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Structure

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Abstract Education is long acknowledged to be a comparison-resistant component of spatial price indices due to the different systems adopted in Member States for organising and delivering this service to consumers. In recent years, Eurostat has adopted a solution to compile high quality statistics in this field as a basis for calculation of education parities, which has some potential wider applications. This paper examines the current approach and presents detailed data from the latest exercise, before examining possible further areas for research to improve the economy, efficiency and effectiveness of the work done.

Keywords Remuneration, Spatial Index, Cost-Of-Living, Axiomatic, Quality Framework

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Introduction

For education, as in other areas, Eurostat aims to compile high quality statistics to allow international comparisons which reflect price difference and maintain equivalence of purchasing power.

Education is long acknowledged to be a comparison-resistant component of spatial price indices due to the different systems adopted in Member States by historical and political tradition for organising and delivering this service, and perceived differences in outcomes. Moreover, expatriate international officials may make different choices than national population.

International comparison exercises, such as those managed by Eurostat, OECD, the United Nations and the World Bank have all to overcome this problem.

International comparison of education

Standards for international statistics on education are set jointly by Eurostat, the Organisation for Economic Co-operation and Development (OECD) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

Structure of education systems

The eight-stage European Qualifications Framework (EQF) and matching International Standard Classification of Education (ISCED) categorise education, ranging from Level 1 "basis general knowledge" up to Level 8 "knowledge at the most advanced frontier". With regard to organisation, the following are common to most European systems:

- preschool and basic "primary" education for around 5 years of schooling;
- "secondary" programs with a lower segment covering education until a first school certificate after around 10 years of schooling, and an upper segment covering education to a supplementary certificate level sufficient to enter tertiary cycle;
- equivalent professional/vocational training;
- tertiary cycle containing all the different types of college and university level education

Under the joint "UOE" (UNESCO-OECD-Eurostat) data collection, participant countries provide an annual mapping of their national systems against the EQF/ISCED levels.

There are also international programmes, including the European Baccalaureate offered through the European Schools, the International Baccalaureate – and national programmes promoted overseas (notably, in terms of numbers of schools and pupils: the American, British, French and German systems) which offer a hybrid system based on country-of-origin components but combining host-country elements. Many operate as private schools with accreditation by country-of-origin government.

Appendix 1 includes mappings for selected systems (American, English, French, German, International Baccalaureate, European Baccalaureate).

There can be important differences in quantity of education (contact hours per week, duration of holidays). There can also be differences in quality of education (curriculum content, teacher qualifications, pupil-to-teacher ratios, diploma scores achieved, success of transitions to tertiary education/world of work).

Educational outcomes

Given the differences in organisation, there is a widespread interest in the quality equivalence of different systems. Country coverage is less complete, and there are different approaches to measuring such outcomes.

In the UK, equivalency guidelines have been developed by the Universities and Colleges Admissions Service (UCAS) to assist decisions whether entry requirements are satisfied by students coming from other education systems. Organisations such as the Secretariat-General of the European Schools and the International Baccalaureate Organisation have done research comparing their qualifications with other systems. Some universities require students to sit standardised admissions tests such as the American College Test (ACT), Scholastic Aptitude Test (SAT), Graduate Management Admissions Test (GMAT), or specific versions for certain subjects (eg. Medicine, Law) or to test language proficiency. However such approaches are difficult to operationalise into a quality adjustment framework for price comparison purposes.

Alternative examples include the long-running OECD "Programme of International Student Achievement (PISA)" triennial studies which focus on achievements of students aged 15 in reading and language proficiency, mathematics and numeracy and scientific knowledge and understanding, in 65 countries (in 2012). By contrast the International Association for Evaluation of Educational Achievement (IEA) quadrennial "Trends in International Mathematics and Science Study (TIMSS)" in 66 countries (in 2011) focuses on curriculum at grade 4 and 8 (approximately age 10 and 14) and the IEA quinquennial "Progress in International Reading Literacy Study (PIRLS)" focuses on curriculum at grade 4 (approximately age 10) in 55 countries (in 2011). These ranking scores can be used to adjust costs data to make them more comparable.

Financing of education services

With regard to delivery, possible scenarios include:

- Full payment by household at point of purchase, whether or not subsequently reimbursed by government or non-profit institution or private employer;
- Part payment by household at point of purchase, with balance of price paid directly to the supplier by government or non-profit institutions or private employer;
- Full payment by government or non-profit institution or private employer.

An important factor is the frequent parallel existence of private/commercial schools which may offer education solutions which deviate from national curriculum. These may be particularly attractive for internationally mobile families, allowing parents to ensure some degree of stability for their children. In consequence, there may be strong price inelasticity (ie. low propensity to switch). Evidence suggests that such schools also survive and succeed due to the attractiveness of their offer to non-expatriate parents.

For example:

- The network of US Department of Defence dependent schools (**DoDDS**) comprised 220 schools in 2000 in 15 countries with almost 250,000 pupils, all accredited by the North Central Association of Schools and Colleges. In 2010, the network of US State Department (**DoS**) independent schools comprised 197 schools in 2000 in 138 countries, with almost 127,000 pupils of which 73% were not U.S. citizens. Many are accredited by a regional body such as the Middle States Association of Colleges and Schools.
- The Agency for French Education Abroad (**AEFE**) school network comprises over 522 schools in 139 countries with almost 370,000 pupils, of whom approximately 60% are not French.
- The German Central Agency for Schools Abroad (**ZfA**) network includes over 140 schools in 72 countries with 82,000 pupils of whom approximately 60% are not German (plus a further 1,100 partner schools that offer German language certification).
- The Association of British Schools Oversea (**AoBSO**) includes more than 160 schools around the world which are directly inspected by the UK Government. The Council of British International Schools (**COBIS**) network includes 290 schools in 80 countries and a further 200 partner schools. COBIS schools are accredited by the British Independent Schools Inspectorate. There are also many unaccredited schools overseas offering a notionally-English curriculum.

- ISC Research database suggests that globally there are now over 11,000 English-medium international schools teaching over 5.6 million students, of whom approximately 80% are children of local families. An important number of these schools offer the International Baccalaureate program.
- A number of commercial sub-groups can be identified within the total, present in multiple countries and offering parallel tuition (even if presence within EU Member States is incomplete). These include the **Nord Anglia** Group with 66 schools in 29 countries; the Global Educational Management System (**GEMS**) schools with 70 schools in 12 countries; the Quality Schools International (**QSI**) schools with 37 schools in 31 countries; the United World Colleges (**UWC**) schools with 18 schools in 18 countries.
- Separate schools may also affiliate themselves to groups, for example in the European Council of Independent Schools (**ECIS**) which represents more than 425 schools.

Although market prices can generally be identified in most Member States, the degree to which they are representative of consumption will vary. When comparing the specific situation of expatriates, it is important to have some objective data.

Historical reminder

Before 2007, the triennial ECP "services" survey compiled prices for education-related item definitions, which were combined with input costs data to produce an Education PPP for A64 purposes (subsequently updated with inflation subindex for education).

Between 2007 and 2015, a different approach was required because the ECP "services " survey no longer collected education-related prices and the A64 PPP was based solely on input costs. With effect from 2011, the ECP exercise integrated quality-adjustment based on PISA program scores. At the same time, a reflection began within the A64 exercise about a more targeted solution for cost-of-living index purposes, including specific data collection.

In order to improve both comparability and representativity, this re-examination included a three-pronged proposal adding (1) input costs data relating to those pupils attending European Schools, and (2) price data for pupils attending private schools, to (3) input costs data for those pupils attending state schools.

A request in 2011 resulted in data becoming available in 2014 from the database of individual education declarations of EU officials about the schools attended by their children. This gave an overall breakdown as follows (and individual breakdowns for each Member State):

	European School	Non–fee paying	Fee–paying	**Total**
Primary	2,624	1,344	609	4,577
Secondary	3,680	2,049	776	6,505
Total	**6,304**	**3,393**	**1,385**	**11,082**

Designing the first school fees survey

Work then continued during 2014, to elaborate survey definitions for the new components and to identify outlets in relevant neighbourhoods for inclusion in the fieldwork.

European schools

The comparability of the curriculum and the quality of the seconded teachers is taken as given for these schools. Currently there are only 14 "Type 1" schools thus EU Member State coverage is incomplete. Average costs data is published on the European Schools website.

Fee-paying schools - coverage

The following principles applied: the school category should be representative of consumption of education service in each participating country, and school selection should be representative of consumption within that category. Rather than relying solely on the self-selecting sample of those schools for which EU officials had already declared enrolment of their children, Eurostat decided to take a wider sample from the potential population of all equivalent schools.

In the absence of precise information about market shares, information from various sources was used. In addition to internal administrative data, these sources included settlement guides issued by local authorities, local employers and local associations. In smaller cities a census of all known international schools was included. Schools outside reasonable commuting distance of the duty station city (defined as 70km) were excluded.

Focus was placed on the following categories to privilege comparability (also a partial indicator of representativity if it accepted that non-accredited schools are inherently less desirable):

(i) "Accredited" European schools;
(ii) French AEFE schools;
(iii) German ZfA schools;
(iv) British schools, privileging those with COBIS and/or IB accreditation, and prioritising members of recognised associations such as ECIS or commercial groups such as Nord Anglia;
(v) American schools, privileging those with DoS accreditation, and prioritising members of recognised associations or commercial groups.

Fee-paying schools – item definition

Eurostat then clarified the definition of tuition fees to be applied:

Definition of price to be recorded:
- Record prices separately for age grades **4-6 years** (nursery cycle), **6-11 years** (primary cycle), **11-18 years** (secondary cycle). If a different pricing structure applies for the school in question, give details in "comments".
- Record total tuition fee for the current academic year: eg. for July 2014 PPP calculation, this means the September 2013-2014 academic year.
If fee for the current year is not available, record information for alternative academic year and give details in "comments".
WARNING: some schools quote fees per term rather than per year in which case the number of terms should also be recorded.
- price to be recorded is the "pure" tuition fee:
.. Exclude one-time enrolment/registration fee for new pupils
.. Exclude fees for boarding
.. Exclude fees for school meals
.. Exclude fees for school transport
.. Exclude fees for school uniform, sports equipment, musical instrument hire, school books, calculators, materials, etc.
.. Exclude fees for school trips
.. Exclude fees for extracurricular activities (eg. music/dance/sport/languages/etc. studied outside normal school hours)
.. Exclude fees for supplementary care (eg. special needs, extra lessons)
.. Exclude discounts for multiple children

The resulting data capture questionnaire looked like this:

School name	Website address	School Year (eg. Sept.2013 to Jul.2014)	ANNUAL TUITION FEE Currency:														Comments
			cycle	Nursery		Primary					Secondary						
			grade	a	b	1	2	3	4	5	6	7	8	9	10	11	12
			entry age	4	5	6	7	8	9	10	11	12	13	14	15	16	17

In drawing up this definition, reference was made to the structure of national education systems (see earlier) and to the World Bank International Comparison Programme (ICP) 2011 definitions for primary and secondary cycles[1], and to the United Nations International Civil Service Commission (ICSC) survey definition for 2010-2015 round. By comparison to those surveys, the following differences are apparent:

- The ICP 2011 questionnaire compiles fees data for a single category in Primary cycle (age 6) and a single category in Secondary cycle (age 11). The Eurostat definition captures potential fee differences across each cycle.
- The ICP 2011 questionnaire compiles the average annual tuition fee per student, excluding payments for educational materials and education support services. The Eurostat definition is considered more comprehensive, identifying many elements with potential price impact to be excluded.
- The ICP 2011 focus is on the calendar year. Under that approach, data for two consecutive academic years is required, and a weighted average has to be calculated using the number of school days of each academic year which fall in the target calendar year. Eurostat focuses on the academic year.
- The ICP 2011 focus is on resident national of the country, and official language of the country. The Eurostat definition focuses on expatriates.
- The ICSC 2010 definition compiles data for grades 1-6, grades 7-9 and grades 10-12 which includes an implicit orientation towards US system, but also allows capture of data for other education systems. The Eurostat questionnaire is split between grades 1-5 and 6-12, reflecting more typical organisation in European system.
- The ICSC 2010 questionnaire records total tuition fees, plus any annual registration fee. The Eurostat definition is considered more comprehensive, identifying many elements with potential price impact to be excluded.
- Like Eurostat, ICSC focus on the academic year.
- The ICSC 2010 focus is on schools commonly attended by children of expatriate UN staff as used for reviewing education grant entitlements. The Eurostat focus deliberately encompasses other schools.

1 The ICP questionnaire also includes definitions for tertiary education, and hourly charge for ancillary classes (foreign language lessons, private lessons in mathematics)

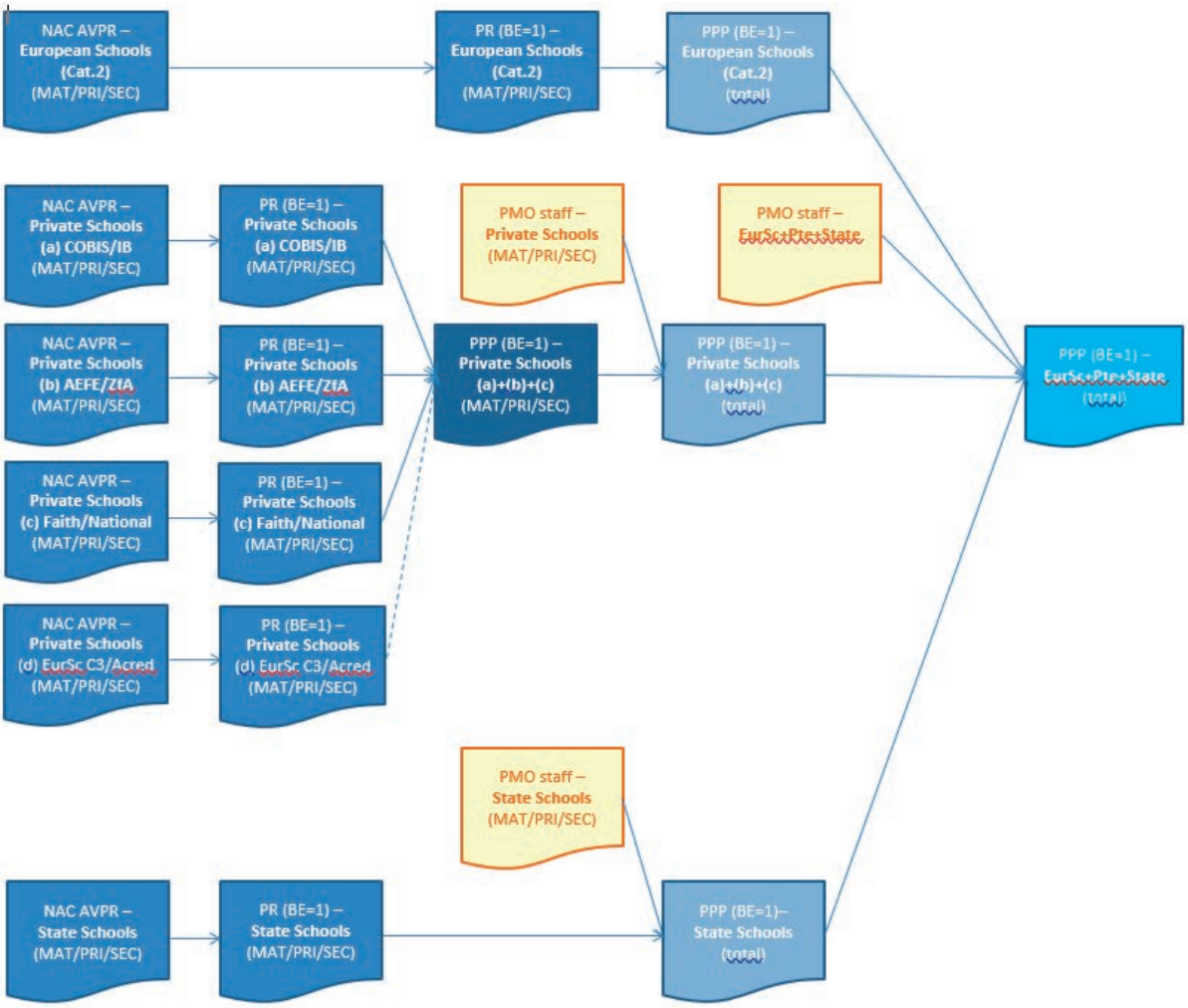
Fieldwork problems

Web scraping is the abstract term which describes the act of extracting information from websites in order to save it locally, and can involve manual or automated procedures. The school fees survey is an example of manual web-scraping, being designed to gather tuition fees data from public websites of schools through individual access and extraction of relevant content. This was a time-intensive task. When conducting the fieldwork, the following problems were typically encountered:

- The selected school may have closed. In this case, an alternative equivalent school was selected where possible.
- School website may not be expressed in one of the main global languages (eg. English, French, German, Spanish). This was more typical of national independent schools than international schools. Workload was distributed insofar as possible to group data collection locations with similar systems and languages, staff allocation reflected language skills.
- Difficulties to find fees statement on website. Occasionally, some schools require telephone contact before releasing fee schedules. Other schools require an application form to be launched even if the process does not necessarily have to be completed. Information is sometimes located within annual budget statements, or on parents association complementary pages, rather than being given prominence. In some countries, there is an independent agency or government website, which records fees data.
- Fees quoted in different currencies than national currency. These are converted ex-post using official exchange rate for survey month.
- Fees may be quoted per term rather than per year. This has to be converted ex-post.
- Fees may be quoted without including mandatory taxes and charges. These have to be identified and integrated ex-post.
- Schools in same location with different education systems (cycles and age grades).

Summary of approach to PPP calculation

The following diagram summarises the calculation approach:



For a given category (a)-(d) of private school the average price is computed as simple arithmetic mean of tuition fees observed in national currency for the “n” schools in that category, done separately in each cycle (MAT=nursery, PRI=primary, SEC=secondary).

$$AVPR\ NAC_{cycle} = \frac{\sum_{i=1}^{n} x^i}{n}$$

The cycle averages (MAT, PRI, SEC) are then combined to give an overall total, computed as weighted arithmetic mean using pupil numbers as weights.

$$AVPR\ NAC_{total} = \frac{\sum\ (AVPR\ \times w\ )}{\sum\ w}$$

These overall averages are then expressed as simple price ratios relative to corresponding average observed in Brussels.

$${}_{DS}PR_{BXL} = \frac{AVPR_{DS}}{AVPR_{BXL}}$$

These price ratios for fee-paying schools are then combined with the separately established cost ratios for European Schools and for non-fee-paying schools, using pupil numbers data for weighting the three categories, to give an overall Fisher parity for education:

Laspeyres-type

$$I_L = \frac{\sum_{i=1}^{3}({}_{DS}PR_{BXL}{}^{i} \times W_{BXL}{}^{i})}{\sum_{i=1}^{3} W_{BXL}{}^{i}}$$

Paasche-type

$$I_P = \frac{\sum_{i=1}^{3} W_{DS}{}^{i}}{\sum_{i=1}^{3} \frac{1}{({}_{DS}PR_{BXL}{}^{i} \times W_{DS}{}^{i})}}$$

Fisher-type

$$I_F = \sqrt{I_L \times I_P}$$

Results of pilot study and definitive surveys

Eurostat presented preliminary results from 2014 study to Statistical Expert Working Group on Articles 64&65 of the Staff Regulations in document A6465/15/10rev. Finalised data was integrated for July 2015 correction coefficient calculation exercise. The following tables present updated results compiled and integrated for July 2018 correction coefficient calculation exercise.

Cost data for European schools

2017/18 average costs extracted from the European Schools website are presented in the following table. The value for Brussels is an average of the four schools (Woluwé, Uccle, Ixelles, Laeken). The data for Luxembourg is the average of the two schools (Kirchberg, Mamer). The cost data for DE[Frankfurt] and BE[Mol] schools was not used as these are not duty stations for which correction coefficients are calculated. The data for ES[Alicante] school was included as this is the largest concentration of EU staff in Spain and there is no European School in Madrid. The data for "accredited" European Schools is not included here because although they offer the same curriculum, the delivery process is very different (notably, use of locally-recruited staff rather than mother tongue teachers seconded from national systems, and the fact they operate under national law and funding). Instead, where they charge tuition fees, they are included under fee-paying schools. The UK[Culham] school changed status since the 2015 exercise.

	BE [=4] (€)	DE[Karlsruhe] (€)	DE[Munich] (€)	ES (€)	IT[Varese] (€)	LU [=2] (€)	NL (€)	UK[Culham] GBP
2018	9,942	13,156	11,119	11,787	14,231	9,652	16,786	n/a
2015	9,710	13,077	10,190	13,529	13,582	10,082	14,745	17,985

Cost data for national non-fee-paying schools

Average costs for non-fee-paying schools from the 2018 exercise are presented in the following table. The source information is extracted from the European Comparison Programme database: the values are already quality-adjusted for PISA outcomes. The values shown are the pupil-weighted averages of primary cycle (ISCED1) and secondary cycle (ISCED2) figures. Latvia and Lithuania 2015 data was originally compiled in national currency, and has been converted to Euro for comparison. Data for the 2015 exercise was not originally processed for Extra-EU duty stations, but has now been included here.

	BE (€)	BG (BGN)	CZ (CZK)	DK (DKK)	DE[Berlin] (€)	DE[Bonn] (€)	DE[Karlsruhe] (€)	DE[Munich] (€)
2018	9,391	2,370	92,362	87,807	7,413	7,413	7,413	7,413
2015	9,338	2,184	81,346	62,736	6,242	6,242	6,242	6,242
	EE (€)	IE (€)	EL (€)	ES (€)	FR (€)	HR (HRK)	IT[Rome] (€)	IT[Varese] (€)
2018	4,042	6,590	4,913	6,119	6,651	22,489	6,467	6,467
2015	2,776	7,085	5,547	5,261	6,645	19,053	6,590	6,590
	CY (€)	LV (€)	LT (€)	LU (€)	HU (HUF)	MT (€)	NL (€)	AT (€)
2018	8,142	3,303	2,692	20,108	731,225	8,528	8,066	12,904
2015	8,568	1,391	2,224	21,233	529,094	5,400	7,318	11,400
	PL (RON)	PT (€)	RON (RON)	SI (€)	SK (€)	FI (€)	SE (SEK)	UK[London] (GBP)
2018	11,590	5,118	8,170	5,699	3,542	9,458	115,185	7,790
2015	10,865	4,095	4,887	6,193	3,107	8,822	106,564	6,916
	UK[Culham] (GBP)	IS (ISK)	NO (NOK)	CH (CHF)	TR (TRL)	AL (ALL)	BA (BAM)	ME (€)
2018	7,790	1,841,048	121,850	25,518	4,786	126,845	2,935	1,956
2015	6,916	1,398,291	90,028	25,681	2,597	121,469	2,698	1,193
	MK (MKD)	RS (RSD)						
2018	92,346	112,733						
2015	67,441	127,002						

Fees data for fee-paying schools

Tuition fees data for private schools from the 2018 exercise is recorded below. Data for Extra-EU duty stations was not compiled for the 2015 exercise.

	BE (€)	BG (BGN)	CZ (CZK)	DK (DKK)	DE[Berlin] (€)	DE[Bonn] (€)	DE[Karlsruhe] (€)	DE[Munich] (€)
2018	15,467	19,907	222,323	34,064	8,373	9,138	10,211	8,995
2015	14,585	21,157	238,189	8,021	9,061	8,187	1,850	10,445
	EE (€)	IE (€)	EL (€)	ES (€)	FR (€)	HR (HRK)	IT[Rome] (€)	IT[Varese] (€)
2018	11,971	6,003	7,714	6,568	10,042	66,266	8,537	9,098
2015	14,699	6,235	7,662	6,386	9,564	71,148	7,167	9,658
	CY (€)	LV (€)	LT (€)	LU (€)	HU (HUF)	MT (€)	NL (€)	AT (€)
2018	6,265	13,773	6,924	8,206	2,986,125	7,771	11,460	11,694
2015	6,444	13,870	6,726	8,844	2,693,991	3,758	10,379	9,897
	PL (RON)	PT (€)	RON (RON)	SI (€)	SK (€)	FI (€)	SE (SEK)	UK[London] (GBP)
2018	32,800	7,169	39,861	7,801	8,957	5,977	43,504	13,968
2015	7,612	6,734	34,824	7,108	9,187	5,893	52,066	11,341

	UK[Culham] (GBP)	IS (ISK)	NO (NOK)	CH (CHF)	TR (TRL)	AL (ALL)	BA (BAM)	ME (€)
2018	18,366	1,131,655	56,678	20,607	65,121	976,018	25,701	12,573
2015	13,567	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	MK (MKD)	RS (RSD)						
2018	410,978	1,140,226						
2015	n/a	n/a						

2018 data is sub-analysed below into three still relatively broad groupings (1) “Anglophone (COBIS/IB/USA)”, (2) “Linguistic (AEFE/ZfA/etc)” and (3) “national”. It is immediately apparent that there is a premium price level for Anglophone international schools by comparison to others. Part of the explanation is that salaries of teachers may be subsidised by the accreditation country for Group 2, or the national government for Group 3.

	BE (€)	BG (BGN)	CZ (CZK)	DK (DKK)	DE[Berlin] (€)	DE[Bonn] (€)	DE[Karlsruhe] (€)	DE[Munich] (€)
Grp 1	24,045	29,463	369,269	48,022	14,125	16,275	15,400	15,761
Grp 2	11,993	15,771	150,371	25,775	4,900	2,000	-	4,979
Grp 3	10,364	14,487	147,328	28,395	6,094	-	5,023	6,245
	EE (€)	IE (€)	EL (€)	ES (€)	FR (€)	HR (HRK)	IT[Rome] (€)	IT[Varese] (€)
Grp 1	19,649	6,906	10,585	10,032	21,444	89,359	14,804	15,651
Grp 2	-	5,101	4,842	4,702	5,388	43,173	6,126	5,667
Grp 3	4,293	-	-	4,969	3,295	-	4,680	5,975
	CY (€)	LV (€)	LT (€)	LU (€)	HU (HUF)	MT (€)	NL (€)	AT (€)
Grp 1	7,046	13,773	10,348	15,056	4,486,840	7,771	15,558	18,095
Grp 2	4,862	-	3,500	3,068	1,485,410	-	7,896	9,780
Grp 3	4,831	-	-	6,495	-	-	10,926	7,206
	PL (RON)	PT (€)	RON (RON)	SI (€)	SK (€)	FI (€)	SE (SEK)	UK[London] (GBP)
Grp 1	41,631	12,840	61,030	10,617	12,254	14,934	95,147	21,161
Grp 2	23,969	4,667	30,859	6,117	5,660	673	10,928	6,775
Grp 3	-	4,000	27,964	6,669	-	2,324	9,750	-
	UK[Culham] (GBP)	IS (ISK)	NO (NOK)	CH (CHF)	TR (TRL)	AL (ALL)	BA (BAM)	ME (€)
Grp 1	18,366	1,970,000	77,275	24,490	80,495	976,018	28,668	12,573
Grp 2	-	-	45,297	18,867	28,182	-	5,600	-
Grp 3	-	234,310	30,647	18,463	-	-	-	-
	MK (MKD)	RS (RSD)						
Grp 1	481,680	1,674,080						
Grp 2	340,276	606,373						
Grp 3	-	-						

Education parities

Education parities (BXL = 1) and correction coefficients (PPP divided by official exchange rate to Euro) from the 2018 exercise are shown in the table below. It can be seen that within the EU only three countries have education price/cost levels higher than Brussels: Germany^{Karlsruhe}, Luxembourg and Netherlands

	BE (€)	BG (BGN)	CZ (CZK)	DK (DKK)	DE^{Berlin} (€)	DE^{Bonn} (€)	DE^{Karlsruhe} (€)	DE^{Munich} (€)
2018	1	0.3664	11.65	4.877	0.687	0.661	1.177	0.884
CC	100	18.7	45.7	65.5	68.7	66.1	117.7	88.4
	EE (€)	IE (€)	EL (€)	ES (€)	FR (€)	HR (HRK)	IT^{Rome} (€)	IT^{Varese} (€)
2018	0.460	0.556	0.445	0.660	0.634	2.785	0.633	1.112
CC	46.0	55.6	44.5	66.0	63.4	37.5	63.3	111.2
	CY (€)	LV (€)	LT (€)	LU (€)	HU (HUF)	MT (€)	NL (€)	AT (€)
2018	0.591	0.381	0.327	1.130	97.75	0.668	1.239	1.000
CC	59.1	38.1	32.7	113.0	31.2	66.8	123.9	100.0
	PL (RON)	PT (€)	RON (RON)	SI (€)	SK (€)	FI (€)	SE (SEK)	UK^{London} (GBP)
2018	1.538	0.471	1.509	0.609	0.506	0.812	7.906	0.7303
CC	36.5	47.1	32.4	60.9	50.6	81.2	75.2	83.3
	UK^{Culham} (GBP)	IS (ISK)	NO (NOK)	CH (CHF)	TR (TRL)	AL (ALL)	BA (BAM)	ME (€)
2018	0.7234	174.4	11.50	2.543	1.162	19.45	0.5420	0.285
CC	82.5	142.3	119.1	212.6	23.8	15.3	27.7	28.5
	MK (MKD)	RS (RSD)						
2018	13.32	23.36						
CC	21.7	19.8						

Impact of education parities on global parity

For the July 2018 calculation exercise, the education basic heading accounted for 14.7‰ of total consumption expenditure weight in Brussels for households of EU officials, and 27.4‰ on average for other EU duty stations (with range between 14.8‰ and 60.9‰ and standard deviation of 9.7‰). Approximately half of the Intra-EU duty stations have expenditure proportion higher than that in Brussels. Whether the education basic heading parity is similar or different to the parities for other basic headings, it is clear that for some locations, it can have a marked contributory impact to the value of the overall parity. The places with the largest weights are Ireland, Spain, Italy^{Rome}, Netherlands, Portugal and UK.

Limitations and areas for research

(a) Quality of weightings data

For duty stations with a European School the high proportion of pupils in that category relative to the other two categories has a determinant impact on the education PPP. For other duty stations, the PPP is influenced by the ratio between non-fee-paying and fee-paying schools.

At individual country level the results are potentially sensitive to changes in the pupil numbers data because the number of EU officials with school-age children is small in some duty stations. For the 2018 exercise, the pupil numbers data was not revised by comparison to the 2015 exercise, so there is no impact.

Integration of similar data where available from Europe-based partner organisations (for example the Coordinated Organisations[2], EuroControl, European Patent Office, United Nations) could increase sample size and mitigate the potential volatility, however as has been the experience for Eurostat regarding EU officials, obtaining such administrative data about pupil numbers on a timely basis can prove difficult.

One solution was proposed at the 2019 meeting of the Statistical Expert Working Group on Article 64&65 of the Staff Regulations, and will be examined by Eurostat as soon as resource constraints allow. Under that suggestion, instead of computing Laspeyres, Paasche and Fisher results at sub-basic heading level using pupil numbers as weights (European Schools / non-fee-paying / fee-paying), a simple geometric average will instead be computed.

As part of the foregoing test, the sensitivity and utility of treating nursery/primary/secondary cycles separately instead of aggregating them together will also be examined.

(b) Heterogeneity within some sub-categories

Within the fee-paying schools category, instead of combining British with American schools and French with German schools, these might be treated as separate categories to improve internal consistency.

The wider heterogeneity within the national independent schools category is partially compensated by increasing the sample size to achieve more robust and representative average price. However, as this is also one of the more difficult school types to collect data for in practice, sensitivity of including/excluding this group could usefully be re-examined.

(c) Development of automated web-scraping tools

Subject to resource constraints, but recognising increasing availability of standardised webcrawler toolkits and other techniques, it may be possible to invest in designing an automated data extraction, and thereby make substantial time and economic savings.

(d) Integration of tertiary education

The current computations do not include expenditure on tertiary education. With increasing numbers of children attending university, this is a potential flaw in the current data. Eurydice recently published 2018/19 data on tuition fees in European Higher Education. The information covers EU28 Member States, EFTA (Iceland/Norway/Switzerland), Turkey and candidate countries (Albania Bosnia-Herzegovina, North Macedonia, Montenegro, Serbia). Subject to resource constraints to allow examination of this data potential, it could be a practical ready-made solution for computing parities for tertiary education in the countries coordinated by Eurostat within European Comparison Programme.

An alternative approach may be to conduct a specific data collection using item definitions inspired by those developed for ICP (2011) purposes. Two definitions are used by ICP: each compiles annual tuition fee data for a First Degree (Bachelors Diploma), for a student aged 18-22, in (i) Computer Science, and (ii) Humanities/Social Science (Sociology recommended). An alternative might be to compile information about the price of MBA courses. However designing and conducting such surveys would be subject to resource constraints, even if organised as an automatic web-scraping exercise rather than manually.

2 Council of Europe (CoE), European Centre for Medium-range Weather Forecasts (ECMWF), European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), European Space Agency (ESA), North Atlantic Treaty Organisation (NATO), Organisation for Economic Cooperation and Development (OECD).

(e) Integration of out-of-area expenditure

The current A64 calculations are binary between duty station and Brussels. Whilst expatriates may incur specific in-area expenditure on education, including supplementary language lessons to help integration process, it can also be typical that they incur significant out-of-area expenditure on education. Mobile families may use boarding schools to maintain educational stability for children and links with country of origin. In particular, many pupils of expatriate officials travel abroad to study at university, and the associated costs can be significant. In 2019 Eurostat submitted a report describing potential solutions to integrate such expenditures in future, subject to analysis of responses to questions introduced into the last round of family budget surveys (2016-2019).

Dissemination and analysis

In combination with complementary information from other sources, the education price data compiled by Eurostat via the schools survey may also be of interest for other international price comparisons regarding education, for example the setting of allowances and grants, or for greater understanding generally of education delivery within the EU.

Spatial information could potentially be provided as global values (eg. the education parities already published in Eurostat annual reports), or broken-down into price level indices for sub-categories of schools (as in this document). Subject to variations in composition in the underlying sample, the comparison of snapshot data at different points in time could provide a measure of specific price inflation.

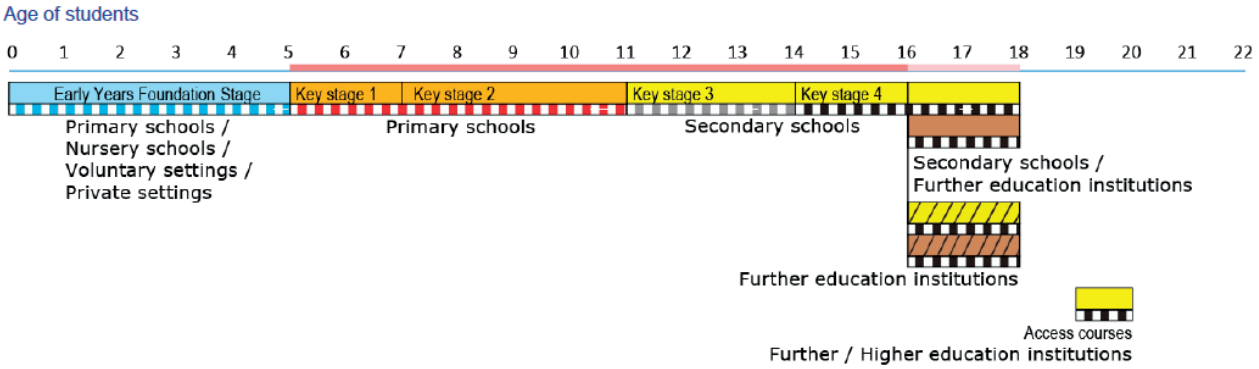
Conclusions

Despite the identified limitations, Eurostat is satisfied that the current approach represents an improvement over previous solutions, and is producing high quality spatial cost-of-living statistics for education as an input for calculation of global correction coefficient values. Subject to resource constraints, Eurostat will continue to refine the approach to achieve greater effectiveness, efficiency and economy, and to satisfy current and future user needs.

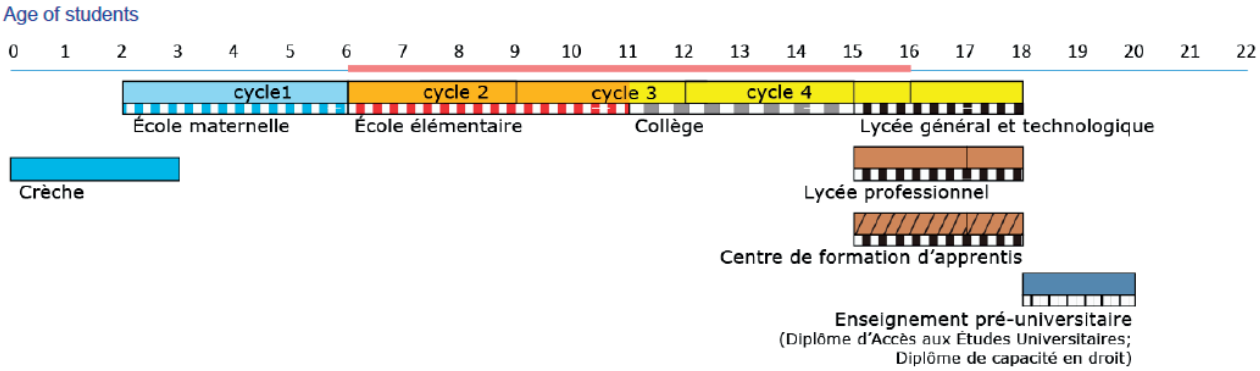
Appendix 1 - Structures

Cycle	Classes	Age
'Early education' (Nursery)	1-2	4 and 5
Primary	1-5	6-10
Secondary Observation cycle Pre-orientation cycle Orientation cycle	 1-3 4-5 6-7	 11-13 14-15 16-18

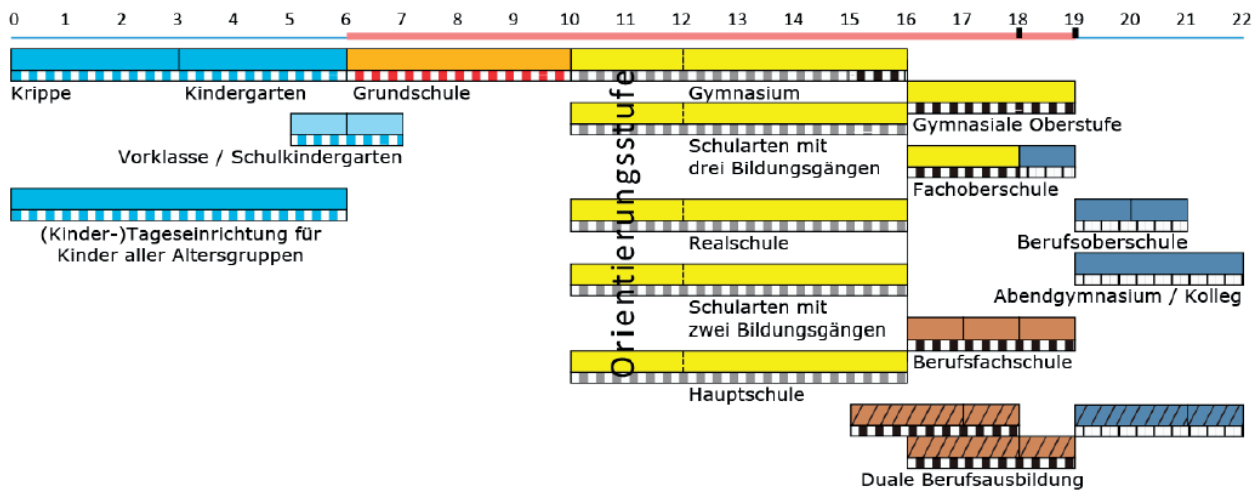
United Kingdom – England



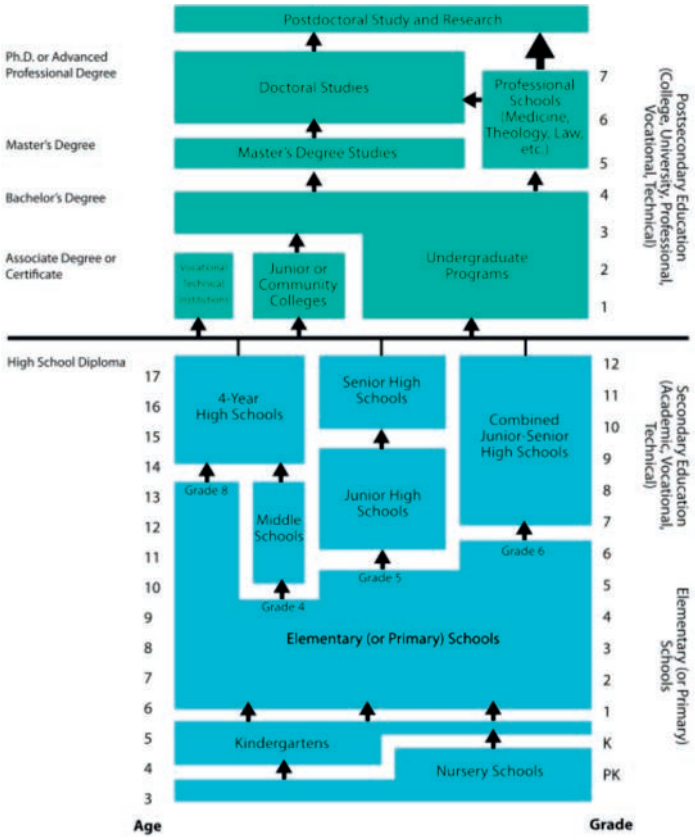
France



Germany



United States



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