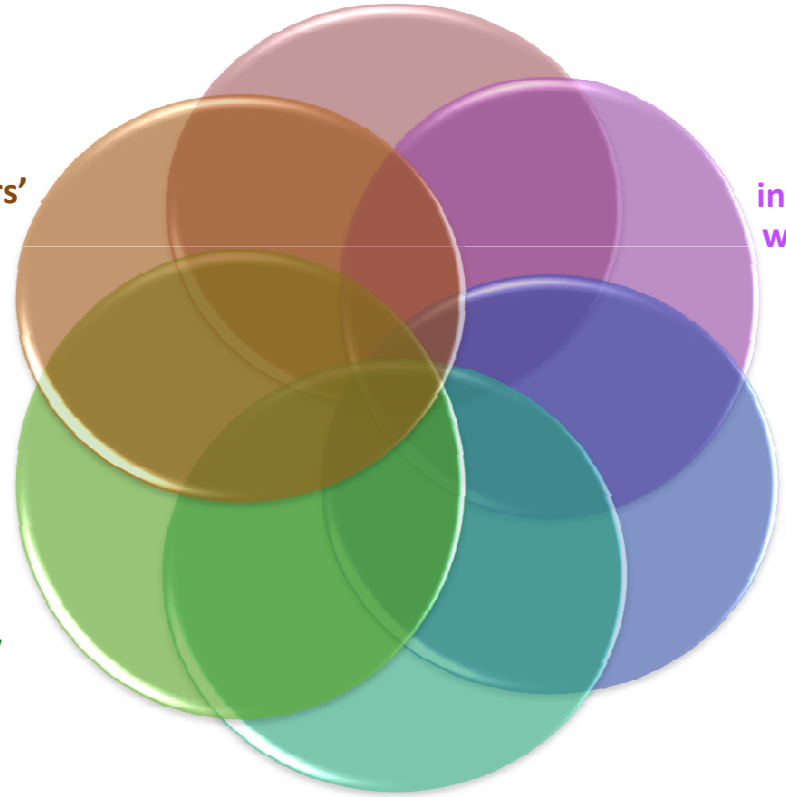




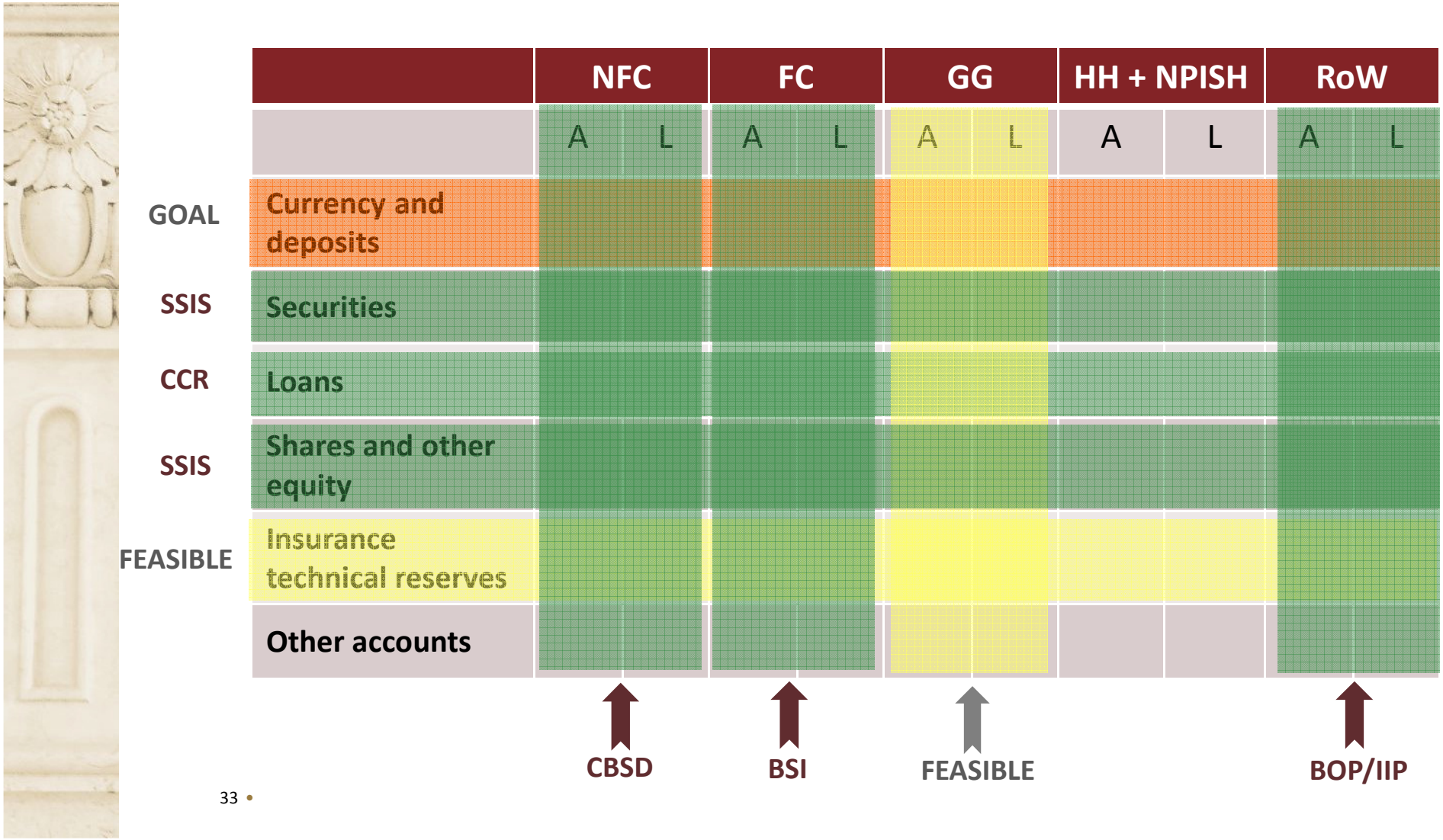
... to integration via a central repository of coherent and consistent information.



Micro-data – Strengths and Opportunities



FINANCIAL ASSETS AND LIABILITIES, INSTITUTIONAL SECTOR AND INSTRUMENT



1. Introduction

2. Integrated management of information

3. New responsibilities of the Statistics Department

4. Micro-databases for statistical purposes

5. The relevance of micro-data for users and for analytical purposes

A micro-data application: The Statistical Bulletin's table on...

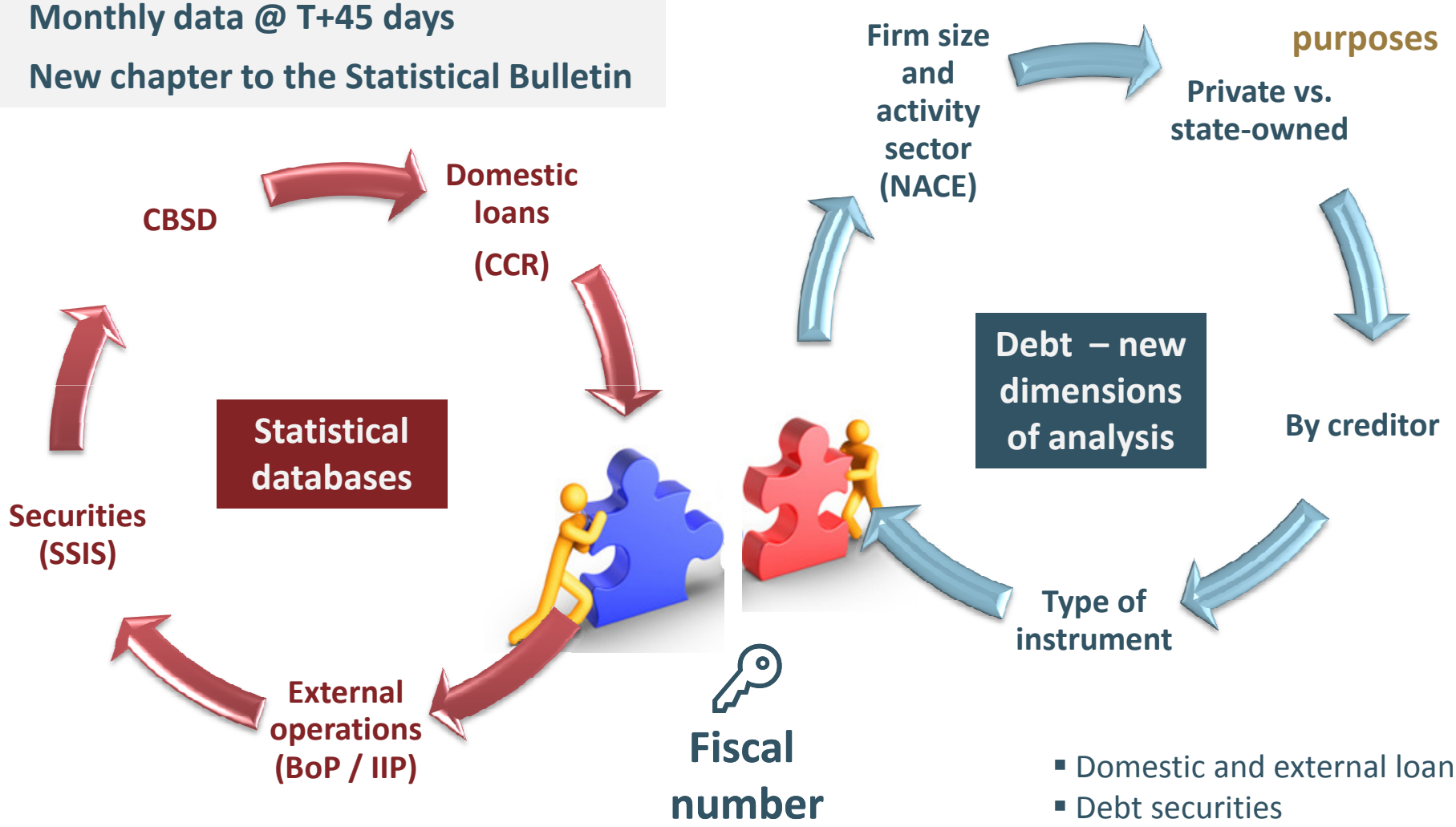
Non-financial Sector Indebtedness

It provides **information about the indebtedness of the non-financial sector, combining several different dimensions of analysis**, namely:

- **Debtor and creditor sector**
- **Size of the company**
- **Type of financial instrument**
- **Economic activity**
- **Original maturity**

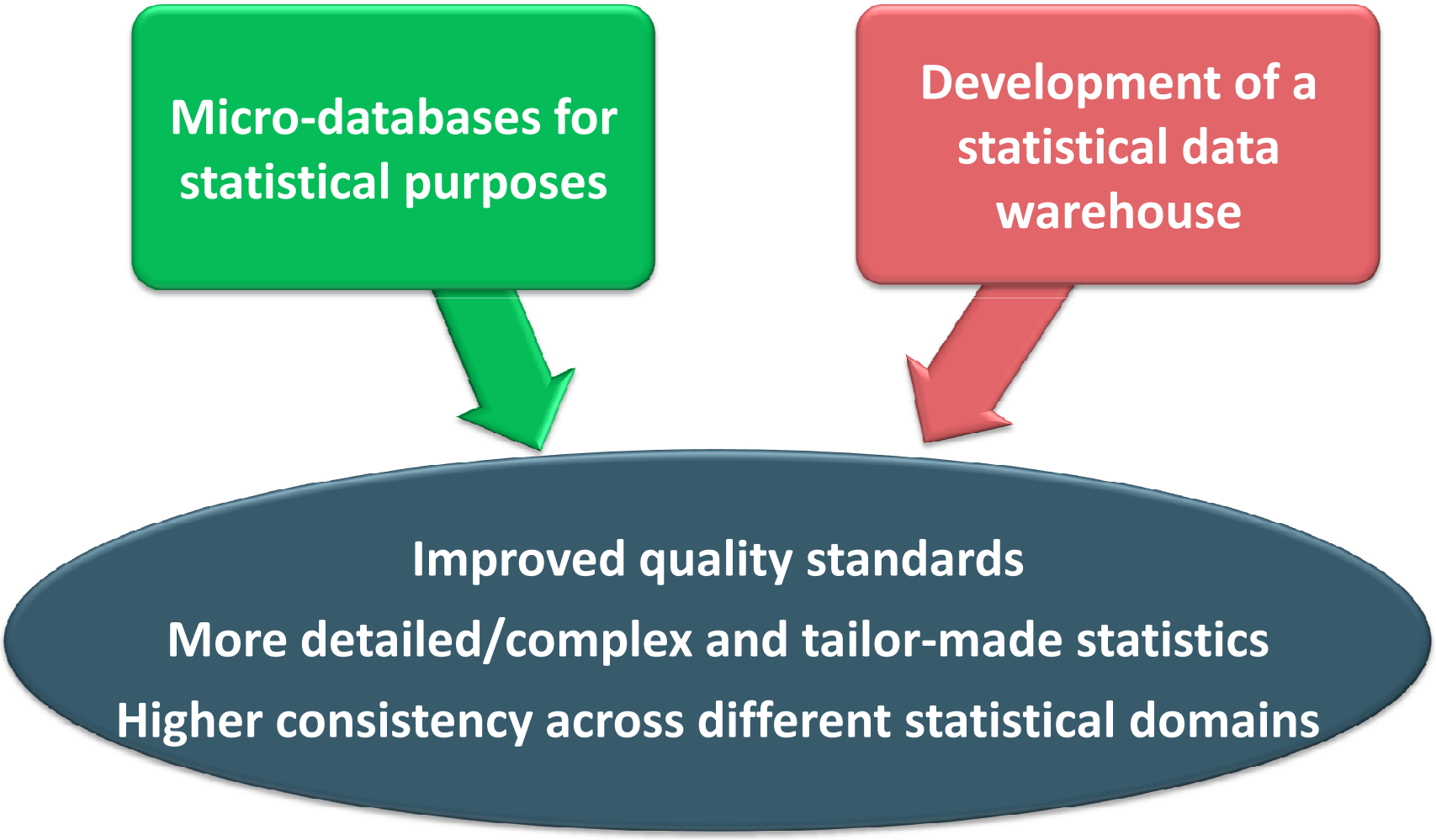
5. The relevance of micro-data for users and for analytical

- Monthly data @ T+45 days
- New chapter to the Statistical Bulletin



- Domestic and external loans
- Debt securities
- Trade credits

Concluding…Innovative and flexible data solutions



BANCO DE PORTUGAL
EUROSYSTEM

Thank you for your attention

Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC Satellite meeting at the ISI Regional Statistics Conference on *"Is the household sector in Asia overleveraged: what do the data say?"*

Kuala Lumpur, Malaysia, 15 November 2014

Assessing household balance sheet and risks – three challenges[1]

Jacques Fournier, Bank of France

[1] Discussion of the presentation *"Using household balance sheet and housing data for systemic risk assessment and policy formulation – Malaysia's experience"* by Chin Ching Lau, Central Bank of Malaysia. The views expressed are those of the author and do not necessarily reflect the views of the BIS or the central banks and other institutions represented at the meeting.

BANQUE DE FRANCE
EUROSYSTÈME

USING HOUSEHOLD BALANCE SHEET AND HOUSING DATA FOR SYSTEMIC RISK ASSESSMENT AND POLICY FORMULATION

Discussion by Jacques Fournier
Banque de France

Kuala Lumpur, 15 November 2014

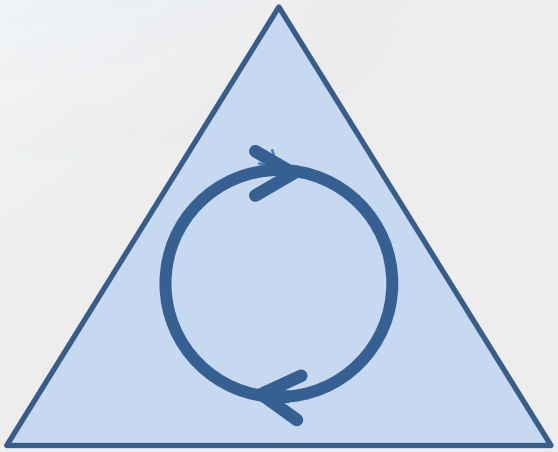
"Man often knows what he does, but never knows what will do what he does"
(Paul Valéry)

"We have to recognize that there is no road that guides us from what exists to what should exist"
(Albert Einstein)

Experience demonstrates that property booms are often the source of vulnerabilities that lead to systemic crisis

- To mitigate this risk, three conditions have to be met:

1. Reliable and comparable data



2. Macro economic analysis

3. Adapted policy measures

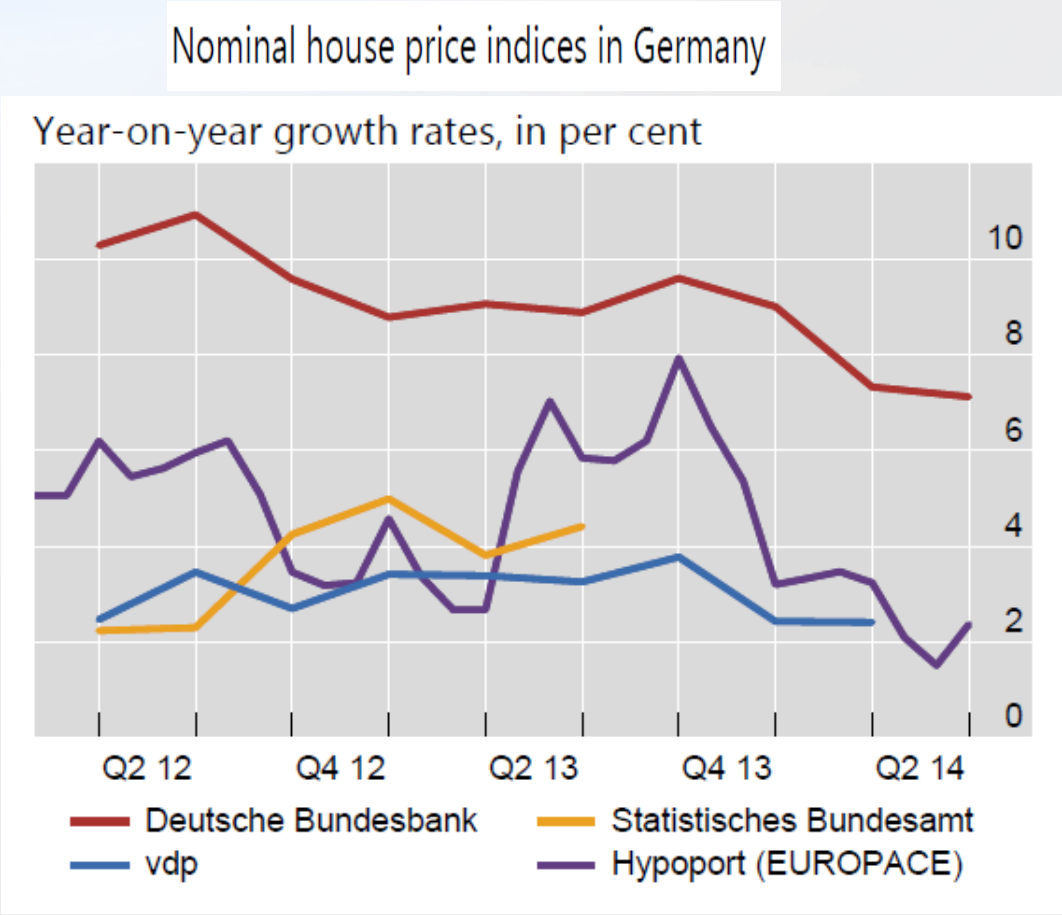
- + a close interaction between these three aspects is warranted, not only for presentations but also in "real Central Bank life".

BANQUE DE FRANCE
EUROSYSTÈME

1. First challenge : reliable and timely data

- In 2009, the G20 asked the BIS and the member central banks to collect and publish residential property prices.
- The coverage is 55 countries today.
- Quality-adjusted prices indices that cover the whole sector (all types of dwelling and all locations in a given country) are available for about two thirds of the 55 countries.
- This database is a huge progress and a key tool for statisticians and economists.
- The process is beginning only: more countries could join, in particular the hedonic approach
- Some questions marks: comparing absolute prices and not only evolutions?

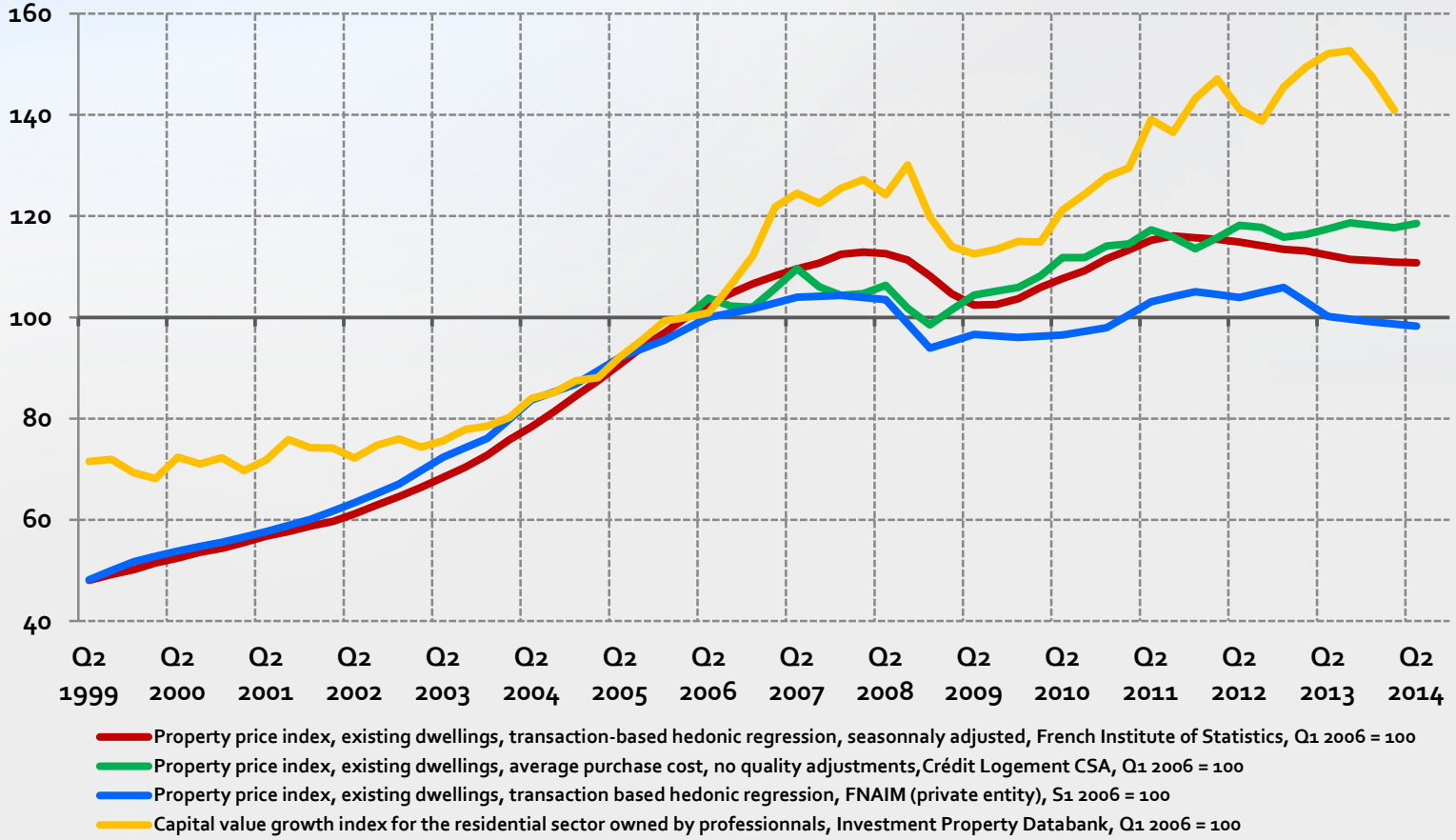
Residential property prices indices may convey contrasted messages
An example : Germany



Source: BIS

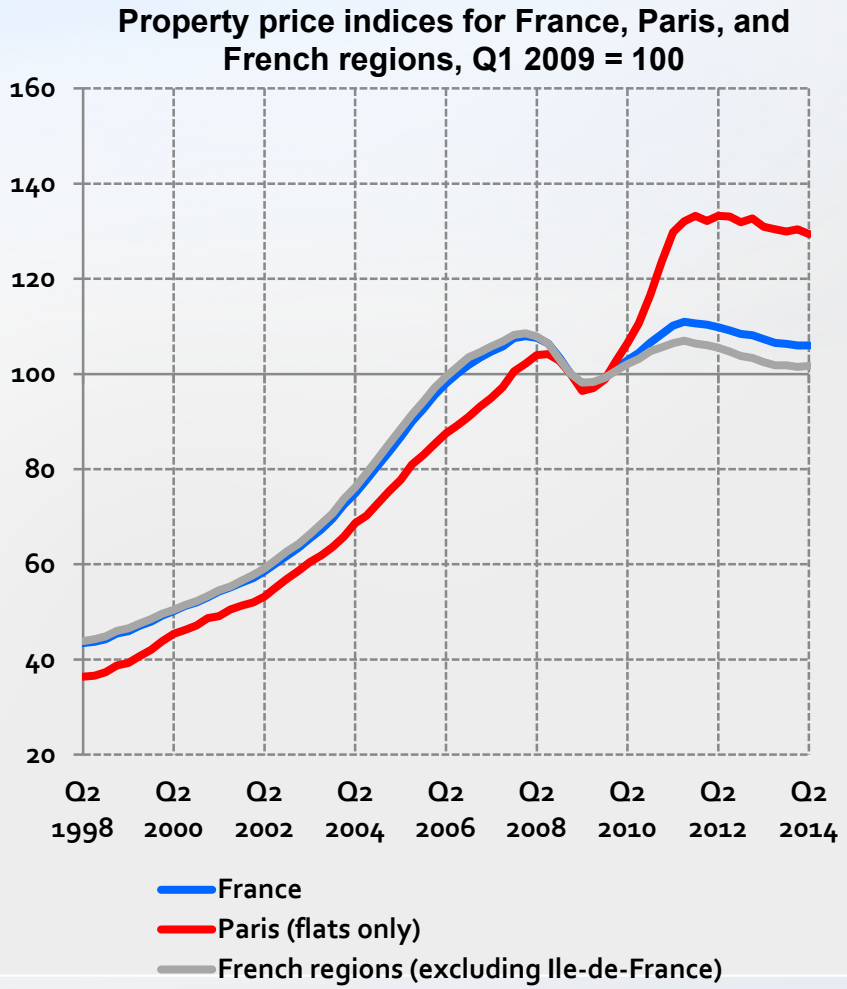
BANQUE DE FRANCE
EUROSYSTÈME

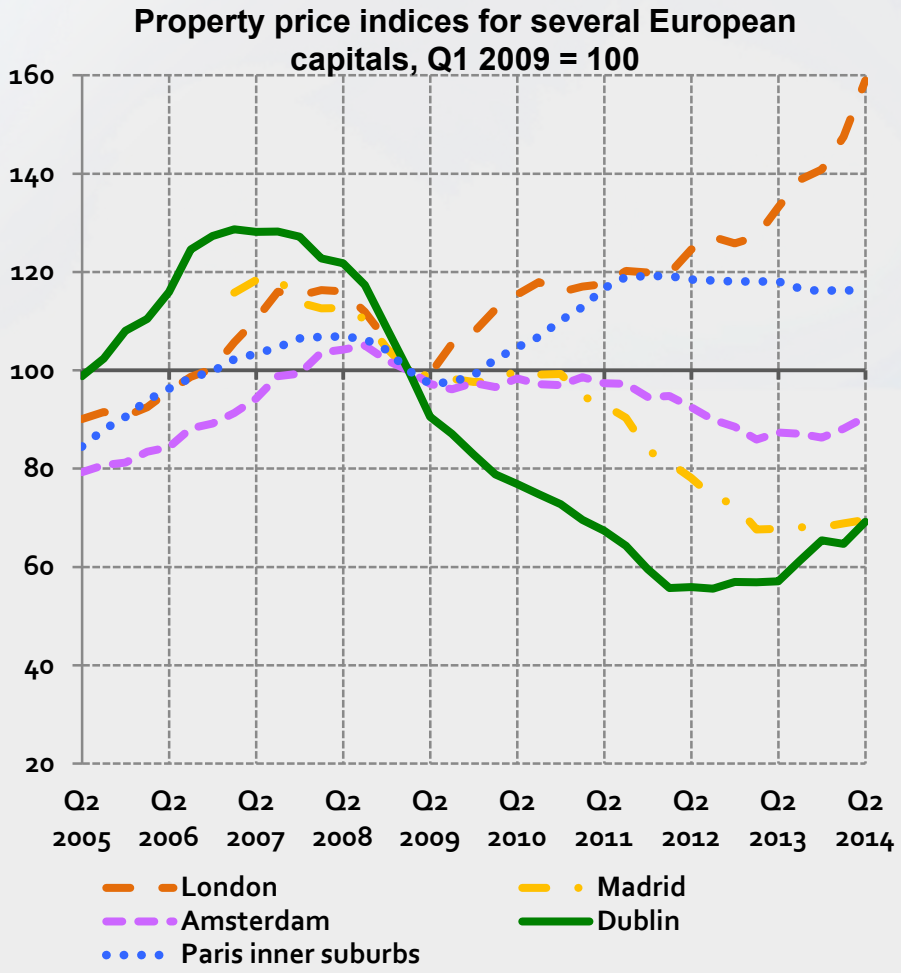
France is another example of indices divergence



Source: INSEE, FNAIM, Crédit logement, IPD. Banque de France computation

Geography matters

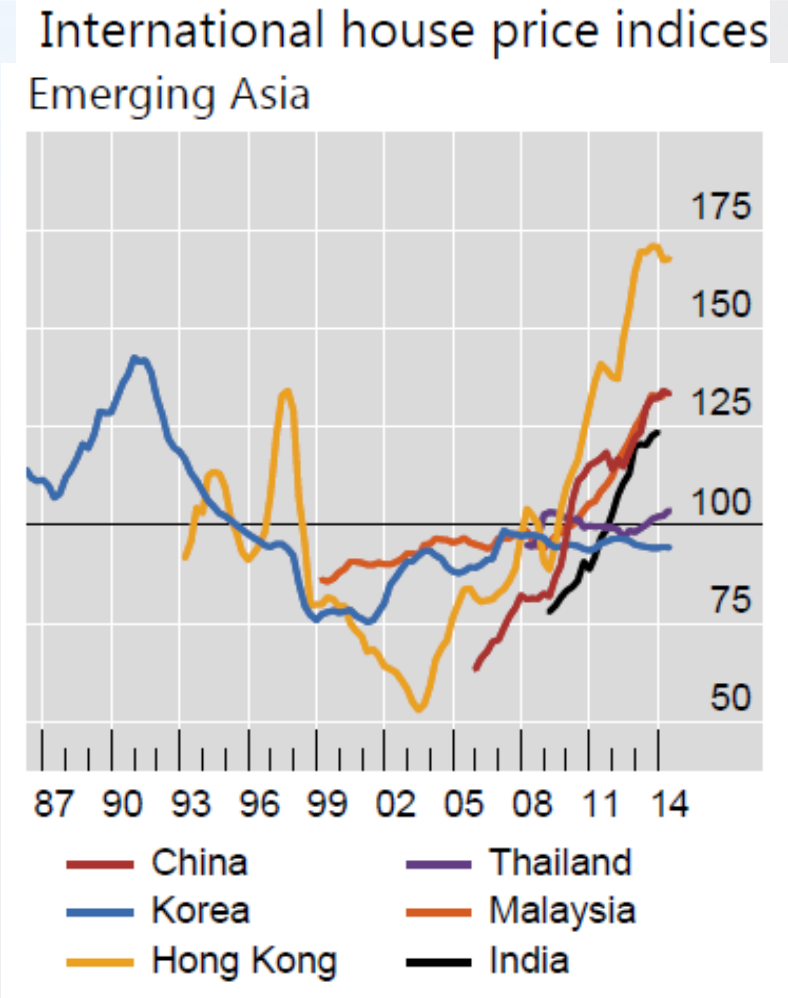




Source: INSEE, ONS, CSO, INE, CBS.
Compilation: Banque de France

BANQUE DE FRANCE
EUROSYSTÈME

By contrast to Europe and the US, house prices rise strongly in many Asian countries



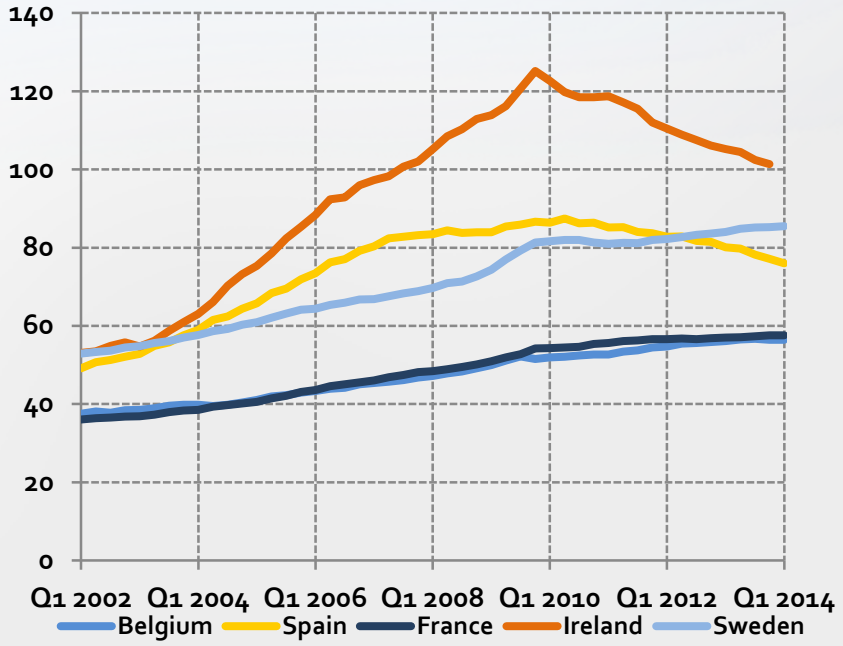
Source: BIS

BANQUE DE FRANCE
EUROSYSTÈME

2. Making an economic and financial analysis

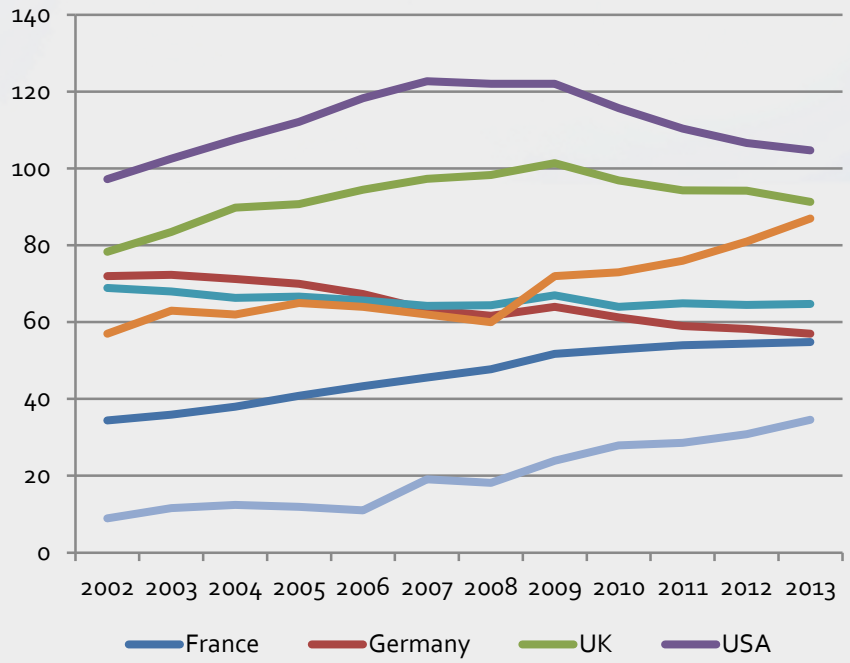
A simple early warning signal: Residential property prices corrections generally took place in countries with HH debt to GDP above 70%

Ratio of households' debt to gross domestic product at market prices (in %)



Source: ECB

Household debt (% of GDP)



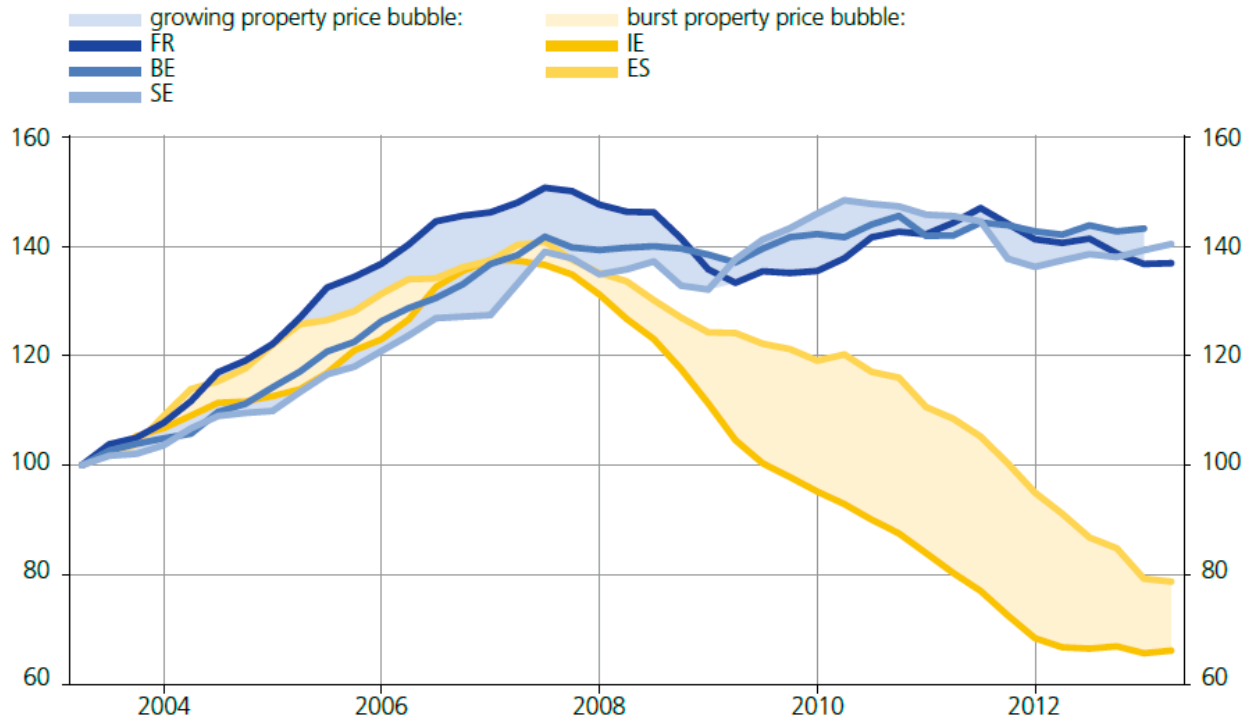
Sources : Banque de France, Bank Negara Malaysia, BIS, IMF

BANQUE DE FRANCE
EUROSYSTÈME

And when the crisis comes, prices can be plummeting dramatically

Heterogeneity in EU residential property markets

(real property prices; Q2 2003 = 100)



Source: ECB.

BANQUE DE FRANCE
EUROSYSTÈME

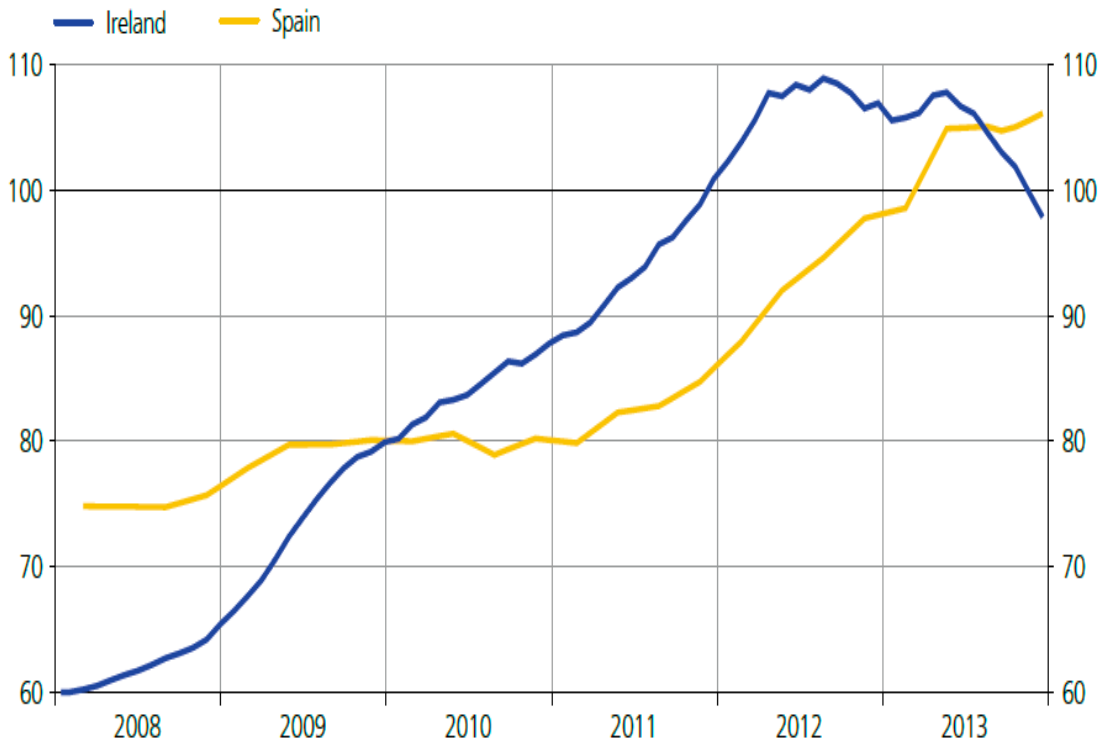
3. Policy steps

BANQUE DE FRANCE
EUROSYSTÈME

As said in the presentation, LTV is not fully convincing

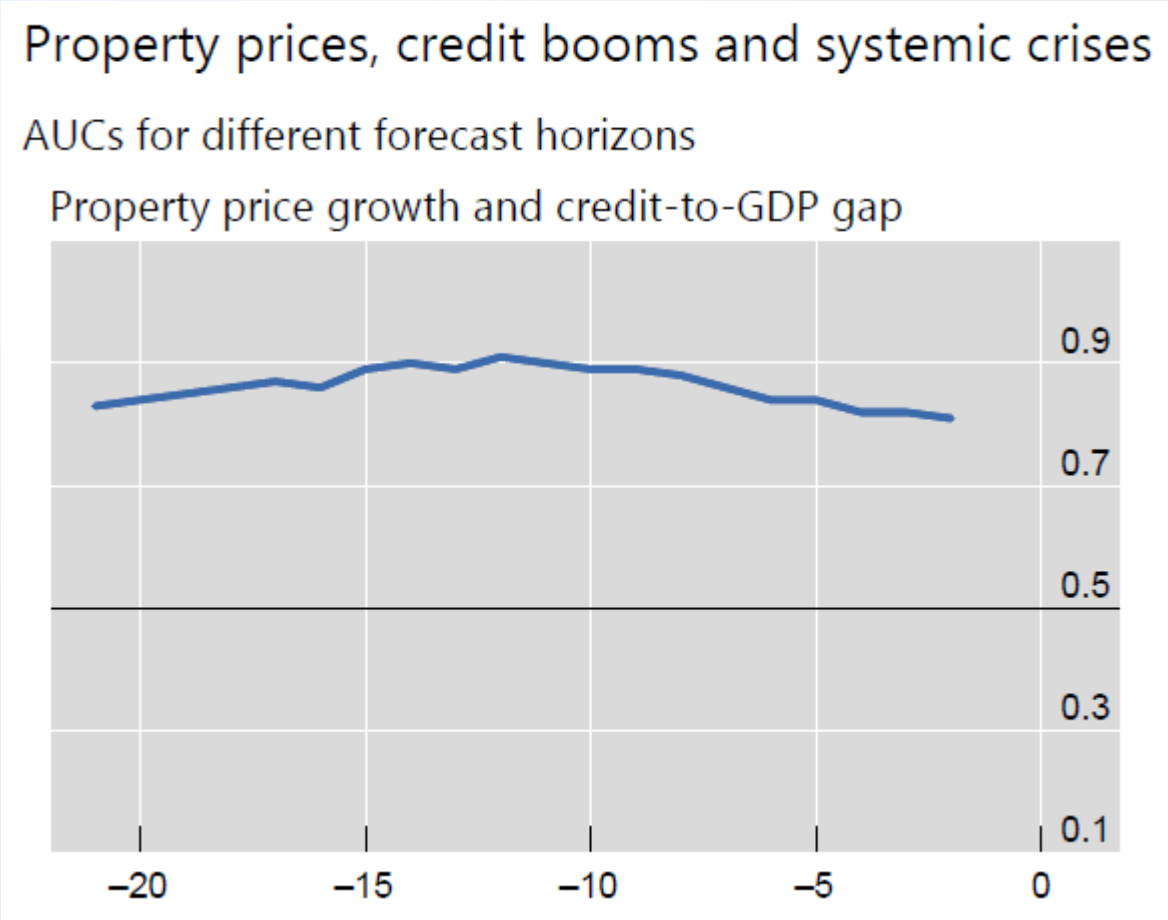
The evolution of LTV ratios, as driven by a decline in property prices

(percentages; mark-to-market LTV)



Sources: NCBs and statistical offices in Ireland and Spain.

Property prices boom is a fairly good leading indicator of systemic crises



Source: BIS

3 main tools:

- At the micro level but for macro purposes: Pillar 2 of the international solvency ratio
- Household indebtedness to GDP
- Credit growth to GDP

Still a question mark: what about the shadow banking?

IFC Satellite Seminar at the ISI Asian Regional Conference in Kuala Lumpur on 15 November 2014

List of participants

Last Name	First Name	Organization
Abdul Hamid	Faridah	Bank Negara Malaysia
Abdul Rahman	Nur Farha	Bank Negara Malaysia
Abdul Rani	Muhamad Shukri	Bank Negara Malaysia
Abdullah	Suhaiza	Bank Negara Malaysia
Ahmed	Dian	Bank Negara Malaysia
Alam	Amirah	Permodalan Nasional Berhad
Ang	Jian Wei	Bank Negara Malaysia
Ariyaratne	Susantha	Central Bank of Sri Lanka
Aspar	Ili Sarah	Bank Negara Malaysia
Avanzini	Diego	Central Bank of Chile
Awang	Nazri	Permodalan Nasional Berhad
Cadete De Matos	Joao	Banco De Portugal
Chang	Wen Huei	Bank Negara Malaysia
Chang	Chareeyan	Bank Negara Malaysia
Chin Wai	Yan	Bank Negara Malaysia
Ching Yieng	Wong	Bank Negara Malaysia
Chun Keat	Kenneth Hiew	Bank Negara Malaysia
Devadas	Sharmila	Bank Negara Malaysia
Deveza	Teresita	Bangko Sentral Ng Pilipinas
Erik	Burcu	Central Bank of The Republic of Turkey
Fournier	Jacques	Banque de France
Gatnar	Eugeniusz	National Bank of Poland
Hennings	Katherine	Banco Central Do Brasil
Higo	Masahiro	Bank of Japan
Hoosain	Aadila	South African Reserve Bank
Ilias	Suhaimi	Maybank Investment Bank Berhad
Jung	Joon	Bank of Korea
Kairul Zaman	Khairul Nadzrin	Bank Negara Malaysia
Khamis	Azizan	Bank Negara Malaysia
Kim	Yoon Kyum	Bank of Korea
Kirchner	Robert	Deutsche Bundesbank
Konno (Mizuno)	Sayako	Bank of Japan
Kue Peng	Chuah	Bank Negara Malaysia
Kwan	Wan Hong	Alliance Bank Malaysia Berhad
La Cava	Gianni	Reserve Bank of Australia
Lau	Chin Ching	Bank Negara Malaysia
Lee	Jooyung	Bank of Korea
Loong	Chee Wei	CLSA Securities Malaysia Sdn Bhd
Lutfi Abdullah	Ahmad	Bank Negara Malaysia
Mat Ali	Haslina	Bank Negara Malaysia
Mat Salleh	Nur Fazila	Bank Negara Malaysia
Mathews	Sangeetha	Reserve Bank of India

Mazlan	Zima Mazfahani	Bank Negara Malaysia
Mehrhoff	Jens	Deutsche Bundesbank
Merican	Yasmine	Permodalan Nasional Berhad
Mohamad Anuar	Ida Melissa	Permodalan Nasional Berhad
Mohamad Bahari	Hariz	Bank Negara Malaysia
Mohamad Gazali	Ahmad Fadhli	Bank Negara Malaysia
Mohd Anwar	Farah Liyana	Bank Negara Malaysia
Mohd Hariri	Mohd Shukri	Permodalan Nasional Berhad
Mohd Husin	Saiful Anuar	Bank Negara Malaysia
Mohd Ibrahim	Rozaini	Bank Negara Malaysia
Mohd Mahayidin	Shamsuddin	Bank Negara Malaysia
Mutalib	Muazlinda	Ministry of Finance
Nadaraja	Devendran	Securities Commission Malaysia
Nazri	Nor Rafidz	Bank Negara Malaysia
Ng	Julie	RAM Holdings Bhd
Nik Jaafar	Norhazleen	Permodalan Nasional Berhad
Nordin	Noorshizatulshima	Bank Negara Malaysia
Nur Isnaini	Farida	Bank Indonesia
Olowofeso	Olorunsola	Central Bank of Nigeria
Othman	Muhammad	Bank Negara Malaysia
Patrawimolpon	Pichit	Bank of Thailand
Quek She Lin	Celine	Hong Leong Bank Berhad
Rahim	Nur Ikmal	Bank Negara Malaysia
Raja Mohammad	Raja Zarina	Malaysian Rating Corporation Berhad
Rosli	Ain Zubaida	Bank Negara Malaysia
Roslie	Fadllyhar	Bank Negara Malaysia
Saadiah	Nor Halimaton	Bank Negara Malaysia
Sahinbeyoglu	Gülbin	Central Bank of The Republic of Turkey
Salihudin	Saiful Amri	Bank Negara Malaysia
Schubert	Aurel	European Central Bank
Setyoningsih	Tri	Bank Indonesia
Shahrier	Nur Ain	Bank Negara Malaysia
Shamsul Iwardi	Aiman	Bank Negara Malaysia
Sheng Ling	Lim	Bank Negara Malaysia
Sia	Ket Ee	Hong Leong Investment Bank
Siow	Zhen Shing	Bank Negara Malaysia
Tan Lee Ming	Amanda	Bank Negara Malaysia
Tek Wooi	Yew	Bank Negara Malaysia
Tissot	Bruno	Bank for International Settlements
Tng	Boon Hwa	Bank Negara Malaysia
Ullah	Mohammad Amin	Bangladesh Bank
Wai Ching	Poon	Monash University Malaysia
Wan Abd Ghani	Wan Non Zarina	Bank Negara Malaysia
Yap	Lay Hua	Ministry of Finance
Yuen	Raymond	Hong Kong Monetary Authority
Zampolli	Fabrizio	Bank for International Settlements