Ilhyock Shim Bilyana Bogdanova Jimmy Shek Agne Subelyte

ilhyock.shim@bis.org bilyana.bogdanova@bis.org jimmy.shek@bis.org agne.subelyte@bis.org

Database for policy actions on housing markets[1]

A new database for policy actions on housing markets covers 60 economies worldwide from January 1990 (or earliest date available) to June 2012. Policy actions are summarised by type, region, timing and direction. We suggest how the database might help policymakers and researchers to review what types of policy action were taken in other economies and to assess their effectiveness.

JEL classification: E50, G28.

Housing markets have fomented a lengthy catalogue of financial crises in advanced and emerging economies alike. Seeking to moderate the frequency and severity of booms and busts in housing credit and house prices, monetary and prudential authorities around the world have applied various types of policy measures that influence primarily housing markets or the provision of housing credit.

In this special feature, we present a database for such policy actions that covers 60 economies worldwide from January 1990 (or the earliest available date) to June 2012. We first describe how we drew on the official publications of central banks and financial authorities to select and consistently document policy actions. The database covers a wider range of countries and measures, as well as a longer time span, than any previously available reference source. We also provide some stylised facts on what type of measures were used, in which countries and regions, and on how these policies have evolved over time.

The database will be useful to both policymakers and researchers. It may help policymakers review what types of policy action were used by authorities worldwide when seeking to influence housing credit and house prices. It will also support researchers who wish to assess the effectiveness of policy actions that influence primarily housing markets. For example, Kuttner and Shim (2013) use these data, together with changes in policy rates and fiscal policy measures, to analyse the effects of monetary, prudential and fiscal policy measures on housing credit and house prices in 57 economies.

[1] The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS. We are grateful to Claudio Borio, Stephen Cecchetti, Frank Packer and Christian Upper for comments on earlier drafts of the article.

About the database

We collected information on various types of policy action affecting housing markets. The resulting database covers the central banks and financial authorities of 60 economies. Our sample includes 13 economies in Asia-Pacific, 15 in central and eastern Europe, seven in Latin America, four in the Middle East and Africa, two in North America and 19 in western Europe. The monthly data span the period from January 1990 to June 2012.[2] Table 1 provides further details of the database's coverage. We focus on monetary policy measures (excluding policy rate changes) and prudential measures affecting housing credit or house prices.

Instead of relying on an ad hoc questionnaire in compiling our data set, we referred to the official publications and press releases of central banks and financial authorities of 60 economies.[3] We also made reference to the lists of policy actions in the following secondary sources, but such measures are included from these sources only when they could be verified from official data:

- Borio and Shim (2007), who record that 18 economies applied non-interest rate monetary policy and macroprudential measures affecting housing credit and prices;
- Crowe et al (2011), who record that 24 economies experiencing real estate booms took some action;
- Hilbers et al (2005), who show that 10 central and eastern European countries that experienced rapid growth of private sector credit took some policy measures in or before 2005;
- Lim et al (2011), who, reporting the results of an IMF survey, list macroprudential measures taken by 40 economies; and
- Tovar et al (2012), who describe measures taken by Bolivia, Brazil, Colombia, Peru and Uruguay to slow down credit growth.

Key selection criteria

Among policy actions that directly or indirectly affect housing market-related activities, we focus on those that have been frequently used to significantly influence housing credit and house prices. In particular, we collect information on prudential measures that directly influence housing credit, and on monetary policy measures that influence house prices indirectly via the availability of housing loans.

[2] The actual starting year varies between 1990 and 2003, depending on the economy.

[3] There are clear benefits and drawbacks to this approach. In terms of benefits, our approach should in principle provide a complete list of all relevant policy actions officially published by central banks and financial authorities, while an ex post survey could suffer from incomplete identification of relevant policy actions. Moreover, by reading through official publications, we can obtain full and accurate information on potentially relevant policy actions. These details allow us to use consistent criteria when determining which measures to include and how to record them consistently. Another benefit of relying on official publications is accurate identification of the implementation date of each policy action. One disadvantage of using official sources is the language barrier for some countries, given that English translations for such documents may be unavailable for earlier periods. Also, for a limited number of countries, archives available on the websites of relevant authorities or offline publication archives available from the BIS library may have one or two missing years. Therefore, we may have omitted relevant policy actions taken in these missing years.

Database coverage

Table 1

Asia-Pacific [13]	Australia (1996;1998)	China (1998;1998)	Hong Kong SAR (1990;1991)	India (1998;1999)	Indonesia (2003;2008)
	Japan (1999;1990)	Korea (2002;1990)	Malaysia (1990;1990)	New Zealand (1990;2010)	Philippines (1990;1990)
	Singapore (1996;1996)	Thailand (1999;1999)	Chinese Taipei (2006;2000)		
Central and eastern Europe [15]	Bulgaria (1990;1990)	Croatia (1997;1998)	Czech Republic (1995;1990)	Estonia (1993;1997)	Hungary (2000;2000)
	Latvia (1992;2000)	Lithuania (1994;2000)	Poland (1997;2002)	Romania (1998;1998)	Russia (1998;1992)
	Serbia (1999;2002)	Slovakia (1993;1995)	Slovenia (1996;2000)	Turkey (1996;2002)	Ukraine (2001;2001)
Latin America [7]	Argentina (2000;2002)	Brazil (1997;1994)	Chile (1991;1991)	Colombia (1992;1999)	Mexico (1999;2011)
	Peru (2000;2000)	Uruguay (2001;2001)			
Middle East and Africa [4]	Israel (1999;1998)	Saudi Arabia (1998;2007)	South Africa (2001;1998)	United Arab Emirates (2001;2011)	
North America [2]	Canada (1990;1992)	United States (1990;1990)			
Western Europe [19]	Austria (1998;1999)	Belgium (1997;2000)	Denmark (2003;2002)	Finland (1997;1990)	France (1997;1990)
	Germany (1990;1993)	Greece (1998;1999)	Iceland (1997;1999)	Ireland (1999;1991)	Italy (1990;1993)
	Luxembourg (1999;1997)	Malta (1998;1990)	Netherlands (1998;1995)	Norway (1998;1991)	Portugal (1996;1991)
	Spain (1998;1999)	Sweden (1997;1991)	Switzerland (1990;2005)	United Kingdom (1990;1991)	

The first year listed in brackets for each economy shows the earliest year for which official source materials from central banks and financial authorities were reviewed in order to identify relevant measures. The second year listed in brackets shows the year that a relevant policy action is first recorded in the database for each economy. The figures in square brackets indicate the number of economies in each region.

Sources: National sources; authors' calculations.

When we note a relevant policy measure, we do not consider the policymaker's intention or objectives as stated in the official record: what matters is the fact that the measure was taken. For instance, we include a measure in our data set even if a central bank changed, say, its reserve requirements for reasons other than the state of the housing market. The omission of measures with other aims that nevertheless did affect the housing market could bias any quantitative studies assessing their effectiveness.[4] Also, our database contains prudential measures taken from both microprudential and macroprudential perspectives.

[4] That said, the announcement of an intended policy action may have some informational content. For example, when a regulator announces that cooling down a housing boom is one of its policy objectives, this statement may have a signalling effect. If clearly stated, a policy objective may indicate the possibility that the authorities will take additional action until the desired effect is achieved.

We include only policy actions that fall into one of the categories we chose ex ante and describe below. So, for example, we do not include policy measures such as raising risk weights on foreign exchange exposures or strengthening the requirements for assessing the financial situation of borrowers with weak or incomplete credit information. We also exclude recommendations or non-binding guidelines without legal force, as well as statements by authorities that warn of housing price misalignments or foreshadow possible policy actions.

Monetary policy measures

Among monetary policy measures, we consider (i) reserve requirements; (ii) credit growth limits; and (iii) liquidity requirements. All of these directly affect the amount of funds available for lending to the private sector including potential homebuyers. Changes in policy rates and asset purchase programmes aimed at lowering long-term interest rates or mortgage rates are not included in the database because we are interested in the impact of administrative measures, and because policy rates and asset purchase programmes are already well documented.

Reserve requirements (RR)

With reserve requirements, banks are required to hold at least a fraction of their liabilities as liquid reserves. These are normally held either as reserve deposits at the central bank or as vault cash. Regulations generally specify the size of required reserves according to the type of deposit (eg demand, savings or time deposits), their currency of denomination (domestic or foreign currency) and their maturity.

The database includes changes in the various forms of reserve requirements. In particular, we consider changes in the reserve requirement ratio and reserve base.[5] We also include both average reserve requirements, where a certain reserve requirement ratio applies to all outstanding eligible liabilities, and marginal reserve requirements, which impose additional reserve requirements that are usually very high on any additional liabilities that banks have assumed after a certain cut-off date or that exceed a specified limit. Finally, we consider reserve requirements on both domestic and foreign currency liabilities.

Limits on credit growth (Credit)

When an economy experiences rapid credit growth, the central bank may impose a quantitative ceiling on the rate of credit growth per month or year, or a maximum per-month or per-quarter increase in lending. Such limits to credit growth include actions that specify a quantitative limit on the rate of credit growth and penalties for exceeding this limit.

Liquidity requirements (Liq)

Liquidity requirements typically take the form of a minimum ratio for highly liquid assets, such as government securities and central bank paper, vis-à-vis certain types of liability. These are prudential regulations with the purpose of ensuring that banks can withstand severe cash outflows under stress. However, liquidity requirements act in a similar way to reserve requirements in that they influence the amount of

[5] We do not include changes in the remuneration rates, reserve maintenance periods or averaging methods because our focus is on policy actions that directly affect the aggregate quantity of funds available for lending. However, it should be noted that this distinction is not clear-cut, given that reserve requirements also operate by influencing the cost of lending.

funds available for lending to the private sector. In this article, we classify liquidity requirements as a part of monetary policy action.

Prudential measures

Financial authorities use various prudential measures to steer the provision of housing credit. We focus on five specific types: (i) the maximum loan-to-value ratio; (ii) the maximum debt-service-to-income ratio; (iii) risk weights on housing loans; (iv) loan loss provisioning applied to housing loans; and (v) limits on banks' exposure to the housing sector.

Maximum loan-to-value ratio and loan prohibition (LTV)

Financial authorities impose a maximum loan-to-value (LTV) ratio or lower an existing one in order to slow down housing loan growth and build up buffers within banks against potential losses from housing loans. The authorities may also choose to prohibit certain types of housing loan, which is equivalent to applying a zero LTV ratio. For example, when China's housing markets were overheating in 2012, the authorities prohibited banks from making loans on second or third houses, and prevented banks from lending to foreigners and non-residents for the purpose of house purchases. We include only nationwide restrictions; in cases where these measures apply only to individual cities, we consider them nationwide if restrictions on lending are imposed in several cities across the country.

Maximum debt-service-to-income ratio and other lending criteria (DSTI)

Another policy that is frequently used to curb the provision of housing credit is to restrict the debt-service-to-income (DSTI) ratio (or debt service ratio) applied to borrowers for house purchases. Typically, financial authorities specify a certain percentage of the borrower's monthly income as the maximum amount of monthly repayments on a home loan. Less frequently, limits on the loan amount are expressed as a multiple of household income (ie maximum debt-to-income ratio) or as a minimum debt-service-to-debt ratio. In addition, when financial authorities shorten the maximum maturity of mortgage contracts or eliminate preferential interest rates for mortgage loans, mortgage borrowers find that their debt repayments increase, which induces them to borrow less. This type of measure is categorised under "other lending criteria".

Risk weights on housing loans (RW)

Under Basels I, II and III, housing loans are subject to risk weights that differ from those applied to corporate or sovereign exposures. Raising the risk weight on housing loans makes it more costly for banks to extend them and, at the same time, banks are induced to build up buffers against potential losses. Often, risk weights are differentiated by the actual LTV ratio for individual loans. For example, the portion of a housing loan's LTV ratio that exceeds a certain threshold (eg 80%) may carry a higher risk weight.

Loan loss provisioning applied to housing loans (Prov)

Similar in effect to risk weights, general and specific loan loss provisions can be increased for housing loans to make them more costly, thus putting a brake on

housing credit growth.[6]

Limits on banks' exposure to the housing sector (Expo)

Limits on banks' exposure to the housing sector will slow housing credit growth and reduce the losses from housing loans should house prices fall. Sometimes, such limits are set as a percentage of a bank's equity. Included in the database are limits on foreign currency lending to unhedged borrowers as a percentage of the bank's equity, since they target the risks stemming from foreign currency-denominated housing loans to households whose income is mainly in local currency.

Documentation of policy actions

Using the selection criteria outlined in the previous subsection, we collected relevant information from official national sources. Each policy action has dates for its announcement and implementation, which are quite often different. The timing of a policy action is based on the implementation date, not the announcement date: we believe this is a more meaningful way of timing a policy action, given that official sources may not disclose its exact announcement date. That said, the announcement date can sometimes be more important than the implementation date because many actions depend on the steering of expectations rather than on current conditions in the housing and mortgage markets. Some, but not all, policy actions recorded in the database also contain the announcement date.

The database aims for easy-to-read and consistent documentation of relevant policy actions taken in different economies. In particular, text entries in the database are organised in the following format: when, why, who introduced what measures, changed a measure from where to where, or rescinded (or reversed) a measure introduced earlier. The web appendix[7] for this article contains a table showing what measures were taken by the authorities of an economy in a given month. Table 2 shows an excerpt from the appendix table.

Among the entries in the appendix table, those in blue cells are relevant actions that we identify as tightening measures and those in yellow cells are the ones identified as loosening measures. The entries in white cells refer to actions for which we do not have enough information to decide whether they tightened or loosened borrowing conditions.[8] These measures are documented in the appendix table, but they are not counted in the next section when we summarise stylised facts on policy actions.

[6] We do not include policy actions that raise provisioning ratios on bad loans since these actions build up buffers inside banks against losses incurred on bad lending and hence do not affect the supply of new loans.

[7] www.bis.org/publ/qtrpdf/r_qt1309i_appendix.xls.

[8] In particular, when two or more measures of the same type with opposite effects, such as a tightening of reserve requirements and a loosening of reserve requirements, were introduced at the same time, the overall effect is sometimes ambiguous. Also for some countries, we know that the operational framework for a type of policy action, such as reserve requirements, changed to a new framework in a given month. However, we were able to obtain detailed information only on the new framework. In this case, it is unclear whether the change had tightening or loosening effects.

Excerpt from the appendix table

Table 2

	China
June 2006	On 1 June 2006, the authorities reduced the maximum LTV ratio applied to housing loans extended by commercial banks from 80% to 70%, while the ratio remained at 80% for housing loans to owner-occupiers with a property size below 90 square metres.
July 2006	On 5 July 2006, the central bank raised the reserve requirement ratio by 0.5 percentage points, from 7.5% to 8% for state-owned commercial banks and joint-stock commercial banks, and from 8% to 8.5% for urban credit cooperatives and financial institutions with capital adequacy ratios below a certain level.
August 2006	On 15 August 2006, the central bank raised the reserve requirement ratio by 0.5 percentage points to 8.5% (and to 9%, respectively).
September 2006	
October 2006	
November 2006	On 15 November 2006, the central bank raised the reserve requirement ratio by 0.5 percentage points to 9% (and to 9.5%, respectively).
December 2006	
January 2007	On 15 January 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 9.5% (and to 10%, respectively).
February 2007	On 25 February 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 10% (and to 10.5%, respectively).
March 2007	
April 2007	On 16 April 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 10.5% (and to 11%, respectively).
May 2007	On 15 May 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 11% (and to 11.5%, respectively).
June 2007	On 5 June 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 11.5% (and to 12%, respectively).
July 2007	
August 2007	On 15 August 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 12% (and to 12.5%, respectively).
September 2007	On 25 September 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 12.5% (and to 13%, respectively). On 27 September 2007, the authorities imposed a maximum LTV ratio of 60% for borrowers applying for second mortgage loans. On 27 September 2007, the authorities raised the minimum lending rate from 0.9 times to 1.1 times the benchmark lending rate of a given maturity.
October 2007	On 25 October 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 13% (and to 13.5%, respectively).
November 2007	On 26 November 2007, the central bank raised the reserve requirement ratio by 0.5 percentage points to 13.5% (and to 14%, respectively).
December 2007	On 25 December 2007, the central bank raised the reserve requirement ratio by 1 percentage point to 14.5% (and to 15%, respectively).
January 2008	On 28 January 2008, the central bank raised the reserve requirement ratio by 0.5 percentage points to 15% (and to 15.5%, respectively).
February 2008	
March 2008	On 25 March 2008, the central bank raised the reserve requirement ratio by 0.5 percentage points to 15.5% (and to 16%, respectively).
April 2008	On 25 April 2008, the central bank raised the reserve requirement ratio by 0.5 percentage points to 16% (and to 16.5%, respectively).
May 2008	On 20 May 2008, the central bank raised the reserve requirement ratio by 0.5 percentage points to 16.5% (and to 17%, respectively).

Stylised facts

This section presents stylised facts on the policy actions documented in the database. The following subsections show how these policy actions have been used in 60 economies over the past two decades or so, first by type and region, then over time and finally by direction (that is, tightening or loosening).

Type, extent and region

In this subsection, we transform the detailed list of policy actions in the appendix table into tables that show the number of policy actions in various dimensions.[9] Table 3 shows how many policy actions were adopted in the 60 economies for each of the nine different types of measure over the past two decades or so. These amount to 836 in total.

Policy actions by type and region

Number of policy actions[1] Table 3

Region	Asia-Pacific [13][2]	Central and eastern Europe [15]	Latin America [7]	Middle East and Africa [4]	North America [2]	Western Europe [19]	All economies [60]
RR	150 (6.5)	221 (8.5)	87 (7.9)	6 (1.1)	7 (1.6)	52 (1.4)	523 (4.9)
Credit	4 (0.2)	7 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.1)	14 (0.1)
Liq	30 (1.3)	4 (0.2)	6 (0.5)	0 (0.0)	0 (0.0)	13 (0.4)	53 (0.5)
Monetary total	184 (7.9)	232 (8.9)	93 (8.4)	6 (1.1)	7 (1.6)	68 (1.9)	590 (5.5)
LTV	56 (2.4)	11 (0.4)	2 (0.2)	0 (0.0)	4 (0.9)	21 (0.6)	94[3] (0.9)
DSTI	20 (0.9)	12 (0.5)	1 (0.1)	1 (0.2)	2 (0.4)	9 (0.2)	45[4] (0.4)
RW	14 (0.6)	19 (0.7)	5 (0.5)	3 (0.5)	0 (0.0)	9 (0.2)	50 (0.5)
Prov	16 (0.7)	10 (0.4)	6 (0.5)	1 (0.2)	0 (0.0)	4 (0.1)	37 (0.3)
Expo	11 (0.5)	8 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)	20 (0.2)
Prudential total	117 (5.0)	60 (2.3)	14 (1.3)	5 (0.9)	6 (1.3)	44 (1.2)	246 (2.3)
Total	301 (12.9)	292 (11.3)	107 (9.7)	11 (2.0)	13 (2.9)	112 (3.1)	836 (7.9)

[1] The values in brackets show the average number of policy actions per country per decade. The number of years for each country that we use for calculating the average value is the difference between June 2012 and the earlier of the two coverage years shown in Table 1. [2] The figures in square brackets indicate the number of economies in each region. [3] The sum of policy actions involving maximum loan-to-value (LTV) ratios and loan prohibitions. The number of actions involving maximum LTV ratios only is 81. [4] The sum of policy actions involving maximum debt-service-to-income (DSTI) ratios and other lending criteria. The number of actions involving maximum DSTI ratios only is 28.

Sources: National sources; authors' calculations.

[9] In order to effectively discuss stylised facts on the use of various types of policy measure, we need to count the number of actions taken by a given jurisdiction in each month. When two actions of the same type were taken on the same date, we consider them as one single measure. On the other hand, when two actions of the same type were taken on different dates in a calendar month, we consider them as two separate measures. For example, if a maximum LTV ratio changes in a month for many different types of borrowers or regions, they are counted as one measure. However, if in the same month the authorities also prohibit certain types of housing loans on a different date, this loan prohibition measure is counted as separate from the maximum LTV measure. Finally, when a central bank raises the reserve requirement ratio on the same eligible liabilities twice on two different dates in a calendar month, these actions are counted as two different measures.

We observe 590 monetary policy actions associated with the three types of non-interest rate monetary policy measure outlined in the previous section. In particular, reserve requirements have been used most frequently among all the nine types of policy action. An important reason could be that changes in reserve requirements can be used for many purposes whereas the other measures influence primarily the housing market. In particular, reserve requirements directly influence overall liquidity in the banking system and are often used as a fine-tuning device in response to rapidly changing liquidity conditions in the market. Also, when a central bank conducts monetary policy by targeting monetary aggregates without actively using interest rate policy, reserve requirements are often used as one of the main tools for influencing the extension of bank credit. Authorities in 48 economies changed their reserve requirement ratio or reserve base at least once between January 1990 and June 2012. The other two types of monetary policy measure, liquidity requirements and credit growth limits, were used much less frequently by fewer than 10 economies for each type.

We also find 246 prudential policy actions related to the five types of prudential measure. Among the five types, financial authorities used maximum LTV ratios and loan prohibitions most frequently, in total 94 times. They also changed risk weights on housing loans 50 times, and introduced or changed maximum DSTI ratios and other lending criteria 45 times. Loan loss provisioning rules on housing loans and limits on banks' exposure to the housing sector were used less frequently than the others, 37 and 20 times, respectively.

When we examine how these policy actions have been taken by region, it is important to calculate the number of policy actions per country per year, since the number of countries varies greatly by region and also the number of years for which data are available differs across countries. We find that the 13 economies in the Asia-Pacific region were the most active users of prudential measures in terms of the average number of actions per country per decade among all six regions. By contrast, the 15 central and eastern European countries and the seven Latin American countries were the most active users of monetary policy measures.

We can also identify which economies were active users of monetary and prudential measures. In particular, the economies that have taken 10 or more monetary policy actions per decade are China, India and the Philippines in Asia-Pacific; Croatia, Romania, Russia, Serbia and Ukraine in central and eastern Europe; and Brazil, Peru and Uruguay in Latin America. Several economies in Asia-Pacific (China, Hong Kong SAR, India, Korea and Singapore), central and eastern Europe (Romania and Serbia) and western Europe (Iceland) have adopted prudential measures five or more times per decade.

Trend over time

Since we have documented policy actions implemented by each economy every month from January 1990, we can show which types of measures were actively used over the past two decades or so. Table 4 shows, for each of the nine types of measure, how many policy actions per country per decade were taken in all 60 economies in the 1990s, the 2000s and between January 2010 and June 2012. The right-hand column of Table 4 shows that the total number of policy actions per country per decade has steadily increased since the 1990s.

This increase in policy activism has been driven more by prudential than by monetary policy. The trend is clearly reflected in the relative shares of monetary and

Policy actions over time

Number of policy actions per country per decade[1] Table 4

	Monetary				Prudential						Total
	RR	Credit	Liq	Total	LTV	DSTI	RW	Prov	Expo	Total	
1990–99	4.9	0.2	0.7	5.8	0.4	0.1	0.2	0.1	0.2	1.0	6.8
2000–09	4.6	0.1	0.4	5.2	0.8	0.5	0.6	0.5	0.2	2.6	7.8
2010–Jun 2012	6.0	0.1	0.3	6.4	2.1	0.9	0.7	0.3	0.1	4.1	10.5

[1] When we calculate the number of policy actions, we first divide the total number of policy actions taken by all economies in a decade by the sum of the number of coverage years for each economy in the decade, and then multiply the average number of actions per country per year by 10 to rescale it to the number of actions taken in a decade.

Sources: National sources; authors' calculations.

rudential measures over time. In the 1990s, the share of monetary policy actions was 85%, while that of prudential policy actions was 15%. The share of prudential policy actions more than doubled to 33% in the 2000s, and increased further to 39% between January 2010 and June 2012, led by the active deployment of LTV and DSTI measures.

What explains this shift from monetary to prudential measures over time? One reason could be that reserve requirements have lost their importance as monetary policy tools after many central banks started to adopt interest rate policy and inflation targeting as the main part of their monetary policy framework from the 1990s. Another possible reason could be that, since the 1990s, financial cycles such as housing credit and house price cycles have become longer, larger and less synchronised with business cycles and inflation cycles (see Drehmann et al (2012)). In response, policymakers in many economies have increasingly resorted to prudential measures specifically affecting the housing sector. Finally, financial authorities in many countries have shifted towards explicit macroprudential objectives after the recent financial crisis.

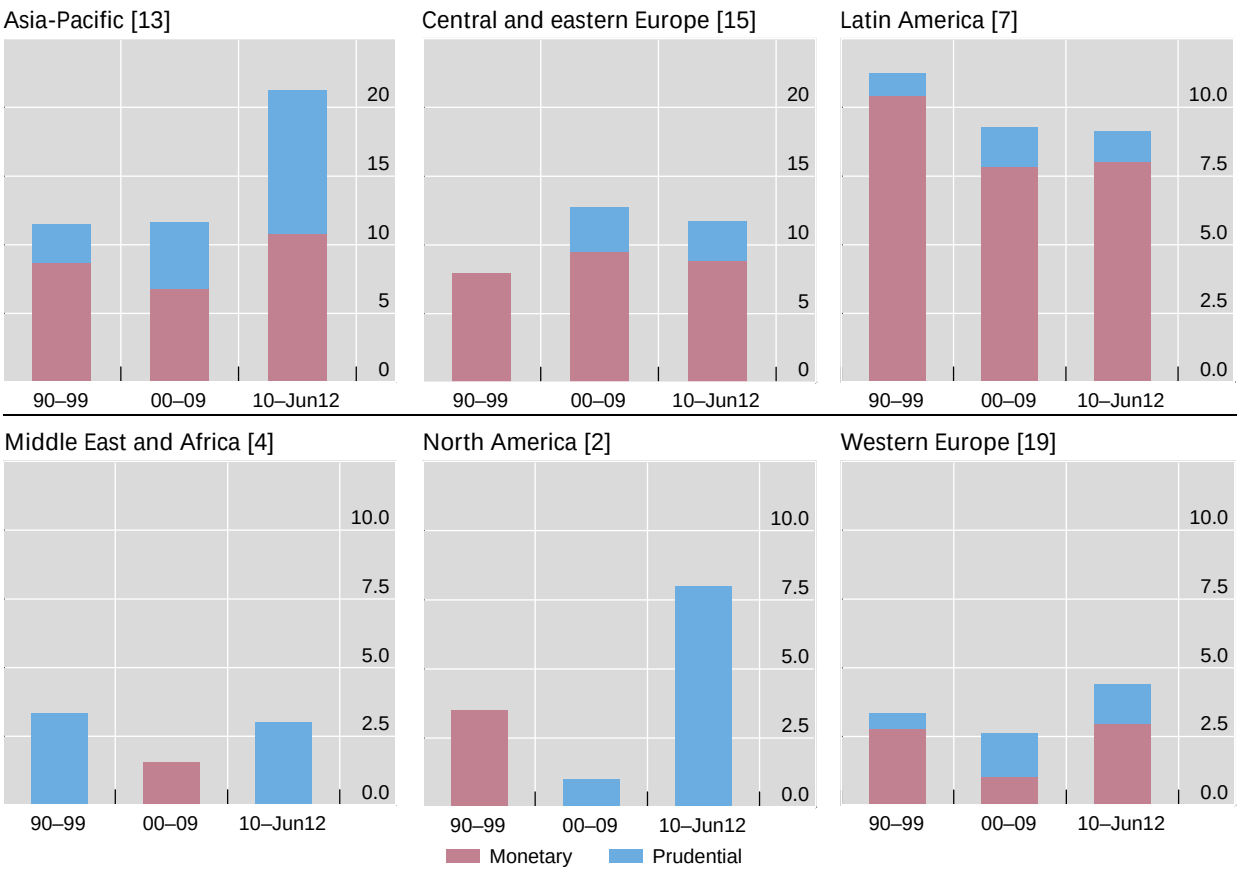
More specifically, we can compare how different regions have used monetary and prudential policy actions over time (Graph 1). In the Asia-Pacific region, prudential measures have gained more importance since the 1990s. In particular, after the Asian financial crisis in the late 1990s, the Asia-Pacific economies applied prudential measures more actively in the first decade of this century than previously. Especially since 2010, the region's authorities have used prudential policy almost as often as monetary policy. This contrasts with the central and eastern European and Latin American economies, which have relied much more on monetary than on prudential measures. Finally, the North American economies stopped using non-interest rate monetary policy actions from the 2000s onwards, and have relied on prudential measures instead.

Tightening or loosening

Finally, we can show whether policy actions have been used to tighten or loosen borrowing conditions. Table 5 lists the number of tightening and loosening measures for each region and type of action. We find that monetary policy moves in all economies are roughly balanced between tightening and loosening, while prudential measures are heavily tilted towards tightening. We note, however, that the relative use of tightening and loosening measures for each country is closely

Policy actions by region over time[1]

Number of policy actions per country per decade[2] Graph 1



[1] The figures in square brackets indicate the number of economies in each region. [2] When we calculate the number of policy actions, we first divide the total number of policy actions taken in all economies in one region in a decade by the sum of the number of coverage years for each economy in the region in the decade, and then multiply the average number of actions per country per year by 10 to rescale it to the number of actions taken in a decade.

Sources: National sources; authors' calculations.

related to the relative length of boom and bust periods in its housing market during the period covered in the database. Adjusting the number of tightening and loosening measures in relation to booms and busts in housing markets for each country is beyond the scope of this article.

Nevertheless, we can compare the choice of whether to tighten or loosen monetary policy with the same choice for prudential policy in each region. We find that, in each of the six regions, the share of tightening actions in prudential measures was greater than that of tightening actions in monetary policy measures. This finding implies that prudential measures were more tilted towards tightening than were monetary policy measures in all regions. One possible reason could be that, in principle, regulators could tighten prudential standards during a housing boom to stem housing credit growth, and loosen them during a crisis to increase buffers above the regulatory minima. In reality, however, regulators often find it difficult in mid-crisis to relax prudential measures that were tightened pre-crisis because market participants might then get the impression that banks were lacking in solvency or liquidity.

Policy actions by direction

Number of policy actions Table 5

	Asia-Pacific [13]	Central and eastern Europe [15]	Latin America [7]	Middle East and Africa [4]	North America [2]	Western Europe [19]	All economies [60]
RR	90/60	115/106	43/44	4/2	0/7	3/49	255/268
Credit	3/1	4/3	0/0	0/0	0/0	2/1	9/5
Liq	13/17	0/4	6/0	0/0	0/0	4/9	23/30
Monetary total	106/78	119/113	49/44	4/2	0/7	9/59	287/303
LTV	41/15	8/3	1/1	0/0	4/0	12/9	66/28
DSTI	16/4	11/1	1/0	1/0	2/0	4/5	35/10
RW	13/1	11/8	3/2	3/0	0/0	6/3	36/14
Prov	14/2	8/2	6/0	1/0	0/0	2/2	31/6
Expo	5/6	4/4	0/0	0/0	0/0	1/0	10/10
Prudential total	89/28	42/18	11/3	5/0	6/0	25/19	178/68

The first value in each cell represents the number of tightening measures, and the second value the number of loosening measures. The figures in square brackets indicate the number of economies in each region.

Sources: National sources; authors' calculations.

Conclusion

A new database for policy actions on housing markets draws on official publications of central banks and financial authorities in 60 economies over the past two decades or so to provide a comprehensive and consistent documentation of such actions. These data show that the Asia-Pacific economies were the most active users of prudential measures, whereas central and eastern European and Latin American countries were the most active users of monetary policy actions (excluding policy rate changes). In addition, we find that prudential measures have been used more frequently in recent years and were more tilted towards tightening than were monetary policy actions. These findings are in line with the increasing interest of policymakers in prudential measures that specifically influence housing credit booms.

For policymakers, the database will show what policy measures other jurisdictions have adopted to tackle the problems associated with booms and busts in housing credit and house prices. However, as collecting these data is very costly, we do not plan to update the database regularly.

For researchers, the database will help to support empirical analyses. In particular, dummy variables could be constructed for each type of policy action, as could numerical variables representing the size or intensity of changes in the policy actions. For example, by constructing dummy variables using the database, Kuttner and Shim (2013) find that certain types of prudential policies and fiscal measures tend to slow house price and housing credit growth. Also, since the database covers a wide range of non-interest rate monetary policy measures such as reserve requirements, it would be possible to gauge the impact of these measures on more general credit growth such as the total credit to the private non-financial sector recently published by the BIS (see Dembiermont et al (2013)).

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