

Poland in an Integrated European Economy: Are Foreign Language Skills Valued by Employers in the Polish Labor Market?

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Abstract: It seems self-evident that ability to speak a language other than one's native tongue would be an economically valuable skill in many labor market situations. A large empirical literature, for example, has identified a significant positive effect on wages for immigrant workers who develop fluency in the language of their migration destination. Much less attention has been paid to possible labor market advantages from mastery of a foreign language by workers remaining in their home country. We present an empirical study of the effect of foreign language ability on the base wage and total salary of full time workers in Poland in 2014 using a unique data set with nearly 100,000 survey responses. Controlling for a large number of worker and firm characteristics, we find a statistically significant and quantitatively important positive effect of self-described English ability on wages. Wage levels are also positively correlated with the number of languages other than English in which the respondent reports an advanced level of ability. The wage effect of foreign language skills is stronger in the private sector, in foreign-owned firms, in regions and industries more closely integrated with foreign trade and in higher level jobs within the firm. Using an educational reform as an instrumental variable, we are able to identify a causal relationship between ability in English and individual wage levels.

1. Introduction

In an increasingly integrated global economy it seems clear that fluency in English or other languages with commercial importance would be a potentially significant addition to a worker's human capital. Language skills might be especially valuable for workers in a country like Poland which has predicated its relatively successful transition strategy on increased integration with Western Europe and, ultimately, membership in the European Union and which has been the beneficiary of significant inflows of foreign capital. In addition, to support this transition policy Poland has adopted language education objectives designed to create a multilingual workforce. While each person has his or her own reasons for learning foreign languages and experiences unique practical benefits, some of the cognitive, social, cultural and economic advantages of bi/multilingualism are universal. Language is now recognized as an economic variable¹ and the 'economics of language' has emerged as an interdisciplinary research field analyzing "the mutual effect of language-related and economic variables" (Grin, 1994, p. 25)². Numerous studies have reported a significant, robust relationship between foreign language skills and macroeconomic indicators, such as GDP, trade, and FDI, and various labor market outcomes, such as employability, occupational mobility, and earnings.

We focus on the impact of foreign language competence on labor income³ earned by workers in the Polish labor market in 2014. We find that individual earnings of workers in Poland are positively correlated with self-reported level of ability in English as well as with advanced competency in one or more of the other five foreign languages considered in the

¹ See Zhang and Grenier (2013) for a comprehensive survey and references therein.

² See, e.g., Chiswick and Miller (2007) and Ginsburgh and Weber (2011) and references therein.

³ In this study, the terms 'earnings,' 'wages,' 'salary' and 'labor income' are used interchangeably.

survey (German, Russian, French, Italian, and Spanish). Our study contributes to the growing field of language economics in several ways:

First, to the best of our knowledge, this study is the first attempt to measure a foreign language wage premium in Poland, a relatively successful transition economy. It is worth noting that such studies are virtually non-existent for the entire group of post-communist states in Europe, even though all of these countries embarked on their transitions to a market economy at a time of increased European economic integration. We were able to find only a few analyses for the Czech Republic, Hungary, Estonia and Latvia.⁴

Second, while our sample is drawn from the *total* Polish population, this may also be described practically as the *native-born* population because immigrants constitute a tiny fraction (less than 2%) of Polish residents.⁵ An extensive strand of the empirical literature on the effect of language acquisition on earnings has concentrated on the returns to immigrants⁶ who learn the main language of their host countries (mostly in Australia, Canada, Germany, the UK and the US). Several studies have examined the wage effect of mother tongue on earnings in multilingual countries such as Canada, Luxemburg, Switzerland, and Ukraine.⁷ However, as Araújo *et al.* (2015, p. 65) conclude, “very little research exists, on the other hand, on the returns to speaking

⁴ See section 3.2 for a review of these papers.

⁵ The 2011 National Population and Housing Census data revealed that 98.1% of the Polish residents were born in Poland and 99.7% per cent were citizens of the Republic of Poland. The largest group among foreigners residing in Poland were Ukrainians (24.1 thousand), followed by Germans (9.2 thousand), Belarusians (7.5 thousand) and Russians (7.2 thousand) (Duszczyc *et al.*, 2013, p. 23).

⁶ Grin (2003, p. 46) points out that “The term ‘rate of return’, in this context, is not fully appropriate. (...) the concept of rate of return presupposes that human capital is treated as an investment entailing (mostly) current expenditure in order to generate future benefits. In other words, the passage of time should be explicitly taken into account. However, the overwhelming majority of existing statistical work on the private value of second language skills eschews the question of time. Typically, information will be gathered on the current value of a range of variables for individual observations, and these values related to one another through multivariate analysis; hence, it is more appropriate to speak about ‘earnings differentials’. Hence, most of the literature in this area therefore presents differentials, not rates of return.” In this study, the term ‘return’ may be occasionally used in lieu of ‘wage differential’ or ‘wage premia.’

⁷ The reader is referred to Gazzola *et al.* (2015) who prepared an up-to-date extensive bibliography on ‘Language Economics.’ In particular, the list of studies on language and labor market outcomes appears on pp. 16-27.

foreign languages for the native population” in a monolingual country. We thus intend to fill this gap by analyzing foreign-language earnings differentials for the native-born population in Poland.⁸ In this regard, our study is novel and differs from the majority of previous work because “the type of language knowledge that is relevant for natives and foreign-born on the labour market, however, is probably not the same” and hence “investigating the differential association between language skills and labour market outcomes for natives and for migrants requires applying different conceptual frameworks and models” (Araújo *et al.* p.65, footnote 32).

Third, many of the limited number studies of foreign language ability of native workers refer to language *use* (typically at the workplace) rather than language *skills*. Language use is a fairly vague and unreliable definition of language competence (Grin, 2003, pp. 19-20). We investigate the extent to which, *ceteris paribus*, a better *general* knowledge of foreign languages can be associated with higher earnings. The rationale behind this approach is that, as Saiz and Zoido, (2005, p.523), conclude, “there might exist wage premia associated with the knowledge of a second language, whether individuals actually use the second language on the job or not.”

Finally, our study uses a large data set with 98,783 observations. This enables us to analyze wage premia associated with different levels of proficiency (beginning, intermediate and advanced⁹) in English, French, German, Italian, Russian and Spanish, while controlling for a large number of socio-demographic factors that may affect earnings. The large number of observations also allows us to explore potential heterogeneity in language-based differentials

⁸ Our study falls into the first sub-category of Group C, according to the classification of empirical research on the relationship between language and earnings in Grin (2003, pp. 18-20). We consider the general population in Poland and estimate the effects of foreign language competence on earnings for those people who have learned a foreign language (say, English, German, Russian or French), that is, the language that is *not* demolinguistically dominant in the country. Despite globalization and integration among the EU states, Poland still remains “an overwhelmingly monolingual country where Polish is the first language used at home for 94.5% of the population and the only language for 92.6%” according to the 2011 Census (Wójtowicz, 2015, p. 99).

⁹ In accordance with a self-assessment grid (CEFR) used in the European Language Portfolio <http://www.coe.int/en/web/portfolio/self-assessment-grid>).

along various dimensions such as gender, type of establishment, position within the establishment and various measures of the extent to which the individual's employment is connected to international economic activity.

We begin with a detailed summary of foreign language education in Poland in section 2 before turning to a review of the literature on the effect of foreign language competence on labor market outcomes in section 3. Part 4 provides details on the data we use and our method of analysis. We report our results in sections 5 and 6, and finish with conclusions in part 7.

2. Foreign language education in Poland, 1944-2016: An overview

2.1 The socialist period (1944-1989)

During the socialist era, the Polish system of school education consisted of the following levels: primary education (*szkola podstawowa*, 8 years, ages 7-14) and secondary education (from age 15). There were various forms of secondary education, such as secondary general (*liceum*, 4 years, ages 15-18), secondary vocational (*technikum*, 4 or 5 years, ages 15-18/19), and basic vocational (*szkola zawodowa*, 3 years, ages 15-17). Children's chances to continue into secondary education depended on rigorous placement exams. During the 1970s and 1980s, the bottom half of primary school graduates were streamed into basic vocational schools, about one third studied in secondary vocational schools, and fewer than 20% were in secondary general education (Wiśniewski, 2007). This distribution of pupils in secondary education reflected the communist ideology of the dominant role of the working class in socialist societies. As a result, by the early 1990s Poland was among the OECD countries with the lowest participation rates in full secondary education (OECD, 2010).

Regarding foreign language education during this period, the Russian language was mandatory since the late 1940s for all pupils from the age of 11 years, (*i.e.*, grade 5 of primary school). A second foreign language – English, German, French or Latin – was introduced only in secondary general schools. In vocational schools, a second foreign language was rarely taught. Consequently, at the end of the 1980s Poland had 18,000 teachers of Russian and only 1,200 teachers of English (Komorowska, 2014, p. 25). In 1989, 100% of pupils studied Russian (*ibid.*, p. 27). Despite the dominance of the Russian language in the Polish educational system, the 40 years of teaching it ended in failure because of low social motivation to learn Russian and because the authorities did not care much about teaching efficiency. Knowledge of a West European language was also at a minimal level of proficiency due to a very limited presence of West European languages in schools and a small percentage of pupils learning it (Janowski, 1992). At the same time, many parents believed that it was West European languages, and especially English, that were crucial for professional advancement of their children, and a large outside-school English teaching market started to emerge in the 1980s.

2.2 Structural reforms in the 1990s

With the demise of the socialist system, a new non-communist government was appointed in September 1989. The new government launched numerous political and economic structural reforms as well as profound reforms of the educational system. It was decided to move from a 8-3 or 8-4 structure¹⁰ to a 6-3-3 structure. This meant that the duration of education in primary school (*szkola podstawowa*) would be reduced to 6 years (ages 7-12). Upon completion of primary education, pupils would continue their education in a 3-year *gymnasium* *i.e.*, general lower secondary school (ages 13-15) after which pupils would be able to choose among the four upper secondary options (ages 16-18/19): a three-year general upper secondary school (*liceum*

¹⁰ That is, 8 years of primary school followed by three or four years in secondary school.

ogólnokształcące), a three-year specialized upper secondary school (*liceum profilowane*), a three-year basic vocational school (*zasadnicza szkoła zawodowa*), or a four-year technical upper secondary vocational school (*technikum*). The new system went into effect in the 1999/2000 school year.

In 1989-1991 the new Polish government developed a list of educational priorities, and the major one was “a large-scale introduction of West European languages, first of all English, to schools” (Janowski, 1992, p. 50). Since the 1989/90 school year, Russian was no longer mandatory and was replaced by English as the first foreign language. The starting age for languages was lowered from 11 to 10. The reform broadened the list of languages for secondary education by introducing Spanish, Italian, Japanese, Hungarian, and Swedish into the curriculum. A second foreign language was optional in the *gymnasium*, but compulsory in the *lyceum* (Komorowska, 2014). The goal of the reform was that by the end of the 20th century all school graduates would speak English and 70% of them would know another foreign language in addition, and all school graduates would speak two foreign languages by 2010 (Janowski, 1992, p. 51).

In the 1991/92 academic year, 59.1% of pupils studied Russian, 18.6% English, 17.2% German, and 3.8% French (Czachor, 2011, Table 2). Russian continued to dominate foreign languages in Poland until the 1996/97 school year, with English at the distant second place, followed by German in the third place. The structure of foreign language learning changed dramatically in the 1996/97 school year when English moved to the first place, followed by German, Russian and French. This lineup of foreign languages generally remains unchanged to these days. The largest increase in the prevalence of the English language occurred in the

1999/2000 school year when its share¹¹ increased to 46.9% from 34.5% in the 1998/99 school year. The shares of other languages in the 1999/2000 school year were: 30.7% German, 16.0% Russian, 4.2% French, 0.8% Latin, 0.1% Hispanic, and 0.1% Italian. These data refer to foreign languages taught as compulsory subjects in school. When foreign language as an *elective* course is taken into consideration, the share of English increases to 51.9%, German – to 32.2% and French – to 4.4% (CODN, 2000, p. 40).

2.3 Post-transition (2000-current)

Poland joined the European Union in 2004. Since then foreign language education in Poland has been organized in accordance with the recommendations of the EU, particularly a Communication titled “Multilingualism: an asset for Europe and a shared commitment” and a Resolution on a European strategy for multilingualism adopted in 2008.¹² Both documents encouraged acquiring language skills in order to enhance social cohesion in the EU. Starting the 2008/09 school year, teaching of the first foreign language is introduced as early as the first grade of primary school (ages 6-7), and teaching of the second foreign language became compulsory in the first grade of the *gymnasium* (age 13). English should be one of the selected languages, however not necessarily the first one.

During the first decade of the 21st century, the prevalence of the English language continued to increase but at a slowing rate, its share dropped in the 2006/07 school year but rebounded afterwards in connection with the implementation of the reforms in 2008 and reached 86.2% in the 2009/10 school year. The share of the German language was quite stable with little fluctuation and overall increased negligibly from 33.4% in the 2000/01 school year to 33.5% in the 2009/10 school year. The share of the French language was the highest in the 2000/01 school

¹¹ Measured as a proportion of all pupils learning this language in all types of schools.

¹² COM(2008) 566 final, and 2008/C 320/01.

year but afterwards gradually declined to 2.7% in the 2009/10 school year. The share of the Russian language fell dramatically from 13.4% in the 2000/01 school year to 4.5% in the 2009/10 school year (ORE, 2011, pp. 10-11). When the learning of foreign language as an *elective* course is taken into consideration, the shares of foreign languages in the 2009/10 school year were as follows: 90.4% English, 43.3% German, 3.5% French (ORE, 2011, p. 8), 7.2% Russian, 0.4% Spanish, 0.2% Italian, 0.1% other languages (Chinese, Japanese, Arabic, etc.) (Komarowska, 2014, p. 26).

The second decade of the 21st century continues to witness the same trends and patterns of foreign languages: the shares of English, German and French are rising, and the share of Russian is falling. In the 2011/12 school year, the shares of pupils learning a particular language were: English 93.7% (91.6% compulsory and 2.1% electively), German 46.1% (39.9% and 7.2%), French 3.6% (3.0% and 0.6%), and Russian 6.7% (5.1% and 1.2%). The majority of pupils (51.5%) studied two foreign languages, 44.3% – one language, and 1.1% – three or more languages (ORE, 2013, pp. 7, 24).

According to Komarowska (2014, p. 27), Poland exhibits unique language constellations which are not typical for other parts of Europe. In Poland, the most common language constellations for a school graduate include English (as an extremely popular language of international communication) and German, Russian or French (as a language of a neighboring country) with Spanish and Italian as a third foreign language typically learned outside of school. The spatial distribution of foreign languages in schools (with the exception of English) shows strong regional differences: German is the dominant language in the western regions, French is relatively strong in some southern parts of the country, and Russian in the eastern part of Poland.

2.4 Looking ahead

The European Council and the OECD consider multilingual regions to be an asset to every member state, and individual multilingualism to be an asset to every citizen. The long-term goal is to increase the number of languages learned by an individual to two or three and to diversify school language offerings. In line with the EU recommendations, Poland is expected to continue promoting multilingualism through a broader language offer in schools, especially the less-widely-used languages of neighboring countries, by encouraging the attainment of higher proficiency levels, and increasing the quality of teaching (Komorowska, 2013, p. 476).

Several surveys were carried out in Poland (either separately or among the EU countries) to assess foreign language skills in the general population and its socio-demographic subgroups. The Polish Academy of Science conducted a national survey on foreign language competences in 1993 and 2013 (Wysmułek and Oleksiyenko, 2015). According to its results, the proportion of respondents able to speak at least one foreign language well enough to have a conversation did not change much during the past 20 years – 41% in 1993 and 43% in 2013. In 2013, the youngest generation (21-25 years of age) exhibited the highest proportion (70%) of those who could speak at least one foreign language. This share was lower (60%) for the 26-35 age group, 35% for the 36-45 age group, and about 30% for all older age groups. Overall, in 2013 the majority of respondents (54%) cited English as their first foreign language, 28% cited Russian and 15% cited German. However, the distribution varied for different age groups: the predominant majority of younger people spoke English while the majority of older generations spoke Russian.

Another survey on foreign language competences was conducted by the European Commission in 2005 and 2012 (EC, 2005; EC, 2012). The findings for Poland were disappointing: the proportion of respondents able to speak at least one foreign language well

enough to have a conversation decreased by 7 percentage points (to 50%), at least two foreign languages – decreased by 10 percentage points (to 22%), at least three foreign languages – decreased by 9 percentage points (to 7%). Only 11% used their first foreign language daily, 24% often but not daily and 59% occasionally. Assessing the usefulness of foreign languages for personal development, 65% of respondents cited English, 31% German, 8% Russian, but 14% said that foreign languages were not useful at all. The Polish people were most likely to be discouraged from learning another language because it was too expensive (38% of responses), they did not have a reason or incentive to do so (26%), or they lacked the time (20%).

The two surveys mentioned above mainly focused on the number of self-reported foreign languages known by an individual, irrespective of proficiency levels. A study by Araújo *et al.* (2015) analyzed both the number of foreign languages and proficiency in 25 EU countries in 2011. In this regards, Poland exhibited the worst results both in the EU and among the Visegrad Group¹³. In Poland, only 13% of individuals who knew one or more foreign languages declared that they knew at least one of them at the proficient level. This share was 17% in the Czech Republic, 24% in Hungary, 36% in Slovakia, and 25% on average in the EU. The study also reported the share of proficient individuals in the total population, that is, among those who knew and did not know foreign languages. Again, Poland remained among the worst performing countries with only 8%, while the EU average was 16%.

In sum, the recent survey evidence suggests that Poland is still very far from the common EU objective defined in 2002 that every EU resident should learn two languages at school in addition to their mother tongue. Given the accelerated pace of globalization and the rapid growth of emerging economies, language skills are becoming crucial. Poland needs to develop its

¹³ The Visegrad Group consists of the four post-communist Central European countries: the Czech Republic, Hungary, Poland, and Slovakia.

citizens' foreign language competence in far greater numbers and in a wider range of languages in order to increase its competitiveness and to enjoy the full benefits of both the European and global integration.

3. Foreign language knowledge and labor market outcomes

3.1. Foreign language competence and productive skills

Globalization and technological advances in the last few decades have dramatically changed the nature of workplaces. Languages are now part of workplace diversity.^{14,15} In the Introduction to a special issue on multilingualism at work in *Multilingua: Journal of Cross-Cultural and Interlanguage Communication*, Jo Angouri (2014, p.1) provides a succinct summary of the increasing role of foreign languages in the workplace:

The modern workplace is multinational and multilingual. Both white and blue collar employees are expected to be mobile, work increasingly in (virtual) teams and to address complex organisational issues in a language that, often, is not their first language. This results in a number of languages forming the ecosystem of public and private workplace settings. Although *linguae francae* in general and English in particular hold a privileged position in the international business area, the linguistic landscape of both small/medium enterprises (SMEs) and multinationals (MNCS) is rich and diverse. Employees cross professional, linguistic and national boundaries as part of their daily routine at work and business mobility is a characteristic of the global economy. (...) About 15 years ago language was identified as the 'the forgotten factor' in MNC management. Since then, and in the context of the knowledge economy, companies have become more aware of the importance and economics of 'language skills' and 'language barriers' (...) and seem to develop 'language management strategies' to address their language needs.

Many employers consider multilingualism a valuable asset in an employee's skill set. Both anecdotal evidence and academic research show that foreign language skills enhance a person's employability. A study by Beblavý *et al.* (2016) analyzed the demand for foreign language skills in the four Visegrad countries. The authors examined about 74,000 job advertisements published on leading online job boards. Foreign languages were demanded in 33-

¹⁴ For instance, an article in the *Financial Times* reports that employees in McKinsey & Co., a global management consulting firm, speak more than 130 languages (Hill, 2013).

¹⁵ Multilingualism in professional settings, and more specifically in the corporate world, is analyzed in numerous academic papers as well as in trade and professional periodical publications. See, *e.g.*, two special issues on multilingualism at work in the *Journal of Multilingual and Multicultural Development* (2013, Issue 6) and in the *Multilingua: Journal of Cross-Cultural and Interlanguage Communication* (2014, No. 1-2). Also, Grin *et al.* (2010), Gunnarsson (2010, 2013), Berthoud *et al.* (2013), "Reducing the impact of language barriers" (2011).

75% of the job advertisements published in the region. English was the most demanded foreign language skill, particularly in Poland where it was listed in 64% of the job advertisements (for comparison, 49% in Slovakia, 39% in Hungary, and 28% in the Czech Republic). In the EC (2012) survey, 50% of the Polish respondents stated that knowing foreign languages increases their chances of getting a better job in Poland.

A recent study on languages and employability in the EU by Araújo *et al.* (2015) reported that knowing foreign languages and being proficient in them was considered an important factor for being employed in 17 of the 24 member states. To better understand the relationship between language knowledge and employment status, Araújo *et al.* (2015) applied logistic regression to the sample of native-born 25-64 year-old adults. The regression results for Poland (17,683 observations) were all positive and statistically significant: knowing one foreign language increased the probability of being employed by 0.215, knowing two or more foreign languages – by 0.199, and being proficient in at least one foreign language – by 0.236 (p. 72). Among those 25-40 years-old, only English significantly influenced the chances of employment, while for the 41-64 years-old, both English and Russian were significant factors (pp. 85, 90).

Why are foreign languages in great demand in the labor market? Why do multilingual speakers have a higher chance of finding a job and being employed and tend to outperform monolinguals in the workplace? Recent research has identified several channels – cognitive, social, and cultural – through which knowledge of foreign languages may affect an employee's productive skills and performance. A brief, non-exhaustive and non-technical description of such channels appears below.

Cognitive effects: The cognitive benefits of ‘the multilingual brain’ have been well-researched in psychology. Experimental evidence shows that knowledge of foreign languages

improves memory¹⁶ and attention¹⁷, boosts creativity and innovation¹⁸, heightens the ability to monitor the environment¹⁹, enhances decision-making skills²⁰ as well as the ability to task-switch/multi-task²¹, and affects the way an individual perceives reality²². Adesope *et al.* (2010) conducted a meta-analysis of 63 studies (involving 6,022 participants) that examined the cognitive correlates of bilingualism and conclude that “bilingualism is reliably associated with several cognitive outcomes, including increased attentional control, working memory, metalinguistic awareness, and abstract and symbolic representation skills” (p. 207).

Social (communication) effects: In a global marketplace, more and more companies expand their business activities beyond national borders and break into new markets. Brannen *et al.* (2014, p. 495) state that “As firms internationalize and enter new markets, whether as ‘born globals’ or more traditionally, they must navigate across countless language boundaries including national languages. Operating internationally means having to interact with

¹⁶ The collective evidence from a number of studies suggests that multilingualism tends to contribute to ‘cognitive reserve’ (see, e.g., Craik *et al.*, 2010; Bialystok *et al.*, 2012).

¹⁷ According to Sorace (2007, p. 194), advantages of multilingualism “are particularly evident in tasks that involve cognitive flexibility and the control of attention; bilinguals seem to be better at selectively paying attention, at inhibiting irrelevant information and at switching between alternative solution to a problem.”

¹⁸ The EC (2009, pp. 7, 19) Report on this subject matter concludes that there is an increasing body of evidence revealing “a greater potential for creativity amongst those who know more than one language, when compared with monolinguals” and that multilingualism leads to “a higher capacity for generating new (creative and innovative) processes.”

¹⁹ Albert Costa, who conducted a study comparing German-Italian bilinguals with Italian monolinguals on monitoring tasks, explains that “Bilinguals have to switch languages quite often – you may talk to your father in one language and to your mother in another language. It requires keeping track of changes around you in the same way that we monitor our surroundings when driving” (Bhattacharjee, 2012).

²⁰ Multilingualism seems to improve decision-making skills by reducing decision-making biases. Keysar *et al.* (2012) find that people make more rational decisions when they think through a problem in a non-native language. The authors write, “Emotions and affect play an important role in decision making and in considerations of risk. (...) An emotional reaction sometimes induces a less systematic decision. Making a decision in a foreign language could reduce the emotional reaction, thereby reducing bias” (p. 667). Costa *et al.* (2014) also find that the impact of various heuristic biases in decision making is diminished when the problems are presented in a foreign language.

²¹ Multilingual people can easily switch from one language system to another, and this ‘juggling’ skill seems to translate into the ability to switch among multiple tasks (see, for example, Prior and Gollan, 2011; Hernández *et al.*, 2013; Wiseheart *et al.*, 2016).

²² Athanasopoulos *et al.* (2015) analyze whether the grammatical patterns of the language affect people’s worldview. The authors find that German monolinguals tend to look at the event as a whole (that is, the action but also the goal of the action), whereas English monolinguals tend to focus only on the action. Interestingly enough, German-English bilingual speakers seem to switch between these perspectives based on the language context they were given the task in.

transcontinental intermediaries, distinct government agencies and foreign institutions, which reside in different language environments.” In these companies, foreign language skills are regarded as a priority because multilingual employees will be able to communicate and negotiate with foreign producers and consumers in their native language. In particular, several studies identified a clear link between foreign language skills and exporting performance of a firm²³ so that language barriers are often viewed as trade barriers²⁴.

Furthermore, knowledge of foreign languages broadens access to multilingual business information worldwide. In the era of global connectivity, businesses are often faced with diverse national informational systems, and translations are often unavailable. More than 7,000 languages are spoken in the world; and there are now over 250 languages represented on the Internet (OECD, 2013, p. 100). Cross-border access to economic and political information is crucial for companies when finding out about other businesses, existing or potential business partners elsewhere in the EU or worldwide, setting up branches, conducting cross-border trade, or providing cross-border services.

Finally, in a modern increasingly multicultural and multiethnic workplace, fluency in foreign languages means that an employee will be able to communicate, interact and connect with co-workers, both in formal and informal settings. Multinational companies increasingly bring together people from around the world to work in teams (virtual or face-to-face) on

²³ The CILT (2006) study surveyed about 2000 exporting SMEs from 29 European countries and found that a significant amount of business was lost because of inadequate language skills: “11% of respondents (195 SMEs) had lost a contract as a result of lack of language skills. (...) 37 businesses had lost actual contracts which together were valued at between € 8 million and € 13.5 million. A further 54 businesses had lost potential contracts worth in total between €16.5 million and €25.3 million. At least 10 businesses had lost contracts worth over €1 million. (...) If the proportion of businesses losing trade through lack of language skills were repeated across the whole EU exporting SME sector, we could calculate conservatively that at least 945,000 European SMEs may be losing trade as a result of lack of language competence” (p. 5). On the other hand, the study finds that SMEs which had a languages strategy and invested in staff with language skills achieved 44% more export sales than those which did not (p.7). The EC (2008) report “Languages mean business” concludes that multilingualism opens doors to new markets and new business opportunities, and that a wide range of languages will be needed in the future.

²⁴ See, e.g., Melitz (2008), Lohmann (2011), Ispphording and Otten (2013).

common projects. Research has shown that language-related issues can impact (either negatively or positively) on group cohesiveness, interpersonal relations and trust as well as on working atmosphere and knowledge-sharing, all of which in turn can impact on team performance.²⁵ It is worth noting that the ability to communicate informally is just as important as formal communication for promoting awareness of others' activities, building valuable interpersonal ties, developing trust, and establishing shared identity and context (Yuan *et al.*, 2013, p. 910). Fluent bi/multilingual speakers will be able to freely socialize with their peers, while less fluent employees may experience anxiety in informal social settings and may hold back from participating in colloquial, spontaneous conversations.

Cultural effects: “The limits of my language mean the limits of my world” (Wittgenstein). Language is a constituent of culture, hence, multilingualism and multiculturalism are intertwined and inseparable. Foreign language education is no longer viewed strictly in terms of the acquisition of communicative competence, but also in terms of intercultural communicative competence (Della Chiesa *et al.*, 2012). Multilingual employees are able to better understand foreign culture. Opening up to a different culture allows multilinguals to see the world from different perspectives, increases their cultural awareness and sensitivity, makes them more adaptable to cultural differences in foreign business environments, and more appreciative of foreign partners' actions and opinions.²⁶

To sum up, foreign language knowledge is now viewed as a form of human capital²⁷ that enhances an employee's performance and productivity in the workplace and, hence, contributes

²⁵ See, e.g., Kassis-Henderson (2005, 2010), Lauring and Selmer (2010) and a special issue of the *Journal of International Business Studies* (2014, Volume 45, Issue 5).

²⁶ See, e.g., Über Grosse (2004), Frederiksson *et al.* (2006), Grin and Faniko (2012), British Council (2013).

²⁷ “Language skills are an important form of human capital. They satisfy the three basic requirements for human capital: they are embodied in the person; they are productive in the labour market and or in consumption; and they are created at a sacrifice of time and out-of-pocket resources” (Chiswick and Miller, 2007, p. 314. Also see Chiswick, 2008, pp. 4-5). “Particular language skills could (...) be interpreted, in the same way as other types of

to value creation. The importance of multilingual staff for companies was stressed in a recent article in *The Financial Times* (Hill, 2013). At the *FT* roundtable, both executives and consultants agreed that companies benefited from the diverse background and skills of multilingual employees and would benefit more in future. Their advice to business was “Hire more multilingual employees, because these employees can communicate better, have better intercultural sensitivity, are better at co-operating, negotiating, compromising. But they can also think more efficiently.” The growing importance of foreign language skills has prompted researchers to develop new concepts – ‘cosmopolitan capital,’ ‘intercultural capital,’ ‘transnational linguistic capital,’ and ‘transnational cultural capital’ – in order to emphasize this very specific aspect of human capital (Carlson, 2016). Whatever the name is, this form of human capital refers to foreign language skills and can be acquired via different forms of foreign language learning.

The links between foreign language competence and the creation of value in an economic sense have been extensively studied in Grin (1994, 2002, 2003, 2006, 2014) and Grin *et al.* (2010). The authors augmented the fundamental economic models with the explicit inclusion of linguistic variables and showed that knowledge of foreign languages is beneficial to individuals, firms and society as a whole and has market and non-market value at the private and societal levels. At the private level, non-market benefits of language learning are mainly derived from the ability to communicate with more people, an exposure to different cultures, a linguistically rich and diverse environment, a joy of learning something new, a feeling of personal achievement, increased reputation, prestige and recognition among peers. Private market benefits of language

skills, as an area in which individuals and societies could profitably invest, as a *source of economic advantage*” (Grin, 2002, p. 13).

acquisition manifest themselves in various labor market outcomes, such as employability, occupational mobility, and earnings.

3.2. Foreign language skills and earnings: theory and evidence

The question whether language itself, *ceteris paribus*, results in earnings differentials “remains, throughout the history of language economics, the single most important area of research” (Grin, 2003, p. 17). Interestingly, to date there are no specific theoretical models that could be used to explain the role of foreign languages as determinants of labor income. The most typical theoretical framework used in the works on language-based wage differentials “is derived from the combination of the language economics perspective with human capital theory developed in education economics” (*ibid.*, p. 46).

Several reasons were put forth to explain why firms may be willing to pay more to multilingual employees than to their comparable monolingual counterparts. First, *ceteris paribus*, multilingual employees can be more productive than monolingual ones, typically because they can carry out duties that monolinguals cannot (see, *e.g.*, Grenier, 1984, p. 38). Second, since foreign language skills can be directly observed at hiring, it may lead to a better matching between the language attributes of a worker and the linguistic characteristics of a job (see, *e.g.*, Grin, 2003, p. 18). In turn, good job matches are believed to redistribute workers from the lower to the upper part of the match quality distribution which determines wages. Third, foreign language competence may be considered by employers as a signal of a worker’s unobserved cognitive ability and motivation. In this case, a wage premium may arise because foreign languages signal generally higher productivity even if a worker’s job responsibilities do not directly require knowledge of foreign languages (see, *e.g.*, Stöhr, 2015, p. 87). All these reasons suggest that “there might exist wage premia associated with the knowledge of a second language,

whether individuals actually use the second language on the job or not" (Saiz and Zoido, 2005, p. 523).

While the theory of language-based earnings differentials is still in a state of development, their existence has been confirmed by a number of empirical studies. Most of these studies focused on the role of language on immigrant earnings and showed that immigrants significantly benefitted from knowing the dominant language of the host country.²⁸

Fewer studies estimated the wage premium associated with speaking a second or foreign language for the native or total population: *e.g.*, Fry and Lowell (2003), Saiz and Zoido (2005), Chiswick and Miller (2010) for the United States, Levinsohn (2007) and Casale and Posel (2011) for South Africa, Lang and Siniver (2009) for Israel, Azam *et al.* (2013) for India. Estimated positive language wage differentials imply that employers do find these skills valuable, although the magnitudes of this effect differ widely.

Several papers included West European countries in their analysis. Williams (2011) considered the EU15 countries (excluding Sweden) in 1994-1999 and found that, with the exception of the UK (where no second language was rewarded), foreign languages increased earnings by 5-20%, depending on the country and the language considered. Ginsburgh and Prieto-Rodriguez (2011) examined returns to several languages used at the workplace by male native employees in nine EU countries in 1994-2001. The authors reported a positive effect of foreign languages on earnings in all nine countries; however, there were differences between Northern (Austria, Denmark, Finland and Germany) and Southern Europe (France, Greece, Italy, Portugal and Spain). In their subsequent study, Ginsburgh and Prieto-Rodriguez (2013) considered male and female workers in six European countries (Denmark, Finland, France,

²⁸ For a recent overview, see Chiswick and Miller (2015). Also, Gazzola *et al.* (2015) prepared an up-to-date extensive bibliography on 'Language Economics.' In particular, the list of studies on language and labor market outcomes appears on pp. 16-27.

Germany, Italy and Spain) in 1994-2001 and found that the foreign language premium was present for both genders in all countries. Stöhr (2015) reported a 12% return to fluent English for the native German population in the 2000s. Outside the European Union, a recent study in Turkey found a positive and significant (20-46%) wage return to proficiency in English and Russian for adult males in 2007 (Di Paolo and Tansel, 2015).

The empirical evidence is even more scant for post-communist Central and East European countries. We are aware of only a few previous studies on the relationship between foreign language skills and earnings in the Czech Republic, Hungary, Estonia and Latvia, and we were unable to find any for Poland. Galasi (2003) reported that speaking English or German increased wages of young Hungarian graduates by about 6% and 4%, respectively, in 1998-1999, although the results were not very robust. Garrouste (2008) assessed economic returns to language skills for the general population in eight countries enrolled in the International Adult Literacy Survey in 1994-1998, which included the Czech Republic and Hungary. The returns to a second language were found to be positive and statistically significant only for men in Hungary, while for Hungarian women and both men and women in the Czech Republic the returns were positive but insignificant. Toomet (2011) reported that English proficiency produced a significant earnings premium (of at least 15%) for Russian-speaking minority men of 20-60 years of age in Estonia and Latvia.

4. Data and variables

The data used in this study are proprietary to the Sedlak & Sedlak (S&S) company. S&S was founded in 1990 and is Poland's oldest HR advisory firm providing compensation consulting services and carrying out salary surveys.²⁹ The aim of the surveys is to build a comprehensive national database on salaries for as many job positions as possible. S&S collects

²⁹ More information about S&S can be found on http://sedlak.pl/en/About_us.html.

salary data directly from companies as well as from the general population via CAWI (Computer Assisted Web Interviewing) where an online questionnaire is provided to the respondent via a link or a website.

In particular, S&S conducts a web-based Polish General Salary Survey (in Polish - Ogólnopolskie Badanie Wynagrodzeń, OBW) which, at the time of writing this article, is the largest non-governmental salary survey in Poland. The survey was launched in 2004; and since then the survey has been ongoing, that is, activated and ready to receive responses all year round. Annual databases are then created by combining the survey responses submitted during January 1 - December 31 of that year. The OBW questionnaire is located on the ‘wynagrodzenia.pl’ website (the domain name can be translated as ‘salary.pl’). The invitations to the survey are distributed through email campaigns, text links connected to various articles published by S&S employees on the Internet, and through cooperation with partner companies, web pages, and paper magazines.³⁰ The mixed methods of soliciting responses make it difficult to calculate a true response rate. However, it is known that nearly 6 million individual users visit the website each year, and more than 100 thousand participate in the survey. To ensure data reliability and quality, S&S employs a number of quantitative and qualitative checks of the survey responses along with a sophisticated data cleaning procedure. It involves plausibility analysis (that is, checking for inconsistent and/or conflicting answers), examining questionnaire completion time, analysis of outliers, *etc.* On average, every year about 5% of all survey responses are excluded from the database.

We use data from the 2014 OBW survey. After excluding observations with missing data, the total number of responses was 98,783. These include only hired full-time workers, and do not include employers and self-employed individuals. For each respondent we have a variety of

³⁰ The full list of partners is available on <http://wynagrodzenia.pl/obw.php> .

background personal (gender, age, education, total work experience), workplace (sector of employment, firm ownership, tenure, occupation, wage) and environmental (local labor market conditions) characteristics.

In the survey, respondents were asked about their knowledge of six foreign languages: English, German, Russian, French, Italian, and Spanish. Table 1 presents descriptive statistics on the foreign language ability of the survey respondents in 2014. For each of these languages, respondents were asked to self-evaluate their proficiency using the following pre-defined scale: no knowledge, beginner, intermediate or advanced. The last three levels correspond to A1/A2, B1/B2 and C1/C2 levels in the self-assessment grid (CEFR) used in the European Language Portfolio.³¹ In our sample, English was the most popular foreign language (86.5% of all respondents had at least some knowledge of it), followed by German (35.4%) and Russian (27.0%). Sixty-four percent stated either intermediate or advanced levels of proficiency in English while this share was about 10% for German and Russian, and about 1-2% for all other languages.

Table 1 also presents descriptive data on the number of languages known at the three levels of competence. A fair number of respondents reported proficiency in multiple languages. For example, 23,366 said they had advanced knowledge of one language but 2,200 claimed advanced ability in two languages and 156 said they had advanced proficiency in 3 to 5 of the six languages in the survey. With 6 languages and 4 proficiency levels, it would be impractical to include all their interactions in the regression model. Hence we focus on the level of ability in English and the number of languages other than English mastered by the individual at the advanced or intermediate level of competence as our measures of foreign language ability. Given that English is the *lingua franca* of Europe (Doughty, 2013; Linn, 2016), that Polish educational

³¹ <http://www.coe.int/en/web/portfolio/self-assessment-grid>

policy gives priority to English and that a large number of survey respondents reported some knowledge of English, it seems appropriate to focus on English while controlling for the number of other languages spoken.

It is possible that self-reported linguistic measures may be susceptible to measurement error. However, self-evaluations are often the *only* way to assess language skills in the general population and they have been widely used in large-scale studies on languages.³² There is some evidence that self-evaluations may be a generally reliable way of measuring the level of language skills. Oscarson (1984), Blanche and Merino (1989) and Ross (1998) all conclude that self-assessments are highly correlated with the outcomes from formal tests of language ability. In the most recent study, Dragemar-Oscarson (2009) reports the results from the Swedish National Evaluation where correlations between self-assessed and formal scores were high (about 0.7) and where 85% of students received the score they had estimated.

Note that our data set does not constitute a random sample from a target population of all hired workers in Poland. Our sample may be defined as a ‘voluntary response sample’ because it only includes those people who voluntarily chose to participate in the survey. Compared to random samples, voluntary response samples are typically prone to different biases. We tested our data set against the official data of the Polish Central Statistical Office (in Polish – Główny Urząd Statystyczny, GUS) and found quite a few strong similarities between the composition of hired workers in our sample and those in the governmental statistics. Our data set is representative across a number of socio-demographic characteristics. For instance, in our sample the share of males is 58% [51% in the official GUS statistics], the share of private sector workers is 78% [71%], the share of workers residing in the Mazowieckie voivoship is 22% [22%], in the

³² For example, three special Eurobarometer surveys titled “Europeans and languages” and “Europeans and their languages” conducted for the European Commission in 2001 (No. 147), 2006 (No. 243) and 2012 (No. 386).

Śląskie voivodship 12% [12%], in the Małopolskie voivodship 11% [8%], in the Dolnośląskie voivodship 9% [8%].³³ Hence, the numbers from our data set are not dissimilar from the official governmental statistics, and we can rule out the presence of a strong self-selection bias, which increases our confidence in the quality of our data set.

Further, we understand that, strictly speaking, our (self-reported and non-random) data are not generally suitable for making statistical inferences. However, in 2015 the American Association for Public Opinion Research changed its position on reporting measures of precision from nonprobability samples and now allows for such reporting, provided that the measures are accompanied by “a detailed description of how the underlying model was specified, its assumptions validated and the measure(s) calculated” (AAPOR, 2015, p. 5). In order to assess the precision of our estimated coefficients, we apply bootstrapping techniques³⁴. To sum up, the very large size of our data set, its similarity to the official statistics for the population of all hired Polish workers, and the proven reliability and validity of self-reported linguistic measures – all these give us confidence to proceed to quantitative analysis and suggest that our findings will be reflective of meaningful phenomena and tendencies in the Polish labor market.

³³ GUS (2015), Section II Hired (paid) employees, Tables 1(16) and 3(18).

³⁴ According to AAPOR (2016, p. 1), “There are a number of approaches that survey researchers use to estimate precision with nonprobability samples. (...) Resampling approaches, such as the bootstrap or jackknife, are preferred (...) These methods approximate the variance of a survey estimator by the variability of that estimator computed from a series of subsamples taken from the survey data set.”

5. Estimation results

Our estimates of the effect of language skill on individual earnings are based upon the following regression model:

$$\ln \text{Salary}_i = \beta_0 + \beta_1 \text{EnglishAdvanced}_i + \beta_2 \text{EnglishIntermediate}_i + \beta_3 \text{EnglishBegInning}_i + \beta_4 \text{NumberOtherLanguages Advanced}_i + \beta_5 \text{NumberOtherLanguages Intermediate}_i + \delta X_i + \varepsilon_i \quad (1)$$

The dependent variable $\ln \text{Salary}_i$ is the log of individual i 's monthly salary (base or total). Our research focus is on the estimates of the coefficients $\beta_1 \dots \beta_5$ that measure the effect of a worker's ability to use foreign languages on his or her wages. Our main language variable is a set of three dichotomous (0, 1) indicators that measure whether individual i claims an advanced, intermediate or beginning level of proficiency in English. We also include variables measuring the number of languages other than English known by the individual at the advanced and/or intermediate levels.

Further, X_i is a vector of control variables and includes a large number of socio-demographic characteristics: indicators of the level of education and whether the person has earned an MBA or PhD degree or participated in post graduate studies after earning a university degree; his/her years of total labor market experience and tenure at the current employer and their squared values; indicators of the major program of study for college graduates, and indicators for male gender, industry of employment, and region of residence. We also include dummy variables designating if the individual receives incentive pay, if the employer is a foreign-owned firm, and whether the employer was a state-owned enterprise, a government agency or a non-profit organization with private sector firms as the reference group. We also control for city size with indicators for workers residing in Warsaw, big cities or medium size

cities relative to those in towns or rural areas. Finally, ε_i is an error term that is assumed to be white noise.

Table 2 presents the main descriptive statistics of our data set. Fifty-eight percent of the respondents were male and nearly 77% of the sample had a university (or higher) degree. The average respondent was approximately 35 years of age with about 11 years of total work experience and about 6 years of tenure with the current employer. The predominant majority were employed in the private sector (78.8%). Almost a third was employed by firms with majority foreign ownership. The average gross monthly base wage was 4,875 Zlotys, or \$1,545³⁵, while the mean total salary, including bonuses, commissions, etc. for the 47.6% with incentive pay, was 6,002 Zlotys, or \$1,902. In addition our regressions include about 90 industry dummies, 16 regional dummies³⁶, 39 for educational specialty of college students and graduates, 3 for city size category that are not reported in Table 2.

We recognize that our estimates of the language coefficients may be biased. It is likely that both earnings and language ability are correlated with a person's general intelligence and ambition and that the motivation to acquire a certain level of language competence is linked to the economic return from that skill. While we include control variables for the educational discipline pursued while at university as a partial control for heterogeneity in intelligence and ambition across people, our data set provides no general measure of either intelligence or ambition that we could use to address the omitted variable bias in this case. We initially assume that our language ability variables, like the indicators of educational achievement, are exogenous to current earnings because language education is compulsory in Polish schools at an early age

³⁵ In 2014, the average annual exchange rate was 3.1551 Zlotys per 1 US dollar.

³⁶ A 'voivodship' ('województwo' in Polish) is the major administrative territorial unit in Poland. The 1999 Polish local government reform reduced the number of voivodships from 49 to 16. Polish voivodships are equivalent to provinces and correspond to the NUTS 2 level according to the EU Nomenclature of Territorial Units for Statistics.

and the acquisition of language skills largely precedes entry into the labor market. The only credible instrumental variable we can consider is the educational reform of foreign language instruction that took place in 1988/89. We use this in IV estimates of the causal effect of English language ability on individual wages in section 6.

Table 3 presents our main OLS estimates of the effect of self-reported ability in foreign languages on the base salary and total salary of the respondents to the 2014 survey. Coefficient estimates for the control variables are not reported but are available from the authors. Because of the voluntary response nature of our sample, we applied bootstrapping techniques in order to estimate the precision of estimates from the survey. We generated 500 independent replications by randomly selecting 98,783 respondents with replacement from the original survey data set. The variability in these 500 estimates derived from each of the 500 replications forms the basis of our standard error for the estimates reported. In Table 3, the bootstrap standard errors are reported in brackets and robust standard errors are reported in parentheses, for comparison. As we might expect, given the large number of observations in our sample, the bootstrap standard errors converge on the robust standard errors so subsequent tables report just the latter statistic.

The coefficient estimates are quite similar with either the individual's base salary or total salary as the dependent variable. The two salary figures are identical for the slight majority of workers in our sample not receiving any form of incentive pay. So we focus our attention on the total salary results. Clearly English language ability is highly correlated with the wages earned by Polish workers. Those with advanced knowledge of English are estimated to earn 34% more than workers with no English in the regression for all workers. The estimated wage advantage for those reporting an intermediate level of English ability is 16% and even a beginning level of English knowledge is associated with a 4% higher salary for all workers. The quantitative effect

of advanced English ability compares favorably with the estimated effects of education level; those with a bachelor's degree earn 26% more than those without a college education and possession of a master's degree is estimated to boost earnings by 41% in this sample. We are reassured that our estimated wage effects of English ability in our full sample compare favorably with other studies of foreign language ability in Europe. For example, Ginsburgh and Prieto-Rodriguez (2011), who are able to estimate a causal relationship, find that the wage returns to using English at work in the period from 1994-2001 range from about 25% in Germany and Italy to over 30% in France and Portugal and 40% in Spain.

In addition to wage gains associated with knowledge of English, advanced competency in one or more of the other foreign languages (German, Russian, French, Italian, and Spanish) is also found to be positively correlated with the wages of Polish workers, albeit to a lesser extent than we see with English. Each additional language known with an advanced level of competence is estimated to raise wages by about 10%. The number of languages known at an intermediate level is not statistically significant in the regression for all workers.

Table 3 also reports regression results for separate samples of male and female workers. In general, the language coefficient estimates are very similar to those reported for the full sample. The coefficients for men tend to be somewhat larger than the corresponding estimates in the female sample and the gender difference in the wage effect of advanced knowledge of English is statistically significant. In general, the coefficients on the other human capital variables in these regressions are also greater in magnitude for male than for female workers, suggesting the existence of gender differentials in the returns to skill in the Polish labor market.

Table 3 reveals fairly large positive effects of English language ability and the number of other languages known at an advanced level on individual earnings in the Polish labor market.

One reason for such effects would be the enhanced productivity of multi-lingual workers in a business climate where Poland is highly integrated with the multi-lingual European Union and Polish firms compete in an increasingly integrated global economy. To examine evidence for a productivity basis for the language effects noted in Table 3, we divide the sample into four subsamples by the type of firm, the ownership of the firm and regional and industry variation in international trade. These results are reported in Table 4.

In columns (1) and (2) of Table 4, we divide the sample by the type of employer identified by the survey respondents. In column (1), the sample consists of those working for privately-owned businesses while in column (2) we present the regression results for workers in state-owned enterprises, government agencies or non-profit organizations. The results show a marked difference in estimated wage effects. The coefficients for knowledge of English at all three levels of ability are substantially larger in the private sector regressions as are the estimated wage effects of the number of the other languages mastered at an advanced level. These results suggest that the Polish labor market places a higher value on the extra productivity associated with foreign language ability that is most pronounced for workers in the more competitive private sector where the interface with the rest of Europe and the global economy is higher. Among the non-private firms, government agencies and non-profit organizations are likely to have a largely local market for their services in which the productivity advantage of multilingual workers is likely to be much smaller.

In columns (3) and (4) of Table 4 we report language coefficients for Polish workers in firms with majority foreign ownership and firms with control by Polish owners. Again the differences are striking. The wage returns to advanced and intermediate knowledge of English are much bigger for those working in foreign-owned establishments with the estimated payoff to

advanced knowledge at nearly 50%. Regarding foreign languages other than English, the effect of the number of advanced level languages on Polish wages is also higher in foreign-owned firms while the number of intermediate level languages is statistically significant only for those working in foreign firms.

In columns (5) and (6) of Table 4 we present results for samples of workers divided by their region of residence and the regional intensity of intra-industry trade. Uminski (2014) argues that entry into the EU intensified trade links and foreign direct investment inflows in Poland. One effect of this has been an increase in the cross-border fragmentation of production that can be measured by indexes of intra-industry trade. Uminski calculates the Grubell-Lloyd index for each of the 16 Polish voivodships (NUTS2 regions) in 2011 and we use these data to classify the 8 voivodships with above average indexes as areas with high regional intra-industry trade. A comparison of the results reported in columns (5) and (6) of Table 4 shows that the effect of advanced and intermediate English ability on wages is somewhat higher for those workers in regions of the country with more intense intra-industry trade linkages. In addition, the wage returns to a beginning knowledge of English and to the number of advanced other foreign languages are similar in both sets of regions.

Finally, columns (7) and (8) split the sample into those working in high international trade industries and those in low trade industries. Here we again see that the estimated effects of language ability on wages are substantially higher in high trade industries for workers with advanced and intermediate levels of English. All of the sub-sample results reported in Table 4 support the conclusion that language ability is more strongly correlated with wages in private firms and sectors of the economy more closely integrated with international firms and markets where the added productivity of multilingual workers would be higher.

In Table 5 we turn to an analysis of the wage effect of language knowledge within narrow job level categories. We classify the survey respondents into four aggregate job level categories ranging from top management to ordinary workers. Presumably unmeasured worker ability, along with the measured human capital characteristics included in the model, is an important factor in sorting individuals among these positions within the firm's job hierarchy. Even when we restrict the analysis to explaining the variation in total salary across workers within these relatively narrow employment categories, we still find evidence for a strong positive relationship between advanced and intermediate knowledge of English and advanced knowledge of one or more of the five other foreign languages considered in the survey on total salary levels. The estimates show that the wage advantage accruing to multilingual workers tends to decrease along with the position of the worker in the occupational hierarchy. Advanced knowledge of English is associated with a 30% or higher wage premium for top managers and directors but even ordinary workers with an intermediate knowledge of English are estimated to earn nearly 5% more than those with no English ability. Interestingly, advanced knowledge of one or more of the five other languages seems to have similar quantitative effects on total salary for workers in the three job categories below the managerial level.

In sum, the regression results reported above provide consistent estimates of the correlation between foreign language ability and remuneration. Advanced knowledge of English is associated with substantial wage premia ranging from 30% to 50% across the various samples we have examined. The returns to intermediate knowledge of English range from 9% to 25% and those associated with a beginning ability level from 3% to 15%. The number of the other foreign languages (German, Russian, French, Italian, and Spanish) mastered at an advanced level of ability has a coefficient generally around 0.10.

6. IV estimates of English language wage effects

To assess the causal effect of English language ability on individual wages we estimate the following regression model using the method of instrumental variables (IV):

$$\begin{aligned} \ln \text{TotalSalary}_i &= \beta_0 + \beta_1 \text{EnglishAbility}_i + \delta X_i + \varepsilon_i \\ \text{EnglishAbility}_i &= \gamma_0 + \gamma_1 \text{EducationReform}_i + \varphi Z_i + u_i \end{aligned} \quad (2)$$

Following Bleakley and Chin (2004), we create a single variable measuring *English Ability* that takes on a value of 0 for those with no knowledge, 1 for those with a beginning knowledge, 2 for those with an intermediate knowledge, and 3 for those with advanced knowledge. This allows us to have a single, potentially endogenous English language variable that can be identified by our educational reform instrumental variable. As discussed in section 2 above, foreign language instruction in Polish primary schools changed significantly in the 1988/89 school year. Beginning that year students could choose a foreign language, with English being in greatest demand, whereas study of Russian had been mandated of all students prior to that school year. In addition, the study of a foreign language in primary school began at age 10, one year earlier than was previously the case. Using this educational reform as an instrumental variable for knowledge of English, we construct a dummy variable equal to one for those workers in the 2014 survey who began their study of a foreign language in primary school after 1988/89. This variable, which we identify as *Education Reform*, has a mean of 0.623 and a standard deviation of 0.484 in our sample of 98,783 workers. Since we have only one IV variable, our regressions in this section of the paper exclude languages other than English from the analysis. The mean for *English Ability* is 1.740 and the standard deviation is 0.960. An examination of correlation coefficients indicates that our educational reform indicator might serve well as an instrument for

English ability. The correlation between *Education Reform* and *English Ability* is 0.347 while that between *Education Reform* and *ln(Total Salary)* is -0.146.

Table 6 reports the results of our instrumental variables estimation. Column (1) provides an OLS estimate of the coefficient on *English Ability*. This is statistically significant and indicates that a one unit increase in *English Ability* raises the logarithm of *Total Salary* by 0.124. Columns (2) and (3) present the results from the two-stage least squares estimates of the coefficients. Column (2) indicates that our instrumental variable, *Educational Reform*, has a statistically significant positive effect on *English Ability*. The second stage estimate of the effect of *English Ability* on *Total Salary* is statistically significant and slightly larger than the OLS estimate. A robust regression test of the endogeneity of *English Ability* yields a test statistic of $F(1,98612) = 1.624$ ($p=0.202$), which cannot reject the null hypothesis that *English Ability* is exogenous. A test for a weak instrument yields a minimum eigenvalue statistic = 292.8. This is substantially above the critical value of 16.38 which allows us to reject the null hypothesis that the instrumental variable is weak. The quantitative effect of *English Ability* is substantially stronger than in the estimates reported in section 5. Advanced knowledge of English would raise total wages by 51% while intermediate knowledge adds 34% and beginning English 17% to total wages in comparison with those having no knowledge of English.

7. Summary and conclusions

We find robust evidence that ability to speak a foreign language is an important component of a worker's human capital in Poland, using a very large sample of individual respondents to a 2014 salary survey and controlling for a large number of wage determinants. Individuals with advanced knowledge of English earn wages 30%-50% higher than those with no knowledge of the language. This return is about on par with possession of a university degree. There are also

substantial wage gains from multilingual ability in other than English foreign languages. The correlations between language ability and wages are substantially stronger for those working in sectors of the economy more closely linked to the European Union and the global economy. The wage returns to advanced or intermediate knowledge of English are higher in foreign-owned businesses, regions of the country with a high rate of intra-industry trade with the rest of Europe, and industries with a greater degree of international trade.

This suggests that the growing integration of Poland with the European Union in particular and the growing importance of global business in general are important reasons for the relative high value placed on foreign language skills in the Polish labor market. We also find that the returns to language skills increase significantly with the job level of the individual. This may indicate that foreign language ability is complementary to other aspects of human capital and thus contributes to increased inequality among workers. But it is important to note that multilingual ability is associated with significantly higher monthly earnings even for low wage earners in our sample.

Although the analysis is limited to the effects of English ability as measured by a more restrictive variable, two-stage least squares estimation using educational reform in 1988/89 to construct an instrumental variable gives us a degree of confidence that the effects of language ability on wages in our sample are causal. As such, our results provide support for the language training policy initiatives of the Polish government and the European Union. There appear to be important productivity advantages to having a workforce with the ability to communicate effectively in commercially important languages that grow in significance in sectors of the economy with closer links to international business.

Table 1. Characteristics of Language Ability: Full Time Hired (Paid) Employees, 2014

Language and proficiency	Mean	Standard deviation	Language and proficiency	Mean	Standard deviation
<i>English</i> Advanced	0.229	0.420	<i>Russian</i> Advanced	0.018	0.136
Intermediate	0.418	0.493	Intermediate	0.095	0.294
Beginner	0.216	0.411	Beginner	0.155	0.362
<i>French</i> Advanced	0.007	0.086	<i>Spanish</i> Advanced	0.003	0.058
Intermediate	0.014	0.118	Intermediate	0.008	0.088
Beginner	0.049	0.217	Beginner	0.031	0.174
<i>German</i> Advanced	0.024	0.152	<i>Number of languages</i> Advanced	0.286	0.509
Intermediate	0.074	0.262	Intermediate	0.616	0.622
Beginner	0.254	0.435	Beginner	0.726	0.759
<i>Italian</i> Advanced	0.003	0.056			
Intermediate	0.006	0.077			
Beginner	0.020	0.142		Observations	98,783

Table 2. Main Descriptive Statistics: Full Time Hired (Paid) Employees, 2014

Characteristic	Mean	Standard deviation
Gender (male)	0.584	0.492
Age, years	34.720	9.286
Education:		
Primary school or gymnasium	0.005	0.072
High school or technikum	0.226	0.418
Incomplete university degree	0.036	0.186
Bachelor's degree	0.146	0.354
Master's degree	0.586	0.492
Post-graduate studies	0.206	0.404
MBA	0.015	0.122
PhD	0.020	0.142
Total work experience, years	11.37	9.108
Tenure with current employer, years	6.600	6.760
Sector of employment:		
private	0.788	0.408
state	0.124	0.329
public	0.064	0.246
nonprofit	0.022	0.148
Foreign firm (50%+ of firm capital is foreign)	0.327	0.469
Earns incentive pay	0.476	0.499
Base salary (Polish Zlotys)	4,875.09	3,858.70
Total salary, i.e., including bonuses (Polish zlotys)	6,002.20	5,788.21
Observations	98,783	

Table 3. Effect of Language Ability on Base and Total Salary

Ln(Base)	(1) All workers	(2) Women	(3) Men	Ln(Total)	(4) All workers	(5) Women	(6) Men
<i>English Ability</i>				<i>English Ability</i>			
Advanced	0.344* (0.006) [0.006]	0.318* (0.008) [0.008]	0.360* (0.008) [0.008]	Advanced	0.347* (0.006) [0.006]	0.321* (0.009) [0.009]	0.363* (0.009) [0.008]
Intermediate	0.162* (0.004) [0.004]	0.134* (0.006) [0.006]	0.183* (0.007) [0.006]	Intermediate	0.163* (0.005) [0.005]	0.138* (0.007) [0.008]	0.182* (0.008) [0.008]
Beginner	0.042* (0.004) [0.004]	0.028* (0.006) [0.006]	0.054* (0.006) [0.006]	Beginner	0.044* (0.005) [0.0105]	0.032* (0.007) [0.007]	0.053 (0.008) [0.008]
<i>Number of other languages</i>				<i>Number of other languages</i>			
Advanced	0.100* (0.006) [0.006]	0.079* (0.008) [0.008]	0.119* (0.010) [0.0239]	Advanced	0.103* (0.007) [0.006]	0.080* (0.009) [0.008]	0.123* (0.011) [0.011]
Intermediate	0.004 (0.003) [0.003]	0.001 (0.004) [0.004]	0.007 (0.004) [0.004]	Intermediate	0.006 (0.004) [0.004]	0.0019 (0.004) [0.004]	0.011* (0.006) [0.005]
Observations	98,783	41,309	57,744	Observations	98,783	41,039	57,744
R ²	0.526	0.516	0.424	R ²	0.511	0.498	0.475

The table reports OLS regression coefficients with robust standard errors in parentheses and bootstrap standard errors (for 500 replications) in brackets. *Significant at 0.05 level or better. Regressions include the full set of controls described in the text.

Table 4. Effect of Language Ability on Total Salary by Firm Type, Ownership and Trade

	(1) Private firms	(2) Non- private firms	(3) Foreign- owned	(4) Polish- owned	(5) High regional IIT	(6) Low regional IIT	(7) High trade industries	(8) Low trade industries
<i>English Ability</i>								
Advanced	0.380* (0.008)	0.214* (0.012)	0.482* (0.013)	0.266* (0.008)	0.362* (0.008)	0.300* (0.012)	0.400* (0.014)	0.333* (0.007)
Intermediate	0.190* (0.006)	0.089* (0.009)	0.251* (0.012)	0.132* (0.006)	0.169* (0.006)	0.148* (0.009)	0.192* (0.012)	0.156* (0.006)
Beginner	0.060* (0.006)	0.012 (0.008)	0.057* (0.012)	0.039* (0.006)	0.042* (0.006)	0.048* (0.009)	0.063* (0.012)	0.039* (0.006)
<i>Number of Other Languages</i>								
Advanced	0.120* (0.008)	0.038* (0.014)	0.124* (0.010)	0.084* (0.010)	0.102* (0.008)	0.103* (0.014)	0.131* (0.015)	0.095* (0.008)
Intermediate	0.013* (0.004)	-0.001 (0.006)	0.020* (0.006)	0.002 (0.004)	0.008 (0.004)	0.003 (0.006)	0.034* (0.008)	-0.000 (0.004)
Observations	77,887	20,896	32,322	66,461	70,818	27,965	19,569	79,214
R ²	0.465	0.420	0.462	0.453	0.517	0.472	0.498	0.515

The table reports OLS regression coefficients with robust standard errors in parentheses. *Significant at 0.05 level or better. Regressions include the full set of controls described in the text.

Table 5. Effect of Language Ability on Total Salary by Job Level

	(1) Top management	(2) Team Leader	(3) Specialist	(4) Worker
<i>English Ability</i>				
Advanced	0.344* (0.032)	0.290* (0.013)	0.222* (0.008)	0.119* (0.010)
Intermediate	0.156* (0.030)	0.100* (0.012)	0.098* (0.007)	0.048* (0.007)
Beginner	0.021 (0.031)	0.005 (0.011)	0.005 (0.007)	0.018* (0.006)
<i>Number of Other Languages</i>				
Advanced	0.081* (0.020)	0.052* (0.013)	0.047* (0.008)	0.051* (0.012)
Intermediate	0.012 (0.014)	-0.020* (0.007)	-0.012* (0.004)	-0.008 (0.006)
Observations	5,681	19,878	50,139	23,085
R ²	0.462	0.454	0.454	0.346

The table reports OLS regression coefficients with robust standard errors in parentheses. *Significant at 0.05 level or better. Regressions include the full set of controls described in the text.

Table 6. IV Estimation of English Ability on Total Salary

	OLS	2SLS	
	(1) <i>Ln(Total Salary)</i>	(2) <i>English Ability</i>	(3) <i>Ln(Total Salary)</i>
<i>English Ability</i>	0.1240* (0.0019)		0.1532* (0.0373)
<i>Education Reform IV</i>		0.1400* (0.0087)	
R ²	0.500	0.391	0.499

The table reports regression coefficients with robust standard errors in parentheses. *Significant at 0.05 level or better. Regressions include the full set of controls described in the text.

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