ADVISORY PANEL ON CONSUMER PRICES – TECHNICAL

Refining the higher education component of the Household Cost Indices

Status: final
Expected publication: alongside minutes

Purpose

1. This paper addresses comments on the APCP-T(18)16 paper, *Calculating a price index for student loan repayments*, discussed in December 2018. It also addresses the future developments discussed in the latest Household Cost Indices 's methodological paper.

Action

2. Members of the Panel are invited to:
   a) comment on the method used to derive expenditure for tuition fees paid upfront;
   b) comment on the method used for Northern Ireland for the estimation of tuition fees paid upfront;
   c) comment on whether voluntary repayments should be included;
   d) comment on the method developed to remove maintenance loans;
   e) comment on which version of the threshold model is preferred.

Background

3. The Household Cost Indices (HCIs) aim to reflect UK households' experience of changing prices and costs. They are intended to measure how much the nominal disposable income of different household groups would need to change, in response to changes in prices and costs, to enable household groups to purchase the same quantities of goods and services at a fixed quality. The broad approach of the HCIs is thus to measure the outgoings of households.

4. The second preliminary estimates of the Household Cost Indices accounted for the first time for student loan repayments. The price index for student loan repayments was derived using a 'threshold model' applied to mean graduate salaries from the Labour Force Survey (LFS), as shown in APCP-T(18)16. The threshold model consists of estimating monthly student loan repayments from graduate salaries and the repayment threshold, taking into account that individuals pay 9% of their income over a given threshold.

5. The current paper proposes improvements to the price indices for student loan repayments, as advised by the Panel (see minutes). To this purpose, the paper investigates further summary measures (deciles and quartiles), other than the mean, and the use of a price index derived from microdata.

6. Based on acquisition principles, CPIH accounts for total university tuition fees, regardless of how they are paid for (i.e. up front or through a loan). For the HCIs, however, a distinction between the type of payment is necessary since only present expenditure affects a household budget. Therefore, the HCIs are designed to account for both upfront tuition fee payments and student loan repayments, which are weighted according to their share of expenditure.

7. Tuition fees paid up front are currently unaccounted for in the HCIs. Their inclusion requires a method for the estimation of upfront tuition fees as well as the relative weight of tuition fees paid upfront, and the amount of student loan debt paid off in the weighting year. The relative

weights, combined with the respective price indices, will allow the two components to be aggregated into the HCIs.

8. This paper provides a method to derive the expenditure of tuition fees paid up front for England, Wales, Scotland and Norther Ireland.

9. To note, the adjustment for student loan repayments poses two questions for the consideration of the Panel. The first is whether mandatory and voluntary repayments should both be included. The second is whether maintenance loans, which are part of the overall repayment figures provided by the Student Loans Company (SLC), should be removed.

Price index for student loan repayments

10. The second preliminary estimates of the Household Cost Indices ("2019 HCIs") adopted mean graduate salaries (excluding bonuses) for the derivation of a price index for student loan repayments. The estimates were used from the Office for National Statistics (ONS) Labour Force Survey (LFS) and were derived in line with the Graduates in the UK labour market publication. A graduate is defined as a person aged 21 to 64 who has left education with a qualification above A level standard, which includes higher education or a degree. Using graduate salaries and income thresholds over the time period 2005 to 2018, the monthly repayments for the average graduate were estimated. The unchained price index was obtained as follows:

$$index_{i,y}\left(Jan_y = 100\right) = \frac{\left(s_{Jan,y} - t_{i,y}\right)9\%}{\left(s_{Jan,y} - t_{Jan,y}\right)9\%} * 100$$

Where s_{Jan} is the mean salary in January of the calendar year y, and t_i is the threshold income for month *i* (which is constant throughout a financial year).

11. The use of mean graduate salaries, over the previously suggested median, followed from the APCP-T(18)16 paper discussed in December 2018. To address feedback from APCP-T on capturing the distribution rather than a point estimate and on using microdata directly, a range of price indices have been derived for comparison. One could view these indices as representing a spectrum of threshold models where, at one end, we have the simple point estimate model previously used and, at the other, we apply the model to each observation in the microdata. In between therefore we can apply the model to quartiles, deciles, etc. For the purposes of this paper we have computed the following indices:

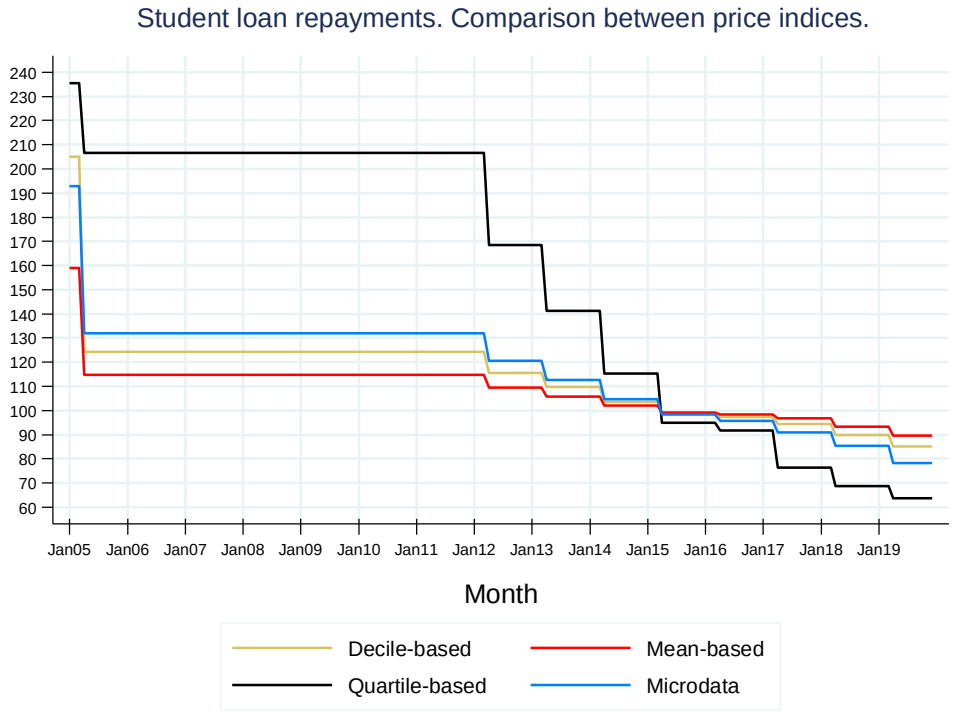
    a) Mean-based (presented previously);
    b) Quartile-based;
    c) Decile-based;
    d) Microdata-based;
    e) Price indices from lagged microdata and deciles (e.g., 2016 salaries and 2017/18 repayment threshold to obtain 2018 price index, reflecting real-time data lags).

12. The microdata approach consists of applying the repayment threshold to the salary of each graduate in the LFS, rather than to an aggregated measure (i.e., mean, quartile, decile graduate salaries). Since each respondent has a sample weight, which was adjusted for in the results presented here, the microdata model reflects population repayments. The microdata price index, which uses all the available information, could thus be considered as a

benchmark. However, data timeliness means that this model couldn't be used directly in a live HCIs publication.

13. Figure 1 shows the price indices for decile, quartile, mean graduate salaries and for microdata. It appears that the decile-based price index, obtained from more disaggregated data, is the closest to the microdata approach although it shows slower growth.

Figure 1. Comparison between price indices for student loan repayments.



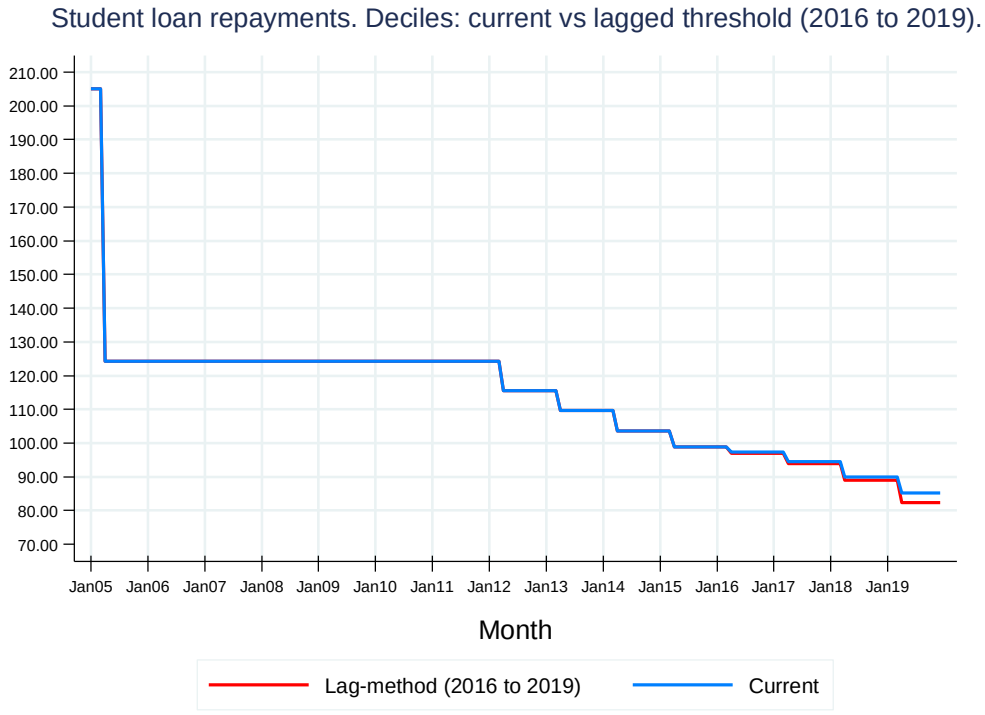
Source: LFS (own analysis)

14. The closeness between the decile- and the microdata-based price indices suggest that either could be used. The quartile-based index appears, instead, to lose considerable information and is not advised as a candidate measure – indeed, its larger aggregation results in larger variation between the first and the last quartile, which is instead smoothed when a decile measure is used. In addition, most households in the lowest quartile are below the income threshold, whereas for deciles most of these houses are filtered out through the bottom two deciles, which are not included in the model.

15. Further information on the suitability of the two price indices comes from the comparison between price indices based on current data (current threshold and salaries) and on lagged data (current threshold and lagged salaries). The use of lagged data is advised when the frequency of publication does not match survey data availability; this is consistent with consumer prices practice where contemporary expenditure data are unavailable and t-2 expenditure is used. When methods are compared, the most suitable is that with the smallest loss of information; that is, with lagged estimates closer to the current estimates. For illustrative purposes, the lagged approach was applied from 2016 to 2019. Figures 2 and 3 point to adopting the lagged microdata approach for the aim of deriving student loan

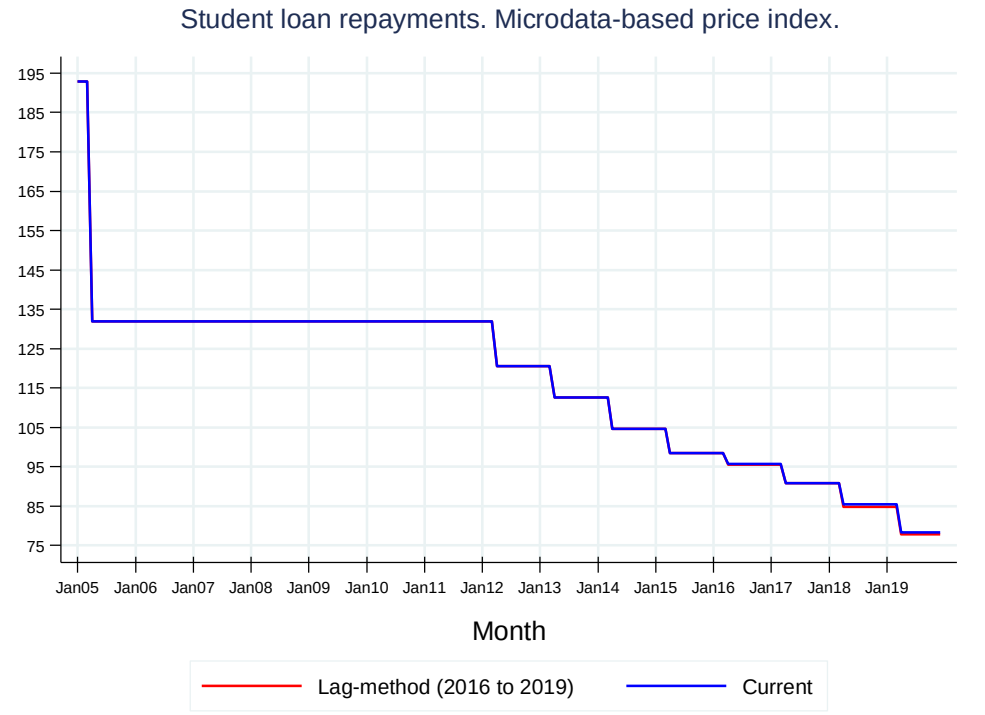
repayments. Indeed, the largest difference between the current and the lagged indices was 0.67 for microdata and 2.85 for deciles.

Figure 2. Current vs lagged price index. Decile approach.



Source: LFS (own analysis)

Figure 3. Current vs lagged price index. Microdata approach.



Source: LFS (own analysis)

Deriving expenditure for upfront tuition fees

16. As an introduction to the method for upfront tuition fees, it is noted that UK-domiciled and EU-domiciled students pay the same fees.

17. Expenditure for upfront tuition fees is not directly available. Indeed, the Higher Education Statistics Agency (HESA) publishes, for each academic year and country, total university fees without information on the type of payment (upfront or through a loan).

18. SLC publishes fees borrowed for each academic year and voluntary and mandatory repayments by repayment cohort and financial year.

19. Upfront tuition fees could be estimated indirectly based on HESA and SLC data who publish annual university fees and fees borrowed, respectively. It follows that upfront tuition fees can be derived as a difference, i.e. by subtracting the fees borrowed from total tuition fees.

20. Upon deriving upfront fees for each academic year, the data were transformed into calendar year as follows:

    Calendar year 2005 = ((academic year 2004-05)/12)*8 + ((academic year 2005-06)/12)*4

21. Table 1 shows the application of the method for England.

Table 1. Example of computation of tuition fees paid upfront. England, academic and calendar year.

Academic year (AY)	Total fees* (£m)	Fees borrowed** (£m)	Fees paid up front (£m)	Calendar year (CY)	Fees paid up front (£m)
AY 2004-05	2,145.7	0	2145.7	**CY 2005**	2190.2
AY 2005-06	2,279.1	0	2279.1	**CY 2006**	2186.3
AY 2006-07	2,808.4	807.7	2000.7	**CY 2007**	1985.6
AY 2007-08	3,344.0	1388.6	1955.4	**CY 2008**	1943.1
AY 2008-09	3,899.6	1981.1	1918.5	**CY 2009**	1974.7
AY 2009-10	4,431.3	2344.2	2087.1	**CY 2010**	2097.1
AY 2010-11	4,689.2	2572.1	2117.0	**CY 2011**	2119.8
AY 2011-12	4,977.5	2852.2	2125.3	**CY 2012**	2109.8
AY 2012-13	6,487.2	4408.2	2078.9	**CY 2013**	2059.3
AY 2013-14	7,957.6	5937.7	2019.9	**CY 2014**	2033.2
AY 2014-15	9,350.4	7290.5	2059.8	**CY 2015**	2084.2
AY 2015-16	10,226.8	8094.5	2132.3	**CY 2016**	2217.4
AY 2016-17	10,857.1	8469.5	2387.6	**CY 2017**	2410.9
AY 2017-18	11,324.8	8867.1	2457.7		

Source: HESA, SLC (own analysis)

*HESA; **SLC

22. Upfront tuition fees for Wales and Scotland were similarly derived.

23. However, the method could not be applied to derive upfront tuition fees for Northern Ireland (NI). This is because tuition loans for NI include the fees borrowed to study in the Republic of Ireland (RoI), leading to negative expenditure for upfront tuition fees when the fees borrowed

exceed total tuition fees. To address this issue, the method proposed for Northern Ireland is as follows:

$$upfront\_fees\_NI = total\_fees\_NI * \frac{1}{3}\left\{\left(\frac{upfront\ England}{total\ England} + \frac{upfront\ Wales}{total\ Wales} + \frac{upfront\ Scotland}{total\ Scotland}\right)\right\}$$

where upfront fees are derived as a product of total university fees in NI and the average proportion of fees borrowed in Great Britain.

24. The calendar year estimates derived for each country in the UK are shown in Table 2.

Table 2. Tuition fees paid up front by country. Calendar year.

CALENDAR YEAR	TUITION FEES PAID UP FRONT			
	ENGLAND	WALES	SCOTLAND	NI
	£m	£m	£m	£m
2005	2190.2	132.3	236.7	53.6
2006	2186.3	127.6	238.6	55.6
2007	1985.6	124.6	236.6	59.3
2008	1943.1	164.3	247.3	67.3
2009	1974.7	183.8	274.5	74.8
2010	2097.1	189.1	299.8	79.6
2011	2119.8	174.7	306.4	77.7
2012	2109.8	193.1	307.1	77.1
2013	2059.3	267.6	328.3	82.0
2014	2033.2	335.2	365.5	83.5
2015	2084.0	395.9	389.3	86.5
2016	2217.4	426.5	404.9	88.1
2017	2410.9	448.0	430.6	91.1

Source: HESA and SLC (own analysis)

Type of repayments

25. Student loan repayments could be mandatory or voluntary. However, it is not clear how one could make a voluntary repayment price index because, by definition, everyone will repay a different amount. Therefore, the only feasible option is to make the assumption that the change in voluntary repayments is similar to the change in mandatory repayments. Then we could just impute the mandatory index for the voluntary one. Some research was thus carried out to assess if the repaying households, under the two types of repayments, are similar.

26. The review outlined that small voluntary repayments have a negligible impact on student debt. This is because an overpayment will not reduce the monthly amount of student loan repayment. Voluntary repayments are thus worthwhile for people who receive a windfall, such as an inheritance or company bonus, provided they clear their loan (almost) in full.

27. This suggests that the assumption of similar households for mandatory and voluntary repayments does not hold. As a result, expenditure for student loan repayments, for the aim of this paper, does not include voluntary repayments. The repayments shown in the paper consist of mandatory repayments only.

Maintenance loans

28. Prospective students can obtain a student loan for tuition fees only, for maintenance only (as was the case in the academic years 2004-05 and 2005-06), or for both.

29. It could be argued that the HCIs' adjustment for the cost of university fees should not incorporate maintenance costs and therefore student loans should refer to tuition fees exclusively. The limitation of including maintenance loans is that it could lead to double counting if the loans are already accounted for across the range of COICOP categories, through the purchase of goods and services.

30. The removal of maintenance loans is complicated by the absence of a breakdown of the repayment figures by type of loans. However, a method has been devised which uses the breakdown information at the time of borrowing for each student cohort. The method is as follows:

    1. Compute proportion of maintenance loans for each student cohort ("C") (data source: SLC's publications);
    2. Derive repayment cohort from student cohort;
    3. Estimate expenditure for maintenance loans by applying C to student loan repayments for each repayment cohort (this latter is provided by the SLC raw data in the ONS Data Access Platform);
    4. Estimate expenditure for tuition fees loans as the difference between student loan repayments and maintenance loans for each repayment cohort;
    5. Aggregate expenditure for tuition fees loans, for each calendar year, across all the repayment cohorts.

Relative weights for upfront fees and for student loan repayments

31. As mentioned earlier, SLC provides information on fees borrowed as well as on repayments. Whereas fees borrowed enable the computation of tuition fees paid upfront, repayments are used to derive weights and, as a result, are the subject of this section.

32. The weight for upfront fees and for (mandatory) student loan repayments was obtained by computing the sum of their respective expenditure and then deriving their ratio over total expenditure. Expenditure for upfront fees was obtained through the method outlined earlier, whereas expenditure for mandatory repayments was drawn from SLC raw data in the ONS Data Access Platform. The relative weights are shown in Table 3.

33. Data in Table 3 are based on upfront tuition fees paid by UK- and EU-domiciled students, and on mandatory repayments from UK residents and EU nationals.

Table 3. Relative weights (percent) for student loan repayments and upfront tuition fees.

Calendar year	Up front tuition fees (%)	Mandatory repayments (%)	Total expenditure for university fees UK/EU (%)
2005	100	0.0	100.0
2006	100	0.0	100.0
2007	87.3	12.7	100.0
2008	83.5	16.5	100.0
2009	78.5	21.5	100.0
2010	75.0	25.0	100.0
2011	71.2	28.8	100.0
2012	67.4	32.6	100.0
2013	65.3	34.7	100.0
2014	64.2	35.8	100.0
2015	63.2	36.8	100.0
2016	62.4	37.6	100.0
2017	61.6	38.4	100.0

Source: HESA and SLC (own analysis)

34. Under National coverage, data should refer to individuals living in the UK. While it is reasonable to assume that EU nationals studying at UK universities reside in the UK, the same assumption does not hold for repayments. Indeed, repayments also come from EU nationals living in the EU. While cross-border repayments should be excluded, this is not feasible because the domicile of EU nationals (held at the SLC) is based on the domicile at the time of the loan application. Therefore, repayments from the EU refer both to EU nationals currently domiciled in the UK as well as to those who have returned to their home country. Although there is no information about the current domicile of EU nationals, from Table 3 it transpires that the inclusion or exclusion of repayments from the EU has a negligible impact on the relative weights. Indeed, the overall proportion of EU repayments is, at most, 0.6 per cent. This finding will be especially relevant when the HCIs will move from the current Domestic approach to National coverage.

Table 3. Mandatory repayments. Proportion of repayments from EU. Calendar year.

CALENDAR YEAR	Mandatory repayments (£m)		EU over total (%)
	UK and EU students	UK students	
2007	350.4	350.4	0.0
2008	478.8	478.8	0.0
2009	690.0	690.0	0.0
2010	886.8	886.7	0.0
2011	1083.1	1082.8	0.0
2012	1302.0	1301.1	0.1
2013	1454.1	1452.2	0.1
2014	1570.3	1566.8	0.2
2015	1724.1	1718.2	0.3
2016	1896.1	1887.1	0.5
2017	2107.3	2094.8	0.6

Source: SLC

Overall price index for student loan repayments and upfront tuition fees

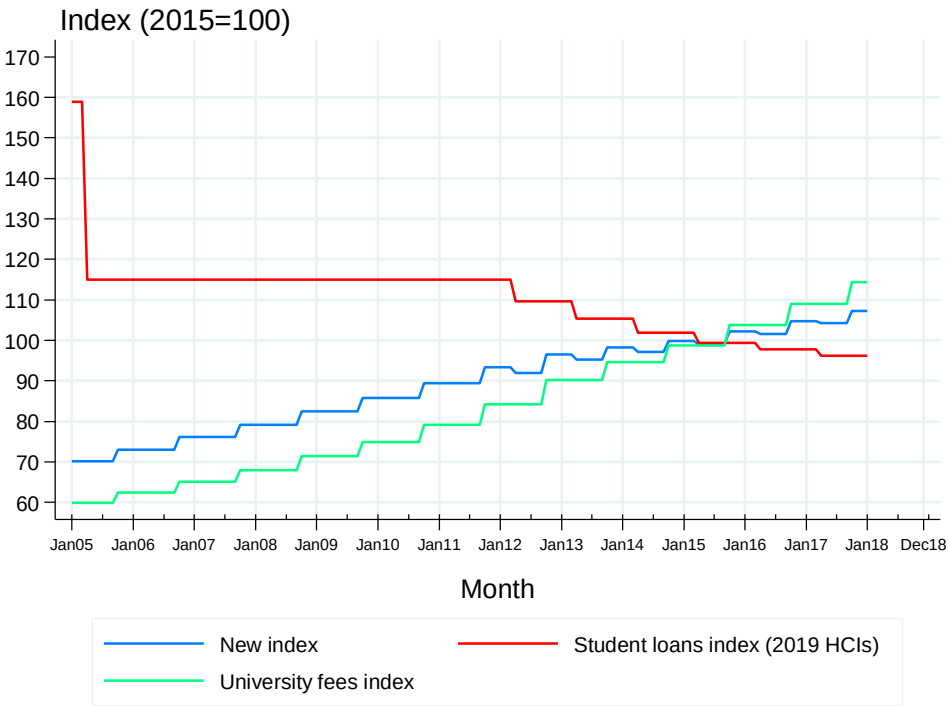
35. The 2019 HCIs accounted for university fees for UK/EU students through the student loan component. This implied that only the price index for student loan repayments was required.

36. However, through the inclusion of upfront tuition fees, the price index for university fees will also become part of the HCIs. This will be achieved by combining the price indices for upfront fees and for student loan repayments with their relative weights. For the publication, the two indices will be also combined with other items in the education class to obtain the total price index for education. For illustrative purposes, the price index presented here refers only to the combination of upfront tuition fees and of student loan repayments.

37. Figure 4 shows the "new" index and the individual price indices, where the student loan index is that used in the 2019 HCIs (i.e. based on mean graduate salaries). The student loan index has a downward trend due to the threshold repayment increasing faster than salaries. On the other hand, the university fees index has an upward trend owing to increasing fees. Because upfront tuition fees have a dominant or larger weight (see Table 2), the full index shows the same pattern as the university fees index.

38. This finding suggests that the comparison between the 2020 and the 2019 HCIs series will show a larger contribution of education on growth.

Figure 4. Price indices comparison. January 2005 to December 2017.



Source: HCIs

Data sources: Strengths and limitations

39. HESA and the SLC represent optimal data sources for the aim of the HCIs, not only because they are the leading agencies on tuition fees and student loans but also because they refer to the whole UK.

40. A limitation is that their data are not timely. Nevertheless, the 2019 publication could be adjusted for tuition fees paid upfront since the time of expenditure refers to t-2 and current data have enabled the derivation of 2017 expenditure.

41. The LFS provides graduate salaries from which student loan repayments and the corresponding price indices are derived. With the exception of the common problem of surveys' experiencing increasingly low response rates, the LFS represents an optimal data source. It is indeed an established source for graduate salaries (Graduate Labour Market Statistics) and data are timely for the purpose of the HCIs publications. Indeed, as January repayments are fixed throughout the year in the threshold model, only the first quarter in a calendar year is required. We currently have access to LFS data up to the third quarter of 2019 which suggests that for the 2020 publication there is no need of a lagged model.

Further development

42. There are currently two repayment plans for graduates who have received student finance within the UK. Plan 1 relates to students from Scotland, Northern Ireland, England and Wales who started their undergraduate course before 1 September 2012. Plan 2 refers to English and Welsh students who started their undergraduate course after 1 September 2012, with mandatory repayments starting from April 2016 if gross income exceeds the annual threshold.

43. The work presented in this paper refers to Plan 1. It will thus be extended to include Plan 2, upon assessing available information in the LFS.

44. For the aim of this paper, it was not feasible to provide estimates after removing maintenance loans. If their removal is agreed, loans for tuition fees only will be derived on time for the HCIs 2020 release.

45. Student loans for NI also include the fees borrowed to study in the RoI. For this reason, the paper presented a method which enables the inclusion of NI in the analysis. This method will be replaced by actual data if the NI Higher Education Authority collects and could provide information on NI-domiciled students' fees.

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