A Portfolio Assessment Tool for Credit Unions

A project proposal from More Metrics for consultation with interested parties

Version 1.1
Prepared by Colin Stewart, More Metrics
Date: 18/01/2019

1. Scope and Objectives

The scope of this More Metrics project is to provide Credit Unions (CU) with a standalone Portfolio Assessment Tool (PAT) that they can use to assess how effective they are at supporting their members. The PAT is primarily designed for CUs whose common bond is supporting a local community, to help them quantify the extent to which they are tackling financial exclusion within their catchment area. The PAT is to be used alongside a CU's normal financial and risk processes that are required to meet operational and regulatory needs. The PAT is therefore an additional analytical framework and not a replacement for any analysis currently undertaken by a CU.

The key objectives for the PAT are as follows:

- To provide CUs with a set of robust and easy to understand measures of their catchment area, loan and depositor portfolios that can be used to assess how well the CU supports its local community.
- To ensure the presentation of results gives CUs the wherewithal to have informed discussions with their stakeholders. The main measures cover deprivation and financial hardship and are provided to help CUs demonstrate their "added value" when talking to Local Authorities, the DWP, the FCA / PRA, Faith and Community leaders amongst others.
- To analyse CUs across the whole of the UK on a consistent basis. This is needed to enable accurate benchmarking between CUs to be undertaken. Benchmarking will provide additional insight for those CUs that partake in this optional extension to the PAT.
- To minimise operational risk by avoiding the need for CUs to share any personal data with third parties. The only data that needs to be supplied by a CU to obtain their PAT are the postcodes of the patch covered by the CU. This approach avoids the need for the CU to supply any membership data outside its organisation. If a Credit Union wishes to be involved in the optional benchmarking study, only summarised data from the PAT needs to be shared by them with More Metrics.
- To use only publically available aggregated data that has no restrictions on its use (e.g. OGL licenced), to keep costs low and minimise any potential GDPR issues. Also to ensure that the main sources used are updated regularly (typically annually), to keep assessments up to date going forward.

2. Overview of the Portfolio Assessment Tool (PAT)

The PAT uses a 10x10 grid of "Wealth decile" versus "Net Income decile" as the basis for segmenting a CU's catchment area and membership portfolios. We will refer to this grid as the "Wealth x Income Grid" or WIG for short. The WIG is calculated at a local neighbourhood level (Output Area). There are c230k Output Areas across the UK with an average of about 300 residents each. Output Area level therefore provides the detail needed to analyse locally concentrated portfolios. The 10x10 grid has 100 cells, with the deciles weighted to ensure that 1% of the adult population aged between 18 and 74 is in each cell.

Different grids are calculated at a UK, Country and Region level, to deal with the wide variations in asset values (especially house price) and incomes across the UK. The Region version of the WIG is used for heat maps in the PAT because this makes the local interpretation more meaningful, but does not allow for direct comparisons across different Regions of the UK.

To enable UK wide comparisons, a wide range of metrics for the CU are summarised by wealth decile and income decile (i.e. WIG cell) in a reporting data table. From this data table, a useful set of analysis is produced for the CU on a consistent basis across the UK.

3. Operational considerations

More Metrics will supply each CU with the PAT in the form of an Excel Workbook containing the relevant data just for their own catchment. It is the CU's responsibility to add their membership data to the PAT in a standard format. The data required for the PAT will be at individual account level for all live accounts at the specified date. The core data fields that need to be extracted for this are limited to the following:

- Postcode (Full home address postcode is required)
- Depositor / Borrower code (D=Depositor, B=Borrower)
- Outstanding Balance
- Borrower status flag (1 = loan payments up to date, 0 = missed payments or in default, 9 = not applicable, i.e. a Deposit or Savings account)

To maximise the usefulness of the PAT, up to 10 extra numeric fields chosen by the CU can be populated to provide additional insight. These might (for example) cover: household income; age of member; no of children in household etc. Populating these fields in this section of the PAT will mean that the data is automatically included in the data table used for subsequent analysis.

Once the CU has added the data to the workbook, the aggregated data table for the individual accounts is created. The resulting data table has 100 rows with all of the data supplied by the CU aggregated in columns tagged by Wealth and Income deciles. At this stage, a range of additional fields supplied by More Metrics are matched in and added to the table for reporting purposes. (See section 5 for more details on what metrics are planned for inclusion).

For those participating in the optional benchmarking study, the data table summary is returned to More Metrics for further processing. The values returned are the standard set, plus any additional fields that have been unanimously agreed by the CUs involved in benchmarking. Once these have been processed by More Metrics, the “Benchmark Group summary data table” is returned for inclusion in the PAT, to provide the reference data needed for additional peer group comparisons.

The rest of the Workbook comprises a set of standard reports covering the core data. An additional set of reports will be populated for those CUs involved in the benchmarking study. The types of report included are likely to cover aspects such as:

- A profile of the CU’s "catchment area" heat mapped using the Wealth x Income grid to see how the levels of wealth and income in their patch compares to the average for their Region.
- Heat maps for members who deposit and borrow by count and value. The expectation is that a CU would be relatively more active in the cells representing neighbourhoods with low income / low wealth for borrowing members, with the bulk of depositors (by balance) likely to be drawn from areas of relatively higher wealth (see section 5 for some analysis that supports these assumptions).
- Results for a broad set of measures covering financial inclusion and deprivation. These will compare the CU's portfolio distribution for each measure to the overall distribution for their catchment area, local authority, regional and national average values. (See Section 5 below for more details on this).

To further enhance the usefulness of the PAT, CUs have full access to the data so that they can undertake their own analysis (e.g. by building their own pivot table reports). In addition, the aim is to encourage collaboration locally, by giving CUs the licence to make the PAT freely available to other organisations in their catchment area, such as the local food bank. This should enable the CU to take a “joined up” approach to supporting neighbourhoods most at risk. If a food bank wanted to use the PAT, all they would need to do is to populate a blank version of the CU’s PAT with their own postcode data leaving the other columns blank. They can then share the summarised outputs from their analysis with the Credit Union and compare notes. The end user licence would allow the CU to distribute their PAT to local, not for profit organisations to allow this to happen.

4. More detail on the Wealth x Income Grid (WIG)

The wealth dimension is derived using count data for estates that on death are subject to Inheritance Tax (IHT), published by HMRC. We model on this data to create local estimates of wealth, standardised by age. This creates a fit for purpose wealth rank that can be applied nationally, regionally and locally.

The "Net Income" measure is calculated using a wide variety of inputs that include More Metrics modelled estimates of earned income and pensioner income combined with ONS published data on living costs at a Regional and Output Area Classification (OAC) level. Other More Metrics modelled datasets are used to estimate borrowing levels and the associated mortgage interest payments needed for the Net Income calculation. Source data for this includes the unsecured loan and mortgage data published by UK Finance at postcode sector level provided by the main high street banks plus Nationwide Building Society (c75% of the market).

The techniques used to model the aggregated, published data down to neighbourhood levels include: disaggregation (used routinely for the More Metrics modelled outputs); apportioning (used for cost of living allocations and more generally to calibrate disaggregation models); and imputation of micro data to create robust predictor datasets for disaggregation modelling.

The resulting disaggregated values for “Wealth" and “Net Income” used for the grid have only a moderately positive correlation with each other (r = 0.4). This means that cross-tabbing the "Wealth" and “Net Income” measures to form the grid structure is analytically useful. The Wealth decile is created first, weighted by population, with the Net Income decile created by Wealth decile thereafter. This approach achieves the desired 1% of the population per cell. For grids calculated below UK level, the decile calculations are done separately for each sub region (i.e. for each Country and Region in turn).

5. Proposed metrics that will be used to analyse CU portfolios

This section provides more detail on the proposed analytical framework and the associated set of measures for inclusion in the PAT. Additional commentary covers a few observations on some of the challenges local CUs may face when interpreting results from the PAT.

5.1. Measures of catchment area variation

Analysis of the overall catchment

- The starting point for the Portfolio Assessment Tool (PAT) is to analyse the CU’s catchment area in terms of its Wealth x Income (WIG) profile. To illustrate this in the absence of actual CU data, the catchment areas for four parliamentary constituencies in London are compared. Wimbledon (low deprivation), Barking (high deprivation), Hammersmith (middling deprivation) and Kensington (middling deprivation). To aid comparison, all cell values have been normalised to an average of 1 using the regional grid for London with the heat map scale held constant across the four tables.

Wimbledon Parliamentary Constituency (least deprived in London)

Wealth \ Income	1-Low									High-10
High-10	2.6	3.2	3.4	4.3	4.1	3.7	4.1	3.2	2.2	2.1
	1.6	2.1	2.1	2.7	3.0	3.0	3.0	2.7	2.7	2.3
	0.8	1.1	1.2	1.5	2.1	2.2	2.0	2.2	2.8	2.1
	0.3	0.4	0.5	0.7	1.2	1.4	1.2	1.3	2.1	1.5
	0.3	0.2	0.3	0.3	0.6	0.8	0.8	0.8	1.3	0.8
	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.5	0.6	0.4
	0.2	0.2	0.1	0.0	0.1	0.3	0.3	0.3	0.3	0.2
	0.2	0.1	0.0	-	0.0	0.2	0.2	0.2	0.2	0.1
1-Low	0.1	0.1	0.0	-	0.0	0.1	0.1	0.1	0.2	0.0
	0.1	0.0	-	-	-	-	-	0.1	-	-

Hammersmith Parliamentary Constituency (middling deprived in London)

Wealth \ Income	1-Low									High-10
High-10	2.5	2.4	1.7	2.0	2.2	2.2	1.8	2.0	1.0	0.8
	2.1	2.1	1.8	1.9	1.8	1.8	1.7	1.6	1.2	1.1
	1.8	2.0	2.1	1.7	1.4	1.4	1.6	1.1	1.1	1.1
	1.7	1.7	2.2	1.5	1.2	1.3	1.2	0.8	0.8	0.7
	1.7	1.7	1.8	1.4	1.1	1.0	0.9	0.5	0.5	0.4
	1.8	1.4	1.3	1.3	1.1	0.8	0.4	0.4	0.4	0.3
	1.5	1.4	0.8	1.0	0.7	0.6	0.3	0.3	0.4	0.3
	1.1	0.8	0.7	0.5	0.5	0.4	0.2	0.2	0.3	0.3
1-Low	0.5	0.5	0.4	0.2	0.3	0.2	0.1	0.1	0.2	0.2
	0.0	0.0	0.1	0.1	0.2	0.1	-	0.0	0.0	0.1

Barking Parliamentary Constituency (most deprived in London)

Wealth \ Income	1-Low									High-10
High-10	0.0	0.0	-	-	-	-	-	-	-	-
	0.0	-	-	-	-	-	-	-	-	-
	0.0	-	0.0	0.0	0.0	0.0	-	-	-	-
	0.1	0.0	0.0	0.1	0.1	0.0	-	-	-	-
	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.1
	0.8	1.0	1.2	0.7	0.9	0.7	0.6	0.6	0.4	0.3
	2.3	2.7	2.5	1.9	1.6	1.3	1.0	1.1	0.8	0.6
1-Low	4.8	5.1	5.1	3.6	2.7	2.2	1.6	1.7	1.2	1.0
	7.8	8.0	8.3	5.8	4.1	2.9	2.1	2.3	1.7	1.4

Kensington Parliamentary Constituency (middling deprived in London)

Wealth \ Income	1-Low									High-10
High-10	1.5	2.2	1.9	2.1	2.8	2.6	2.8	2.4	4.8	12.1
	1.2	1.5	1.5	1.5	1.7	1.8	1.9	1.7	2.8	6.3
	0.9	1.1	1.0	0.9	0.9	1.2	1.2	1.1	1.6	2.2
	0.9	0.9	0.8	0.5	0.6	0.8	0.9	0.9	0.9	1.0
	0.9	1.0	0.8	0.4	0.5	0.5	0.7	0.9	0.7	0.6
	0.8	0.9	0.8	0.5	0.5	0.3	0.4	0.7	0.5	0.4
	0.7	0.8	0.7	0.5	0.4	0.3	0.3	0.4	0.3	0.2
	0.5	0.5	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.1
1-Low	0.4	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1
	0.1	0.2	-	0.0	0.0	0.0	0.0	0.1	0.2	0.1

- Wimbledon shows a peak cell value of 4.3 for high wealth (10)/mid income (4). This means there are 4.3 times as many people living in neighbourhoods with this level of wealth and income in Wimbledon as you would expect from the average values for the London Region as a whole. There are insignificant numbers of neighbourhoods in the lowest wealth/lowest income, bottom-left corner for

this constituency with a value of 0.1, meaning there are only a 1/10th of the London Region average residents for this cell in Wimbledon.

- By contrast, Barking has a high value of 8.3 for low wealth (1)/below average Income (3). There is also a significant over-representation of neighbourhoods in the lowest wealth/lowest income cell with a relative value of 7.8. There are no neighbourhoods in cells towards the top-right, highest wealth/highest income corner of the grid.
- Hammersmith and Kensington show a broadly similar pattern over most of the grid, but Kensington has a very high over-representation of neighbourhoods in the top-right, highest wealth/highest income cell at 12.1 times the London Region average. Both Hammersmith and Kensington have similar levels in cells towards the bottom-left, lowest wealth/lowest income corner at about half the London Region average.

Analysis of the CU target populations for deposits and borrowing

- The next thing we need for interpreting the results from the PAT is analysis that identifies which parts of the WIG a CU should target for depositor and borrowing members, recognising that the bulk of liabilities by value (deposits) raised by the CU are likely to come from wealthier neighbourhoods with the assets (lending) provided to neighbourhoods that are towards the bottom-left corner of the WIG (lower wealth/lower income).
- In the absence of actual CU data, we need to find a useful proxy for identifying CU target populations, for borrowing and a good option for this is to use analysis of the catchment areas of relevant businesses. We have done this below by analysing a gravity-weighted distribution of neighbourhoods within 2km of outlets for three different businesses. The figures have been normalised to a cell average of 1.
- Business A has outlets in England, Scotland and Wales and focuses on serving the needs of financially disadvantaged customers. It is a good proxy for a CU's borrowing members because it delivers physical goods locally to its customers on weekly rent to buy terms at a relatively high APR. Its catchment area profile is strongly skewed to the bottom-left, lowest wealth/lowest income neighbourhoods.

Business A: Financial Institution (E,W & S): financially excluded customers										
	1-Low				Income					High-10
High-10	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5
	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6
	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.6
Wealth	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7
	1.2	1.2	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.8
	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.0	0.9
	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.1	1.0
1-Low	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2
	1.8	1.6	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.3

- Business B is a general retailer that offers products at low unit prices to its customers. It is another useful proxy for a CU's members (borrowers and depositors) because it is aimed at meeting the needs of households on tight budgets. It also has a large number of outlets across the UK, allowing us to undertake regional analysis which is useful because the importance of CUs to the local economy varies considerably across the UK regions. The grid below is, for Business B's Northern Ireland and Scotland outlets where CUs are more active. Its catchment area profile is skewed towards lower income neighbourhoods across all wealth bands.

Business B: General Retailer (NI & S): Commited to low unit price										
	1-Low				Income					High-10
High-10	1.8	1.5	1.2	1.1	1.1	1.1	1.0	1.0	0.9	0.8
	1.5	1.3	1.1	1.0	1.0	1.0	0.9	0.8	0.7	0.7
	1.4	1.2	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.6
Wealth	1.4	1.2	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7
	1.3	1.1	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.7
	1.3	1.1	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8
	1.4	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.8
	1.4	1.2	1.1	1.0	0.9	0.9	0.9	0.9	0.8	0.8
1-Low	1.5	1.3	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.8
	1.6	1.4	1.2	1.1	1.0	1.0	1.0	0.9	0.8	0.8

- Business C is a financial institution that focuses on community banking with branches across England, but with a particularly strong presence in London where it targets affluent areas. It is a good proxy for a CU's depositor members as it offers competitive savings products delivered through branches with extended opening hours. Its catchment area profile is different in London compared to the rest of England, but in both cases is skewed away from the lowest wealth/lowest income, bottom-left corner of the grid.

Business C: Financial Institution (London): Community Bank										
	1-Low				Income					High-10
High-10	1.1	1.3	1.5	1.5	1.6	1.6	1.7	1.7	1.9	2.4
	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.6	1.8
	1.0	1.0	0.9	0.9	1.0	1.0	1.1	1.1	1.3	1.5
Wealth	1.0	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.2
	1.1	1.0	0.9	0.9	0.8	0.8	0.9	0.9	1.0	1.1
	1.0	0.9	0.9	0.8	0.9	0.8	0.9	1.0	1.0	1.1
	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.0
1-Low	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.0
	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9
	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.9

Business C: Financial Institution (England excl London): Community Bank										
	1-Low				Income					High-10
High-10	2.3	1.6	1.1	0.9	0.9	0.9	1.0	0.9	0.8	0.7
	1.9	1.4	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.7
	1.4	1.2	1.1	0.9	0.8	0.7	0.7	0.7	0.7	0.7
Wealth	1.4	1.2	1.1	0.9	0.8	0.8	0.8	0.7	0.7	0.7
	1.3	1.1	1.0	0.9	0.8	0.9	0.9	0.8	0.7	0.7
	1.3	1.0	0.9	0.8	0.8	0.9	0.9	0.9	0.8	0.8
	1.2	1.0	0.8	0.8	0.9	0.9	1.0	1.0	0.9	0.8
1-Low	1.0	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.0	0.9
	0.8	0.7	0.8	1.0	1.2	1.3	1.4	1.3	1.3	1.2
	0.7	0.7	0.7	1.0	1.3	1.5	1.7	1.7	1.6	1.5

Initial Observations and discussion points

- An important observation from our analysis of catchment areas is that a large imbalance between the size of the depositor and borrower target populations is likely to occur for some CUs. This is starkly illustrated by comparing the WIG heat-maps for the selected parliamentary constituencies in London.
- The risk is that CUs with high concentrations of depositor neighbourhoods (assumed to be higher wealth/higher income) will be "awash with cash" putting pressure on them to lend to anyone who asks, as they seek out eligible borrowers from a restricted pool. Could this have been part of the reason for the failure of Kensington and Chelsea CU? Press reports indicate this may have been a contributory factor: https://www.theguardian.com/money/2018/oct/09/credit-union-in-wealthy-london-borough-collapses
- By contrast, a CU operating in an area like Barking will have access to a large pool of potential borrowing members with a good spread away from the lowest wealth/lowest income corner of the grid so that the CU can avoid the most risky business and still maintain lending volumes. This however may mean it has a greater demand than the supply of funds available.
- The PAT should help individual CUs understand where their catchment is on the spectrum of "depositor rich" to "borrower rich" by comparison to their Region average (and for those involved in the benchmarking study, to their peers). This should make them much more alive to the pitfalls of balancing supply and demand. At a more strategic level this should prompt CU's to target their

marketing efforts and /or change their catchment area, and /or combine together to get a more balanced WIG profile that best serves local needs at an acceptable overall risk.

5.2. Measures of Deprivation and Life Chances

Proposed measures analysed at a UK level

- More Metrics can provide a wide-range of measures "off-the-shelf" as part of the PAT to help assess how well a CU is supporting neighbourhoods with high levels of deprivation and with reduced life chances. Here we look at the index of multiple deprivation; the proportion of Children living in Low Income Families; the proportion of 18 year olds going to University; and the level of charitable giving. Other measures (not shown) in the PAT will cover mortality, smoker and obesity risk to provide a fuller picture.

- For the tables shown below, the heat map scale is varied for each measure to ensure that areas of highest deprivation / worst life chances are coloured red with the neighbourhoods with lowest deprivation / best life chances coloured green.

Index of Multiple Deprivation (IMD)

Wealth \ Income	1-Low									High-10
High-10	5.8	6.3	6.6	6.8	7.1	7.4	7.6	7.8	8.0	8.2
	5.1	5.6	6.0	6.4	6.6	6.9	7.2	7.5	7.8	8.1
	4.6	5.0	5.5	5.9	6.2	6.6	6.9	7.3	7.6	7.9
	4.1	4.5	5.0	5.5	5.8	6.2	6.5	6.9	7.3	7.7
	3.6	4.0	4.5	4.9	5.3	5.6	6.0	6.5	6.9	7.4
	3.1	3.5	3.9	4.3	4.7	5.1	5.5	6.0	6.5	7.1
	2.7	2.9	3.3	3.7	4.1	4.5	4.9	5.4	6.0	6.7
	2.2	2.5	2.8	3.1	3.4	3.8	4.2	4.7	5.3	6.1
	1.8	1.9	2.1	2.4	2.7	3.0	3.4	3.8	4.4	5.2
1-Low	1.1	1.2	1.4	1.6	1.8	2.1	2.4	2.8	3.3	4.0

Children in Low Income Families (CinLIF)

Wealth \ Income	1-Low									High-10
High-10	11%	10%	10%	9%	8%	8%	7%	7%	6%	6%
	14%	13%	12%	11%	10%	9%	8%	8%	7%	6%
	16%	15%	13%	12%	11%	10%	10%	9%	8%	7%
	18%	16%	15%	14%	13%	12%	11%	10%	9%	8%
	20%	18%	17%	15%	14%	13%	12%	11%	10%	9%
	22%	20%	19%	17%	16%	15%	13%	12%	11%	9%
	24%	23%	21%	20%	18%	17%	15%	14%	12%	10%
	26%	25%	24%	22%	21%	19%	18%	16%	14%	12%
	28%	28%	27%	25%	24%	22%	20%	19%	17%	14%
1-Low	33%	32%	31%	29%	27%	26%	24%	22%	20%	17%

University Entry Rates at 18 (via UCAS)

Wealth \ Income	1-Low									High-10
High-10	31%	33%	35%	37%	39%	41%	43%	45%	47%	49%
	28%	30%	31%	33%	35%	37%	40%	42%	44%	46%
	25%	27%	29%	31%	33%	35%	37%	39%	41%	44%
	24%	25%	27%	29%	31%	32%	34%	37%	39%	42%
	23%	24%	25%	27%	28%	30%	32%	35%	37%	40%
	21%	22%	23%	25%	26%	28%	30%	32%	35%	39%
	20%	21%	22%	23%	24%	26%	28%	30%	33%	36%
	19%	19%	20%	21%	22%	24%	25%	27%	30%	34%
	17%	17%	18%	19%	20%	22%	23%	25%	28%	31%
1-Low	16%	16%	16%	17%	19%	20%	22%	23%	25%	28%

Charitable Giving (Gift Aid %)

Wealth \ Income	1-Low									High-10
High-10	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%
	14%	14%	15%	16%	16%	17%	19%	20%	21%	23%
	12%	12%	13%	14%	14%	15%	16%	18%	19%	21%
	11%	11%	11%	12%	13%	14%	15%	16%	17%	19%
	9%	10%	10%	11%	12%	12%	13%	14%	16%	18%
	9%	9%	9%	10%	10%	11%	12%	13%	14%	16%
	8%	8%	8%	9%	9%	10%	10%	11%	13%	14%
	7%	7%	7%	8%	8%	8%	9%	10%	11%	13%
	6%	6%	6%	7%	7%	7%	8%	8%	9%	11%
1-Low	5%	5%	5%	5%	5%	6%	6%	6%	7%	9%

- The average index of multiple-deprivation (IMD) Decile varies from a value of 1.1 at lowest wealth/lowest income, to 8.2 at highest wealth/highest income. IMD Decile 1 is most deprived and IMD Decile 10 is least deprived.
- The Proportion of Children in Low Income Families (published by ONS at LSOA level) varies by a factor of more than 5 times across the leading diagonal (from 33% at lowest wealth/lowest income to 6% at highest wealth/highest income).
- The More Metrics modelled estimate proportion of 18 year olds going to University (based on UCAS applications for 2016) is estimated to vary from 16% at lowest wealth/lowest income to 49% at highest wealth/highest income.
- The More Metrics modelled estimate for the proportion of people donating to charity varies from 5% at lowest wealth/lowest income to 25% at highest wealth/highest income. This estimate is based on the proportion of tax payers who have a non-zero value for Gift Aid on their tax return

Initial Observations and discussion points

- The various measures chosen above all show a similar pattern across the WIG, indicating that CUs that score overall green or red on one measure are also likely to do the same on the other measures. Nevertheless the provision of multiple measures is useful to enable the CU to talk about their performance against the things that are most relevant to particular stakeholders.

- The measures used for this analysis are comparable across all parts of the UK, providing a level playing field (unlike the catchment area analysis shown earlier). This is of potential value to national and local government departments where any resource allocations relating to the CU Sector need to be evidence based.

5.3. Measures of Financial inclusion / exclusion

Proposed measures analysed at a UK level

- Estimates of product penetration and debt levels across the Wealth x Income grid provide us with some useful measures of financial inclusion / exclusion. The main data sources for this analysis are the datasets published by UK Finance at postcode sector level for mortgage and unsecured borrowing by value and the FCA financial lives survey tables for product penetration. Additionally the 2011 census data for tenure can be used as a useful local cross-check for mortgage penetration (albeit somewhat out of date). The financial institutions that contribute to the UK Finance datasets cover about 75% of the total market. A mixture of disaggregation modelling and apportioning allows us to calculate estimates at Output Area level across the UK, which in turn are mapped to the WIG to provide the following tables.
- The proportion of adults estimated to have a residential mortgage is most strongly associated with net income, varying from a low value of 14% of adults aged between 18 and 74 found in the lowest income column to a high of 42% found in the highest income column. A variation of c3 times between the max and min cell values in the WIG table.

Proportion of Adults with a Residential Mortgage										
	1-Low				Income					High-10
High-10	25%	29%	32%	33%	34%	35%	35%	36%	35%	32%
	26%	31%	33%	35%	36%	37%	38%	38%	37%	34%
	26%	31%	34%	35%	37%	38%	39%	39%	39%	36%
Wealth	25%	30%	33%	35%	37%	38%	39%	40%	40%	38%
	24%	29%	33%	35%	36%	38%	39%	40%	41%	39%
	23%	28%	31%	33%	35%	37%	39%	40%	41%	40%
	22%	26%	29%	32%	34%	36%	38%	40%	41%	41%
	20%	24%	27%	29%	32%	34%	36%	38%	40%	42%
1-Low	17%	21%	24%	26%	28%	31%	33%	35%	38%	41%
	14%	17%	20%	22%	24%	26%	29%	32%	35%	38%

- The proportion of adults estimated to have unsecured debt is derived from FCA financial lives survey data for any loan, overdraft or card product excluding transactors. The data used here covers the whole of the market including high-cost lenders and Credit Unions. This analysis shows a similar pattern to the mortgage proportion distribution, but with a smaller range. This varies from a minimum cell value of 45% of adults aged between 18 and 74 to a maximum cell value of 62%. A variation of c1.4 times compared to c3 times for mortgage product ownership across the table.

Proportion of Adults with Unsecured Debts (excl transactors)										
	1-Low				Income					High-10
High-10	58%	59%	60%	61%	61%	61%	61%	61%	60%	57%
	56%	58%	59%	60%	61%	61%	61%	61%	60%	58%
	54%	56%	58%	60%	60%	61%	61%	61%	61%	58%
Wealth	53%	55%	57%	59%	60%	61%	61%	61%	61%	59%
	52%	54%	56%	58%	59%	60%	61%	61%	61%	60%
	51%	53%	55%	57%	58%	59%	60%	61%	62%	61%
	50%	52%	54%	56%	57%	58%	59%	61%	61%	61%
	48%	50%	52%	54%	56%	57%	58%	59%	61%	62%
1-Low	47%	49%	51%	53%	55%	56%	57%	58%	60%	61%
	45%	47%	49%	50%	53%	54%	55%	56%	58%	60%

- The average value of unsecured borrowing per adult aged 18 to 74 is derived from postcode sector data published by UK Finance for loans and overdrafts provided by the main high-street banks, plus Nationwide BSoc. This shows a similar overall pattern as the unsecured borrowing proportion but with a higher range varying from an average of £500 per adult for the lowest cell to £930 for the highest cell. A variation of c1.8 times compared to c 1.3 times for unsecured borrowing product ownership. It is assumed that neighbourhoods towards the bottom-left corner of the WIG will be more likely to borrow from high-cost lenders and their data is not included in the UK Finance figures shown below, unlike the proportion data in the table above.

Average Unsecured Lending Per Adult aged 18 to 74 / £ (UK Finance contributors only)										
Wealth	1-Low				Income					High-10
High-10	640	700	740	760	780	800	810	810	810	800
	650	720	760	790	800	820	830	830	830	800
	640	720	770	800	820	840	840	850	850	820
	640	720	770	800	830	850	860	870	870	840
	640	710	770	800	820	850	870	880	880	860
	620	700	750	790	820	850	880	900	900	880
	610	680	730	770	800	840	860	890	900	900
	590	650	700	740	780	810	840	870	910	930
1-Low	560	620	660	700	730	770	800	840	890	920
	500	560	600	630	670	690	740	790	830	880

- The value of mortgage borrowing per adult aged 18 to 74 shows a different pattern. The pattern seen here is similar to that seen for the measures of deprivation with the greatest variation across the grid diagonally from an average of £5,480 per adult at lowest wealth/lowest income to £40,800 per adult at highest wealth/highest income. A variation of over 7 times across the leading diagonal. Again, the figures in this table only include that provided by the mainstream lenders covered by the UK Finance statistics.

Average mortgage Lending Per Adult Aged 18to74 / £ (UK Finance contributors only)										
Wealth	1-Low				Income					High-10
High-10	18,910	21,850	24,590	26,940	29,940	32,250	34,620	36,890	38,730	40,800
	17,180	19,750	21,670	23,370	25,140	26,930	29,170	31,640	33,560	35,310
	15,730	18,110	19,820	21,140	22,660	24,110	26,040	28,200	30,110	32,160
	14,730	16,830	18,310	19,790	21,080	22,520	23,990	25,750	28,010	30,420
	13,670	15,500	17,210	18,420	19,790	20,930	22,300	24,040	26,320	28,820
	12,250	14,270	15,860	17,230	18,390	19,590	20,950	22,590	24,900	27,410
	11,230	12,930	14,360	15,530	16,800	18,050	19,420	20,960	23,080	25,700
	9,810	11,470	12,770	13,980	15,190	16,410	17,850	19,430	21,530	24,220
1-Low	7,920	9,610	10,950	12,140	13,310	14,380	15,740	17,360	19,340	22,070
	5,480	7,260	8,710	9,800	11,020	12,080	13,420	14,900	16,640	19,240

Initial Observations and discussion points

- The WIG patterns for the various measures of financial inclusion / exclusion are more varied and are accordingly a little trickier to interpret than the "deprivation and life chances" measures. The absence of any detailed open source data on the lending provided by CUs is a gap that should be filled over time if there is a reasonable take up of the PAT, but day one this is largely an unknown and we need to infer the likely position from other sources.
- What can be deduced is that neighbourhoods in the bottom-right corner of the WIG (lowest wealth/highest income have a high penetration of mortgages and unsecured debt amongst the adult population This area of the grid can therefore be regarded as having a high-demand for borrowing, but is not the highest priority for CUs as it is well served by mainstream lenders.
- Against that backdrop, the PAT should be good at distinguishing between different types of CU:
  - The ones that "get the balance right" by focussing on more risky assets (towards the bottom-left corner), but with an appropriate level of assets sourced from neighbourhoods towards the

bottom-right to ensure a sufficient overall level of return for the pooled risk. These CUs should be identified as having a high added value by the PAT with a WIG distribution profile that is close to the ideal benchmark.

- The ones that "play it safe" by focussing too much on neighbourhoods towards the bottom-right corner of the WIG at the expense of those most in need. This could be because of an over-cautious approach to risk, and / or poor targeting, and /or a lack of opportunity due to the CU's specific catchment profile. These CUs should be identified as having low added value by the PAT with a WIG distribution profile that is on the low risk side of the ideal benchmark.
- The ones that "are high risk" by focussing too much on neighbourhoods in the bottom-left corner of the WIG without heed to achieving a sufficient return from the portfolio overall to cover the pooled risk. This could be because of poor targeting leading to an over-supply of cash to lend and a loosening of credit criteria to maintain net income. These CUs should be easy to spot as having a high added value, but with a WIG distribution profile that is on the high risk side of the ideal benchmark.

5.4. Modelled Risk Measure

Proposed risk measure analysed at a UK level

- More Metrics does not know of any open-source, publically-available data for credit risk and the restricted data that is available on credit defaults (e.g. CCJ) at a local level is sensitive data, with potential GDPR implications.
- As an open source alternative, More Metrics has used aggregated Insolvency count data published by "The Insolvency Service" for this analysis. More Metrics use disaggregation modelling to obtain estimates at Output Area level, which are scaled by estimates of borrowing proportions to calculate an average insolvency rate for the borrowing population. These are converted to a relative insolvency rate across the WIG to achieve a cell average of 1.

Relative Insolvency Risk of Borrowers										
	1-Low				Income					High-10
High-10	0.80	0.77	0.72	0.69	0.65	0.63	0.60	0.58	0.56	0.52
	0.96	0.91	0.84	0.78	0.74	0.71	0.68	0.64	0.61	0.57
	1.07	1.02	0.94	0.87	0.82	0.78	0.74	0.69	0.65	0.60
	1.15	1.11	1.03	0.95	0.88	0.83	0.79	0.75	0.70	0.64
Wealth	1.24	1.19	1.11	1.02	0.95	0.90	0.85	0.80	0.74	0.67
	1.31	1.26	1.19	1.10	1.03	0.97	0.91	0.85	0.79	0.70
	1.40	1.35	1.28	1.20	1.12	1.06	0.99	0.92	0.84	0.75
	1.53	1.47	1.38	1.29	1.22	1.15	1.08	1.00	0.91	0.81
1-Low	1.65	1.59	1.49	1.39	1.31	1.23	1.16	1.08	1.00	0.88
	1.80	1.75	1.67	1.55	1.43	1.31	1.23	1.17	1.10	0.98

- This indicates that there is a 3.4 times change in default rates across the diagonal from a value of 1.8 for lowest wealth/lowest income, falling to a value of 0.52 for the highest wealth/highest income cell.

Initial Observations and discussion points

- The WIG patterns for insolvency risk show the expected variation across the leading diagonal from bottom-left to top-right. The absence of any detailed open source data on the default rates for CUs is a gap that should be filled over time if there is a reasonable take up of the PAT. For now we need to treat these insolvency risk estimate as being purely indicative, because they are not derived from actual loan default data and are not calibrated to actual default rates.
- Once a better risk measure for each of the WIG cells is available (from the benchmark study), this will provide useful additional insight to CUs that should help them expand their book prudently, while at the same time maximising the support given to neighbourhoods in greatest need.

6. Data acknowledgements and attributions

More Metrics gratefully acknowledges the many organisations and government departments that make their data available to the general public.

Our main source of data for models is 2011 census data supplemented by a wide-range of more up to date data provided by National Records of Scotland (Crown Copyright, OGL), Northern Ireland Statistics and Research Agency (Crown Copyright, OGL), Office of National Statistics (Crown Copyright, OGL).

Postcode to Output Area mappings and IMD data are taken from the ONSPD / NSPL files regularly published by ONS. These files contain National Statistics data © Crown copyright and database right 2016 onwards: https://www.ons.gov.uk/methodology/geography/geographicalproducts/postcodeproducts

Other data sources used to create the PAT that are Crown Copyright and used under OGL are as follows:

- Insolvency model uses Insolvency Count data published by The Insolvency Service
- Inheritance Tax Model (used for the Wealth calculation) uses data published by HMRC
- Earned Income Model (part of the Net Income calculation) uses Annual Survey of Hours and Earnings (ASHE) data published by ONS
- Pensioner Income Model (part of the Net Income calculation) uses data published by DWP
- Household Expenditure (part of the Net Income calculation) uses data from the Living Costs and Food Survey published by ONS
- Children in Low Income Families model uses data published by DWP
- Gift Aid model (Charitable giving) uses data published by HMRC

UK Lending by Postcode Sector (unsecured and mortgages) published by UK Finance is used as the source for the "average lending per adult" tables: https://www.ukfinance.org.uk/statistics/postcode-lending/

Financial Product Ownership for Mortgages and Unsecured data has been sourced from the summary data published by the Financial Conduct Authority as part of the Financial Lives Survey: https://www.fca.org.uk/publications/research/understanding-financial-lives-uk-adults

The source data used for the University Entry Rate model is licensed by UCAS www.ucas.com/data-and-analysis and is subject to the terms of the https://creativecommons.org/licenses/by/4.0/legalcode, as amended from time to time.

7. Contact Details

We welcome comments and feedback on our proposal. We are particularly keen to work with and obtain comments from people involved with this sector in any capacity including:

- People working or volunteering in Credit Unions or who represent groups of Credit Unions (e.g. ABCUL);
- People interested in the support Credit Unions give to vulnerable communities working in Charitable organisations, Central Government Departments, Local Government and any other relevant local organisations (such as food banks);
- People working in Academia, Charitable Organisations, Government Departments, Financial Institutions, Consultancies or Data companies who are interested in helping us test and validate the datasets we propose using for the PAT.

Please feedback any comments on this document to Colin Stewart at More Metrics by e-mail. colin.stewart@moremetrics.co.uk

Appendix: Glossary

1. "Census data". Open source datasets published as a result of the UK wide census of 2011.
2. "OA". Output Areas (OA) equate to the lowest geographical level that census data is published. Output Areas in England & wales comprise approximately 300 residents spread across an average of about 7 residential postcodes. In Scotland Output areas are smaller, equating to approximately 100 residents. There are about 230k OAs across the UK.
3. "LSOA". Lower Super Output Areas are contiguous groupings of Output Areas and are therefore broader geographic areas. There are about 40k LSOAs across the UK. The terminology used is different in Scotland, but for simplicity we refer to areas at the next level above OA as LSOA across all parts of the UK.
4. "Neighbourhood level". Equates to census 2011 Output Areas
5. "Local level". Equates to census 2011 LSOAs
6. "Neighbourhood Data". Refers to specific More Metrics modelled outputs and other data collated by More Metrics that are considered to be of particular value to Credit Unions at OA level.
7. "IMD". Index of multiple deprivations produced by Office of National Statistics (ONS) and their equivalents across the UK. Ranks every LSOA in each constituent country of the UK from the most deprived to least deprived. Rank 1 is the most deprived
8. "IMD decile". Orders the LSOAs in each constituent country by deprivation into 10 equally sized groups. Decile 1 is most deprived, decile 10 least deprived
9. "Credit Union catchment or footprint". Refers to the geographical extent of the Credit Union's operations
10. "Credit Union Peers". Refers to the collective group of Credit Unions that pool data as part of the benchmarking study.
11. "Micro data" and "imputed micro data". The full set of an individual's answers to questions asked at the 2011 census is called "micro data". These census records for individuals are not made available to the public, although a 1% sample of anonymised micro data for a small selection of variables has been published for general use as "teaching files". By contrast, "imputed micro data" is calculated by More Metrics as needed from connected sets of open source, data as a proxy for micro data. It is a "best guess" approximation for "micro data" that is anonymised and can be used without restriction.
12. "OGL". Open Government Licence. Details of the conditions that apply to the use of data under this licence can be found here www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

