Office for National Statistics

Article

Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds): historical households and non-profit institutions serving households (NPISH) sectors' data on loans and equity and investment fund shares or units

Historical time series for the households and non-profit institutions serving households (NPISH) sectors' loans and equity and investment fund shares or units, and descriptions of resolutions of the issues and the difficulties faced in developing historical estimates.

Table of contents

1 . Abstract

This article is the fourth in a series of articles presenting our work to reconcile the historical data for the combined households and non-profit institutions serving households (NPISH) sectors. It presents historical time series separately for total assets and total liabilities (if available) for the sector's loans (AF.4) and equity and investment fund shares or units (AF.5). It also describes resolutions of the issues and the difficulties faced in developing these historical estimates. This work is part of a wider programme within the Office for National Statistics (ONS) to restore and reconstruct historical balance sheet data, prior to 1987, for the different institutional sectors of the UK economy.

We have mainly used the historical balance sheet data sources already referenced in the previous article Historical estimates of financial accounts and balance sheets, but we have also identified others that contributed to some of the previously published sources. We have explored the way these historical data have been compiled, trying to highlight and resolve any emerging issues. We hope this will form the basis of an approach that can be used in future publications presenting historical data for the remaining financial assets categories within this institutional sector.

The published estimates for the financial, loans, and equity and investment fund shares or units assets and liabilities held by the combined households and NPISH sector currently go back to 1987 only. The historical time series data in this article provide users with data that go back to 1920. These are best endeavour provisional annual historical estimates and should be evaluated in conjunction with other initiatives, such as the Economic Statistics Centre of Excellence project, which also constructs historical data, although looking at different aspects of the economy.

2 . Introduction

As noted in our previous article, Historical estimates of financial accounts and balance sheets, the need to monitor the distribution of assets and liabilities throughout the UK economy has increased since the financial crisis in 2008. This highlights the need for the analysis of financial stocks and flows in the economy and for econometric-based policy work to be put in a historical context. The study of infrequent financial events benefits from the availability of long historical time series data that span different government policies and that cover periods of structural change in the financial sector.

The Office for National Statistics's (ONS) published annual financial balance sheet data cover a relatively short period only, back to 1987, on a European System of Accounts (ESA) 2010 basis. In this article, we focus on the two financial categories loans (AF.4) and equity and investment fund shares or units (AF.5), part of the combined households and non-profit institutions serving households (NPISH) sector, and propose a historical time series for use in future analyses (see Reconciling the sources of historic data for the households and non-profit institutions serving households (NPISH) sectors for more information about the AF categories).

The proposed historical series in this article:

- are for total loans and for total equity and investments levels separately

- contain data relating to periods prior to 1987

- consider differences in the data between different sources for specific time periods

- are consistent with ESA 2010

We invite comments on these time series and on the general approach. Our intention is to produce further articles presenting similar time series for the other financial categories in the combined households and NPISH sectors.

It is worth noting that the content of the personal sector, the category used in our earlier data sources and that is sometimes referred to as being equivalent to the combined households and NPISH sectors, is slightly different. For example, the definition of the personal sector in ESA 1995 included partnerships, whereas in ESA 2010, partnerships are included in the definition of the corporate sectors.

We faced various challenges in creating these historical time series, mainly related to bringing together different sources of data. The datasets used were constructed by several authors, over different periods of time, working in different sectors and sometimes using different methodologies. Some sources used different content (instruments, sub-instruments and headings) when presenting data for a particular financial category. As is often the case with historical data, there were also periods when data were missing for a particular source. Missing data have been dealt with on a case-by-case basis.

The time series produced in this article are an initial step within a wider project, which aims to achieve the reconstruction and restoration of historical data for all economic institutional sectors and for both balance sheets and financial transactions data.

3 . Data sources

A variety of historical data sources have been used in the reconstruction and restoration of the loans and equity and investment fund shares or units historical time series for the combined households and non-profit institutions serving households (NPISH) sectors'. These were described in detail in the article Historical estimates of financial accounts and balance sheets. A few of the data sources in this article were also enhanced with additional granular data on loans and equity and investments assets and liabilities, derived from the Office for National Statistics (ONS) Central Shared Database (CSDB)[1]. A brief description of the sources for these datasets is given in this section.

Solomou and Weale's Personal sector wealth in the United Kingdom, 1920 to 1956 (1997), provides estimates for 1920 to 1956, the earliest data we have found for loans and equity and investments fund shares or units (AF.4 and AF.5). These personal sector estimates were the only data we found covering this time period. They came from several sources, as described in Solomou and Weale's article. The dataset does not include all the necessary instruments nor is there a detailed instrument breakdown. Nevertheless, it is an impressive dataset that makes the most use of the balance sheet statistics that are available for this time period.

Financial assets and liabilities by institutional sector (Roe, 1971) is taken from Roe's "Financial Interdependence of the UK Economy" (1971a). This provides a highly detailed breakdown of financial assets and liabilities from 1957 to 1966, organised by both instrument and sector, which is rare for historical balance sheet data. The level of detail will be valuable for estimating the finer level of detail of instruments in other datasets.

Miscellaneous balance sheet data, 1957 to 1986, contains miscellaneous official balance sheet data that enable some linking of the pre- European System of Accounts (ESA) 1995 dataset. The data within these spreadsheets were derived from 'Economic Trends' (1980 and 1981) and 'Financial Statistics Supplementary Tables' (1987) publications. The data for the non-bank private sector (NBPS) reported within these balance sheets are less heavily rounded than the data for the other balance sheets. The dataset derived from the 'Financial Statistics Supplementary Tables' will be referred to as FinStats in this article.

Pre-ESA 1995 financial accounts and balance sheets is the last set of sector financial account and balance sheet estimates produced by the ONS under the pre-European System of Accounts (ESA) 1995. This was recovered from the annual UK National Accounts (Blue Book) 1997 dataset and contains data as published in mid-1998, prior to the introduction of the ESA 1995 set of accounts. Balance sheet data, by sector, are available only as far back as 1982 for most detailed instruments. However, data for total financial assets and liabilities, by sector, is given back to 1975 for many sectors and in some cases back to 1966. As noted in Historical estimates of financial accounts and balance sheets, there are some discrepancies between these totals and the sum of the individual assets and liabilities to which they relate. In this article, we try to find an approach for reconciling these differences.

CSDB-extended pre-ESA 1995 data. This is the main new development presented in our previous article [Historic households and non-profit institutions serving households (NPISH) sectors data on currency and deposits](). It provides a large amount of granular-level data for earlier years that was not available in the previously mentioned pre-ESA 1995 source in [Historical estimates of financial accounts and balance sheets](). In the CSDB-extended pre-ESA 1995 dataset, sub-instrument data were generally available back to 1966 and, for some sub-instruments, back to 1957. As mentioned in our previous article [historic households and non-profit institutions serving households sectors data on currency and deposits](), in assessing the validity of this newly identified data compared with [pre-ESA 1995 financial accounts and balance sheets](), the data from the two datasets were found to be highly consistent. Having said that, this data-set is being developed with further historical granular-level data from the CSDB to support the construction of granular-level historical time series data for all the economic institutional sectors. These data are usually identified using Central Database Identifiers (CDIDs) [2].

The final sources used are ONS's UK Economic Accounts: institutional sector – households and non-profit institutions serving households, [financial balance sheets Quarter 4 (Oct to Dec) 2017 data (published 29 March 2018)](), which will be labeled as '[ONS-q4 2017]()' data in this article. These data are consistent with ESA 2010 and provide a benchmark for the historical series we are aiming to achieve. These datasets were particularly helpful in allocating pre-ESA 1995 balance sheet instruments to ESA 2010 categories.

Notes for: Data sources

1. CSDB is an ONS computer system that contains the time series components from which all of the series published in Financial Statistics are derived.

2. CDID is a central database identifier; each data series on CSDB is identified by four letters.

4 . Reconciling the historical estimates for the combined households and NPISH sectors

The general approach used for the reconstruction and reconciliation of the combined households and non-profit institutions serving households (NPISH) sectors' historical data is fairly similar to that presented in our [previous article](). The instruments from each dataset were assigned to the appropriate European System of Accounts (ESA) 2010 classification, after comparing the financial instrument definition with the ESA 2010 guidelines. Where possible, the instruments were grouped based on their sub-classification. Once the instruments were classified, they were summed and we found totals for each year, for each classification, in each dataset. These series were then translated into a single overlapped series for the total combined households and NPISH sector's assets and liabilities data.

One of the main issues faced when attempting to produce a single, historical data series consistent with ESA 2010 for the combined households and NPISH sectors' loans and equity and investment fund shares or units was that often we were unable to find sub-instrument estimates overlapping in time to validate the data for earlier years contained in some of the historical sources. As there is no other data source for these earlier years, the broad approach taken in this article was to use the figures as presented in those sources.

A further issue was the lack of granular-level data for some sub-instruments for some years. We have tried to find data for any missing sub-instruments using other equivalently detailed historical sources when possible, as this may lead to more accurate totals overall.

In order to reconcile the data from the different historical sources to meet current ESA 2010 requirements, we have continued to use data from the '[ONS-q4 2017]()' ESA 2010 as the basis of our reconciliation process, to maintain consistency with our previous work.

5 . Historical loans data for the combined households and NPISH sectors (AF.4)

The European System of Accounts (ESA) 2010 defined the financial category 'Loans' (AF.4) as being created when creditors lend funds to debtors and being characterised by the following features:

- the conditions governing a loan are either fixed by the financial corporation granting the loan or agreed by the lender and the borrower directly or through a broker

- the initiative to take out a loan normally lies with the borrower

- a loan is an unconditional debt to the creditor that must be repaid at maturity and that bears interest

Loans can be financial assets or liabilities of all resident sectors and the rest of the world, and this is the case for the combined households and non-profit institutions serving households (NPISH) sector.

Historical loans assets data for the combined households and NPISH sectors

According to the 'ONS-q4 2017' European System of Accounts (ESA) 2010 data, the households and non-profit institutions serving households (NPISH) sectors' loans assets total is published under a single time series titled 'Loans-other issued by UK residents (AF424N1)'.

This time series data currently only goes back to 1987. To restore historical data for this series, prior to 1987, historical data first needed to be restored for all the financial instruments and their components. These financial instruments are then reconciled against equivalents from historical sources. Total loan assets are then estimated and compared with equivalents from other historical sources to ensure validity.

Investigation suggested that historical data prior to 1987 do exist for all the instruments that feed into the combined households and NPISH sectors' loans assets, using archived data from the Office for National Statistics's (ONS) Central Shared Database (CSDB). There are number of financial instruments time series currently contributing to the published 'Loans-other issued by UK residents (AF.424N1)' instrument. Instrument map 1 has been created to present the historically extended ONS-q4 2017 instruments and illustrate the way these instruments data are reconciled between the different historical sources of available data.

Instrument map 1: Reconciled instruments for total households and NPISH sectors' loans assets data

	Household and NPISH Loans Assets (AF.4)								
	Solomou and Weale Data (1920 - 1956)	Roe's Data (1957-1966)	NBPS Data (1966-1980)	NBPS Data (1976-1986)	Finstat Data (1978 - 1985)	CSDB-extended Pre-ESA 1995 Data (1966 - 1997)	Pre-ESA 1995 Data (1982 - 1997)	Historically extended 'ONS-q4 2017'- ESA 2010 Data (2017 - 1966)	'ONS-q4 2017'- ESA 2010 data (2017 - 1987)
AF.4	Local authority debt at market value		Local authority temporary deposits (1980 - 1966)	Local authority temporary deposits (1986 - 1976)	Temporary deposits with local authorities (AKTY) (1985 - 1978)	Historic Local authority temporary debt (ADHJ) (1997 - 1966)	Historic Local authority temporary debt (ADHJ) (1997 - 1982)	Historic Short-term loans to local government (ADHJ) (1986 - 1966)	Short-term loans to local government (ADHJ) (2017 - 1987)
			Historic Long-term loans to local government (ADKK) (1980 -1966)	Historic Long-term loans to local government (ADKK) (1976 -1986)	Long term loans to local authorities (AKUO) (1985 - 1978)	Historic Local authority Other £ debt (ADKK) (1997 - 1966)	Historic Local authority Other £ debt (ADKK) (1997 - 1982)	Historic Long-term loans to local government (ADKK) (1986 -1966)	Long-term loans to local government (ADKK) (2017 -1987)
			Property unit trust units outstanding (AKUJ) (1980 - 1966)	Property unit trust units outstanding (AKUJ) (1976 - 1986)	Property unit trust units outstanding (AKUJ) (1985 - 1978)	Historic Property unit trust units outstanding (AKUJ) (1997 - 1982)		Property unit trust units outstanding (AKUJ) (2017 - 1987)	Property unit trust units outstanding (AKUJ) (2017 - 1987)
			Historic Public corporations £ debt, guaranteed stock (APQF) (1980- 1966)	Historic Public corporations £ debt, guaranteed stock (APQF) (1976- 1986)		Historic Public corporations £ debt (REVA) (1997 - 1966)	Historic Public corporations £ debt (REVA) (1997 - 1982)	Historic Public corporations £ debt, guaranteed stock (APQF) (1985- 1966)	Public corporations £ debt, guaranteed stock (APQF) (Pre- 1987)
								Historic Public corporations debt, regional (RDCG) (1987 - 1974)	Public corporations debt, regional (RDCG) (Pre-1987)
								Historic Long-term loans - Other, issued by UK residents (NNOQ) (1986 - 1966)	Long-term loans - Other, issued by UK residents (NNOQ) (2017 - 1987)
		House mortgages	Historic Other domestic short-term loans outstanding		Domestic short term loans not elsewhere included (AKUN) (1985 - 1978)	Historic Other domestic short-term loans outstanding (AKUN) (1997 - 1966)		Historic Other domestic short-term loans outstanding (AKUN) (1986 - 1966)	Other domestic short-term loans outstanding (AKUN) (2017 - 1987)
		Long term loans				Split from Miscellaneous instruments REWG	Other domestic short term loans (RDOS) (1997 - 1966)	Historic Other domestic short-term loans (RDOS) (1986 - 1966)	Other domestic short-term loans (RDOS) (2017 - 1987)
		Long term loans overseas	Other domestic long-term loans (1980 - 1966)	Other domestic loans (ALFJ) (1986 - 1976)	Other domestic long term loans (ALFJ) (1985 - 1978)		Other domestic long term loans to IC (RDCF) (1997 - 1966)	Historic Other domestic long term loans to IC (RDCF) (1986 -1984)	Other domestic long term loans to IC (RDCF) (2017 -1987)
								MFI offshores adj Short-term borrowing from persons (-HJWX) (post 1996)	MFI offshores adj Short-term borrowing from persons (-HJWX) (2017 - 1997)
								Short-Term Borrowing From Persons (-	Short-Term Borrowing From Persons (-

										RLYV) (post 1986)		RLYV) (2017 - 1987)

Source: Office for National Statistics

Notes:

1. The blank cells represent financial instruments that are either missing from the data source or do not meet the full requirements of mapping to the ''ONS-q4 2017'' ESA 2010 classification.

2. The grey cells represent financial instruments that move from another source to replace a blank cell.

To assess the validity of the newly identified combined households and NPISH sectors', historically extended 'ONS-q4 2017' ESA 2010 loans assets data annual total loans assets estimates for the period 1966 to 1997 were compared with the equivalent from a number of historical sources covering various periods, Figure 1.

Figure 1: Comparing annual estimates for the combined households and NPISH sector's historical total loans assets data with a number of equivalent historical sources

1966 to 1997

Figure 1: Comparing annual estimates for the combined households and NPISH sector's historical total loans assets data with a number of equivalent historical sources

1966 to 1997

£ million

Legend:
- The historically extended 'ONS-q4 2017' ESA 2010 data (1966 to 1997)
- Pre-ESA 1995 data (1982 to 1997)   — FinStats data (1978 to 1985)
- Non-bank private sector data (1976 to 1986)
- Non-bank private sector data (1966 to 1980)

Source: Office for National Statistics and Expert Studies

The data in Figure 1 appear to be incompatible. There are large differences between the newly restored historically extended 'ONS-q4 2017' ESA 2010 data and all equivalents from other sources. The exception to this are the data from FinStats, which looks much more plausible. These differences were especially noticeable with the compared data from the pre-ESA 1995 dataset.

Investigation to assess the reasons behind the large difference with the pre-ESA 1995 data revealed that this difference is mostly caused by missing instruments. The missing instruments were:

- property units trust unit outstanding

- other domestic short-term loans

- other domestic short-term loans outstanding

- other domestic long-term loans

- data on short-term borrowing

Further investigation into the pre-ESA 1995 instruments revealed that all of the missing instruments, except the instruments on short-term borrowing, were actually included in the pre-ESA 1995 dataset, but they were combined with others under an instrument labeled 'Miscellaneous instruments'. Therefore, to avoid splitting this instrument, the approach adopted was to replace these pre-ESA 1995 missing instruments with the equivalent from the newly found historically extended dataset, see MAP 1.

Similarly, our investigation to assess the reasons behind the difference between the newly restored historically extended 'ONS-q4 2017' ESA 2010 data and the two non-bank private sector (NBPS) datasets revealed that these differences were caused by missing instruments from the NBPS dataset. However, we also found that some of these missing instruments were actually in the datasets but grouped with other households and NPISH sectors categories instruments. For example, the instrument 'Property unit trust unit outstanding' was found to be combined with the instrument labeled 'Units trust unit', which should be part of the 'combined households and NPISH equity and investment fund shares or units' category, AF.5. Rather than splitting the combined NBPS instrument, we decided to replace the missing instrument, property units trust unit, with equivalent data from the newly found historically extended 'ONS-q4 2017' ESA 2010 data.

Table 1: The full set of combined households and NPISH sectors' loans assets data available from the various sources (in £millions) (Link to Excel spreadsheet due to size)

Table 1 was created to present all the restored historical data for the currently published 'ONS-q4 2017' ESA 2010 'Loans-other issued by UK residents (AF424N1)' and its instruments and for all those equivalents from other historical sources under consideration.

Figure 2 illustrates the effect of using the historically extended ESA 2010 instruments to replace the missing pre-ESA 1995 and both NBPS datasets instruments. See MAP1 for replaced instruments.

Figure 2: Reconciled annual estimates for the combined households and NPISH sector's historical total loans assets data with number of equivalent historical sources

1966 to 1997

Figure 2: Reconciled annual estimates for the combined households and NPISH sector's historical total loans assets data with number of equivalent historical sources

1966 to 1997
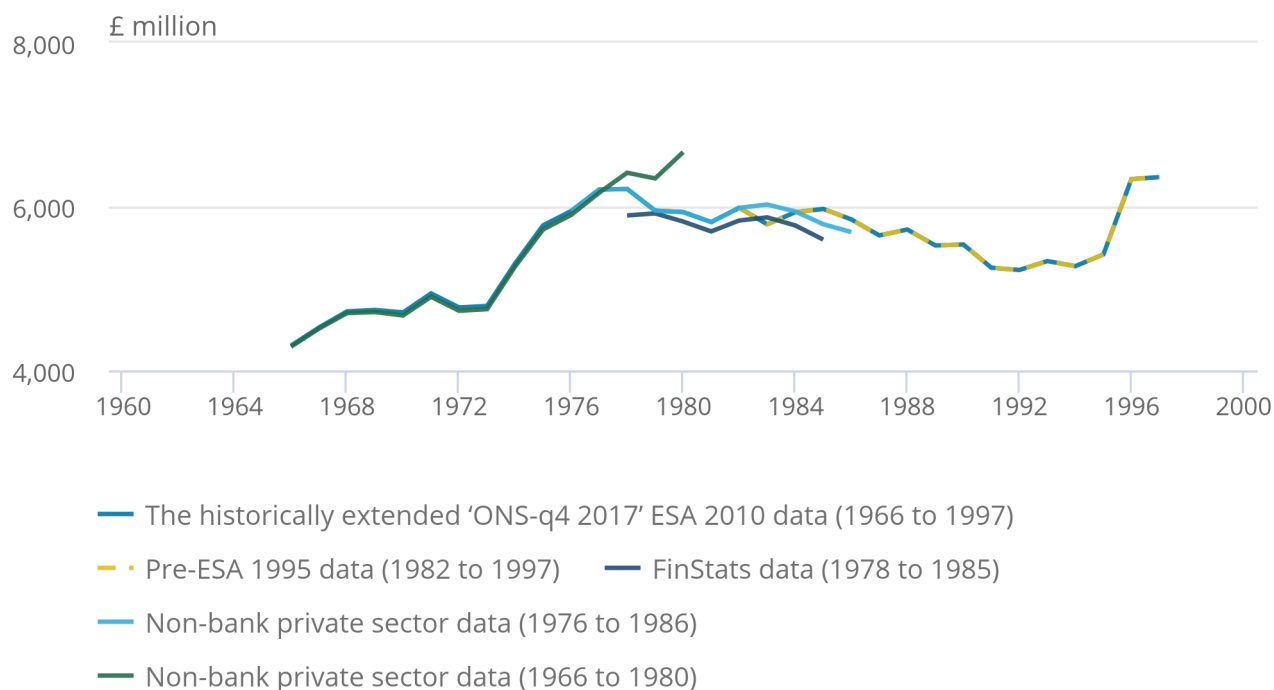
Source: Office for National Statistics and Expert Studies

As can be seen from Figure 2, the differences between the newly restored historically extended 'ONS-q4 2017' ESA 2010 data on the households and NPISH sectors' total loans assets, and their equivalent from the other historical data sources, have been improved, and the data looks much more consistent when compared with the starting position in Figure 1.

A challenge we faced when attempting to produce a single, historical data series was finding consistency between different historical data sources. One way to improve consistency between sources, as shown in Figure 2, is to compare similar sub-instrument estimates that overlap in time. Unfortunately, the earlier the historical data, the less overlapping are the data can be found. This is particularly true with data prior to 1966. As there is no other data source for these earlier years, the broad approach taken was to use the figures as presented in those sources.

Therefore, Figure 3 identifies what we believe to be the best building blocks to use for the construction of historical time series of the households and NPISH sectors' loans assets data back to 1920.

Figure 3: The datasets forming the households and NPISH sectors' loans assets (AF.4) historical series
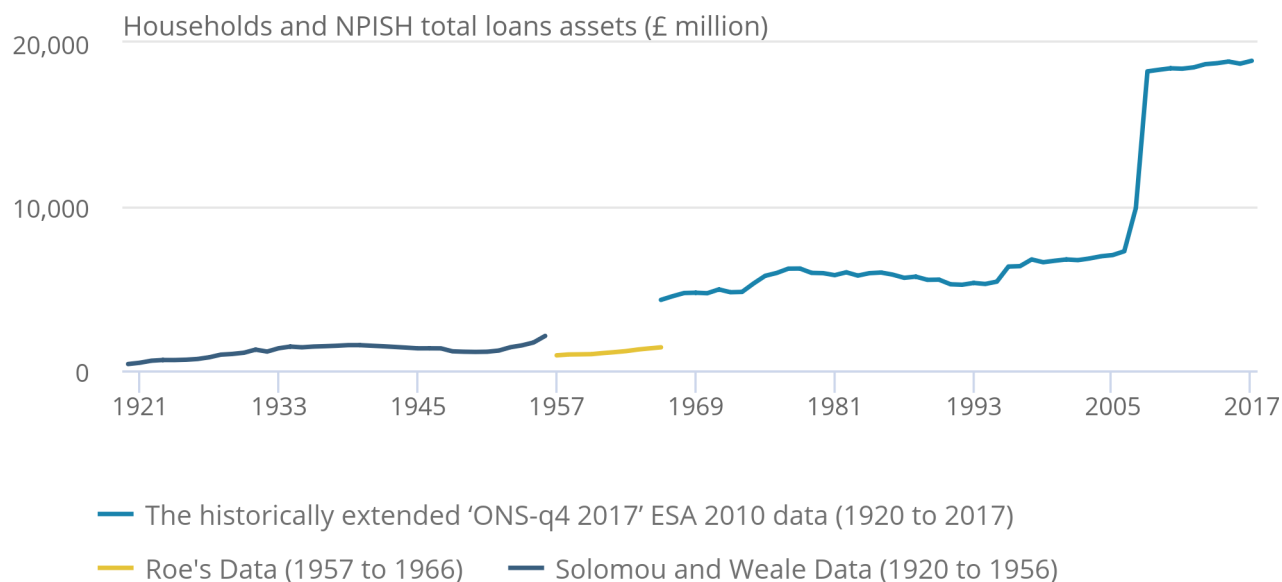
Using these building blocks, Figure 4 illustrates the suggested experimental historical annual time series for the combined households and NPISH sectors' loans assets, consistent with 'ONS-q4 2017' ESA 2010, 1920 to 2017.

Figure 4: Total loans assets estimates for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010

1920 to 2017

Figure 4: Total loans assets estimates for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010

1920 to 2017

Source: Office for National Statistics and Expert Studies

Notes:

1. The 'ONS-q4 2017'-ESA 2010 data in this chart are subject to balancing adjustments that bring the financial account for each sector in line with their respective non-financial accounts. These balancing adjustments are reviewed each year and open to change. Therefore these data may be revised in future publications.
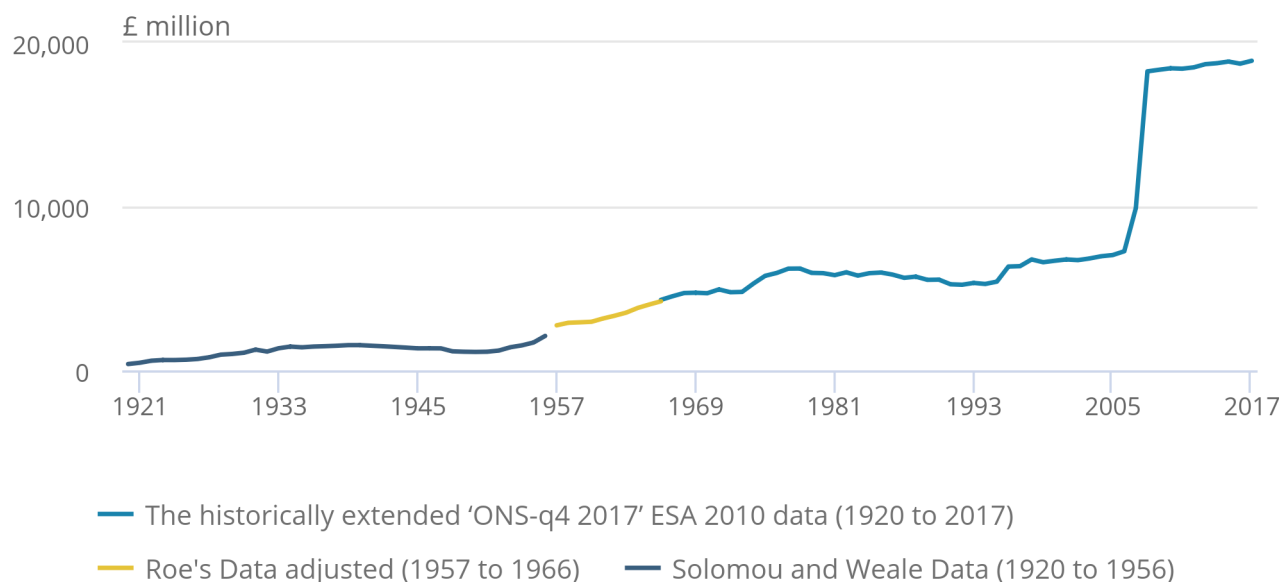
The series in Figure 4 has been left disjointed to highlight historical breaks in the series. One noticeable discontinuity in the historic series, our focus, is Roe's time series data. We believe these underestimate the annual total loans for the combined households and NPISH sector by approximately three times its reported value. It is difficult to know the real reasons behind the underestimate. It may be owing to the way loans were estimated, such as the grouping of estimates for public corporations with those for government (see Roe (1971)) and possibly owing to underestimating the level of domestic loans, as it only covers long term loans (see Figure 5 for the adjusted Roe's data).

Figure 5: Total loans assets estimates for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010, including Roe's adjusted estimates

1920 to 2017

Figure 5: Total loans assets estimates for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010, including Roe's adjusted estimates

1920 to 2017

£ million

- The historically extended 'ONS-q4 2017' ESA 2010 data (1920 to 2017)
- Roe's Data adjusted (1957 to 1966) — Solomou and Weale Data (1920 to 1956)

Source: Office for National Statistics and Expert Studies

Notes:

1. The 'ONS-q4 2017'-ESA 2010 data in this chart are subject to balancing adjustments that bring the financial account for each sector in line with their respective non-financial accounts. These balancing adjustments are reviewed each year and open to change. Therefore these data may be revised in future publications.

Historical loans liabilities data for the combined households and NPISH sectors

According to the last version of 'ONS-q4 2017' European System of Accounts (ESA) 2010 data, five financial instruments (time series) feed into the total loans liabilities annual estimates for the combined households and non-profit institutions serving households (NPISH) sectors. According to the European System of Accounts (ESA) 2010, these instruments are split into short- and long-term loans liabilities. These instruments include:

- short-term loans that are:

    - issued by UK monetary financial institutions (NNRG)

    - foreign currency loans (NNRI)

    - issued by the rest of the world monetary financial institutions (NNRK)

- long-term loans that are:

    - secured on dwellings (NNRP)

    - other, issued by UK residents (NNRU)

According to the contributions made to the total combined households and NPISH sectors' loans liabilities annual estimate, these instruments are made up of:

- long-term loans secured on dwelling (78%)

- short-term loans issued by UK monetary financial institutions (14%).

- (all others) (8%)

Annual estimates for these instruments based on ESA 2010 are currently published only back to 1987, financial balance sheets 2017 (published 18 March 2018). Totals for these instruments were then reconciled with their equivalent from other sources and overall total loans liabilities were then compared with their equivalent from other historical sources to ensure validity.

In-depth investigation suggested that historical data prior to 1987 do exist for all the instruments that feed into the combined households and NPISH sectors' loans liabilities and for their components, except for the instrument 'Short-term loans issued by UK monetary financial institutions'. For this instrument, historical data was harder to find. Figure 6 presents the components that feed into this combined households and NPISH sector instrument.

Figure 6: Instruments feeding into short-term loans by UK monetary financial institutions

Source: Office for National Statistics

The main contributor to the current 'ONS-q4 2017' ESA 2010 instrument, 'Short-term loans by UK monetary financial institution', is an instrument currently labeled as 'Sterling loans by UK MFI'. Our investigation revealed that this instrument only contains data for UK banks. Therefore, for this article this instrument will be labeled as 'Sterling loans by UK banks' instead. In investigating the components that feed into this instrument, we found its only component is an instrument labeled as 'Bank lending (exc personal sector(ps)) sterling', which does not have any data that predates 1997.
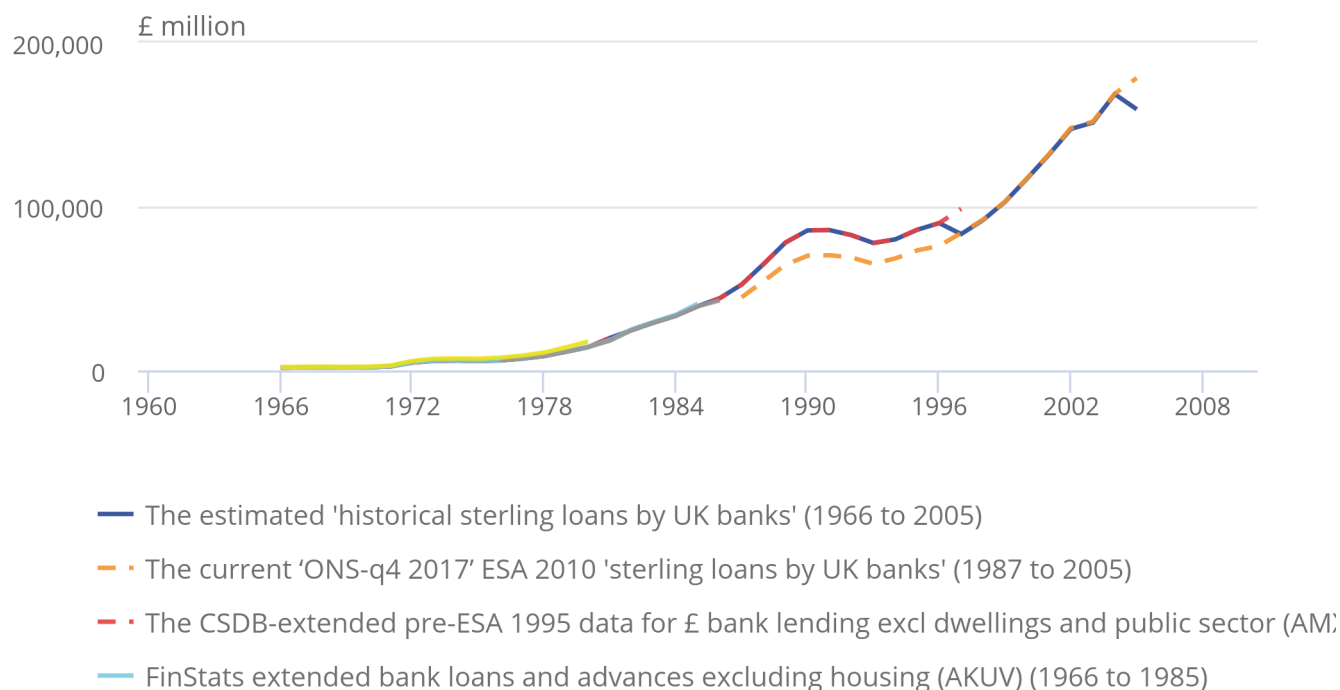
However, our investigation revealed that prior to 1997, the instrument, 'Bank lending (exc ps) sterling', was historically calculated as the difference between an instrument labeled 'Bank lending to the personal sector' and one labelled 'Loans secured on dwellings other'. This was confirmed when data from this calculation (1966 to 2005), which we labeled as 'Historical sterling loans by UK banks', was compared with overlapped data from 'Sterling loans by UK banks' (1987 to 2005) and with equivalent instruments from other historical sources, see Figure 7.

Figure 7: Comparing 'Historical sterling loans by UK banks' with current 'ONS-q4 2017' ESA 2010 'Sterling loans by UK banks' and their equivalent from other historical sources

1966 to 2005

Figure 7: Comparing 'Historical sterling loans by UK banks' with current 'ONS-q4 2017' ESA 2010 'Sterling loans by UK banks' and their equivalent from other historical sources

1966 to 2005

— The estimated 'historical sterling loans by UK banks' (1966 to 2005)

— · The current 'ONS-q4 2017' ESA 2010 'sterling loans by UK banks' (1987 to 2005)

— · The CSDB-extended pre-ESA 1995 data for £ bank lending excl dwellings and public sector (AM)

— FinStats extended bank loans and advances excluding housing (AKUV) (1966 to 1985)

Source: Office for National Statistics and Expert Studies

As expected, Figure 7 shows that, despite the differences in the way this instrument was labeled by the various historical sources, there were almost indistinguishable differences in the time series between the estimated 'Historical sterling loans by UK banks' and all the other historical sources, except for a difference with the current 'ONS-q4 2017' ESA 2010 'Sterling loans by UK banks'. The difference seems to have started in 1997, when the historical time series dropped in level. Then, the two series, post-1997, became almost identical until 2005, when they diverged again. In this article, our focus will be on the possible reason behind the difference between the current 'Sterling loans by UK banks' and historical time series prior to 1997.
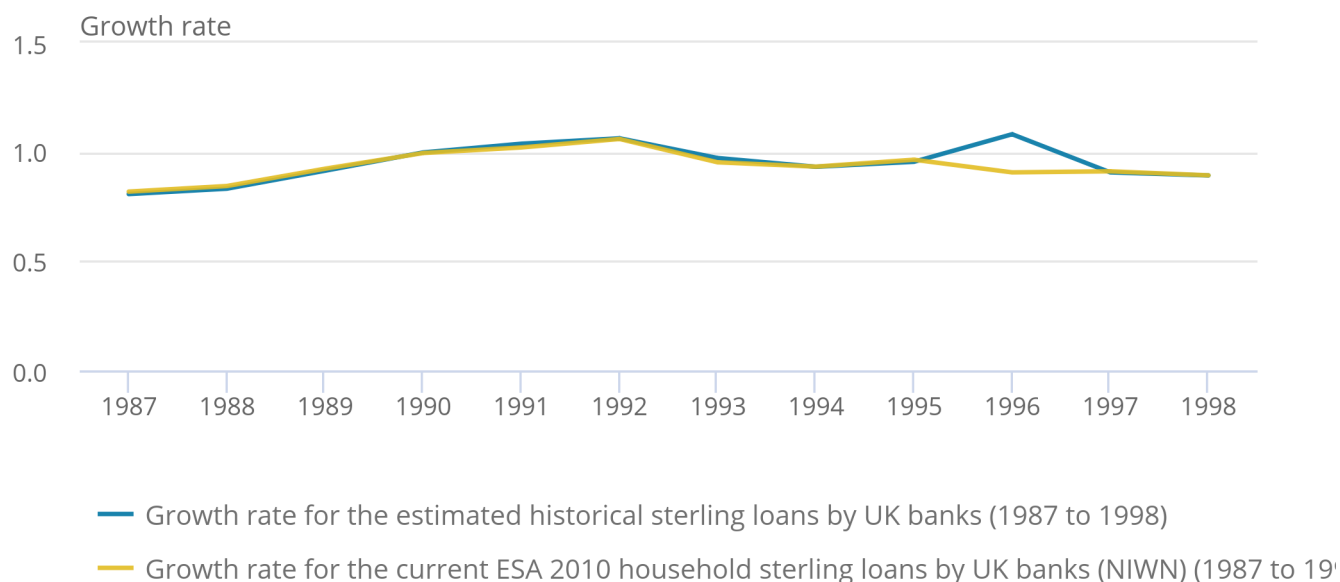
In-depth investigation into the reason for the difference, working closely with colleagues from the Monetary Financial Institution (MFI) branch of the Office for National Statistics (ONS), revealed that this difference, pre-1997, was the result of an attempt to correct the current time series 'Sterling loans by UK banks' historically. In particular, there was an attempt to take into consideration the change in level due to the conversion of building societies into banks during 1997 and the resultant change in classification. This had been achieved by modelling the data for the period from 1987 to 1997 using the growth rates from the instrument 'Historical sterling loans by UK banks', per Figure 8.

Figure 8: Growth rate comparison between 'Sterling loans by UK banks' and estimated 'Historical sterling loans by UK bank'

1987 to 1998

Figure 8: Growth rate comparison between 'Sterling loans by UK banks' and estimated 'Historical sterling loans by UK bank'

1987 to 1998

Growth rate

— Growth rate for the estimated historical sterling loans by UK banks (1987 to 1998)

— Growth rate for the current ESA 2010 household sterling loans by UK banks (NIWN) (1987 to 19

Source: Office for National Statistics

As can be seen from Figure 8, the growth rates from the two instruments are almost identical. We believe this suggests that the 'Historical sterling loans by UK banks' data is a good estimate for the series 'Sterling loans by UK banks' prior to 1987. However, in this article no attempt will be made to adjust this historical line prior to 1987 pending future data improvements.

Having gathered all the historical data for all the instruments feeding into total loan liabilities for the combined households and NPISH sectors (see Table 2), these historical data were then reconciled with their equivalents from all the other historical sources under consideration.

Table 2: The full set of combined households and NPISH sector loans liabilities data available from the various sources (in £millions) (Link to Excel spread sheet due to size)

Instrument map 2 illustrates the availability and reconciliation of historical data for these instruments from the different sources.

Instrument map 2: Reconciled instruments for total households and NPISH sectors' loans liabilities data

Household and NPISH Loans liabilities (AF.4)

AF.4		Solomou and Weale Data (1920 - 1956)	Roe's Data (1957-1966)	NBPS Data (1966-1980)	NBPS Data (1976-1986)	Finstat Extended Data (1978-1985)	Finstat Data (1978 - 1985)	CSDB-extended Pre-ESA 1995 Data (1966 - 1997)	Pre-ESA 1995 Data (1982 - 1997)	Historically extended 'ONS-q4 2017' ESA 2010 Data (2017 - 1966)		'ONS-q4 2017' ESA 2010 Data (2017 - 1987)		
	Bank Advances (1920 - 1956)		Bank advances in the U.K. (1957 - 1966)	Bank lending (1966 - 1980)	Sterling bank lending (1976 - 1986)	Bank loans and advances (excluding housing) (AKUV) (1966 - 1985)	Bank loans and advances (excluding housing) (AKUV) (1978 - 1985)	£ bank lending excl. dwellings and public sector (AMXF) (1966 - 1997)	£ bank lending excl. dwellings and public sector (AMXF) (1982 - 1997)	Short-term loans	Issued by UK monetary financial institutions (NNRG) (1966 - 2017)	Short-term loans	Sterling loans by UK banks (NIWN+NJPL) (2017 - 1987); Sterling loans by UK building societies (NIWP+NJPN) (2017 - 1992)	Issued by UK monetary financial institutions (NNRG) (2017 - 1987)
			Other money at call (1957 - 1966)		Bank lending in other currencies (1976 - 1986)	Other domestic short term loans (AKUW) (1966 - 1985)	Other domestic short term loans (AKUW) (1978 - 1985)	FC bank lending excl. public sector (RHHT) (1982 - 1997)	FC bank lending excl. public sector (RHHT) (1982 - 1997)		Foreign currency loans (NNRI) (1975 - 2017)		Foreign currency loans by UK banks (NIWO+NJPM) (2017 - 1987)	Foreign currency loans (NNRI) (2017 - 1987)
								Issued by the rest of the world monetary financial institutions (NNRK) (1979 - 2017)			Issued by the rest of the world monetary financial institutions (NNRK) (1979 - 2017)		Short term loans by rest of world (ZMFD+ZMFA) (2017 - 1987)	Issued by the rest of the world monetary financial institutions (NNRK) (2017 - 1987)
AF.4	Mortgages (1920 - 1956)		House mortgages (1957 - 1966)	Loans for house purchase: other financial institutions (1966 - 1980)	Loans for house purchase: other financial institutions (1976 - 1986)	Building society secured lending (AKVA) (1966 - 1985)	Building society secured lending (AKVA) (1978 - 1985)	Building society secured lending (AHKV) (1966 - 1997)	Building society secured lending (AHKV) (1982 - 1997)		Secured on dwellings (NNRP) (1966 - 2017)		Loans secured on dwellings (NIWV+NJPT) (2017 - 1987)	Secured on dwellings (NNRP) (2017 - 1987)
	Insurance Company Mortgages (1920 - 1956)			Loans for house purchase: public sector (1966 - 1980)	Loans for house purchase: public sector (1976 - 1986); Loans for house purchase: banks (1976 - 1986)	Loans for house purchase and financial institutions (AKUY+AKUZ+AKVB+AKVC+AKVR) (1966 - 1985)	Loans for house purchase and financial institutions (AKUY+AKUZ+AKVB+AKVC+AKVR) (1978 - 1985)	Other secured lending (REEH) (1966 - 1997)	Other secured lending (REEH) (1984 -1997)	Long-term loans		Long-term loans		
	Consumer Credit (1920 - 1956)		Hire-purchase in the U.K. (1957 - 1966)	Hire purchase and other instalment debt (1966 - 1980)	Loans and advances by credit companies and retailers (1976 - 1986)	Loans and advances by credit companies and retailers (AKUX) (1976 - 1985)	Loans and advances by credit companies and retailers (AKUX) (1978 - 1985)	Retailer unsecured credit (RRAQ) (1984 - 1997)	Retailer unsecured credit (RRAQ) (1966 - 1997)		Other, issued by UK residents (NNRU) (1966 - 2017)		Other long-term loans by UK residents (NIXA+NJPY) (2017 - 1987)	Other, issued by UK residents (NNRU) (2017 - 1987)
			Other instalment credit in the U.K. (1957 - 1966)			Other public sector loans (AKVD) (1966 - 1985)	Other public sector loans (AKVD) (1978 - 1985)	Other public sector lending (REUH) (1984 - 1997)	Other public sector lending (REUH) (1966 - 1997)					
			Long term loans (1957 - 1966)	Other domestic long-term loans (1966 - 1980)	Other domestic loans (1976 - 1986)	Other domestic long & short term loans (AKVE) (1966 - 1985)	Other domestic long & short term loans (AKVE) (1978 - 1985)	Other unsecured credit (RMIS) (1986 - 1997)	Other unsecured credit (RMIS) (1986 - 1997)					

Source: Office for National Statistics

Notes:

1. The blank cells represent financial instruments that are either missing from the data source or do not meet the full requirements of mapping to the 'ONS-q4 2017' ESA 2010 classification.

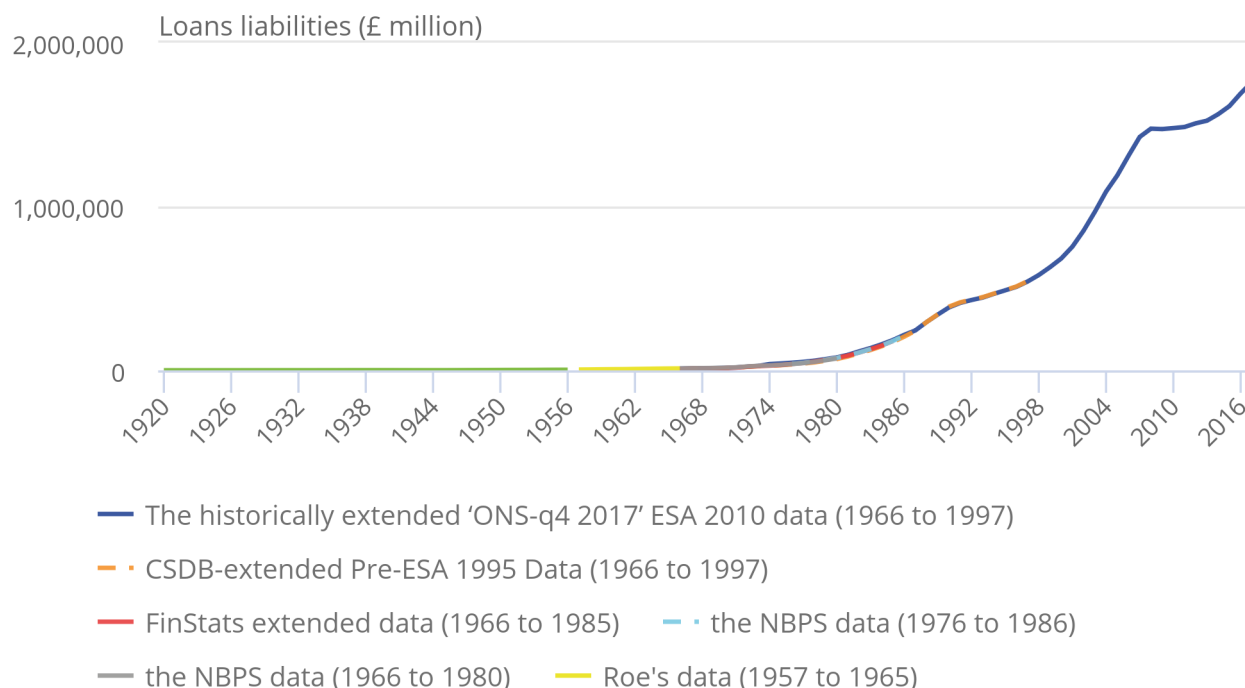2. The grey cells represent financial instruments that move from other sources to replace a blank cell.

To assess the validity of the newly restored 'ONS-q4 2017' ESA 2010 historical data, we compared aggregated the total households and NPISH sectors' loans liabilities from 'ONS-q4 2017' ESA 2010 and their equivalents from all historical sources, as seen in Figure 9.

Figure 9: Reconciled loans liabilities historical estimates for the combined households and NPISH sector, in line with 'ONS-q4 2017' ESA 2010 definitions

1920 to 2017

Figure 9: Reconciled loans liabilities historical estimates for the combined households and NPISH sector, in line with 'ONS-q4 2017' ESA 2010 definitions

1920 to 2017

Loans liabilities (£ million)

——	The historically extended 'ONS-q4 2017' ESA 2010 data (1966 to 1997)
— ·	CSDB-extended Pre-ESA 1995 Data (1966 to 1997)
——	FinStats extended data (1966 to 1985) — · the NBPS data (1976 to 1986)
——	the NBPS data (1966 to 1980) —— Roe's data (1957 to 1965)

Source: Office for National Statistics and Expert Studies

Figure 9 shows the reconciled datasets from the different sources are now indistinguishable (but not absolutely identical). This is especially the case between the historically extended 'ONS-q4 2017' ESA 2010 dataset (1966 to 2017), the CSDB-extended pre-ESA 1995 dataset (1966 to 1997), and the FinStats-extended combined households and NPISH sectors' loans liabilities data (1966 to 1985).

On that basis, Figure 10 identifies what we believe to be the best building blocks to use for the construction of historical time series of the combined households and NPISH sectors' loans liabilities.

Figure 10: The datasets forming the combined households and NPISH sector's loans liabilities (AF.4) historical series
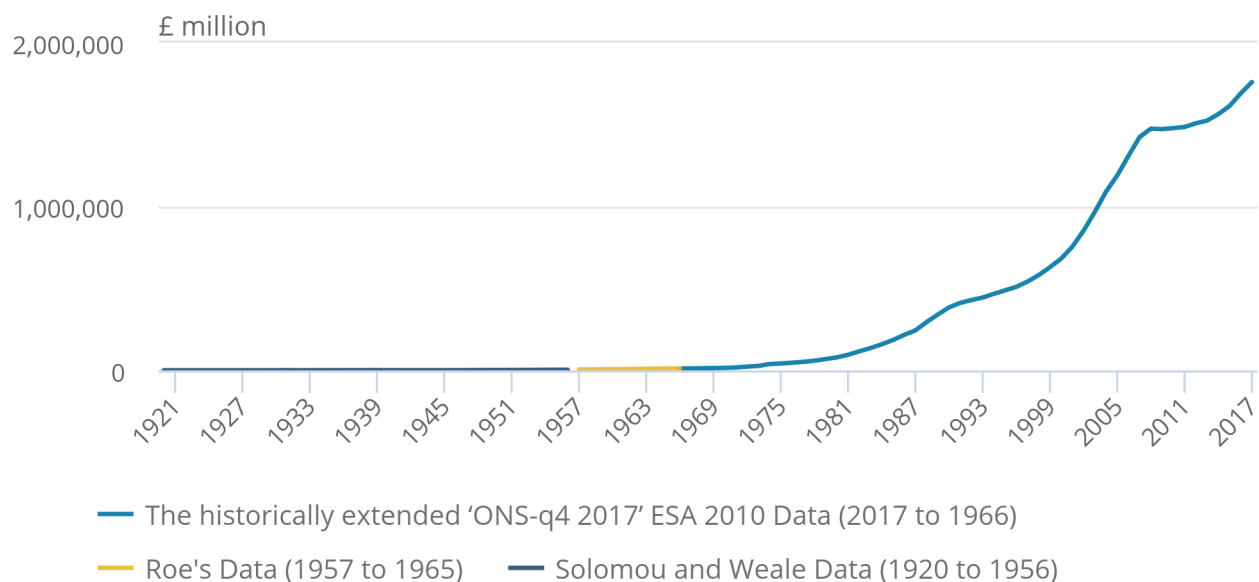
Source: Office for National Statistics

Using these building blocks, Figure 11 illustrates the suggested experimental historical time series estimates for the combined households and NPISH sector's loans liabilities, consistent with 'ONS-q4 2017' ESA 2010, 1920 to 2017.

Figure 11: Total loans liabilities estimates for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010

1920 to 2017

Figure 11: Total loans liabilities estimates for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010

1920 to 2017

£ million

Legend:
- The historically extended 'ONS-q4 2017' ESA 2010 Data (2017 to 1966)
- Roe's Data (1957 to 1965)
- Solomou and Weale Data (1920 to 1956)

Source: Office for National Statistics and Expert Studies

All of the series in Figure 11 have been left disjointed to highlight breaks in the series. However, no break was found in the series. However, these data could be revisited in the future as part of the enhanced financial account continuous development work.

6 . Historical equity and investment fund shares or units data for the combined households and NPISH sector (AF.5)

According to the European System of Accounts (ESA) 2010, the combined households and non-profit institutions serving households (NPISH) sector's financial category 'Equity and investment fund shares or units' (AF.5) is defined as any financial asset that is a claim on the residual value of a corporation, once all other claims have been met. Therefore, all the AF.5 instruments appear as assets in the financial account. At a published level, in the 'ONS-q4 2017' ESA 2010 data, there are seven financial instruments (time series) feeding into the total equity and investment fund shares or units (AF.5) annual estimates for the combined households and NPISH sector. These are:

1. Listed UK shares [NNOX, AF.511N1, 1990 to 2017]

2. Unlisted UK shares [NNOY, AF.512N1, 1990 to 2017]

3. Other UK equity [NNOZ, AF.519N6, 1987 to 2017]

4. UK shares and bonds issued by other UK residents [NSQR, AF.519N7, 1987 to 1989]

5. UK mutual funds' shares [NNPG, AF.52N1, 1987 to 2017]

6. Equity and investment shares or units issued by the rest of the world [NNPC, AF.519N9, 1987 to 2017]

7. Rest of the world mutual funds' shares [NNPH, AF.52N9, 1990 to 2017]

These instruments cover data encompassing:

- quoted UK shares listed on the London Stock Exchange (1)

- unquoted UK shares that are tradeable or potentially tradeable financial instruments issued by UK corporations (2)

- shares and tradeable or potentially tradeable financial instruments issued by foreign corporations and quasi-corporations (3 to 5)

- UK and rest of the world mutual funds shares (6 to 7)

Since the estimates of transactions in quoted and unquoted shares by the households and NPISH sectors are derived as a residual once all other sectors of the economy have been accounted for, they can be subject to a wide margin of error.

As mentioned previously, the current Office for National Statistics (ONS) annual data, based on ESA 2010, only goes back to 1987 and in some cases only to 1990. Therefore, in order to restore historical data for the equity and investment fund shares or units assets (AF.5) in line with ESA 2010 prior to 1987, equivalent historical data for the published instruments and their components, mentioned earlier, needed to be restored from the ONS Central Shared Database (CSDB). Instruments totals were then reconciled against their equivalent from historical sources. The equity and investments fund shares or units total was then compared with other historical sources to ensure validity.

Our search for historical data revealed that the instruments listed, and unlisted UK shares in their current ' ONS-q4 2017' formation, are relatively new, and that currently existing data for them only goes back to 1990. However, evidence from historical literature seems to suggest that these instruments are a subset of another financial instrument, 'UK company securities', which was reported in the historical pre-ESA 1995 (1982 to 1997) dataset. 'UK company securities' consists of tradeable or potentially tradeable financial instruments issued by UK companies and includes 'UK debentures and loan stock' and 'UK ordinary and preference shares'. Using Central Shared Database (CSDB)-extended pre-ESA 1995, we restored historical data for UK company securities, 1966 to 1997.

To examine the relationship between the total 'UK company securities' and the currently published ' ONS-q4 2017' ESA 2010 'UK listed and unlisted shares' total, overlapped data (1990 to 1996) from the two instruments were compared, per Figure 12.

Figure 12: Relation between total 'UK listed and unlisted shares' and 'UK company securities' data for the combined households and NPISH sector

1990 to 1996

Figure 12: Relation between total 'UK listed and unlisted shares' and 'UK company securities' data for the combined households and NPISH sector

1990 to 1996

£ million

Legend:
— The sum of listed and unlisted Shares 'ONS-q4 2017' ESA 2010 dataset
— UK company security CSDB extended pre-ESA95
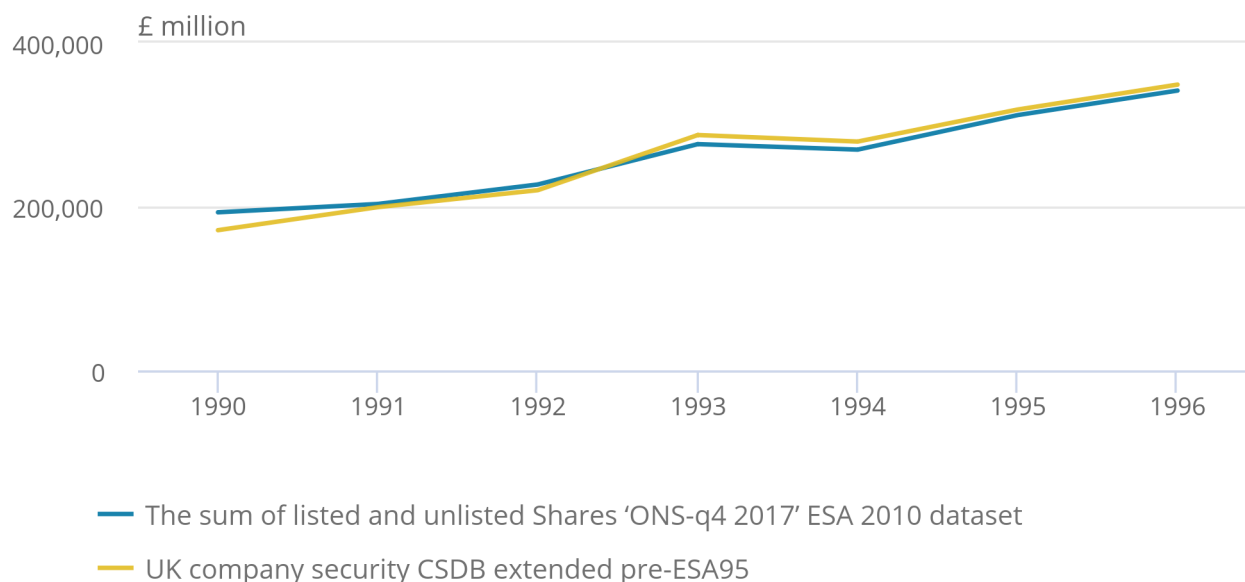
Source: Office for National Statistics and Expert Studies

As can be seen, there is a strong relationship between the two instruments, and the instrument 'UK company securities' is believed to be by far the main instrument contributing to the historical trend for the currently published 'ONS-q4 2017' ESA 2010 listed and unlisted UK shares.

Since no separate historical data was found for listed and unlisted UK shares prior to 1990, from any of the historical sources, we decided that the best way forward was to model the historical back series for the two instruments using the growth rates from the newly restored UK company securities instrument.

Figure 13 shows the back-casted historical series for UK listed and unlisted shares (1966 to 1996). The series are presented in their original disjointed form in order to highlight any break during the overlapped periods (1990 to 1996).

Figure 13: Back-casted historical data for the households and NPISH sectors' UK-listed and UK-unlisted shares series

1966 to 2017

Figure 13: Back-casted historical data for the households and NPISH sectors' UK-listed and UK-unlisted shares series

1966 to 2017
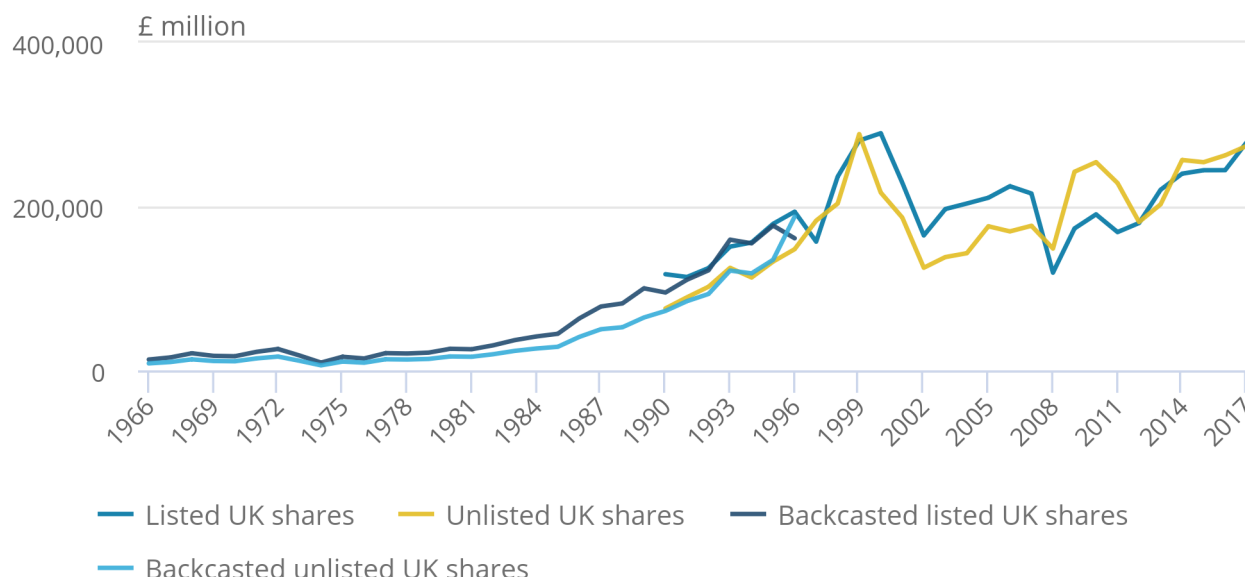
Source: Office for National Statistics

Overall, the back-casted data looks plausible and consistent with the published series. Hence, in the absence of other historical data, this modelled data will be used instead of the historical data for the two published ' ONS-q4 2017' ESA 2010 series, UK listed and unlisted shares (1 and 2) from 1966 to 1989.

Our investigation also revealed that the currently published AF.5 ESA 2010 instrument 'UK shares and bonds issued by other UK residents' (1987 to 1989) definition is also equivalent to that for companies securities. Therefore, in this case it is our belief that the back-casted data for the UK listed and unlisted shares will remove the need, in future improvements, to publish this instrument, as the UK listed and unlisted shares historical data will serve as their equivalent.

For the published 'ONS-q4 2017' ESA 2010 'Other UK equity' (3) time series, the data currently only goes back to 1987. However, our investigations revealed that historical data do exist for this instrument, and we restored this data back to 1966. Similarly, for the published 'ONS-q4 2017' ESA 2010 'UK mutual funds shares' (5) instrument data, our investigation revealed that the data are equivalent to another, pre-ESA 2010 instrument, labelled 'UK units trust unit'. Therefore, historical data from the latter were used to populate and restore the historical data for the instrument 'UK Mutual funds shares', back to 1966.

Finding historical data for the 'ONS-q4 2017' ESA 2010 instrument 'Equity and investment shares or units issued by the rest of the world' (6) was much more complicated. Our investigation revealed that the current ' ONS-q4 2017' ESA 2010 data for this instrument are composed of the merger of two pre-ESA 2010 instruments: the 'Direct outward investment in property' and the 'Rest of the world shares and other equity'. Prior to the implementation of ESA 2010, these two instruments were reported separately and were often reported by historical sources under different labels. For example, the pre-ESA 1995 financial accounts and balance sheets reported some data (1997 to 1982) for these two instruments and labelled it as 'Direct investment in property abroad' and 'Overseas securities', respectively. Similarly, the historical source FinStats reported them (1978 to 1985) as the two instruments 'Property overseas' and 'Overseas government and company securities', respectively.

Our search for historical data for the instrument 'Direct outward investment in property' revealed that data do exist for this instrument back to 1966 from 1996 and that this data is in line with what was reported by some of the historical sources under consideration, such as pre-ESA 1995 and the FinStats. However, it is at a much lower annual measurement level than what is currently published, per Table 3.

Table 3: Comparison of published and historical data for direct outward investment in property (1978 to 1997), £m

Year	Direct outward investment in property 'ONS-q4 2017' ESA 2010	The historic direct outward investment in property, CSDB-extended pre-ESA 95 dataset (1966 to 1997)	The historic direct investment in property abroad, pre-ESA 95 dataset (1982 to 1997)	The historic property overseas, FinStats data for 1962 to 1985
1978		344		350
1979		324		444
1980		327		329
1981		371		381
1982		383	383	388
1983		434	434	432
1984		483	483	475
1985		423	423	427
1986		499	499	
1987	4926	507	507	
1988	5246	517	517	
1989	5740	594	594	
1990	6,722	533	533	
1991	8,138	708	708	
1992	9,240	753	753	
1993	10,482	632	632	
1994	10,893	634	634	
1995	11,337	671	671	
1996	11,909	663	663	
1997	15,158	565	565	

Source: Office for National Statistics

Further investigation into the difference in level revealed that this is mainly because of methodological improvements to some of the National Accounts measurements during Blue Book 2015.

In this article, we make no attempt to adjust the level of the newly found historical data for the direct outward investment in property to make it consistent with the current, post-1987 ESA 2010 published level. We decided this is something to be considered in future historical data improvements for these sectors.

Regarding the availability of historical data for 'ONS-q4 2017' ESA 2010 'Rest of the world shares and other equity' (7), our investigation revealed that throughout the early datasets, prior to ESA 2010, this instrument was reported wrongly as 'Overseas securities' or 'Overseas assets' and was allocated totally to AF.5. However, as we mentioned in our previous publication, prior to ESA 2010 'Overseas securities' consisted of a combination of:

- 'Overseas government securities', which was equivalent to the sum of 'Investment by unnamed entities bonds overseas' and 'investment in rest of the world bonds'. Together these form the current 'ONS-q4 2017' ESA 2010 'bonds issued by the rest of the world' instrument, which should be and was allocated to AF.3, debt securities.

- 'Overseas company securities', or what is also referred to as 'Investment in rest of the world shares' and that are believed to be equivalent to the 'Rest of the world shares and other equity' and should be allocated to AF.5.

Therefore, as mentioned in our previous publication, historical data for the instrument 'Overseas securities' needed to be restored back to 1966 from 1997, split into the two instruments listed, and allocated to AF.3 and AF.5, respectively. A similar process was followed for all the historical sources that hold the equivalent instrument.

To assess the assumption that the newly split 'Overseas company securities' data are equivalent to the 'Rest of the world shares and other equity' data, a snapshot (11-years period) of the latter was taken from 'ONS-q4 2017' and from an earlier version Blue Book 15. This was compared with the newly split 'Overseas company securities' data, per Figure 14.

Figure 14: Relation between the combined households and NPISH sector's 'Rest of the world shares and other equity' and the newly split 'Overseas company securities' instruments data

1987 to 1997

Figure 14: Relation between the combined households and NPISH sector's 'Rest of the world shares and other equity' and the newly split 'Overseas company securities' instruments data

1987 to 1997

£ million

[Line chart showing three series from 1987 to 1997, y-axis 0 to 15,000 £ million]

Legend:
- Rest of the World shares and other equity 'ONS-q4 2017' ESA 2010
- Rest of the World shares and other equity BB15
- Newly split overseas company security
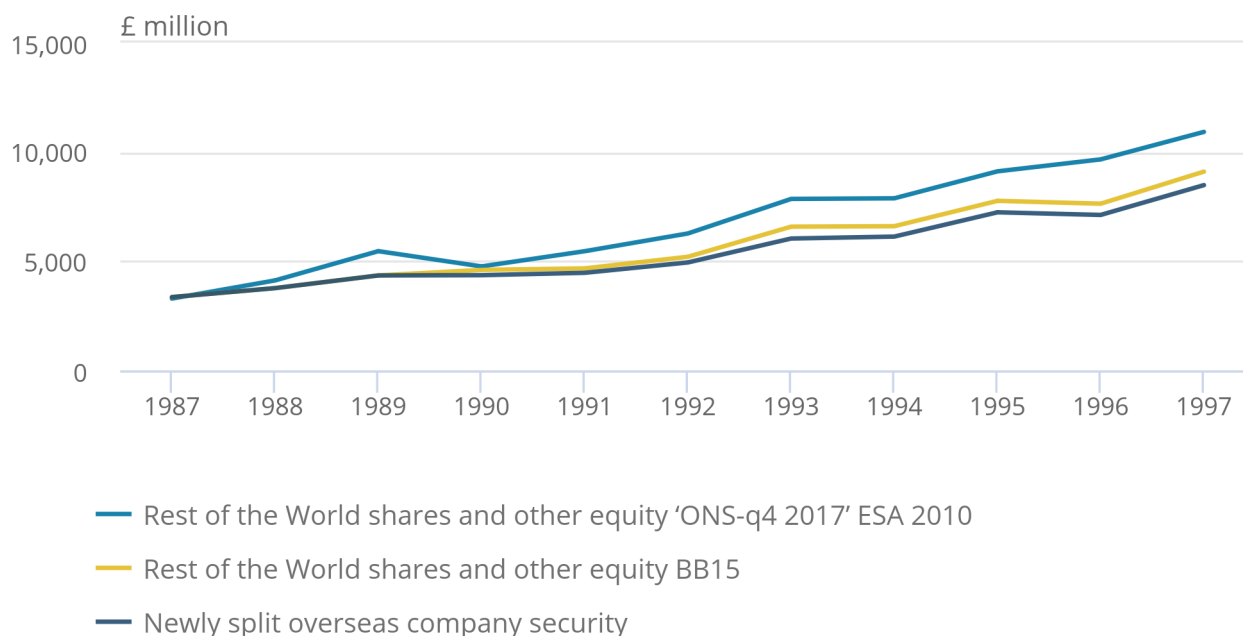
Source: Office for National Statistics

There is a close relationship between the Blue Book 2015 annual estimates of the 'Rest of the world shares and other equity' and the newly split 'Overseas company securities', especially toward 1987, but both were reporting lower-level estimates compared to what was reported in 'ONS-q4 2017'. Further investigation revealed that the difference was attributable to the methodological improvements to some of the National Accounts measurements during Blue Book 2015. No attempt was made in this article to adjust the historical figures, prior to 1987, for this instrument. This is something to be considered in any future improvement for these sectors.

No historical data, prior to 1990, were available for the 'ONS-q4 2017' ESA 2010 instrument 'Rest of the world mutual funds shares' (7), which represents the financial accounts items of offshore ordinary shares within open-ended investment companies. Consequently, current published data will be used.

Table 4 was created to present all the restored historical data for the current published ESA 2010 equity and investment fund shares (AF.5) instruments and all those equivalents from all the historical sources under consideration.

Table 4: The full set of the combined households and NPISH sector's ESA 2010 equity and investment fund shares or units (AF.5) data available from the various sources (in £millions) (Link to Excel spreadsheet due to size)

Having restored the historical data for the 'ONS-q4 2017' published instruments for the equity and investment fund shares or units (AF.5), we created Instrument Map 3 to present and illustrate the way these instruments were reconciled between the different sources of available historical data for this instrument.

Instrument map 3: Reconciled instruments for the households and NPISH sectors' equity and investments fund shares or units

Equity and investment fund shares/units (AF.5)

	Solomou and Weale Data (1920 - 1956)	Roe's Data (1957-1966)	NBPS Data (1966-1980)	NBPS Data (1976-1986)	Finstat Data (1978 - 1985)	CSDB-extended Pre-ESA 1995 Data (1966 - 1997)	Pre-ESA 1995 Data (1982 - 1997)	Historically extended 'ONS-q4 2017' ESA 2010 Data (2017 - 1966)	'ONS-q4 2017' ESA 2010 Data (2017 - 1987)
AF.5 UK and Foreign Equity holdings	UK quoted and unquoted ordinary and preference shares / stocks (1966 - 1957)	UK ordinary and preference shares (1980 - 1966)	UK ordinary and preference shares (1986 - 1976)	UK preference shares (AKUG) (1985 -1978)	UK company securities (REYX) (1997 -1966)	UK company securities (REYX) (1997 -1982)	Historic Listed UK shares residual back-casted (1989-1966)	Listed UK shares residual only back to (NNOX) (2017 - 1990)
					UK ordinary shares (AKUH) (1985 - 1978)			Historic Unlisted UK shares residual back-casted (1989 -1966)	Unlisted UK shares residual only back to (NNOY) (2017 - 1990)
									UK shares and bonds issued by other UK residents only for (NSOR) (1989 - 1987)
			Retail co-operatives: members' funds (1986 - 1976)	Retail co-operative societies: funds of members (1985 - 1978)			Historic Retail co-operatives members funds (1986 - 1966)	Other UK equity back to 1987 (NNOZ)	Retail co-operatives members funds (ALFD) (2017 - 1987)
	Physical assets overseas (1966 - 1957)			Property Overseas (AKUM) (1985 - 1978)	Direct and other investment abroad (AQHH) (1997 - 1966)	Direct and other investment abroad (AQHH) (1997 - 1982)	Historic Direct outward investment in property (1986 - 1966)	Shares and other equity issued by rest of the world back to 1987 (NNPC)	Direct outward investment in property (NIUJ/AQHH) (2017 - 1987)
	Overseas company securities (1966 - 1957)	Split Overseas company Assets (1980 - 1966)	Overseas Assets (AF.3 and AF.5) (1980 - 1966)	Split Overseas company Assets (1986 - 1976)	Overseas Assets (AF.3 and AF.5) (1986 - 1976)	Split Overseas company securities (1985 - 1978)	Overseas government and company securities (AQHG) (AF.3 and AF.5) (1985 - 1978)	Overseas company securities (FA.5) (1997 - 1966)	Overseas securities (AQHG) (1997 - 1982) / Overseas company securities (FA.5) (1997 - 1982) / Overseas government securities (AF.3) (1997 - 1982)	Historic Shares and other equity issued by rest of the world (1986 to 1966) / Historic Investment in RW shares (1986 - 1966)	Investment in RW shares (XBNQ) (2017 - 1987) / Others (MFEP + MFFK) 1990
	Unit trust units (1966 - 1957)	Unit trust units (AKUI) (1980 - 1966)	Unit trust units (AKUI) (1986 - 1976)	Unit trust units (AKUI) (1985 - 1978)	Unit trust units (AKUI) (1997 - 1966)	Unit trust units (AKUI) (1997 - 1982)	Historic Unit trust units (1986-1966)	UK mutual funds' shares (NNPG) (2017 - 1987)	Unit trust units (AKUI) (2017 - 1987) / Unquoted UK shares, sub-cat total (NIVQ) (2017 -1990)
							Rest of the world mutual funds shares (2017 - 1990)		Rest of the world mutual funds shares (NNPH) (2017 - 1990)

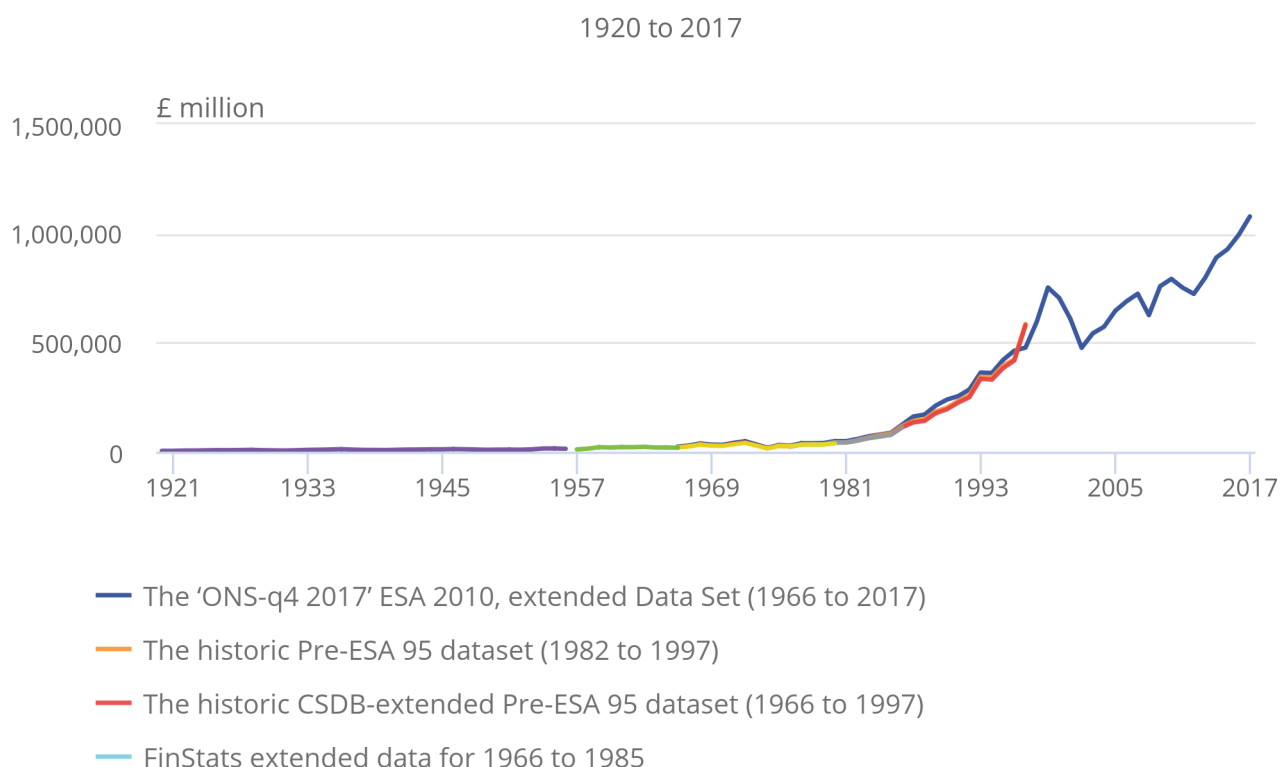**Source: Office for National Statistics**

Notes:

1. The blank cells represent financial instruments that are either missing from the data source or do not meet the full requirements of mapping to the 'ONS-q4 2017' ESA 2010 classification.

2. The grey cells represent financial instruments that move from another source to replace a blank cell.

To assess the validity of the newly restored historical data for the 'ONS-q4 2017' ESA 2010 equity and investment fund shares or units (AF.5) instrument, they were compared with equivalents from all historical sources under consideration. The result is presented in Figure 15.

Figure 15: Reconciled historical estimates for equity and investments fund shares or units for the combined households and NPISH sector, in line with 'ONS-q4 2017' ESA 2010 definitions

1920 to 2017

Figure 15: Reconciled historical estimates for equity and investments fund shares or units for the combined households and NPISH sector, in line with 'ONS-q4 2017' ESA 2010 definitions

1920 to 2017

The 'ONS-q4 2017' ESA 2010, extended Data Set (1966 to 2017)

The historic Pre-ESA 95 dataset (1982 to 1997)

The historic CSDB-extended Pre-ESA 95 dataset (1966 to 1997)

FinStats extended data for 1966 to 1985

Source: Office for National Statistics and Expert Studies

Figure 15 shows the households and NPISH sectors' total equity and investment fund shares or units historical estimates on a consistently defined 'ONS-q4 2017' ESA 2010 basis. It shows that the reconciled datasets from the different sources are now harmonious overall for this instrument, with some minor difference between the 'ONS-q4 2017' ESA 2010 dataset (1987 to 2017) and the CSDB-extended pre-ESA 1995 dataset (1966 to 1997). These minor differences are expected given the issues highlighted earlier. However, no divergences between the sources were found historically.

Having highlighted the issues and methods previously, Figure 16 identifies what we believe to be the best building blocks to use for the construction of a historical time series of the households and NPISH sectors' equity and investments fund shares or units assets.

Figure 16: The datasets forming the combined households and NPISH sector's equity and investments fund shares or units (AF.5) historical series

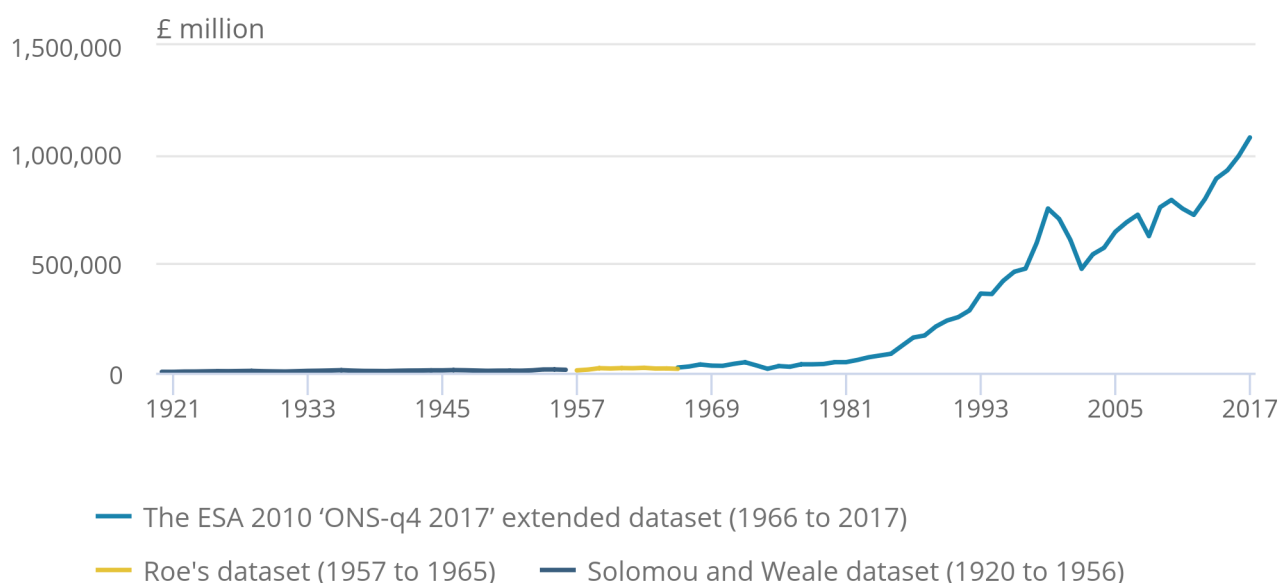**Source: Office for National Statistics**

Using these building blocks, Figure 17 illustrates the suggested experimental historical time series estimates for the combined households and NPISH sector's equity and investment fund shares or units, consistent with ' ONS-q4 2017' ESA 2010, 1920 to 2017.

Figure 17: Experimental historical estimates for the total equity and investment fund shares or units for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010

1920 to 2017

Figure 17: Experimental historical estimates for the total equity and investment fund shares or units for the combined households and NPISH sector, consistent with 'ONS-q4 2017' ESA 2010

1920 to 2017

£ million

Legend
The ESA 2010 'ONS-q4 2017' extended dataset (1966 to 2017)
Roe's dataset (1957 to 1965) — Solomou and Weale dataset (1920 to 1956)

Source: Office for National Statistics and Expert Studies

7 . Conclusion and next steps

This article further develops our previous work reconciling the sources of historical data for the combined households and non-profit institutions serving households (NPISH) sector. It proposes a historical time series for the combined households and NPISH sector's loans (assets and liabilities) and equity and investments fund shares or units (assets) consistent with 'ONS-q4 2017' European System of Accounts (ESA) 2010, 1920 to 2017. This work also highlights some data issues and possible future work for improvements to work towards consistency with current data.

It is worth highlighting, at this stage, the large volume of data this research has involved and the limited availability of detailed literature tracing local historical data changes over time. This has made the task of restoring these historical data difficult. Nevertheless, it is our belief that this work provides a set of acceptable historical time series data and has gone some way towards setting out some of the challenges faced when dealing with such historical data. It has also provided some useful tools and principles such as the instrument mapping approach.

Although the data and information provided in this article have been subject to a set of checks and balances, it is likely that further quality improvements are possible and will likely be implemented in future work. The intention is to use the approach presented in this article to produce further articles that will cover assets and liabilities for the remaining households and NPISH sectors' financial categories and then, resource permitting, to do the same for all the financial institutional sectors. This would be a sizeable research programme, however, expected to take a number of years.

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9 . Relevant links

Flow of Funds archived background information

Explanatory Notes: - Institutional sectors and financial instruments - AF.2 Currency and deposits - AF.3 Debt securities - AF.4 Loans - AF.5 Equity and investment fund shares or units - AF.6 Pensions, insurance and standardised guarantee schemes - AF.71 Financial derivatives

14 June 2019 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – Financial Services Survey 266 – return of assets and liabilities, Quarter 4 2018

30 January 2019 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – using Equifax data to visualise patterns of borrowing across the UK

26 November 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – 2018 matrix update

2 November 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – historic households and non-profit institutions serving households (NPISH) sectors data on debt securities

2 August 2018 – Economic Statistics Transformation Programme: Enhanced financial accounts (UK Flow of Funds) – using Thomson Reuters data to better understand the economy

3 July 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – using Beauhurst data to better understand the economy

2 July 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flows of funds) – Financial Services Survey 266 – quarterly return of assets and liabilities

26 June 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – enhancing the understanding of UK household finance

8 May 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – shadow banking, money market funds

2 May 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – using Equifax data to better understand the economy

1 May 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – shadow banking introductory article

30 April 2018 – Experimental financial statistics for insurance using Solvency II regulatory data – enhanced financial accounts (UK flow of funds)

15 February 2018 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – historic households and non-profit institutions serving households (NPISH) sectors data on currency and deposits

23 January 2018 – Economic Review: January 2018 – Economic Statistics Transformation Programme: a flow of funds approach to understanding quantitative easing

17 November 2017 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – 2017 matrix update

23 October 2017 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) – progress on commercial data use

25 September 2017 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) reconciling sources of historic data for households and the non-profit institutions serving households (NPISH) sectors

12 September 2017 – Economic Statistics Transformation Programme: Enhanced financial accounts (UK flow of funds) – A flow of funds approach to understanding financial crises

31 August 2017 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) estimating the value of other accounts receivable or payable in the UK economy

21 July 2017 – Economic Statistics Transformation Programme: enhanced financial accounts (UK flow of funds) improving the measurement of company quarterly profits

3 July 2017 - Economic Statistics Transformation Programme: Enhanced financial accounts (UK flow of funds) progress on financial derivatives data

5 June 2017 – National Accounts articles: The UK Enhanced Financial Accounts; the introduction of the new securities dealers survey data and expansion of financial sub-sector detail

31 May 2017 – [Economic Statistics Transformation Programme: Enhanced financial accounts (UK flow of funds) commercial data use](#)

31 May 2017 – [Economic Statistics Transformation Programme: Enhanced financial accounts (UK flow of funds) improving the economic sector breakdown](#)

27 April 2017 – [Economic Statistics Transformation Programme: Enhanced financial accounts (UK flow of funds) employee stock options](#)

24 April 2017 – [Financial intermediation services indirectly measured (FISIM) in the UK revisited](#)

29 March 2017 – [Economic Statistics Transformation Programme: Enhanced financial accounts (UK flow of funds) Government tables for the special data dissemination standards plus (SDDS plus)](#)

30 January 2017 – [The UK Enhanced Financial Accounts: changes to defined contribution pension fund estimates in the national accounts; part 2 – the data](#)

16 January 2017 – [The UK Enhanced Financial Accounts: changes to defined contribution pension fund estimates in the national accounts; part 1 – the methodology](#)

8 August 2016 – [Economic Statistics Transformation Programme: UK flow of funds experimental balance sheet statistics, 1997 to 2015](#)

14 July 2016 – [Economic Statistics Transformation Programme: Flow of funds - the international context](#)

14 July 2016 – [Economic Statistics Transformation Programme: Developing the enhanced financial accounts (UK Flow of Funds)](#)

10 March 2016 – [Identifying Sectoral Interconnectedness in the UK Economy](#)

24 February 2016 – [Improvements to the Sector and Financial Accounts](#)

12 January 2016 – [Historical Estimates of Financial Accounts and Balance Sheets](#)

6 November 2015 – [Comprehensive Review of the UK Financial Accounts](#) including explanatory notes for each financial instrument covered in the matrix

November 2015 – [Bank Stat article on the review of the UK Financial Accounts](#)

13 July 2015 – [Introduction Progress and Future Work](#)

10 . Acknowledgements