

# Strengthening skills for a knowledge-intensive economy: The Case of Costa Rica

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## Abstract

This paper estimates the job market benefits of speaking English fluently for Costa Rica, a small open developing economy. We use the country's cross sectional household surveys from the 2005-2016 period, which provide labor market information and household characteristics for a sample of households representative at a national, regional and by type of area level. Our estimates show that for all wage earners, English speakers have a monthly wage an 18.8% higher than their non English-speaking counterparts. While for private sector workers, the premium estimated is of 25%. Furthermore, this wage premium does not have a declining trend overtime as one would expect in competitive labor markets. We also found that English speakers work less hours per week, have a higher chance of getting paid vacations, paid sick leave and a thirteenth wage with respect to non-English speakers. Thus showing that proficiency in a language accrues higher wages and better labor conditions.

## Introduction

Measuring job market skill premiums has always been of great interest for labor economists and public policy professionals. Acquiring relevant job market skills not only grants higher wages, but also better quality jobs and a more productive economy overall. Furthermore, more open and globally integrated economies require language skills to be granted access into new markets and be competitive in them. The literature that measures the benefits of bilingualism points out that English is the foreign language with the highest premium. This is no surprise, as it is the global language for international relations, science, communications and international commerce (Crystal, 2003; Ku and Zussman, 2010). By the same token, it was estimated that in the early 2000s a third part of the world was exposed routinely to English and a quarter of the world -approximately 1.5 billion people- was competent in the language (Crystal, 2003). Therefore, proficiency in English in particular, is more of a necessity than an option.

The bilingualism job market premium research can be classified in three broad categories: i) measuring the returns to immigrants of learning the host-country language (Fry and Lowell, 2003; Chiswick, 1998; Dustmann and van Soest, 2002), ii) the value for local workers of speaking a foreign language (Saiz and Zoido, 2005; Stöhr, 2015), iii) and the returns to different languages in multilingual countries and regions (Rendom, 2007; Cattaneo and Winkelmann, 2003; Vaillancourt, 1996 ; Vaillancourt et al., 2007). However, the empirical evidence has hitherto shown mixed results in developed countries. On the one hand, it has been found that for United States, there are no returns on English skills once one controls for education attainment (Fry and Lowell, 2003), and that there are small salary returns to speaking a second language for native college graduates (Saiz and Zoido, 2005). Conversely, in Europe the literature shows substantial positive wage effects for foreign languages (Ginsburgh and Prieto-Rodriguez, 2011; Toomet, 2011; Stöhr, 2015).

On the other hand, there is little evidence of job market benefits of bilingualism for developing countries, mainly due to data limitations and lack of pertinent surveys. For instance, it has been found that speaking English has positive wage returns in Turkey (Di Paolo and Tansel, 2015)), India (Azam et al., 2013)), and South Africa (Casale and Posel, 2011)). For indigenous Spanish speaking population in Bolivia (Chiswick et al., 2000), it has been found that they are discriminated in the labor market, thus accruing a negative wage premium.

In this paper, we study the job market benefits of speaking English fluently for Costa Rica, an open small economy with high development indicators, and one of the most politically stable countries in Latin America. Over the last decades, the country has changed its growth strategy from an import substitution model in the sixties and seventies, to an open economy that has made foreign direct investment (FDI) the principal engine of the country's economic dynamism. As a result of that new development path, all governments had invariably committed to attract knowledge-intensive firms and foster the tourism sector that mostly demand English-speaking labor. Hence, these relatively recent labor demands have required training of the labor force through different educational public policies (OECD, 2012), but, in a large scale, it is still a voluntary decision to acquire full competence in English speaking skills. In addition, the main commercial partners of Costa Rica have not significantly changed over time, but the requirement of foreign language skill has. Thus, the demand of foreign language -specially English- coincides when the country made foreign direct investment (FDI) the principal engine of the country's economic dynamism, and fostered the integration into the world economy through the attraction of knowledge-intensive firms in the manufacturing, services and tourism sector.

Furthermore, contrary to the European Union or the United States, most of the immigration that Costa Rica experiences is from Central American countries that share Spanish as an official language, so the cultural diversity that migration creates, does not contribute for bilingual abilities in the population. Therefore, any job market benefit associated with proficiency in English is due

to labor market demands and skill compensations, and not due to idiosyncratic shocks or specific population dynamics. Thus making Costa Rica a suitable country to measure the labor market benefits of speaking English fluently as a second language in a globalized developing economy.

We extend on existing literature firstly by measuring the benefits of bilingualism in the labor market in a wider perspective. To the best of our knowledge, all studies dedicated to measuring the job market benefits of knowing additional languages focus in estimating wage premiums, whereas we also estimate the change in the worker's job conditions through variables such as the total hours worked per week and whether the person receives paid vacations and sick paid leave. Secondly, our dataset is compromised of twelve annual household surveys that are representative at national and regional level, which also entail a non-censored sample of workers of Costa Rica. Therefore, we can determine how these effects have changed over time for more than a decade, while allowing us to control for various potentially confounding factors and to split samples by sex, area and levels of education attained. In a nutshell, our dataset allows for a more rigorous analysis of the bilingualism premium, since not all the labor benefits are given as a salary.

Our results show that there is a very significant wage premium associated with fluently speaking English in Costa Rica. For the whole period of study, we estimate the English-speaking premium to be of a 18.8% for all wage earners and of 25% for private sector wage earners. This premium ranges anywhere between a 12.3% and 23.4% for all wage earners and a 19.2% and 31.1% for private sector wage earners for any year considered in this study. Furthermore, this premium does not have a declining trend over time as one would expect in competitive labor markets. This wage premium is robust and significant for different model specifications and sample splits. We find that fluently speaking English also lowers weekly worked hours, and raises the probability of getting paid vacations and paid sick leave. Although these effects are not robust for every year in our sample, the average effect during the whole period is significant and robust.

## Data

All of our data comes from Costa Rica's household surveys from 2005 to 2016, which are the years where it was enquired whether each member of the household speaks English or not. The data collection method is through in person interviews, and it is focused on collecting -among other characteristics- for all the members of the household: income, access to education and social insurance of its occupants, employment situation and working conditions. These surveys are conducted at July of each year, with a sample of over 10.000 households per year that is representative at a national and regional levels. For this particular study, we focus on the household and employment characteristics of the surveys, such as income earned after taxes, wage after taxes, age, industry where each person works, whether a person's job is in the public or private sector, level of education, zone of residence, number of members in the household, level of poverty, possession of durable consumer goods, access to public services and government programs, among many other variables.

Below in table 1, we display the number of total observations used from household survey in our samples. In the "Total" column we first show the original number of observations in each household survey. The second column, "Selected sample", displays the number of total observations left from a first selection round. Observations out of the 25 to 65 age range, observations that have no education, workers that are owners of firms, work in domestic chores or were not paid, and unemployed people that do not work because they are either retired or have a disability that do not allow them to work.

Additionally, we dropped all of the workers that worked less than 30 and more than 60 hours per week in their main occupation for two reasons. Firstly, this range of hours corresponds to the people that are working at least three quarters of a full time and at most full time and a half per

week. We keep workers in this range of hours workers per week to minimize non-controllable biases. For instance, some people might decide to work half time or less because they decided simply do not want to work more, and not necessarily because their job requires them to work this amount of hours. Another possibility is that some people might work very few hours because in their main occupation they have no choice but to take a job in such conditions. Similarly, one does not know if someone works more than 60 hours per week because said person chooses to do so or because his or her job demands it. Said people could either be exploited workers or workaholics. Therefore by bounding the hours per week worked, we can be more certain that we are comparing people with more similar characteristics and incentives.

The last two columns show the two samples used in our econometric estimations. The third column, “All wage earners”, only includes the working population that earns a salary. This first sample includes every worker that earns a wage, regardless of the sector of the worker’s job. Thus, self-employed and unemployed people are eliminated from the previous column. The last column, “Private sector wage earners”, only considers the wage earning population that works in the private sector of the economy. This separation is analytically relevant, since private sector wages reflect more closely the market value of the language premium. Conversely, most of the salary compensations of the Costa Rican public sector are defined by strict set of rules that do not vary significantly through time.

**Table 1**  
Observations per year and samples

Year	Total	Selected sample	All wage earners	Private sector wage earners
2005	43682	7447	6102	4395
2006	45139	7943	6363	4508
2007	46278	8253	6718	4846
2008	46101	8270	6723	4937
2009	48071	9072	7397	5223
2010	41184	7725	6173	4321
2011	40860	7950	6465	4547
2012	3990	7873	6413	4571
2013	38779	7606	6220	4314
2014	38399	7888	6597	4633
2015	37291	8135	6934	5039
2016	37006	8082	6929	5057
<b>Total</b>	<b>466780</b>	<b>96244</b>	<b>79034</b>	<b>56391</b>

Source: Authors’ estimates using household surveys 2005-2016.

The independent variable of main interest is comprehensive English competence. An individual is considered competent exclusively when they speak, read and write English thoroughly. If the person is not proficient in one of the characteristics mentioned above, is not considered to dominate the language adequately. Additionally, the household surveys do not allow for different levels of English proficiency; however, this does not undermine our results given their magnitude and statistical significance. Whether it is that a person overstates or understates his or her level of English, this would only lower the magnitude of the estimated English premium. Thus, our results would be at worst, lower bound estimates of the real magnitude of the English premium.

In this research we consider 5 dependent variables on which we estimate the effect of speaking English fluently: after tax wage, hours worked per week, whether the person receives a thirteenth wage<sup>1</sup> at the end of the year, whether the person receives paid vacations from his or her work and

<sup>1</sup>The “thirteenth wage” (known in Spanish as “aguinaldo”), is an economic benefit of an inalienable character that Costa Rican legislation grants to all workers of the public and private sector, and consists of remuneration given once a year which is equivalent to one month’s salary. All regular employees, if they have accumulated a year of service, are entitled to receive the benefit in full, or partially, according to the months they have labored.

whether the person can get sick paid leave from his or her work. For the after tax wage, we only considered the wage from the main occupation for each individual after paying for social security and personal income tax. In the household surveys, this wage is presented in current Costa Rican colones. In order to conduct across time comparisons, we have deflated each wage to express them in constant Costa Rican colones of June of 2015, which is the base year and month of the latest estimates of Costa Rica's price consumer index. Then, we converted these constant colones to constant American dollars by using the exchange rate at the end of June of 2015.

As for hours worked per week, each household survey records the usual amount of hours a person dedicates to his or her primary and secondary occupation. For our estimations, we only consider the weekly hours dedicated to the main occupation. For the rest of the variables, the household surveys explicitly indicate whether or not each worker gets paid vacations, sick leave and the thirteenth wage in his or her main occupation. Therefore, its use for our purposes and interpretation is straightforward.

In addition, we considered a set of independent variables that control for confounding factors that affect our dependent variables of interest. More specifically, we consider the sex, age, type of area of residence -urban or rural-, maximum level of education attained, the current region of residence and the household survey from which each observation was extracted. We also consider the migrant condition of each individual, where each observation is either one of the three following possibilities: i) Non-migrant, which is a person that lives in the region where he or she was born, ii) Internal migrant, which is a person that was born in a different region than the one where he or she currently resides, and iii) International migrant, the person was born in a different country. Table 2 displays the descriptive statistics for the two samples used in this research. For each sample, we show the mean value of each dependent and independent variable for English speakers and non-English speakers, and the difference of means for each variable along with its significance.

**Table 2**  
Summary statistics

	All wage earners			Private sector wage earners		
	English speakers	Non-English speakers	Difference	English speakers	Non-English speakers	Difference
<b>Dependent Variables</b>						
After tax wage	1515.36	798.59	716.77***	1404.25	619.61	784.64***
Hourly wage	33.72	17.36	16.36***	30.65	12.99	17.66***
Hours worked per week	45.77	47.33	-1.55***	46.55	48.29	-1.73***
Thirteenth wage	74.2%	64.7%	9.4%***	73.0%	61.0%	12.0%***
Sick leave	71.5%	59.4%	12.0%	69.9%***	54.4%	15.5%***
Vacations	73.1%	61.4%	11.7%	71.7%***	56.7%	15.0%***
<b>Personal characteristics</b>						
Women	39.9%	33.4%	6.5%***	34.8%	27.1%	7.7%***
Age	35.79	39.32	-3.53223***	34.62	38.30	-3.6818***
Rural area	25.0%	47.9%	-22.9%***	24.6%	51.8%	-27.3%***
Private sector worker	68.4%	71.7%	-3.3%***			
<b>Highest level of education attained</b>						
<b>Primary</b>						
Incomplete	0.5%	11.2%	-10.8%***	0.7%	15.1%	-14.4%***
Complete	2.6%	30.3%	-27.7%***	3.4%	36.8%	-33.3%***
<b>Secondary</b>						
Incomplete academic	6.0%	17.1%	-11.1%***	8.0%	19.9%	-12.0%***
Incomplete technical	13.8%	13.4%	0.4%	17.0%	13.0%	4.0%***
Completed academic	0.4%	0.6%	-0.2%	0.5%	0.7%	-0.2%
Completed technical	2.1%	2.1%	0.0%	2.3%	1.9%	0.4%***
<b>Tertiary</b>						
Postsecondary education	61.5%	22.7%	38.8%***	59.2%	12.1%	47.1%***
Graduate education	13.2%	2.6%	10.6%***	8.9%	0.6%	8.3%***
<b>Migrant condition</b>						
Non-migrant	47.6%	52.5%	-4.9%***	45.6%	50.5%	-4.9%***
Internal migrant	45.0%	38.4%	6.6%***	45.1%	37.6%	7.5%***
International migrant	7.4%	9.1%	-1.7%***	9.3%	12.0%	-2.6%***
<b>Region of residence</b>						
Central	71.9%	52.3%	19.6%***	75.7%	52.8%	22.9%***
Chorotega	6.0%	10.1%	-4.1%***	5.8%	9.1%	-3.3%***
Central pacific	5.8%	9.0%	-3.2%***	5.9%	9.1%	-3.2%***
Brunca	4.5%	9.9%	-5.5%***	3.0%	9.2%	-6.2%***
Atlantic huetar	6.5%	10.4%	-3.9%***	4.5%	11.6%	-7.1%***
North huetar	5.3%	8.3%	-3.0%***	5.1%	8.2%	-3.2%***
<b>Year of survey</b>						
2005	7.2%	7.8%	-0.6%***	6.8%	7.9%	-1.2%***
2006	7.4%	8.1%	-0.7%***	7.0%	8.1%	-1.2%***
2007	8.1%	8.6%	-0.5%	8.1%	8.7%	-0.6%
2008	7.5%	8.6%	-1.1%***	7.5%	8.9%	-1.4%***
2009	9.0%	9.4%	-0.4%	9.2%	9.3%	0.0%
2010	7.4%	7.9%	-0.5%	7.2%	7.7%	-0.6%
2011	7.6%	8.3%	-0.7%***	7.3%	8.2%	-0.9%***
2012	7.1%	8.2%	-1.1%***	7.2%	8.2%	-1.1%***
2013	7.2%	8.0%	-0.8%***	6.9%	7.7%	-0.9%***
2014	9.1%	8.2%	0.8%***	9.1%	8.1%	1.0%***
2015	11.2%	8.5%	2.8%***	11.9%	8.6%	3.4%***
2016	11.2%	8.4%	2.8%***	11.9%	8.6%	3.3%***

Source: Authors' estimates using household surveys 2005-2016.

Notes: \*\*\*, \*\* and \* represent significance at 1%, 5% and 10% respectively.

In comparison to non-English speakers, English speakers have higher after tax wages<sup>2</sup>, higher hourly wages, they work less hours per week, a higher percentage of them receive a thirteenth wage, and are offered sick leave and vacations in their work. Also with respect to non-English speakers, English speakers are in average younger, a higher percentage of them are women and live in urban areas, and a lower percentage of them work in the private sector.

As for education, the majority of English speakers have attained some form or higher education, whereas most of non-English speakers have attained at most primary education. The composition of the migrant population on each sample is similar, where the majority of the observations are people that live in the region where they were born. This proportion of the observations is closely followed by internal migrants, which are people that at the time of the survey live in a different

<sup>2</sup>All wages are expressed in constant US dollars of June 2015.

region from the one where they were born. And lastly, the proportion of international migrants is lower for English speakers than for non-English speakers in the two samples considered in this research. The fifth panel displays the region of residence at the time of the survey for each observation, where for each sample and group of observations, most of the observations resided in the central region of Costa Rica at the time of the survey. And lastly, the final panel displays the distribution of all of the observations by the survey from which they were extracted.

## Econometric model

Our estimates are based on the following econometric model:

$$Y_{isg} = \alpha + \beta English_i + \delta X_i + \rho Migrant_i + \tau Education_i + \lambda Region_i + \kappa_s + \pi_g + \varepsilon \quad (1)$$

Where  $Y_{isg}$  are the set of dependent variables for each observation  $i$ , extracted from the household survey  $s$  and was born in the year  $g$ . Namely, our dependent variables are: the natural logarithm of the after tax wage<sup>3</sup>, the number of hours worked per week, a dummy variable indicating whether or not the observation received a thirteenth wage at the end of the year, a dummy variable indicating whether or not the worker receives sick paid leave from his or her job and a dummy variable indicating whether or not his or her work grants paid vacations.  $English_i$  is a dummy variable indicating whether or not the person speaks English fluently, hence  $\beta$  is our estimate for the benefit of knowing English. In the annex, we include a table showing the average wage in constant US dollars in order to translate our  $\beta$  our beta estimates in monetary terms.

$X_i$  is the set of personal characteristics for each observation shown in the second panel of the summary statistics table: sex, age, type of area where the person currently lives and a dummy variable that indicates whether the person is a private sector worker or not.  $Migrant_i$  are dummy variables that indicate the migrant condition, i.e., if the person currently resides in a different region from the one he or she was born or in a different country.  $Education_i$  are dummy variables indicating the highest level of education attained.  $Region_i$  are dummy variables of the region of residence of the observation at the time of the survey. Finally,  $s$  are household survey fixed effects and  $g$  are year of birth fixed effects.

## Results

In figure 1 we show the estimated job market premiums for each year from 2005 to 2016 for the sample of all workers that earned wages and the sample that only considers private sector wage earners for the three dependent variables that yielded statistically significant results for every year. Each point in the figure represents the estimated coefficient for our dependent dichotomous variable that indicates whether a person fluently speaks English or not. All of the estimates include all the control variables discussed in the previous section and all regressions are estimated using robust standard errors.

Our estimates show that there are important and robust job market premiums over time. Furthermore, we find that the premium for private sector workers is higher than the premium for all workers for every year and for each variable. This comes as no surprise since civil servants are scantily rewarded for fluency in a second language in Costa Rica. When considering all wage earners, a fluent English speaker earned in average from 12.9% to 23.4% more than a non-English speaker. For private sector workers, this premium ranged from a 19.2% to 31.1% . Along similar lines, a competent English speaker earned in average between 4.11 and 9.24 additional US dollars

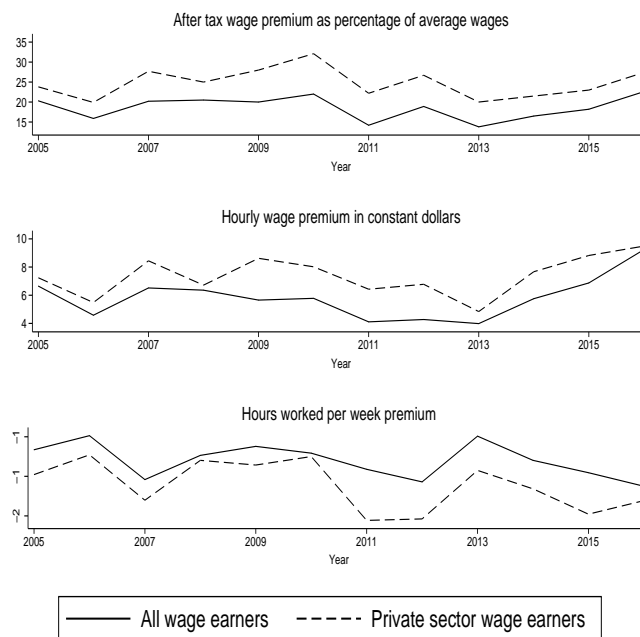
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<sup>3</sup>All wages are expressed in constant US dollars of June of 2015.

per hours with respect to non-English speakers when considering all wage earners, and between 4.84 and 9.49 additional US dollars when considering only private sector wage earners. Finally, a fluent English speaker worked in average anywhere from 0.49 to 1.13 less hours per week than their non-English speaking counterparts when considering the entire sample. Whereas for private sector workers, we found that English speaking ones worked from 0.73 to 1.56 less hours per week than non-English speakers.

In addition to the robustness and notable magnitude of our estimates, we find that there is no clear pattern for any of these premiums over time for either sample. While there are clear peaks and valleys on each series in the figure, they have oscillated around certain values and do not show a decreasing trend over time, as one would expect in competitive labor markets.

**Figure 1**  
Estimated job market premiums English speakers in Costa Rica, 2005-2016



*Notes: all estimates for the after tax wage premium and hourly wage are significant at a 1% significance level. For the hours worked per week premium estimates, most are also significant at a 1% significance level and other at the 5% and 10% significance levels.*

To put these wage premium results in perspective, we quantify these in US dollars in the table 3 below. Our estimates show that in average, fluent English speakers earn in average 118 to 239 more US dollars after taxes with respect to non-English speakers for any given year between 2005 and 2016. Furthermore, the English after tax wage premium is between a 26% and 45% of Costa Rica's minimum wage for any given year and sample considered. This in turn, implies that the English wage premium has been anywhere around 14% and 32% of average wages in Costa Rica.



**Table 3**  
Average after tax wage and English premium in dollars by year

Year	Average wage		English premium		Premium as percentage of minimum wage	
	All sample	Private sector	All sample	Private sector	All sample	Private sector
2005	732.05	617.77	148.61	147.03	33.4%	33.1%
2006	747.29	615.17	118.82	122.42	26.6%	27.4%
2007	771.88	657.13	155.92	182.03	34.4%	40.2%
2008	775.69	654.03	159.02	163.51	34.8%	35.7%
2009	860.61	710.77	172.12	199.02	36.8%	42.6%
2010	880.91	684.50	193.80	219.72	40.1%	45.4%
2011	912.53	687.96	129.58	152.73	26.5%	31.3%
2012	910.10	703.24	172.01	187.77	34.5%	37.6%
2013	938.19	708.68	129.47	141.74	25.9%	28.3%
2014	932.30	732.16	153.83	157.42	29.9%	30.6%
2015	1037.56	838.98	188.84	192.97	35.5%	36.3%
2016	1060.89	845.36	239.76	231.63	44.8%	43.3%

Source: Authors' estimates using household surveys 2005-2016.  
Notes: all wages have been converted to US dollars of June of 2015.

Table 4 below shows our estimates for the entire period and all the dependent variables of interest. We find that for all wage earners, English speakers earn in average 18.8% more than non-English speakers. This premium is of a 25% for the case of private sector workers that earned a wage. In terms of constant US dollars, these results respectively indicate that in average an English speakers earns 158.72 and 176.74 more US dollars per month than a non-English speaker.

By the same token, English speakers earn more per labored hours and work less hours per week than their non-English speaking counterparts. More precisely, within the entire wage earners sample, an English speakers earns in average 6 more US dollars per hours and works almost an hour less per week. For private sector workers, English speakers earn in average 7.6 more US dollars per labored hour and work 1.1 less hours per week. In addition, fluent English speakers have a significantly higher probability of being granted paid vacations, paid sick leave and a thirteenth wage at the end of the year.

**Table 4**  
General results

	Dependent Variables					
	Logarithm of after tax wage	Hourly wage	Worked hours	Vacations	Paid sick leave	Thirteenth wage
<b>All wage earners</b>						
Effect	0.188***	6.015***	-0.824***	0.0246***	0.0262***	0.0150***
Robust standard error	(0.00662)	(0.260)	(0.0756)	(0.00451)	(0.00471)	(0.00435)
Observations	79,034	79,034	79,034	79,034	79,034	79,034
<b>Private sector workers</b>						
Effect	0.250***	7.632***	-1.160***	0.0219***	0.0257***	0.0107*
Robust standard error	(0.00848)	(0.290)	(0.0981)	(0.00600)	(0.00624)	(0.00575)
Observations	56,391	56,391	56,391	56,391	56,391	56,391
<b>Controls</b>						
Sex	Yes	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Type of area	Yes	Yes	Yes	Yes	Yes	Yes
Migrant condition	Yes	Yes	Yes	Yes	Yes	Yes
Private sector	Yes	Yes	Yes	Yes	Yes	Yes
Region of residence	Yes	Yes	Yes	Yes	Yes	Yes
Year of survey	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates using household surveys 2005-2016.  
Notes: \*\*\*, \*\* and \* represent significance at 1%, 5% and 10% respectively.

## Results by zone of residence

In table 5 we display the results by splitting the sample in observations that currently reside in urban and rural areas. Our results are consistent with was previously found in the general results. Namely, that speaking English fluently entails a significant after tax wage premium, working less hours per week, earning more per hour labored and having better chances of getting paid vacations, paid sick leave and a thirteenth wage at the end of the year. Nonetheless, there is no pattern of the comparative magnitude of effects across dependent variables and between the types of area considered.

**Table 5**  
Results by area

	Dependent Variables					
	Logarithm of after tax wage	Hourly wage	Worked hours	Vacations	Paid sick leave	Thirteenth wage
<b>All wage earners</b>						
Urban	0.196***	6.441***	-0.721***	0.0254***	0.0282***	0.0142***
Robust standard error	(0.00778)	(0.314)	(0.0879)	(0.00522)	(0.00546)	(0.00502)
Observations	43,265	43,265	43,265	43,265	43,265	43,265
Rural	0.185***	5.045***	-0.747***	0.0281***	0.0265***	0.0220**
Robust standard error	(0.0128)	(0.461)	(0.149)	(0.00906)	(0.00939)	(0.00871)
Observations	35,769	35,769	35,769	35,769	35,769	35,769
<b>Private sector workers</b>						
Urban	0.254***	7.963***	-0.984***	0.0230***	0.0300***	0.0107
Robust standard error	(0.00999)	(0.353)	(0.114)	(0.00697)	(0.00725)	(0.00667)
Observations	28,882	28,882	28,882	28,882	28,882	28,882
Rural	0.257***	6.864***	-1.148***	0.0258**	0.0200	0.0167
Robust standard error	(0.0163)	(0.513)	(0.191)	(0.0119)	(0.0123)	(0.0114)
Observations	27,509	27,509	27,509	27,509	27,509	27,509
<b>Controls</b>						
Sex	Yes	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Migrant condition	Yes	Yes	Yes	Yes	Yes	Yes
Private sector	Yes	Yes	Yes	Yes	Yes	Yes
Region of residence	Yes	Yes	Yes	Yes	Yes	Yes
Year of survey	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates using household surveys 2005-2016.

Notes: \*\*\*, \*\* and \* represent significance at 1%, 5% and 10% respectively.

Regarding the wage premium, this one is higher for urban workers than rural workers when considering all wage earners, whereas for private sector workers, the wage premium is slightly higher for rural workers than for urban workers. However, consistent with the general results, the wage premium for speaking English is notably higher for private sector workers than for all wage earners. The same pattern is found with the wage per hour and the hours labored in a week. We also find that English-speaking wage earners have higher chances of getting paid vacations, paid sick leave and a thirteen wage. This results however, loses robustness when considering only private sector workers.

## Results by sex

When we split our samples by sex, we find that for all wage earners the English premium effect for men is higher than for women, whereas the opposite is true for private sector workers. However, one must bear in mind that the average after tax wage for all wage earners is higher for women (927.8) than for men (858). In US dollars, this would imply that for all wage earners, English

speaking men earn an additional 171,59 US dollars in comparison with their non-English counterparts. While for women, the gain is of 157,81 US dollars. Hence, the nominal increase in the after tax-wage is higher for men than for women. In the private sector, women (677.25) have a lower after wage tax than men (718.47). Implying that the gains of fluently speaking English for men and women are 182,85 and 165.24 US dollars. In other words, in the private sector women are compensated slightly a bit more than men for speaking English fluently.

**Table 6**  
Results by sex

	Dependent Variables					
	Logarithm of after tax wage	Hourly wage	Worked hours	Vacations	Paid sick leave	Thirteenth wage
Men	0.202***	6.477***	-0.778***	0.0323***	0.0309***	0.0204***
Robust standard error	(0.00894)	(0.358)	(0.100)	(0.00605)	(0.00627)	(0.00580)
Observations	52,063	52,063	52,063	52,063	52,063	52,063
Women	0.170***	4.966***	-0.865***	0.0105	0.0173**	0.00524
Robust standard error	(0.00978)	(0.367)	(0.116)	(0.00676)	(0.00714)	(0.00655)
Observations	26,971	26,971	26,971	26,971	26,971	26,971
<b>Private sector workers</b>						
Men	0.235***	7.615***	-1.184***	0.0294***	0.0308***	0.0169**
Robust standard error	(0.0109)	(0.384)	(0.124)	(0.00767)	(0.00791)	(0.00732)
Observations	40,643	40,643	40,643	40,643	40,643	40,643
Women	0.271***	7.247***	-1.106***	0.00531	0.0153	-0.00268
Robust standard error	(0.0133)	(0.420)	(0.160)	(0.00957)	(0.0101)	(0.00926)
Observations	15,748	15,748	15,748	15,748	15,748	15,748
<b>Controls</b>						
Age	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Type of area	Yes	Yes	Yes	Yes	Yes	Yes
Migrant condition	Yes	Yes	Yes	Yes	Yes	Yes
Private sector	Yes	Yes	Yes	Yes	Yes	Yes
Region of residence	Yes	Yes	Yes	Yes	Yes	Yes
Year of survey	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates using household surveys 2005-2016.

Notes: \*\*\*, \*\* and \* represent significance at 1%, 5% and 10% respectively.

As for the other dependent variables, men have notable higher gains than women in additional hourly wage and the probabilities of being granted paid vacations, paid sick leave and a thirteenth wage. Women do have higher gains in hours worked per week, but only when considering the entire wage earners sample. In other words, speaking English is a skill that is more handsomely rewarded among men than among women. A possibility for this result is sex discrimination in the labor market, where men simply gain more from additional skills simple because they are men. The other possibility, which is also the most plausible according to our data, is that there are bigger job market differences between wage earning men that speak English fluently and those that do not, than between wage earning women that speak English fluently and those that do not. To further inquire into this possibility, in table 7 below, we show the mean values for men and women according to their mastery of english and their respective differences.

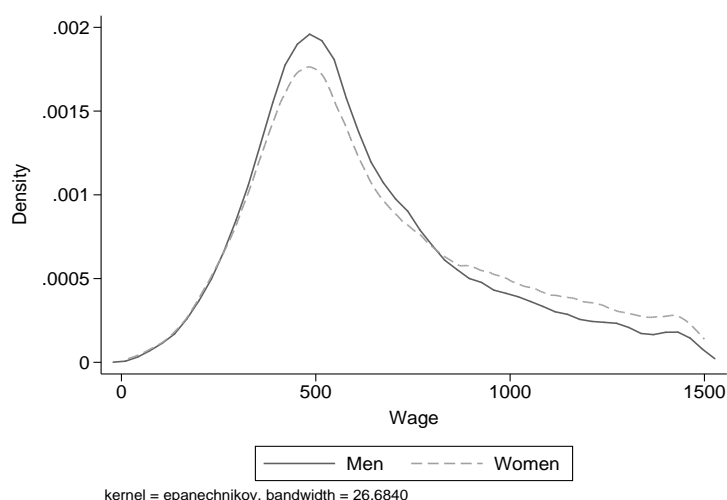
**Table 7**  
Mean values of dependent variables by sex

	Wage earning men			Wage earning women		
	English speakers	Non-English speakers	Difference	English speakers	Non-English speakers	Difference
<b>Dependent Variables</b>						
After tax wage	1616.3	768.17	848.13***	1363.4	859.37	504.03***
Hourly wage	35.36	16.35	19***	31.28	19.4	11.88***
Hours worked per week	46.65	48.18	-1.52***	44.46	45.62	-1.164***
Vacations	71.6%	57.6%	14.02%***	75.28%	68.95%	6.3%***
Sick leave	70%	56%	14.03%***	73.62%	66.28%	7.3%**
Thirteenth wage	72.6%	61.4%	11.22%***	76.4%	71.3%	5%***

Source: Authors' estimates using household surveys 2005-2016.  
Notes: \*\*\* represents significance at 1%.

Indeed, we find that differences between english and non-english speakers are larger for men than for women. Therefore, the differences in the job market premiums shown in table 6 are more likely driven by differences in the differences in the quality of jobs for each sex rather than sex discrimination. This idea is further reinforced by the fact that the distribution of all wages is more favorable for women than for men, as shown in figure 2 below.

**Figure 2**  
After tax wage kernel density by sex



Source: Authors' estimates using household surveys 2005-2016.

However, it is important to bear in mind that most of our sample is composed of men, mainly because women tend to be more easily left out of the labor market or not participate in it. Hence, the sample of women used in our estimates are representative of women that have already overcome barriers of entry to participate in the labor market. Therefore, it comes as no surprise that these women might in average have better jobs and jobs conditions than men.

## Results by highest level of education attained

Lastly, in table 7 we show our results by each level of education considered in this research. We find high and significant wage premiums for each level of education considered. On the other hand, we find that most of the significant benefits of speaking fluently English are concentrated in the people with the highest levels of education and people with completed primary school.

**Table 8**  
Results by highest education level attained

	Dependent Variables					
	Logarithm of after tax wage	Hourly wage	Worked hours	Vacations	Paid sick leave	Thirteenth wage
<b>All wage earners</b>						
Incomplete primary	0.379***	4.701***	1.494	0.0448	0.0569	0.0639
Robust standard error	(0.0633)	(1.630)	(0.971)	(0.0688)	(0.0682)	(0.0637)
Observations	7,892	7,892	7,892	7,892	7,892	7,892
Complete Primary	0.242***	4.244***	-0.704	0.0874***	0.0763***	0.0560**
Robust standard error	(0.0345)	(0.732)	(0.474)	(0.0262)	(0.0277)	(0.0255)
Observations	21,381	21,381	21,381	21,381	21,381	21,381
Incomplete secondary	0.166***	3.322***	-1.051***	0.0376**	0.0355*	0.0326*
Robust standard error	(0.0214)	(0.418)	(0.288)	(0.0188)	(0.0194)	(0.0180)
Observations	12,926	12,926	12,926	12,926	12,926	12,926
Complete secondary	0.220***	4.871***	-0.830***	0.0114	0.0133	0.00396
Robust standard error	(0.0147)	(0.353)	(0.173)	(0.0112)	(0.0115)	(0.0107)
Observations	12,308	12,308	12,308	12,308	12,308	12,308
Higher education	0.198***	7.541***	-0.644***	0.0113**	0.0141**	0.00474
Robust standard error	(0.00825)	(0.356)	(0.0916)	(0.00521)	(0.00548)	(0.00503)
Observations	24,527	24,527	24,527	24,527	24,527	24,527
<b>Private sector workers</b>						
Incomplete primary	0.381***	4.748***	1.462	0.0565	0.0678	0.0772
Robust standard error	(0.0648)	(1.669)	(0.988)	(0.0691)	(0.0684)	(0.0638)
Observations	7,607	7,607	7,607	7,607	7,607	7,607
Complete Primary	0.244***	4.146***	-0.621	0.0909***	0.0776***	0.0519*
Robust standard error	(0.0363)	(0.767)	(0.505)	(0.0278)	(0.0294)	(0.0274)
Observations	18,638	18,638	18,638	18,638	18,638	18,638
Incomplete secondary	0.176***	3.521***	-1.211***	0.0344*	0.0339*	0.0273
Robust standard error	(0.0224)	(0.438)	(0.304)	(0.0199)	(0.0204)	(0.0190)
Observations	10,875	10,875	10,875	10,875	10,875	10,875
Complete secondary	0.250***	5.486***	-0.862***	0.0169	0.0187	0.00826
Robust standard error	(0.0166)	(0.395)	(0.195)	(0.0127)	(0.0131)	(0.0120)
Observations	8,667	8,667	8,667	8,667	8,667	8,667
Higher education	0.273***	9.548***	-0.936***	0.0124*	0.0200**	0.00185
Robust standard error	(0.0117)	(0.454)	(0.128)	(0.00753)	(0.00790)	(0.00723)
Observations	10,604	10,604	10,604	10,604	10,604	10,604
<b>Controls</b>						
Sex	Yes	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Type of area	Yes	Yes	Yes	Yes	Yes	Yes
Migrant condition	Yes	Yes	Yes	Yes	Yes	Yes
Private sector	Yes	Yes	Yes	Yes	Yes	Yes
Region of residence	Yes	Yes	Yes	Yes	Yes	Yes
Year of survey	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates using household surveys 2005-2016.

Notes: \*\*\*, \*\* and \* represent significance at 1%, 5% and 10% respectively.

In addition, every educational level does have a significant gain from learning English in their hourly wage. The same cannot be said for the hours worked per week, where most of the gains are accrued by the wage earners that have more than primary school studies. In other words, even if the benefits of speaking English do not have similar effects across educational levels, each of those levels can have significant gains from speaking English.

## Discussion

We have shown that there are important job market premiums associated with fluently speaking English in Costa Rica. The most notable premiums are on the after tax wage and the hourly wage of workers, which are very large and robust for every specification and sample considered. Along similar lines, fluently speaking English does not only provide higher wage, but also better job benefits. In addition to earning more, English speaking workers work less hours per week and are more likely to receive paid vacations, paid sick leave, a thirteenth wage. Therefore, there seems to be clear robust evidence to claim that speaking English is a skill that is highly valued in Costa Rica.

Nonetheless, as we had previously shown, the job market premium of speaking English varies between samples. While workers from urban and rural areas are similarly rewarded, there are stark differences between sexes and levels of education. When comparing each sex separately, we find that the job market premiums for men that speak English with respect to non-English speaking men is higher than for women that speak English with respect to non-English speaking women. Although it seems that this is due to the fact that since women participate less in the workforce -for reasons not discussed in this paper-, in average lesser paying jobs are more occupied by men than women. In other words, the mean wage for men is higher than for women, but the median is higher for women. As for the comparison between levels of education, the lower the education, the higher the wage premium. But the higher the educational level, the more benefits a person accrues from speaking English fluently.

A possible explanation for these results, is the existence of very high added value sectors in the Costa Rican economy that largely explain these premiums, *à la* dual sector economy model. In table 8 we show the percentage of workers in each economic activity considered in Costa Rica's household surveys that speak English fluently, where we indeed find that there are some activities with little to almost none workers that are fluent English speakers and others were more than a quarter of its wage earners are fluent English speakers.

**Table 9**  
Percentage of workers that speak English fluently by area of economic activity

Economic activity	All wage earners	Private sector wage earners
Agriculture, cattle raising and fishing	1,70%	1,70%
Mining Industry	2,90%	2,90%
Manufacturing industries	9,20%	9,23%
Electricity supply	10,72%	10,90%
Water supply	3,78%	2,22%
Construction	4,52%	4,50%
Commerce	10,42%	10,44%
Transportation and storage services	11,90%	11,43%
Hotels and restaurants	13,18%	13,18%
Information and communications	40,06%	49,92%
Finances	22,26%	26,94%
Real state	18,60%	18,65%
Professionals and scientists	29,23%	29,32%
Administration services	21,21%	21,21%
Public administration	11,21%	11,63%
Teaching	15,95%	26,93%
Health	12,46%	16,45%
Arts	20,36%	20,72%
Other services	12,20%	10,88%
NGOs and other organizations	47,46%	47,41%

Source: Authors' estimates using household surveys 2005-2016.

Therefore, it could be the case that our results are being driven by a certain group of workers that happen to be in industries that have great job market benefits in comparison to the rest of the Costa Rican economy. One way to test for this is to control for economic activity in our regressions. However, it is worth noting that doing so might not be an ideal econometric strategy the most sound econometric due to the potentially endogenous nature of these controls with respect to our

independent variable of interest. In other words, workers in certain economic activities might self-select themselves to work in said activities because they speak English. Hence, our beta estimate would not be capturing the premium associated with speaking English in the economy but might rather be capturing the job market premium associated to this potential self-selection bias. Nonetheless, if it is the case that certain sectors explain the job market premiums found in the previous section, one would expect that our estimated beta would notably lower its magnitude and perhaps significance with respect to our previous results. Table 9 displays our general results when adding economic activity dummies to our regressions.

**Table 10**  
Bad controls estimates

	Dependent Variables					
	Logarithm of after tax wage	Hourly wage	Worked hours	Vacations	Paid sick leave	Thirteenth wage
<b>All wage earners</b>						
Effect	0.182***	5.964***	-0.736***	0.0194***	0.0221***	0.0104**
Robust standard error	(0.00664)	(0.263)	(0.0751)	(0.00456)	(0.00476)	(0.00439)
Observations	79,034	79,034	79,034	79,034	79,034	79,034
<b>Private sector workers</b>						
Effect	0.246***	7.592***	-0.984***	0.0167***	0.0225***	0.00609
Robust standard error	(0.00858)	(0.296)	(0.0984)	(0.00611)	(0.00636)	(0.00586)
Observations	56,391	56,391	56,391	56,391	56,391	56,391
<b>Controls</b>						
Sex	Yes	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Type of area	Yes	Yes	Yes	Yes	Yes	Yes
Migrant condition	Yes	Yes	Yes	Yes	Yes	Yes
Private sector	Yes	Yes	Yes	Yes	Yes	Yes
Region of residence	Yes	Yes	Yes	Yes	Yes	Yes
Year of survey	Yes	Yes	Yes	Yes	Yes	Yes
Economic activity	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates using household surveys 2005-2016.

Notes: \*\*\*, \*\* and \* represent significance at 1%, 5% and 10% respectively.

As it can be appreciated, there is indeed a minor decrease in the magnitude of the estimated job market premiums. However, this decrease is marginal and the results remain very significant, large and robust<sup>4</sup>. Therefore, the econometric evidence suggests that our results are not being driven by the agglomeration of workers in certain economic activities in Costa Rica. This is an encouraging result, because it entails that every worker in Costa Rica regardless of the economic activity where he or she labors can gain job benefits by learning English. What is more, many countries might also be in a position similar to Costa Rica, where every worker in any economic activity could reap benefits from learning English in spite of there being particular activities in the economy with higher added values and better wages.

Thus far, our results show that speaking English fluently has been a large and robust job market benefits enhancement skill. However, it is puzzling how in spite of all the benefits associated to learning English, there is no decreasing trend over time for any of these benefits. It appears in fact that in 12 years, these premiums have actually remained stable. This directly contradicts the development strategy Costa Rica has been trying to adopt for more than two decades, which has focused on attracting high added value foreign investment and tourism, both sectors that usually operate in English. As a matter of fact, from 2005 to 2015, FDI has increased its value in 64.76%<sup>5</sup>, while tourism has increased its value in 89.38%<sup>6</sup>. While the percentage of English speaking people

<sup>4</sup>The results found in the different sample splits hold after adding these controls as well, they are not shown in this document to save space but are available upon request.

<sup>5</sup>From 1364.13 millions of dollars in 2005 to 2636.01 millions of dollars in 2015.

<sup>6</sup>From 1670.83 in 2005 to 3164.31 in 2015.

in Costa Rica between the ages of 25 and 45 has increased from 10.88% to 12.35% from 2005 to 2015.

Therefore, although Costa Rica has been successful in attracting FDI and promoting tourism, the job market premiums associated to speaking English have barely varied, evidencing that the job market has not self adjusted to reduce the relative scarcity of second language competence. This is a warning for revisiting and designing better public policies regarding second language skills and -in a broader sense- development.

## Conclusions

We estimated the job market premiums associated with speaking English in Costa Rica, a small, open, developing economy. For this, we used the country's household surveys from 2005 to 2016, which provided samples of workers representative of the country's workforce. Furthermore, the surveys allowed us to control for confounding factors in our estimations such as the sex, age, year of birth, educational level and migratory condition of each individual.

We found for all wage earners, an after tax wage premium of 18.8%, an hourly wage premium of 6.01 dollars, an hours worked per week premium of minus 0.82, an increase of 2.4% in the probability of having paid vacations, an increase in the probability of having paid sick leave of 2.6% and an increase of the probability of receiving a thirteen wage of 1.5%. For private sector wage earners, these premiums were of 25%, 7.6 dollars, minus 1.16 hours per week, and probability increases of 2.1%, 2.5% and 1.07% respectively. These results are robust to different models and over the period of study. However, these premiums vary between samples. Even though workers from urban and rural areas are similarly rewarded, there are stark differences between sexes and levels of education. When comparing each sex separately, we find that the job market premiums for men that speak English with respect to non-English speaking men is higher than for women that speak English with respect to non-English speaking women. Although it seems that this is due to the fact that since women participate less in the workforce -for reasons not discussed in this paper-, in average lesser paying jobs are more occupied by men than women. In other words, the mean wage for men is higher than for women, but the median is higher for women. As for the comparison between levels of education, the lower the education, the higher the wage premium. But the higher the educational level, the more benefits a person accrues from speaking English fluently.

Our results show that these job market premiums do not fade over time. Denoting that Costa Rica's labor market has not adjusted to reduce the relative scarcity of second language competence, in spite that the country has focused in attracting foreign direct investment and fostering activities that are English speaking intensive in the past twenty years.



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**Table 11**

Average wages in constant US dollars

	2005-2016	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>All wage earners</b>													
<b>All Sample</b>	881.82	732.05	747.29	771.88	775.69	860.61	880.91	912.53	910.10	938.19	932.30	1037.56	1060.89
<b>Men</b>	858.00	727.24	740.52	768.31	779.76	839.28	854.29	873.76	875.84	888.22	903.20	1,010.17	1038.31
<b>Women</b>	927.80	742.57	761.72	779.10	767.52	902.03	933.42	988.58	974.66	1032.25	985.70	1,085.63	1,099.28
<b>Urban</b>	1028.04	870.43	887.11	943.10	916.04	1032.15	1021.30	1066.75	1052.85	1084.95	1053.62	1106.94	1138.58
<b>Rural</b>	704.95	600.32	620.34	617.81	660.20	713.41	730.59	743.98	763.69	783.77	764.69	795.79	784.42
<b>Incomplete Primary</b>	452.97	426.01	410.49	431.16	434.31	447.86	464.52	467.33	466.94	452.36	457.70	506.57	523.68
<b>Complete Primary</b>	532.45	465.59	484.15	500.66	504.64	529.88	538.93	535.63	561.40	548.13	542.44	599.53	612.99
<b>Incomplete Primary</b>	608.29	565.72	559.62	584.43	578.38	587.70	621.39	625.70	632.68	635.21	618.85	640.97	655.01
<b>Complete Primary</b>	800.54	714.90	750.18	745.10	746.44	843.22	847.85	796.75	815.13	841.90	781.72	840.11	835.05
<b>Higher Education</b>	1509.30	1288.85	1269.98	1326.08	1344.23	1459.95	1508.59	1607.42	1,552.95	1,592.30	1533.20	1691.60	1751.13
<b>Private sector workers</b>													
<b>All Sample</b>	706.96	617.77	615.17	657.13	654.03	710.77	684.50	687.96	703.24	708.68	732.16	838.98	845.36
<b>Men</b>	718.47	631.93	629.66	676.38	680.50	720.32	691.86	695.25	712.56	709.53	735.66	861.65	868.62
<b>Women</b>	677.26	574.57	571.77	604.01	583.71	686.25	664.63	668.45	679.91	706.55	723.52	787.09	796.45
<b>Urban</b>	831.93	743.43	736.54	818.32	777.31	868.59	792.53	800.03	814.14	817.28	835.22	909.57	914.93
<b>Rural</b>	575.76	517.92	523.73	533.66	567.44	595.37	587.88	585.55	608.16	612.71	607.74	604.24	610.58
<b>Incomplete Primary</b>	445.33	415.20	405.00	427.82	428.31	445.67	450.64	458.11	455.66	443.56	452.94	496.47	515.18
<b>Complete Primary</b>	511.18	450.88	470.25	488.65	491.58	519.02	510.16	498.05	532.05	521.94	515.47	573.58	588.94
<b>Incomplete Primary</b>	581.75	541.49	541.74	569.11	570.80	564.96	593.43	590.86	593.07	579.78	581.87	615.51	630.35
<b>Complete Primary</b>	728.54	671.73	701.58	703.58	691.14	772.03	768.48	710.99	730.99	730.91	693.19	765.97	761.73
<b>Higher Education</b>	1349.55	1317.42	1202.66	1319.01	1302.59	1375.33	1266.83	1313.23	1285.71	1308.92	1318.13	1490.16	1505.42

Source: author's estimates with household surveys, 2005-2016.

Notes: all figures are expressed in constant US dollars of June of 2015.