# Euro's effect on intra-European Union tourism flows: Tourism creation, tourism diversion and tourism potentials.

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**Abstract**

This paper investigates the impact of the Economic and Monetary Union (EMU) on international tourism flows across a set of thirty-seven developed countries. To do this, an augmented gravity model is estimated using a sample of 31 European countries plus 6 non European-OECD countries over the period 1995-2012. Results suggest a large impact of the euro on intra-Eurozone tourism of around 45% to 126% when proper estimation method, control group and definition of the Eurozone are used. Moreover, evidence of tourism creation is also found. The greatest impact of the euro on tourism is estimated to have been during the first years of its inception and its effect differs across countries. Moreover, the timing of the euro's effect suggests that the magnitude of its impact on tourism is concentrated in the early stages, mainly with the changeover in 2002. Thereafter, the euro's effect on tourism steadily falls until being not significant in 2009, suggesting that the impact of the euro on tourism is lower during the current economic crisis. Finally, the potential tourism gains for new members and possible entrants of adopting the euro are explored.

**Keywords**

Euro's effect, international tourism, gravity model, tourism potential

## Introduction

Since the inception of the euro, the bulk of the literature has focused on the analysis of its economic impact. Indeed, empirical research in International Economics has adopted the euro's effect as an area of significant interest. In this sense, substantial effort has been put into estimating the impact of the euro on international trade and its role in macroeconomic performance (Frankel, 2010). . Some papers estimate an early effect of the euro. Micco, Stein and Ordoñez (2003) estimate an increase on trade which ranges between 5% and 20%, Faruquee (2004) estimates that the euro has boosted trade among member states by roughly 10%, Flam and Nordstrom (2006) report estimates of 26%, Aristotelous estimates an overall effect of the euro of around 6%, Baldwin (2006) obtained a pro-trade effect of 9% or Bun and Klaassen (2007) report an increase of 3% for the trade's effect of the euro. Recent papers estimates the euro effect considering more years since the common currency was adopted. Camarero et al (2014) estimate a euro effect of 18% while Sadeh (2014) obtained that exports between two participating member states was 92% higher than it would have been without the euro. These different estimated euro's effects depend on the sample size, the countries considered in the analysis, the estimation techniques and the dependent variable used.[1]

Sharing a common currency implies the elimination of exchange rate volatility and transaction costs. Moreover, the introduction of euro coins and notes in 2002 eliminated currency conversion between countries belonging to the Economic and Monetary Union (EMU).

[1] Sadeh (2014) provides an interesting review of previous papers on the euro's impact on trade highlighting their main empirical problems

[2] Webber (2001) found that variance of the exchange rate is a significant determinant of tourism demand holding that a risk averse tourist may decide to cancel, delay or even switch to another tourist destination if there is too much volatility

According to the World Tourism Organization (UN-WTO) (1998), the euro would bring positive impacts or benefits on tourism flows since it affects the economic environment in which firms and consumers move about. Adopting the euro enhances price transparency since it makes easy for tourists to compare prices in the various destinations of the Union, and hence competition is improved.

Sharing a common currency eliminates exchange rate fluctuations, for both travellers and firms, reducing the costs and time spent on currency exchange, causing lower travel-operational costs and mitigating administrative problems and even possible cheating on the currency exchange. Additionally, within the currency union, the exchange rate is no longer a factor of relative price competition, since it is not possible through real exchange rate depreciation to take possible advantages to lower the relative price of tourism products vis-à-vis competitors (Rudež and Bojnec, 2008). The UN-WTO also highlights some macroeconomic benefits of the euro when the economic and political integration causes lower interest rates, and thus less expensive investments in tourism, as well as provides long-run price stability, which both enhance tourism competitiveness. Finally, the birth of a new international reference currency allows stakeholders to denominate international contracts in euros and not only in dollars or yens. EMU countries become more sheltered to exchange rate fluctuations between strong currencies which facilitate the internationalization of tourism enterprises.

To sum up, the adoption of the euro facilitate and promote tourism among Eurozone countries since it eliminates tourism barriers associated to exchange rate volatility and currency conversion costs as well as reduces fixed costs implying an increase on the number of international tourists. Belke and Gros (2001) provide an additional channel for the euro effect on

tourism through the option value of waiting which shrinks when exchange rate volatility disappears.[2] In this respect, a better understanding of the effect of the euro on tourism flows may add another argument to the debate on the benefits of joining the EMU.

According to the UN-WTO data, tourist arrivals to the Eurozone represented 30% of overall world tourist arrivals in 2012, and half of these tourists arrived from other member states. However, in spite of the relevance of exploring the impact of the euro on international tourism flows, the only antecedent in empirical economic literature is the paper by Gil-Pareja et al (2007) that estimate an effect of the euro on intra-Eurozone tourism flows of 6.5% by considering a sample of 21 OECD countries over the period 1995-2002. This moderate effect could be explained by the shortness of the euro period studied (1999-2002), as well as by the fact that the launch of the circulating euro was precisely on 1 January 2002. For their part, Santana-Gallego et al (2010) analyze the role of different exchange rate regimes on tourism including the currency union. However, the application of this result to the specific euro case is hard to accept because they are considering different common currency experiences. This argument is also discussed by Frankel (2010) in the analysis of the discrepancy between the magnitude of the euro effect on trade and the impact of other monetary unions. De Vita (2014) also explores the role of different exchange rate regimes on international tourism flows obtaining that sharing a common currency exerts the strongest positive impact on inbound

[2] Webber (2001) found that variance of the exchange rate is a significant determinant of tourism demand holding that a risk averse tourist may decide to cancel, delay or even switch to another tourist destination if there is too much volatility of the exchange rate at the destination of their initial choice. This idea is in accordance to Belke and Gros (2001), where an increase in the exchange rate volatility may induce tourists to wait to travelling.

tourism. In particular, considering the case of the euro up to 2011, the effect of common currency on tourism is around 30%.

Baldwin (2006) holds that European Union (EU) membership is an extremely complex process that involves thousands of laws, regulations and practices that affect trade (as well as tourism flows) within the EU and third party nations, most of which are unobservable. Therefore, to properly analyse the impact of the euro on international flows, the control group must be limited to the EU countries. [3] Nevertheless, Sadeh (2014) argues that an appropriate control group must include enough countries that did not join the euro area but that would have similarly responded to the launch of the euro had they joined it. The present study analyses tourism flows between the 28-EMU countries plus three non-EMU countries (Switzerland, Norway and Iceland) that participate in the European Free Trade Association (EFTA) which is part of the EU's internal market. Moreover, six non-European OECD countries (Australia, Canada, Japan, New Zealand, Turkey and United States), which are developed economies similar to the Eurozone members, are also included in the control group.[4]

Another relevant aspect studied in this paper is the path of the euro's effect over time. For instance, the relevance of the dates of introduction of the irrevocable exchange rates in 1999 and that of circulation of coins and notes in 2002 can be compared. Since 2002, any calculus is eliminated and the decisions of tourists, as consumers, could have been more affected by the

[3] Baldwin (2006) refers to the EU-28 countries as the cleanest definition of the control group. Flam and Nordstrom (2006) also include Norway and Switzerland in their research.

[4] Sadeh (2014) uses a Propensity Score Matching technique to select the control group by matching each eurozone country with a non- euro member. The control group includes countries that if joining the euro area would on average trade with the same intensity as the actual euro area member states.

introduction of euro coins and notes than by the inception of the irrevocable conversion rates for the euro in 1999. From a psychological point of view, Jonas et al (2002) and Wakker et al (2007) argue in favour of the year 2002, since from that date, consumers were physically confronted with the euro. Ranyard et al (2005) find that consumers' attitudes with respect to the euro focus on the economic and practical aspects of currency change.

Moreover, the influence of the euro on the magnitude of tourism flows takes time to be registered, although its effect could have been felt in advance. In other words, the announcement and the last phases of the Exchange Rate Mechanism prior to the inception of the euro could have influenced tourists' decisions about the destination country of their visits. So, the presence of leads and lags in the euro impact may be tested. What is more, this analysis may shed light on the euro's effect during the current economic crisis. Indeed, characterizing the euro's path of impact on tourism over time would be of particular interest to prospective members of the EMU or for future common currency experiences.

Two more related issues are explored in this research. Firstly, the euro could lead to tourism diversion. Trade diversion is commonly tested when the effect of the euro on international trade is estimated (Frankel and Rose, 2002) but tourism diversion has not been properly studied yet. Following the ideas mentioned by Belke and Spies (2008) for international trade, tourism creation implies that lower cost tourism suppliers inside the currency union substitute higher cost domestic producers as a result of diminished tourism costs. So, domestic tourism is substitute by international tourism to Eurozone countries. Tourism diversion takes place when low cost tourism suppliers outside the currency union are replaced by higher cost Euro Area producers. So, international tourism trips outside the Eurozone are replaced by international

trips to Eurozone countries. Therefore, the adoption of the euro may lead to initializing new international tourism flows as well as to a geographical restructuration of tourism flows by tourism creation and tourism diversion. Secondly, the effect of the euro on tourism is compared among EMU members in order to study whether the positive impact that the euro has on tourism is widespread across members. This analysis would clarify the issue of whether all countries are taking advantage of joining to the EMU in the same way or, on the contrary, results are driven by the experience of just a few of them.

Finally, the "tourism potential" of adopting a common currency is explored. The EMU has experienced an enlargement process after the introduction of the euro in 1999, as well as there being several countries planning to join the Eurozone. However, although potential gains of the enlargement process have been explored in the international trade literature, no paper has calculated the "tourism potential" of adopting the euro.[5] Our paper contributes to filling this gap in the literature by obtaining the potential gains in terms of tourism for several European countries joining the EMU.

To sum up, this research contributes to the empirical economic literature in several ways: (i) the impact of the euro on international tourism is properly estimated by using a sample that includes thirty-seven developed countries; (ii) the ex-post euro effect on tourism is estimated for a longer time period (1995-2012), which involves a reliable period of 11 years of circulating euros and 14 years of irrevocable exchange rates; (iii) the existence of tourism diversion or tourism creation of the EMU is tested; (iv) the path of the impact of the euro over time is

[5] For the analysis of trade potentials, see Baldwin (1994), Papazoglou et al (2006), De Benedictis and Vicarelly (2005),Brouwer et al (2007) or Belke and Spies (2008) among others.

addressed to find out possible leads and lags and its behaviour during the current crisis; (v) the effect of the euro on bilateral tourism for each EMU-11 members is explored and (vi) tourism potential of adopting the euro is calculated for a set of candidates and hypothetical members. As far as we are concerned, this research is the first attempt to explore tourism diversion and the time-path of the euro's effect on tourism, as well as calculating the potential gains for tourism in joining the EMU. Furthermore, this paper address some empirical problems that arise in the few existing papers on this issue by using a longer database and a proper control group and by including both country-year and country-pair fixed effects in the regression.

The paper is organized as follows. The second section describes the econometric specification used in the empirical analysis. The third section presents and discusses the results of the empirical analysis. The fourth section presents a counterfactual exercise to calculate the tourism potential of adopting the euro, and finally some conclusions are drawn in the fifth section.

**Econometric Specification**

The gravity model has been the workhorse for empirical analyses of the effect of the euro on trade flows[6]. Under the assumption of tourism as a particular type of trade, a gravity equation can be used to study the main determinants of tourism volume (See for instance Durbarry, 2000; Eilat and Einav, 2004; Khadaroo and Seetanah, 2008 or Neumayer, 2010). In fact, Kimura and Lee (2006) show that trade in services is better predicted by gravity equations than

[6] Rose (2009) surveys 26 studies and, taking together all these estimates, observes that EMU has increased trade by about 8 to 23 per cent in its first years of existence

trade in goods and Culiuc (2014) finds that the gravity model explains tourism flows better than trade in goods for equivalent specifications. Morley et al (2014) show that gravity models for tourism can be derived from the consumer choice theory providing theoretical underpinnings for the use of this model to explain bilateral tourism.[7]

Anderson and van Wincoop (2003) hold that the volume of trade between any two countries depends not only on their level of bilateral trade resistance but also on how difficult it is for each of them to trade with the rest of the world, i.e. multilateral resistance. Feenstra (2002) proposes the introduction of exporter and importer dummies as a way of controlling multilateral trade resistance (CFE). However, Ruiz and Vilarrubia (2007) points out that, when using panel data to estimate a gravity equation, the omission of time-varying multilateral trade resistance leads to important bias in the results. Thus, time-varying (or country-year) fixed effects, as an extension of the methodology proposed by Feenstra (2002) for cross-sectional data, are considered in this empirical analysis. After controlling for time varying fixed effects (CYFE), what remain to be explained are therefore country-pair characteristics that influence tourism. In this respect, sharing the euro may reduce bilateral resistances to tourism between pairs of countries.

[7] Morley et al (2014) consider that individuals maximize their utility by consuming tourism trips and other goods and services subject to a budget constraint. By summing up all individuals demands, total international trips between two countries can be obtained. Sharing a common currency can be interpreted as part of the bilateral cost of travelling from an origin country to a destination one. Moreover, these authors suggest the existence of zero tourism flows when no individual from a particular origin have a maximum utility involving travelling to a particular destination. To that respect, adopting the euro might reduce not only variable but also fixed cost related to international travel, and hence it help to justify the absence of tourism diversion effect of the euro.

Furthermore, it is necessary to control for the endogeneity bias that arises when countries decide to adopt a common currency because it would increase their tourism flows with other member countries. Flam and Nordstrom (2006) and Baier and Bergstrand (2007) introduce both country-year and country-pair fixed effect to assess the impact of Free Trade Agreements on trade flows. Berger and Nitsch (2005) and Pakko and Wall (2001) also include both sets of fixed effects to explore the effect of currency unions on international trade. As argued by Pakko and Wall (2001), including country-pair fixed-effects avoids estimation bias that can arise because of misspecified or omitted time invariant factors that are correlated with bilateral trade and some right-hand-side variables.

Here, it is important to note that the introduction of time-varying fixed effects makes it impossible to estimate the coefficient on time-variant country characteristics, such as GDP and population in origin and destination countries, while the introduction of country-pair fixed effects dropped from the estimate time invariant country pair characteristics such as distance between countries, common language or common colonial relationship. Thus, our preferred specification only includes time-variant country pair characteristics as followed:

$$LnTou_{ijt} = \beta_0 + \beta_1 EU_{ijt} + \alpha' E_{ijt} + \gamma_{it} + \gamma_{jt} + \gamma_{ij} + u_{ijt} \quad (1)$$

where *Ln* denotes natural logs, *i* and *j* indicate destination and origin countries respectively, *t* is time, and the variables introduced are defined as follows. Firstly, the dependent variable is bilateral tourism flows between country pairs, i.e. $Tou_{ijt}$ is the number of tourist arrivals to country *i* from country *j* in year *t*. The source of annual international arrivals by country of origin

is the UNWTO.[8] Secondly, there are time-variant bilateral factors affecting tourism such as $EU_{ijt}$ *that* is a binary variable which is unity if *i* and *j* are both members of the European Union in year *t*. $EU_{ijt}$ controls for the different enlargement episodes of the European Union.[9] It is also relevant lo take into account that, besides Denmark, the date of entry to the EU lies closer to joining the Schengen Area, which allow citizens to travel without a visa.

Regarding the variables of interest, $E_{ijt}$ is a set of dummy variables measuring the effect of the euro on tourism. [10] Finally, $\gamma_{it}$ and $\gamma_{jt}$ are multilateral resistances, i.e. destination-year and origin-year fixed effects, respectively, $\gamma_{ij}$ are country-pair fixed effects while $u_{ijt}$ is a well-behaved disturbance term.

[8] The UN-WTO defines a tourist as an overnight traveler taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited. So business related tourism, which can be differently affected by the euro, are included in our dependent variable. Although it is not possible to discriminate by purpose of the trip due to data availability, the largest share of total tourist arrivals to countries in the sample is for personal purpose (from 64% to 96%) and not relevant changes in these shares have been observed after the introduction of the euro.

[9] As suggested by Brouwer et al (2007), dummy variables for both countries in the Eurozone or both countries in the EU are introduced separately as they represent two separate forms of economic integration: the first one, a first variable of interest, is an estimate of the marginal contribution of euro for participating countries whereas the second is an estimate of the marginal contribution of EU for member countries.

[10] Table A1 in the appendix presents the countries included in the analysis as well as the date of the different enlargement episodes of the EU and the Eurozone used to define dummy variables.

**Empirical results**

The empirical analysis uses a sample of 37 developed economies (EU-28, three EFTA countries and six non-European OECD economies) over the period 1995-2012. Equation [1] is estimated by defining different variables related to the euro's effect on tourism

*The euro's effect on tourism*

The first analysis of this research focuses on the impact of the euro on international tourism flows. The estimate results for equation (1) are presented in Table 1. We distinguish three different specifications: Model (A) measures the effect of the euro on tourism by using data from 1995 up to 2012 and considering the dynamic of the enlargement process of the EMU; Model (B) addresses differences in the effect of the euro depending on the date of inception, i.e. differences in the impact of the euro depending on whether the country initially adopted the euro in 1999 or joined later[11], Model (C) takes into account the initial stage of the EMU when irrevocable exchange rates were set in 1999, and the second stage after the Euro started to circulate in 2002.

[Table 1, here]

In Model (A), a dummy variable that is unity when both countries in the pair belong to the EMU is defined (*Euro both)*. This variable considers all the countries that belong to the EMU,

[11] *Euro-11*=Austria, Belgium, France, Finland, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain (Year of EMU entry is 1999) while Euro-New includes the countries that adopt the euro later.

regardless of the date of inception. So, this variable jointly considers the initial countries that joined the EMU in 1999, as well as the new ones that joined during the various enlargement episodes. The coefficient of *Euro both* is positive and significant at 1% level suggesting that the euro promotes intra-Eurozone tourism by a factor of 44.63.%.[12] This impact is much larger than the 6.5% estimated by Gil-Pareja et al (2007), but our research provides a more accurate estimate of the ex-post impact of the euro on tourism flows because an appropriate control group and a longer time period is used. As pointed out by Sadeh (2014), the low estimate of the early effect of the euro on trade is explained because its impact is more gradual and fitful than anticipated. Moreover, this author highlights how much the estimated euro effect depends on the choice of dataset.

Another relevant issue is to check whether adopting the euro made Eurozone more open to tourism (tourism creation) or, on the contrary, leads to more intense tourism flows within the Eurozone at expense of diversion of tourism with non-members (tourism diversion). The argument is direct if a change in relative bilateral resistances is recognized, i.e., the increase of relative costs with third party countries could lead to tourism diversion. In the case of international tourism, the elimination of exchange rate volatility, transaction costs, and any calculus since 2002 may lead to more intense tourism flows within the Eurozone but a reduction of international tourism between the Eurozone and other countries. So, a dummy variable that fully control with tourism with third-countries whatever the direction is included (*Euro one*). This variable takes the value one when only one country in the pair belongs to the EMU.The

[12] The percentage effect is equal to [exp(α)-1]x100, with α being the coefficient of the Euro dummy variable.

estimated coefficient shows that the euro's effect on trade with non-members is around 18.77%. Consequently, as for international trade, evidence of tourism creation is found. [13]

In 1999, eleven countries joined the EMU, and afterwards six more countries incorporated the euro at different stages. Model (B) addresses the different enlargement episodes in the effect of the euro depending on the date of inception, i.e. differences in the impact of the euro depending on whether the country initially adopted the euro in 1999, *Euro-11,* or joined later, *Euro-new* In particular, *Euro-11 both* takes the value 1 if both countries in the pair joined the EMU in 1999, e.g. for the pair Austria-Germany for years 1999-2012. *Euro-New both* takes the value 1 when one of the countries in the pair is a new member and the other already belongs to the EMU. It includes the cases of Cyprus (2008), Estonia (2011), Greece (2001), Malta (2008), Slovakia (2009) and Slovenia (2007). For instance, the pair Cyprus-Austria takes the value 1 for years 2008 to 2012. *Euro-11 one* and *Euro-new one* are accordingly defined to consider only one Euro-11 or a Euro-new country in the pair.

The estimated coefficients of both variables suggest that the impact of the euro on international tourism flows is higher for countries that initially joined the EMU rather than in those that incorporated afterwards. In particular, the impact of the euro on intra-EMU-11 is 146%, whereas the effect on new member states is around112.5%,.For the tourism diversion effect, the impact on tourism with third countries is 59.4% and 28.7% for the EMU-11 and the new euro members, respectively. Sadeh (2014) argues that the lower impact of the euro for the new members can be explained because the impact of the euro takes time to be registered. This result is further

[13] Adopting the euro makes country members more open and therefore boosts their trade with third party nations (Micco et al 2003, Faruqee, 2004 or Cafiso, 2011).

explored using counterfactual analysis in section 4, where the potential tourism gains are calculated considering what would have happened if new entrants had adopted the euro in 1999.

Finally, Model (C) takes into account the initial stage of the EMU when irrevocable exchange rates were set in 1999, and the second stage when the Euro started to circulate in 2002. Two dummy variables are defined, *Euro-11 both 1999-2001* that takes the value one if both countries in the pair belonged to the EMU-11 during the period 1999-2001, and *Euro-11 both 2002-2012* that takes the value one when both countries are EMU-11 for the period 2002-2012. The former variable controls for the fixed irrevocable exchange rate between country members, although national currencies remained circulating, while the latter reflects the introduction of the euro as the national currency. Both variables are significant at 1% significance level. It is observed how although the estimated impact of the euro is a bit higher for the period 1999-2001; differences between both coefficients are not significant. Consequently, the relevant issue seems to be joining the EMU, which implies having zero exchange rate volatility, rather than having a common physical currency circulating.[14] However, as shown in the next section, when the difference of the log of tourist arrivals is used as dependent variable, a relevant effect of the changeover is obtained.

[14] Given the disruption of the changeover to Euro notes and coins in 2002, it is also considered as the pre-changeover period 1999-2002, but results are near the same.

*The dynamics of the euro's effect on tourism*

The second analysis of this research explores the dynamic of the impact of the euro on tourism flows. This exercise may shed light on the time-path of the euro effect as well as exploring the euro's performance during the current economic crisis. Indeed, the characterization of the path of the impact of the euro on tourism over time would be of interest for future common currency experiences and for prospective members of EMU. The influence of the euro on tourism flows might take time to be registered, but its effect could have been felt in advance. In other words, the announcement of the last phases of the Exchange Rate Mechanism prior to the inception of the euro could have influenced tourists' decisions about the destination country of their visits. So, the presence of an anticipate effect of the euro can be tested by analysing the effect of the euro in tourism flows for the whole sample period even before the inception of the euro. As far as we know, this is the first attempt to measure the path of the euro's impact on tourism over time.

[Table 2, here]

Table 2 presents estimates of the euro's effect disaggregated by year. Two approaches to analyse the euro patter over time can be used. Micco et al (2003) estimate the year-by-year impact of the euro by interacting the Euro variable with year dummies since the EMU was created, i.e. from 1999 to 2012. Alternatively, Sadeh (2014) proposes to estimate the differences of the log of trade on the lags of membership differences. Thus, the coefficients of these differences reflect the changes to trade as a result of the entry to the euro area. In this section, a similar approach to the one used by Sadeh (2014) is applied. However, since our

dataset starts in 1995 only 4 lags could be defined. [15] Moreover, we are interested in explore how the euro behave in terms of tourism during the economic crisis. Therefore, we run regression of the differences of the log of trade on *Euro year* dummy variables as in Micco et al (2003). We also follow the estimate procedure propose by Sadeh (2014) by including country year fixed effect but estimating the regression but the regression is run with random effects, because the country pair fixed effects are constant over time and should not affect annual changes in tourism for a given pair

To explore a possible advanced effect of the euro, the *Euro year* variables would take the value 1 at a specific year if both (or one) countries would be members of the EMU four year latter. As an example, *Euro both 1995* would take the value 1 for Austria and Belgium in 1995 since both countries adopted the euro in 1999. Similarly, this variable would take the value 1 for France and Hungary in 2000 since the latter country adopted the euro in 2004. t is important to note that $Euro_{ijt}$ captures the incorporation of new members. To remove the effect of the enlargement process, the year-by-year estimate is also carried out for the variable *E*MU-11 countries which limits the euro effect to the countries that initially joined the EMU.

As can be observed in Table 2, the time path of the Euro both year and Euro one year is similar. There is not a positive and significant effect of the euro until 2001 and in 2002 the largest impact on tourism differences. This year is the date of the changeover when the euro started to circulate. Thereafter, the euro's effect on tourism steadily falls until being not significant in 2009.

[15] In his paper, membership differences have a value of 1 only in 1999 (2001 for Greece) and 0 in all other years. Seven lags to the differenced euro dummies are specified. , Further lags were not possible because specifying each lag omits one year from the beginning of the dataset (which started in 1991), so an eighth lag would omit the crucial year 1999.

In 2012 the euro's effect is significantly negative. These results suggest that the impact of the euro on tourism is lower during the current economic crisis. Coefficients of *Euro-11 foll*ow a similar time-path.

*The euro's effect across member states*

Finally, it is relevant to analyse the effect of the euro for each country and test whether there are significant differences between them. Results are presented in Table 3 where the country-by-country effect of the euro is estimated by comparing their individual impact with the impact in rest of the Eurozone. Similar to Faruqee (2004) for trade, a new variable is constructed to isolate the tourism impact for each EMU member. Taking Austria as an example, *Euro-11 both* takes the value of one for pairs formed by Austria (as the destination country) and other EMU country. Accordingly, *Euro-11 both Others* is then redefined to exclude Austria.

[Table 3, here]

As can be observed in Table 3, the results suggest that tourism gains of adopting the euro present a wide dispersion at the country level. For 7 out of 11 countries, the euro presents a significantly positive effect on tourism, which ranged from 276.6% in Finland to 73.5% in Austria, although only Finland and Germany present an above average estimated effect of the euro on tourism. The impact of the euro on tourism flows is not significant for three countries; Belgium, France and Spain while Italy presents a significantly negative impact of euro on tourism flows.

For the tourism creation effect, measured by the variables *Euro-11 one and Euro-11 one Others,* results are similar. Austria, Finland, Ireland, Netherlands and Portugal present a

significantly positive effect of the euro for tourism between a member EMU-11 and a non-member EMU-11 country, it is not significant for Belgium, Germany, Luxembourg and Spain, and evidence of tourism diversion is found for France and Italy. From the country perspective, the results further suggest that the tourism gains from the euro have not been evenly distributed among member states. These heterogeneous results for the euro's effect across countries are also found by Gil-Pareja et al (2007) for international tourism and by Faruqee (2004) and Aristotelous (2006) for the case of international trade.

Furthermore, these results are in accordance to the ideas discussed in Smeral and Weber (2000) which forecast that tourism exports rise in the hard-currency countries (as like Austria or Netherlands) by improving price competitiveness, while it lowers tourism export in the soft-currency countries (as Italy or Spain). Jenkins (2001) argued that there will be downward pressures on prices in the Euro area, especially where prices are high (such as Ireland, Luxembourg or Finland), because tourists seek better value-for-money, which may easily be identified by better comparison of prices in the euro as a single currency

**Counterfactual analysis**

As mentioned in the introduction, a very relevant issue to evaluate the effect of the euro on intra-EU tourism flows is analysing the potential tourism gains of joining the Eurozone. The EMU has experienced successive enlargement processes after the introduction of the euro in 1999, as well as there being several countries planning to adopt the euro. Although the potential of the enlargement process has been explored in international trade literature, there is no paper

that calculates the "tourism potential" of adopting the euro. This analysis may shed light on the gains of joining the Eurozone in terms of tourism. To do this, a counterfactual analysis is carried out.

The counterfactual analysis is a common methodology to evaluate the effect of joining the EU or adopting the euro.[16] It can be used to explore whether the United Kingdom or Sweden would have been better off if they had joined the Euro. An important caveat to the counterfactual is that can be subject to the Lucas (1976) critique in the sense that the deep parameters underlying the baseline estimates are likely to be different under the counterfactual scenario. However, several authors have argued that the change in the deep parameters may be too small to have a major implication (Rudebusch, 2005; Dubois et al, 2007 or Smith, 2009). Moreover, Belke and Spies (2008) obtain that the in-sample and out-of-sample results are in the same direction when they are analysing the impact of the euro enlargement process.

As shown in Table 2, estimates from Model (C) suggest that the impact of the euro on international tourism flows is mainly concentrated in the countries that initially joined the EMU in 1999, rather than in the countries that incorporated later. In this section, a counterfactual analysis estimates the potential tourism gains considering what would have happened if new member states had adopted the euro in 1999. Furthermore, potential gains for candidate states and for possible entrants are also computed.

[16] The Lucas Critique states that the structure of an economy is endogenous to the economic policies applied to it. So, a new economic will bring structural changes in the economy, in expectations and in the actual behaviour that govern market supply and demand.

Following Brouwer et al (2007) and Belke and Spies (2008), the effects of EMU enlargement, future and "hypothetical" adoption of the euro for individual countries can be approximated using a counterfactual analysis that involves three different steps. (i) Firstly, the baseline scenario (real model) is estimated. In this case, equation (1) is calculated including the *Euro-11 both and the Euro-11 one* dummy variables, and then tourism flows between country pairs are predicted. (ii) Secondly, a counterfactual scenario is estimated by considering that a new country joined the EMU in 1999. Now this country is added to the *Euro-11 both and Euro-11 one* $_t$ dummy variables. This scenario is replicated for each of the 20 EUropean countries in the sample that did not join the EMU when it was created. Again, tourism flows under this counterfactual scenario are predicted. (iii) Finally, predicted tourism flows for the baseline and the counterfactual scenario are compared to calculate the potential gains in terms of tourism of adopting the euro.[17]

The baseline model is always the same but the counterfactual scenarios are computed country-by-country considering that a new member joins the EMU in 1999 each time. Taking Cyprus as an example, under the baseline scenario the Euro-11 both variable takes the value one, when both countries in the pair belong to the Euro-11 group, while under the counterfactual scenario *Euro-11 both* also takes the value one when Cyprus is in the pair with another Euro-11 country since 1999. Similarly, the dummy variable *Euro-11 one* is generated under the real and the counterfactual scenario.

[17] Since we are comparing the predicted results obtained from the baseline model and the counterfactual, or results are not subject to critique by Egger (2002) who states that systematic differences between predicted and observed trade flows are likely due to a misspecification of the model

[Table 4, here]

Table 4 presents the results of the counterfactual analysis by calculating the potential gains in terms of tourist arrivals from other Eurozone members. The percentage change for the 20 possible entrants are split into three groups: Group (A) considers the countries that participated in the enlargement process until 2012, Group (B) considers the candidate countries that are planning to adopt the euro after 2012 and Group (C) considers countries that are not planning to adopt the euro any time soon. The average percentage increase in tourist arrivals associated to hypothetically adopting the euro in 1999 is presented. In Group (A), Slovenia (459.4%-373.5%) and Estonia (316.9%-74.5%) present the highest tourism gains from Euro-11 origins and third countries. This is a reasonable finding since these countries are relatively more open to the Eurozone countries than Cyprus or Slovakia that present low or negative increases in tourism arrivals. Note that the gains from tourism for Greece are low and negative since their real date of entry is close to 1999. For the candidate countries, Group (B), Latvia (619.1%-349.1%), Croatia (568.8%-382.6%), Romania (187.4%-76.2%) and Czech Republic (129.3%-32.4%) present large gains from tourism of adopting the euro. In Group (C) tourism gains are positive for tourist arrivals from EMU-11 countries for Norway (113.9%) and Sweden (44.2%) The tourism potential gains vary across countries.

Bussiere et al (2005), Cieslik et al (2012), Sadeh (2014) also obtains some negative impact of the euro for trade. This result can be justified since there is not evidence of tourism creation (*Euro-11 one* variable is significantly positive) in the baseline scenario. Therefore, benefits from non-member countries already exist, so adopting the euro may have a negative effect on their tourist arrivals.

**Concluding remarks**

This paper provides an extensive and updated analysis of the euro's effect on tourism flows. The empirical analysis not only uses a longer time period that allows a more thorough estimate of the ex-post effect of the euro, but also an appropriate control group is defined. Moreover, the updated sample period allows us to estimate the time-path of the euro's effect exploring the performance of the common currency on the annual changes in tourism, and so exploring the impact of the changeover in 2002 and the 2008 economic crisis., The findings are relevant for demonstrating the effect of adopting the euro or joining other currency union experiences. A better understanding of the euro effect on tourism flows contributes by adding another argument to the debate on the benefits of joining to the Eurozone.

The estimated impact of the euro on tourism flows is 44.6%, although its magnitude increases to 146% when the analysis is limited to the initial Euro-11 initial members of the EMU. Indeed, the estimated effect of the euro is larger for this group of countries than for new members that incorporated into the Eurozone later. For tourism with third countries, evidence of tourism diversion is not found. Additionally, it seems that tourism gains from adopting the euro have not been evenly distributed among member states.

The time-path of the euro effect is also estimated and results suggest that the highest impact is concentrated in the early stages (1999-2004), mainly with the changeover in 2002, Thereafter, the euro's effect on tourism steadily falls until being not significant in 2009-2011 and significantly negative in 2012. These results suggest that the impact of the euro on tourism is lower during the current economic crisis.

Finally, the counterfactual analysis shows the potential gains in terms of tourism of joining the EMU. These gains vary across countries, being negative for some of them. In that case, this countries would not further benefit on joining the Eurozone this benefits already exist even without adopting the euro. In any case, this is only one dimension of the effect of the euro. Other economic consequences of the political integration need to be evaluated. Our research provides policymakers of future and potential entrants with an additional argument in favour of joining the EMU.

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## Tables and Figures

**Table 1.** Euro's effect on tourism

| | (A) | (B) | (C) |
|---|---|---|---|
| **EU** | 0.230*** | 0.221*** | 0.218*** |
| | (0.0454) | (0.0447) | (0.0452) |
| **Euro both** | 0.369** | | |
| | (0.175) | | |
| **Euro one** | 0.172* | | |
| | (0.0908) | | |
| **Euro-11 both** | | 0.900*** | |
| | | (0.185) | |
| ***Euro-11 both (1999-2001)*** [1] | | | 0.767*** |
| | | | (0.134) |
| ***Euro-11 both (2002-2012)*** [2] | | | 0.746*** |
| | | | (0.134) |
| **Euro-11 one** | | 0.466*** | 0.392*** |
| | | (0.0935) | (0.0672) |
| **Euro-new both** | | 0.754*** | 0.602*** |
| | | (0.161) | (0.114) |
| **Euro-new one** | | 0.252*** | 0.176** |
| | | (0.0966) | (0.0808) |
| **test 1 = 2** | | | 0.32 |
| | | | [0.5717] |
| **Observations** | 18,423 | 18,423 | 18,423 |
| **Number of idpair** | 1,159 | 1,159 | 1,159 |
| **R-squared** | 0.689 | 0.689 | 0.689 |

**Note:** Significant at 1% (***), 5%(**) and at 10% (*) level.
Constant, country-year and country-pair fixed effects are not reported.
t-statistics appear between parentheses and p-values between brackets.
Robust standard errors clustered by pair are computed

Table 2. Euro's effect over time

| | (A) | | (B) |
|---|---|---|---|
| **Euro both 1996** | -0.0552 | **Euro-11 both 1996** | -0.0552 |
| **Euro both 1997** | 0.0493 | **Euro-11 both 1997** | 0.0503 |
| **Euro both 1998** | -0.116* | **Euro-11 both 1998** | -0.119* |
| **Euro both 1999** | 0.0209 | **Euro-11 both 1999** | 0.0213 |
| **Euro both 2000** | 0.0383 | **Euro-11 both 2000** | 0.0383 |
| **Euro both 2001** | 0.219*** | **Euro-11 both 2001** | 0.208*** |
| **Euro both 2002** | 0.406*** | **Euro-11 both 2002** | 0.415*** |
| **Euro both 2003** | 0.219*** | **Euro-11 both 2003** | 0.217*** |
| **Euro both 2004** | 0.179*** | **Euro-11 both 2004** | 0.128*** |
| **Euro both 2005** | 0.178*** | **Euro-11 both 2005** | 0.170** |
| **Euro both 2006** | 0.106** | **Euro-11 both 2006** | 0.112*** |
| **Euro both 2007** | 0.226*** | **Euro-11 both 2007** | 0.212*** |
| **Euro both 2008** | 0.255*** | **Euro-11 both 2008** | 0.246*** |
| **Euro both 2009** | 0.0847 | **Euro-11 both 2009** | 0.101* |
| **Euro both 2010** | -0.0768* | **Euro-11 both 2010** | -0.0882** |
| **Euro both 2011** | 0.00707 | **Euro-11 both 2011** | -0.00479 |
| **Euro both 2012** | -0.185*** | **Euro-11 both 2012** | -0.181*** |
| **Euro one 1996** | -0.0284 | **Euro-11 one 1996** | -0.0284 |
| **Euro one 1997** | 0.0525 | **Euro-11 one 1997** | 0.0466 |
| **Euro one 1998** | -0.0362 | **Euro-11 one 1998** | -0.0372 |
| **Euro one 1999** | -0.0273 | **Euro-11 one 1999** | -0.0213 |
| **Euro one 2000** | 0.0651 | **Euro-11 one 2000** | 0.0574 |
| **Euro one 2001** | 0.0995*** | **Euro-11 one 2001** | 0.110*** |
| **Euro one 2002** | 0.198*** | **Euro-11 one 2002** | 0.193*** |
| **Euro one 2003** | 0.105*** | **Euro-11 one 2003** | 0.108*** |
| **Euro one 2004** | 0.118*** | **Euro-11 one 2004** | 0.141*** |
| **Euro one 2005** | 0.119*** | **Euro-11 one 2005** | 0.105*** |
| **Euro one 2006** | 0.0445* | **Euro-11 one 2006** | 0.0458** |
| **Euro one 2007** | 0.116*** | **Euro-11 one 2007** | 0.124*** |
| **Euro one 2008** | 0.115*** | **Euro-11 one 2008** | 0.131*** |
| **Euro one 2009** | 0.0381 | **Euro-11 one 2009** | 0.0299 |
| **Euro one 2010** | -0.0284 | **Euro-11 one 2010** | -0.0288 |
| **Euro one 2011** | 0.00554 | **Euro-11 one 2011** | 0.0119 |
| **Euro one 2012** | -0.0941*** | **Euro-11 one 2012** | -0.0957*** |
| **Observations** | 17,198 | | 17,198 |
| **Number of idpair** | 1,151 | | 1,151 |

**Note:** Significant at 1% (***), 5%(**) and at 10% (*) level.
Constant, country-year and country-pair fixed effects are not reported.
For simplicity standard errors are not reported.

Table 3. Euro-11 effect by member

| Country | Austria | Belgium | Finland | France | Germany | Ireland |
|---|---|---|---|---|---|---|
| **Euro-11 both**[1] | 0.551*** | 0.123 | 1.326*** | -0.189 | 0.743*** | 0.595*** |
| | (0.192) | (0.115) | (0.174) | (0.164) | (0.233) | (0.143) |
| **Euro-11 both others**[2] | 0.501*** | 0.193 | 1.069*** | 0.317*** | 1.486*** | 0.451** |
| | (0.133) | (0.120) | (0.162) | (0.108) | (0.169) | (0.211) |
| **Euro-11 one**[3] | 0.352** | 0.118 | 0.676*** | -0.290** | -0.0388 | 0.179** |
| | (0.176) | (0.0900) | (0.106) | (0.145) | (0.192) | (0.0859) |
| **Euro-11 one others**[4] | 0.264*** | 0.105 | 0.563*** | 0.173*** | 0.767*** | 0.261** |
| | (0.0714) | (0.0664) | (0.0827) | (0.0559) | (0.0857) | (0.106) |
| **test 1 = 2** | 0.06 | 0.39 | 7.35 | 9.86 | 16.04 | 0.94 |
| | 0.8007 | 0.5337 | 0.0068 | 0.0017 | 0.0001 | 0.3316 |
| **test 3 = 4** | 8.93 | 0.01 | 1.63 | 8.98 | 19.5 | 0.36 |
| | 0.0001 | 0.9085 | 0.2025 | 0.0028 | 0.0000 | 0.5476 |
| **Country** | **Italy** | **Luxembourg** | **Netherlands** | **Portugal** | **Spain** | |
| **Euro-11 both**[1] | -0.458*** | 0.684*** | 0.742*** | 0.631** | 0.282 | |
| | (0.142) | (0.0990) | (0.207) | (0.297) | (0.205) | |
| **Euro-11 both others**[2] | 0.0990 | 0.784*** | 0.647 | 0.729** | 0.776** | |
| | (0.105) | (0.0921) | (0.584) | (0.300) | (0.303) | |
| **Euro-11 one**[3] | -0.478*** | 0.0901 | 0.311** | 0.628*** | 0.0434 | |
| | (0.117) | (0.101) | (0.156) | (0.164) | (0.141) | |
| **Euro-11 one others**[4] | 0.0659 | 0.427*** | 0.354 | 0.345** | 0.392** | |
| | (0.0558) | (0.0483) | (0.292) | (0.152) | (0.152) | |
| **test 1 = 2** | 18.39 | 1.35 | 0.05 | 1.31 | 5.71 | |
| | 0.0000 | 0.2448 | 0.8218 | 0.2534 | 0.0170 | |
| **test 3 = 4** | 20.54 | 9.24 | 0.01 | 8.97 | 2.83 | |
| | 0.0000 | 0.0024 | 0.9168 | 0.0028 | 0.0928 | |

*Note:* Significant at 1% (*), 5% (**) and at 10% (***) level. Estimate coefficients of the explanatory variables as well as time-varying origin and destination fixed effects are not reported, t-statistics appear between parentheses and p-values between brackets. Robust standard errors are computed

Table 4. Counterfactual analysis

| Regions | EMU | No EMU |
|---|---|---|
| **Group A: Enlargement** | | |
| Cyprus | -10.0% | -30.9% |
| Estonia | 316.9% | 74.5% |
| Malta | 47.6% | 52.9% |
| Slovakia | 7.2% | -23.5% |
| Slovenia | 459.4% | 373.5% |
| **Group B: Candidates** | | |
| Bulgaria | -14.0% | -28.7% |
| Croatia | 568.8% | 382.6% |
| Czech Republic | 129.3% | 32.4% |
| Hungary | -56.7% | -70.8% |
| Latvia | 619.1% | 349.1% |
| Lithuania | -50.4% | -36.0% |
| Poland | -32.4% | -35.3% |
| Romania | 187.4% | 76.2% |
| **Group C: Hypothetical members** | | |
| Greece | -6.1% | -9.2% |
| Denmark | -39.1% | -49.5% |
| Iceland | -9.2% | -51.1% |
| Norway | 113.9% | -12.6% |
| Sweden | 44.2% | 54.8% |
| Switzerland | -27.7% | -31.7% |
| United Kingdom | -57.1% | -68.9% |

*Note*: % change from predicted tourist arrivals between the baseline model and the counterfactual model are presented. The increase of tourist arrivals from the Eurozone is calculated for the average 1999-2012 period. Due to data availability the % change is computed for Estonia and Sweden in 2001 and for Norway in 2011

Appendix

Table A.1 List of countries included in the appendix

| | Euro | EU | | Euro | EU |
|---|---|---|---|---|---|
| **Australia** | | | **Latvia** | | 2004 |
| **Austria** | 1999 | 1995 | **Lithuania** | | 2004 |
| **Belgium** | 1999 | 1995 | **Luxembourg** | 1999 | 1995 |
| **Bulgaria** | | 2007 | **Malta** | 2008 | 2004 |
| **Canada** | | | **Netherlands** | 1999 | 1995 |
| **Croatia** | | | **New Zealand** | | |
| **Cyprus** | 2008 | 2004 | **Norway** | | |
| **Czech Rep.** | | 2004 | **Poland** | | 2004 |
| **Denmark** | | 1995 | **Portugal** | 1999 | 1995 |
| **Estonia** | 2011 | 2004 | **Romania** | | 2007 |
| **Finland** | 1999 | 1995 | **Slovakia** | 2009 | 2004 |
| **France** | 1999 | 1995 | **Slovenia** | 2007 | 2004 |
| **Germany** | 1999 | 1995 | **Spain** | 1999 | 1995 |
| **Greece** | 2001 | 1995 | **Sweden** | | 1995 |
| **Hungary** | | 2004 | **Switzerland** | | |
| **Iceland** | | | **Turkey** | | |
| **Ireland** | 1999 | 1995 | **United Kingdom** | | 1995 |
| **Italy** | 1999 | 1995 | **United States** | | |
| **Japan** | | | | | |