Teachers' Salaries in Latin America

Earnings Gaps and Their Evolution at the turn of the 20th century

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This paper

What is this paper about?

- To what extent are teachers' earnings below (or above) those of their peers? (with a particular emphasis on : "who are their peers?")
- What role do their socio-demographic characteristics play?
- How are these differences distributed?
- How these differences evolved?

How do we do it? Methodology

- Harmonized and comparable measures for a group of countries in the region
- Matching and a decomposition that compares only individuals with the same characteristics (Ñopo, 2008)
- A more precise comparison of teachers and their peers

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This paper (2)

Findings? Insights?

- The extent to which teachers are underpaid is stronger than what has been previously reported in the literature.
- Important role for education and part-time work.
- Cross country heterogeneity.
- Job schedules and job tenure (that is, larger vacations and more job stability) also play an important role (compenssting differentials)
- Teachers' underpayment is more pronounced among males, older workers, household heads, part-timers, informal workers, those who work in the private sector, and among those with complete tertiary education.
- The earnings gaps decreased during last decade, especially for preschool and primary teachers, females, younger workers, and part-timers

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The Literature: Mixed Evidence

- Psacharopoulos et al. (1996). 12 countries LA circa 1989. Mixed evidence
- Liang (1999). 12 countries LA circa 1995. Mixed evidence: BRA, ECU ↓; BOL, CHI, PAR =
- Hernani (2005). 17 countries LA circa 2000. Teachers ↑ 25% (except in Brasil)
- Argentina, Bolivia, Guatemala, México, Perú (fuera de Lima): teachers ↑.
- Chile: M: teachers ↓. F: teachers ↑.

Teachers' Salaries in Latin America. How Much are They (under or over) Paid?

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This paper: 9 countries (9 household surveys)

Country	Name Of The Survey	Year	Coverage
Brazil	Pesquisa Nacional por Amostra de Domicilio (PNAD)	2008	National
Chile	Encuesta de Caracterizacion Socioeconomica Nacional (CASEN)	2009	National
Ecuador	Encuesta de Empleo, Desempleo y Subempleo (ENEMDU)	2006	National
El Salvador	Encuesta de Hogares de Propositos Multiples (EHPM)	2009	National
Honduras	Encuesta Permanente de Hogares de Propositos Multiples (EPHPM)	2007	National
Mexico	Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH)	2008	National
Nicaragua	Encuesta Nacional de Hogares sobre medicion de Niveles de Vida (EMNV)	2005	National
Panamá	Encuesta de Hogares (EH)	2007	National
Uruguay	Encuesta Continua de Hogares (ECH)	2007	Urban

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Populations of interest: school teachers and other professionals and technicians

Country	Office Workers/Other Proessionals and Technicians/Teachers (non tertiary) Working Populations*							
	Full Set		Pre-School and Elementary Teachers		Secondary Teachers		Other Professionals and Technicians	
	Number of observations	Expanded observations	Number of observations	Expanded observations	Number of observations	Expanded observations	Number of observations	Expanded observations
Brazil	157775	76800000	3829	1870619	1055	494701	19798	9647079
Chile	82905	6021479	1521	111737	278	31928	8568	1027836
Ecuador	9147	2404002	522	115693	254	56255	1093	293211
El Salvador	24299	1961864	518	41415	54	4758	1788	203243
Honduras	26203	1910929	688	50867	205	14618	2807	188640
Mexico	44373	39900000	35	26909	71	50962	3323	3015056
Nicaragua	11024	1652432	377	48401	64	9292	592	118800
Panamá	18843	1269338	395	24953	220	14764	1702	131078
Uruguay	25432	532842	592	12238	418	9023	2841	61053
All countries	400001	132452886	8477	2302832	2619	686301	42512	14685996

* Working populations in each country are identified as those earning a salary in the main occupation.

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Comparing apples and oranges

Country	Code	Description
CIUO codes for teachers*	232	Profesores de la enseñanza secundaria
	233	Maestros de nivel superior de la enseñanza primaria y preescolar
	331	Maestros de nivel medio de la enseñanza primaria
	332	Maestros de nivel medio de la enseñanza preescolar
Brazil	2311	Professores de nível superior na educação infantil
	2312	Professores de nível superior do ensino fundamental (primeira à quarta série)
	2313	Professores de nível superior no ensino fundamental de quinta à oitava série
	2321	Professores do ensino médio
	3311	Professores de nível médio na educação infantil
	3312	Professores de nível médio no ensino fundamental
	3313	Professores de nível médio no ensino profissionalizante
	3321	Professores leigos no ensino fundamental
Mexico	1310	Profesores de Preparatorias y equivalentes
	1320	Profesores de Enseñanza Secundaria
	1330	Profesores de Enseñanza Primaria
	1340	Profesores de Enseñanza Preescolar
CIUO Codes for other professionals and technicians (all countries)	Group 2	Profesionales Científicos e Intelectuales
	Group 3	Técnicos y profesionales de nivel medio

* Used in Chile, Ecuador, El Salvador, Nicaragua and Uruguay

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Descriptive statistics: the sociodemographic profile

	Pre-School and Elementary Teachers	Secondary Teachers	All School Teachers	Other Professionals and Technicians
	(1)	(2)	(3)=(1 & 2)	(4)
Personal Characteristics				
Men (Gender)	12.4%	34.3%	17.5%	55.3%
Age Groups				
24 and under	10.5%	7.9%	9.9%	15.2%
25 to 34	32.0%	29.7%	31.5%	32.4%
35 to 44	30.9%	28.2%	30.3%	25.3%
45 to 54	19.9%	24.9%	21.1%	17.9%
54 and over	6.7%	9.3%	7.3%	9.1%
Education Level				
None or primary incomplete	0.3%	0.0%	0.2%	3.9%
Primary complete or secondary incomplete	3.2%	1.3%	2.8%	9.9%
Secondary complete or tertiary incomplete	88.6%	75.2%	85.5%	69.7%
Tertiary complete	7.9%	23.5%	11.5%	16.6%
Presence of Children (≤12 years) in the Household	47.4%	38.4%	45.4%	38.9%
Presence of Elder (≥65 years) in the Household	14.2%	14.3%	14.2%	13.2%
Head of the Household	30.4%	40.2%	32.7%	46.6%
Presence of Other Household Member with Labor Income	78.8%	77.2%	78.4%	72.7%

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Descriptive statistics: the sociodemographic profile

	Pre-School and Elementary Teachers	Secondary Teachers	All School Teachers	Other Professionals and Technicians
	(1)	(2)	(3)=(1 & 2)	(4)
Labor Characteristics				
Part time workers (≤30 hours)	45.7%	41.0%	44.6%	13.4%
Formality (has social security)	87.4%	86.3%	87.1%	65.8%
Works in the public sector	77.2%	70.4%	75.7%	26.2%

Source: Authors' compilations based on National Household Surveys

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Relative earnings: Average school teachers' hourly earnings equal to 100 for each country.

	Relative Hourly Earnings (Base: Average School Teacher Earnings in each Country=100)			
	Pre-School and Elementary Teachers	Secondary Teachers	All School Teachers	Other Professionals and Technicians
	(1)	(2)	(3)=(1 & 2)	(4)
Average Hourly Earninngs	91.16	129.65	100.00	131.30
By Country				
Brazil	90.31	136.65	100.00	150.42
Chile	93.98	121.07	100.00	127.45
Ecuador	90.91	118.69	100.00	106.53
El Salvador	101.27	88.97	100.00	95.17
Honduras	99.51	101.69	100.00	79.77
Mexico	96.38	101.91	100.00	78.37
Nicaragua	96.34	119.04	100.00	189.44
Panamá	91.57	114.24	100.00	109.51
Uruguay	96.91	104.19	100.00	121.81

Teachers earn on average more than their peers

In Nicaragua teachers earn on average slightly more than half of what their peers earn

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Relative earnings

	Relative Hourly Earnings (Base: Average School Teacher Earnings in each Country=100)			
	Pre-School and Elementary Teachers	Secondary Teachers	All School Teachers	Other Professionals and Technicians
	(1)	(2)	(3)=(1 & 2)	(4)
Average Hourly Earninngs	91.16	129.65	100.00	131.30
Personal Characteristics				
Men				
No	90.33	123.90	96.47	112.96
Yes	97.03	140.67	116.71	146.13
Age Groups				
24 and under	58.87	83.32	63.35	62.97
25 to 34	79.90	117.54	88.05	113.03
35 to 44	96.63	126.92	103.10	138.47
45 to 54	106.53	150.64	118.51	173.21
54 and over	124.76	159.61	135.01	208.18
Education Level				
None or primary incomplete	41.98	32.73	41.90	57.16
Primary complete or secondary incomplete	69.80	99.22	72.88	66.85
Secondary complete or tertiary incomplete	89.73	125.58	96.96	131.93
Tertiary complete	117.77	144.31	130.27	184.05
Presence of Children (<12 years) in the Household				
No	94.98	135.72	105.53	138.24
Yes	86.94	119.92	93.35	120.42
Presence of Elders (>65 years) in the Household				
No	91.25	130.09	100.16	132.23
Yes	90.64	127.04	99.03	125.20

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Relative earnings

	Relative Hourly Earnings (Base: Average School Teacher Earnings in each Country=100)			
	Pre-School and Elementary Teachers	Secondary Teachers	All School Teachers	Other Professionals and Technicians
	(1)	(2)	(3)=(1 & 2)	(4)
Average Hourly Earninngs	91.16	129.65	100.00	131.30
Personal Characteristics				
Head of Household				
No	87.73	118.62	94.03	105.00
Yes	99.00	146.06	112.29	161.39
Presence of Other Household Member with Labor Income				
No	94.12	138.09	104.77	149.42
Yes	90.37	127.16	98.69	124.50
Labor Characteristics				
Part time				
No	85.29	114.25	92.38	121.49
Yes	98.14	151.83	109.47	194.93
Formality				
No	61.45	102.57	71.46	99.80
Yes	95.46	133.93	104.22	147.65
Work in the Public Sector*				
No	76.48	146.02	94.98	138.15
Yes	95.42	125.95	101.61	164.74

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The Main Counterfactual Question

What would the distribution of earnings for teachers be, in the case that their individual characteristics follow the distribution of the characteristics for their peers?

→ Matching on characteristics

The Matching Algorithm

→ Result:

A sample of matched teachers and their peers with the same distribution of observable individual characteristics (but not necessarily the same distribution of earnings).

This Matching Approach is…

Ñopo (2008)

A non-parametric alternative to B-O decompositions that has advantages in terms of:

- Simplicity

  Avoiding the estimation of earnings equations

- Flexibility

  It "contains" all possible propensity scores

- Identification/Correct specification

  Recognizing that the supports of empirical distributions of characteristics do not completely overlap (the failure to recognize this leads to an overestimation of the unexplained component of the wage gap)

- Information

  Allowing us to compute directly the distribution of the unexplained effects, not just the average

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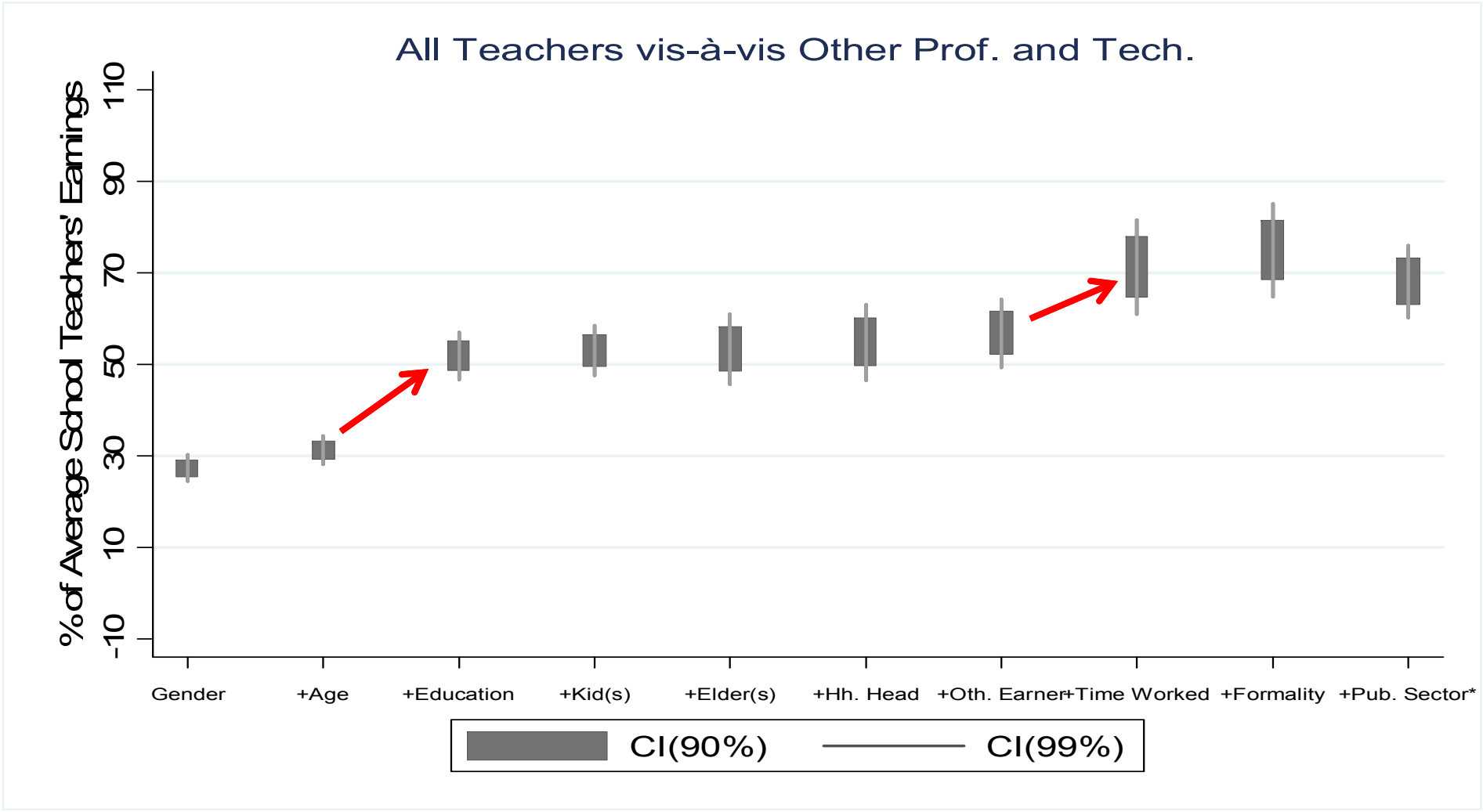
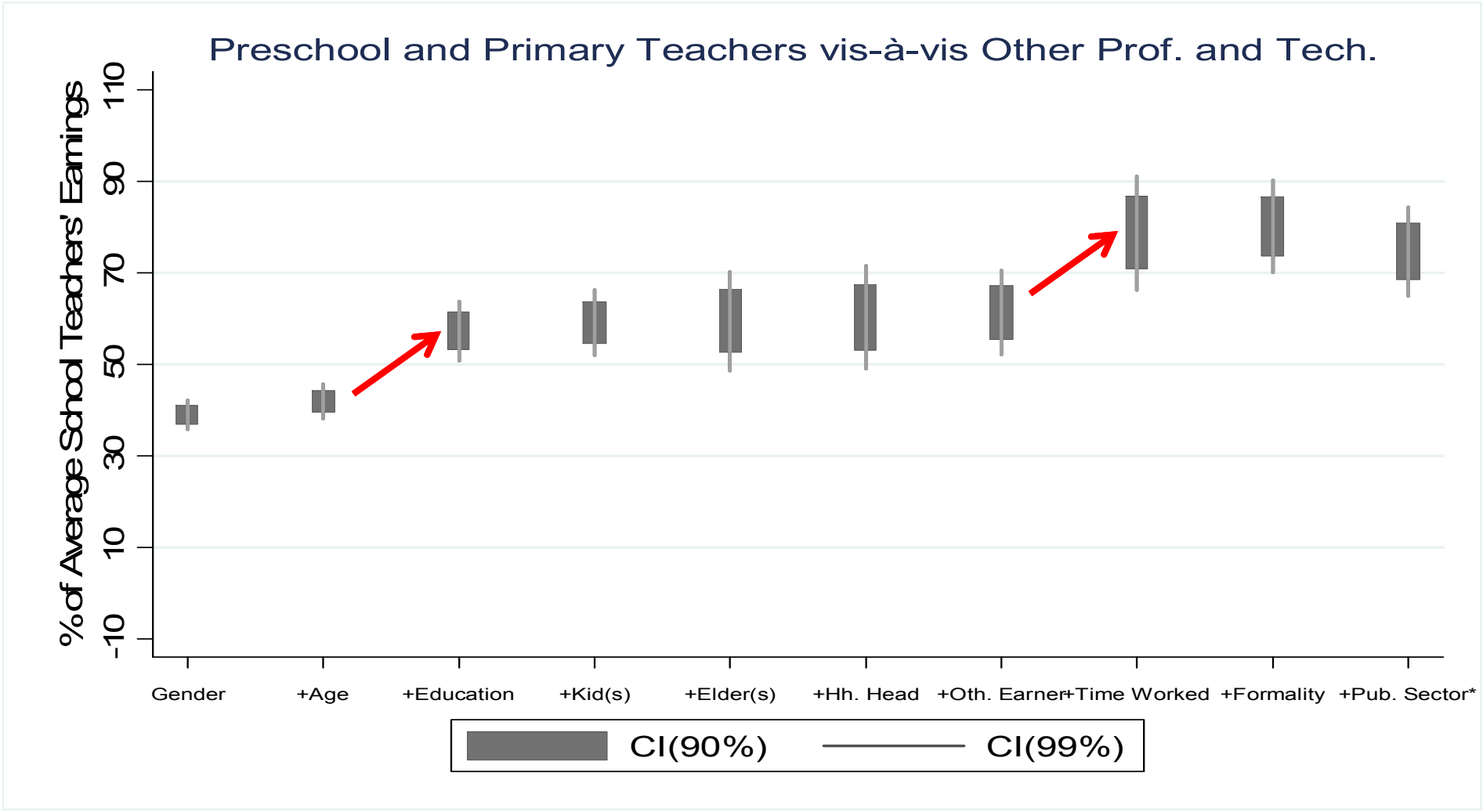
Advantages/Disadvantages

- ☺ It is not necessary to estimate earnings equations (no functional form assumption)
- ☺ Better assessment. The traditional approach seems to deliver biased results when the differences in supports are not taken into account
- ☺ Once the matching has been done, it is straightforward to:
  - » Explore the distribution of the unexplained wage gap
  - » Explore not only wage gaps but also gaps for other labor market outcomes (participation, unemployment, unemployment spells, segregation)
- ☹ Curse of Dimensionality. The method does not allow us to use too many explanatory variables.
- ☹ It does not take into account selection into the labor markets

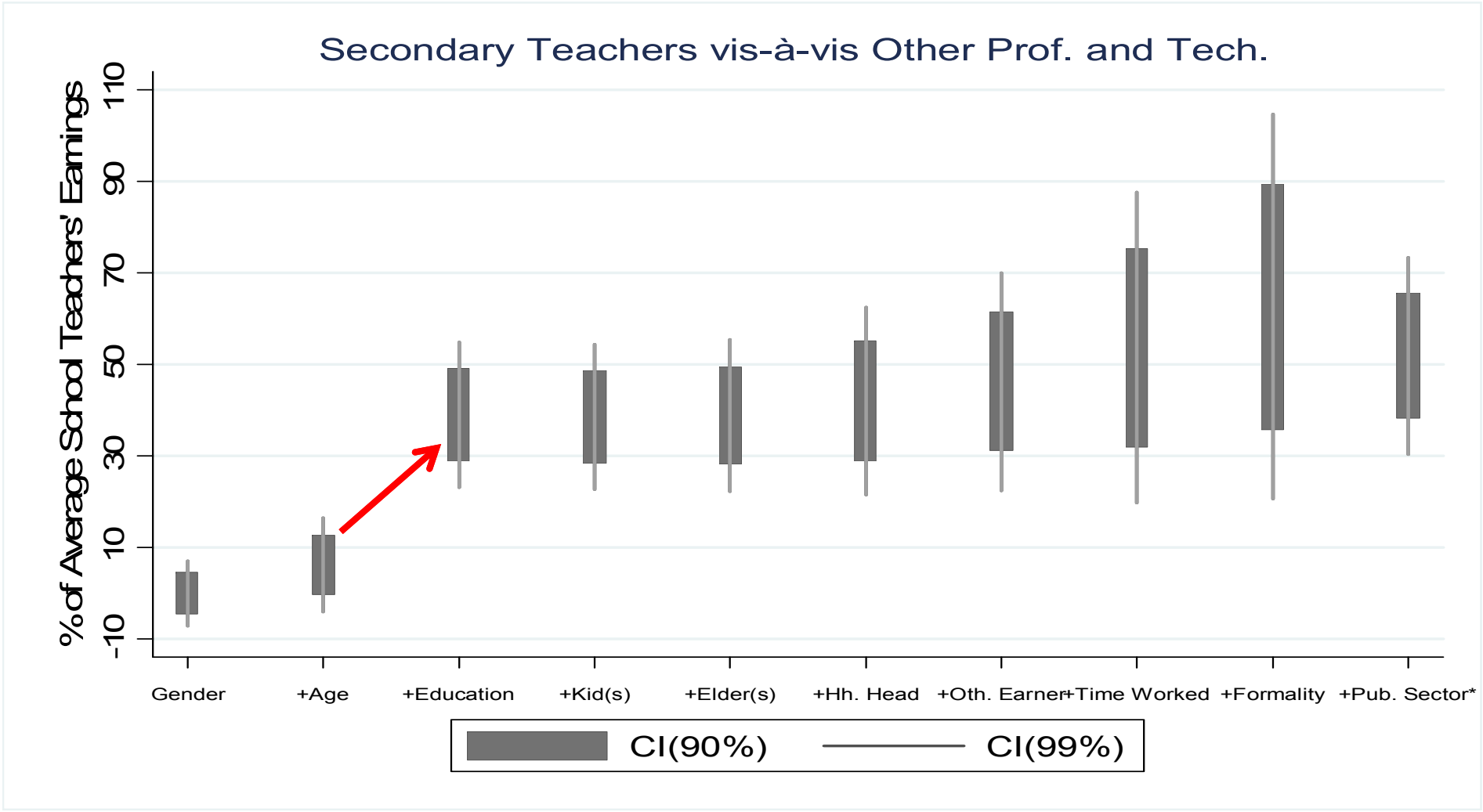
The earnings gaps: school teachers vs. other professionals and technicians



The earnings gaps: pre-school and elementary teachers vs. other professionals and technicians

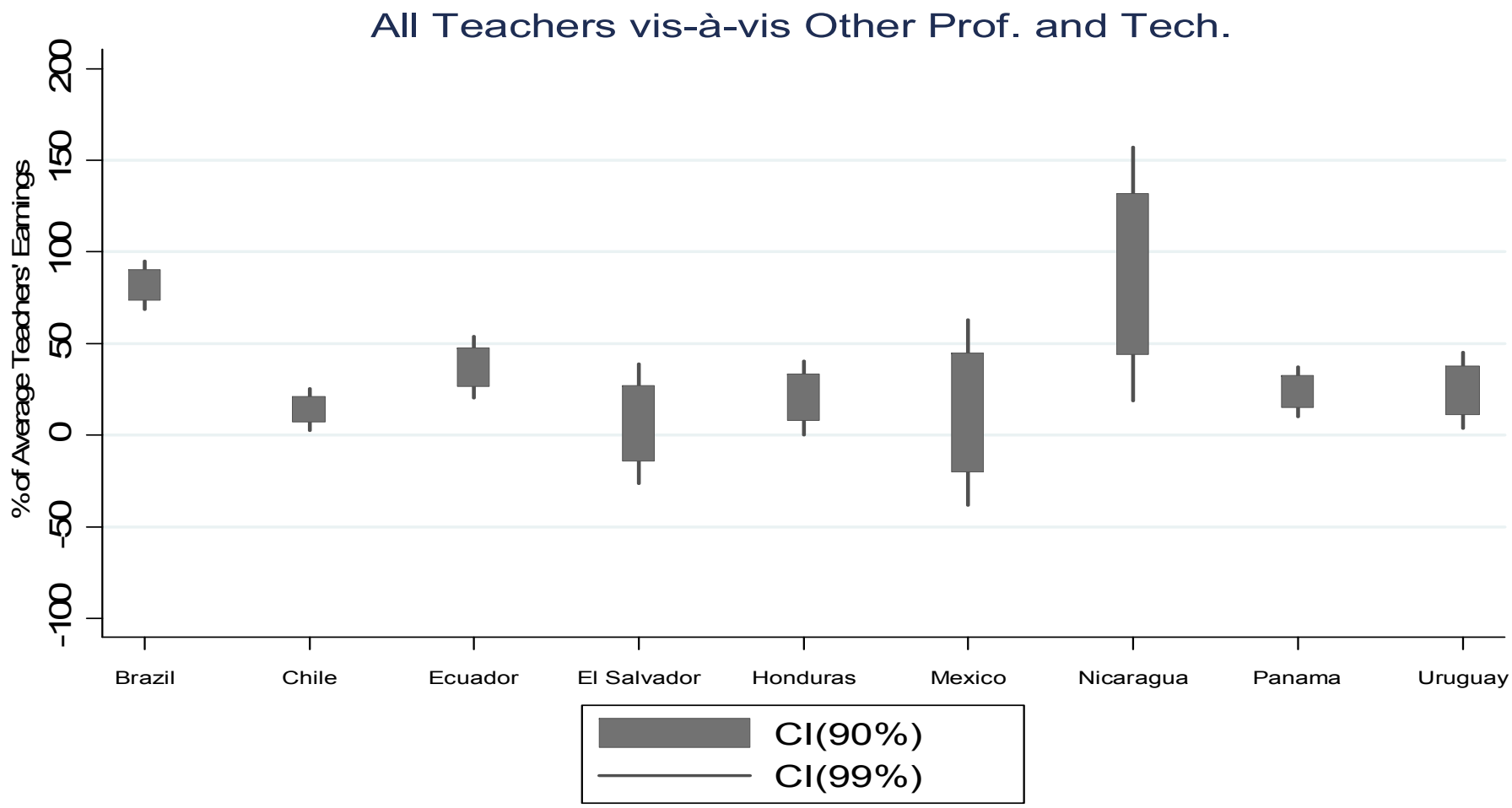


The earnings gaps: secondary teachers vs. other professionals and technicians



What about the differences across countries?

The earnings gaps: school teachers vs. other professionals and technicians



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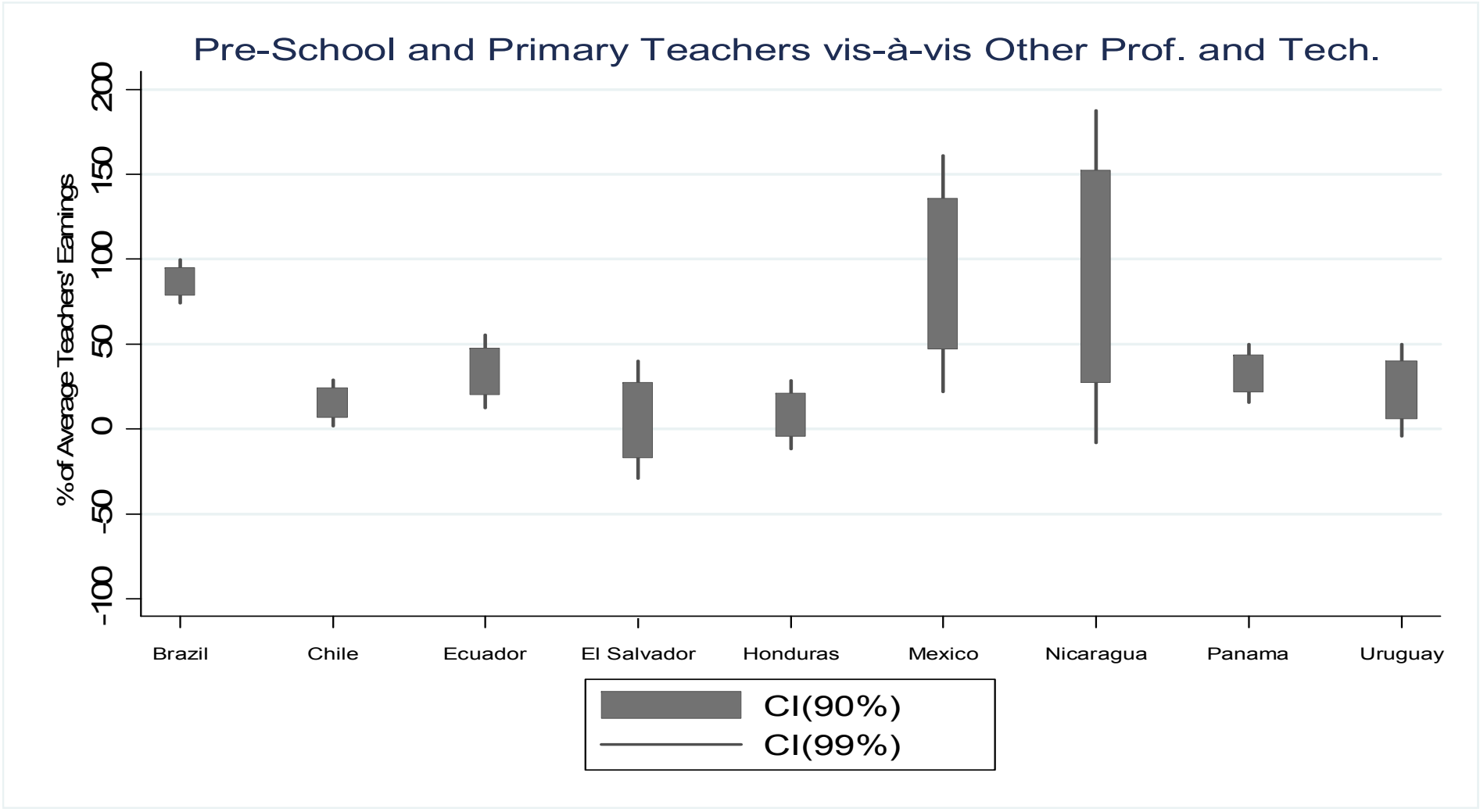

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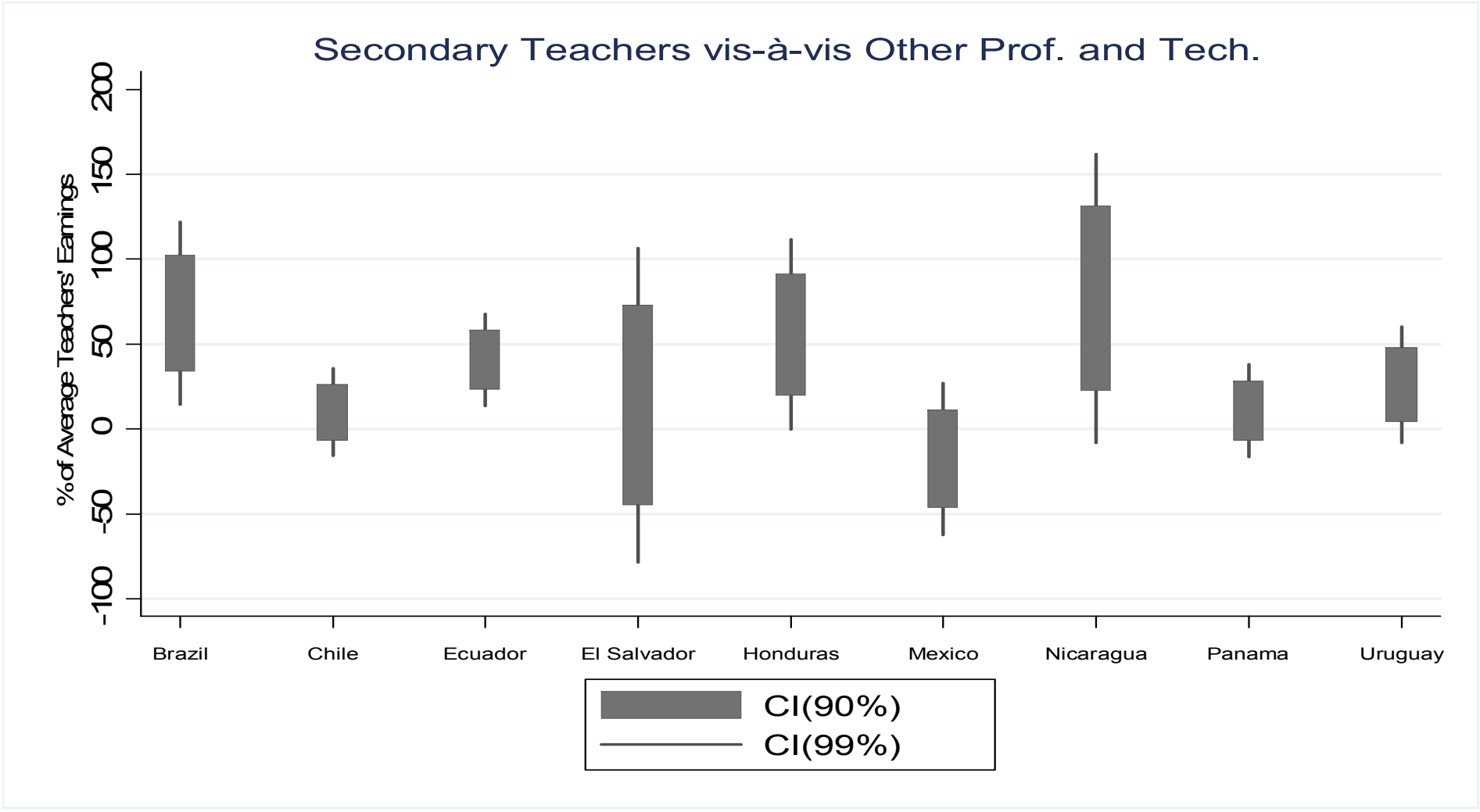
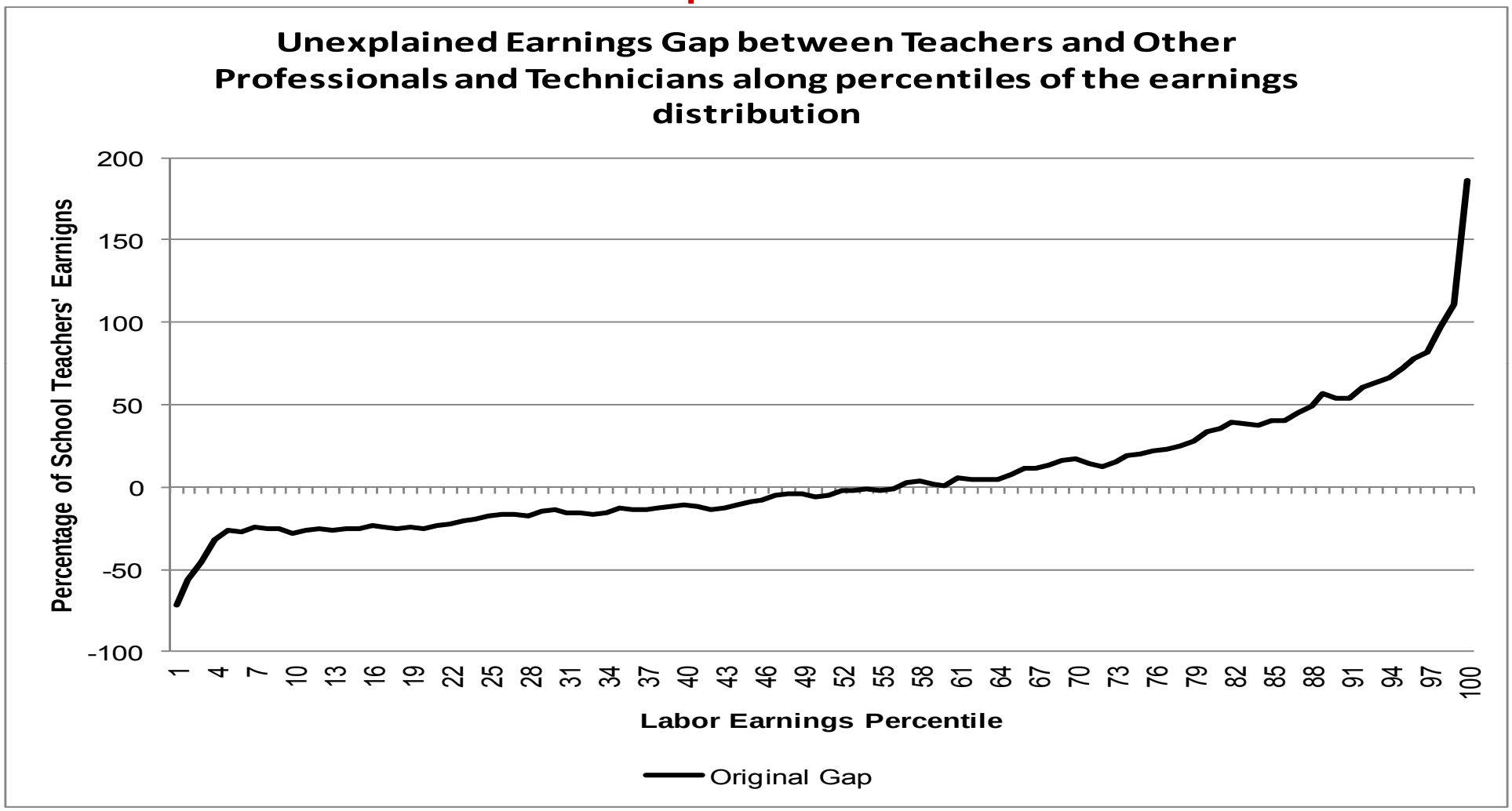


Distribution of the unexplained differences



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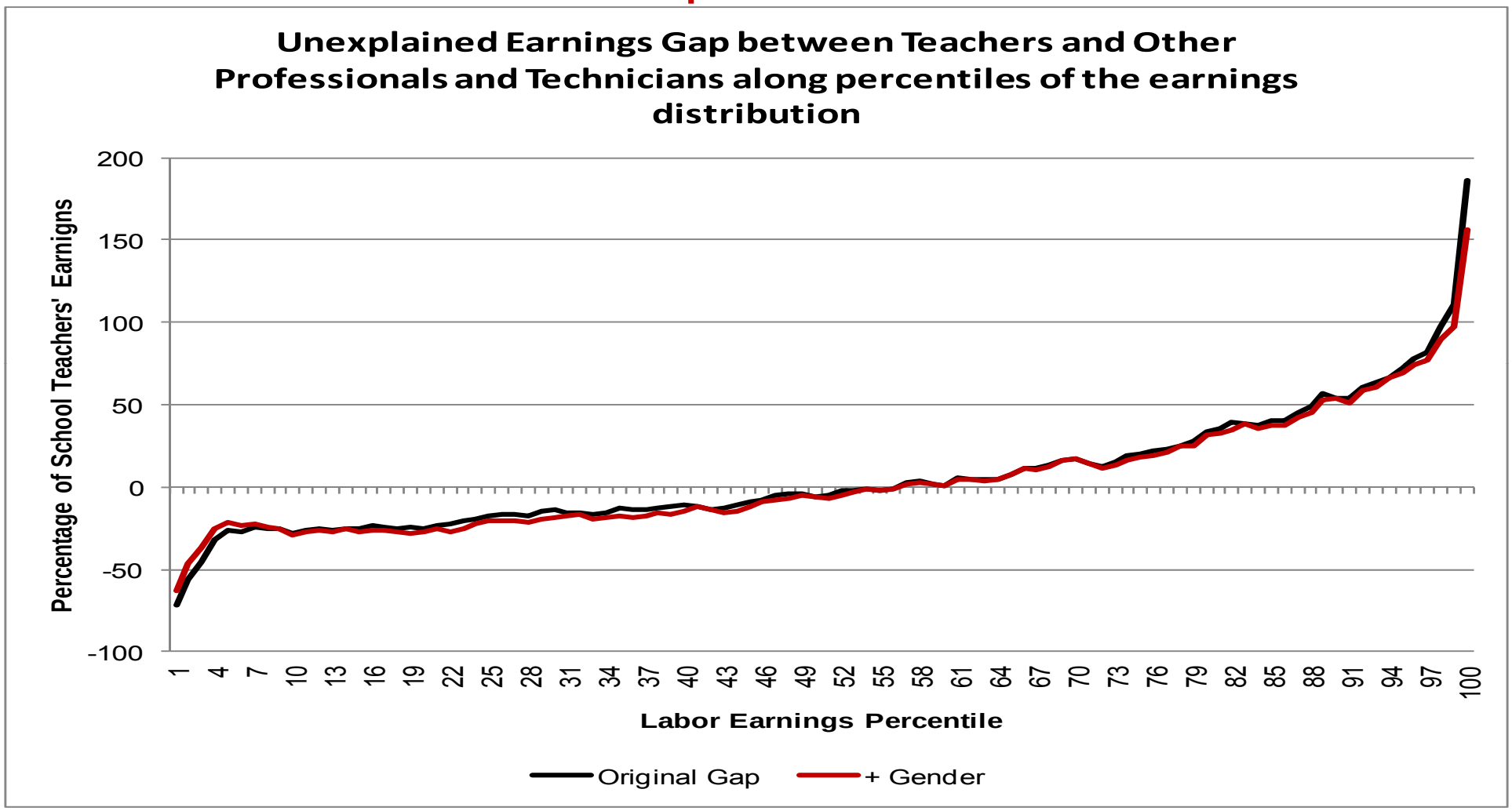

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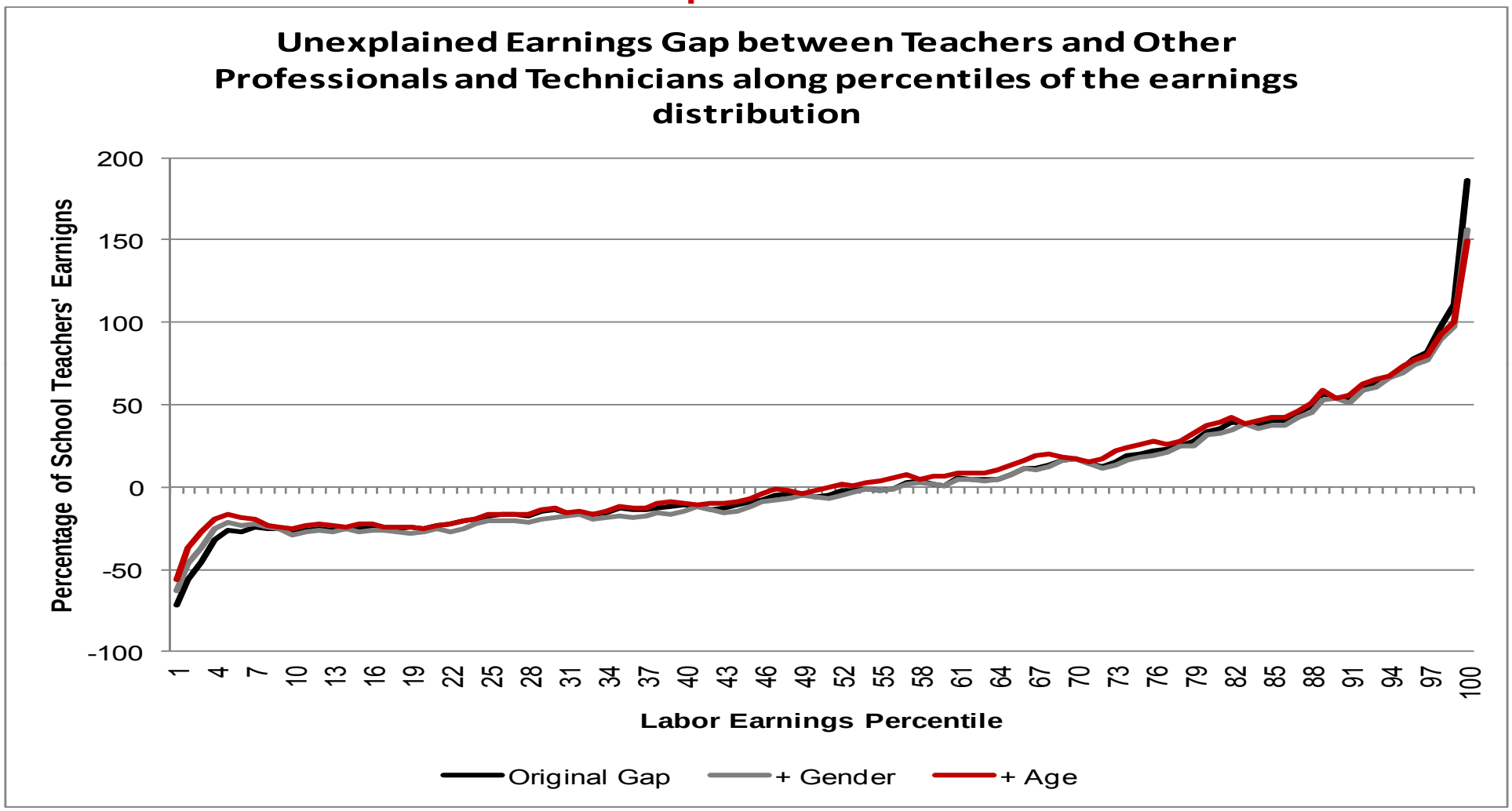

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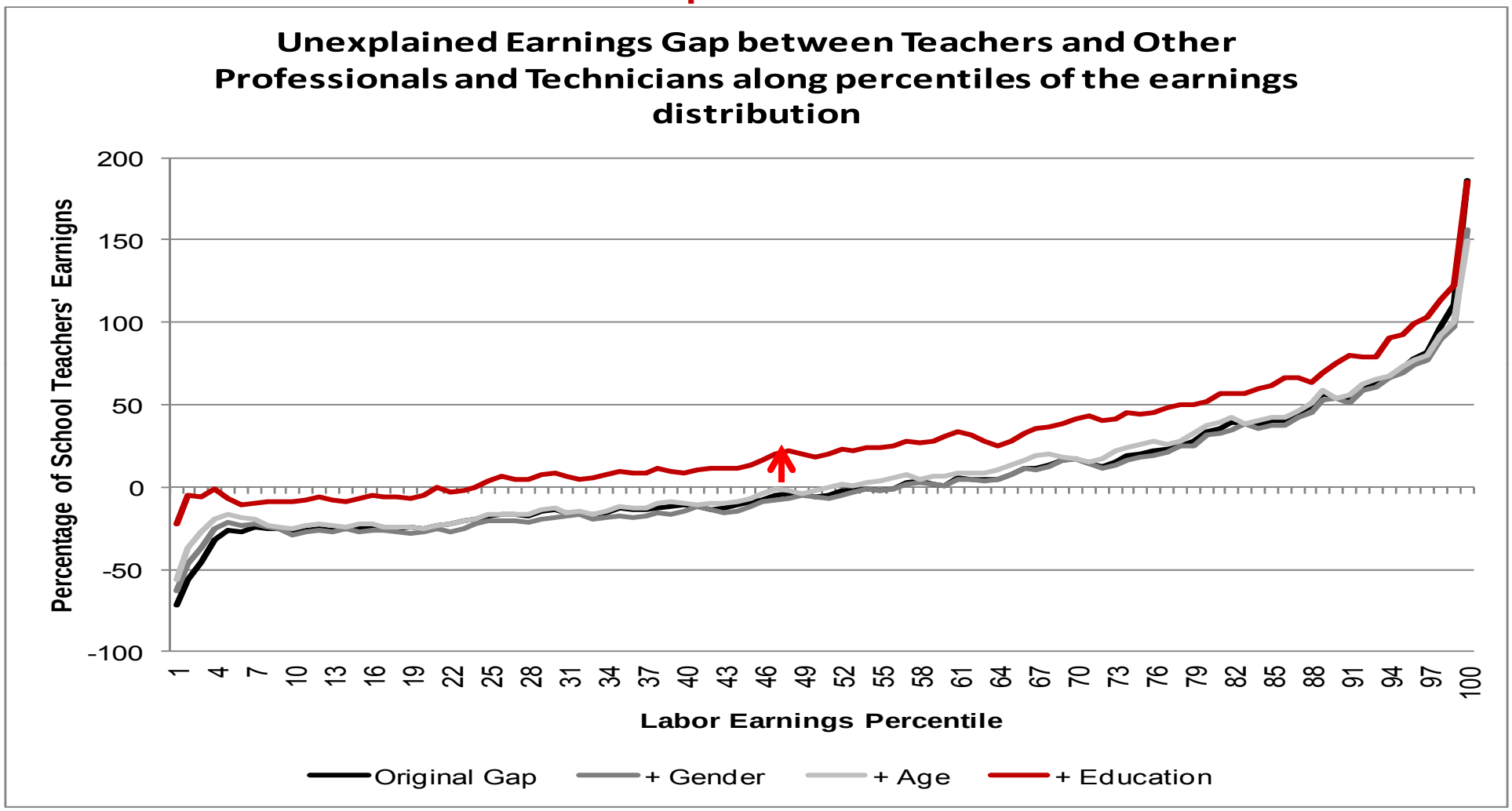

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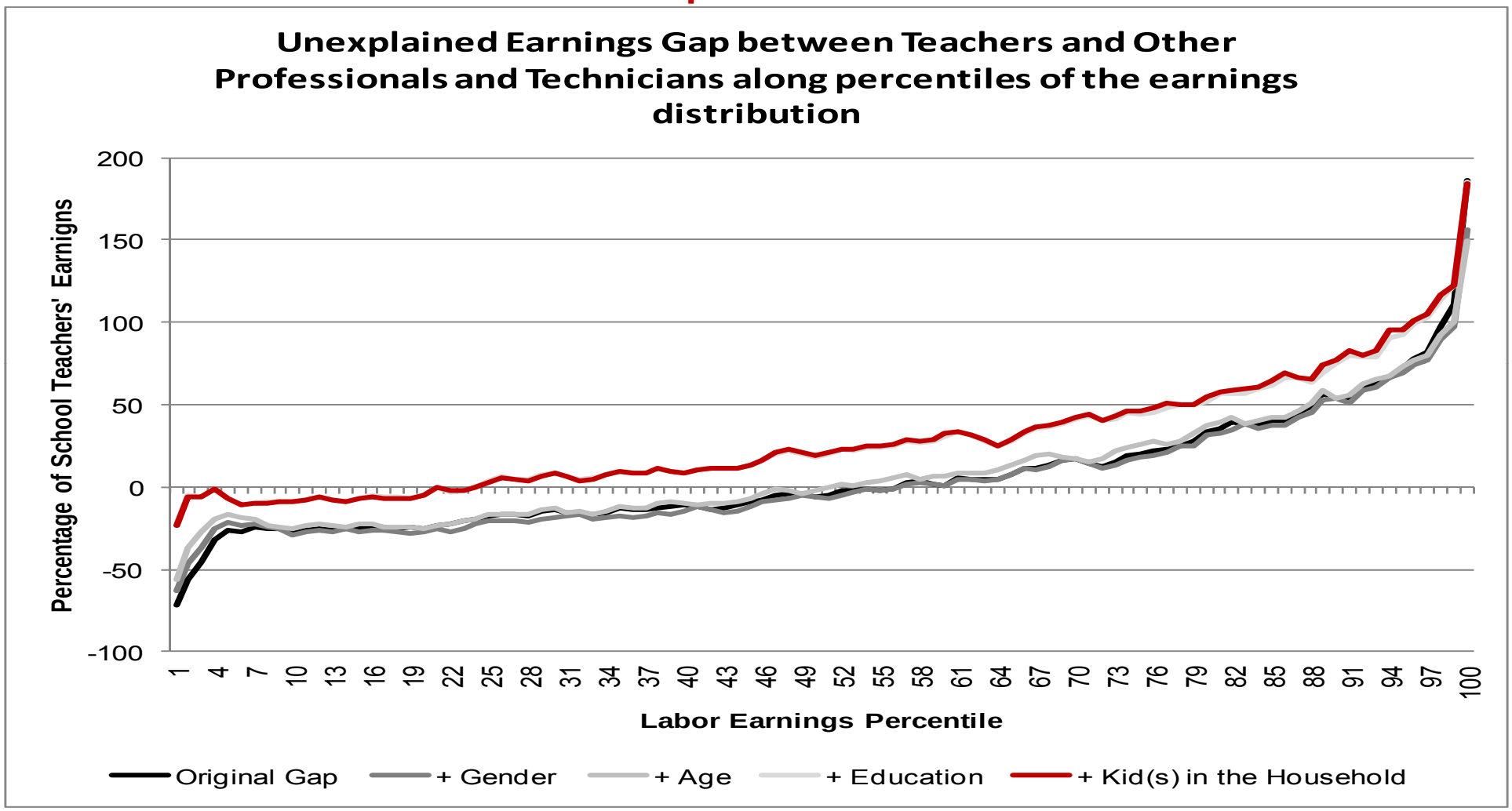

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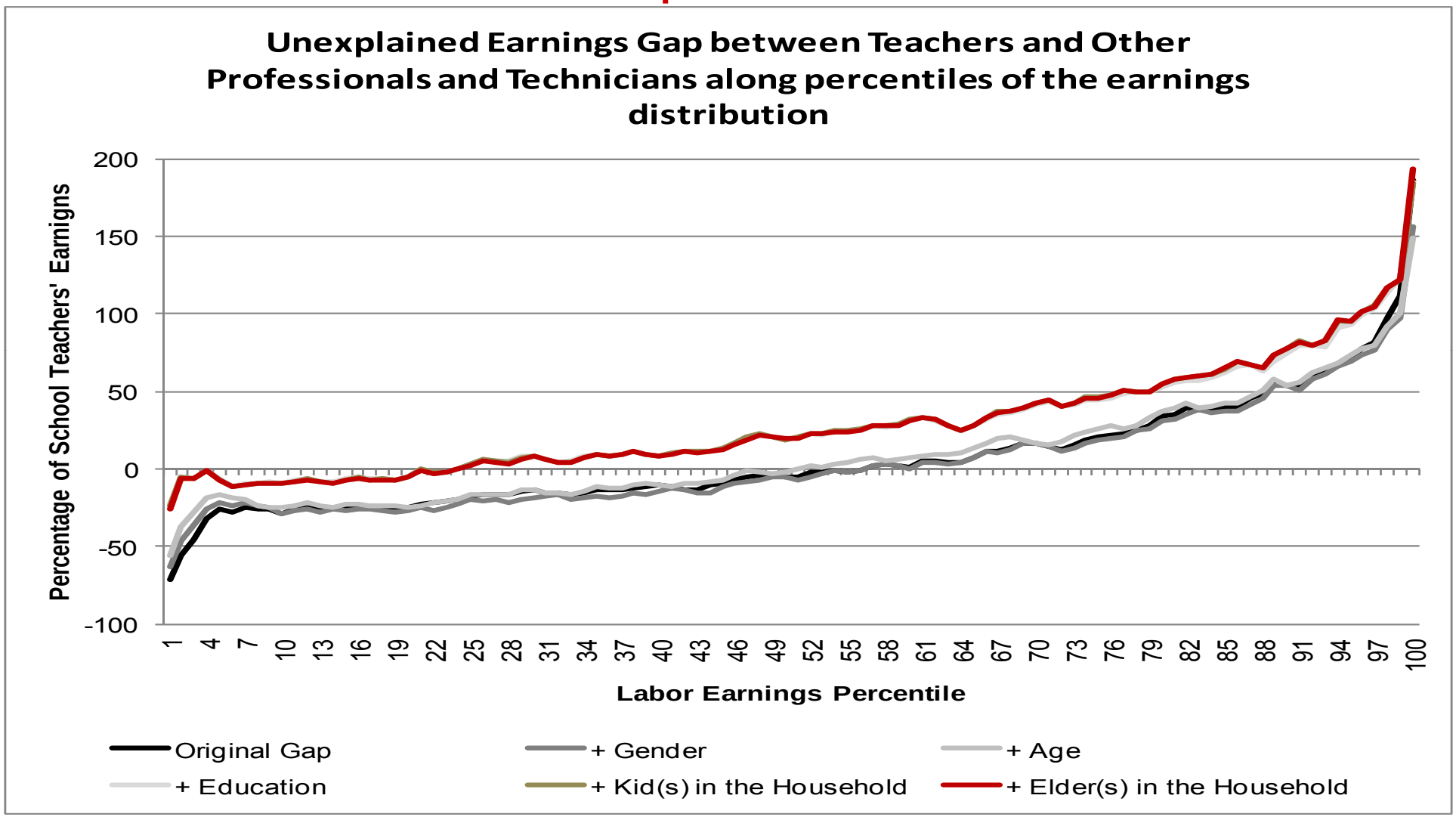

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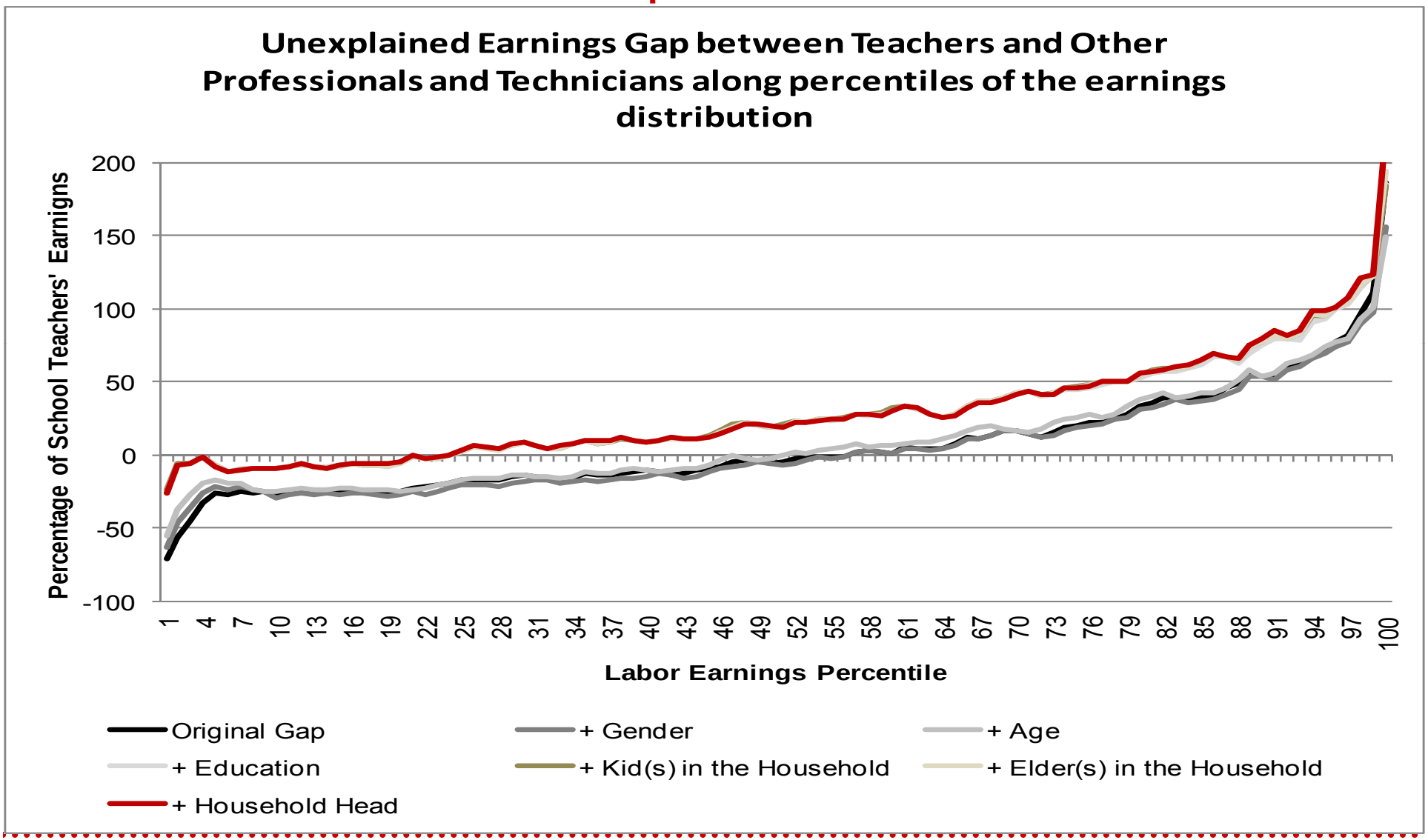

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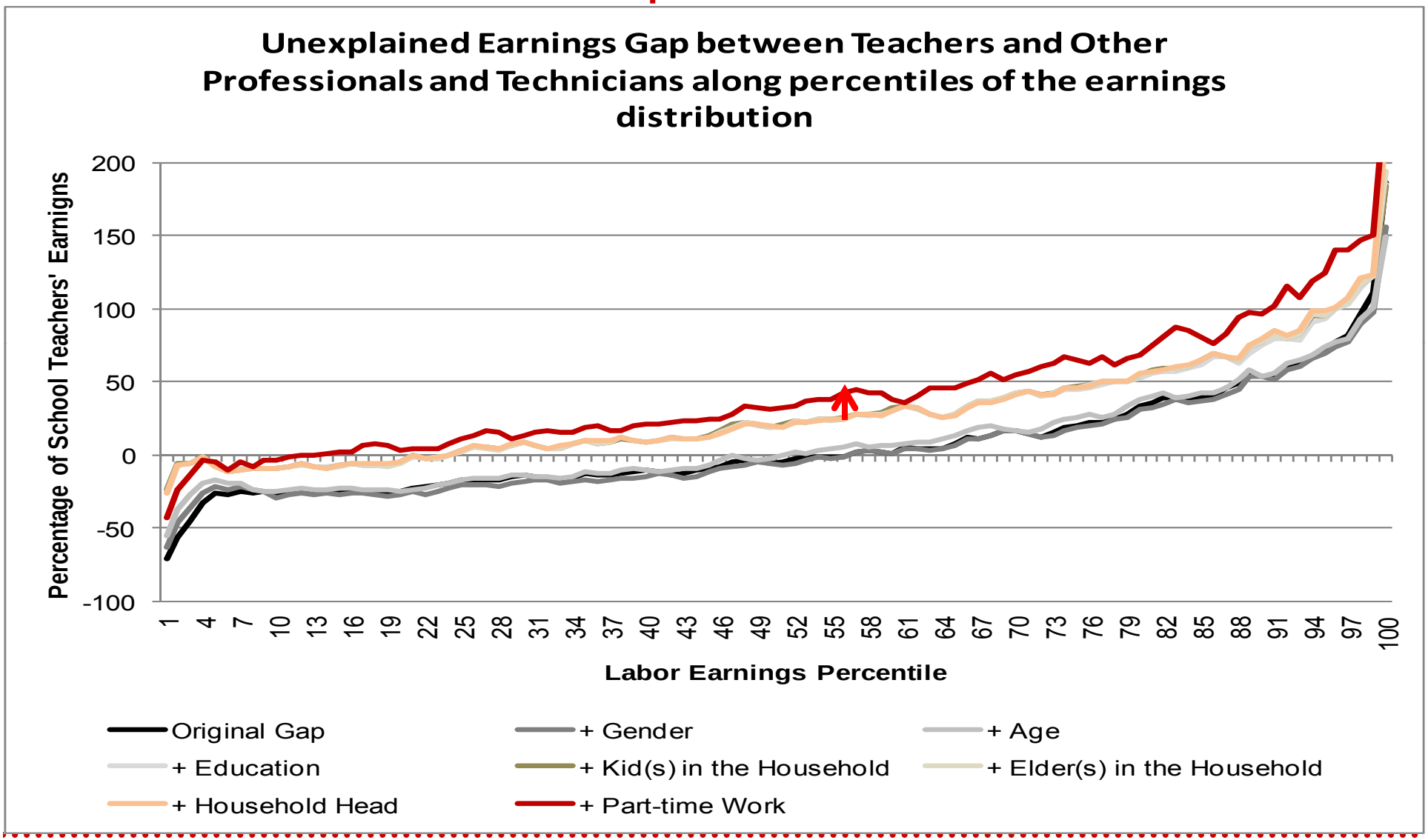

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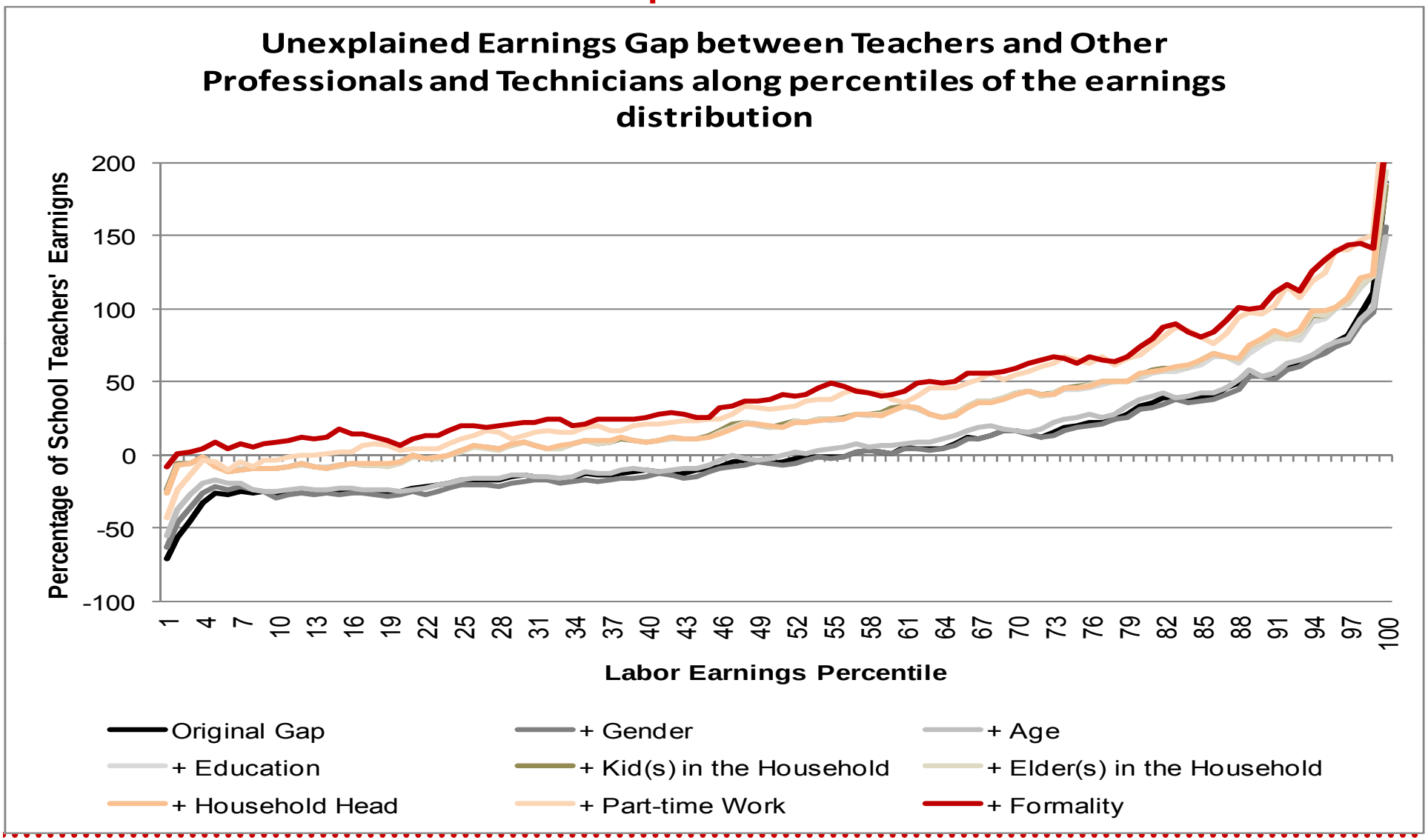

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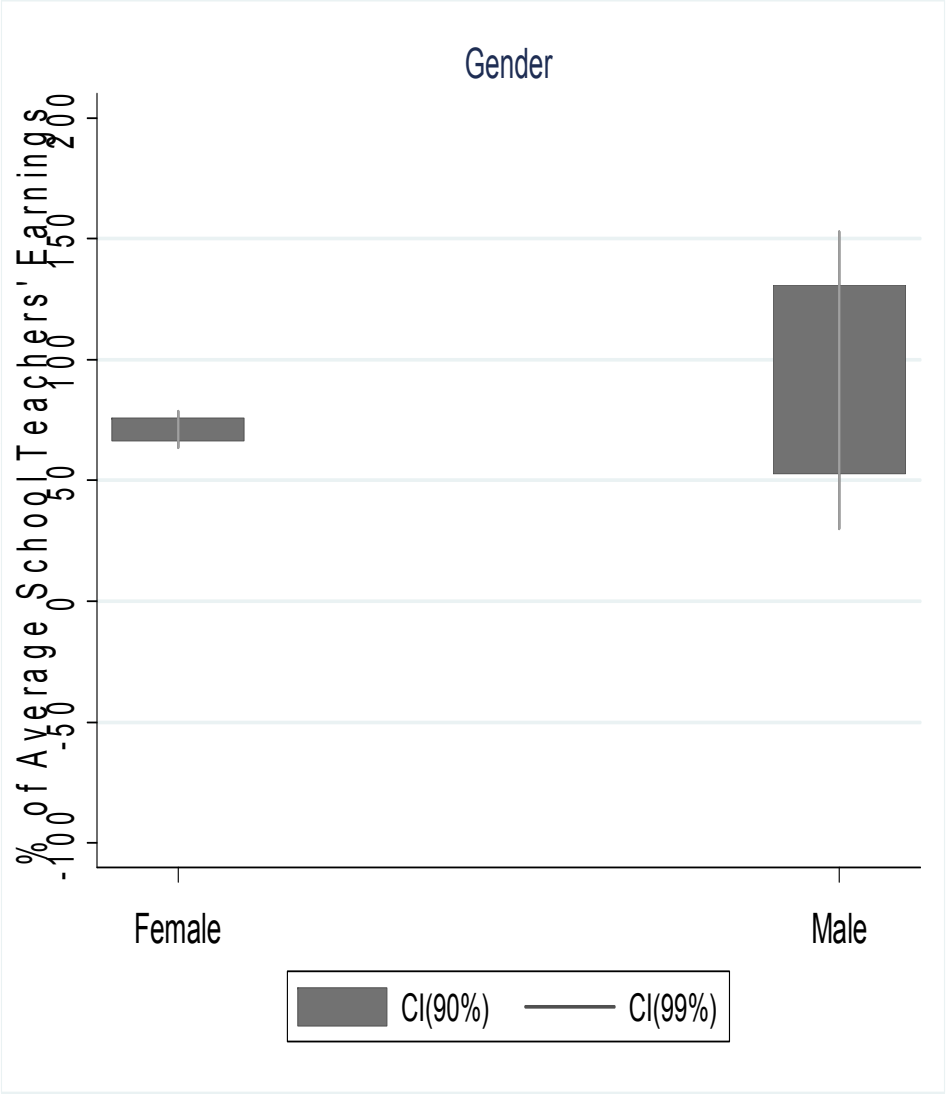
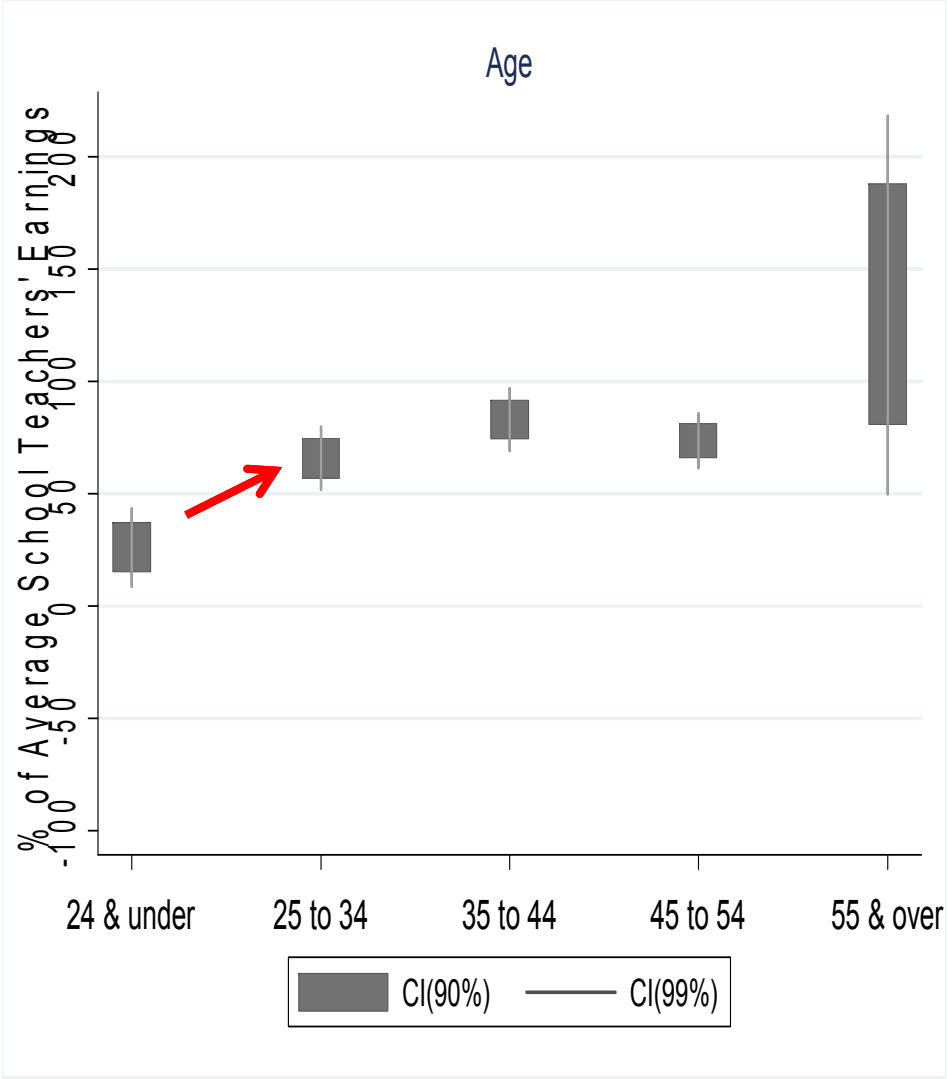
Distribution of the unexplained differences (1)





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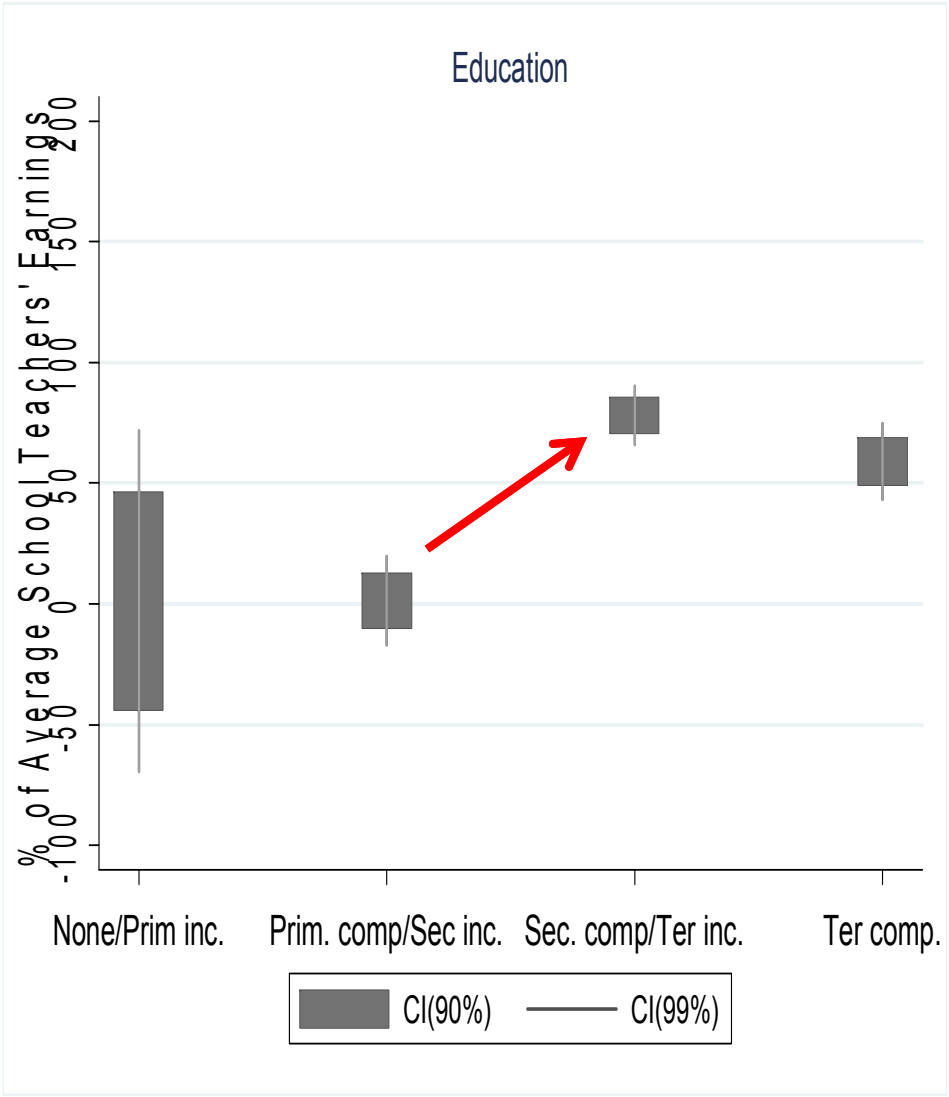
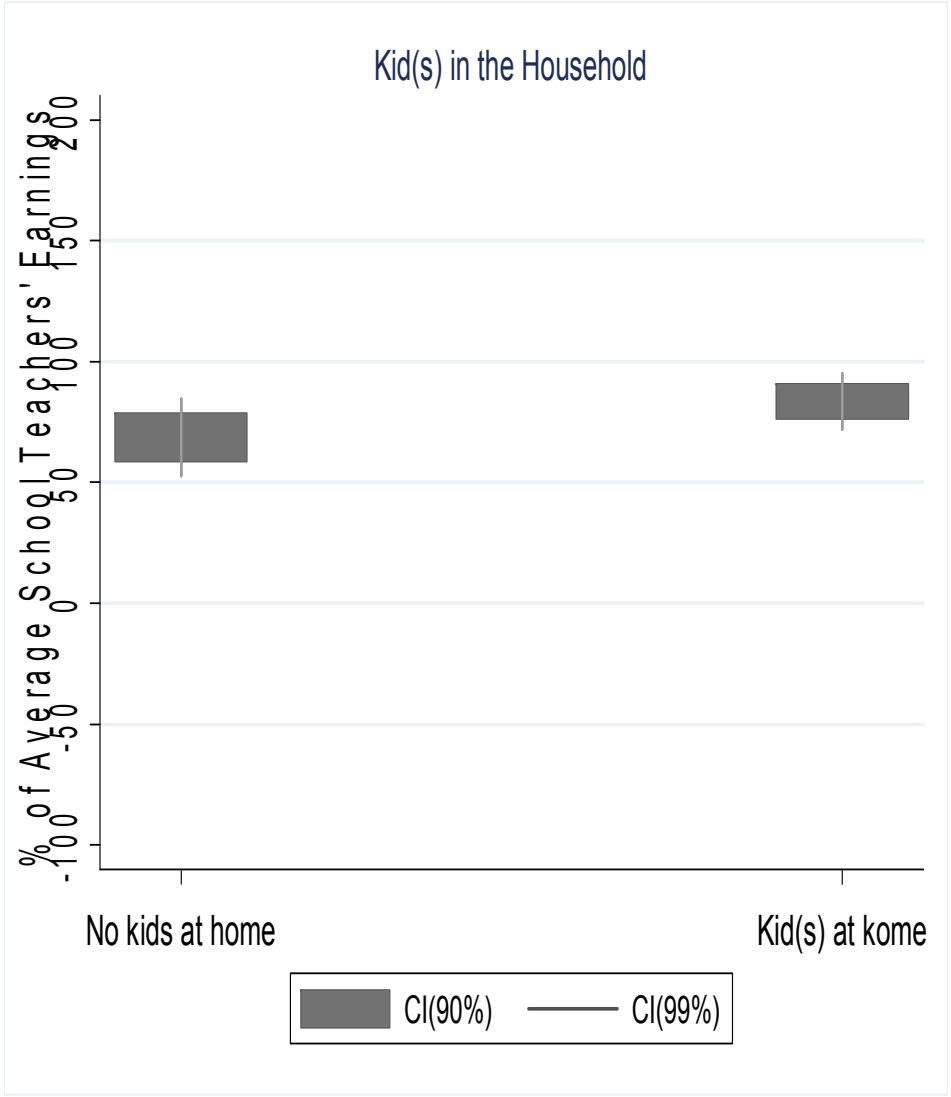
Distribution of the unexplained differences (2)





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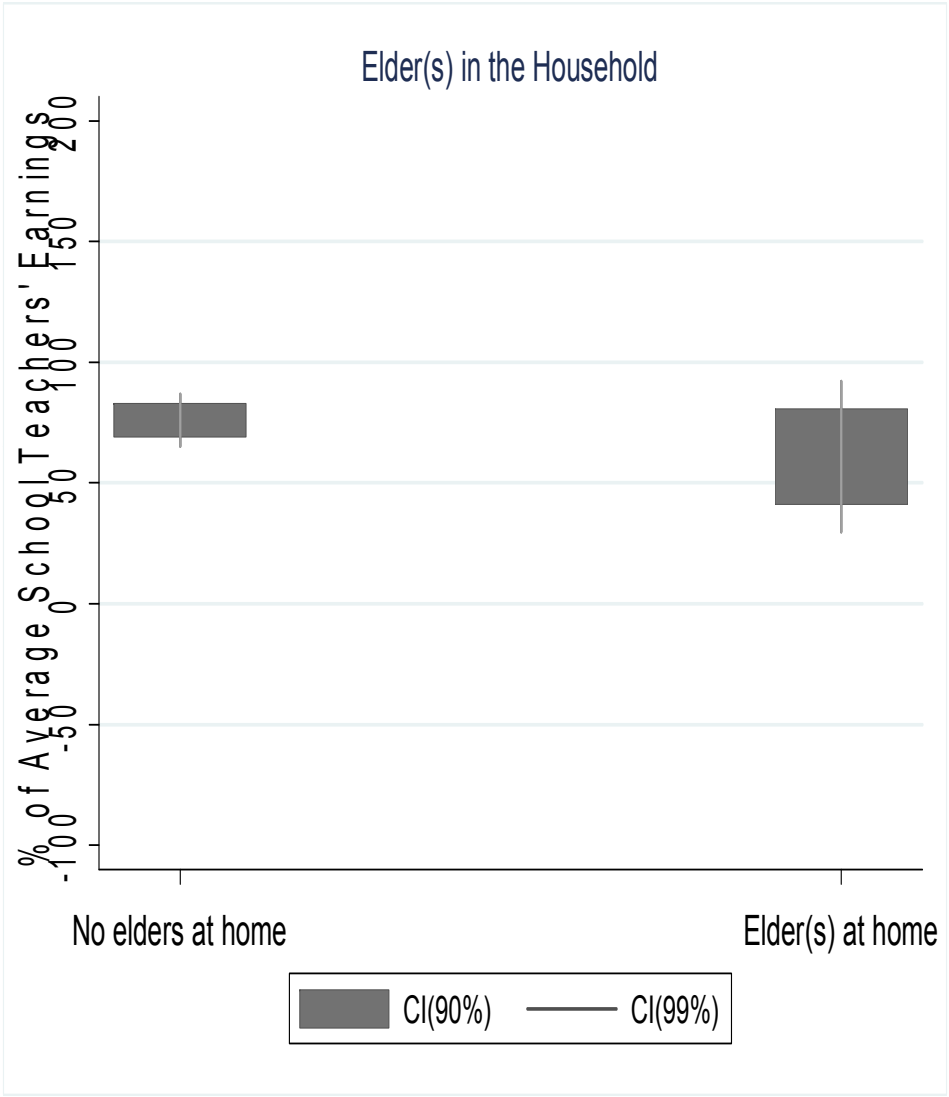
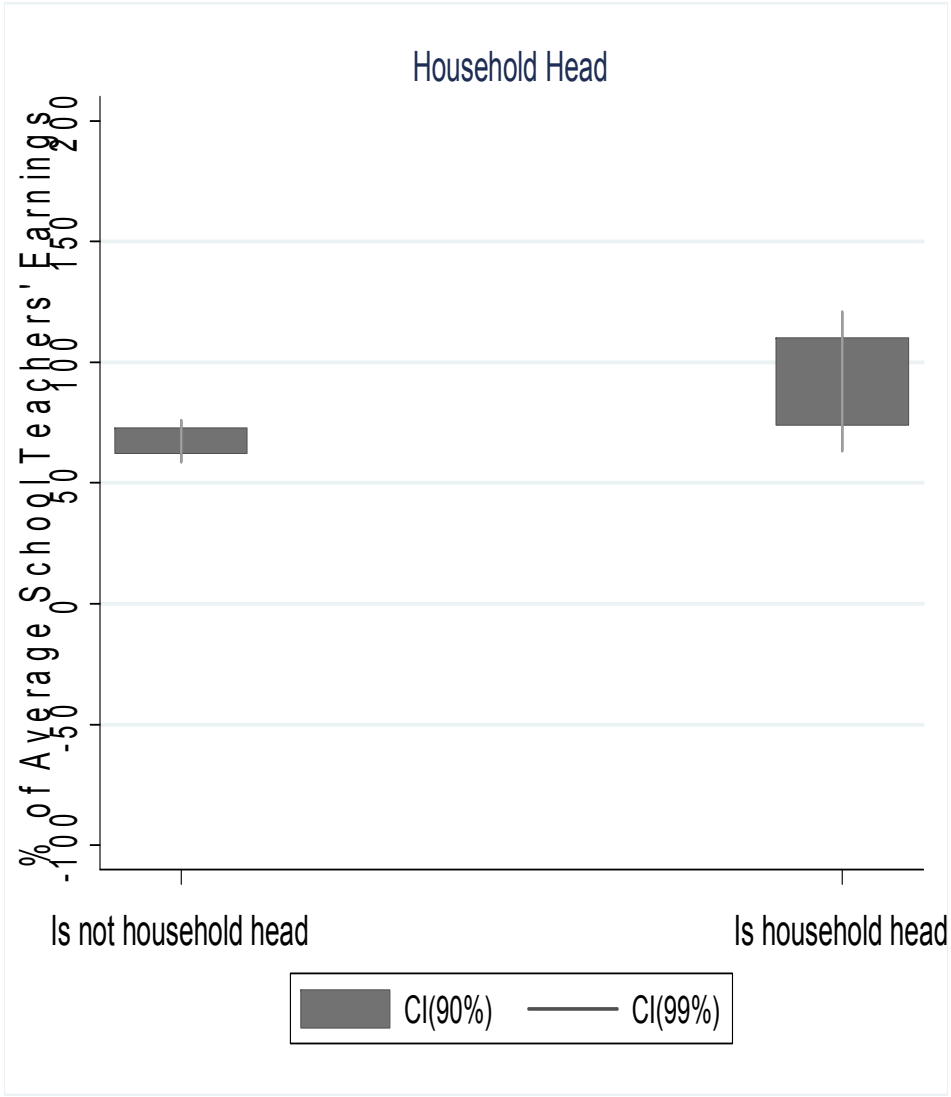
Distribution of the unexplained differences (3)





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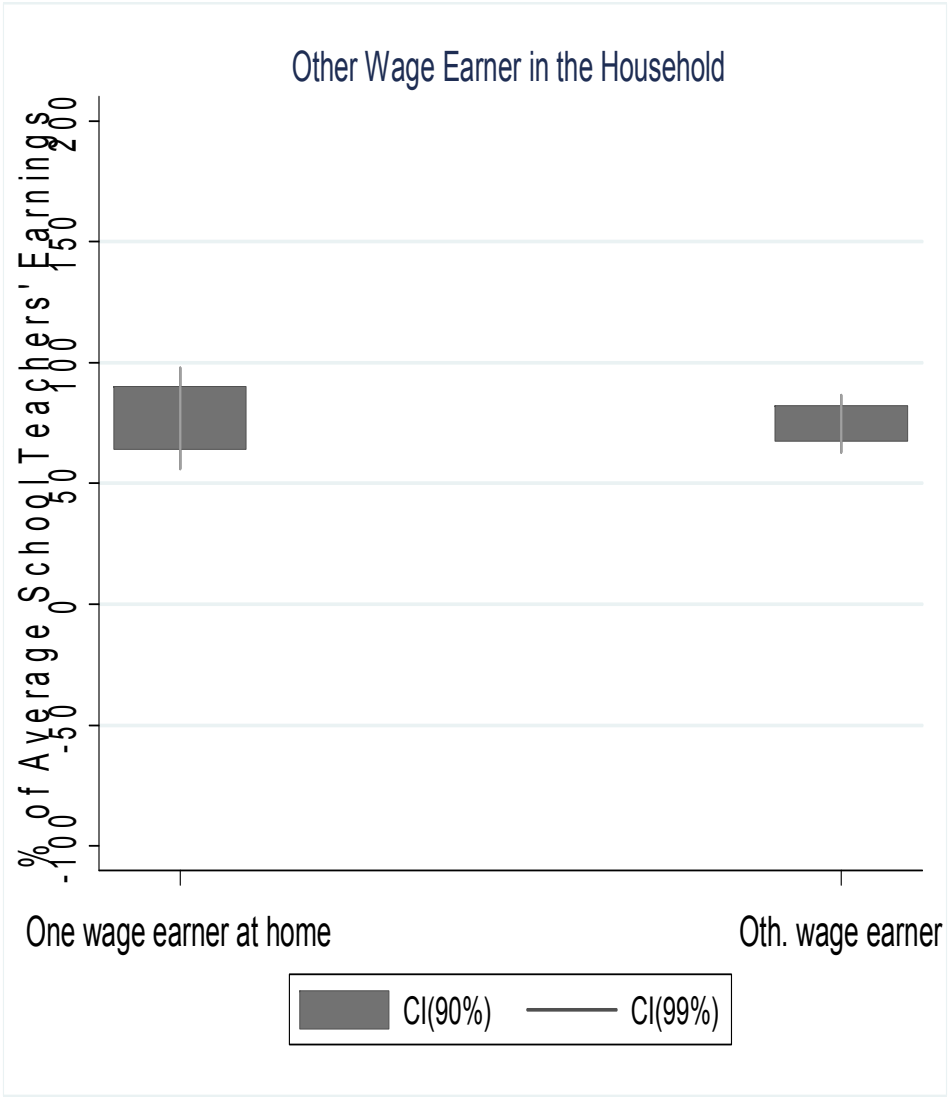
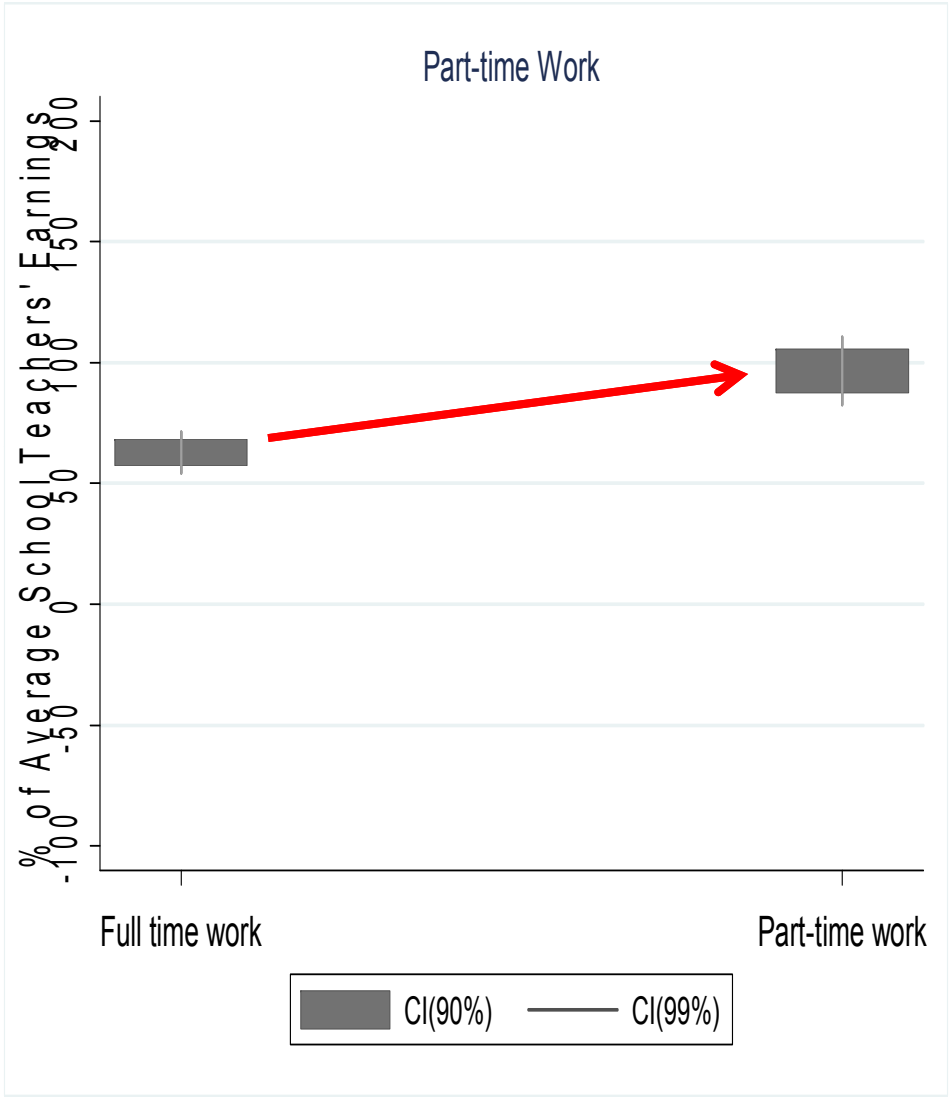
Distribution of the unexplained differences (4)





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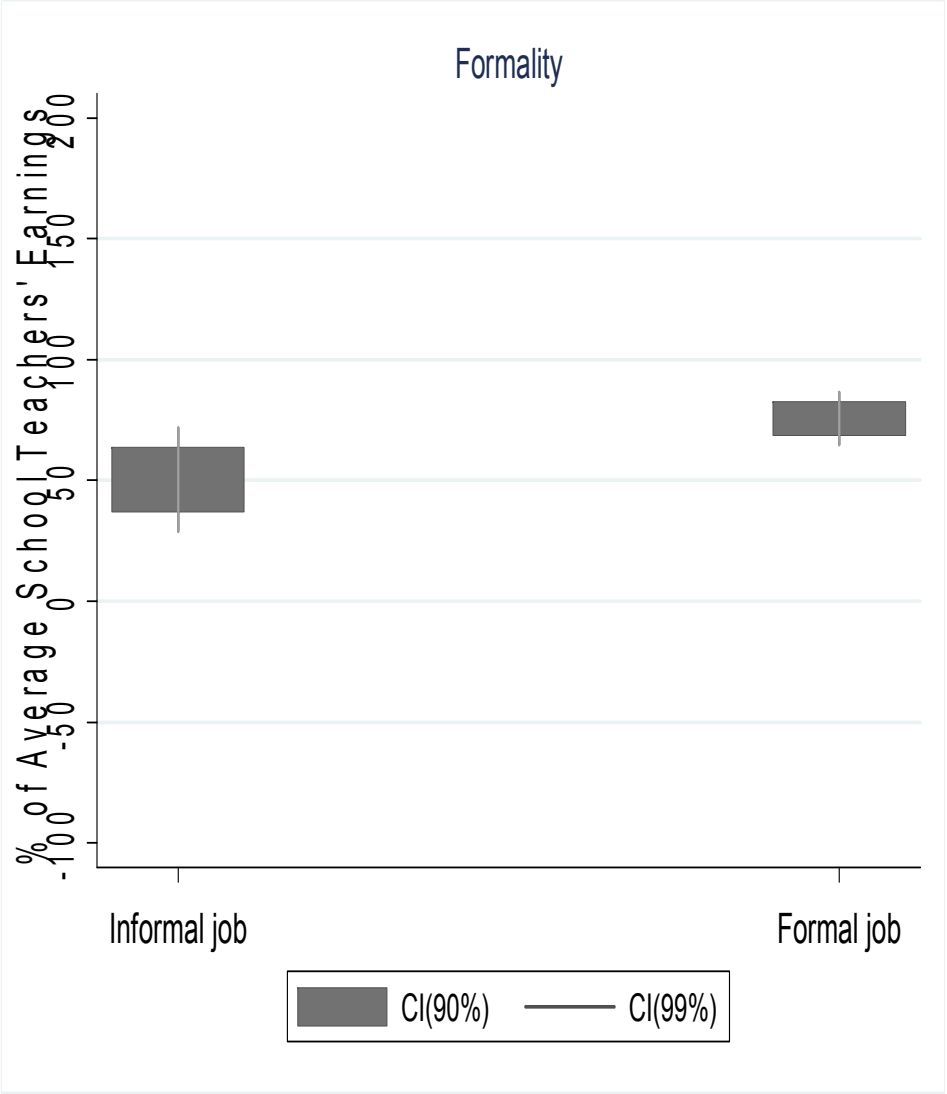
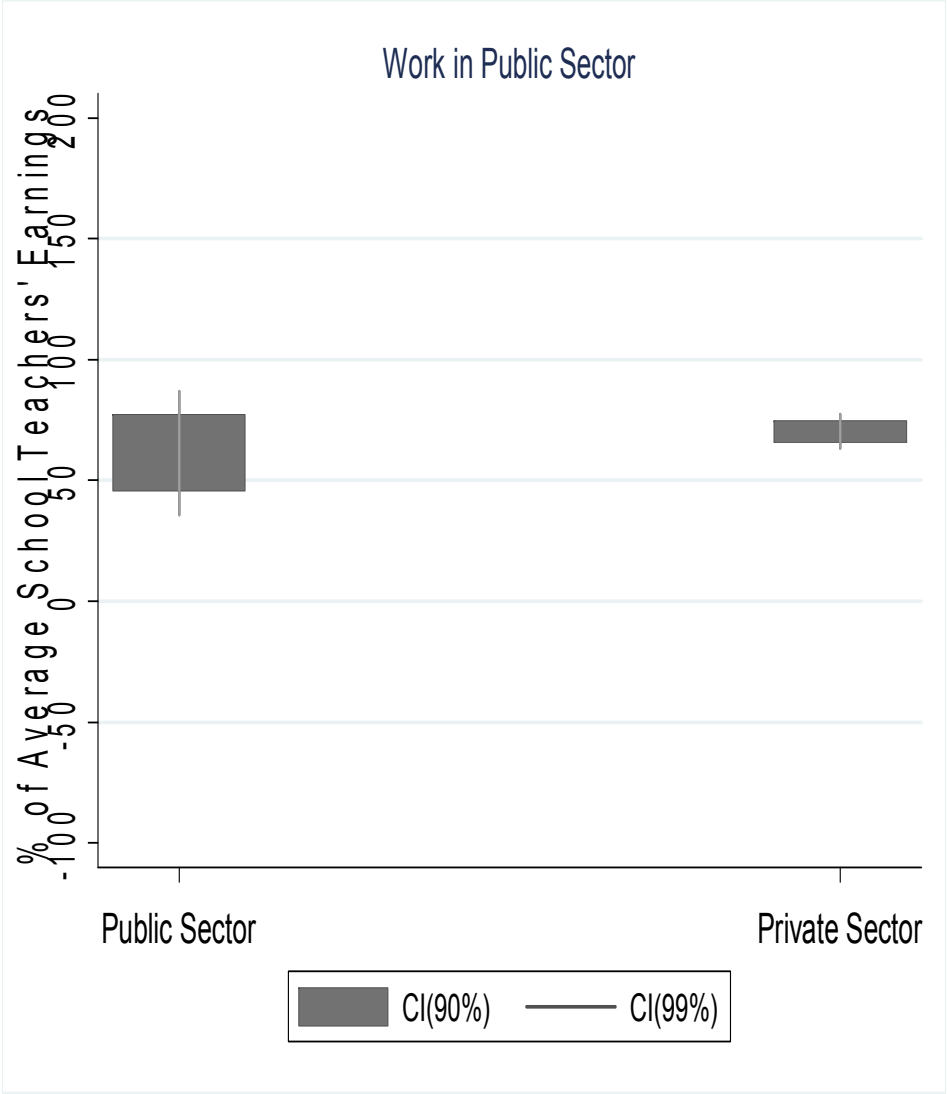
Distribution of the unexplained differences (5)





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The gap is still important when considering job-break periods

	Decompositions Using the "Full Set" of Observable Characteristics		
	School Teachers vis-à-vis Other Professionals and Technicians	Pre-School and Elementary Teachers vis-à-vis Other Professionals and Technicians	Secondary Teachers vis-à-vis Other Professionals and Technicians
Prorated hourly earnings			
Δ	17.4%	28.8%	-9.5%
Δ0	57.2% (0.04)	61.8% (0.04)	46.2% (0.15)
Monthly earnings			
Δ	64.6%	79.4%	28.8%
Δ0	75.6% (0.03)	79.6% (0.03)	66.2% (0.09)
Yearly earnings			
Δ	47.5%	60.7%	15.4%
Δ0	57.6% (0.03)	61.3% (0.03)	48.9% (0.08)

Standard errors in parentheses

Source: National household surveys

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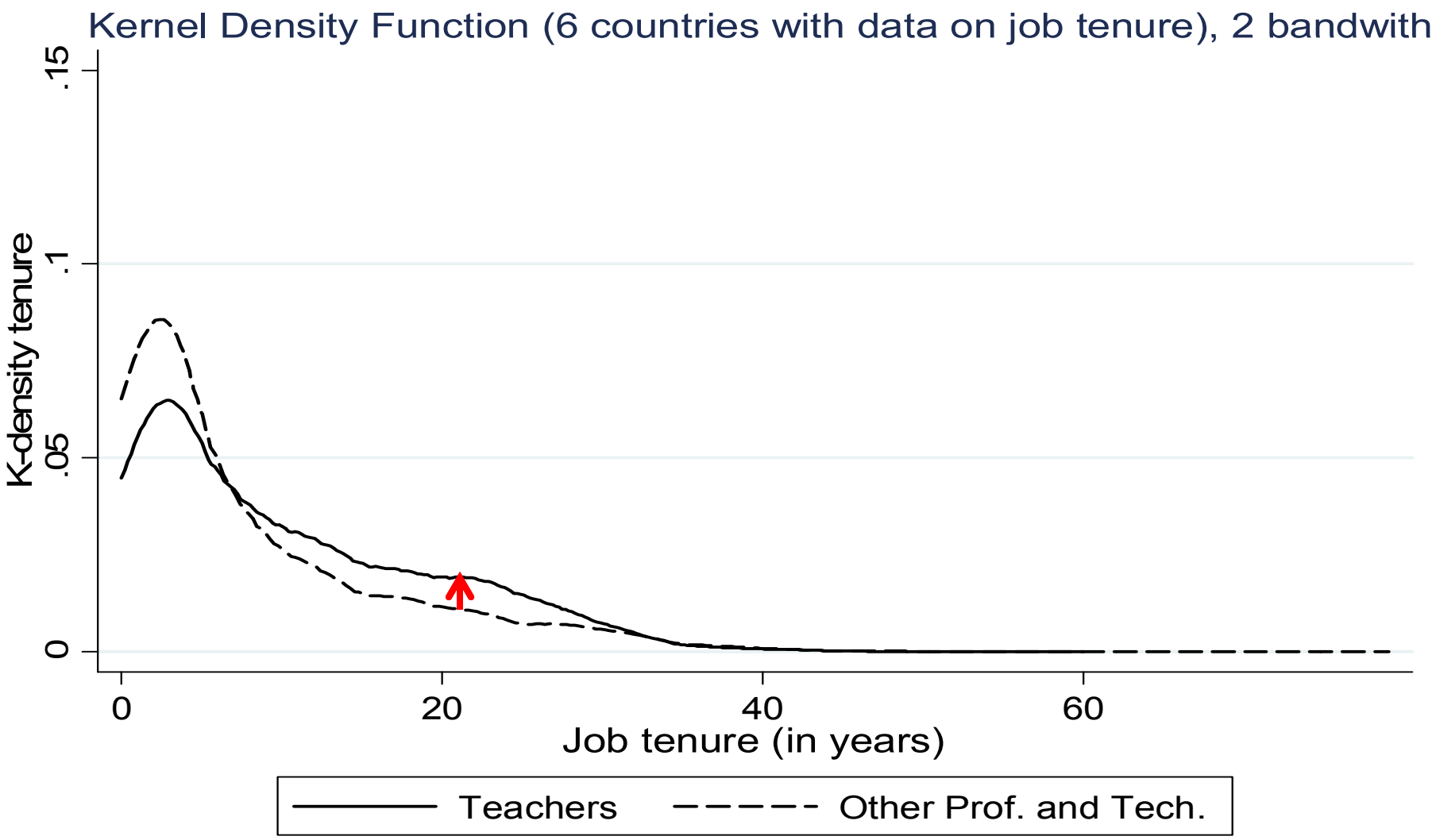
Tenure is a differentiating factor



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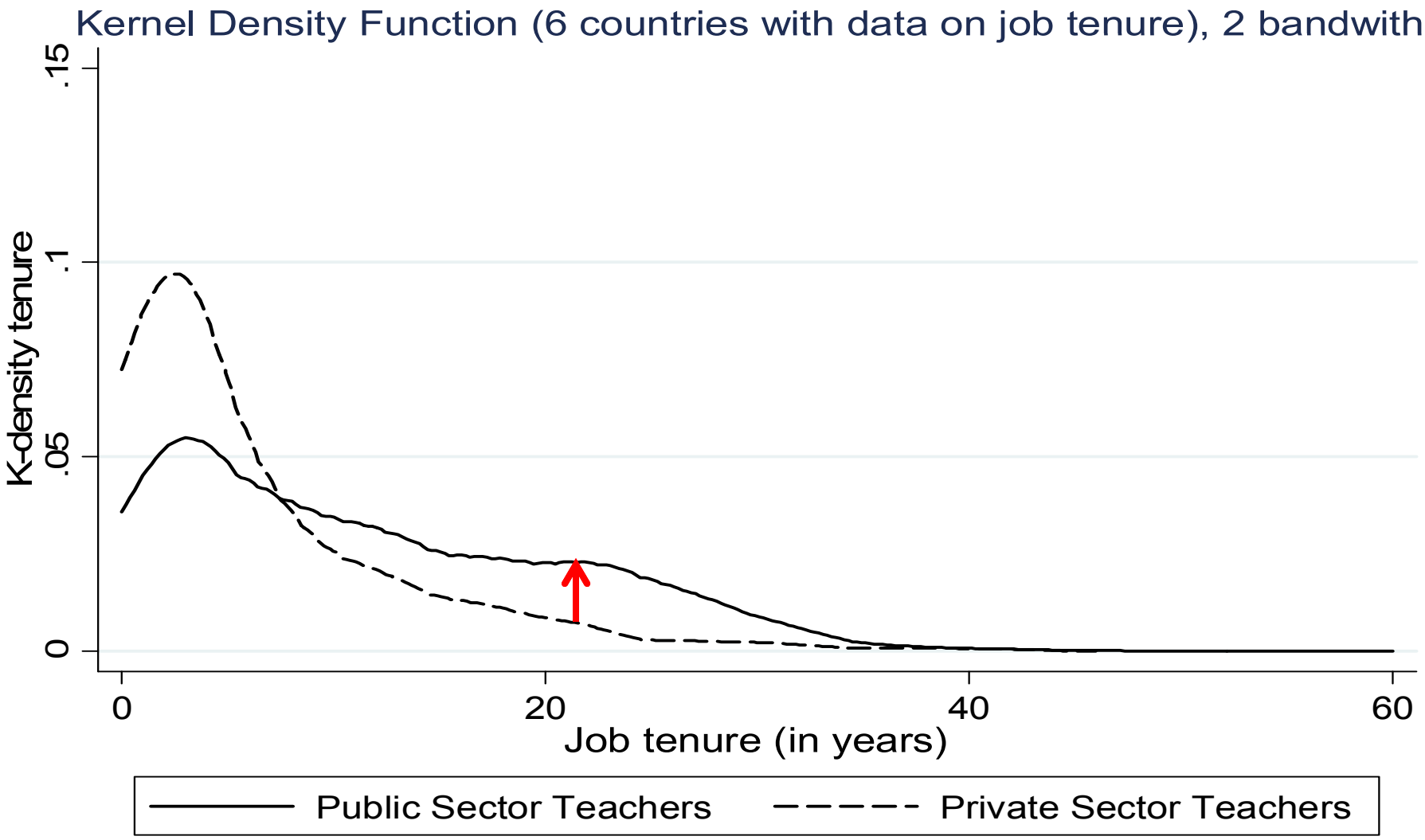
Particularly in the public sector



And the way teachers'earnings evolve with tenure is more "plain"

Evolution of Teachers' Salaries in Latin America at the turn of the 20th century

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This paper: 7 countries (14 household surveys)

Country	Name Of The Survey	Year
Brazil	Pesquisa Nacional por Amostra de Domicilio (PNAD)	1995 2009
Chile	Encuesta de Caracterizacion Socioeconomica Nacional (CASEN)	1998 2009
Ecuador	Encuesta de Empleo, Desempleo y Subempleo (ENEMDU)	1995 2006
El Salvador	Encuesta de Hogares de Propositos Multiples (EHPM)	1995 2009
Mexico	Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH)	1996 2008
Nicaragua	Encuesta Nacional de Hogares sobre medicion de Niveles de Vida (EMNV)	1998 2007
Uruguay	Encuesta Continua de Hogares (ECH)	1998 2007

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Descriptive statistics: the sociodemographic profile

	Pre-School and Elementary Teachers		Secondary Teachers		All School Teachers		Other Professionals and Technicians	
	Circa 1997	*Circa 2007*	*Circa 1997*	*Circa 2007*	*Circa 1997*	*Circa 2007*	*Circa 1997*	*Circa 2007*
Personal Characteristics								
Men (Gender)	12.5%	11.7%	41.8%	36.1%	19.5%	17.5%	55.4%	55.0%
Age Groups								
24 and under	15.2%	10.7%	9.1%	8.2%	13.8%	10.1%	13.5%	15.4%
25 to 34	37.3%	32.5%	32.2%	26.0%	36.1%	31.0%	38.2%	33.7%
35 to 44	30.6%	31.2%	35.2%	30.8%	31.7%	31.1%	29.4%	24.8%
45 to 54	13.6%	19.0%	18.6%	24.2%	14.8%	20.3%	13.1%	17.6%
54 and over	3.3%	6.5%	4.9%	10.8%	3.7%	7.5%	5.8%	8.5%
Education Level								
None or primary incomplete	4.4%	0.2%	2.5%	0.0%	3.9%	0.2%	6.8%	4.1%
Primary complete or secondary incomplete	7.2%	2.3%	2.7%	1.0%	6.2%	1.9%	13.3%	9.1%
Secondary complete or tertiary incomplete	73.5%	89.6%	55.8%	80.4%	69.2%	87.4%	56.6%	71.3%
Tertiary complete	14.9%	7.9%	39.0%	18.6%	20.7%	10.5%	23.3%	15.5%
Presence of Children (≤12 years) in the Household	48.8%	42.3%	38.0%	35.3%	46.2%	40.6%	45.1%	36.9%
Presence of Elder (≥65 years) in the Household	11.5%	12.7%	10.1%	13.9%	11.2%	13.0%	10.7%	12.4%

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Descriptive statistics: the sociodemographic profile

	Pre-School and Elementary Teachers		Secondary Teachers		All School Teachers		Other Professionals and Technicians	
	Circa 1997	*Circa 2007*	*Circa 1997*	*Circa 2007*	*Circa 1997*	*Circa 2007*	*Circa 1997*	*Circa 2007*
Personal Characteristics								
Head of the Household	20.8%	30.1%	42.9%	43.0%	26.1%	33.2%	49.0%	45.7%
Presence of Other Household Member with Labor Income	80.7%	76.8%	79.1%	72.2%	80.3%	75.7%	70.4%	71.7%
Labor Characteristics								
Part time workers (≤30 hours)	49.0%	43.8%	29.2%	36.3%	44.3%	42.0%	12.1%	12.9%

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Relative earnings: Average school teachers' hourly earnings equal to 100 for each country.

	Relative Hourly Earnings (Base: Average School Teacher Earnings circa 1997 in each Country=100)							
	Pre-School and Elementary Teachers		Secondary Teachers		All School Teachers		Other Professionals and Technicians	
	Circa 1997	*Circa 2007*	*Circa 1997*	*Circa 2007*	*Circa 1997*	*Circa 2007*	*Circa 1997*	*Circa 2007*
Average Hourly Earninngs	92.76	109.19	123.08	141.84	100.00	116.97	143.00	123.56
By Country								
Brazil	89.23	106.56	153.08	139.71	100.00	113.93	189.04	133.33
Chile	96.36	92.34	111.06	118.96	100.00	98.25	137.78	125.22
Ecuador	97.95	164.30	102.44	217.45	100.00	181.55	142.99	204.73
El Salvador	100.09	129.66	99.17	113.91	100.00	128.04	98.10	121.86
Mexico	98.95	94.99	102.59	100.44	100.00	98.56	74.81	77.24
Nicaragua	91.94	101.70	151.52	125.66	100.00	105.56	198.57	199.97
Uruguay	100.33	132.72	99.58	142.68	100.00	136.95	139.28	166.81

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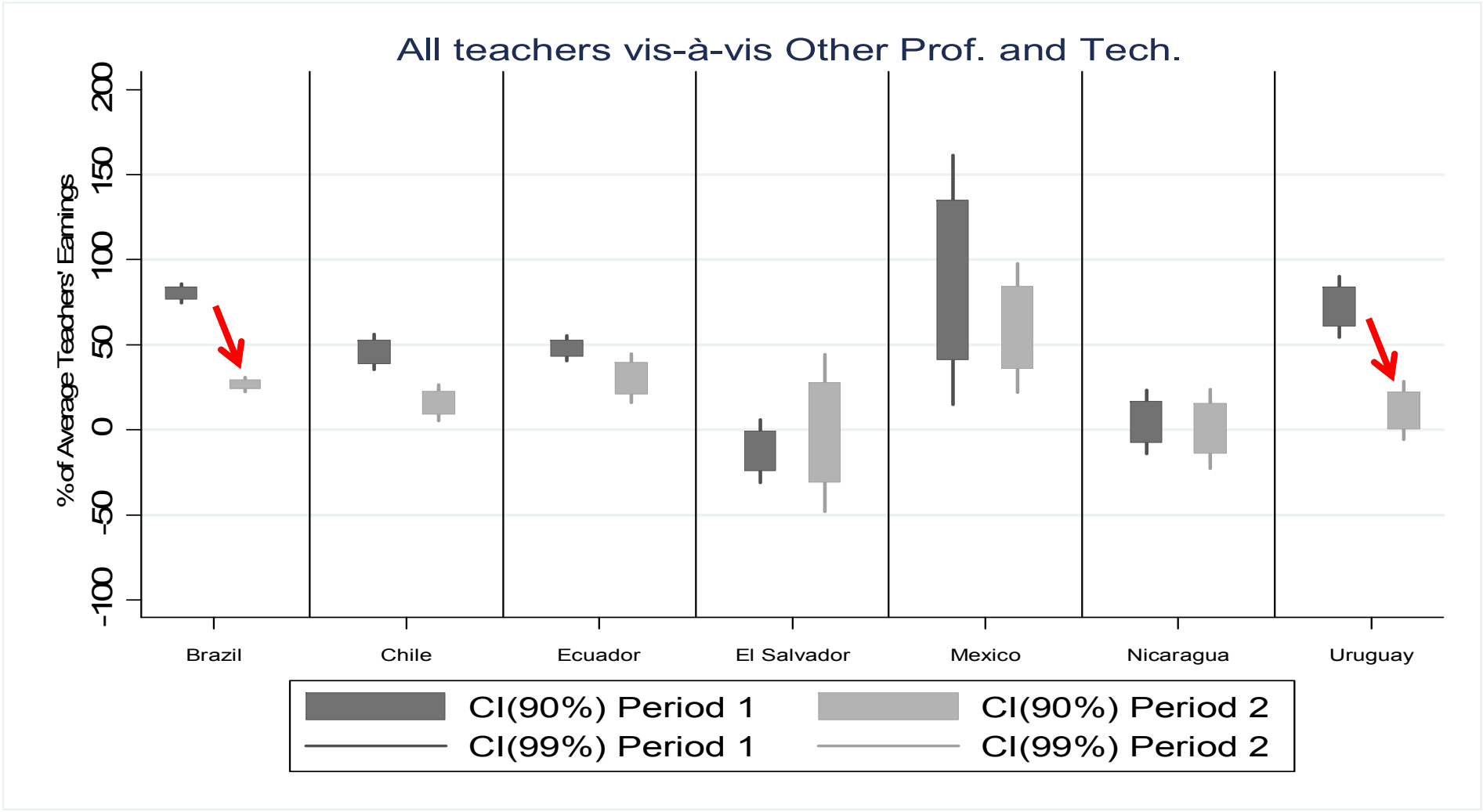
The earnings gaps: pre-school and elementary teachers vs. other professionals and technicians



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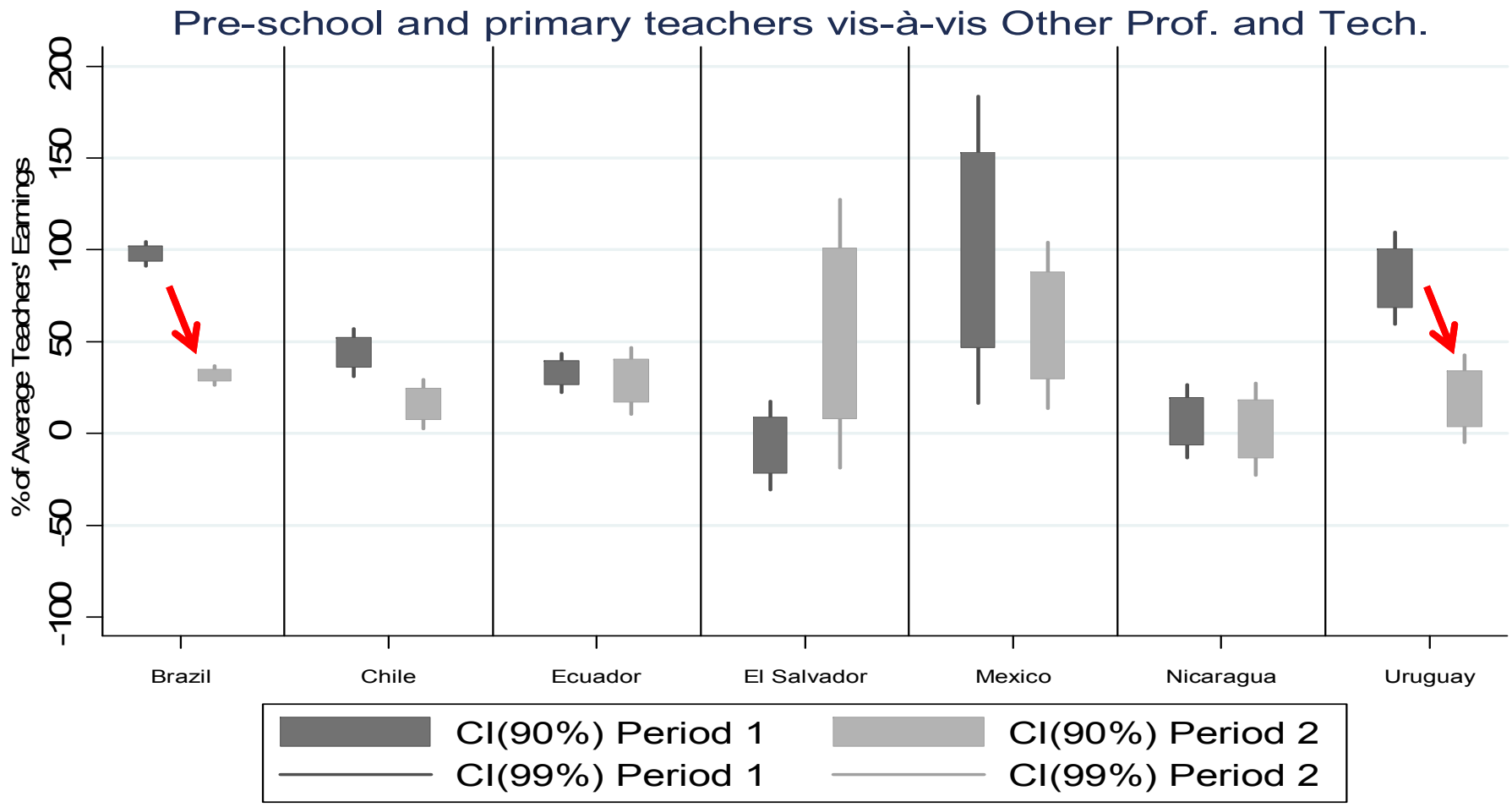
The earnings gaps: pre-school teachers vs. other professionals and technicians



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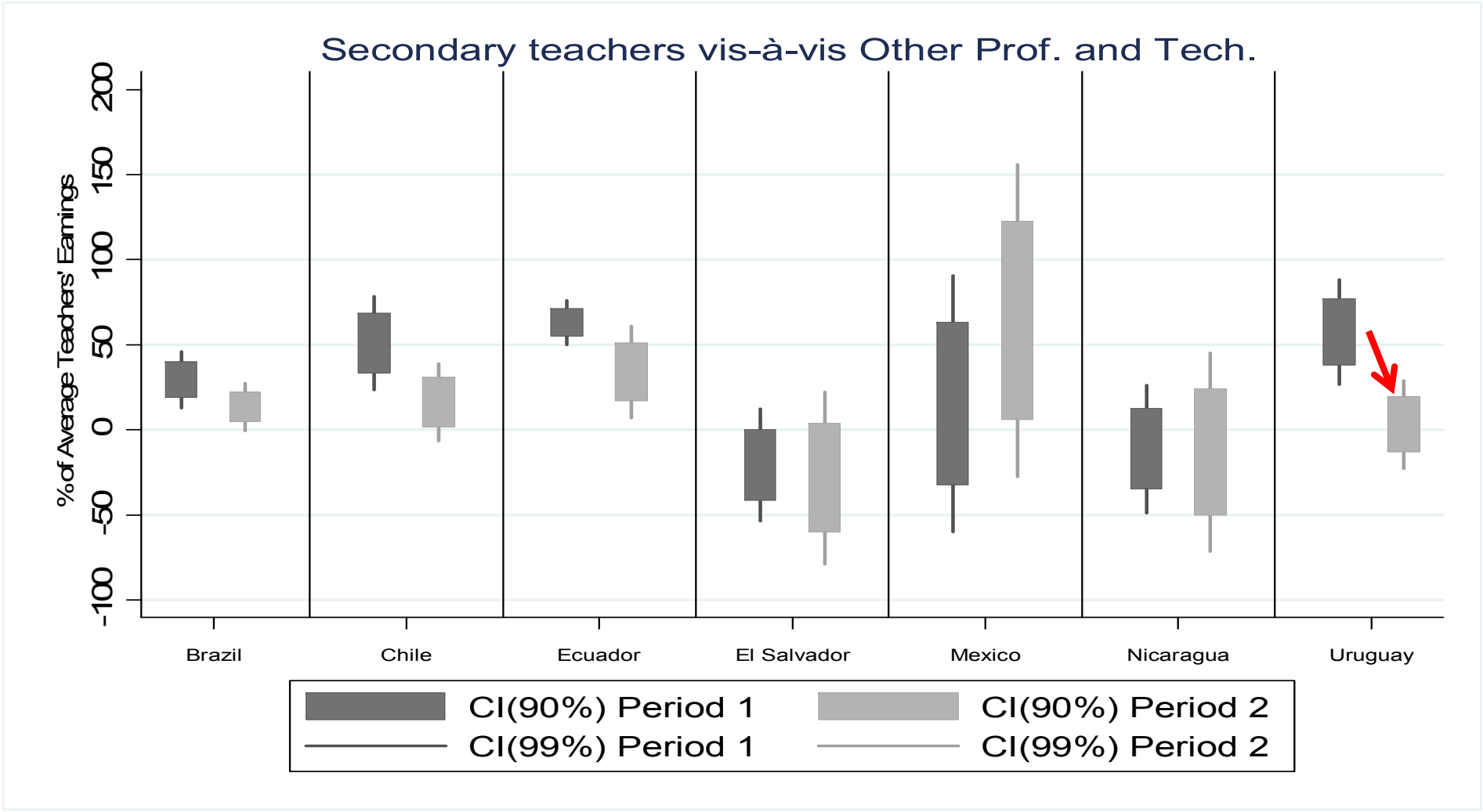
The earnings gaps: secondary teachers vs. other professionals and technicians



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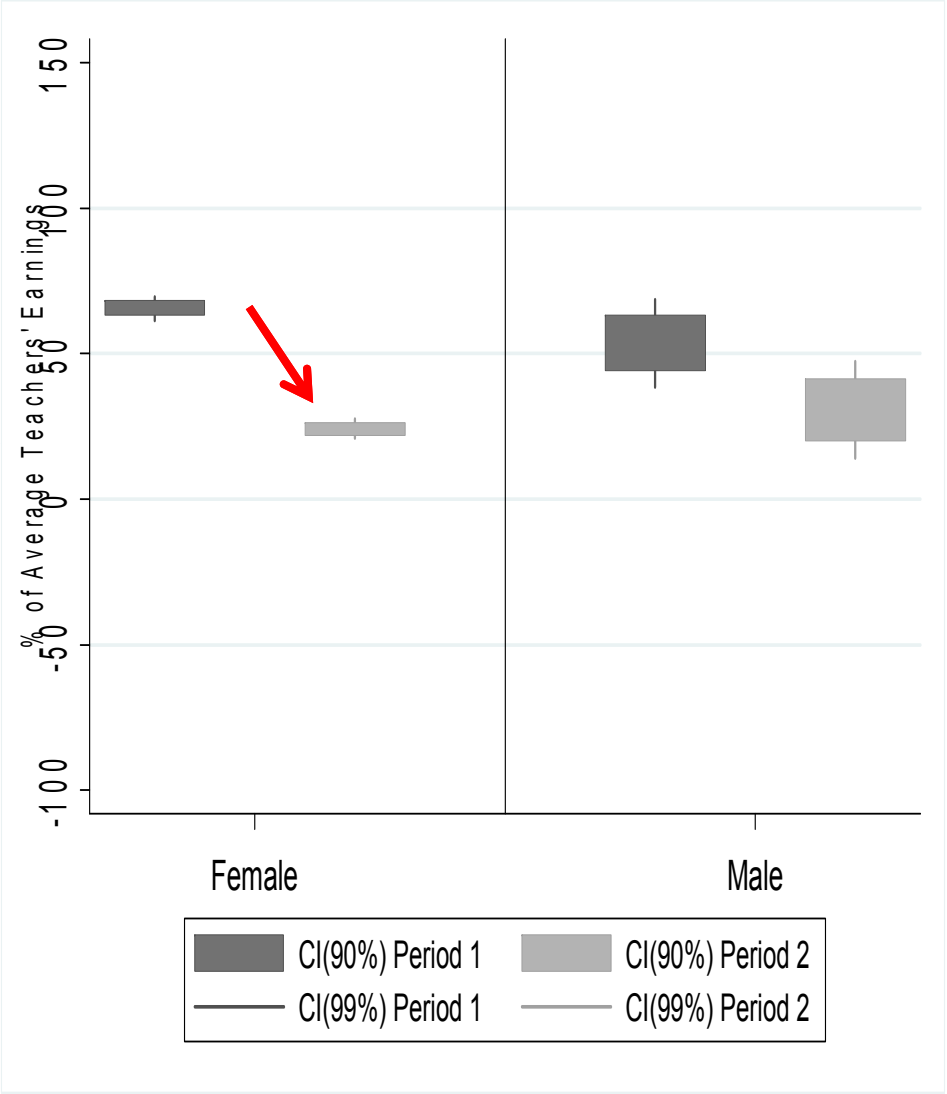
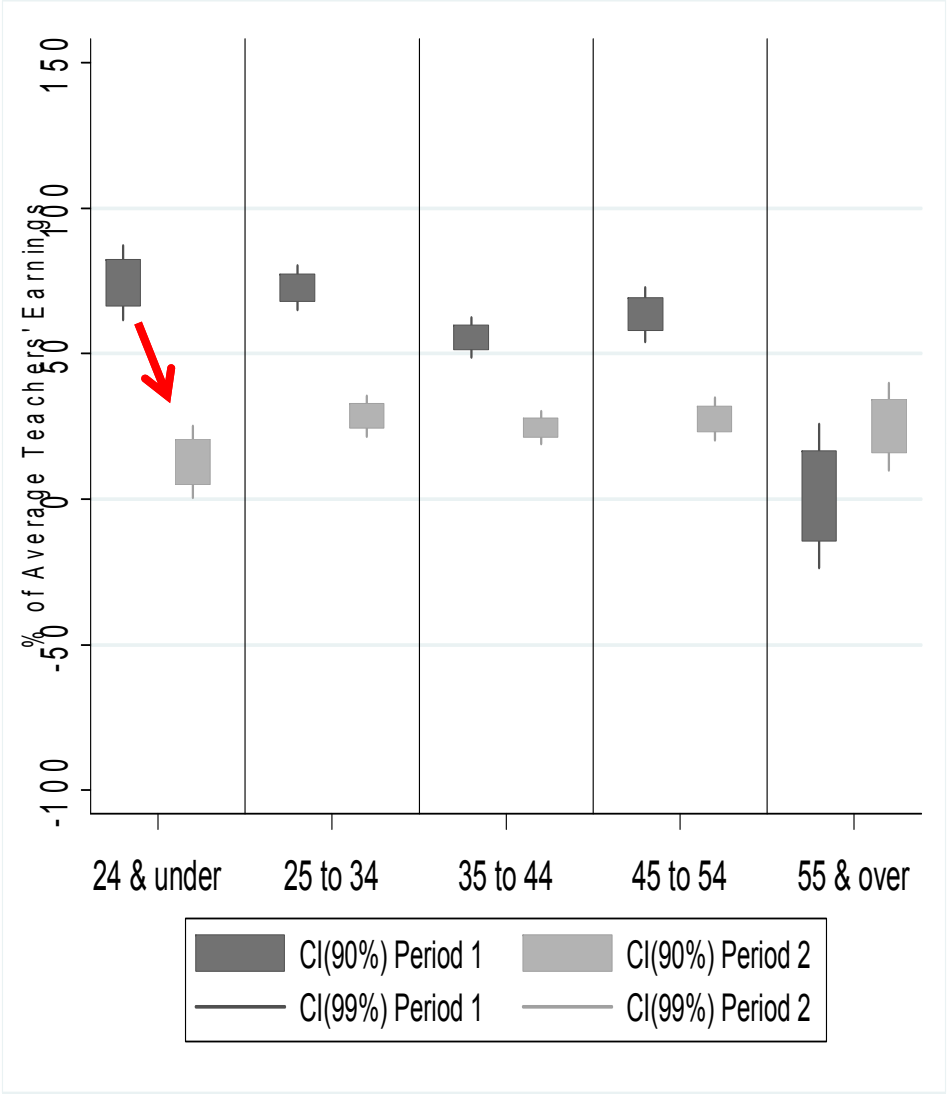
Distribution of the unexplained differences (1)





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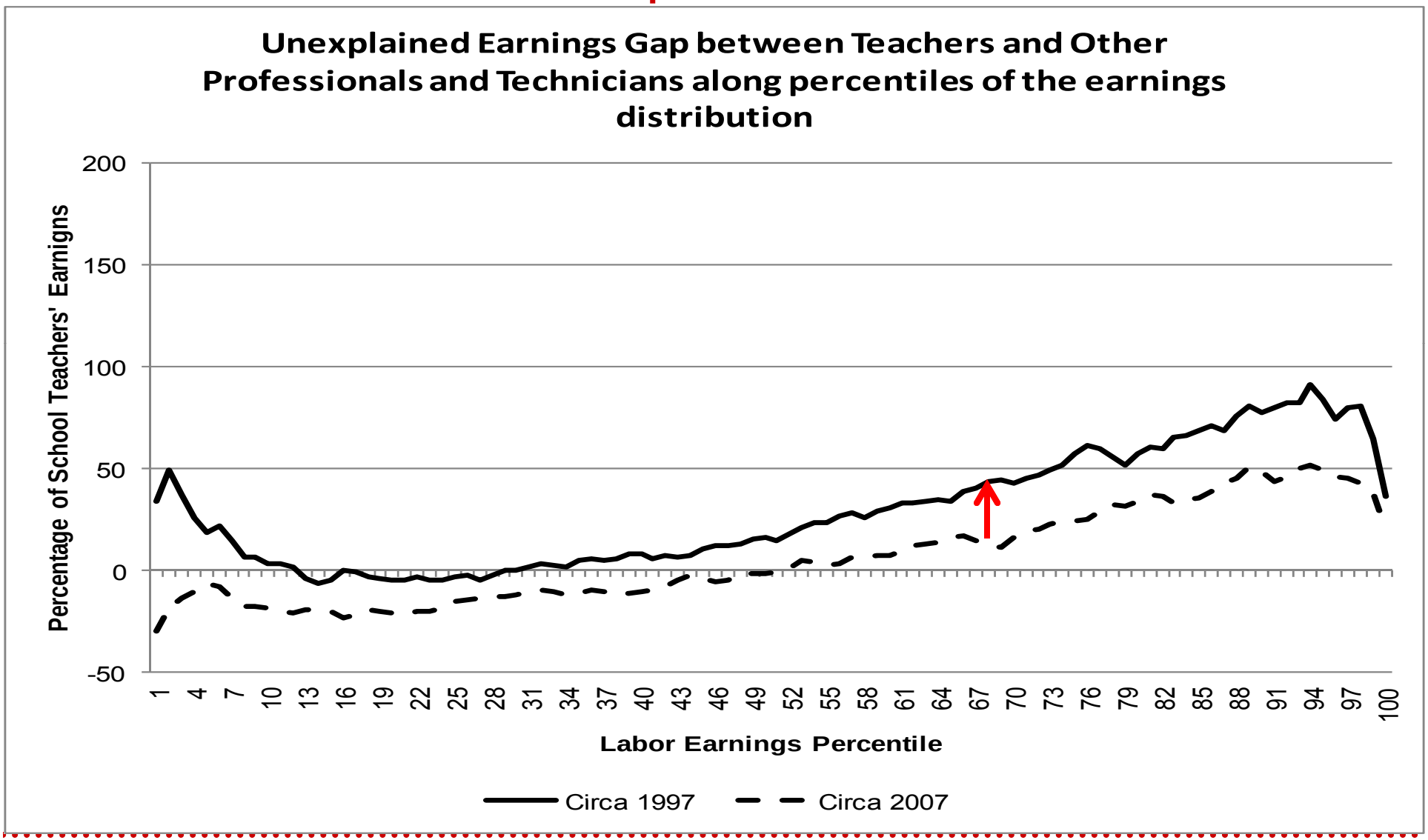

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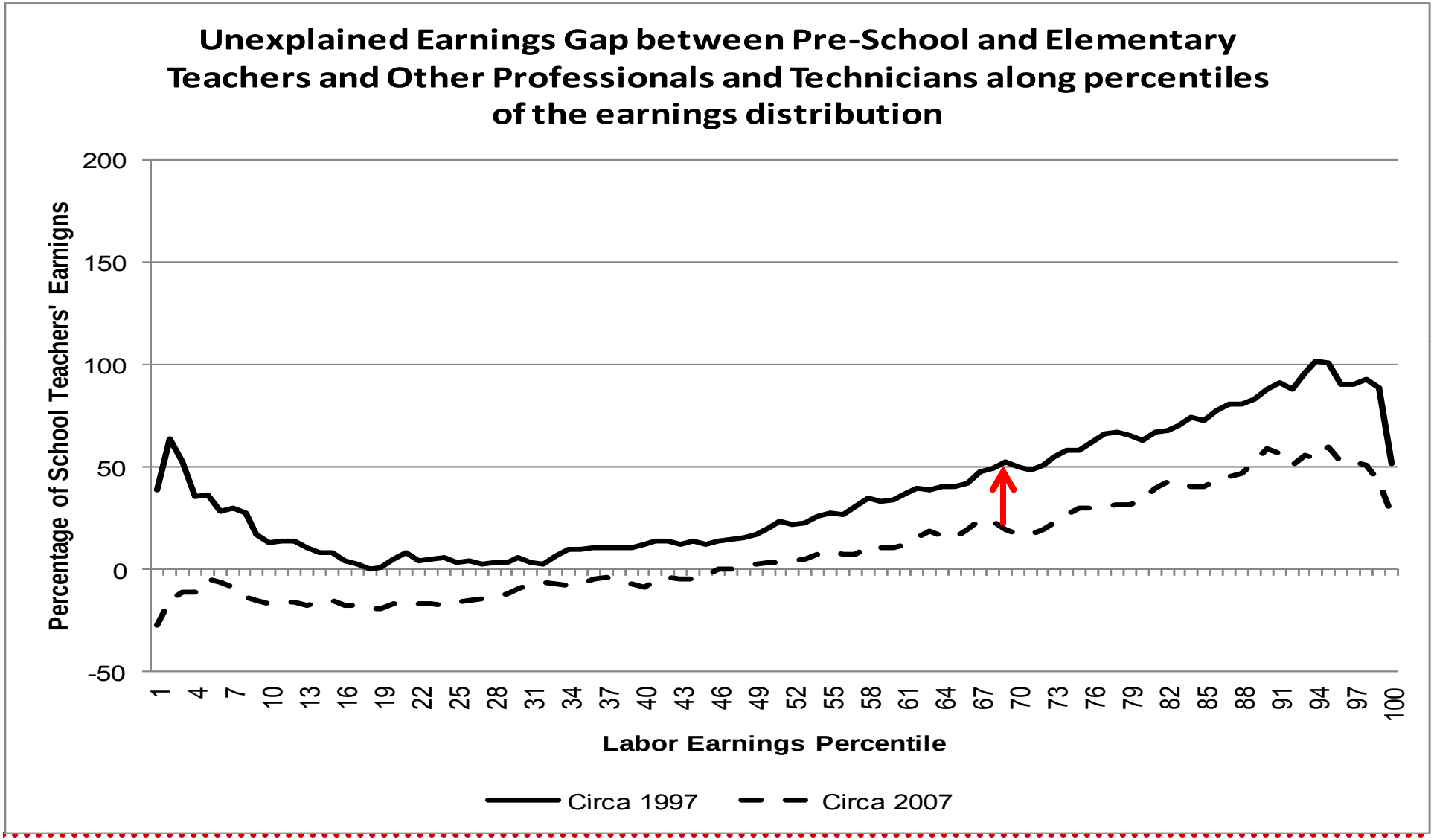

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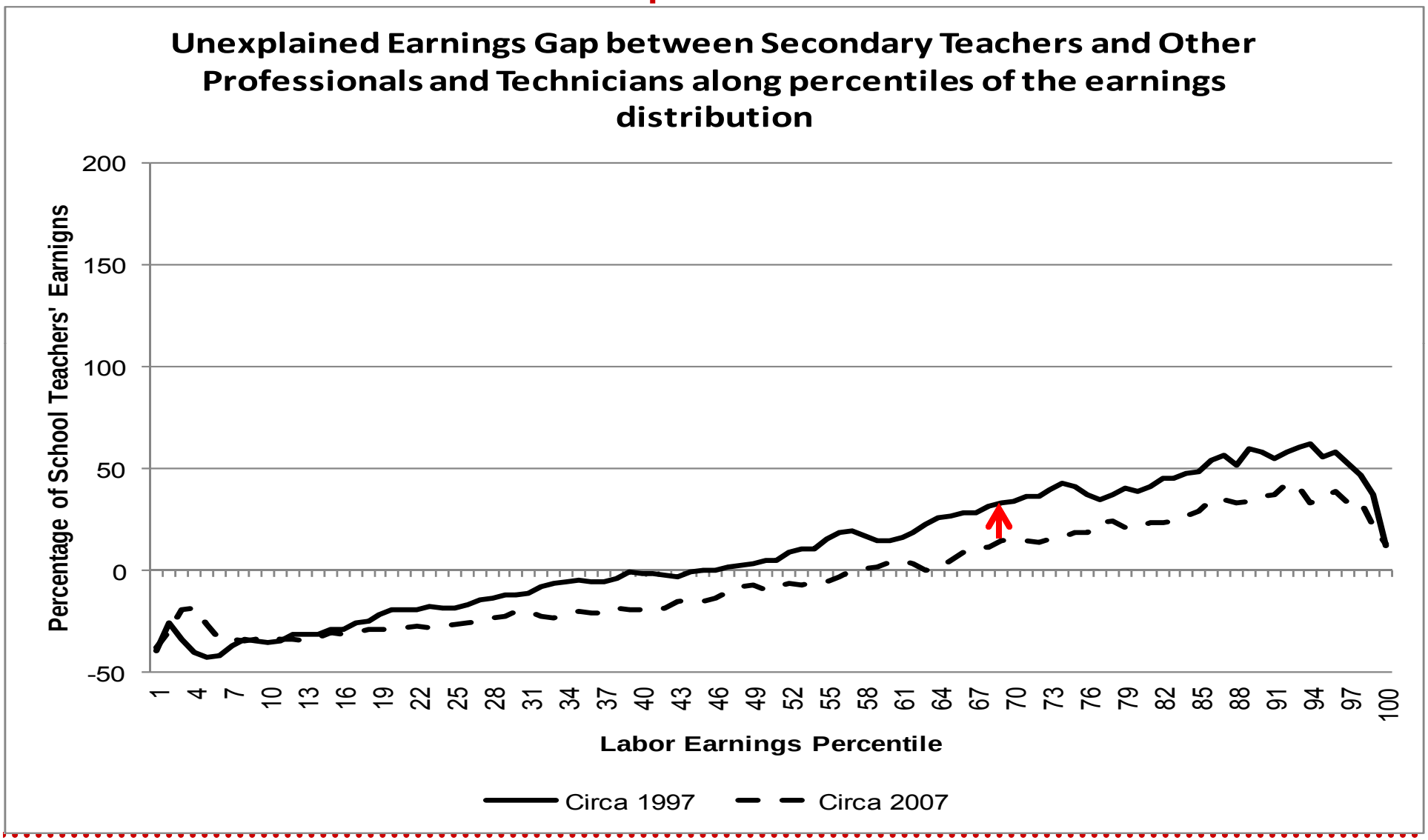

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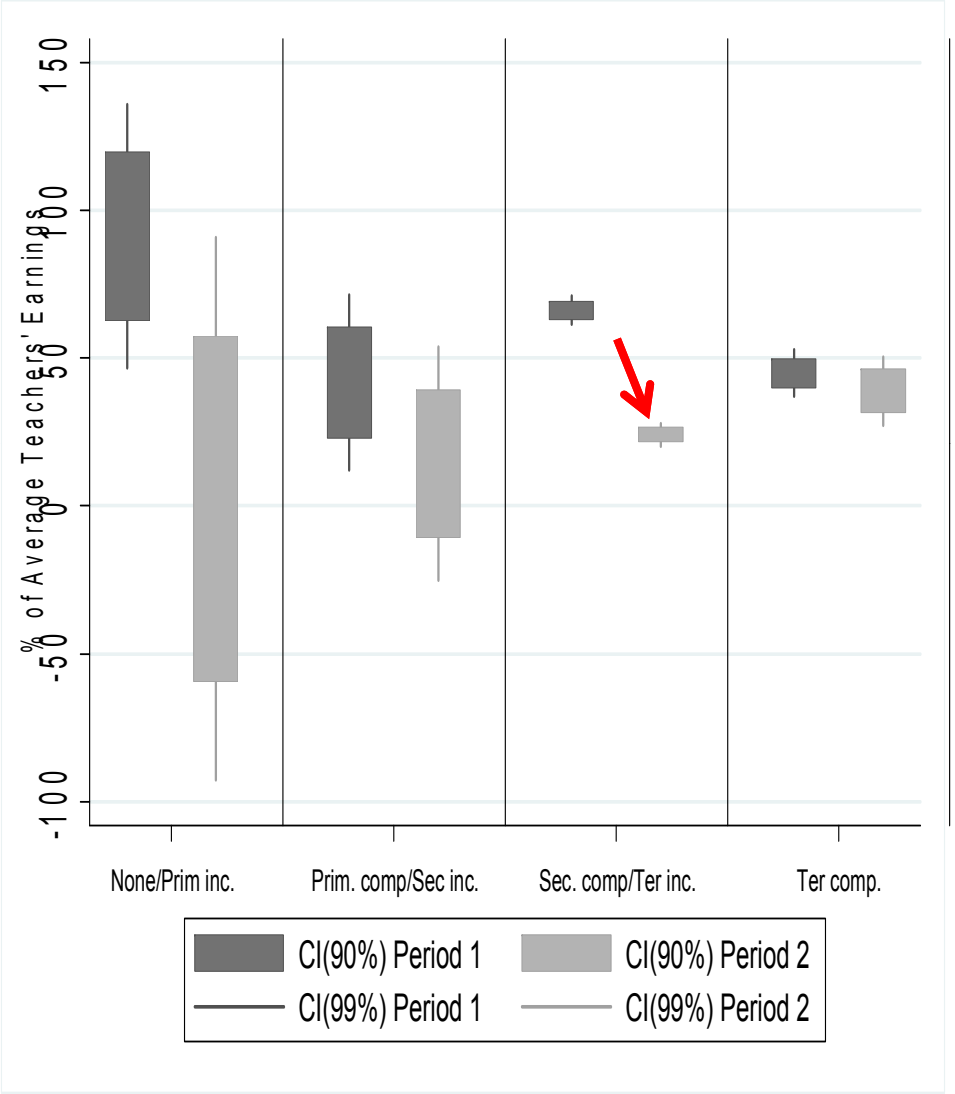
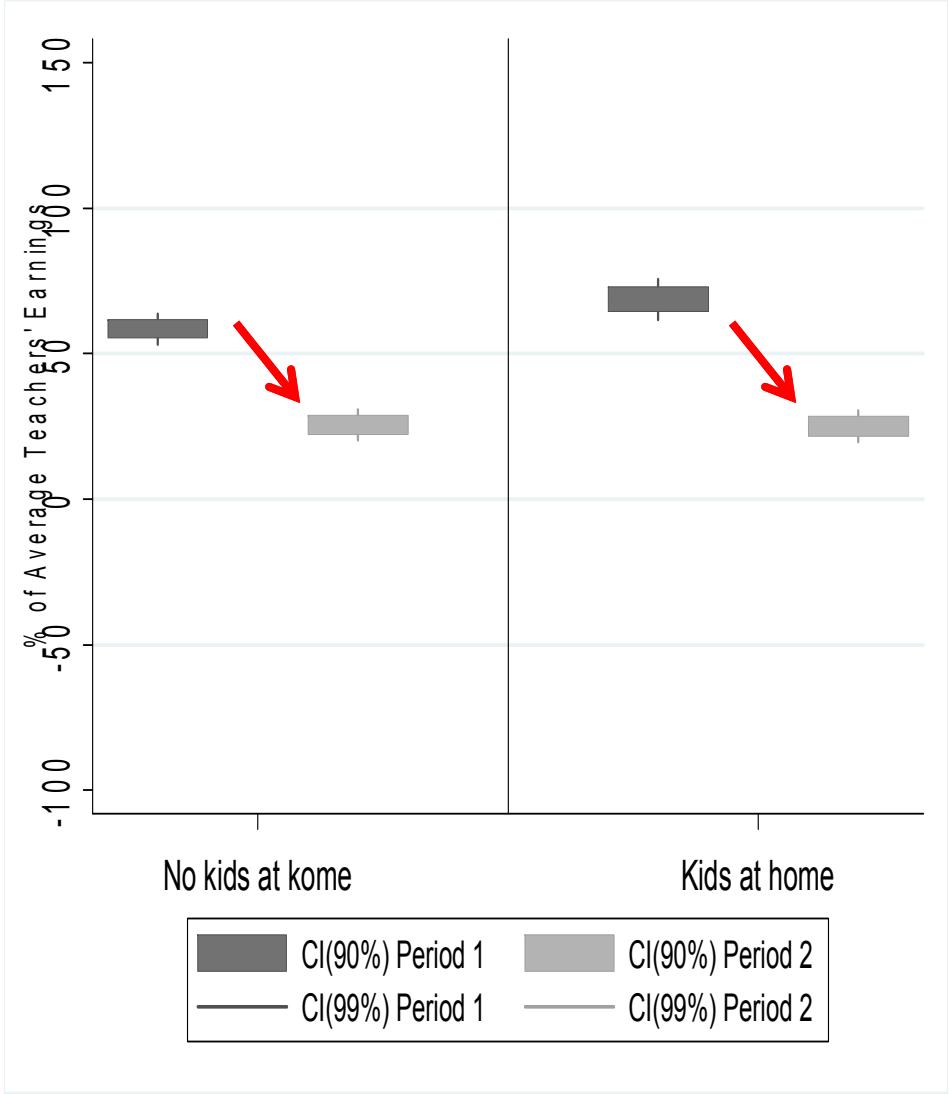
Distribution of the unexplained differences (2)





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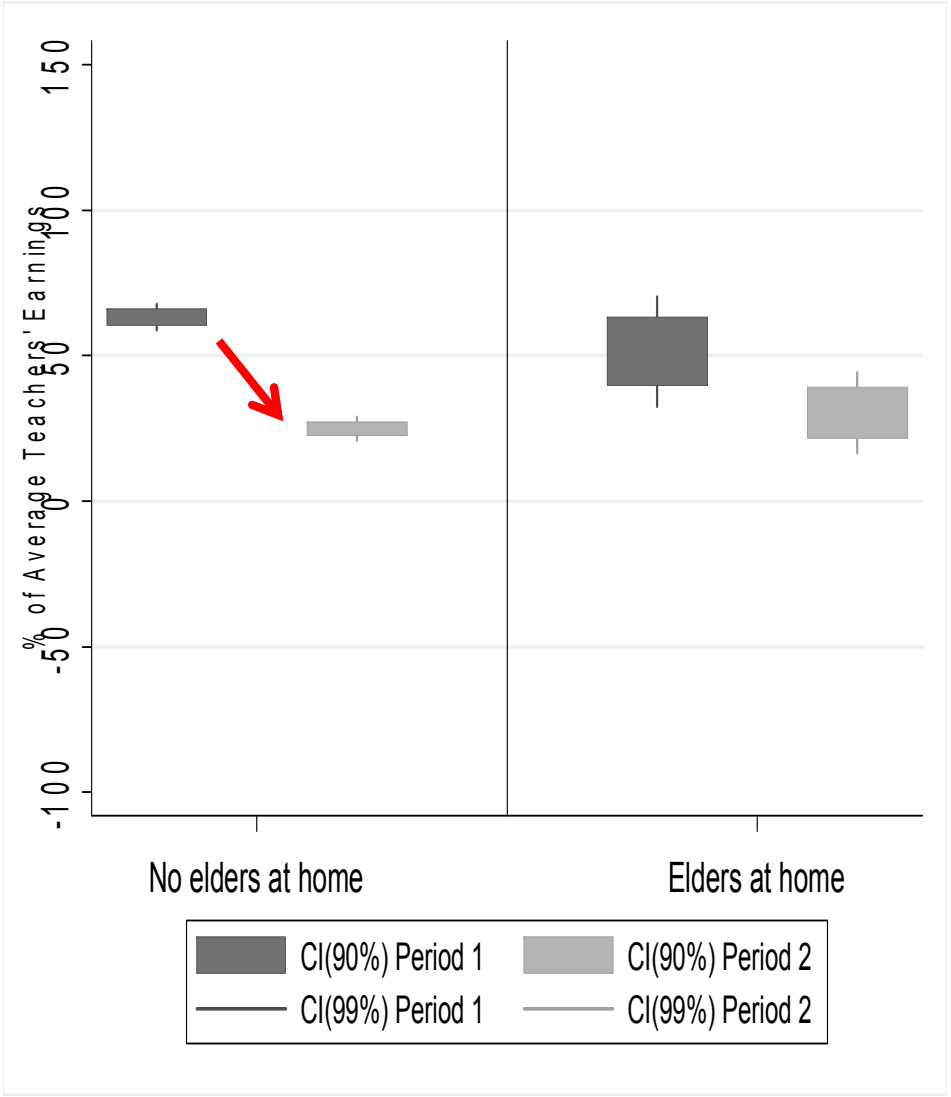
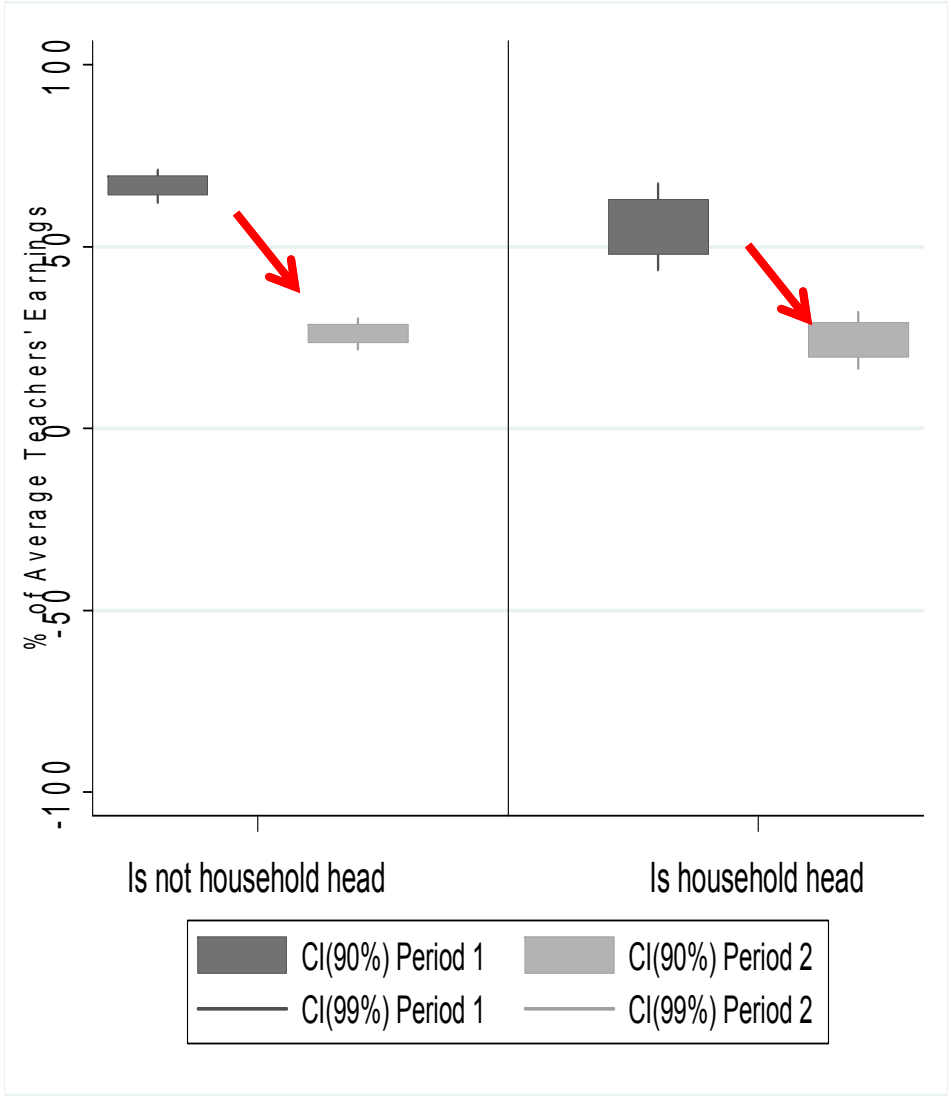
Distribution of the unexplained differences (3)





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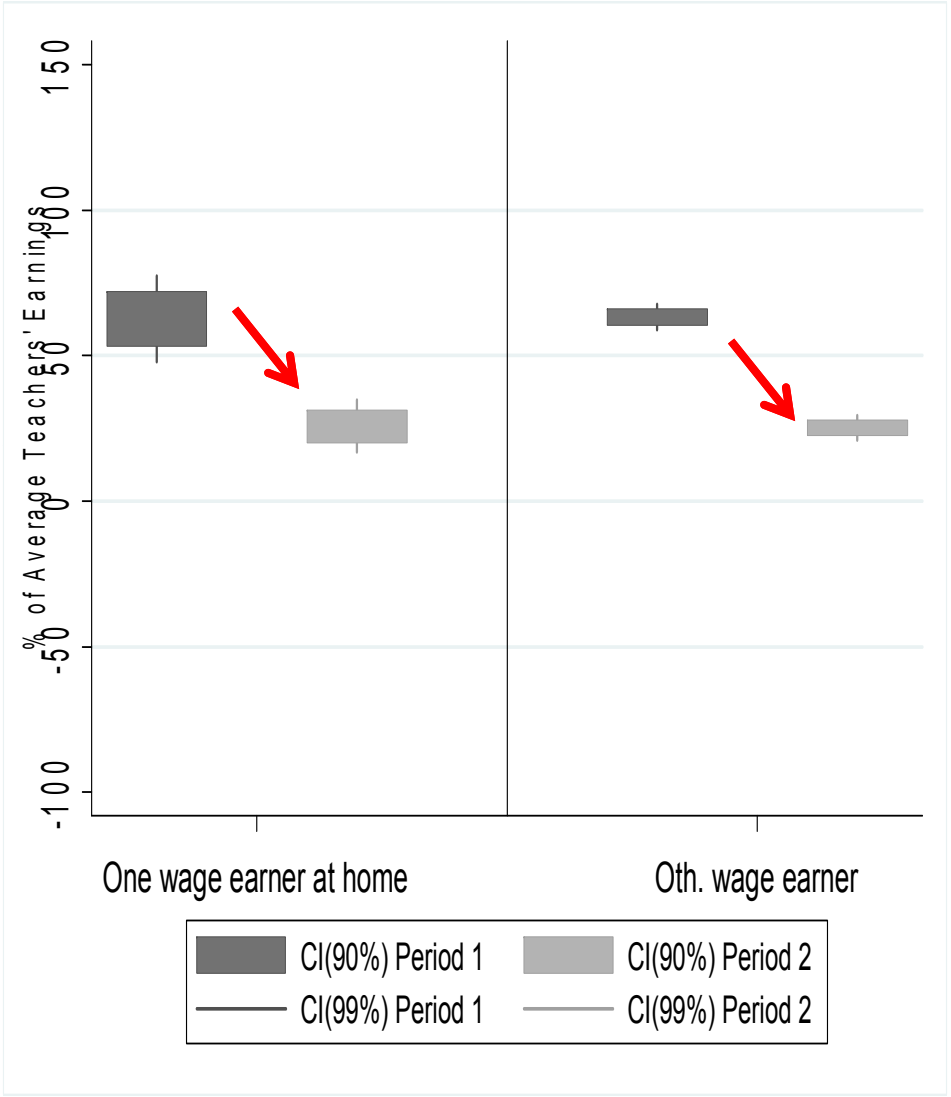
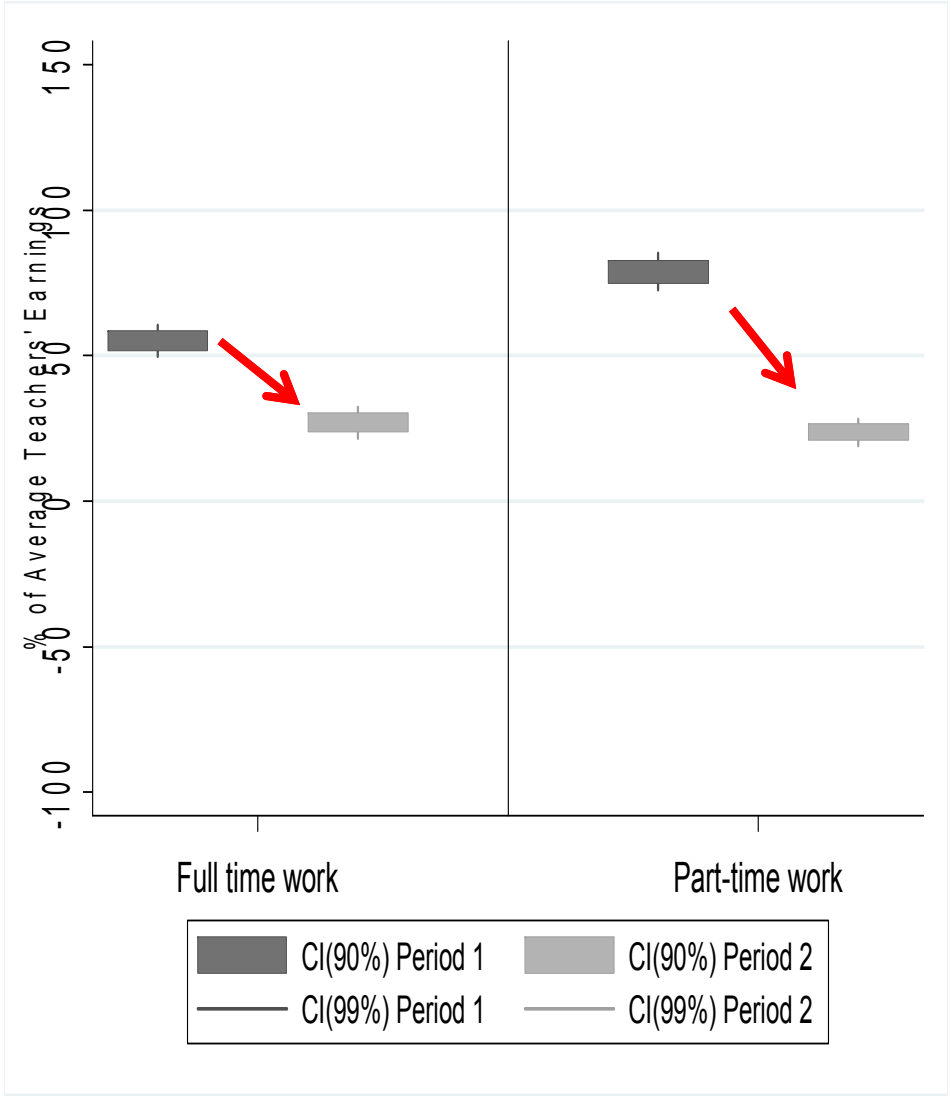
Distribution of the unexplained differences (4)





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Summarizing

- Teachers earn between 30% and 70% less than their peers (the situation used to be worse a decade ago)
- The underpayment persists even after accounting for two important compensating differentials: job schedules and vacation periods
- The underpayment of more pronounced among older workers, those highly educated and part-timers
- Still, behind the underpayment it is likely the case that there are important differences in abilities…

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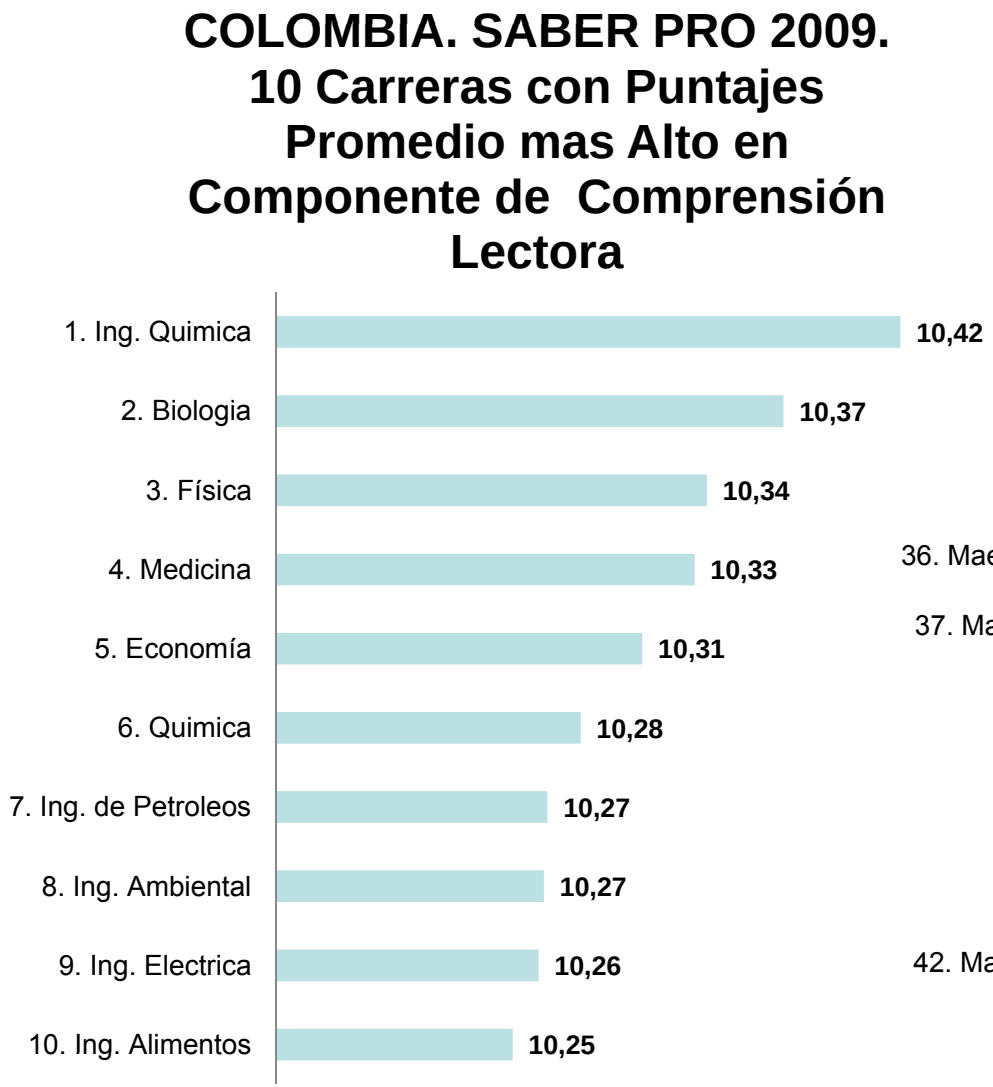
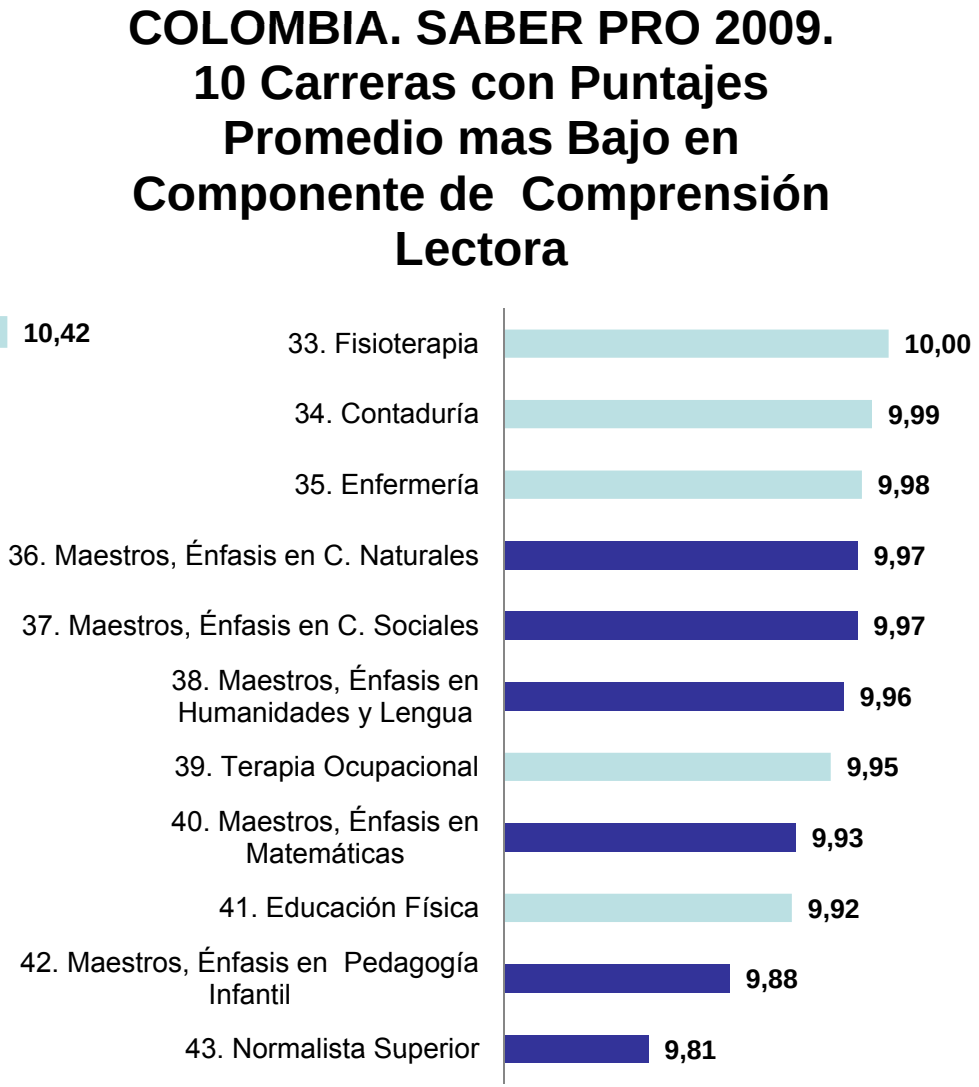
Colombian new teachers and reading skills





Fuente: Instituto Colombiano para la Evaluación de la Educación (ICFES)

Nota: Las barras de color rojo corresponden a las carreras relacionadas a la formación de maestros de escuela

* Los Normalistas Superiores se forman para cumplir actividades docentes a nivel de primaria y secundaria

MUCHAS GRACIAS

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