Business travels,

multinational firms and international trade

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Abstract

Business travels are a key driver of growth as they contribute to knowledge diffusion and innovation. They are also a relevant component of services trade. This paper analyzes the determinants of business travels expenditure in Italy, where this phenomenon is relevant and it is concentrated in few Italian regions. Using a "unilateral" gravity approach, I find significant correlations between trade flows, FDI stocks and business travel expenditures. Identification is addressed using inverse measures of offshorable and of routinary tasks, instrumental variables and selection methods. The analysis highlights that the pattern of business travels expenditure is shaped to a greater extent by activities that are lest intensive in offshorable or routinary tasks. This result suggests that remote controls systems substituted only more standardized activities. Indeed, broadband diffusion in the partner countries reduced business travels expenditure only in more routinary sectors. Overall this evidence is consistent with the view that business travels have been affected by the recent developments in ICT.

Keywords: services trade, travel, FDI, knowledge diffusion

JEL codes: F14, F20, J61, O33

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1. Introduction

Innovation is fostered by many channels. In addition to R&D expenditure, firms may benefit from sharing information among entrepreneurs and managers meetings in various modes, spanning from more traditional forms such as market fairs (Moser, 2005; Moser, 2012) to very advanced digitalized systems (Wolff, 2011).

One of the most used forms of information sharing is given by business travels (BT's henceforth), especially across countries. Indeed, various works have showed that BT's play an important role in fostering knowledge and innovation in the economy of the area that hosts these travelers: for example, Piva *et al.* (2018) analyze unbalanced panel covering on average 16 sectors per year in ten countries during the period 1998–2011. They find that mobility through business visits is an effective mechanism to improve productivity, being about half that obtained by investing in R&D.

Notwithstanding their importance, in the last years BT's have been declining among some of the most developed economies: in 2010 they were 21.0% of total travels of a group of selected OECD countries;[2] in 2017 this percentage fell to 15.8%. While part of the declining share is due to the strong growth in total travels (30%), BT's levels fell sharply especially in the last three years of analysis.

Given their relevance for local economic systems, it is important to understand the determinants of BT's expenditure and the reasons for their recent decline.

In order to answer to the first question this paper considers the increasing fragmentation of production across countries, where the greater participation of firms to global value chains might increase international travels for business purposes. Then, two first candidates to explain these patterns are imports and exports. Indeed, employees of an exporting company might travel to the country of destination before shipping the good (for example, for contractual arrangements, or negotiations, etc…) or after the delivery (e.g.: sales services, maintenance and assistance). Analogously, an importer firm might send its workers abroad to find best input suppliers. Also inward and outward FDI stocks may determine the patterns of BT's: when a firm is part of a multinational conglomerate, there are continuous contacts between the mother firm and its affiliates not only through telephones, video calls, e-mail and other media, but also through travels of employees of any of these firms to exchange direct experience, training, for direct supervision,

[2] These are countries for which there are reliable, comparable and sufficiently long statistics: Australia, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Greece, Hungary, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, New Zealand, Poland, Slovenia, Sweden, Turkey and the United States.

etc… In these cases, personal interactions between the mother company and the subsidiaries may affect innovation of the latter companies (Elia *et al.*, 2019).

With regard to the other research question, the recent decline of BT's expenditure, first note that at the same time as BT's decline, there has been an overall rising trend of international travels for leisure purposes: this rules out any reason related to transport or booking technology. Then, I explore other possible explanations: *i*) business cycles fluctuations in the partner countries relative to the Italian regions; *ii*) the rising role of ICT that induced firms to organize information exchanges and meetings through newly available technologies, such as videoconferencing or ERP systems of corporate organization. For the latter, note that firms choices are largely difficult to observe by the researcher. Then, this paper tests how much BT's expenditure can be predicted by international specialization activities that have a high/low intensity of offshorable tasks. Moreover, also the diffusion of broadband in the partner countries contributes to explain the declining pattern of BT's expenditure inasmuch as highly offshorable or routinary tasks are involved in firms activities with the rest of the world (namely, FDI's and trade flows).

The empirical analysis is based on Italian data, which offer various advantages:

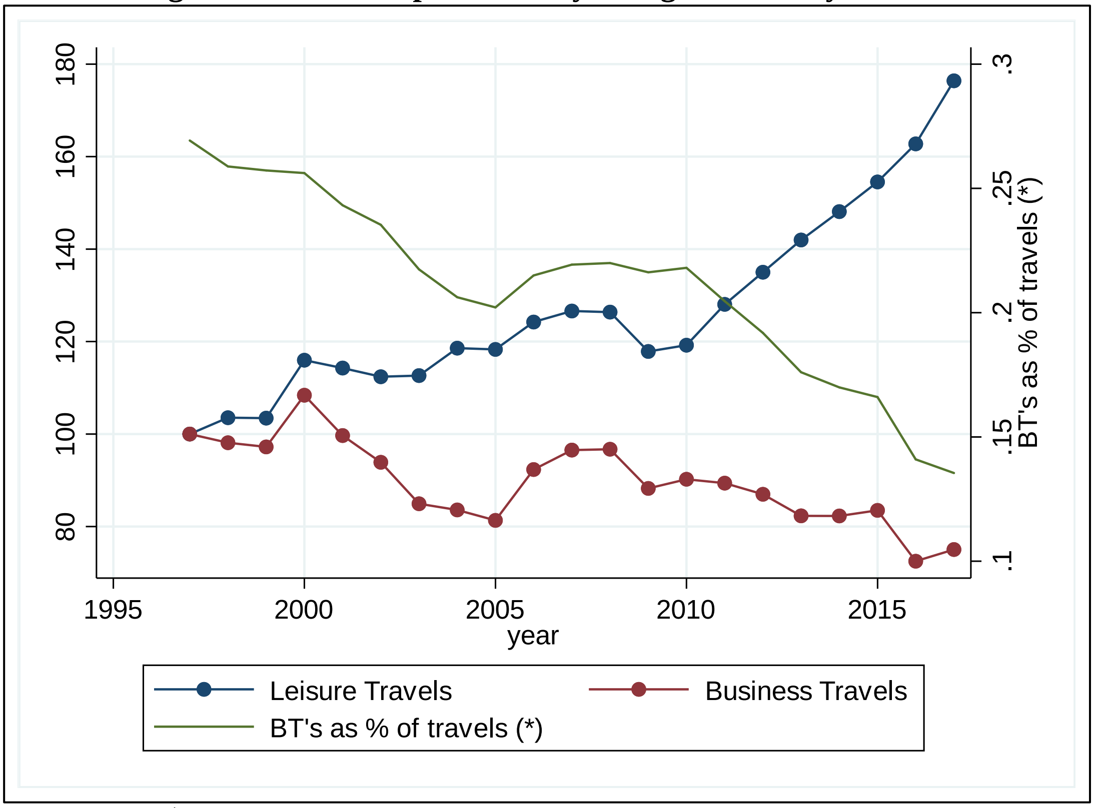
a. Italy is one of the few countries that has detailed and accurate data on BT's. This allows to analyze the phenomenon along three relevant dimensions: partner countries (more than 200), a rather long time span (data are available since 1995, even though I will use a shorter time span: see below) and regions. This last feature makes Italian data unique to make within country analyses on business travels and it is particularly relevant for analyzing BT's, given their role in fostering innovation in local economies. Indeed, Italy is a well suited study case, considering the well-known North South divide of the country in terms of international economic openness and, more in general, of the level of development. Accordingly, also BT's are spread unevenly across Italian regions, so that it is appropriate to analyze the phenomenon at regional level. In this way, this study highlights another possible channel and of internationalization and of economic growth in local economies.

b. Italy shares the decline of other advanced economies: BT's declined by 16.8%. In the same period, they fell from 21.8% to 13.6% as a percentage of total travels. Moreover, since data for Italy are available also in earlier years, this trend is much longer: indeed BT's were 26.9% of total travels in 1997. At the same time leisure travels expenditure by foreigners increased by almost 80% until 2017, the analogous amount for BT's fell by more than 20%: see figure 1.

c. In the last years Italian firms have been rapidly increasing the adoption of ICT's for sharing information within the company: the available aggregate data from National Institute of Statistics (ISTAT) show that the share of firms with enterprise resource planning (ERP) systems – to share information among different areas of the company – increased from 21.1% in 2012 to 35.9% in 2015.

In order to fully exploit the pairs country-region over time, the empirical model is a modified version of the standard gravity model, where the incoming expenditure is explained by trade flows (exports and imports) and by FDI stocks (inward and outward) of the Italian regions with the partner countries in each year. Since the dataset is based only on regions of Italy (and not regions of other countries), this asymmetry makes the gravity approach "unilateral."

Fig. 1. Travelers' expenditure by foreigners in Italy



(*): right scale. Source: Bank of Italy.

With regard to identification, three main issues have been addressed: omitted variables, reverse causality and selection. The empirical model includes country fixed effects to eliminate the influence of unobserved time invariant factors from the foreign countries, and region-year fixed effects to take into account of specific region time varying shocks (business cycles, etc…) that may derive, for example, from any of the two recent crises (Financial Crises and Sovereign Debt Crisis). For reverse causality, the economic links variables (FDI's, exports and imports) are lagged one year, but they also enter interacted with an index that indicates how much a given activity requires personal contact rather than remote control: the idea is that the more an activity requires personal contact (or less standardized operations), the more likely it requires BT's across countries to exchange information. In a second specification I also use a modified version of the instrumental variables of the economic links, where the instruments are the same variables lagged four years.[3] As a final concern, I address the issue of endogenous selection with a Heckman estimation, where the identifying assumption is based on the differences in the institutional variables – the World Governance Indicators – between the partner countries and the Italian regions.[4]

The estimates cover only the period 2008 and 2015. While this choice is driven by the availability of FDI's stocks data (see section 3 for details), this is a sufficiently long period to examine the recent trends in technology improvements that may have reduced BT's.

Using any of the identification approaches mentioned above, the analyses show that the two trade measures (exports and imports) and the two FDI variables have a significant impact on the BT's incoming expenditure. The magnitude of the estimated parameters is greater for exports and imports than for FDI's (inward and outward) in any specification. The results are corroborated by various robustness checks.

Moreover, the analysis reveals that: *a*) the weaker business cycle of the Italian regions, relative to that of the partner countries, contributed to some extent to the decline of BT's expenditure; *b*) economic activities that are least intensive in offshorable tasks predict a much larger share of the expenditure and this share has increased significantly over the eight years of the sample. Similar results are obtained for the least routinary activities. In other terms, ICT substitution affected BT's expenditure only in activities with more standardized tasks. Indeed, broadband diffusion in the partner countries affects negatively BT's expenditure for very standardized activities.

Overall, the analysis confirms that, even if the improvements in ICT may have reduced BT's expenditure to some extent, internationalization of economic activities has a relevant role in determining BT's, which are an important component of services trade and also play a fundamental role in spurring innovation in local economic systems.

The paper is structured as follows. In the next section I briefly review the literature on business travels, focusing on the most recent empirical works. In section 3 I describe the empirical specification and in section 4 the datasets used. Section 5 shows the results of the estimates and in section 6 I focus on the role of growth and of technology shocks in explaining business travel expenditure. The conclusions are in section 7.

[3] Since any of these economic links variables may be auto-correlated, the risk of not satisfying the exclusion restriction is addressed by using as instruments the residuals of a preliminary regression of the principal component of these variables on the dependent variable. The intuition is that the residual should filter out the correlations between the lagged regressors and the dependent variable. For more details see section 3.

[4] The idea is that a greater the difference of institutions between the foreign country and the Italian region attracts business travelers.

2. Literature review

In the recent years a number of studies has focused on the growing importance of services in world trade (for a review see Francois and Hoekman, 2010). While these mainly focus on modes of supply 1 (cross-border) and 3 (FDI) as defined by GATS[5], lesser attention has been paid to travels (these constitute mode 2, with consumption abroad of travelers crossing borders).

In this paper, I narrow the focus to a component of travels, that is travels for business purposes. Insofar very few studied have focused on BT's, partly due to the lack of detailed data. Moshirian (1993) analyzes estimates the determinants of passenger transportation services for a panel of 16 OECD countries and finds that price competitiveness is an important factor in determining these trade flows. However, this study does not further disentangle between business and leisure travels. Kulenndran and Kenneth (2000) investigated the relationship between international trade and international travels of Australia with its trading partners (USA, UK, New Zealand and Japan) and find evidence that, among others, BT's lead to increase international trade flows.

Using a survey on 203 business travelers to and from Australia, Tani (2005) finds that the main motivation of business travelers is to share knowledge, while boosting sales is the least relevant. More recently, Carvalho *et al.* (2016) estimate growth model of expenditure by foreign business travelers on 136 countries for the years 2005 and 2009. Their results suggest that policies aimed increasing capital investment in tourism, leisure tourism and trade openness should be pursued in order to stimulate the growth in the business tourism segment. While the present paper shares the same purpose of Carvalho *et al.* (2016) – in finding the determinants of business travels expenditure – it differs in two relevant aspects: it explicitly addresses endogeneity of the likely determinants of BT's expenditure and it complements the analysis by conducting a within country study in order to take into of the relevant regional heterogeneity.

Third, note that there is another strand of the literature that has focused on the role of BT's to foster international trade and innovation via face-to-face communication and building of "relationship capital." Using U.S. state level data on international business-class air travel, Cristea (2011) shows that the demand of business-class air travel is related to the volume and composition of exports. Hovhannisyan and Keller (2015) estimate the impact of foreign business travel from and to the U.S. on the patenting rates and other innovation measures the American states. While the present paper analyzes the inverse direction of causality (from economic variables to business

[5] Recall the four modes of supply of services across borders as defined by GATS agreements are: *i*) cross-border (where the client receives services performed by a provider located in another country); *ii*) consumption abroad (e.g: travelers crossing borders); *iii*) commercial presence of the provider in another country (essentially FDI); *iv*) movement of natural persons (the supplier crosses the border and performs the service abroad).

travels), it shares with these works the focus on the role of technologies in enhancing face-to-face rather than remote communication or decision making processes.

Finally, some works have started to analyze the role of ICT technology on BT's. An early work by Denstadli (2004) – based on a survey to enterprises in the aftermath of the September 11 – found a limited impact of videoconferencing on business air travel in the Norwegian airline industry, with substitution rates of 2.5–3.5%. He also found that entrepreneurs expected videoconferencing to grow but remain supplementary to personal contact. More recently, using survey data from Taiwan's technology industry, Lu and Peeta (2009) found a substitution relationship between business air travel and videoconferencing, where videoconferencing usage increased in meeting contexts that do not specifically require face-to-face interaction. The paper is very related to this last work because it allows for a differential use of ICT technology by firms.

3. The empirical specification

The empirical exercise is aimed at testing the importance of economic links between countries and Italian regions on incoming BT's expenditure. To this aim, I adopt a "unilateral" gravity specification as mentioned above. To make the point, consider first a OLS specification as the following equation:

$$\ln(E_{r,c,t}) = \beta_0 + \beta_1 \ln(FDI^{in}_{r,c,t-1}) + \beta_2 \ln(FDI^{out}_{r,c,t-1}) + \beta_3 \ln(X_{r,c,t-1}) + \beta_4 \ln(M_{r,c,t-1}) + \gamma_c + \gamma_{r,t} + \Gamma Z_{r,c,t} + u_{r,c,t} \qquad (1)$$

where the natural log of business travel incoming expenditure (E) is by the Italian region r, originating from the country c of the travelers at year t. $\ln(E_{r,c,t})$ is regressed against the four candidate regressors: the log of bilateral inward FDI's ($FDI^{in}_{r,c,t-1}$) and of outward FDI's ($FDI^{out}_{r,c,t-1}$), respectively) and the log of bilateral exports ($X_{r,c,t-1}$) and of bilateral imports ($M_{r,c,t-1}$). Note that as a first simple attempt to limit the concerns of reverse causality, these four regressors are lagged one period. Moreover, to address the omitted variables concerns I add country and region-year fixed effects: γ_c and $\gamma_{r,t}$ respectively. Finally, in the robustness checks I also add the controls at region-country-year level ($Z_{r,c,t-1}$): the real exchange rate, the relative GDP per capita, a contiguity dummy for border effects. Finally, note that the specification in equation (1) already embeds implicitly typical time invariant bilateral covariates of gravity equations where the distance between regions and countries is mainly captured by country fixed effects assuming, without loss of generality, that the actual distance from a country does not vary substantially across regions. Nevertheless, in the controls this small bias is reduced by adding estimated distances from the Italian regions to foreign countries.

A second issue, as also described in the following section, is that the dependent variable has many zero values. In this case OLS estimates biased and not consistent parameters given the pervasive presence of zeros values on business travel flows, as it is well known in the gravity literature: Silva and Tenreyro (2006) show that in presence of heteroscedasticity of the error term, the stochastic formulation of the model in equation (1) would result in a biased, inconsistent and inefficient estimator. To address this issue, I resort to a more appropriate estimator, the Poisson Pseudo Maximum Likelihood (PPML) proposed by Silva and Tenreyro (2006).[6] The PPML has various advantages. First, since it is applied on the *level* of the dependent variable, not to the logarithm, it avoids dropping zero observations. Second, it is a robust approach to heteroskedasticity and, under a weak assumption that the gravity model contains the correct set of explanatory variables, it is consistent. Third, it is not necessary that the data are distributed as Poisson. Finally, it allows a direct interpretation of the coefficients. Therefore, I repeat the previous estimates using the PPML estimator using the following specification, where the dependent variable in levels, rather than in logs:

$$E_{r,c,t} = \beta_0 + \beta_1 \ln\left(FDI^{in}_{r,c,t-1}\right) + \beta_2 \ln\left(FDI^{out}_{r,c,t-1}\right) + \beta_3 \ln\left(X_{r,c,t-1}\right) + \beta_4 \ln\left(M_{r,c,t-1}\right) + \gamma_c + \gamma_{r,t} + \Gamma Z_{r,c,t} + u_{r,c,t} \quad (2)$$

3.1 Addressing identification: interacted variables

To address the endogeneity concerns in the empirical models exposed insofar, recall that I have included various types of fixed effects to neutralize the issue of omitted variables. Moreover, FDI's and trade flows are lagged one year to deal with reverse causality. Nevertheless, I could not sufficiently eliminate most of the identification concerns. Indeed, it could still be possible that an increase of BT's to any Italian region enhances the attractiveness of the territory, which translates into higher levels of FDI's and/or of international trade flows. In this case, the estimated coefficients would be biased, as they would be capturing also the reverse causality link, that is from BT's to international economic links.

As a first attempt to better identify the direction of causality (from the existing economic links to business expenditure), I interact each of the four economic variables of interest with an index that indicates how much a given economic sector requires personal (face-to-face) contact rather than remote distance control. Then, the empirical model becomes the following:

[6] A possible alternative is to use the OLS of the log (1+x) which proxies for sufficiently large values of x the log(x). While this approach has been widely used in the policy literature, because of its simplicity, it has no theoretical basis and, given the high percentage of zero observations, there is the risk of serious bias in the estimates with respect to the true values of the parameters. Another alternative is to use the tobit estimator (with left censoring and a constant), but this also is not appropriate as it applies well to cases with only few zeros or where the zeros might reflect unobservable negative values, which is not in the case in this analysis.

$$E_{r,c,t} = \beta_0 + \beta_1 ln(\widetilde{FDI}^{in}_{r,c,t-1}) + \beta_2 ln(\widetilde{FDI}^{out}_{r,c,t-1}) + \beta_3 ln(\tilde{X}_{r,c,t-1}) + \beta_4 ln(\tilde{M}_{r,c,t-1}) + \gamma_c + \gamma_{r,t} + \Gamma Z_{r,c,t} + u_{r,c,t} \quad (3)$$

where the subscript "~" means that the variable is interacted with a weighting variable constructed at sector level *s*. For example, for inward FDI's this is:

$$\widetilde{FDI}^{in}_{r,c,t-1} = \sum_{s=1}^{S} w_s \cdot FDI^{in}_{r,s,c,t-1} \quad (4)$$

where the weight w_s here represents the percentage a sector depends on less offshorable tasks (it is an *inverse* measure of offoshorability): these are tasks that do not require personal contact or that allow interaction or control at distance (see section 4 for more details). To better explain the advantage of this interaction term, consider for example the case of a foreign firm performing an activity that requires intensive direct personal contact (rather than remote control or monitoring). Then, one we would expect that BT's between the region of the subsidiary and the country of the headquarter of the multinational corporation are more frequent or imply a longer stay at destination (and the related expenditure higher) than in the case of another firm whose subsidiary does very standard operations which can be controlled by technology systems, such as SAP systems or video conference, from the headquarter. In practice, I use two different indexes used by the literature to study the offoshorability of tasks and the routiness of jobs. While the discussion of these indicators is postponed to the following section describing the data, it is useful here to highlight that these indicators and the weights w_s used in equation (4) have been computed using US data. This allows to have sufficient exogeneity between these measures and the variables of interest (business travels, but also international trade flows and FDI's).

3.2 Addressing identification: instrumental variables

Another way to address reverse causality is to use instrumental variables. To this purpose I use a modified version of equation (2), where I use the endogenous regressors (logs of *X, M* and *FDI*'s variables) lagged four years (that is starting from 2008 until 2011) on the current values of the same variable (from 2012 to 2015). However, note that simply using these lagged variables satisfies the correlation condition, but it might not work for the exclusion restriction. In fact, lagged economic links could still affect the current dependent variable because all these variables are auto-correlated. Therefore, I need to I filter out (at least the theoretical) correlation between current expenditure and the lagged economic links variables. To do so, I first reduce the four lagged economic links into one variable, taking the principal component. Then I regress this principal component on the current expenditure and take the residual of this regression:

$$\ln(PC_{r,c,t-4}) = \delta_0 + \delta_1 E_{r,c,t-4} + \gamma_c + \gamma_{r,t-4} + iv_{r,c,t-4} \quad (5)$$

where *PC* is the first principal component of the four economic links variables lagged four years.[7] This procedure ensures that the residual, that is the candidate instrumental variable ($iv_{r,c,t-4}$), is, at least theoretically, not correlated with the dependent variable of interest $E_{r,c,t}$. I apply this procedure on the economic links variables and on the economic links interacted with the various task measures using, for each specification, the IV version of the PPML estimator (IV-PPML).

3.3 Addressing identification: selection

Note that the PPML estimator does not provide a theoretical foundation to the selection issue (that is, the real meaning of the zeros of the dependent variable). Therefore, I also re-estimate model (1) using a Heckman two steps selection model. The Heckman model of equation (1) is estimated using variables of institutional quality to detect selection (the exclusion restriction). With regard to these variables, I use measures the World Governance Indicators, since they are available at both region and at country for the years analyzed (see section 4 for details). I build measures of *relative* institutional quality (that is, between each region and country) for any year of analysis. In particular, I use the simple difference between the level of the foreign country variable and the corresponding level of the variable in each region. A higher difference reflects a better institutional quality in a foreign country relatively to the Italian region considered. The idea is that the greater is this difference, the more necessary it is to have physical presence (rather than remote control) of foreigners to an Italian when making business, in order to check not only the local firm, but also the economic, social and cultural context in which the company is running its activity.

4. Data description

In this section I first describe the main three datasets (of Business Travels, of FDI's and of international trade flows). Then I explain the institutional variables used, the data on the occupational task an how the related indexes are constructed. Finally a brief description is given on the institutional data (WGI) for the selection equation in the Heckman model.

Business travels. International incoming travel data for business purposes are from the Bank of Italy dataset of international travels. The data are from a survey made at the usual points of entry/exit of travelers (airports, ports, borders, customs, etc..) and it is used to build the travel component of the balance of payments. In this dataset we observe incoming data reported by foreigners going to Italy for work, holiday or other purposes. For the purpose of this paper I restrict the analysis to travelers moving for work purposes (business travelers), discarding people crossing the borders for leisure

[7] Note that the principal component analysis reveals that only one variable has an eigenvalue greater than 1.

purposes, migrants and trans-boundary workers (that is, commuters crossing the border on a daily basis).[8] The dataset provides personal expenditure and number of days spent abroad for each person foreigner interviewed. In the ensuing analysis, I collapse personal data at country, region and year level, and use expanded data (of expenditure and days) to represent the corresponding population of interest.

Foreign Direct Investment. Inward and outward FDI stocks are built using ORBIS of Bureau van Djik. In this dataset, for each Italian limited liability company I take the country of residence and the share of control of the owners. Inward FDI's are given by the sum of total assets of firms owned by foreigners. Outward FDI's are built in a similar way. Then, inward FDI (*FDI_in*) are proxied by the sum of total assets of companies owned by foreign residents, and outward FDI are determined by total assets of foreign firms under the control of an Italian company or person.

Since these data are available only for the period between 2007-2014, all the ensuing analysis is limited to the period 2008-2015 (indeed, FDI variables enter with a one year lag in the empirical specification). A consequence of using this period is that FDI stocks are computed as foreign percentage of total assets rather than of the company value (equity capital). This is because many firms are listed and their value has been subject to high volatility during the period of analysis for the financial market turmoil (the Financial Crisis of 2008-2009 and the Sovereign Debt Crisis of 2011-2102) rather than reflecting the actual company value.

International trade data. Data on the exports and imports of goods are from the Italian National Institute of Statistics (ISTAT). The data are available at regional level (where regions correspond to NUTS2 level in the European classification) for each year.

After merging the three databases, the data have been rectangularized as in a gravity usual framework, so to as to make a strongly balanced panel dataset, with an equal number of observations by region, by country and by year. Since business expenditure is very concentrated in few countries and only in some regions, the rectangularization highlights many observations (63%) with zero values of inward expenditure, if one considers these missing data as zero of travel flows and not measurement errors. For this reason, in addition to using appropriate estimators (see section 3), I make a preliminary selection on the data by reducing the number of observations with zero expenditure, in order to reduce the risk of non-convergence of the maximum likelihood function of these non-standard estimators (PPML). This consists of: *a*) dropping the records in which BT's expenditures and FDI's are null and where trade flows are below an arbitrary threshold of 1 million

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[8] This last phenomenon is of little relevance and it regards mainly people moving from the regions at the border with Switzerland.

of euros; *b*) dropping the countries for which the sum of BT's expenditure per year is below the threshold 1% of the total national. After these preliminary selections, the dataset contains 20,000 observations, spanning over 20 regions and 125 countries and 8 years. All data are in thousands of euros. Economics data are in real terms, using as deflators the consumer price indexes at regional level for BT's, imports and inward FDI's (from ISTAT), the consumer price indexes of the partner country for exports and outward FDI's.

Occupational measures. I use two different indexes suggested by the literature on tasks, labor and trade. These capture the complexity of firm activities that make them offshorable and the role of technology with respect to the routiness of jobs. The first is the index built by Blinder and Krueger (2013) of offshorability (henceforth BKI) based on the observation that even complex tasks, involving high levels of skill and human judgment, can be offshored via telecommunication devices. Blinder and Krueger (2013) compute various indicators using the results of the Princeton Data Improvement Initiative (PDII) dataset survey. Following Goos, Manning and Salomon (2014) I focus on their preferred measure, in which the values are given by the assessment of professional coders based on a worker's occupational classification.

The second indicator is the common routineness of an occupation (Routine Task Intensity, henceforth RTI) index used by Autor D.H., Levy F. and Murnane, R.J. (2003), Autor and Dorn (2013) and Autor, Dorn, and Hanson (2013). The idea for using RTI in this context is that a firm is composed workers performing different tasks, where some consist of simple routine activities, that are easier to be replaced by computerized remote control systems (such as SAP) than jobs that instead require abstract thinking, complex judgment, human interaction or manual intervention (e.g.: janitors).

Note that since these indicators measure the content of workers across tasks, they are typically classified across occupations of workers, rather than activities of firms. Then, I use US data (to grant a degree of exogeneity of these measures) and these are classified using the System of Occupations Classification. From this classification I make various conversions in order to transform the original data into sectoral indexes, using sector-occupation tables of the Bureau of Labor Statistics, that for any given sector in the US provide the number of workers performing the various occupations. As a result of this process, I obtain the task indicators at sector level where the sectors are classified with NACE Rev. 2 nomenclature at 3 or 4 digit). This approach has been used also by Basco and Mestieri (2018) to investigate cross border M&A's. The details of the indicators and of this process are described in the Appendix. Liu *et al.* (2016) take a similar approach to the present work showing that international BT's, a proxy for face-to-face communication, lead to more outsourcing of more complex services in the US.

Institutional data. There is a wide array of institutional quality measures to choose from, that are suggested in the literature of international economics. Nevertheless, it is helpful to consider that the particular specification adopted here requires measures that are available at both regional level and at country level, and possibly they should also vary over time. I find that an appropriate set of these variables is given by the institutional quality variables computed by Nifo and Vecchione (2014) for the Italian regions and by the World Governance Indicators at country level (for a methodological description see Kaufmann *et al.*, 2011). Since the Nifo and Vecchione measures are methodologically very similar to the WGI ones, the sub-indicators from each of the two datasets are highly comparable. In detail, I take the sub-indicators that are available from both sources: *i*) Control of Corruption; *ii*) Government Effectiveness; *iii*) Regulatory Quality; *iv*) Rule of Law; *v*) Voice and Accountability.[9] The theory and an established empirical evidence suggests that the level of these variables should predict the economic links variables (FDI's and the trade flows): see for example Dellis *et al.*, 2017 and Nunn, 2007. Nevertheless, in the empirical specification where the records are at region-country-year level, the relative value of these institutional variables should be considered. To this aim, I build an indicator of the simple difference between the level of the foreign country variable and the corresponding level of the variable in each region. Here, a higher value of the difference reflects a better institutional quality in a foreign country relatively to the Italian region considered.[10] Finally, note that since the institutional quality indicators of Nifo and Vecchione are available from 2004 to 2012, the difference indicators are lagged 3 years in the empirical specification of equation (1) or (2).

Table A.1. in the Appendix describes briefly the data and table A.2 provides summary statistics.

5. Results

5.1 Descriptive evidence

Figure 2 shows the distribution of business travels across Italian regions (averaged over the entire sample years: 2008-2015). Incoming BT's are very concentrated in few regions of the North

[9] See table A.1 for the content of the WGI indicators. Note that the from the WGI indicators Political stability has been excluded since this is not available in Nifo and Vecchione (2014).

[10] To this aim, all original variables are first normalized between 0 and 1, where 0 is the minimum and 1 is the maximum value of institutional quality. In turn, also the difference is also normalized between 0 and 1.

of Italy (such as Lombardy, Veneto and Emilia Romagna) and Lazio.[11] Our main explanatory variables (FDI's and trade flows) are also highly concentrated in few Italian regions, in the North and Lazio: see fig. 3.

Fig. 2. Distribution of business travels by region

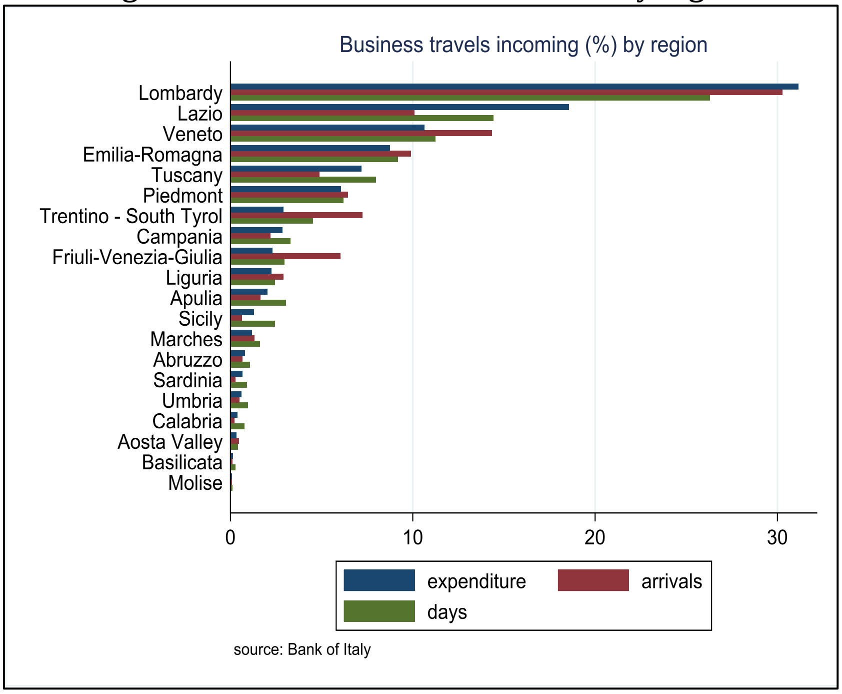


Figure 4 shows that distribution of BT's across countries (only the countries with a share of at least 1% are displayed). Notice that BT's measures are especially concentrated in high income countries, with only few emerging countries, such as China, India, Brazil, and Turkey. This result has been reported also by Bentivogli *et al.* (2016). Finally, note that also the distribution of economic links across countries (only the countries with a share of at least 1% are displayed in figure 5) shows that most of the economics links are towards advanced countries.

Overall this preliminary descriptive evidence shows that both BT expenditure and economic links are very correlated across countries and regions. A more challenging task is to measure how much these links determine the amounts of business travels in Italy. For this purpose, I show the results of the econometric analysis in the following subsections.

[11] Lazio is the region where the capital (Rome) is located. In this city various big size companies formerly owned by the government have maintained their headquarter, even after being privatized since the nineties.

Fig. 3. Distribution of economic links by region

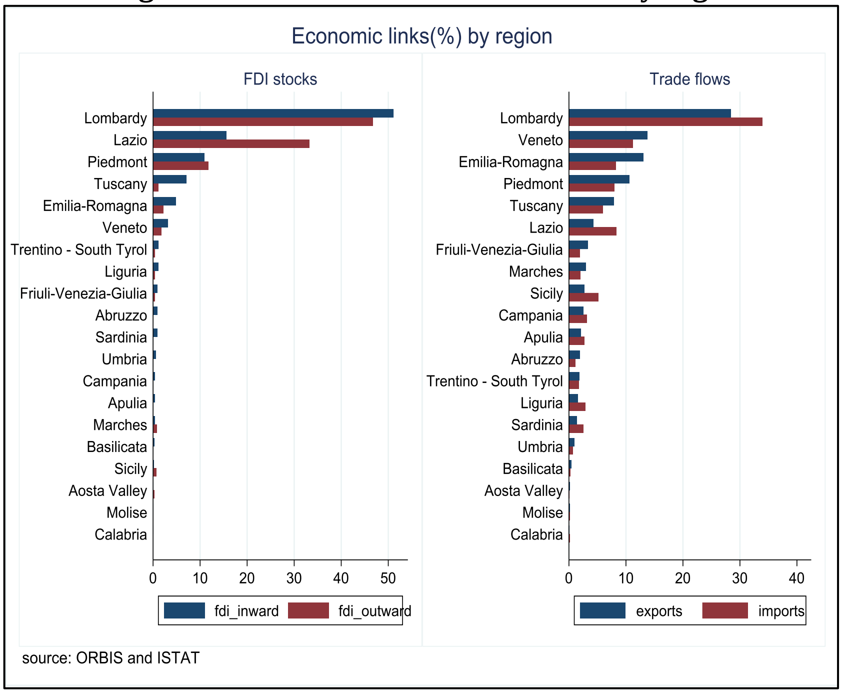


Fig. 4. Distribution of business travels by country

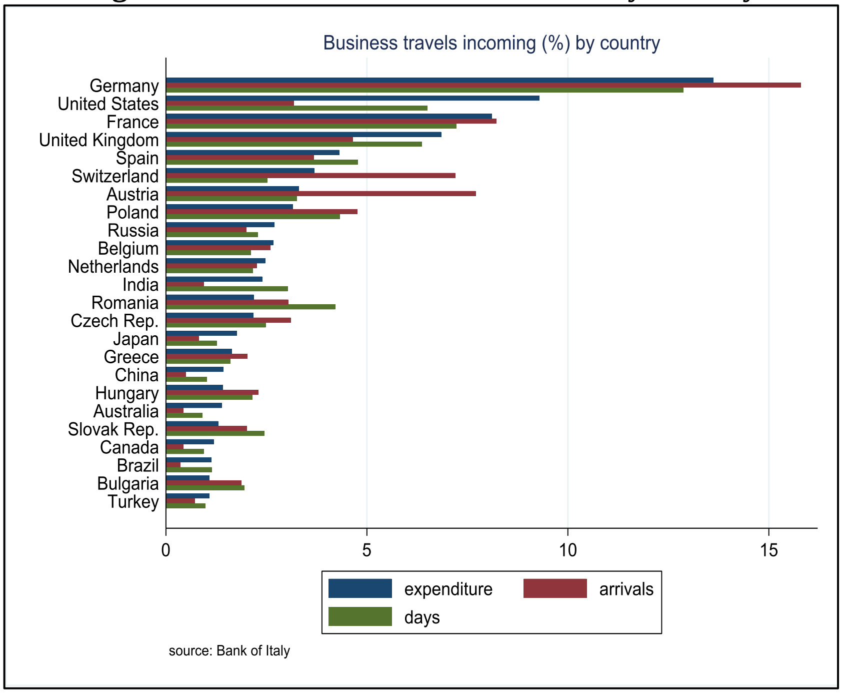
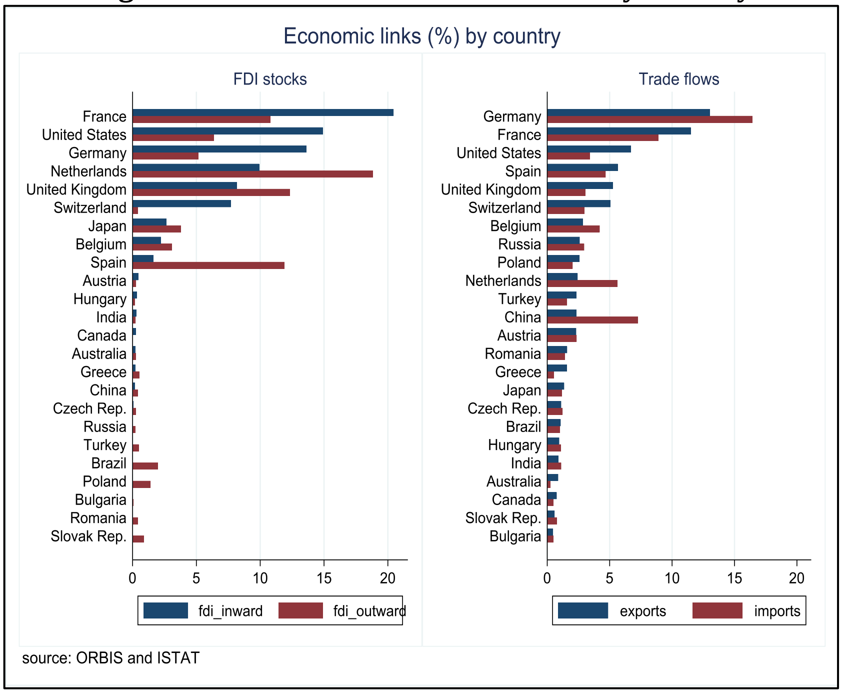


Fig. 5. Distribution of economic links by country



5.2 *Preliminary estimates*

In this subsection I show the estimates of the plain empirical gravity specification of equations (1) and (2). The analysis of equation (3) is postponed to subsection 5.3.

Table 1 reports the estimates of the incoming expenditure as modeled in equations (1) and (2). Columns 1 reports the OLS estimates of the log of business travels expenditure and show that the coefficients of the log of FDI's and of exports are positive and significant as expected, while the coefficient of imports is not significantly different from zero. In column 2 the first principal component of the four variables of interest is also significantly positive;[12] in columns 3 and 4 I repeat the previous exercises adding region-country-time variables: the relative value of income per capita (RGDP_PC), the real exchange rate (RER), a contiguity variable (Countiguity) and distance.

Unfortunately, in a large part of the observations the dependent is the log of zero values of expenditure and therefore they are dropped in these OLS estimates. Then, a proper estimator is the Poisson Pseudo Maximum Likelihood (PPML) proposed by Silva and Tenreyro (2006) for gravity models, as already explained in section 3. When I re-estimate equation (2) using PPML the results show that all the four candidates (FDI's and trade flows) have positive and significant effects on the level of incoming expenditure (column 5). This result is confirmed when I use the first principal

[12] The PCA reveals that there is only one variable with an eigenvalue of 2.58. The same result applies to the ensuing analyses, where I will use only the first principal component.

component (column 6) and also when I add the other controls (real GDP per capita, the real exchange rate, the contiguity dummy and distance): columns 7 and 8.

Finally, note that distance has a significant and negative effect as expected, but the very low magnitude of this estimated coefficient suggests that the country fixed effects actually absorb most of the effects of distance between Italy and the countries of origin, while the additional distance effect due to the different geographic position of the Italian regions has a limited explanatory impact.

Table 1. OLS and PPML regressions on the main explanatory variables or the principal component.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	PPML	PPML	PPML	PPML
dependent variable:	log(expenditure)				expenditure			
Log(1+FDI_in)	0.0410***		0.0335***		0.0225***		0.0183***	
	(0.0061)		(0.0058)		(0.0053)		(0.0050)	
Log(1+FDI out)	0.0472***		0.0415***		0.0158**		0.0124**	
	(0.0054)		(0.0053)		(0.0064)		(0.0058)	
Log(1+Exp)	0.1086***		0.0710**		0.3195***		0.2746***	
	(0.0290)		(0.0284)		(0.0395)		(0.0359)	
Log(1+Imp)	0.0192		0.0064		0.1453***		0.1160***	
	(0.0159)		(0.0162)		(0.0286)		(0.0244)	
PC(EL)		0.3525***		0.2887***		0.2751***		0.2089***
		(0.0324)		(0.0300)		(0.0515)		(0.0375)
RGDP_PC			-0.1842	-0.1603			-0.1516	0.0389
			(0.1531)	(0.1505)			(0.1252)	(0.1160)
Contiguity			0.9508***	0.9470***			0.7116***	0.8637***
			(0.2233)	(0.2210)			(0.1224)	(0.1493)
Distance			-0.0006***	-0.0006***			-0.0003**	-0.0005***
			(0.0001)	(0.0001)			(0.0001)	(0.0002)
RER			-0.0000	-0.0000			0.0000	0.0000
			(0.0000)	(0.0000)			(0.0000)	(0.0000)
Observations	7765	7765	7717	7717	19880	19880	19460	19460
R^2	0.586	0.585	0.593	0.593	0.888	0.877	0.894	0.887

The dependent variable is built on the incoming expenditure of foreign travelers for business purposes. PC1 is the first principal component of the economic links variables (EL): Log(FDI_in), Log(FDI out), Log(Exp) and Log(Imp). RER is the real exchange rate, RGDP_PC is the relative value of income per capita, Contiguity is a dummy for bordering countries, Distance is the geo distance between the capital of the region and that of the partner country. All variables are described in table A.1. All estimates include country FE's, and region-year FE's. Standard errors (clustered at region and country level) in parentheses are robust in the OLS estimates. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5.3 Estimates using interacted regressors

The estimates in the previous subsection confirm the expected results, but they do not fully address identification, despite the inclusion of various types of fixed effects to neutralize most of the omitted variables concerns, and entering FDI's and trade variables lagged one year for the concerns of reverse causality. Indeed, it could still be possible that business travelers go to Italy to explore new business opportunities that are not determined by existing FDI's or trade flows, but might be correlated with them (e.g: high levels of inward FDI's or of exports activity might signal that the region is very attractive for business). As already mentioned in section 3, this issue is addressed by interacting each of the four economic variables of interest with an index that indicates how much a given activity requires personal contact rather than distance control. In practice, recall that I use the two indexes: the offshorability index (BKI) of Blinder and Krueger (2013) and the Routine Task Intensity index (RTI). Note that these measures are entered in_the estimations as *inverse* indicators, so that higher values correspond to lower level of offoshorability (such that they require a greater content of face-to-face or personal interactions) or of routiness (meaning that they are less likely to be replaced by automatic systems of remote control).[13]

Table 2. PPML estimates on the main explanatory variables interacted with occupation measures and their principal component (baseline)

	(1)	(2)	(3)	(4)
Log(1+FDI_in) x BKI	0.0192***			
	(0.0055)			
Log(1+FDI_out) x BKI	0.0114*			
	(0.0063)			
Log(1+Exp) x BKI	0.2905***			
	(0.0355)			
Log(1+Imp) x BKI	0.1166***			
	(0.0251)			
PC(EL) x BKI		0.2004***		
		(0.0369)		
Log(1+FDI_in) x RTI			0.0189***	
			(0.0054)	
Log(1+FDI_out) x RTI			0.0117*	
			(0.0062)	
Log(1+Exp) x RTI			0.2942***	
			(0.0356)	
Log(1+Imp) x RTI			0.1139***	
			(0.0246)	
PC(EL) x RTI				0.2033***
				(0.0370)
Controls	Yes	Yes	Yes	Yes
Observations	20000	20000	20000	20000
R^2	0.888	0.876	0.888	0.876

PPML estimates where the dependent variable is the incoming expenditure of foreign travelers for business purposes. PC's are the first principal component of the previous four regressors as they appear on the table. The controls included are: real GDP per capita is the relative value of income per capita, the real exchange rate (RER), a contiguity dummy for bordering countries and the geo-distance between the capital of the region and that of the partner country. BKI and RTI are the inverse indexes of tasks offoshorability and of routinary tasks. All variables are described in table A.1. All estimates include country FE's and region-year FE's. Standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The results of the PPML estimates using these interacted coefficients are in Table 2 and each specification confirms that all the four variables of economic links – interacted with any of the occupational indexes – have in all the specifications a significant impact on the BT's expenditure. Moreover, also the magnitude of the estimated coefficients is quite similar to that of Table 1 (column 5).

13 To allow comparability across indexes each has been normalized between 0 and 1. For example, an index equal to 0 means complete routiness or complete offoshorability.

5.4 Addressing endogeneity: reverse causality

In this subsection I address the issue of reverse causality using instrumental variables and the methodology described in section 3.2. In practice, I use a modified version of equation (2), where I consider the endogenous regressors (*X*, *M* and *FDI*'s variables) lagged four years, that is starting from 2008 until 2011; conversely, the dependent variable ranges between 2012 and 2015. Note that simply using these lagged variables as instruments would satisfy the correlation condition, but it might not fully satisfy the exclusion restriction (that is, the lagged economic links should not directly affect the dependent variable, i.e.: current incoming expenditure): for example, a new machinery starting to operate in 2009 might produce revenues and attract foreign investors also in 2012. In other terms, BT's and economic links are strongly serially correlated over time, as shown in table 3.[14]

Table 3. Autocorrelations

$Log(E_t)$	1.0000									
$Log(E_{t-4})$	0.5769*	1.0000								
$Log(1+FDI\_in_t)$	0.4461*	0.5229*	1.0000							
$Log(1+FDI\_in_{t-4})$	0.4392*	0.4409*	0.7256*	1.0000						
$Log(1+FDI\_out_t)$	0.5062*	0.6082*	0.5778*	0.5232*	1.0000					
$Log(1+FDI\_out_{t-4})$	0.4856*	0.5576*	0.5994*	0.5623*	0.7864*	1.0000				
$Log(1+Exp_t)$	0.5796*	0.6465*	0.4580*	0.3807*	0.5127*	0.4608*	1.0000			
$Log(1+Exp_{t-4})$	0.5692*	0.6420*	0.4501*	0.3720*	0.5056*	0.4570*	0.9234*	1.0000		
$Log(1+Imp_t)$	0.5337*	0.6252*	0.4318*	0.3582*	0.5054*	0.4543*	0.7912*	0.7723*	1.0000	
$Log(1+Imp_{t-4})$	0.5220*	0.6257*	0.4432*	0.3684*	0.5044*	0.4563*	0.7931*	0.7823*	0.9000*	1.0000

*: Correlations different from zero at 5% confidence level.

In order to satisfy the exclusion restriction, I take the residual of the regression of the principal component (of the four economic links variables lagged four years) on expenditure as described in equation (5) and use it as instrumental variable. For each specification, I use the IV version of the PPML (IV-PPML). The estimates are shown in table 4.

Column 1 shows the effect of the PC on the economic links variables PC(EL), estimated with PPML without instrumenting. The coefficient is significant, it has the expected sign and a much larger in magnitude than the corresponding PPML estimate (see table 1, column 6). In columns 2 to 4 I repeat the same exercise using the instrumental variable PPML (IV-PPML) on PC(EL) and on this variable interacted with the inverse measures of offshorability and of routiness; in all these specifications the effect is positive and strongly significant. The first stage estimates in columns 5 to 7 show that there correlation condition is satisfied in any specification. Overall, this

[14] I checked for autocorrelation by estimating eq. (2) using PPML and regressing the residual on its lag. I obtain a coefficient of 0.9303 and an R2 of 0.92.

exercise reveals that there is a causality link between the economic links variables and BT expenditure.

Table 4. IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PPML	IV-PPML			PPML	PPML	PPML
		2nd stage			1st stage		
$PC(EL_t)$	3.1171***	6.5031***					
	(0.6104)	(1.0259)					
$PC(EL_t)$ x BKI			5.9218***				
			(0.9587)				
$PC(EL_t)$ x RTI				6.0338***			
				(0.9770)			
$IV(EL_{t-4})$					0.0807***		
					(0.0055)		
$IV(EL_{t-4})$ x BKI						0.0774***	
						(0.0057)	
$IV(EL_{t-4})$ x RTI							0.0777***
							(0.0057)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10000	9880	10000	10000	9880	10000	10000

The table shows PPML estimates (column 1) and IV-PPML estimates (columns 2 to 7). The dependent variable in the second stage (columns 2 to 4) is current business travel expenditure during the years 2012-2015. The excluded instrument is determined as the residual of equation (5) during the years 2008-2011. First stage estimates are in columns 5 to 7. PC(EL) is the first principal component of the economic links variables, as explained in the text. BKI and RTI are the inverse indexes of tasks offoshorability and of routinary tasks. The controls included are: the real exchange rate (RER), Real GDP per capita is the relative value of income per capita, a contiguity dummy for bordering countries and the geo-distance between the capital of the region and that of the partner country. IV(EL) is the instrumental variable computed as in equation 5. All variables are described in table A.1. All estimates include country FE's and region-year FE's. Standard errors (clustered at region and country level) in parentheses are robust. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Finally, to further disentangle the causal role of the two channels of international integration, I have repeated the exercise above using two PCA variables as main regressors, one for FDI's and another for the trade flows. Accordingly, also the two instrumental variables are defined, one is for FDI's and one for exports and imports, using equation (5) in the same fashion as above. The results show that both types of economic links variables have a significant effect on BT's expenditure (see table A.3).[15]

5.5 Addressing endogeneity: selection

As explained in section 3.3, the PPML estimator does not provide a theoretical foundation to the selection issue (that is, the real meaning of the zeros in the dependent variable). Therefore, I re-estimate equation (1) using a Heckman two steps selection model, where the selection variables are the relative measures institutional quality, as described in section 4. Recall that a higher (positive)

[15] As robustness check I have also included exports and imports of services by region and year. Note that this variable is not available for many countries (but only for groups of countries) and for some regions overall services trade is negligible. Therefore, I have considered only services trade flows with the rest of the world. The results, showed in the Appendix (table A.6) confirm the main findings of the text.

value of the difference indicator means that institutional quality is higher in the partner country with respect to the Italian region.

As a preliminary step towards heckman estimation, I detect whether any of these relative indicators satisfies the exclusion restriction, that is whether they determine BT's expenditure only through the number of travelers arrived in each region and not also through an undesired direct effect on the value of BT's expenditure. Since there is no theoretical motivation for excluding a priori a direct effect of any relative institutional variable on business expenditure, I test empirically the correlations between these variables. To this aim, I run OLS regression of equation (1) adding, alternatively, any of the five the synthetic difference indicators of relative institutional quality.[16] The estimates (table A.4 in the Appendix) suggest that control of corruption and voice and accountability are good candidates for the exclusion restrictions since they do not significantly affect the dependent variable.

Table 5. Heckman regressions of log(expenditure) on the main explanatory variables using differences of control of corruption for selection

	(1)	(2)		(3)	(4)		(5)	(6)
Panel A: outcome equation; dependent variable: log(expenditure)								
Log(1+FDI_in)	0.0172***		Log(1+FDI_in) x BKI	0.0195***		Log(1+FDI_in) x RTI	0.0191***	
	(0.0055)			(0.0060)			(0.0059)	
Log(1+FDI out)	0.0308***		Log(1+FDI_out) x BKI	0.0330***		Log(1+FDI_out) x RTI	0.0327***	
	(0.0047)			(0.0052)			(0.0051)	
Log(1+Exp)	0.1554***		Log(1+Exp) x BKI	0.1648***		Log(1+Exp) x RTI	0.1662***	
	(0.0206)			(0.0205)			(0.0206)	
Log(1+Imp)	0.0511***		Log(1+Imp) x BKI	0.0565***		Log(1+Imp) x RTI	0.0548***	
	(0.0115)			(0.0120)			(0.0118)	
PC(EL)		0.2494***	PC(EL) x BKI		0.2517***	PC(EL x) RTI		0.2521***
		(0.0237)			(0.0233)			(0.0234)
Controls	Yes	Yes	Controls	Yes	Yes	Controls	Yes	Yes
Panel B: selection equation; dependent variable: log(arrivals)								
Log(1+FDI_in)	0.0133**		Log(1+FDI_in) x BKI	0.0141*		Log(1+FDI_in) x RTI	0.0142*	
	(0.0066)			(0.0074)			(0.0073)	
Log(1+FDI out)	0.0350***		Log(1+FDI_out) x BKI	0.0392***		Log(1+FDI_out) x RTI	0.0383***	
	(0.0056)			(0.0063)			(0.0062)	
Log(1+Exp)	0.0258*		Log(1+Exp) x BKI	0.0277**		Log(1+Exp) x RTI	0.0283**	
	(0.0140)			(0.0141)			(0.0141)	
Log(1+Imp)	0.0231***		Log(1+Imp) x BKI	0.0273***		Log(1+Imp) x RTI	0.0261***	
	(0.0076)			(0.0080)			(0.0079)	
PC(EL)		0.1943***	PC(EL) x BKI		0.1989***	PC(EL x) RTI		0.1982***
		(0.0263)			(0.0263)			(0.0263)
D1(COC)	2.2762**	2.1306**	D1(COC)	2.2510**	2.1032**	D1(COC)	2.2593**	2.1124**
	(1.0340)	(1.0329)		(1.0341)	(1.0330)		(1.0341)	(1.0330)
Controls	Yes	Yes	Controls	Yes	Yes	Controls	Yes	Yes
/mills lambda	1.2980***	1.1829***		1.2863***	1.1630***		1.2890***	1.1670***
	(0.0642)	(0.0603)		(0.0643)	(0.0605)		(0.0642)	(0.0604)
Observations	19456	19456		19456	19456		19456	19456

Heckman estimates where the dependent variable is the log of the incoming expenditure of foreign travelers for business purposes. The regressors in columns 3 and 4 are interacted with BKI (the inverse indexes of tasks offoshorability). In columns 5 and 6 the regressors are interacted with the inverse index of tasks routinary tasks (RTI). D1(COC) is the difference in the control of corruption index between the foreign country and the Italian region. In Panel B only the variables of interest are showed. All estimates in Panel A and Panel B include the following controls: the real exchange rate, the relative GDP per capita, a contiguity dummy and geo-distance. All variables are described in table A.1. All estimates include also country FE's and region-year FE's. Robust standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

[16] The difference indicators are the simple difference (labeled as "D1(..)") between the foreign country and the Italian region.

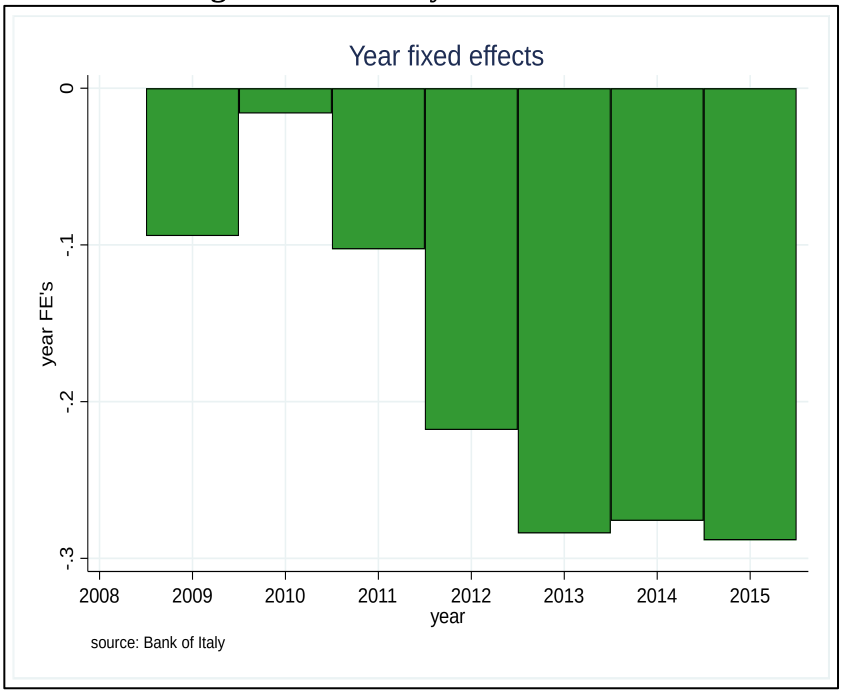
Supported by this evidence, I move to estimate equation (1) with a two-step Heckman estimation, where the simple difference of control of corruption or of voice and accountability are used as the exclusion restriction variables. The results of heckman estimation using the difference of control of corruption (D1(COC)) are showed in table 5. Panel A show the estimates of the outcome equations and, as in the PPML estimates of table 2, all the four economic links variables have a significant and positive impact on BT incoming expenditure (column 1). A similar result is obtained in column 2 where the four regressors are replaced by their first principal component. Then, in columns 3 to 6 I repeat the same exercise using the economic links variables interacted with the inverse measures of offoshorability (BKI) and of routinary tasks (RT) and the previous results are confirmed.

Finally, the same results are obtained when I repeat these estimates using the difference of the voice and accountability indicator (D1(VAA)): see table A.5.

6. The Role of the business cycle and of technology

After addressing identification, I turn to explain the declining pattern of BT's over time. The plot of BT expenditure over a period of 18 years in figure 1 reveals a peak in 2000, and then another in 2008. Despite the two peaks, over all the period BT expenditure has declined by 11,8% until 2015. Section 5.3 already showed that international economic links in sectors that are intensive in offshorable or routinary tasks significantly correlate with business travel expenditure. The negative effect over time can also be seen in the dataset by estimating a PPML regression of equation (3) modified by using year fixed effects separately from region and country fixed effects. The estimated year fixed effects, showed in fig. 6, are all negative relative to year 2008. Moreover, with the exception of year 2010, they have decreased over time. This result suggests that in the period of analysis an increasingly negative effect affected the pattern of BT's. In order to understand the possible determinants of this decline in the ensuing analysis I investigate the following possible explanations: *i*) the business cycle affecting of foreign countries relative to the Italian regions; *ii*) the rising role of ICT that induced firms to organize information exchanges and meetings through newly available technologies, such as videoconferencing or ERP systems of corporate organization.

Fig. 6. Estimated year fixed effects



6.1 The business cycle

One possible explanation is that the low performance of the Italian economy, with a sluggish business cycle in the past decades, and relative better performance in other countries may have reduced the attractiveness to visit the Italian regions for business purposes. To see this point, in table 6 I estimate equations (2), (3) and (5) adding the ratio between the real GDP of the partner country relative to that of the Italian region.

Table 6 shows in the first six columns the estimates using the PPML estimator: the coefficients on the economic link variables remain significant and positive in all specifications estimated with PPML (columns 1, 3 and 5); qualitatively similar results are obtained when the principal component variables are used (columns 2, 4 and 6). Interestingly, in all these estimates the relative GDP (RGDP) is positive and significant, even though in some specifications only at 10%. The magnitude ranges between 0.71 and 0.49 and it implies that a 1% increase of GDP in the foreign country, relative to GDP of the Italian region, increases BT's expenditure by about 0,6. Finally, note that when I repeat the estimates using the IV strategy outlined in section 3.2, the principal component of the international economic links remain significant; differently, the relative

GDP is not different from zero, but note that this last result might depend on the very short time period considered, when.[17]

Table 6. PPML estimates using regional and countries GDP levels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	PPML							IV-PPML Second stage		
Log(1+FDI_in)	0.0172***									
	(0.0050)									
Log(1+FDI_out)	0.0120**									
	(0.0058)									
Log(1+Exp)	0.2777***									
	(0.0363)									
Log(1+Imp)	0.1140***									
	(0.0245)									
PC(EL)		0.2040***						6.5684***		
		(0.0382)						(1.0299)		
Log(1+FDI_in) x BKI			0.0184***							
			(0.0056)							
Log(1+FDI_out) x BKI			0.0111*							
			(0.0063)							
Log(1+Exp) x BKI			0.2881***							
			(0.0362)							
Log(1+Imp) x BKI			0.1157***							
			(0.0251)							
PC(EL) x BKI				0.1954***					5.9733***	
				(0.0377)					(0.9605)	
Log(1+FDI_in) x RTI					0.0181***					
					(0.0054)					
Log(1+FDI_out) x RTI					0.0114*					
					(0.0063)					
Log(1+Exp) x RTI					0.2917***					
					(0.0363)					
Log(1+Imp) x RTI					0.1131***					
					(0.0247)					
PC(EL) x RTI						0.1982***				6.0888***
						(0.0379)				(0.9791)
RGDP	0.7083***	0.5981**	0.4994*	0.5756**	0.4944*	0.5704**	0.8270***	-0.3455	-0.2390	-0.2739
	(0.2498)	(0.2621)	(0.2606)	(0.2679)	(0.2602)	(0.2675)	(0.2520)	(0.6703)	(0.6799)	(0.6829)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
								First stage		
$IV(EL_{t-4})$								0.0812***		
								(0.0055)		
$IV(EL_{t-4})$ x BKI									0.0781***	
									(0.0057)	
$IV(EL_{t-4})$ x RTI										0.0784***
										(0.0057)
Controls								Yes	Yes	Yes
Observations	19100	19100	19100	19100	19100	19100	19100	9460	9580	9580
R^2	0.893	0.887	0.893	0.886	0.893	0.886	0.878			

Estimates where the dependent variable is the incoming expenditure of foreign travelers for business purposes. The estimator is PPML in columns 1 to 6 and IV-PPML in columns 7 to 9. PC's are first the first principal component of the Economic Links variables (EL): FDI inward, FDI outward, Exports and Imports. BKI and RTI are the inverse indexes of tasks offoshorability and of routinary tasks. RGDP is the log difference of real GDP in the partner country relative to the Italian region. The controls included are: real GDP per capita is the relative value of income per capita, the real exchange rate (RER), a contiguity dummy for bordering countries and the geo-distance between the capital of the region and that of the partner country. IV(EL) is the instrumental variable computed as in equation 5. All variables are described in table A.1. All estimates include country FE's and region-year FE's. Standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Overall, these estimates show that the role of the relative GDP measure (RGDP) on BT's is significant, even though the evidence is not very robust. Nevertheless, note that RGDP might be very correlated and the economic links covariates. Column 7 shows this point: by removing all economic links from the regression, the magnitude of RGDP increases to 0.83 and it is significant at 1%. Therefore, the empirical model adopted here trade flows and FDI's already incorporates a good part of the business cycle fluctuations.

[17] In other estimates (unreported for sake of brevity), I repeat the same exercise excluding the real GDP per capita, which might be very correlated with the relative GDP, and the results are substantially unchanged.

6.2 *The role of technology: analysis by tasks*

A second plausible explanation is the role of communication technology, where for example communication and control systems actually shape BT's. Indeed, firms that are intensive in standardized activities, such as the routine or offshorable tasks, may more easily rely on remote control or communication systems, thus lowering the demand of BT travels. This point was also raised by Basco and Mestieri (2018) who analyze M&A's highlight that harder-to-monitor (less standardized) industries tend to have fewer M&As, although this is mitigated by ICT diffusion.

In order to examine this point, I test whether the overall level of business travel each year is predicted more (or less) by international economic links using intensively low (or high) offshorable / routinary activities. Disentangling these negative effects requires to estimate a modified version of equation (3), where the economic link variables have been interacted with high and low dummies of the task inverse indexes of offshorable/routinary activities. The idea is summarized in the following equation:

$$E_{r,c,t} = \mu_0 + \mu_1 \ln\left(F\dot{D}I^{in}_{r,c,t-1}\right) + \pi_1 \ln\left(F\ddot{D}I^{in}_{r,c,t-1}\right) + \mu_2 \ln\left(F\dot{D}I^{out}_{r,c,t-1}\right) + \pi_2 \ln\left(F\ddot{D}I^{out}_{r,c,t-1}\right) +$$

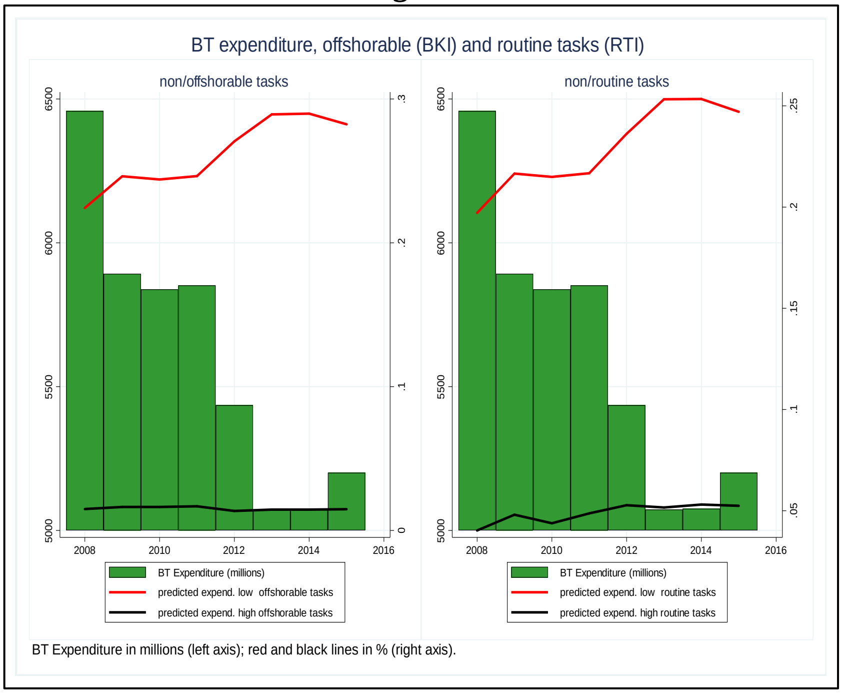
$$+\mu_3 \ln\left(\dot{X}_{r,c,t-1}\right) + \pi_3 \ln\left(\ddot{X}_{r,c,t-1}\right) + \mu_4 \ln\left(\dot{M}_{r,c,t-1}\right) + \pi_4 \ln\left(\ddot{M}_{r,c,t-1}\right) + \gamma_c + \gamma_{r,t} + u_{r,c,t} \qquad (6)$$

where the single dot ($\dot{}$) denotes the interaction between the economic link variable and the dummy for *high* task intensity (offshorable/routinary), and the double dot ($\ddot{}$) denotes the interaction with the dummy of *low* task intensity (the difference between the two dummies have been calculated with respect to the median of the original task indicator). After estimating (6), I compare the share of the dependent variable predicted by the high versus the low intensity dummy variables and plot them against the actual series of BT's. The results using the BK index of offshorability are showed in figure 7 (left chart):[18] in the period of analysis while BT's expenditure in Italy falls from almost 6,5 to about 5,2 million of euros (left scale axis), the percentage of BT that is explained by sectors that are intensive in not offshorable tasks has increased from about 22% to around 28% (right scale axis). Conversely, the share explained by sectors highly intensive in offshorable tasks has remained stable around 2%. These trend reveal that and the gap between high and low intensity predicted expenditures has increased across the years. In a similar fashion, the visual analysis of the right chart of figure 8 reveals similar results when the economic link variables are interacted with the RTI index: the percentage predicted by the non-routinary activities has increased from about 20% to

[18] The coefficient estimates are showed in the Appendix (table A.7).

almost 25% (right scale axis), while the share explained by routinary intensive sectors has remained stable around 5%. [19]

Figure 7



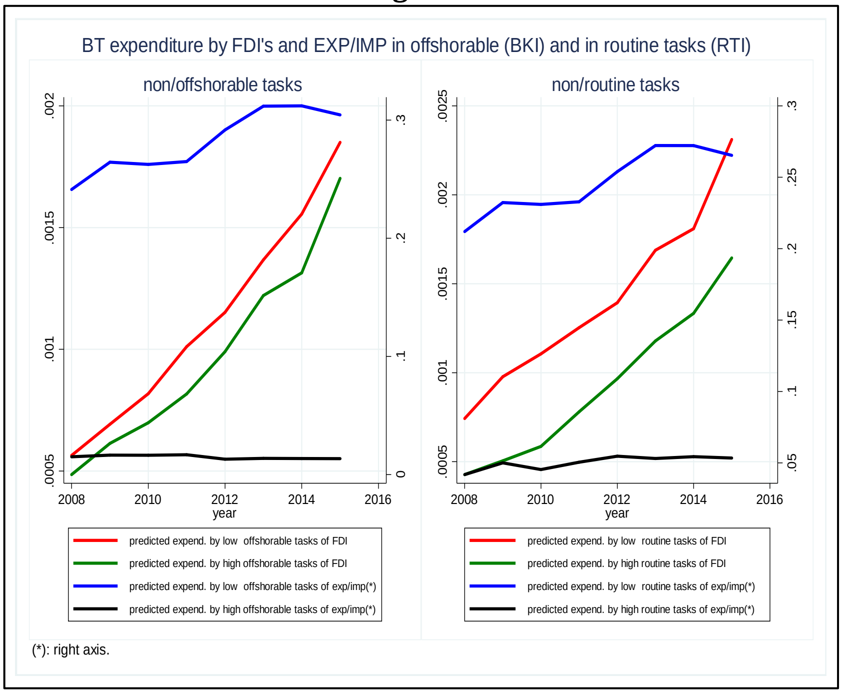
In order to better understand the role of each determinant, I repeat the previous exercise by splitting the share of expenditure into four components: the share explained by highly offshorable/routine task FDI's, by low offshorable/routine task FDI's, and the analogous other two measures for exports and imports. The results are drawn in figure 8 which shows two interesting patterns. First, low offshorable/routine tasks FDI's and exports explain a greater share of overall BT expenditure than that of the corresponding high intensity measures. Secondly, exports and imports explain a greater share than FDI's, even though the role of foreign investments is increasing steadily over time.

6.3 The role of technology: broadband diffusion.

Another way to see the role of technology is to consider the role of broadband diffusion in the partner countries. Indeed, the flow of incoming business travelers might be negatively determined by the technology diffusion internet broadband in the partner country, which could act as a substitute of BT's. To this purpose, I estimate the equations (2) and (3) using the principal component of economic links (for sake of brevity and of clarity) also interacted with the broadband per capita ratio variable ($BBPC_{ct0}$), which is at country level c and at time t_0.

[19] Similar results are obtained using the IV-PPML estimator and the methodology applied in section 5.4: see figure A.1 in the Appendix.

Figure 8



The results of these estimates are showed in table 7. Column (1) shows that the principal component of the economic links variables has a positive effect on BT's expenditure as expected, but the effect is negative for regions having greater economic links with countries where broadband is more diffused (PCA(EL) x BBPC). To better isolate the channels behind this last result, I repeat the estimates using the principal component of economic links interacted with high/low task intensity (offoshorability in columns 2 and routine tasks in column 3) and again with broadband diffusion. Column 2 shows that BT's expenditure is increased by the economic links with highly offshorable tasks (PCA(EL x BKI_high)); however, for these activities the effect of broadband is negative, meaning that broadband displaces BT's expenditure. On the opposite, for activities requiring low offshorable tasks (PCA(EL*BKI_low) x BBPC), the effect of broadband is positive and significant: this means that the use of ICT systems (like videoconferencing) in tasks having a low standardization component, increases the need for further face-to-face contact. The results in column 3 using routinary tasks provide similar results.[20]

Finally, one may wonder whether the negative effects of broadband in highly standardized tasks may actually reverse the overall effect of economic links. This is not the case. Indeed, the sum of the estimated parameters on the two variables in column 1 is statistically different from zero (χ^2= 34.87, p-value = 0.0000); repeating the test in columns 2 and 3 on all the principal component

[20] In unreported estimates I repeat the exercise using the same IV strategy reported above and similar results are obtained.

variables provides similar results. Overall, table 7 shows that ICT diffusion reduces BT's expenditure and that the effect is limited to more standardized tasks, as expected. Nevertheless, its magnitude is not sufficient to counterbalance the positive impact of the economic links variables.

Table_7. PPML estimates on the use of broadband in partner countries

	(1)	(2)	(3)
PCA(EL)	0.2808***		
	(0.0480)		
PCA(EL) x BBPC	-0.0034**		
	(0.0016)		
PCA(EL x BKI_high)		0.2460***	
		(0.0598)	
PCA(EL x BKI_high) x BBPC		-0.0078***	
		(0.0025)	
PCA(EL x BKI_low)		0.0405	
		(0.0442)	
PCA(EL x BKI_low) x BBPC		0.0039*	
		(0.0020)	
PCA(EL x RTI_high)			0.2659***
			(0.0597)
PCA(EL x RTI_high) x BBPC			-0.0086***
			(0.0025)
PCA(EL x RTI_low)			0.0463
			(0.0432)
PCA(EL x RTI_low) x BBPC			0.0043**
			(0.0020)
Controls	Yes	Yes	Yes
χ^2 test	34.87	17.08	19.95
p-value	(0.0000)	(0.0000)	(0.0000)
Observations	18460	16162	16162
R^2	0.891	0.892	0.894

PPML estimates where the dependent variable is the incoming expenditure of foreign travelers for business purposes. PC(EL) is the first principal component of the log of the Economic Links variables (EL): FDI inward (FDI_in), FDI outward (FDI_out), Exports (Exp) and Imports (Imp). The controls included are: real GDP per capita is the relative value of income per capita, the real exchange rate (RER), a contiguity dummy for bordering countries and the geo-distance between the capital of the region and that of the partner country. BBPC is fixed broadband subscriptions in the partner countries per 100 people. All variables are described in table A.1. Estimates include country FE's and region-year FE's. Standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

7. Conclusions

The paper has tested empirically the correlations between the expenditure of incoming travelers for business purposes and four variables expressing economic links: inward and outward FDI's, exports and imports.

The empirical exercise consists of a "unilateral" gravity model, which considers bilateral expenditure flows are among 125 countries and 20 Italian regions in 8 years. Since these detailed data have many zero values in the dependent variable, I have estimated the model using the PPML. Various arrangements for identification have been adopted: interacting the four international economic links variables with (inverse) indexes of offshorable and routinary tasks, that require personal contact rather than the possibility of using systems of remote communication and control; an instrumental variables approach; a selection Heckman estimation.

The results show that all four variables of international economic links have a significant and positive impact on BT expenditure. The effects are robust to the inclusion of various controls and to different sets of fixed effects to take into account of unobservable factors. In this way, the paper shows that international economic links provide additional benefits to the recipient local economy other than the ones already widely studied by the economic literature.

In the second part of the paper I have examined the role of the business cycle and of technology improvements in shaping business travels expenditure. The analysis shows that the business cycle had a significant role in shaping the pattern of expenditure by business foreigners, even though the effect is partly captured by the international economic links variables. Moreover, the share of BT expenditure's share predicted by activities requiring less offshorable or less routinary tasks is larger than the residual share of standardized tasks. As a further proof, broadband diffusion in the partner countries decreases the business travels expenditure in Italian regions but only for sectors that are highly intensive in standardized tasks.

Overall, the analysis confirms that, despite the improvements in ICT, internationalization of economic activities has a relevant fundamental role in determining business travels, which are an important component of services trade and also play a fundamental role in spurring innovation in local economic systems.

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APPENDIX

Details on the occupational indexes

The **RTI** measure is based on Autor, Levy, and Murnane (2003) and it is the difference between the log of Routine tasks measure and the sum of the log of Abstract and the log of Manual tasks.[21]

The **BK** index is built using individual level data from the Princeton Data Improvement Initiative (PDII) dataset, which is a survey freely available from Alan Krueger's web-page. Blinder and Krueger compute three measures: one self-reported, one a combination of self-reported questions made internally consistent, and the last one which is based on the assessment of professional coders. I choose the third as this is the preferred one by the authors.

Conversion of occupation measures into sectoral indexes.

I start from the measures computed by Goos Manning and Salomon (2014), which are classified with the ISCO1988 system at two digit and adapt them to the main dataset through a series of correspondences. The first two steps consist of converting the occupations from the ISCO1988 classification to the more recent ISCO2008 (using the correspondence tables of the ILO at three digit) and then from ISCO2008 to SOC2010 (using the crosswalk tables provided by the Bureau of Labor Statistics, BLS).[22] In the third step the data, which are occupation level, are converted into sector level data, using the tables of the BLS: these tables provide for each year interest (2007 to 2014) the level of employment in the US of each occupation (in SOC classification) in every sector, where this is classified using the NAICS 2007 and NAICS 2012 systems at four digit. After this conversion, I compute all the five indexes (the routine intensity, the offshorability, etc..) at sector level. The final step consists of converting the sectoral indicators from NAICS to the NACE Rev. 2 classification using a correspondence table from the European Commission. As a result of this process, I have for each NACE Rev. 2 sector, at 3 or 4 digit, the five indicators considered. All measures are normalized to range between zero and one, with greater values denoting lower offshorability or lower routineness of tasks.

[21] See Autor, Levy, and Murnane (2003) for more details on each of these indicators.

[22] Namely, ISCO is the International System of Classification of Occupations. SOC is the (System of Occupation Classification) is adopted in the US by the Bureau of Labor Statistics.

Table A.1. Variables description

FDI_in	It is a measure proxying inward FDI's: the amount of total assets in real terms of Italian limited liability firms in each region controlled by a foreign firm (source: ORBIS).
FDI_out	It is a measure proxying outward FDI's: the amount of total assets in real terms of foreign limited liability firms in each country controlled by an Italian firm in any region (source: ORBIS).
Exp	Exports of goods valued in real terms (source: Istat).
Imp	Imports of goods valued in real terms (source: Istat).
Exp(S)	Exports of services valued in real terms (source: Bank of Italy).
Imp(S)	Imports of services valued in real terms (source: Bank of Italy).
BKI	Blinder and Krueger offshorability task intensity index (source: Goos et al., 2014).
RTI	Autor's Routine Task Intensity index (source: Goos et al., 2014).
RER	Real exchange rate (source: International Financial Statistics, Penn World Tables; consumer prices for the Italian regions are from Istat)
Relative GDP	Relative GDP and relative GDP per capita (sources: Istat and Penn World Tables)
Governance Indicators *	World Governance Indicators (WGI) and Nifo and Vecchione (2014)
BBPC	Fixed broadband subscriptions per 100 people (source: World Bank)

*: The WGI indicator (see http://info.worldbank.org/governance/WGI/#doc) is composed by Control of corruption("captures "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests"), Government effectiveness ("captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies"), Regulatory quality "captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development"), Rule of law ("captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence"), Voice and accountability ("captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media") and Political stability which is the only excluded indicator here because it is not available in the regional indexes by Nifo and Vecchione (2014).

Table A.2. Summary statistics

variable	observations	mean	sd	p50	min	max
BT's expenditure	20,000	2,241.33	10,345.46	0.00	0.00	248,860.20
Log(FDI_in) (1)	20, 000	1.22	3.36	0.00	0.00	17.54
Log(FDI out) (1)	19,880	1.75	4.05	0.00	0.00	19.00
Log(Exp) (1)	19,880	8.53	3.44	9.00	0.00	16.53
Log(Imp) (1)	20,000	8.53	3.44	9.00	0.00	16.53
Log(relative GDP p.c.)	19,460	-1.63	1.56	-1.62	-5.40	2.16
Log(RER)	19,880	3.14	3.22	2.34	-1.51	22.97
Contiguity	20,000	0.01	0.08	0.00	0.00	1.00
Distance (2)	20,000	4,897.57	3,746.37	4,045.60	30.66	18,572.15
D1(COC)	20,000	0.71	0.13	0.67	0.49	1.00
D1(GOE)	20,000	0.74	0.12	0.72	0.50	1.00
D1(REQ)	20,000	0.79	0.11	0.79	0.50	1.00
D1(ROL)	20,000	0.75	0.14	0.72	0.50	1.00
D1(VAA)	20,000	0.78	0.13	0.77	0.50	0.99
D1(GI)	20,000	0.75	0.13	0.72	0.50	1.00
BBPC	18,720	8.04	10.6	2.02	0.00	40.20

(1): millions of euros. (2): kilometers.

Table A.3. IV Estimates (2nd and 1st stage) with 2 IV's

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	OLS	2nd stage IV-PPML	1st stage PPML	1st stage PPML	2nd stage IV-PPML	1st stage PPML	1st stage PPML	2nd stage IV-PPML	1st stage PPML	1st stage PPML
PC(FDI_t)	0.7497***	1.7350***								
	(0.1869)	(0.5110)								
PC(X_t+M_t)	7.3786***	8.9593***								
	(0.9502)	(1.0498)								
PC(FDI_t) x BKI					1.6364***					
					(0.4854)					
PC(X_t+M_t) x BKI					8.2337***					
					(1.0135)					
PC(FDI_t) x RTI								1.6559***		
								(0.4972)		
PC(X_t+M_t) x RTI								8.2454***		
								(1.0063)		
IV(FDI_{t-4})			-0.0246	-0.0390***						
			(.)	(0.0024)						
IV(X_{t-4}+M_{t-4})			0.5834	0.2939***						
			(.)	(0.0090)						
IV(FDI_{t-4}) x BKI						-0.0269	-0.0428***			
						(.)	(0.0025)			
IV(X_{t-4}+M_{t-4}) x BKI						0.5625	0.3025***			
						(.)	(0.0091)			
IV(FDI_{t-4}) x RTI									-0.0276	-0.0425***
									(.)	(0.0025)
IV(X_{t-4}+M_{t-4}) x RTI									0.5591	0.3013***
									(.)	(0.0090)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10000	9880	7760	9880	10000	7840	10000	10000	7840	10000

The dependent variable is the log of the incoming expenditure of foreign travelers for business purposes in column (1) and the level of expenditure in the second stage estimates (columns 2, 5 and 8). The excluded instrument is determined as the residual of equation (5) during the years 2008-2011. First stage estimates are in columns 3, 4, 6, 7, 9 and 10. The RTI is the Routine Index of Autor *et al.* (2013) and with BK is the Offshorability index of Blinder and Krueger (2013). The controls included are: the real exchange rate (RER), Real GDP per capita is the relative value of income per capita, a contiguity dummy for bordering countries and the geo-distance between the capital of the region and that of the partner country. All variables are described in table A.1. All estimates include country FE's and region-year FE's. Standard errors (clustered at region and country level) in parentheses are robust. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4. Before Heckman: test the exclusion restriction with differences

	(1)	(2)	(3)	(4)	(5)	(6)
	EL	PC(EL)	EL x RTI	PC(EL) x RTI	EL x BK	PC(EL) x BK
D1(COC)	1.8532	1.8061	1.8353	1.7585	1.8146	1.7805
	(1.2003)	(1.2047)	(1.2003)	(1.2029)	(1.2004)	(1.2030)
Observations	7717	7717	7717	7717	7717	7717
R^2	0.590	0.589	0.591	0.590	0.591	0.590
D1(GOE)	2.8247**	2.7928**	2.8315**	2.7810**	2.8364**	2.7777**
	(1.2142)	(1.2199)	(1.2146)	(1.2186)	(1.2142)	(1.2192)
Observations	7717	7717	7717	7717	7717	7717
R^2	0.590	0.589	0.591	0.590	0.591	0.590
D1(REQ)	6.2070***	6.2028***	6.2033***	6.1883***	6.2087***	6.1782***
	(1.2547)	(1.2575)	(1.2545)	(1.2546)	(1.2537)	(1.2555)
Observations	7717	7717	7717	7717	7717	7717
R^2	0.592	0.591	0.592	0.592	0.592	0.591
D1(ROL)	5.5337***	5.5249***	5.5151***	5.4809***	5.5007***	5.4958***
	(1.5371)	(1.5430)	(1.5374)	(1.5399)	(1.5371)	(1.5405)
Observations	7717	7717	7717	7717	7717	7717
R^2	0.591	0.590	0.591	0.591	0.591	0.591
D1(VAA)	-1.9873	-1.8629	-1.9795	-1.8997	-1.9766	-1.9003
	(1.3582)	(1.3621)	(1.3586)	(1.3591)	(1.3574)	(1.3603)
Observations	7717	7717	7717	7717	7717	7717
R^2	0.590	0.589	0.591	0.590	0.591	0.590
D1(WGI)	6.7305***	6.7383***	6.7199***	6.6697***	6.7113***	6.6786***
	(1.9424)	(1.9571)	(1.9433)	(1.9526)	(1.9434)	(1.9530)
Observations	7717	7717	7717	7717	7717	7717
R^2	0.591	0.590	0.591	0.591	0.591	0.591

OLS estimates where the dependent variable is the log of BT incoming expenditure. The table shows only the coefficients of interests of the various relative variables: these are the simple difference indicator (D1(…)) that is built on the following five sub-indicators: COC=Control of Corruption; GOE=Government Effectiveness; REQ=Regulatory Quality; ROL=Rule of Law; VAA=Voice and Accountability; WGI= World Governance Indicator (built on the average of the previous indicators). The estimates include also the four economic links variables labeled here as levels (not shown): Log(1+FDI_in), Log(1+FDI out), Log(1+Exports) and Log(1+Imports). They also include (not shown) country FE's and region-year FE's and the following additional controls: the real exchange rate (RER), Real GDP per capita is the relative value of income per capita, a contiguity dummy for bordering countries and the geo-distance between the capital of the region and that of the partner country. All variables are described in table A.1 Robust standard errors (clustered at region and country level) in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table A.5. Heckman regressions of log(expenditure) on the main explanatory variables using differences of voice and accountability for selection

	(1)	(2)		(3)	(4)		(5)	(6)
			Panel A: outcome equation; dependent variable: log(expenditure)					
Log(1+FDI_in)	0.0171***		Log(1+FDI_in) x BKI	0.0194***		Log(1+FDI_in) xRTI	0.0190***	
	(0.0055)			(0.0061)			(0.0059)	
Log(1+FDI_out)	0.0307***		Log(1+FDI_out) x BKI	0.0329***		Log(1+FDI_out) x RTI	0.0325***	
	(0.0047)			(0.0052)			(0.0051)	
Log(1+Exp)	0.1562***		Log(1+Exp) x BKI	0.1657***		Log(1+Exp) x RTI	0.1671***	
	(0.0205)			(0.0205)			(0.0206)	
Log(1+Imports)	0.0516***		Log(1+Imports) x BKI	0.0569***		Log(1+Imports) x RTI	0.0553***	
	(0.0115)			(0.0120)			(0.0118)	
PC(EL)		0.2491***	PC(EL) x BKI		0.2514***	PC(EL) x RTI		0.2518***
		(0.0237)			(0.0233)			(0.0234)
Log(1+FDI_in)	0.0137**		Log(1+FDI_in) x BKI	0.0145*		Log(1+FDI_in) xRTI	0.0147**	
	(0.0066)			(0.0074)			(0.0073)	
Log(1+FDI_out)	0.0345***		Log(1+FDI_out) x BKI	0.0386***		Log(1+FDI_out) x RTI	0.0377***	
	(0.0056)			(0.0063)			(0.0061)	
Log(1+Exp)	0.0253*		Log(1+Exp) x BKI	0.0271*		Log(1+Exp) x RTI	0.0277*	
	(0.0140)			(0.0141)			(0.0142)	
Log(1+Imports)	0.0231***		Log(1+Imports) x BKI	0.0273***		Log(1+Imports) x RTI	0.0261***	
	(0.0076)			(0.0080)			(0.0079)	
PC(EL)		0.1933***	PC(EL) x BKI		0.1979***	PC(EL) x RTI		0.1972***
		(0.0263)			(0.0263)			(0.0263)
D1(VAA)	2.2401**	2.2166**	D1(VAA)	2.2150**	2.1894**	D1(VAA)	2.2169**	2.1935**
	(1.0313)	(1.0313)		(1.0316)	(1.0313)		(1.0315)	(1.0313)
mills lambda	1.3096***	1.1919***		1.2978***	1.1719***		1.3007***	1.1760***
	(0.0642)	(0.0603)		(0.0643)	(0.0604)		(0.0642)	(0.0604)
Observations	19456	19456		19456	19456		19456	19456

Heckman estimates where the dependent variable is the log of the incoming expenditure of foreign travelers for business purposes. The regressors in columns 3 and 4 are interacted with BKI (the inverse indexes of tasks offoshorability). In columns 5 and 6 the regressors are interacted with the inverse index of tasks routinary tasks (RTI). D1(VAA) is the difference in the c voice and accountability index between the foreign country with that of the Italian region. In Panel B only the variables of interest are showed. All estimates in Panel A and Panel B include the following controls: the real exchange rate, the relative GDP per capita, a contiguity dummy and geo-distance. All variables are described in table A.1. All estimates include also country FE's and region-year FE's. Robust standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6. Adding exports and imports of services

	(1) PPML	(2) PPML	(3) PPML	(4) PPML	(5) PPML	(6) PPML	(7) IV-PPML	(8) IV- PPML	(9) IV- PPML
Log(1+FDI_in)	0.0217***								
	(0.0054)								
Log(1+FDI_out)	0.0117*								
	(0.0061)								
Log(1+Exp)	0.2795***								
	(0.0359)								
Log(1+Imp)	0.1173***								
	(0.0245)								
PC(EL)		0.2668***					0.8227***		
		(0.0462)					(0.1289)		
Log(1+FDI_in) x BKI			0.0232***						
			(0.0060)						
Log(1+FDI_out) x BKI			0.0110*						
			(0.0066)						
Log(1+Exp) x BKI			0.2943***						
			(0.0357)						
Log(1+Imp) x BKI			0.1183***						
			(0.0250)						
PC(EL) x BKI				0.2581***				0.7363***	
				(0.0454)				(0.1185)	
Log(1+FDI_in) x RTI					0.0228***				
					(0.0059)				
Log(1+FDI_out) x RTI					0.0114*				
					(0.0066)				
Log(1+Exp) x RTI					0.2981***				
					(0.0359)				
Log(1+Imp) x RTI					0.1156***				
					(0.0246)				
PC(EL) x RTI						0.2617***			0.7547***
						(0.0457)			(0.1214)
Log(1+Exp(S)+Imp(S))	-0.0285	-0.0668	-0.0286	-0.0658	-0.0282	-0.0659	0.4519***	0.5168***	0.5005***
	(0.0506)	(0.0516)	(0.0505)	(0.0515)	(0.0505)	(0.0516)	(0.1617)	(0.1572)	(0.1588)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17060	17060	17060	17060	17060	17060	9880	10000	10000
R^2	0.886	0.879	0.886	0.879	0.886	0.879			

The dependent variable is the incoming expenditure of foreign travelers for business purposes. The estimator is PPML in columns 1 to 6 and IV-PPML in columns 7 to 9. PC(EL) is the first principal component of Economic Links (EL) variables (in logs): FDI inward (FDI_in), FDI outward (FDI_out), Exports of goods (Exp), Imports of goods (Imp) and of the sum of exports and imports of services (Exp(S)+Imp(S)). The controls include: the real exchange rate, the relative GDP per capita, a contiguity dummy and geo-distance. All variables are described in table A.1. All estimates include country FE's, region FE's and year FE's. Standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure A.1

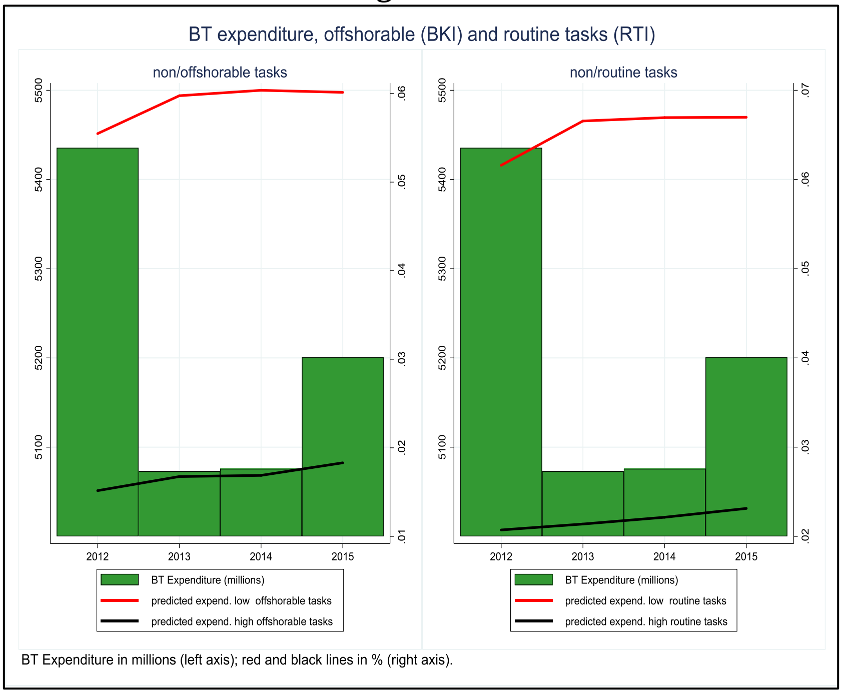

Table A.7. PPML estimates using high/low task intensity interactions

	(1)	(2)	(3)	(4)
	Offshorable tasks (BKI)		Routinary tasks (RTI)	
Estimator	PPML	IV-PPML	PPML	IV- PPML
Log(1+FDI_in) x Low Task intensity	0.016***		0.012**	
	[0.006]		[0.005]	
Log(1+FDI_in) x High Task intensity	0.015**		0.022***	
	[0.006]		[0.005]	
Log(1+FDI_out) x Low Task intensity	0.007		0.014**	
	[0.005]		[0.005]	
Log(1+FDI_out) x High Task intensity	0.007		0.002	
	[0.005]		[0.005]	
Log(1+Exp) x Low Task intensity	0.311***		0.284***	
	[0.039]		[0.040]	
Log(1+Exp) x High Task intensity	0.025***		0.081***	
	[0.009]		[0.018]	
Log(1+Imp) x Low Task intensity	0.124***		0.098***	
	[0.029]		[0.027]	
Log(1+Imp) x High Task intensity	0.022***		0.042***	
	[0.007]		[0.010]	
PC(EL) x Low Task intensity		3.322**		3.757**
		[1.460]		[1.467]
PC(EL) x High Task intensity		2.167		2.108
		[1.431]		[1.321]
Constant	-3.171***	0.632	-2.912***	0.418
	[0.844]	[1.095]	[0.846]	[1.049]
Controls	Yes	Yes	Yes	Yes
Observations	17,441	8609	17,441	8609
R-squared	0.890		0.895	

The dependent variable is the incoming expenditure of foreign travelers for business purposes. In columns 1 and 3 the estimator is PPML, and the dataset is between 2008 to 2015. In columns 2 and 4 the estimator is IV Poisson and the dataset is between 2012 and 2015. PC(EL) is the first principal component of Economic Links (EL) variables: FDI inward FDI_in, FDI outward (FDI_in), Exports (Exp) and Imports (Imp). The controls include: the real exchange rate, the relative GDP per capita, a contiguity dummy and geo-distance. All variables are described in table A.1. Estimates in columns include country FE's, region-year FE's. Standard errors (clustered at region and country level) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.