

Returns to Foreign Language Skills in a Developing Country: The Case of Turkey

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Abstract:

This paper examines the returns to foreign language skills in Turkey, which is characterized by fast economic and social development. We consider English and several other languages among male wage earners aged 25-65. We find positive returns to proficiency in English and Russian, which increase with the level of competence. Knowledge of French and German are also positively rewarded, although their economic value is mostly linked to an increased likelihood of holding specific occupations. Focusing on English, we also explore the heterogeneity in returns to skills by several observed characteristics as well as heterogeneity along the conditional wage distribution.

Key Words: Foreign Languages, Returns to Skills, Heterogeneity, Middle East, Turkey

JEL Codes: I25, J24, J31, O15, O53

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1. Introduction

Foreign language (FL henceforth) skills represent a form of human capital that can be rewarded in the labor market. Several papers highlight the positive economic value of FL knowledge among the native populations of developed countries. Any existence of positive returns to FL competences is expected to be even more relevant in developing countries. Indeed, fostering widespread FL knowledge of the population, alongside formal schooling and other cognitive skills (Hanushek and Woessmann, 2008), might represent a stepping stone for economic development in the globalized world (Seargeant and Erling, 2011). However, there are relatively few studies on this topic in the developing countries, mainly due to data limitations.

This paper investigates returns to FL skills in the Turkish labor market. Turkey provides an interesting case for several reasons. First, economic value of FL skills in Turkey has not been previously investigated. Second, during past decades Turkey experienced impressive growth rates increases in international trade and commerce, tourist arrivals, foreign direct investments (FDI), and Research and Development (R&D) activities which contributed to the country's rapid social and economic development. At the same time, these accomplishments and whole globalization process stimulated the demand for FLs (Fidrmuc and Fidrmuc 2009, Fidrmuc 2011, Hoon et al. 2011). Demand for FLs arises in order to better communicate and interact with foreign counterparts,

producers, suppliers, consumers, customers and authorities with a view to get information on the functioning of the foreign markets and overcome the linguistic and cultural barriers. Therefore, fostering FL skills would be especially important for a mid-sized, middle income, emerging economy like Turkey, since this would improve the national performance in the global knowledge economy and stimulate the potential for further economic growth and development. Rising demand for FLs, combined with its relatively scarce supply among Turkish workers, generates the potential for important economic rewards. This paper's main aim is to analyze the existence and amount of this potential economic premium in the Turkish in the labor market.

We draw on the Adult Education Survey (AES) a novel data — collected by the Turkish Statistical Institute (TURKSTAT) in 2007 — that contains detailed information about knowledge and use of several FLs. Therefore, we are able to analyze returns to several FLs, without constraining the focus only to English, as previously done for other developing countries. In order to keep the empirical analysis tractable, we focus on male wage-earners between the ages 25-65. We estimate earnings regressions augmented by indicators of FL competences. We also control for occupation fixed-effects in order to account for the indirect link between language and earnings through occupation. Parental education is used as an additional control, which captures the effect of unobserved factors, such as cognitive and non-cognitive skills and social networks, on earnings.

More specifically, this paper seeks to answer the following empirical questions. What are, on average, the returns to FLs knowledge? Are there increasing returns to different levels of skills in FLs? Furthermore, focusing on English, we analyze the heterogeneity in returns to English skills by frequency of English use at work, birth-cohort, education and occupation, as well as rural/urban location. Finally we consider the heterogeneity in the returns to English skills according to unobservable factors using quantile regression techniques.

Obtaining unbiased estimates represents the main concern in the econometric analysis of the return to language skills as it is for other traditional forms of human capital such as schooling. Unobserved individual heterogeneity (e.g. innate ability), reverse causality and misclassification/measurements error due to self-reporting might bias the estimates in an OLS framework. Although we recognize these potential sources of bias, the results we present are conditional correlations, which may not reflect the true causal parameters of interest. We are unable to use instrumental variables estimation due to lack of suitable instruments in the data. Nevertheless, the robustness of our results to inclusion of control variables and to the heterogeneity analysis, as well as their

similarity to the evidence in previous studies allow us to argue that FL skills are positively rewarded in the Turkish labor market. The organization of this paper is as follows. Section 2 provides background about the relevance of FL knowledge in Turkey (see Di Paolo and Tansel, 2013). Section 3 gives a brief review of literature. Section 4 describes the data used. Section 5 reports the empirical results (see Di Paolo and Tansel, 2013 for a longer version that includes a discussion). Conclusions and policy implications appear in Section 6.

2. The Economic Return to Language Skills: Selected Literature

Conceiving language competences as a form of human capital gained consensus in the literature during the last decades. The language proficiency, similar to formal schooling, is a costly asset that is embodied in the individual and is likely to be productive in the labor market (see Chiswick and Miller, 2007, 2014 and Chiswick 2008 for a general overview) Most of the literature concerns immigrants, because competences in a host country's language are fundamental for their economic and social integration.

The same framework can be applied for explaining skills in both local and FLs among the native population. There are several reasons for the positive relationship between language proficiency and earnings. First, language might directly affect productivity by enhancing efficiency in communication among coworkers and managers. Second, language itself may enable achieving more prestigious occupations that are also likely to be better remunerated (Chiswick and Miller 2009, Quella and Rendon 2012), and workers obtain a premium if their language skills match linguistic requirements in the workplace (see Chiswick and Miller 2010, 2013). This means that a substantial part of the positive relationship between language competences and earnings is indirect, operating through the occupational channel¹. Third, language competences might be remunerated also when not directly used/relevant in the workplace, since this asset represents a positive signal for other cognitive skills from the employer's perspective. Indeed, there is substantial evidence in the literature on the improved cognitive skills of bilinguals or those who have studied a FL. Cooper (1987) and Olsen and Brown (1992) find higher college entrance examination scores among students who have studied a FL in high school in the U.S. According to Bialystok (1999), Adesope et al. (2010) and Leikin (2012) the bilinguals have a generalized cognitive advantage

¹ Indeed, the results presented by Aldashev et al. (2009) suggest that the positive effect of language proficiency among immigrants in Germany is completely driven by occupational selection, given that it disappears once the endogenous selection into economic sector and occupation is controlled for.

over monolinguals in the executive functions involving mental flexibility, inhibitory control, attention control, and task switching as well as creativity, flexibility, and originality in problem solving. Thus, in this context, language competences could increase earnings directly by raising an individual's productivity.

Indeed, a growing number of papers reported significant returns to FL skills among the native population. There are a number of studies on developed countries. Saiz and Zoido (2005), studied the return to FLs using a sample of US college graduates. Willams (2011) reports significant earnings premiums for FL usage at work in twelve European countries. Ginsburgh and Prieto-Rodriguez (2011), confirmed the substantial return to English proficiency in several European countries. Also Lang and Siniver (2009), who analyzed the case of English in Israel (as well as Hebrew among immigrants from Russia), show that this language knowledge is significantly remunerated in the Israeli labor market for both immigrants and natives, although the return to English skills appears heterogeneous for different groups of workers.

The return to English proficiency has been analyzed in a few developing countries, such as Latvia and Estonia, South Africa and India. Toomet (2011) found that local languages are not remunerated in Latvia and Estonia, while English proficiency produces a significant earnings premium. Levinsohn (2007) and Casale and Posel (2011) reported high returns to English competences in South Africa and, similarly, Azam et al. (2013) also obtained substantial earning returns to English skills in India. This evidence confirms that English proficiency is a valuable asset also in developing countries. Our study resembles to the last group concerned with developing countries, since we investigate the return to foreign language skills in Turkey. However, in both South Africa and India English is the former colonial language and currently one of the official languages, whereas this is not the case in Turkey, Latvia or Estonia where English is a non-native and non-official language. In this sense our study is close to the paper by Toomet (2011), however, he considers the case of Russian minority in Latvia and Estonia, whereas we consider the total native population of Turkey. Further, unlike the previous studies for developing economies, we first consider the return to several FLs spoken in Turkey (in a similar fashion to Willams, 2011) and we then analyze English skills more deeply.

4. Data and Descriptive Statistics

The empirical analysis is based on nationally-representative Turkish data from the Adult Education Survey (AES). This survey contains detailed information about FL knowledge, skills and use, together with socio-demographic and labor market characteristics. The sample includes 39,478 individuals aged 18 and over. We restrict the sample to males aged 25-65 who were regularly employed as wage earner at the time of the survey². We exclude part-time employees and immigrant males as well as observations with missing information and we end up with a sample of 6,018 male employees.

The AES survey asks individual's knowledge of up to 7 FLs. In the case of having some knowledge of at least one FL, individuals report detailed information about the two FLs they know best the way they learnt those languages, as well as their frequency of use at work and for leisure. Table 1 shows the basic descriptive statistics

[TABLE 1 AROUND HERE]

Roughly 64% of the individuals in the sample do not speak any FLs³. Over one in three individuals are able to speak at least one FL, most speak just one. FL knowledge is more common among the younger cohort, those with greater educational attainment, and among white collar employees, especially if otherwise high-skilled. Knowing at least one FL is slightly more common in urban than in rural areas⁴.

Table 2 reports that English is the most widely known FL, with about 82% of those who possess some knowledge of FLs declaring that English is one of the languages they know — at least to some extent. German represents the second most frequent language known by 11%, and considerably less common than English. The largest share of Turkey' exports go to Germany as noted above, which is also the traditional destination for Turkish emigrants. Arabic is the third most frequent language (8.6%), which is taught in religious vocation high

² Females are excluded from the analysis in order to avoid problems of endogenous selection into labor market participation and employment. We consider individuals aged between 25 and 65 because regular schooling is usually completed before 25 years of age and can therefore be taken as exogenous, which helps to limit the potential endogeneity of schooling in the earnings regressions. We retain wage earners since this facilitates the interpretation of the earnings regressions, albeit the results obtained considering also employees and self-employed workers are virtually the same (see Di Paolo and Tansel, 2013). Selection into wage employment among males could also be an issue. For this reason, we controlled for endogenous selection into wage employment among males and the results are virtually unchanged (full results are available upon request). Therefore, we decided to focus on wage earner males, implying that we aim at providing evidences that are consistent for the selected sample.

³ Indeed, raw data from the original AES data suggest that Turkey is the country with the highest percentage of individuals who declare no knowledge of any FL (75.5% in the whole sample), compared to the Europe-27 average of 37.5%. The numbers from Turkey are relatively similar only to those from Hungary (74.8%) and Romania (69.6%). More details can be consulted here: <http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database>. Notice that this evidence is consistent with the results obtained in the Euro-barometer Survey of 2006, albeit slightly worse (probably because the AES data reported by Eurostat refer to individuals aged 25-65).

⁴ Locations with population over 20,000 are defined as urban and the locations with population 20,000 or less are defined as rural areas.

schools and might be common among the indigenous population in the south-southeast of the country, as well as among people with some migration experience in MENA countries (which were alternative migration destinations during the 1980s). Arabic is followed by French (6.7%), which was widely taught as part of the oldest generation's schooling. Less common is Russian (2.3%) which is not taught in the school system. However, Russian is likely to be known by returning Turkish workers from the migration wave towards Russia and Central Asia that occurred in since the 1990s (Tansel and Yaşar, 2010), as well as migrants from Bulgaria.

[TABLE 2 AROUND HERE]

Further, English is relatively more common within the younger cohort, as is Russian, while the knowledge of German, Arabic and French is somewhat higher among older populations. English is more widespread among the younger and French is common among the older cohorts. Russian, German, and Arabic are significantly more common among the less educated. In particular, almost 50 percent of Arabic speakers sampled have 5 or fewer years of schooling. Those who know German among the less educated may be return migrants from Germany, but, unfortunately, we do not have information about previous migration experiences. English is more frequently known among white collar employees, while blue collar employees who declare to know FLs are relatively more likely to know Arabic. Finally, the incidence of Arabic knowledge and — to a lesser extent — of German knowledge appear to be relatively higher in rural areas. In the case of German, this evidence might be reflecting previous (direct or indirect) migration background from Germany. Regarding Arabic, its incidence among low educated individuals residing in rural areas might mirror ethnic identities with Arabic roots⁵.

In Table 3 we focus more deeply on the FL individuals know better. English represents the primary FL for about four fifths of FL speakers, followed by German (7.4%), Arabic (5.9%) and French (4.9%). Next we consider the way in which people learnt the best FL they know (not shown here). Most of the people acquired English skills at school (79% among those who affirm English to be the best FL they know), in a private course (10%) or by self-learning (7%). On the contrary, 94% of French speakers learnt this language at school. The share of individuals who declare to have learnt German and Russian abroad is significantly higher than for other languages. Finally, albeit 40% of those that consider Arabic as the best FL they know learnt Arabic at (religious

⁵ Unfortunately, it is not possible to discern this point since the Turkish questionnaire of the AES survey does not include specific questions about mother tongue (which are indeed included for other countries). Therefore, the information about Arabic knowledge should be taken with caution, since its distinction with ethnic background is somewhat subtle.

vocation) schools and 35% of them learnt it within the family. We can also go into more detail about the quality of FL skills⁶. Among those who declare English to be their first FL, 55% report having a basic level, about 31% have regular skills and only 14% have advanced skills. The distribution of German skills follows a similar pattern, whereas French skills are mostly concentrated into the basic level and those who claim Arabic to be their first FL are likely to have advanced skills⁷.

[TABLE 3 AROUND HERE]

Finally, raw earning differentials by general FL knowledge are reported in Table 4. The AES survey includes net monthly earnings from the main job (in Turkish liras). Tabulating monthly earnings by deciles shows that the incidence of top-coded earnings is significantly higher among those who speak at least one FL, but, lower in the bottom deciles. Thus, knowing a FL is generally associated with higher earnings. Similarly, average monthly earnings are markedly higher among FL speakers. However, not all FLs are associated with higher earnings.

[TABLE 4 AROUND HERE]

Indeed, the knowledge of German, English, Russian, or French is clearly associated with higher earnings. However, this is clearly not the case for Arabic, which instead seems associated with lower earnings. Nevertheless, the relationship between FL knowledge and earnings that we observe in the raw data might be confounded by other individual and labor market characteristics that are likely to co-vary with both FL knowledge and earnings. Therefore, in the next section we analyze the return to FL knowledge in a regression framework, which would provide the *ceteris paribus* or conditional association between FL knowledge and skills and labor market earnings. The complete list of explanatory variables used in the empirical analysis is provided in Table 1A in the Appendix together with some descriptive statistics.

⁶ Notice that the AES questionnaire contemplate four different self-reported levels of command of foreign languages, namely 1 “I can understand and speak a few words and sentences”, 2 “I can understand and use the most general daily expressions”, 3 “in the instances where the language is used in a clear fashion, I can understand the essence and express the experiences and events in a printed text” and 4 “I can understand and use the language in a flexible (fluent) manner in various subjects involving a series of difficult texts. I am almost completely competent in this language”. Given the low number of cases for levels 3 and 4 we decided to group these two FL command levels into one. Therefore, in the empirical analysis we will use 3 separate levels of skills: 1) basic skills (corresponding the original level 1 in the survey), 2) regular skills (corresponding to level 2) and advanced skills (corresponding to either level 3 or 4 in the AES questionnaire).

⁷ The distribution of skills in Russian indicates that the majority of those who declare this language to be the first FL they know report regular skills. However, these numbers should be read with caution because of the reduced number of cases in the selected sample.

5. Empirical Results

5.1 Foreign Language Knowledge and Earnings

In this section we study the conditional relationship between FL knowledge and labor market earnings. Table 5 contains the results from several OLS regressions of log earnings on typical human capital and labor market variables, plus different indicators of FLs. knowledge. First, we include dummies for the number of FLs that are known by each individual in the sample. Second, we estimate several separate equations containing a dummy for each specific FL. Third, the five different FLs indicators are jointly included in the regression. Finally, we add occupation fixed-effects and dummies for parental education. Occupation fixed-effects (two-digit ISCO88 classification) informs us about the extent to which the relationship between FL knowledge and earnings is indirect, working through the occupational channel — i.e. individuals who know FLs earn more because they are attracted into better paid occupations. Furthermore, including the highest parental education among the two parents should help to control for the unobservable characteristics, such as cognitive-and non-cognitive ability and social networks.

[TABLE 5 AROUND HERE]

The estimates of the control variables are quite standard. The return to one additional year of schooling ranges between 7.8% -8.7% when occupation is not included in the model and it slightly declines after controlling for occupation fixed effects, indicating that occupation mediates the conditional association between schooling and earnings. Potential experience presents the typical inverted U-shaped pattern. Permanent workers obtain higher earnings than those with a fixed-term contract, with an earnings differential of about 30%. A dummy for urban location, accounts for the uneven structure of the labor market and indicates that urban workers earn 12-17% more than their rural counterparts.

Table 5 shows that having some knowledge of one FL is associated, on average, with 8% higher earnings, which increases to 15% in the case of knowing two FLs and up to 38% in the infrequent case of three or more FLs. However, not all languages are equally rewarded in the labor market. In fact, knowing English has a clearly significant return (around 11%), the estimates for French and German are also statistically significant with about 8% returns, while. Arabic is associated with lower earnings. Finally, we obtain a noticeably high and significant return to Russian knowledge, which is associated with 20% higher earnings. When we simultaneously include all

FL dummies the point estimates of English and German remain unchanged, while that of French becomes significant and slightly higher. The return to Russian is somewhat reduced in this full specification, indicating that it might be driven by other “language-related” unobservable characteristics. After controlling for occupation fixed effects⁸, we obtain a lower return to English knowledge. Occupation accounts for about 30% of the return to English, which is still substantial and significant even among employees within the same occupation. A similar pattern is observed for French and German and Russian. Finally, controlling for occupation yields a still significant and negative effect for Arabic⁹. Finally, we include dummies for parental education, which are significant predictors of earnings, implying a certain degree of social segmentation in the Turkish labor market. Moreover, we observe a very modest reduction in the point estimates of the FLs considered

This last evidence points out the robustness of our results to the potential omitted variables bias. We argue that unobserved individual heterogeneity does not represent the main driver of the positive relationship between FL knowledge and earnings. Lang and Siniver (2009) obtained similar estimates when they simultaneously included two different languages in the earnings equation. Since the ability to learn two or more different FLs should be similarly correlated with general unobservable skills, they argued that if knowing different languages mainly depends on unobserved ability, a significant change should be observed when dummies for different languages are simultaneously included. In our case, the coefficients of English and German knowledge are virtually unaffected by the inclusion of other FL indicators in the regression (while only minor changes are observed for other languages). This supports the fact that the effect of unobserved individual heterogeneity is limited.

⁸ We also tried to include dummies for economic sector. However, once controlling for occupation, the inclusion of sector fixed effects barely affected the return to FL knowledge (in a similar fashion as in Azam et al., 2013). Therefore, sector dummies have been suppressed in order to simplify the presentation (the full results are available upon request). It might be argued that the inclusion of occupation fixed effects represents “bad controls” (following Angrist and Pischke, 2009), in the sense that the estimation of the treatment effect’s parameter (i.e. FL return) is confounded by the inclusion of controls that depend on the treatment itself (i.e. occupation). Therefore, under positive occupational sorting, the mediating impact of occupation in the language-earning relationship is likely to represent a lower bound of the whole relevance of occupation.

⁹ Notice also that the negative return to Arabic knowledge is even more pronounced when the urban area dummy is not included in the set of covariates (-9.4%). These results, together with the evidence that knowledge of Arabic is more common among older and less educated employees located mostly in rural areas, point out that the negative relationship between Arabic language knowledge and earnings is probably due to the fact that Arabic knowledge does not always represent an “investment” in a FL and thus this negative return should be taken with caution. We believe that disposing of information about the region of residence would help in disentangling this evidence since we expect that this negative differential is driven by individuals residing in rural areas in the southeastern part of the country. However, the regional identifiers of the Turkish AES 2007 data are not released due to data protection legislation.

5.2 Returns to Different Skill Levels in FLs

The results in the previous section point out that having some knowledge of languages other than the mother-tongue generally has a market value in Turkey. However, if the labor market pays a different price for different levels of command of a language, general levels of FL knowledge might be just a partial picture of the earnings return to this human capital asset. Hence, in this section we exploit the available information about different skill levels of best FL known¹⁰. Table 6 reports the results of earning regressions with dummies for different level of competences in each FL individually and simultaneously.

[TABLE 6 AROUND HERE]

The results reveal the return to different levels of proficiency in English are positive and increasing—ranging between 20-46%. These results are very close to those reported by Azam et al. (2013) in India, who found that the return to speaking fluent and little English are 35% and 13% respectively (relative to men who speak no English)¹¹. Basic French skills are negatively associated with earnings and the coefficient for regular French skills is positive but imprecisely estimated, while having advanced French skills has a remarkably high return of 68%. In contrast, the returns to German skills are insignificant. Russian skills are significantly remunerated only at the advanced level, with 27% increased earnings. Next we include all the dummies for all the skill levels for all the FLs. In this case the return to FL skills will be conditioned on competences in each of the (mutually exclusive) possible best FLs known and the reference category will be those individuals with no FL command. The results show that the return to English skills is almost unaffected by this exercise. However, basic French skills are no longer negative while there the returns to regular and advanced French skills are significant and higher. The returns to basic and advanced German skills are both significant, and no change is observed in the return to

¹⁰ Albeit we also dispose of information about skills in the second FL, we just focus on the first FL because of the reduced number of individuals who know more than one FL. Indeed, the returns to skills in second FLs are mostly insignificant and the estimates for skills in the first FL are robust to the inclusion of second foreign language's skills. Moreover, we consider a more parsimonious specification that incorporates only skills in languages that have a positive return in this step of our analysis (i.e. we do not include skills in Arabic, given that this language appears not to be rewarded in the labor market). Notice also that the estimated models contain the same set of controls reported in Table 5, whose estimates are roughly the same and are neither reported nor discussed here for brevity reasons. Further, we also tried to control for the way in which people learnt the best FL they know and the results were virtually the same.

¹¹ Our results regarding the return to English skills are also in line with what is reported elsewhere in the literature, for developed (Lang and Siniver, 2009, Willams, 2011 and Ginsburgh and Prieto-Rodríguez, 2011) and developing countries (Levinsohn, 2007 and Casale and Posel, 2011 Toomet, 2011), albeit that the indicators for English proficiency are not always directly comparable. The main exception are the results obtained by Saiz and Zoido (2005), who find 2-3% return to speaking a second language for college graduates in the US. This relatively low return is in all likelihood due to the fact that English represents a *lingua franca* for international trade, although it might be also a consequence of the peculiarity of the sample used. This is also consistent with the evidence reported by Willams (2011) for UK and Ireland, where no significant returns are obtained for the use of FLs (other than English) at work.

advanced Russian skills. Finally, adding occupation fixed effects (and parental education) to this model produces modest reductions in the returns to FL skills, indicating again that FL knowledge also affects earnings indirectly — via occupational attainments. In the rest of the paper we focus more deeply on the economic value of English competence since it represents the most widely spoken FL in Turkey — as well as in other non-English speaking countries in Europe (see European Union 2006, 2012) — and is commonly used as the *lingua franca* for commerce and trade (see Ku and Zussmann 2010, Fidrmuc 2011). However, so far we considered returns to different levels of competences in English to be the same for all the Turkish male employees, although they might be heterogeneous according to several observed and unobserved individual characteristics.

5.3 Heterogeneous Returns to English Skills

5.3.1 Returns by Frequency of English Use at Work

Following the previous literature (Saiz and Zoido, 2005, Lang and Siniver, 2009, Casale and Posel, 2011, Toomet 2011 and Azam et al., 2013 among others), we consider the possibility of heterogeneous returns to English skills. First, until now we implicitly assumed that English skills are remunerated because they are used in the labor market (Grin et al. 2010). If this is true, the return to English competences should increase — at least to a certain extent — with the degree to which it is used at work. However, English proficiency may also signal other valuable skills to the employer. This means that being proficient in English would be remunerated even if not actually used at work. We now examine the potential heterogeneity of return to English depending on the frequency of its use in the workplace. Table 7 reports the results from this exercise.¹²

We find a concave relationship between returns to English skills and the rate at which it is used at the workplace. Having regular English skills brings better remuneration if this language is used at least once per month, and the premium decreases in the case of more recurrent use of English at work. The evidence for advanced skills is similar. Moreover, the returns by the frequency of use are ever increasing in the case of advanced English skills when estimated within the same occupation, implying that English competence is a signal for acceding to certain jobs since the returns are positive for regular and advanced English skills which are not

¹² The model is estimated including interactions between English skills and the frequency of English usage at work, plus all the controls included in previous specifications (complete results are available upon request).

used in the workplace, but signal to the employer other cognitive and non-cognitive skills. Lower returns are observed only in the case of regular English skills when used at least once per week.

5.3.2 Returns by Age-Cohorts

Second, Table 8 shows the results when the sample is split by age cohort of younger (25-39) and older (40-65) workers. Consistent with the results from India (Azam et al., 2013), the return to English in Turkey are higher for the older cohort of workers, especially for regular English competences. This evidence indicates that while the demand for English competences increased, its supply must have also increased. In India, older cohorts of workers with advanced English competences receive up to 70% higher earnings than those with no English skills. Controlling for occupation fixed-effects reduces the return to advanced English skills among the younger cohort. This suggests that the effect of English knowledge on the chances of attaining a better remunerated job is especially pronounced during the early labor market career. Alternatively¹³, FL competences are more relevant in certain types of jobs that are better rewarded than in the past.

5.3.3 Returns by Education and Occupation

Third, we consider the potential complementarities between English competences and other labor market skills. Following, Lang and Siniver (2009), Casale and Posel (2011) and Azam et al. (2013), we estimate separate equations for workers with low, medium and high educational attainments. The results appear in Table 9. The evidence for Turkey appears at odds with what is generally reported for other countries. While other authors obtained significant complementarities between education and FL knowledge in our case there is evidence of weak substitutability between English skills and formal education since the return to advanced English skills for the medium-and-high-educated employees is lower than for the low-educated. A similar pattern is observed for regular skills albeit with similar coefficients for different educational levels. Controlling for occupation and parental education somewhat reduces the return to English skills among employees with different education levels. In order to further investigate language- formal education complementarities, we compute the return to English skills according to birth-cohort and completed education (similar to Azam et al., 2013).¹⁴ The results,

¹³ This ambivalent interpretation of the results by cohort concerning occupation derives from the impossibility of separating age from (pure) cohort effects in a cross-section of data.

¹⁴ Specifically, with the aim of maintaining a sufficient number of observation in each model, we estimated the equation(s) separately for the younger (25-39) and the older (40-65) birth-cohorts and we interacted English skills dummies with two dummies for completed

reported in Table 10, again suggest substitutability between schooling and English proficiency, albeit this occurs at the advanced English skills among the younger cohort and at the regular English skills among the older cohort. This is also consistent with increasing English competences over time together with the expansion of formal education among Turkish young people.

The issue of complementarity between FLs and other labor market skills can also be obtained by estimating the model for different types of occupations, as done by Saiz and Zoido (2005) for the USA, by Lang and Siniver (2009) for Israel, and by Williams (2011) for EU countries. We divide the sample by standard high/low skill—white/blue collar categorization. The results in Table 11 show that the returns to basic English skills are insignificant for all of the four occupational groups. The returns to regular English skills are similar and significant for all groups except for the high-skilled blue collar employees. Advanced English skills are significant and highly rewarded in all four occupations whereby the reward for the low-skilled blue-collar is noticeably higher than for the other occupations.

5.3.4 Returns by Rural/Urban Areas

Finally we estimate the model separately for urban and rural areas, as was done by Azam et al. (2013). They found that, among Indian male workers, there is no difference in returns to English language between rural and urban locations. Our results in Table 12 show that returns to regular and advanced English skills are somewhat higher for urban than for rural areas. This is expected since most of the economic activities in which English is relevant and remunerated take place in urban areas where multinational firms, government and ICT intensive firms operate. The presence of more schools and migration of skilled workers towards urban agglomerations mean that the supply of workers with English skills would also be higher in such locations.

5.4 Quantile Regression Estimates

Until this point our empirical analysis only considered earnings differences associated to FL skills at the mean of the conditional wage distribution. Further, we analyzed the presence of heterogeneous returns according to several observed characteristics. We now investigate the return to English skills along the conditional wage

education that capture the differential returns to English skills for medium-and-high educated employees (relative to the base category of low-educated employees).

distribution using Quantile Regression analysis¹⁵, as previously done by Ginsburg and Prieto-Rodríguez (2011) and by Toomet (2011). Acquiring English skills might change not only the location but also the shape of the conditional earnings distribution. Further, the conditional earnings differentials proxy for unobservable earnings potential, then the Quantile Regression sheds light on the differential returns by unobserved individual heterogeneity.

Quantile Regression estimates are reported in Table 13. The heteroskedasticity test rejects the null hypothesis of constant residual variances in all cases we therefore report robust standard errors (Machado et al. 2011), The first panel contains the results for the baseline set of controls. The return to basic English skills is virtually zero at any quantile, while return to regular and advanced English competences are positive and increasing across different quantiles. The F tests reject the null hypothesis of constant coefficients along the earnings distribution. The results show that workers with higher earnings potential obtain higher returns to English proficiency, which is in line with the results obtained for several European Countries (Ginsburg and Prieto-Rodríguez 2011) and for Estonia and Latvia (Toomet 2011) except the very high return in the first decile. However, the estimates return to advanced English skills in the first decile of the conditional earning distribution represents a noticeable exception, given that being fully proficient in English among workers who are placed at the lower tail of the earnings distribution appears to be equally remunerated than for their counterparts at the top of the distribution (which is consistent with the higher return to advanced English skills obtained for the less-educated as well as for low skilled blue-collar workers). When occupation and parental education are controlled for the return to regular English becomes constant along the wage distribution and the increasing returns to advanced competences are clearly attenuated. The F tests for coefficients equality along the earnings distribution for any skill levels are not rejected. The heterogeneity in the returns according to unobservable earnings potential appears to be mostly linked to occupation-related selection based on unobservable traits. This evidence again confirms that mastering FLs is especially important in specific occupations, mostly at the upper percentiles of the earnings distribution. Disentangling the effect of selection into occupation is, however, a complicated task that requires more detailed and complete data, and we defer a deeper analysis of this issue to future research. Nevertheless, the main message that can be derived from the Quantile Regression analysis is that the earnings

¹⁵ See Koenker and Basset (1978), Koenker and Hallock (2001), Koenker (2005) for additional details about Quantile Regression methods.

premium associated to the command of English is positive and substantial across the entire conditional distribution of earnings, reinforcing the robustness of the overall findings from this research.

6. Conclusions and Policy implications

The knowledge of foreign languages represents a form of human capital. Drawing on data from the 2007 Adult Education Survey, this is the first study that estimates the earnings returns to FL skills in Turkey, a country recently characterized by rapid economic and social development. The ongoing changes in the Turkish economy have fostered the relevance of and demand for FL competences in the labor market. However, the endowment of FL skills among the Turkish labor force appears to be rather scarce. Overall, this situation points to the existence of substantial economic premiums to the command of FLs. Quantifying such returns represents the main purpose of this paper. Examining the returns to FLs is important, since it will guide policy makers and individuals about how much to invest in fostering competences in FLs among current and future generations of workers. Overall, the results from our study suggest that acquiring competences in FLs represents a profitable investment in the Turkish labor market. The returns to this investment are clearly positive at the individual level. Indeed, becoming proficient in English, but also in Russian and, to a lesser extent French, and German, constitutes a significant potential for higher earnings and, more generally, for better labor market performance, as FL knowledge seems to increase the chances of obtaining a better and more remunerated job. Thus proficiency in FLs has important implications in terms of labor market outcomes, since it improves employability, occupational prospects and earnings potential. Moreover, it seems plausible that the economic value of FL knowledge would be positive not only at the individual level, but also at the societal level. Our results suggest that fostering FL skills should be taken as an additional challenge for Turkish policy makers. There are several reasons for considering that increasing FL competences among the Turkish population would further promote international trade, internationalization and openness in the Turkish economy, as well as R&D activities and innovation. In turn, this would generate greater potential for growth and socio-economic development of the nation, improving its position in the global knowledge economy.

Indeed, improving English skills among the population would be especially beneficial for a mid-sized developing country such as Turkey, since it may help reduce existing disparities in global competition between

emerging economies for international trade and attracting new FDIs. This is extremely relevant in light of the significant scale and resource advantages of the two leading Asian emerging countries, India and China. In fact, in the former, English represents a former colonial language that is co-official and widely spoken among the population, especially among the highly educated, and the latter has the largest English-learner population in the world (Crystal, 2008, He and Li, 2009). Moreover, we believe that, relative to other mid-sized emerging economies, fostering competences in English, as well as in other relevant European languages, might be especially important in Turkey for two additional reasons. First, given the geographical location of the country, this could favor its historical role of “bridge” for commodities trading between Asia and Europe. Second, reducing language barriers would be especially relevant for further attenuating already reduced cultural barriers between Turkey and EU countries, which might represent an additional stimulus for commerce and trade.

Several policy implications can be directly advocated in light of our results, which can be reasonably extrapolated to other developing countries as well as to developed countries with insufficient endowment of FL skills in their labor forces. First, policy makers should emphasize teaching of English at schools, in order to increase the English proficiency of future generations of workers. This would be especially important due to growing demand for FL competences in the Turkish labor market in the near future, with the prospect of further economic growth and development and possible access to the EU. The 1997 Turkish education reform increased the amount of FL teaching during the schooling process. The radical changes of the subsequent 2012 restructuring also introduced a gradual increase in FL instruction. However, there is no evidence about the effectiveness of these reforms in improving the FL proficiency of students from different grades. Therefore, evaluating the effect of the 1997 reform on English proficiency represents an object of our future research¹⁶. Moreover, the government should also foster English teachers’ training and professional requirements, since teachers play a fundamental role in guaranteeing the effectiveness of the above-mentioned educational reforms.

Second, for the current generation of workers, future public policies should be directed to encourage and subsidize their attendance at private FL centers. This is a sensible approach as our findings point out certain, albeit not high, substitutability between English skills and general schooling for the young. In fact, beyond

¹⁶ Indeed, the future availability of the Turkish AES 2012 data will enable estimating the causal effect of the increase in teaching English at schools with the 1997 reform. In fact, the new data will contain information about individuals who are affected by the reform (i.e. the treatment group) and the others who are not exposed to the reform (i.e. the control group).

earnings, FL skills may also enhance employability and labor market opportunities for low-educated young individuals who may possibly come from a disadvantaged socio-economic and family background. Moreover, as suggested by Rupérez-Micola et al. (2012), broadcasting films or programs in their original English with subtitles in national language, as it is done in several countries, especially in Northern Europe, might help increase English skills among the population. Here we emphasize English as the FL to be taught, not only because of its international value and in light of its relevance compared to other languages that emerges from our results, but also because there currently is a substantial stock of English language teachers, albeit still less than the demand for them. Teaching Russian in schools would take time to accomplish, because of the need first to train teachers. The current demand for Russian speaking workers could be met by teaching Russian at special schools such as tourism schools or at FL centers. There may also be some space for policies aimed at improving competences in German and French. However, our less conclusive results regarding these two languages, and given the hegemony of English as the *lingua franca*, less priority should be given to investments in these languages.

In contrast, our findings suggest that there is no earnings premium to knowledge of Arabic in the Turkish labor market. Given this result, from an economic perspective, the policy makers should discontinue investing scarce resources into teaching Arabic at the religious vocation schools¹⁷. These skills are not rewarded in the labor market and hence are non-productive. Also noteworthy is the absence of Chinese language instruction in Turkey, excepting a couple of university programs. Chinese language instruction could be important given the recent increases in the volume of trade with China. Further, since most productive potential of FL skills is expected to be allocated in the private sector, especially among firms exposed to English-intensive activities such as international trade, R&D, ICT and tourism, private businesses should contribute to financing FL training of their workforce and complement government's public investment. Finally, Turkey should be able to benefit more from language competences of its citizens with immigrant backgrounds, such as the growing population of return-migrants from Germany attracted by the current economic development path of the country.

¹⁷ A recent law passed at the parliament mandated that starting with the 2013-2014 academic year the "Ottoman language" will be a compulsory course at the social sciences high schools and an elective course in all other high schools (Sol Portal, April 6, 2013). A dead language like Ottoman language is expected to have no economic value in the labor market. It could be instructed to those who are specializing in the Ottoman history or Ottoman literature at the undergraduate or post-graduate programs of the universities rather than at the high schools.

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TABLES

Table 1: Foreign language knowledge among Turkish male employees

	no Foreign Languages	one Foreign Language	two Foreign Languages	three or more FLs	TOTAL (%)
BIRTH COHORT					
cohort 25-39	61.72	33.78	3.75	0.74	100
cohort 40-65	67.96	27.56	4.12	0.36	100
COMPLETED EDUCATION					
low-education	92.91	6.26	0.67	0.16	100
medium-education	56.48	39.4	3.59	0.53	100
high-education	18.19	69.09	11.09	1.63	100
OCCUPATION					
high-skilled white collars	33.92	56.78	8.09	1.22	100
low-skilled white collars	60.81	34.18	4.16	0.85	100
high-skilled blue collars	83.27	15.4	1.18	0.15	100
low-skilled blue collars	80.77	17.36	1.7	0.17	100
URBAN/RURAL AREAS					
urban	63.04	32.63	3.74	0.58	100
rural	68.02	26.84	4.47	0.66	100
TOTAL (%)	64.04	31.47	3.89	0.6	100
NUMBER OF OBSERVATIONS	3854	1894	234	36	6018

Table 2: Foreign languages spoken (among foreign language speakers, N = 2164)

	English	French	German	Arabic	Russian	Others
BIRTH COHORT						
cohort 25-39	86.5	4.2	10.4	7.2	2.6	1.4
cohort 40-65	73.9	11.6	13.1	11.6	1.5	2.0
COMPLETED EDUCATION						
low-education	47.8	3.3	14.4	28.3	5.6	11.1
medium-education	82.0	6.8	9.9	7.4	2.8	1.3
high-education	88.9	7.1	12.2	6.3	1.2	0.1
OCCUPATION						
high-skilled white collars	85.4	7.4	11.8	7.8	1.7	0.6
low-skilled white collars	85.7	5.4	11.5	6.7	3.0	0.9
high-skilled blue collars	76.2	5.7	9.7	9.7	2.2	3.5
low-skilled blue collars	71.7	6.5	10.6	13.3	3.2	4.4
URBAN/RURAL AREAS						
urban	84.0	6.7	11.0	6.7	2.3	1.2
rural	74.6	6.2	12.7	17.4	2.1	3.4
TOTAL (%)	82.3	6.7	11.3	8.6	2.3	1.6

Table 3: Foreign language skills (among foreign language speakers, N = 2164)

	% over FL	basic	regular	advanced
first FL = English	79.44			
		55.03	31.47	13.50
first FL = French	4.85			
		73.33	20.00	6.67
first FL = German	7.44			
		50.93	31.06	18.01
first FL = Arabic	5.87			
		20.47	38.58	40.94
first FL = Russian	0.74			
		12.50	75.00	12.50
first FL = Other	1.66			
		27.78	19.44	52.78

Table 12: Heterogeneous returns to foreign language skills — urban/rural areas

	urban area			rural area		
no English skills	<i>reference category</i>			<i>reference category</i>		
basic English skills	-0.003 <i>(0.018)</i>	-0.003 <i>(0.018)</i>	-0.006 <i>(0.018)</i>	0.045 <i>(0.044)</i>	0.034 <i>(0.042)</i>	0.027 <i>(0.042)</i>
regular English skills	0.206 ^a <i>(0.028)</i>	0.163 ^a <i>(0.027)</i>	0.148 ^a <i>(0.027)</i>	0.152 ^a <i>(0.055)</i>	0.121 ^b <i>(0.061)</i>	0.111 ^c <i>(0.060)</i>
advanced English skills	0.475 ^a <i>(0.037)</i>	0.387 ^a <i>(0.037)</i>	0.355 ^a <i>(0.039)</i>	0.305 ^a <i>(0.079)</i>	0.274 ^a <i>(0.094)</i>	0.257 ^a <i>(0.096)</i>
<i>parental education</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>
<i>occupation fixed effects</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
number of observations	4811	4811	4811	1207	1207	1207
Adjusted R ²	0.364	0.414	0.421	0.301	0.376	0.377

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic) and type of contract. Urban area = individuals residing in urban areas. Rural area = individuals residing in rural areas.

Table 4: Distribution of foreign languages and net monthly earnings (in Turkish liras)

Income deciles	All the sample	at least one FL	English	French	German	Arabic	Russian	Other FL
% Q ₁ (top decile)	9.39	4.0	3.4	0.69	2.86	10.7	4.08	20.59
% Q ₂	10.14	5.5	4.9	6.25	5.71	8.56	2.04	8.82
% Q ₃	12.38	6.9	6.5	3.47	4.9	8.02	10.2	17.65
% Q ₄	7.76	5.4	5.4	3.47	5.31	5.88	4.08	5.88
% Q ₅	12.4	9.2	9.7	5.56	9.8	6.42	10.2	2.94
% Q ₆	7.68	6.8	6.3	6.25	8.16	4.81	8.16	23.53
% Q ₇	13.78	15.7	15.4	13.19	13.88	25.67	18.37	2.94
% Q ₈	7.98	12.6	12.2	19.44	11.02	15.51	14.29	5.88
% Q ₉	10.5	17.9	18.3	21.53	17.55	10.16	10.2	11.76
% Q ₁₀ (bottom decile)	8.01	16.1	17.9	20.14	20.82	4.28	18.37	--
Total (%)	100	100	100	100	100	100	100	100
average monthly earnings (in Turkish Liras)	923.9	1255.9	1280.2	1543.6	1332.9	962.1	1230.8	713.2

Table 5 (continued): foreign language augmented earnings regressions

	Number of foreign languages	English	French	German	Arabic	Russian	all FLs	all FLs	all FLs
no foreign languages		<i>reference category</i>							
one foreign language	0.075 ^a (0.016)								
two foreign languages	0.147 ^a (0.037)								
three or more foreign languages	0.376 ^a (0.096)								
knows English		0.107 ^a (0.016)					0.111 ^a (0.016)	0.086 ^a (0.015)	0.072 ^a (0.015)
knows French			0.084 ^c (0.044)				0.103 ^b (0.043)	0.090 ^b (0.041)	0.089 ^b (0.040)
knows German				0.082 ^b (0.032)			0.085 ^a (0.032)	0.065 ^b (0.031)	0.056 ^c (0.030)
knows Arabic					-0.066 ^b (0.033)		-0.066 ^b (0.034)	-0.088 ^b (0.034)	-0.067 ^c (0.034)
knows Russian						0.199 ^a (0.069)	0.141 ^b (0.070)	0.136 ^b (0.068)	0.129 ^c (0.067)
occupation fixed effects	no	no	no	no	no	no	no	yes	yes
number of observations	6018	6018	6018	6018	6018	6018	6018	6018	6018
Adjusted R ²	0.351	0.351	0.346	0.347	0.346	0.347	0.353	0.410	0.417

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$.

Table 6: Return to foreign language skills

	English skills	French skills	German skills	Russian skills	all FLs skills	all FLs skills	all FLs skills
reference category:	<i>English no first FL</i>	<i>French no first FL</i>	<i>German no first FL</i>	<i>Russian no first FL</i>	<i>No foreign languages*</i>		
basic English skills	0.005 <i>(0.017)</i>				0.019 <i>(0.018)</i>	0.015 <i>(0.017)</i>	0.011 <i>(0.017)</i>
regular English skills	0.196 ^a <i>(0.025)</i>				0.213 ^a <i>(0.026)</i>	0.175 ^a <i>(0.025)</i>	0.160 ^a <i>(0.025)</i>
advanced English skills	0.456 ^a <i>(0.034)</i>				0.475 ^a <i>(0.035)</i>	0.396 ^a <i>(0.035)</i>	0.366 ^a <i>(0.036)</i>
basic French skills		-0.079 ^b <i>(0.039)</i>			0.001 <i>(0.040)</i>	0.011 <i>(0.038)</i>	0.014 <i>(0.038)</i>
regular French skills		0.171 <i>(0.115)</i>			0.259 ^b <i>(0.117)</i>	0.192 ^c <i>(0.104)</i>	0.208 ^b <i>(0.100)</i>
advanced French skills		0.679 ^c <i>(0.403)</i>			0.792 ^c <i>(0.404)</i>	0.640 <i>(0.402)</i>	0.575 <i>(0.385)</i>
basic German skills			0.004 <i>(0.040)</i>		0.078 ^c <i>(0.041)</i>	0.067 ^c <i>(0.038)</i>	0.063 <i>(0.038)</i>
regular German skills			-0.078 <i>(0.065)</i>		0.002 <i>(0.065)</i>	-0.035 <i>(0.063)</i>	-0.034 <i>(0.063)</i>
advanced German skills			0.113 <i>(0.085)</i>		0.189 ^b <i>(0.088)</i>	0.174 ^b <i>(0.087)</i>	0.160 ^c <i>(0.088)</i>
basic Russian skills				0.626 <i>(0.464)</i>	0.636 <i>(0.452)</i>	0.597 <i>(0.434)</i>	0.578 <i>(0.437)</i>
regular Russian skills				0.174 <i>(0.145)</i>	0.213 <i>(0.140)</i>	0.234 ^c <i>(0.135)</i>	0.225 ^c <i>(0.136)</i>
advanced Russian skills				0.272 ^a <i>(0.030)</i>	0.280 ^a <i>(0.017)</i>	0.228 ^a <i>(0.039)</i>	0.252 ^a <i>(0.068)</i>
<i>parental education</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>
<i>occupation fixed effects</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
number of observations	6018	6018	6018	6018	6018	6018	6018
Adjusted R ²	0.370	0.348	0.346	0.346	0.374	0.423	0.428

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic), type of contract and a dummy for urban area. * No foreign languages (reference category in the last three columns) means that neither English, French, German or Russian are the first FL that the individual knows.

Table 7: Heterogeneous returns to foreign language skills — frequency of language use at work

	model 1	model 2	model 3
no English skills	<i>reference category</i>		
basic English skills - not used at work	-0.018 <i>(0.018)</i>	-0.017 <i>(0.017)</i>	-0.019 <i>(0.017)</i>
basic English skills - used less than once per month	0.037 <i>(0.046)</i>	0.028 <i>(0.047)</i>	0.017 <i>(0.047)</i>
basic English skills - used at least once per month	0.216 ^a <i>(0.064)</i>	0.199 ^a <i>(0.066)</i>	0.183 ^a <i>(0.067)</i>
basic English skills - used at least once per week	0.138 <i>(0.085)</i>	0.086 <i>(0.078)</i>	0.063 <i>(0.076)</i>
basic English skills - daily used	0.079 <i>(0.099)</i>	0.106 <i>(0.097)</i>	0.090 <i>(0.096)</i>
regular English skills - not used at work	0.125 ^a <i>(0.029)</i>	0.103 ^a <i>(0.028)</i>	0.087 ^a <i>(0.028)</i>
regular English skills - used less than once per month	0.210 ^b <i>(0.103)</i>	0.165 ^c <i>(0.094)</i>	0.154 <i>(0.096)</i>
regular English skills - used at least once per month	0.402 ^a <i>(0.065)</i>	0.367 ^a <i>(0.066)</i>	0.344 ^a <i>(0.066)</i>
regular English skills - used at least once per week	0.221 ^a <i>(0.067)</i>	0.151 ^b <i>(0.063)</i>	0.148 ^b <i>(0.063)</i>

regular English skills - daily used	0.317 ^a <i>(0.065)</i>	0.267 ^a <i>(0.061)</i>	0.251 ^a <i>(0.059)</i>
advanced English skills - not used at work	0.268 ^a <i>(0.059)</i>	0.221 ^a <i>(0.061)</i>	0.201 ^a <i>(0.062)</i>
advanced English skills - used less than once per month	0.461 ^a <i>(0.109)</i>	0.371 ^a <i>(0.104)</i>	0.349 ^a <i>(0.104)</i>
advanced English skills - used at least once per month	0.540 ^a <i>(0.130)</i>	0.418 ^a <i>(0.115)</i>	0.377 ^a <i>(0.114)</i>
advanced English skills - used at least once per week	0.486 ^a <i>(0.076)</i>	0.421 ^a <i>(0.076)</i>	0.390 ^a <i>(0.074)</i>
advanced English skills - daily used	0.516 ^a <i>(0.048)</i>	0.436 ^a <i>(0.050)</i>	0.401 ^a <i>(0.051)</i>
parental education	no	no	yes
occupation fixed effects	no	yes	yes
number of observations	6018	6018	6018
Adjusted R ²	0.374	0.424	0.429

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic), type of contract and a dummy for urban area.

Table 8: Heterogeneous returns to foreign language skills — birth-cohort

	cohort 25-39			cohort 40-65		
no English skills	<i>reference category</i>			<i>reference category</i>		
basic English skills	-0.006 <i>(0.019)</i>	0.001 <i>(0.018)</i>	-0.004 <i>(0.018)</i>	0.028 <i>(0.034)</i>	0.007 <i>(0.034)</i>	0.001 <i>(0.034)</i>
regular English skills	0.153 ^a <i>(0.027)</i>	0.115 ^a <i>(0.026)</i>	0.103 ^a <i>(0.026)</i>	0.282 ^a <i>(0.056)</i>	0.239 ^a <i>(0.054)</i>	0.216 ^a <i>(0.053)</i>
advanced English skills	0.425 ^a <i>(0.043)</i>	0.336 ^a <i>(0.042)</i>	0.310 ^a <i>(0.042)</i>	0.512 ^a <i>(0.057)</i>	0.470 ^a <i>(0.060)</i>	0.420 ^a <i>(0.066)</i>
parental education	no	no	yes	no	no	yes
occupation fixed effects	no	yes	yes	no	yes	yes
number of observations	3783	3783	3783	2235	2235	2235
Adjusted R ²	0.332	0.396	0.403	0.412	0.455	0.460

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic), type of contract and a dummy for urban area.

Table 9: Heterogeneous returns to foreign language skills — education

	high education			medium education			low education		
no English skills	<i>reference category</i>			<i>reference category</i>			<i>reference category</i>		
basic English skills	0.009 <i>(0.034)</i>	0.017 <i>(0.033)</i>	0.013 <i>(0.033)</i>	0.012 <i>(0.021)</i>	0.011 <i>(0.020)</i>	0.007 <i>(0.020)</i>	0.055 <i>(0.050)</i>	0.014 <i>(0.047)</i>	0.004 <i>(0.048)</i>
regular English skills	0.129 ^a <i>(0.039)</i>	0.100 ^a <i>(0.037)</i>	0.086 ^b <i>(0.037)</i>	0.147 ^a <i>(0.034)</i>	0.111 ^a <i>(0.033)</i>	0.099 ^a <i>(0.033)</i>	0.364 ^b <i>(0.156)</i>	0.313 ^b <i>(0.154)</i>	0.292 ^c <i>(0.153)</i>
advanced English skills	0.320 ^a <i>(0.044)</i>	0.260 ^a <i>(0.044)</i>	0.232 ^a <i>(0.046)</i>	0.410 ^a <i>(0.061)</i>	0.308 ^a <i>(0.070)</i>	0.289 ^a <i>(0.073)</i>	0.631 ^a <i>(0.034)</i>	0.697 ^a <i>(0.040)</i>	0.658 ^a <i>(0.044)</i>
parental education	no	no	yes	no	no	yes	no	no	yes
occupation fixed effects	no	yes	yes	no	yes	yes	no	yes	yes
number of observations	1226	1226	1226	2254	2254	2254	2538	2538	2538
Adjusted R ²	0.221	0.307	0.318	0.162	0.239	0.244	0.124	0.200	0.207

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic), type of contract and a dummy for urban area.

Table 11: Heterogeneous returns to foreign language skills — occupation

high-skilled white-collar	high-skilled blue-collar	low-skilled white-collar	low-skilled blue-collar
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	<i>reference category</i>			<i>reference category</i>			<i>reference category</i>			<i>reference category</i>		
no English skills	-0.018	-0.022	-0.029	0.028	0.025	0.015	0.045	0.041	0.041	0.021	0.016	0.013
basic English skills	<i>(0.029)</i>	<i>(0.029)</i>	<i>(0.029)</i>	<i>(0.039)</i>	<i>(0.039)</i>	<i>(0.038)</i>	<i>(0.034)</i>	<i>(0.034)</i>	<i>(0.034)</i>	<i>(0.032)</i>	<i>(0.031)</i>	<i>(0.031)</i>
regular English skills	0.168 ^a	0.148 ^a	0.127 ^a	0.053	0.059	0.060	0.104 ^b	0.101 ^b	0.103 ^b	0.172 ^b	0.164 ^b	0.162 ^b
advanced English skills	<i>(0.034)</i>	<i>(0.034)</i>	<i>(0.034)</i>	<i>(0.088)</i>	<i>(0.086)</i>	<i>(0.086)</i>	<i>(0.045)</i>	<i>(0.045)</i>	<i>(0.045)</i>	<i>(0.070)</i>	<i>(0.068)</i>	<i>(0.070)</i>
	0.344 ^a	0.301 ^a	0.257 ^a	0.373 ^a	0.382 ^a	0.380 ^a	0.361 ^a	0.368 ^a	0.375 ^a	0.664 ^b	0.602 ^b	0.608 ^b
	<i>(0.041)</i>	<i>(0.042)</i>	<i>(0.044)</i>	<i>(0.104)</i>	<i>(0.100)</i>	<i>(0.099)</i>	<i>(0.075)</i>	<i>(0.078)</i>	<i>(0.081)</i>	<i>(0.292)</i>	<i>(0.299)</i>	<i>(0.279)</i>
parental education	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>yes</i>
occupation fixed effects	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
number of observations	1719	1719	1719	1357	1357	1357	1179	1179	1179	1763	1763	1763
Adjusted R ²	0.355	0.395	0.403	0.106	0.122	0.137	0.276	0.284	0.286	0.200	0.260	0.266

Note: OLS regressions with robust standard errors within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic), type of contract and a dummy for urban area. High-skilled White collar = individuals with 2-digits ISCO88 comprised between 11 and 34. Low-skilled White collar = individuals with 2-digits ISCO88 comprised between 41 and 52. High-skilled Blue collar = individuals with 2-digits ISCO88 comprised between 61 and 74. Low-skilled Blue collar = individuals with 2-digits ISCO88 comprised between 81 and 93.

Table 13: Heterogeneous returns to foreign language skills — conditional wage distribution

	Q_{0.1}	Q_{0.25}	Q_{0.5}	Q_{0.75}	Q_{0.9}	F test (Prob.)
no English skills	<i>reference category</i>					
basic English skills	-0.007	0.006	0.014	0.001	-0.013	0.84
	<i>(0.025)</i>	<i>(0.026)</i>	<i>(0.018)</i>	<i>(0.020)</i>	<i>(0.029)</i>	
regular English skills	0.156 ^a	0.170 ^a	0.148 ^a	0.226 ^a	0.294 ^a	0.04
	<i>(0.051)</i>	<i>(0.030)</i>	<i>(0.026)</i>	<i>(0.032)</i>	<i>(0.052)</i>	
advanced English skills	0.520 ^a	0.362 ^a	0.423 ^a	0.512 ^a	0.527 ^a	0.02
	<i>(0.046)</i>	<i>(0.056)</i>	<i>(0.041)</i>	<i>(0.039)</i>	<i>(0.080)</i>	
parental education	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	
occupation fixed effects	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	
pseudo R2	0.341	0.368	0.369	0.367	0.356	
no English skills	<i>reference category</i>					
basic English skills	-0.006	0.008	0.013	-0.025	0.011	0.27
	<i>(0.023)</i>	<i>(0.018)</i>	<i>(0.018)</i>	<i>(0.020)</i>	<i>(0.026)</i>	
regular English skills	0.137 ^a	0.121 ^a	0.173 ^a	0.168 ^a	0.205 ^a	0.3
	<i>(0.036)</i>	<i>(0.025)</i>	<i>(0.026)</i>	<i>(0.031)</i>	<i>(0.034)</i>	
advanced English skills	0.324 ^a	0.272 ^a	0.384 ^a	0.405 ^a	0.422 ^a	0.05
	<i>(0.054)</i>	<i>(0.039)</i>	<i>(0.039)</i>	<i>(0.051)</i>	<i>(0.057)</i>	
parental education	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	
occupation fixed effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	
pseudo R2	0.381	0.406	0.416	0.407	0.382	
no English skills	<i>reference category</i>					
basic English skills	-0.011	0.013	0.011	-0.026	0.003	0.26
	<i>(0.023)</i>	<i>(0.019)</i>	<i>(0.018)</i>	<i>(0.021)</i>	<i>(0.026)</i>	
regular English skills	0.134 ^a	0.107 ^a	0.149 ^a	0.165 ^a	0.194 ^a	0.35
	<i>(0.037)</i>	<i>(0.027)</i>	<i>(0.026)</i>	<i>(0.031)</i>	<i>(0.037)</i>	
advanced English skills	0.332 ^a	0.271 ^a	0.358 ^a	0.364 ^a	0.368 ^a	0.18
	<i>(0.051)</i>	<i>(0.040)</i>	<i>(0.040)</i>	<i>(0.055)</i>	<i>(0.062)</i>	
parental education	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	
occupation fixed effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	
pseudo R2	0.393	0.413	0.421	0.415	0.386	
Number of Observations	6,018	6,018	6,018	6,018	6,018	

Note: Quantile Regressions with robust standard errors (Machado et al. 2011) within parenthesis in italic. ^c Significant at $p < 0.1$, ^b significant at $p < 0.05$, ^a significant at $p < 0.01$. All the models include controls for years of schooling, potential experience (quadratic) type of contract and a dummy for urban area.