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MOVEMENTS OF PEOPLE FOR MOVEMENTS OF GOODS?

Rinaldo Brau
Anna Maria Pinna

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CRENoS – CAGLIARI
VIA SAN GIORGIO 12, I-09100 CAGLIARI, ITALIA
TEL. +39-070-6756406; FAX +39-070- 6756402

CRENoS - SASSARI
VIA TORRE TONDA 34, I-07100 SASSARI, ITALIA
TEL. +39-079-2017301; FAX +39-079-2017312

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Via Is Mirrionis, 1
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Movements of People for Movements of Goods?*

Rinaldo Brau and Anna Maria Pinna
University of Cagliari and CRENoS

Abstract

While it is well established to think of international tourism as a type of exports, namely 'home' exports, the potential of tourism flows as an engine for fostering trade among countries is a poorly studied topic. In this paper we show that this relationship can be studied at a very detailed level by exploiting the disaggregation of existing information on international trade and inbound tourism. We consider a sample of 25 countries belonging to the European Union, a region which has been interested by common shocks such as the establishment of the Euro as the new currency for many countries and the liberalization in the air transport market. We carry out a panel data analysis by means of which we assess whether international tourist arrivals by a given country activate additional exports towards the same country. We find not only that tourism can promote exports, but also that this effect displays important differences depending on whether or not consumption goods are considered. This finding is consistent with the idea that the experience of tourists in a given destination reduces the fixed costs of trade, thus facilitating access to the advantages of international trade for more peripheral economies.

Keywords: tourism and trade, bilateral exports; bilateral tourist flows.
Jel Classification: F14, F15, L83

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1. Introduction

It is a well established view to consider revenues from inbound tourism as equivalent to exports, namely an export of services recorded in the balance of payments of the host country. Moreover, the provision of goods for tourists can be also seen as a particular type of exports which does not involve border costs since they are sold 'at home'. Nonetheless, scholars have surprisingly missed considering tourist flows within standard international trade models.

According to economic theory, one economic effect of the movement of people across borders is the facilitation of a further exchange of products, i.e. traditional exports. This because a travel involves an exchange of information with a dual content: on local products and on foreign tastes. While for somewhat related flows the empirical evidence is well established -e.g. in the case of migration analysis, where it has been found that larger bilateral migration networks are associated with larger trade flows[1] - the impact of tourism on trade flows has been largely neglected.

Of course, the study of the relationship between tourism and exports is not new, but other approaches to the issue have been prevailing so far. On the one hand, several works have considered tourism and exports as joint determinants of growth and tried to detect long-run causal relationships (e.g. Shan and Wilson, 2001; Dritsakis, 2004; Cortès Imenez *et al*, 2009; Oh, 2005; Durbarry, 2004). The latter study is particularly interesting since aggregate exports and international tourism are studied by means of a production function where economic growth is explained by physical capital, human capital and exports. Other works tried to detect the existence at an aggregate level of causal links between exports and international tourism, seen as different sources of foreign receipts, and the long-run economic growth.

On the other hand, a few empirical contributions have established a relationship with the international trade literature by borrowing the gravity model approaches in order to explain tourist flows (roughly speaking, international tourist arrivals are the dependent variable) (e.g. Durbarry, 2000; Eilat and Einav, 2004; Gil-Pareja et al, 2007a, b; Zhang

[1] E.g., see Gould (1994) and Head and Reis (1998); and more recently Peri and Requena-Silvente (2010).

and Jensen, 2007; Santana-Gallego *et al*, 2010). The gravity specifications usually adopted relate bilateral international tourist flows to countries' economic size (GDP and population), and to their own geographical distance. As pointed out by Eilat and Einav (2004), this application of gravity equations to tourist flows lacks clear theoretical foundations, compared to bilateral commodity trade, since a-priori there is no reason to believe that a country should attract and export tourists in proportion to its total GDP.[2] In order to improve the fit of the data, gravity models can be enhanced by incorporating other controls such as area, common border or common language and, recently, transport infrastructure (Khadaroo and Seetanah, 2008).

Explanations on how tourism may affect the nature and the size of commodity transactions are quite intuitive. First of all, tourism facilities and services are likely to involve the import of specific goods which are needed in order to satisfy visitors' needs.[3] In addition, according to the so-called "opportunity hypothesis" by Kulendran and Wilson (2000), international travellers - even though for merely holiday reasons - may identify business opportunities which could originate the establishment of import/exports businesses once they come back to their own country.

Switching to the effect on exports, the direct contact between tourists and local products could first of all represent a way to promote the domestic supply of particular goods in the international markets at lower costs than simply activating international marketing activities. In fact, a visit across borders can facilitate better consumer knowledge and getting acquainted with goods produced in another country. In the same way, tourism may change consumers' attitudes about foreign cultures, inducing new demand for foreign products. In this respect, the commuting of people across borders is expected to attenuate the effect

[2] This consideration of course applies to the country's GDP, and not to per capita GDP, which on the contrary is a strong predictor of outbound tourism. Another GDP-related variable which could affect tourism is the difference between countries' GDP, if we think that tourist from rich countries are more likely to visit places with similar endowments of facilities (e.g. see, Eugenio-Martin, Morales and Sinclair, 2008).

[3] For example, development of hotels and other tourism infrastructure often needs the expansion of import trade with overseas states. But also for this issue, i.e. the relationship between tourism expansion and imports of capital goods, there is a general lack of empirical evidence.

of borders on the movements of goods. Finally, as suggested by Marrocu and Paci (2011), tourist flows may represent an important (and cheap) information source on international market tastes, which can help local firms to improve the quality of their own products, or produce new goods targeted for international tastes "revealed" by tourists' consumption on holiday.

In principle, all such channels could activate international demand once tourists come back to their own countries.[4] Hence, tourism should nicely nest within international trade theory, and the economic intuition suggests considering tourism as a factor which is likely to reduce variable and fixed (and hidden) costs of trade, fostering international trade in a form compatible with the predictions of more recent theories with gravity models (e.g. Chaney, 2008). Moreover, given the nature of the economic channels described in the previous paragraph, we expect tourism to have an impact mainly on consumption goods, *vis à vis* capital and intermediate commodities.

In this paper the focus is on the effects of tourism on the flows of international trade. As the importance of exports is usually recognized for most countries in view of economic development, and given the difficulties related to accessing international markets, especially for smaller economies, we aim to assess whether tourism flows can have the indirect effect of promoting more trade. In particular, we evaluate whether tourism, as proxied by arrivals, can foster exports, precisely if arrivals to country *i* (from country *j*) stimulate exports from *i* to *j*.[5] For this purpose, we merge the information from international trade and

[4] In theory, both the intensive and extensive margins of trade are involved in the processes described. While the selling of products in the host country ('at home') is likely to involve also firms which do not operate in the international markets (extensive margin), usually the vast majority, the increase in traditional exports is more likely to be satisfied by firms which already place their products outside the domestic market. But in theory whether the effect is on trade volumes already in place or on the creation of new ones depends on whether the exchange of information promoted by a travel implies a reduction on the fixed costs of participating to trade (increase of the extensive margin) or a reduction of trade costs (increase of the intensive one).

[5] Focusing on a single good, Fisher and Alana (2009) test this kind of conjecture checking whether arrivals in Spain from Germany are a stimulus for exports of Spanish wines (to Germany).

international tourist arrivals datasets and link arrivals in a country from a specific origin to the exports by the hosting economy directed to the country of origin which generated the tourist flow.

A recent paper in line with our research approach is Quinn (2009), who finds a positive role of tourist visits on US aggregate exports using a panel made up of 19 countries. However, we think that most useful information can be obtained when going into the detail of exports. For example, on the basis of the considerations made above, we expect a differential impact of tourism on the export of consumption goods (for which the arguments on tourists' experience of foreign goods and their feedback on firms located in the destination may apply) *vis à vis* goods which are not for final consumption. We also expect that tourists come into contact with some goods (like food products, beverages and all manufactures with a local variety) much more easily than with others. For that reason, we consider an extended database which combines bilateral tourist arrivals between 25 European Union countries with corresponding export data disaggregated for production stage (primary, capital, intermediate and consumption) and for product category (ISIC rev2 3-digit industry level).

With this data set, we control for the different aspects of the country-pair relationship which are involved in the two-way exchange. With respect to aggregate analysis, where the focus is on the overall causal relationship between tourism, economic growth and exports, the panel approach here proposed has the advantage to investigate on this linkage through the mainstream framework (gravity) used in the trade literature. Several explanatory variables generally used in the international trade literature are considered in order to assess the existence of a robust effect of tourism bilateral flows on the nature and size of trade flows. Our answer is generally positive. The practical implications of such results are that promoting international tourism could have much more "indirect" important effects on the economy than usually conceived. In

particular, tourism activities may represent not only a way to realize exports "at home", but also a way to ease usual exports "at destination".[6]

The paper is organised as follows. In the next section we describe the dataset on which we base our analysis, whilst Section 3 discusses our empirical methodology. Section 4 presents our main econometric results and Section 5 concludes.

2. The data

Our analysis is carried out on a dataset of bilateral trade and tourists' flows among countries. In spite of the recurrent association of tourism receipts with exports, existing international data sources do not reflect this equivalence. For example, according to the World Bank, trade of goods and services represent the value of all goods and other market services provided to the world in the definition of total exports". We have, therefore, created a new dataset by merging two separate publicly available data sources.

Data on international tourist arrivals flows disaggregated at the country-of-origin level have been taken by the Yearbook of Tourism Statistics and the Tourism Factbook, released each year by the World Tourism Organization's (UNWTO). These publications represents the best source of detailed information on the number of arrivals, length of holidays and tourists' country of origin. Bilateral tourist flows have been built by matching for each couple of countries the information on total arrivals of non-resident visitors in all kind of accommodations by nationality, in most cases where this information was available. In the remaining cases, the dataset has been filled-up by considering the overall international arrivals at national borders and by country of origin.

As for trade data, our dataset contains information on bilateral exports in values, volumes and in the number of goods traded for 25 Countries in Europe[7] by isic_rev2 sector and by product type (or stage

[6] A major difference between selling to foreigners 'at home' and traditional exports (selling in the international markets) is the absence of those trade impediments (both variable and fixed costs) which explain why some firms do not engage in any activity in the international markets (Helpman, Melitz and Rubinstein, 2008; Melitz, 2003).

[7] The countries considered are the following: Austria, Belgium-Luxembourg, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France,

of production). The data used have been recovered from the latest release of the BACI database.[8] For the purposes of our investigation on the effects of bilateral tourism flows, the information on bilateral country trade can be disaggregated into 28 industrial sectors (ISIC rev2 3-digit industry level, see the table in the Appendix), and grouped by transformation levels based on the "Broad Economic Categories" of the UN (primary, capital, intermediate and consumption). On the basis of the various effects of tourism on exports described in the Introduction, we focus our attention on two broad categories: trade of "consumption goods" where the exports should be primarily affected by tourism flows; "other goods", for which the effect of tourism should be not relevant or at least lower.[9]

As for the geographical areas to be considered, we have focused our attention on a relatively homogeneous group, i.e. the EU27 countries with the exception of Sweden and Malta, for which the data on tourist flows are incomplete. The available years for tourist data flows are 1998-2009, whilst data for production and bilateral trade are available over the period 1980-2009. Thus, given this partial mismatch, the analysis here presented will investigate on the relation tourism-trade flows using data on the 12 years between 1998 and 2009.

Finally, we have taken the data for some control variables such as GDP and population from the World Development Indicators (2011 edition).

Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and United Kingdom.

[8] BACI (*Base pour l'Analyse du Commerce International*) is built using as a primary source the COMTRADE dataset provided by the United Nations Statistical Department. With respect to the latter database, BACI provides a better coverage and control of trade data.

[9] Some effect on whole categories of goods cannot be ruled out since business travel of importers constitute a share of international statistics on inbound tourism arrivals recorded, and other business travels could be finalized at starting new import activities (the Marco Polo hypothesis, according to Kulendran and Wilson, 2000). In any case, these kinds of effect should apply to all kinds of goods so that, on the whole, exports of consumption goods should be more responsive to tourism flows.

3. Empirical strategy

In order to estimate the effect of tourism flows (arrivals from country *j* to country *i*) on the exports of country *i* we use the so-called gravity equation model, which is one of the most successful empirical models for the analysis of trade volumes. The success of the gravity equation stems from the ability to explain some simple trade patterns, namely: a) bilateral trade rises with the size of either trading partner; b) countries further apart trade less; c) borders appear to impede trade a lot.

Though it has been criticized for a longtime for its supposed poor theoretical foundations, the gravity model has gained solid microfoundations for many years, since the seminal contribution by Anderson (1979). In time, further theoretical refinements have been developed in its support (e.g., Bergstrand 1985, 1989; Deardorff 1995; Eaton and Kortum 2001). An important issue is that any country-pair has elements of heterogeneity which have to be taken into account. Furthermore, heterogeneity at the country level is related to each exporter country (*i*) and each destination (*j*) in the world markets, i.e. the position of the single pair has to be controlled with respect to all possible alternatives. This issue has been clarified by Anderson and Wincoop (2003): bilateral trade flows depend on the destination and origin price levels which are related to the existence of trade barriers ("multilateral resistance") with respect to all the possible trade partner alternatives. Empirically, the refinements of the first basic gravity equation (which only included measures for size and distance) have aimed to detect which factors affect trade costs and which variables can be used as proxies for them.[10] In line with that, our specification of the gravity equation is augmented with a variable (tourism flows) which is thought to "facilitate" the establishment of easier trade relationships between countries, being a potential channel of transmission of information on foreign products.

[10] Distance is the first factor to be considered, given that geography is a clear contribution to the costly movements of goods across economies. Related to geography is adjacency, and more generally any measure related to the position of an economy in space (landlocked countries or islands have been normally identified as different). Other variables which can capture the costly aspects of trade are cultural and institutional indicators, such as a common language and colonial links. A final group of controls for membership to any free trade agreement (such as EU, CEFTA, and FTA).

As an alternative to a complete specification of multilateral trade resistance determinants, panel specification controls become the most viable solution to correctly specify the gravity equation.[11] The most common specifications look like one of the following log-linear models:

$$\ln X_{ijt} = \alpha + \beta_1 \ln SIZE_{it} + \beta_2 \ln SIZE_{jt} + \beta_3 \ln TradeCosts_{ij} + \varphi_i + \gamma_j + \theta_t + \varepsilon_{ijt} \quad (1a)$$

$$\ln X_{ijt} = \alpha + \beta_1 \ln SIZE_{it} + \beta_2 \ln SIZE_{jt} + \gamma_{ij} + \theta_t + \varepsilon_{ijt}, \quad (1b)$$

where countries' flows of exports (from *i* to *j* at time *t*) are a function of economic size of the two economies (bigger countries tend to trade more) and depend negatively on trade costs (first of all captured by the distance between *i* and *j*). All continuous variables in equation (1) are usually expressed in logarithms. In both specifications θ_t is a set of time dummies.

The two specifications differ for the set of fixed effects (FEs) introduced. The first specification (e.g., see Matyas, 1997) includes three separate controls for exporter, importer and time effects, still allowing for the identification of the effects of distance. The second includes a country-pair (i.e the specific exporter-importer flow). In this case, coefficients of bilateral variables are estimated on the time dimension of the panel, whilst the coefficient for distance cannot be estimated (and the same applies to other time-invariant variables such as common border, common language). Wherever there is not a specific interest to obtain an estimate for the coefficient of distance, such specification has to be preferred, since it gets rid of all those fixed factors (observable and unobservable) which can characterise the pair with respect to all the possible alternatives, while making it possible to correctly identify the effects of time-variant variables. This also applies to our exercise in this paper, aimed at detecting whether there is a relationship between commuting flows of tourists (from *j* to *i*) and the exchanges of goods in the complementary direction (from *i* to *j*), i.e. whether and how tourism can affect exports.

[11] This represents an easy alternative which still provides consistent and efficient estimates as an alternative to the recursive trade system for gravity equations proposed by Anderson and Wincoop (2003) in order to estimate price terms at the country level.

Hence, considering the model (1b) with fixed effects for the country-pair and arrivals to country *i* from country *j,* our empirical model takes the form:

$$\ln X_{ijt} = \alpha + \beta_1 \ln SIZE_{it} + \beta_2 \ln SIZE_{jt} + \beta_3 \ln ARRIVALS_{jit} + \gamma_{ij} + \theta_t + \varepsilon_{ijt} \quad (2)$$

The key parameter in our regression analysis is the coefficient of the ARRIVALS variable, which measures the size of the effect from movements of goods to movements of people. Namely, a positive coefficient β_3 would suggest that tourist arrivals in country *i* from a specific origin contribute to explain exports of *i* by destination.

Although fixed effects allow us to control for the pair, estimates from the previous equation are potentially exposed to additional sources of heterogeneity which may hamper the robustness of our analysis of the effects of bilateral tourism flows on the trade of consumption goods. First, we need to consider how different the single countries are in terms of their propensity to trade, i.e. as a single exporting (*i*) or importing economy (*j*).[12] In view of that, we introduce a robustness control for this source of heterogeneity by means of two measures of "trade propensity" for each exporter and importer country: a) total world exports for country *i* receiving tourist inflows and total world imports for country *j* emitting tourism outflows*;* b) the simple number of world export destinations for country *i.* Symmetrically, we consider total imports from the rest of the world and the number of import origins for *j.*[13]

Second, we need to control for a few important milestones which marked the integration process of European countries in the 1998-2009 period. The most relevant one was the adoption of a common currency, the euro, which has been shown to have a positive effect on bilateral trade, though small (Frankel, 2010). Another important institutional arrangement has been the joining of the Schengen area by most of Eastern Europe countries. This is likely to be correlated to bilateral tourism flows entailing a visa-free travel regime among member states.

[12] It is well known for example that, *ceteris paribus*, smaller economies tend to trade more.

[13] More precisely, in order to eliminate any possible correlation with our dependent variable, we have subtracted the actual trade flow *i-j* from world totals.

Finally, the different timing in entering the European Union could also have affected bilateral trade and tourism flows. In order to control for these institutional changes, we therefore introduce three dummy variables which take value 1 where a country pair in a given year belongs to the Euro, Schengen and EU area, respectively.

The resulting expression for carrying out these robustness controls in the study of the relationship between tourism flows and the trade of consumption goods is the following:

$$\ln X_{ijt} = \alpha + \beta_1 \ln SIZE_{it} + \beta_2 \ln SIZE_{jt} + \beta_3 \ln ARRIVALS_{jit} + \beta_4 \ln TOTEXP_{it} + \beta_5 \ln TOTIMP_{jt} + \\ + \beta_6 \ln NDEST_{it} + \beta_7 \ln NORIG_{jt} + \beta_8 \ln NORIG_{jt} + \beta_9 EURO_{ijt} + \beta_{10} SCHENGEN_{ijt} + \beta_{11} EU_{ijt} + \gamma_{ij} + \theta_t + \varepsilon_{ijt}.$$

(3)

An unaddressed issue when estimating equation (3) is the possible presence of endogeneity due to the correlation between the arrivals variable and the error term ε_{ijt}, which could arise because of simultaneity or even reverse causation between trade and tourism as well as the presence of possible unobservable factors affecting both bilateral tourism and trade.[14] Due to the resulting correlation between the explanatory variable and the error term, one may expect that a significant coefficient for arrivals could actually be determined by common unobservable components affecting the explanatory (arrivals) and the dependent variable (trade). Examples of that may include a reduction of juridical barriers to movement of commodities and people not adequately controlled for in the available dataset. However, in our analysis, the possibility to disaggregate trade flows between consumption (or final) and other (on final) goods turns out to be particularly useful. In fact, the information-based argument for tourism improving exports suggests a <u>different</u> impact of people's flows on the export of those goods with which tourists are more likely to gain first-hand knowledge when travelling (consumption goods vs. other goods). It turns out that, if this conjecture holds, *ceteris paribus* we get two simple testable implications which can confirm the presence of a genuine effect of bilateral tourism on the trade of consumption goods: i. in the presence

[14] In formal terms, the error term in the previous equation could be split as $\varepsilon_{ijt} = u_{ijt} + v_{ijt}$, where u_{ijt} is a latent factor affecting both bilateral tourism and trade and v_{ijt} the "true" idiosyncratic error.

of a positive (negative) effect from tourism on trade, the coefficient β_3 should be higher when estimating eq.(3) for exports of consumption goods (X_{ijt}^{C}) than when considering the other goods (X_{ijt}^{OG}); ii. alternatively, a significant and positive effect should arise when adding an interaction between arrivals and the category of consumption goods into an estimation of eq. (3) on the bulk of traded goods. In this second case, a testable econometric model would be:

$$\begin{aligned}\ln X_{ijrt} = {} & \alpha + dC + \beta_1 \ln SIZE_{it} + \beta_2 \ln SIZE_{jt} + \beta_3 \ln ARR_{jit} + \beta_4 \ln TOTEXP_{it} + \\ & + \beta_5 \ln TOTIMP_{jt} + \beta_6 \ln NDEST_{it} + \beta_7 \ln NORIG_{jt} + \beta_8 \ln NORIG_{jt} + \beta_9 EURO_{ijt} + \\ & + \beta_{10} SCHENGEN_{ijt} + \beta_{11} EU_{ijt} + \beta_{12}\left(dC * \ln ARR_{jit}\right) + \gamma_{ij} + \varepsilon_{ijrt}\end{aligned}, \quad (4)$$

where β_{12} will measure the differential effect of arrivals on export flows depending on the kind of product traded and the dummy dC controls for a possible different intercept for exports of different types.

4. Results

We start presenting the results from the estimation of the gravity equations (2) and (3). The dependent variable is the natural logarithm of the value of exports (in millions of US dollars at current prices) of consumption goods -i.e. final goods- from country *i* to country *j*. Eq. 2 and 3 have been estimated considering the natural logarithm of total GDP at constant 2005 values expressed in USD at PPP (lnGDP) as a measure for the economic size of the two economies, and fixed effects for the country-pair (*i,j*) in order to control for the specificity of pairs' links.

The results for the estimation of eq. (2) are reported in Column (1) of Table 1. The coefficient of our variable of interest (the log of arrivals to *i* from country *j*) is strongly significant[15] and indicates an elasticity of exports flows with respect to arrivals in the exporting countries of about 0.05. In other words, doubling tourism arrivals in country *i* from country *j* would increase total exports of *i* on *j* of about 5%.[16]

[15] Robust standard errors are computed according to the Stock and Watson (2008) correction suggested for fixed effect panel data models.

[16] In a previous draft of this study, in which the latest available year was 2004, we could detect a greater effect (up to 9%). Hence, regressions carried out with the present dataset detect a reduction of the size of the effect in the most recent

This result is robust to different specifications. In Column (2), we report the estimates of a model which considers, as a further control for heterogeneity of both partners in the country pair, total export capacity (for country *i*) and import propensity (for country *j*), as well as the simple number of trade relationships of each country. We can see that the absolute value of the effect by total arrivals is essentially unaffected. A further robustness control is made in Column (3), where countries' size is represented both by total GDP and total population. The latter variables display a negative sign,[17] and do not entail any significant change in the estimation of the relationship between tourism flows and export of consumption goods.[18] The same applies to the estimates reported in the Column (4) of Table 1, where we have inserted the dummies for the adoption of the Euro as a single currency, membership of the Schengen area and European Union. Incidentally, only the last indicator displays a statistically significant effect on the export of consumption goods.[19]

In the last two columns of Table 1 we aimed to ascertain whether and to what extent the positive relationship between bilateral tourism and trade of final goods can be considered a long lasting effect, or

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years. By contrast, the statistical significance of the regression results is usually reinforced, presumably thanks to the larger sample size. Only in the next years it will become possible to study whether this recent reduction is mainly due to the effects of the world crisis which has started in 2008, or to a genuine vanishing of the relationship over time.

[17] The most intuitive effect for the population variable is a positive one, but its role in the gravity setting is sometimes considered to be ambiguous (e.g. Bergstrand, 1989), and studies which present estimation results with negative population coefficients are not uncommon (e.g. see Harris, Mátyás, and Tombazos, 2008 and the papers cited therein). In our case we found a negative coefficient even when considering population alone instead of income. The coefficient for arrivals was robust also to this specification.

[18] Note that we also control for population effects by considering the log of income per capita, instead of having two separate regressors for income and population. The coefficient of the arrivals variable is robust also to this specification.

[19] As a further control, we checked whether results change when "lagged" tourist arrivals are considered. In fact, arrivals are also linked to the exporting activity because they also account for business trips, and the "stimulus effect of tourism on trade can take place after some time. Results are basically unaffected, and therefore are not here presented.

whether it is mostly driven by the market liberalization and integration process which, in the Eastern European countries, anticipated their joining the EU in 2004 and 2007. This could have determined a large expansion of both tourism and trade, but without any direct relationship between them.[20] We have, therefore, split our dataset and run two separate regressions: a first one restricted to country pairs belonging to the 'old' European Union made up of 15 members (Column 5); and a second one for the trade exchanges between and with the 'new' member states (Column 6). As can be seen, the significant positive relationship between tourism arrivals and export of consumption goods is not limited to the 'new' Europe but characterizes both groups, though with a significant difference (0.03 vs. 0.05) between them. Let's incidentally note that, within the EU15 group, a positive effect of the adoption of the euro as a single currency is now detected, although significant only at the 0.1 level.

[20] We thank an anonymous referee for having stressed this point.

Table 1. Export of consumption goods and international tourist arrivals: fixed Effects estimation; 1998-2009.

Dependent variable: *log of bilateral exports of consumption goods*						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
lnARRIVALS	0.0498***	0.0472***	0.0475***	0.0464***	0.0296***	0.0536***
	(0.0092)	(0090)	(0.0089)	(0.0089)	(0.1114)	(0.0121)
$lnGDP_i$	2.1750***	1.4015***	1.0698***	1.3013***	0.7906**	1.2893***
	(0.1731)	(0.2159)	(0.2249)	(0.2121)	(0.3539)	(0.2542)
$lnGDP_j$	2.0170***	1.3868***	1.6348***	1.2920***	1.0637***	1.1870***
	(0.1751)	(0.2296)	(0.2699)	(0.2204)	(0.2948)	(0.2685)
$lnPOP_i$			-1.0613			
			(0.6711)			
$lnPOP_j$			-1.4623**			
			(0.6880)			
$lnTOTEXP_i$		0.4454***	0.4535***	0.4300***	0.2889	0.3626***
		(0.0909)	(0.0945)	(0.0015)	(0.2013)	(0.1080)
$lnTOTIMP_j$		0.4100***	0.2114	0.3842***	0.1117	0.3963**
		(0.1384)	(0.1653)	(0.1447)	(0.2979)	(0.1643)
$NDEST_i$		0.0018	0.0037	0.0015	0.0067	0.0016
		(0.0031)	(0.0034)	(0.0031)	(0.0052)	(0.0036)
$NORIG_j$		-0.0026	-0.0035**	-0.0026	-0.0113*	-0.0015
		(0.0016)	(0.0017)	(0.0016)	(0.0067)	(0.0015)
$EURO_{ij}$				-0.0021	0.0785*	-0.0174
				(0.0399)	(0.0436)	(0.0805)
$SCHENGEN_{ij}$				0.0582	-0.0001	0.0683
				(0.0393)	(0.0639)	(0.0603)
EU_{ij}				0.0969**		
				(0.0492)		
CONSTANT	-98.07***	-76.36***	-30.25	-70.54***	-43.34**	-66.42***
	(9.02)	(9.27)	(23.50)	(9.62)	(20.69)	(11.66)
YEAR DUMMIES	✓	✓	✓	✓	✓	✓
Observations	5109	5109	5109	5109	1573	3536
R-squared	0.706	0.731	0.644	0.734	0.738	0.594
Number of country pairs	276	276	276	276	78	198

Notes: LnARRIVALS is the log of tourist arrivals in country *i* from country *j*; LnPOP*i* is is the log of total population of country *i;* LnPOP*j* is is the log of total population of country *j*; LnGDP*i* is the log of total GDP of country *i*; LnGDP*j* is the log of total GDP of country *j*; LnTOTEXP*i* is the log of total exports of country *i* to the rest of the world; LnTOTIMP*j* is the log of total imports of country j from the rest of the world; NDESTi and NORIGj are the number of export countries for i and the number of import countries for *j*; EURO, SCHENGEN AND EU are dummy variables taking value 1 when both countries belong respectively to the EURO, SCHENGEN AND EU area; robust Stock-Watson standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

We now evaluate whether the effect detected for tourism arrivals varies when considering different types of products. Table 2 shows the results of our estimates when considering the "other goods" aggregate. The first column in the Table provides a separate estimate (sample split) for "other goods" by using the same specification adopted for consumption good in column (4) of Table 1. Considering the aggregate of non final goods, bilateral tourist arrivals do not have any statistically significant effect on bilateral trade (the estimated coefficient is also small and negative). Besides, this result still holds when separately considering trade exchanges internal to EU15 member states (Column 3), and those involving the countries which entered the EU in 2004 and 2007 (Column 5). It is evident that the results we found for the trade exchange of consumption goods are not driven by some unobservable factors common to trade and tourism: international arrivals influence differently exports according to the stage of production or level of transformation, with a significant positive effect for consumption goods and a negligible insignificant effect in the other case. In other words, there exists a robust differential positive effect of tourism on consumption goods exports.

The distinctiveness of the effect on consumption goods is confirmed in Columns 2, 4 and 6 of Table 2, where we have reported the estimates carried out on the entire sample of trade exchanges in which the relationship between tourism and the export of consumption goods is captured by the coefficient associated with the interaction variable in equation (4). In this case, the estimated coefficient of tourist arrivals is statistically insignificant or even negative (for the exports within the EU15 area). Also the dummy for consumption goods captures a negative effect on the intercept term. By contrast, as expected, the coefficient of the interaction term is positive and strongly significant. The results therefore show again that the relationship between tourism and exports does not apply to the whole bilateral trade exchanges.

Table 2. Export of non final goods, total export and international tourist arrivals: fixed effect estimation; 1998-2009.

Dependent variable: *log of bilateral exports of non final goods*						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
lnARRIVALS	-0.0093	-0.0117	-0.0060	-0.0261*	-0.0132	-0.0070
	(0.0064)	(0.0080)	(0.0077)	(0.0156)	(0.0088)	(0.0112)
$lnGDP_i$	0.0597	0.6805***	0.1270	0.4572*	0.0975	0.6934***
	(0.1747)	(0.1472)	(0.2259)	(0.2611)	(0.2306)	(0.1834)
$lnGDP_j$	0.2048	0.7484***	0.5084**	0.7861***	0.1226	0.6548***
	(0.1963)	(0.1569)	(0.2046)	(0.2156)	(0.2551)	(0.1959)
$lnTOTEXP_i$	1.0592***	0.7446***	1.0577***	0.6733***	1.0056***	0.6841***
	(0.0805)	(0.0585)	(0.1214)	(0.1165)	(0.1079)	(0.0700)
$lnTOTIMP_j$	0.8689***	0.6265***	0.5969***	0.3543*	0.9220***	0.6592***
	(0.1220)	(0.0968)	(0.2167)	(0.2079)	(0.1518)	(0.1090)
$NDEST_i$	0.0001	0.0008	-0.0025	0.0017	-0.0002	0.0007
	(0.0016)	(0.0018)	(0.0039)	(0.0031)	(0.0020)	(0.0022)
$NORIG_j$	-0.0016	-0.0021	-0.0001	-0.0058	-0.0019*	-0.0017*
	(0.0011)	(0.0010)	(0.0031)	(0.0035)	(0.0011)	(0.0010)
$EURO_{ij}$	0.0459	0.0219	0.0155	0.0470*	0.1056	0.0441
	(0.0367)	(0.0295)	(0.0311)	(0.0284)	(0.0792)	(0.0624)
$SCHENGEN_{ij}$	-0.1445***	-0.0432	-0.0353	-0.0176	-0.1891***	-0.0604
	(0.0332)	(0.0279)	(0.0320)	(0. 0377)	(0.0534)	(0.0441)
EU_{ij}	0.0967**	0.0968***				
	(0.0426)	(0.0339)				
LnARRIVALS*dC		0.0605***		0.0758**		0.0543***
		(0.0132)		(0.0310)		(0.0186)
dC		-1.5358***		-1.7264***		-1.4714***
		(0.1595)		(0.4328)		(0.2048)
Constant	-27.82***	-48.41***	-32.26**	-36.94	-26.55**	-45.75***
	(8.10)	(6.95)	(14.01)	(15.79)	(10.44)	(8.56)
YEAR DUMMIES	✓	✓	✓	✓	✓	✓
Observations	5109	10218	1573	3146	3536	7072
R-squared	0.774	0.761	0.857	0.803	0.640	0.635
Number of id_pairs	276	276	78	78	198	198

Notes:
LnARRIVALS is the log of tourist arrivals in country *i* from country *j*; LnPOP*i* is is the log of total population of country *i;* LnPOP*j* is is the log of total population of country *j*; LnGDP*i* is the log of total GDP of country *i*; LnGDP*j* is the log of total GDP of country *j*; LnTOTEXP*i* is the log of total exports of country *i* to the rest of the world; LnTOTIMP*j* is the log of total imports of country j from the rest of the world; NDESTi and NORIGj are the number of export countries for i and the number of import countries for *j*; EURO, SCHENGEN AND EU are dummy variables taking value 1 when both countries belong respectively to the EURO, SCHENGEN AND EU area; dC is a dummy variable taking value 1 for the trade of consumption goods; robust Stock-Watson standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

As a third step of our analysis, we have applied the empirical model given by eq. (3) to a set of specific sectors which compose the aggregate "consumption goods" category, thus checking for differential effects of tourist flows depending on the type of manufacturing production. In fact, within each sector, flows can be distinguished by type of products according to the different level of transformation, so that we can focus on consumption goods. We therefore estimate a gravity equation augmented with a further cross-section dimension which indicates sectors defined according the isic_rev2 categories.[21] Results and the sectors considered are presented in Table 3, where only the coefficient for the lnARRIVALS variable, which can be directly interpreted as an elasticity, has been included.

As can be seen, the positive relationship between international tourist arrivals and exports applies to most kinds of manufacturing: whether light manufacture, such as textiles, clothing, leather manufacture and footwear (sectors 321, 322, 323 and 324), with elasticities respectively equal to 4.8%, 6.1%, 3.3% and 3.7%; or heavy manufacture, such as machinery, metal and rubber products, chemical products and transport equipment, with elasticities ranging between 2.3 and 6.0%. The remaining sectors mainly display positive signs, although sometimes not statistically significant, and any significant negative effect from tourism to exports has been detected, except for the residual category.[22]

[21] Moreover, in each sector-level regression we have considered, as measure of "trade propensity" for exporter (importer) countries, total world exports (imports) and the number of world exports (imports) of each specific sector.

[22] For some goods characterized by low unitary weight and volume, the activation of bilateral tourism flows could actually reduce trade of consumption goods, since tourists can buy goods in the destination and then carry them on board when coming back-home. The negative sign of tobacco could actually accord with this idea.

Table 3. Sectoral elasticities of arrivals on exports of consumption goods

Isic rev2	Description of the sector	Elasticity to arrivals	Standard error
111	Agriculture and livestock production	0.0064	(0.0144)
112	Agricultural services	0.0679*	(0.0410)
121	Forestry	0.0219	(0.0438)
122	Logging	0.0089	(0.0261)
130	Fishing	-0.0202	(0.0197)
311	Food manufacturing	0.0071	(0.0107)
313	Beverage industries	0.0107	(0.0159)
314	Tobacco manufacture	-0.0363	(0.0291)
321	Manufacture of Textiles	0.0479***	(0.0132)
322	Manufacture of wearing apparel, except footwear	0.0605***	(0.0148)
323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel	0.0335**	(0.0152)
324	Manufacture of footwear, except vulcanized or moulded rubber or plastic footwear	0.0372**	(0.0157)
331	Manufacture of wood and wood and cork products, except furniture	-0.0297	(0.0240)
332	Manufacture of furniture and fixtures, except primarily of metal	0.0042	(0.0157)
341	Manufacture of paper and paper products	0.0009	(0.0174)
342	Printing, publishing and allied industries	0.0122	(0.0122)
352	Manufacture of other chemical products	0.0299**	(0.0152)
355	Manufacture of rubber products	0.0232*	(0.0130)
356	Manufacture of plastic products not elsewhere classified	0.0179	(0.0105)
361	Manufacture of pottery, china and earthenware	0.0212	(0.0164)
381	Manufacture of fabricated metal products, except machinery and equipment	0.0286**	(0.0120)
382	Manufacture of machinery except electrical	0.0358**	(0.0178)
383	Manufacture of electrical machinery apparatus, appliances and supplies	0.0308**	(0.0123)
384	Manufacture of transport equipment	0.0600***	(0.0161)
385	Manufacture of professional and scientific and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods	0.0190	(0.0143)
390	Other manufacturing industries	0.0205*	(0.0111)
	Other- not classified	-0.0534**	(0.0235)

Notes: Robust Stock-Watson standard errors; *** p<0.01, ** p<0.05, * p<0.1.

Future research is probably needed in order to understand the apparent dichotomy between manufacture, where most coefficients are positive and significant, and some primary sectors (see fishery, agriculture production, forestry), where the relationship is not significant.

5. Discussion and conclusions

This paper has aimed to cast light on the economic implications of bilateral tourism flows on trade. Unlike previous studies, we have adopted a disaggregated approach where country-by-country trade exchanges have been considered.

Our results generally support the view that tourism matters for international trade. In most specifications, the international arrivals variable was statistically significant, and the sign of the estimated coefficient were in line with our theoretical expectations. Foreign arrivals to a country are associated with a specific increase of exports towards the country of origin of the foreign flows. Two possible explanations can be behind our results: tourist arrivals are a way for domestic producers to introduce their products to foreign costumers, or, to put it differently, tourist commuting reveals tastes of foreign demand. Furthermore, arrivals include also business trips which are explicitly devoted to creating new commercial relations across countries. Both explanations interpret movements of people across borders as a way of nurturing the flows of information necessary for increasing sales in foreign markets. Is tourism is a channel for export creation, or is trade affecting tourism? In line with some previous studies (e.g. Shan and Wilson, 2001), we think that the first link is clearer in its interpretation and more interesting from a policy perspective. Our disaggregated approach has been able to provide conclusions that are more clear-cut than those obtained so far by considering aggregate exports and total tourist flows: a relationship between inbound tourism flows and exports exists, it is positive and is a peculiarity of consumption goods.

The practical implications of such results are that promoting international tourism could have much more "indirect" important effects on the economy than usually conceived. Namely, tourism activities represent not only a way to realize exports "at home", but also a way to ease usual exports "at destination", which often represent a cumbersome obstacle for more peripheral regions in Europe. Of course, this is a

second order effect, so that the empirical evidence found in this study should not be intended in the sense of saying that tourism promotion would represent a primary way to develop countries' export capacity, or an alternative to market liberalisation policies

Many additional research questions deserve future analysis. If also the commuting of people across borders could attenuate the effect of borders on the movements of goods, the "microeconomics" of this phenomenon of cost of trade reduction is not well investigated. We know from the most recent literature (e.g. Cheneay, 2008) that, at the firm level, reductions in costs not only cause an increase in the size of exports of each exporter, but also allows some new firms to engage in international trade (the so called extensive margin). It would certainly be important to assess the relative role of the two margins in the case of tourism-related productions.

Another interesting research question is whether there are more sophisticated ways to control for the possible two way relationship. Considering the fact that the incidence of consumption goods should vary at a sector level, with appropriate data we believe that there is a potential for constructing a rigorous identification strategy, building on the Rajan and Zingales (1998) approach.

It would be finally important to assess the robustness of our result on the exports of consumption goods by studying the effects on imports, given that the latter issue has been often reported in the literature as one of the main risks of tourism specialization, i.e. much of tourism international revenues are often devoted to purchase those capital and consumption products which are needed in order to fulfil tourists' expectations.

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