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Master in Economic Development and Growth

The contribution of tourism development to economic growth of Sweden: A panel data approach

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Abstract: By using panel data for 21 counties in Sweden from 2003 to 2013, the purpose of this study is to examine the relationship between tourism development and economic growth in this country, within the neoclassical growth framework. To address the objective of this study, the appropriate panel data methods are used, namely both static and dynamic panel approaches. The results show that tourism is a positive and significant determinant of Swedish economic growth. Moreover, the tourism coefficient proves its robustness through majority of performed estimations. Therefore, this study supports the existence of the tourism-led growth hypothesis in this Scandinavian country, which is in line with our expectations. Hence, macroeconomic policies that promote tourism expansion will directly stimulate economic growth and this is expected to happen in the future since Swedish tourism capacity is still not used at its full potential.

Key words: Tourism, economic growth, panel data, Sweden

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1. Introduction

Economic growth is one of the most researched topics in macroeconomic theory. By definition provided by the World Bank¹, economic growth is “quantitative change or expansion in a country’s economy, conventionally measured as the percentage increase in gross domestic product (GDP) or gross national product (GNP) during one year”. This expansion in an economy can result from using more capital (resources) or by increasing productivity (efficiency). In order to formulate the proper policies and instruments that will invigorate the long-term growth, it is necessary to analyze the actual stimulants of growth.

Tourism industry had long been neglected as an important economic growth contributor. However, the latest trends in tourism industry across the globe are positively affecting the awareness of governments, international organizations, researchers and academics, towards perceiving tourism as an important player in stimulating economic growth. According to the records of the World Tourism Organization (UNWTO), the UN agency that specializes in tourism related topics and statistics, tourism has been constantly growing ever since the 1950s, across the globe, and as such it has become one of the main pillars for social and economic progress. This trend resulted in opening up of countries and increase of investment in tourism, which eventually led to a continuous increase in number of tourist arrivals. Globally speaking, international tourist arrivals have increased from 25 million in 1950 to 1.13 billion in 2014². Moreover, it is expected that this number will grow to 1.8 billion by 2030. Figure 1 shows the continuously increasing trend in number of arrivals in the world as a whole, but also for high income, middle income, low income and OECD countries separately. It is evident that the biggest share in this increase has happened in the high income countries, while the poorest countries have barely taken part in this trend.

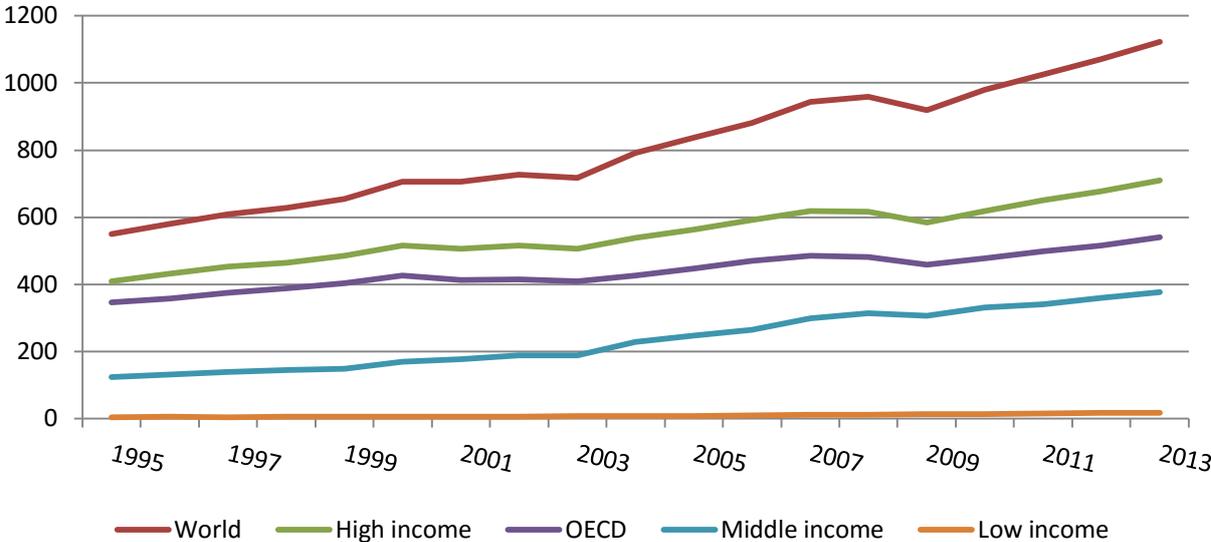
In the last decades, tourism has proved to be one of the fastest and constantly growing service sectors in the world that is presently accounting for about 30% of world services exports. Its rapid progress has resulted in tourism being competitive nowadays with shares of oil exports, food products or vehicles exports. That is to say, according to the latest publications of the UNWTO, tourism is responsible for creating 9% of the world’s GDP, every

¹ The World Bank Glossary: <http://www.worldbank.org/depweb/english/beyond/global/glossary.html>

² As published by the UNWTO, Tourism Highlights, 2015 Edition

11th job post and 6% of total world's exports³. Following these results, expectations that tourism can stimulate the economic growth through increase in investment in infrastructure, employment opportunities, higher levels of foreign exchange earnings, etc. seem reasonable. From this point of view, it is expected that this study can provide some useful information for policy makers in formulating effective tourism policies that will be compatible with long-term growth tendencies.

International Tourism - Arrivals, 1995-2013 (in millions)



*Figure 1: Evolution of international arrivals
Source: World Development Indicators⁴*

The sustained demand for tourism activities has proved to be a successful tool for economic development and job creation. Together with its ability to generate higher levels of employment and increase domestic incomes, tourism encourages local governments to invest in infrastructure development and growth for the rest of the economy. Consequently, tourism produces spill-over effects also towards the local residents whose life standards are improved and also affects poverty reduction. This is of particular relevance for developing countries that usually struggle with high unemployment rates, low incomes and with internationally incompetent industries.

³ As published by the UNWTO, Tourism Highlights, 2015 Edition

⁴ According to the World Bank classification, high income economies are those with a gross national income per capita above \$12736, middle income are those with GNI per capita between \$1045 and \$12735, and low income economies have less than \$1045.

Most of the tourism related literature is based on tourism-led growth hypothesis which supports the contribution of tourism to economic growth and it belongs to the export-led growth discussion. Despite the indisputable reality of the tourism sector's results, it is still not clear from the existing literature whether the results of tourism industry are effectively promoting the economic growth or not. In other words, no consensus has yet been reached on whether the contribution of tourism economic expansion is positive, negative or insignificant. On one hand, there are empirical studies who found supportive evidence for the theory of tourism as a promoter of economic growth: Tang and Abosedra (2014) for Middle East and North African region, Holzner (2011) for a sample of 134 countries, Gökovali and Bahar (2006) for Mediterranean region, Gunduz and Hatemi (2005) for Turkey, Durbarry (2004) for Mauritius, Balaguer and Cantavella-Jorda (2002) for Spain, and others. On the other hand, some of the studies found that tourism has no effect on economic growth: Payne and Mervar (2010) for the case of Croatia, Katircioglu (2009) for Turkey, Oh (2005) for Korea, Lundgren (2005) for mountain region of Sweden.

With this in mind, the main objective of this study is to investigate empirically the contribution of tourism to the overall economic performance of Sweden, one of the top performers among the high income countries. Namely, the purpose of this paper is to study tourism as a determinant of economic growth alongside traditional factors such as capital and labor, through the impact on real GDP per capita, during the period from 2003 until 2013. To our knowledge, no similar studies have been realized for this country.

Since the analysis will be done by using a county-level data, this period was chosen according to the desired data availability. The research will be performed by applying advanced econometric tools and methods to capture the impact of tourism development. More detailed, the analysis will be based on both static and dynamic panel data estimation with focus on examining the validity of the existence of the tourism led-growth hypothesis. The static model is estimated using four different methods: pooled ordinary least squares (OLS), fixed effects (FE), first differences (FD) and instrumental variable (IV). The dynamic model was estimated with the Arellano and Bond (1991) GMM estimator.

The remainder of the paper is structured as follows: the following section is devoted to the literature review about the tourism led-growth hypothesis and different types of research in

the tourism area, performed in the world and in Sweden. In continuation, Section 3 provides some stylized facts about Sweden and its tourism development. Section 4 briefly describes theory behind the empirical specification, presents the empirical model and the source of data. Section 5 is devoted to the empirical results of the study. The main conclusions will be drawn in the final section, followed by expected policy implications.

2. Literature Review

With the growing role of tourism in the global economy over the last couple of decades, as it would be expected, its growing presence in the research area has followed accordingly. However, as it was already mentioned, the question of whether tourism is influencing the rate of economic growth has been provided with conflicting answers. In other words, there is no clear or generalized answer about the nature of relationship between tourism and economic growth, but there are many possibilities left for further research.

Following the classification of Ozturk (2010) about different types of causality found in the empirical research on the causal relationship between energy consumption and economic growth, Tugcu (2014) makes distinction of four different lines of the tourism-led growth:

- 1) The *neutrality* hypothesis suggests no causality between tourism and economic growth.
- 2) The *feedback* hypothesis indicates bi-directional causality between tourism and economic growth, their joint and simultaneous determination.
- 3) The *growth* hypothesis denotes a situation where there is uni-directional causality running from tourism to economic growth. Tourism is seen as a vital determinant of growth either directly or through other production factors.
- 4) The *conservation* hypothesis implies that increase in economic growth (real GDP) uni-directionally causes the tourism sector to strengthen.

The empirical literature on tourism-economic growth nexus is also diverse with respect to methods used. The role of tourism has been investigated in a country-specific environment, from regional perspective and/or within a multi-country framework. Moreover, aside from focusing on different entities, these studies were employing different econometric methods: cross-section, time series or panel data approaches. There is a certain number of studies that

is more qualitative oriented, and usually includes surveys and questionnaires analysis (see Svelds, 2015; Gössling and Mattsson, 2002). In the remaining of this section, we will provide a brief review of the studies that have been dealing with the tourism-economic growth nexus.

Having in mind the positive contribution of tourism for many areas of economy (foreign income, employment and other), it is of a great importance to realize whether tourism development causes economic growth, or is it the economic expansion that is causing an increase of tourism activities. In order to give an answer to this dilemma, researchers have been mainly focusing on cointegration and multivariate Granger causality tests (Toda and Yamamoto, 1995) to study the relationship between tourism and economic growth in individual country scenario. Therefore, the most frequent approach in this sense was the time series analysis, often followed by forecasting of the inbound tourism demand: Tang and Tan (2015) for Malaysia, Tugcu (2014) for Mediterranean countries, Tang and Abosedra (2012) for Lebanon, Brida *et al.* (2010) for Uruguay (with respect to Argentinian tourism expenditures), Gunduz and Hatemi (2005) for Turkey, Durbarry (2004) for Mauritius, Eugenio-Martin *et al.* (2004) for Latin American region, Balaguer and Cantavella-Jordá (2002) for Spain, and others. However, the results have been far from unanimous.

One of the revolutionary papers was written by Balaguer and Cantavella-Jordá (2002) who were also the first authors to mention the tourism-led growth hypothesis within the export-led growth literature. They performed a study for the case of Spain and found that tourism and economic growth are cointegrated, and that it is the tourism industry that Granger-causes the economic growth. Their findings are confirmed by other studies. Brida *et al.* (2010) found a positive cointegration between Uruguayan GDP per capita, expenditure of Argentinian tourists and exchange rate between Uruguayan and Argentinian currencies. Granger causality was found to run from tourism expenditure to GDP per capita, which is in line with results obtained by previous researches done for Latin American countries (for instance, Eugenio-Martin *et al.*, 2004).

Durbarry (2004) finds the causality that runs from exports towards economic growth for the economy of Mauritius. Moreover, based on different exports formulations in his research and their inconsistency of proving the causality, the author reaches a conclusion that in the case when exports of goods fail, tourism can be a source of economic growth.

On contrary, authors like Lee (2012) for Singapore, Payne and Mervar (2010) for Croatia, Katircioglu (2009) for Cyprus, Oh (2005) for Korea found the opposite: it is the economic growth that Granger causes tourism development. Katircioglu (2009) rejects the validity of tourism-led growth hypothesis in Cyprus, since his results suggested that growth in real income stimulates international tourist arrivals. Similarly, Payne and Mervar (2010) failed to find the causality from tourism development to economic growth in the case of Croatia. They used quarterly data in order to examine the long-run causality, and showed that there is a positive unidirectional Granger causality from real GDP to international tourism revenues. Accordingly, the authors suggest that tourism sector will grow once the policies that stimulate institutional transparency and positive investment climate are implemented. As a result, international tourists would perceive this as a signal of country's stability and increase in tourism revenues would follow.

An interesting study was performed by Antonakakis *et al.* (2015) on the sample of 10 European Union countries that included both stronger, enduring economies (Sweden included) and countries that were severely affected by the latest Great recession in 2007. The goal was to determine the nature of relationship between tourism and economic growth. It was found that this relationship varies over time: during the crisis period, some of the countries have moved from tourism-led economic growth towards economy-driven tourism development, while others have done the opposite. In other words, this relationship is dependent on different economic events (it was noticed that these events had higher impact on economies of Greece, Cyprus, Spain and Portugal).

As econometric techniques have been becoming more and more sophisticated, researchers started turning towards panel data analysis that combines cross-sectional and time-series data and allows for better precision and higher power. Eugenio-Martin *et al.* (2004) suggested using a fixed effect panel approach in order to control for the unobservable differences across countries and obtain consistent estimators. Since using tourism in growth equations may cause endogeneity, the most common way of controlling for it is by using dynamic panel estimators (Tang and Abosedra, 2014; Holzner, 2011; Sequeira and Nunes, 2008). Among those, the most common are Differenced and System GMM estimators introduced by Arellano and Bond (1991), Blundell and Bond (1999), Bond *et al.* (2001) that provide unbiased estimation of endogenous variables and correct estimate of causal impact.

Sequeria and Nunes (2008) use the System GMM estimation claiming that it is the most appropriate for economic growth empirical models. Aside from showing that tourism specialization enhances growth performances, the authors assign a bigger role to tourism for poor countries who will “always benefit from tourism specialization“. Similar was shown by Eugenio-Martin *et al.* (2004) who noticed a significant contribution of tourism in low and medium income countries of Latin American region, but not in high income countries.

Gökovali and Bahar (2006) performed a panel data analysis based on a sample of 13 countries of Mediterranean region for a period of 16 years (1987-2002). Aside from confirming the expected positive contribution of investment share of GDP and increase in labor force, Gökovali and Bahar (2006) found that tourism is another factor leading to economic growth. Namely, as the share of tourism receipts in exports of this region increases by 1 per cent, the authors prove that GDP growth rate increases by 8 per cent. Therefore, these authors confirm hypothesis of the positive relation and existence of tourism-led growth.

Tang and Abosedra (2014) found results that are corroborated with previous findings. Namely, these authors used both static and dynamic panel data estimation methods (pooled OLS, random effects and fixed effects, followed by generalized method of moments – GMM estimator) to account for the impact of tourism, energy consumption and political instability on economic growth in Middle East and North African (MENA) countries. Their findings support the existence of tourism-led growth (and energy-led growth) hypothesis in this region. Specifically, Tang and Abosedra (2014) point out that a 10 per cent increase in per capita real tourism implies 0.07 per cent increase in the economic growth of MENA countries.

Significant part of the existing literature has also explored the relationship between tourism (tourist arrivals) and trade, since tourism is filed under export commodities. This type of study was performed for numerous countries (Fry *et al.*, 2010; Wong and Tang, 2010; Gil-Alana and Fischer, 2010; Shan and Wilson, 2001 and others). Fry *et al.* (2010) investigated the relationship between trade and inbound tourism in the case of South Africa for which both tourism and trade are important from the economic growth point of view. Their assumptions are confirmed by results of their study: tourist arrivals and trade predict each other

depending on the partner country. The existence of two-way causality represents an alert for tourism as one of the tools for expanding international trade between South Africa and the rest of the world. Bidirectional causality between arrivals and openness to trade was found by Wong and Tang (2010) for Singapore, by Shan and Wilson (2001) for the case of China, by Massidda and Mattana (2013) for Italy, Santana-Gallego *et al.* (2011) for the OECD countries, etc. Interestingly, Norsiah and Kamaruzaman (2010) found unidirectional causality from trade to tourism, meaning that the increase in total trade will cause the tourism sector development. On contrary, Lionetti and Gonzales (2012) demonstrate that there is no Granger causality between tourism and trade in the Latin American region.

Significant part of the literature has been investigating tourism in relation with the Dutch disease phenomenon that implies that countries who dispose of abundant natural resources have worse economic achievements and weaker industry sectors than countries with fewer resources. With respect to this, economies that are dependent on tourism are possibly suffering from the “beach disease effect” (Holzner, 2010). However, Chao *et al.* (2006) find evidence that tourism development, although leading to emergence of the beach disease, increases the welfare level of the local residents in the short run.

When it comes to the empirical studies related to tourism in Sweden, the list is relatively scarce. However, from our reading, no studies were performed to account for the actual quantitative impact of tourism on economic growth at a national level. Most of the studies were based on certain regions (few municipalities or cities) or certain niche markets: farm tourism (Gössling and Mattsson, 2002), polar tourism (see Müller *et al.*, 2013), World Heritage sites (Svels, 2015). Furthermore, Finnish-Swedish border case was examined from the perspective of tourism cooperation and destination building (Prokkola, 2008; Ioannides *et al.*, 2006). As expected, it was found that tourism development in this region is hindered by the existence of the border, although the two countries are socio-culturally coherent. Although this border is practically non-existing (both countries belong to the EU), it still makes the realization of regional development goals harder.

Gössling and Mattsson (2002) analyzed whether farm tourism can be considered as a solution for a sustainable development, especially in remoted parts of Sweden. The authors focused on peripheral regions of Sweden suffering from structural problems such as low

employment opportunities, decrease in income and educational attainment, and reduction of other services. This analysis was survey-based and it involved farms from the northernmost regions and southernmost regions. Although it is admitted by the authors that farm tourism is a small-scale activity (only 0.6% of total number of farms in Sweden actually participate in tourism), and its contribution to the total income is minor (half of the farmers that were involved in the survey earned less than SEK 10,000 and SEK 5,000 in Skåne and Northern Sweden respectively), they found evidence that support previously posted question. The authors also provide a systematized list of advantages of farm tourism from sociocultural, economic, political and ecological perspective; however, many of these aspects are not validated empirically - they are based only on personal statements of the farmers.

Svels (2015) was studying the importance of World Heritage sites for tourism and local communities, while comparing Swedish and Finish case. Compared to Finland, it was found that the importance of World Heritage sites in Sweden was less important for regional development and tourism development in general.

One of the very few papers that were studying the impact of tourism on economic growth in Sweden was provided by Lundgren (2005). This study involved a panel data approach by applying the GMM estimation techniques to investigate the determinants of economic growth in 15 mountain municipalities of Sweden. The special focus was set on the forest industry, tourism sector and protected lands. However, the findings show that there is no significant effect of tourism on local growth, nor the other way around. Nevertheless, development of the Swedish national GDP is positively related to tourism, while the amount of protected areas is significantly related to tourism, with a weak negative impact (explained through restrictions imposed to business operations in those areas). The author argues that the decision of the Swedish government to increase the land protection areas would affect economic growth in those mountain regions that are suffering from decrease in population and net migration. Lundgren (2005) points out that local tourism employment is mainly determined by non-local factors and is not a driving force for local economic growth. His conclusion basically gives bigger weigh to forest industry over tourism.

Sweden is also known globally for its Right of Public Access (Allemansrätt)⁵, a right for public to have free access to countryside areas for walking, cycling, skiing and camping (with the exception of private gardens). This right is at times seen as a national trademark, being deeply rooted in the Swedish cultural heritage, and it presents a medium that enhances exploration of Swedish natural wonders, coast, archipelagoes and mountains. From the point of view of tourism entrepreneurs, the Right of Public Access is considered a success factor (Sandell and Fredman, 2010). Although increased levels of this type of activities might result in possible degradation of nature areas, the relevant literature shows that developed countries are suffering from less severe environmental impacts of tourism than developing countries (Cohen, 1978). However, new tourist areas, especially if followed by large-scale "transformational" projects, could produce more detrimental impact on the environment.

Moreover, it is generally recognized that regions with temperate climate are more successful in their development than tropical regions (Gallup and Sachs, 1998). This is explained through higher prevalence of different diseases, limited possibilities for production activities, and other factors. Moreover, another favored correlation between geography and economic development was noticed in the case of coastal regions that dispose of greater incomes than landlocked countries. After examining GDP per capita data, Gallup and Sachs (1998) found that almost all high-income countries are in the mid and high latitudes.

It is expected that the climate changes will affect tourism patterns. Namely, tourism industry is predicted to gradually move towards higher latitudes and altitudes destinations. Furthermore, it was found that the optimal holiday destination has an average temperature of $16.2 \pm 2 \times 0.5$ °C (Bigano *et al.*, 2006). The international tourism market is then expected to decrease worldwide due to climate change and global warming, but it seems that Sweden could benefit out of it. However, Gossling and Hall (2008) point out on estimates of emissions from tourism activities in Sweden (particularly through transport) and the necessity of integrating these emissions in climate policies. According to their research, emissions from tourism represent around 10% of total Swedish emissions.

⁵ Swedish Environmental Protection Agency, Naturvårdsverket: <http://www.swedishepa.se/Environmental-objectives-and-cooperation/Swedish-environmental-work/Work-areas/This-is-the-Right-of-Public-Access/>

Before continuing with the explanation of theoretical modelling and econometric analysis behind this study, in the following section we will first present some stylized facts about Sweden, its geography, economy and tourism sector.

3. Facts about Swedish Economy and Tourism Sector

Sweden is considered as one of the most successful developed economies in which tertiary and quaternary sectors of industry are dominant. At the beginning of the third millennium, it is characterized as service economy with the 7th highest GDP per capita in the world⁶.

Keeping its neutrality throughout the 20th century wars has enabled Sweden to become one of the top performers globally nowadays. Schön (2010, p.385) characterized the post-war period by the information (electronics) and transport revolution that accelerated after the 1970s. This phenomena was followed by the radical changes in business and market organization, but also in government`s position from economic point of view. These changes were reflected both internally and externally, especially since 1970s. On one hand, small local businesses gained the access to many new knowledge-based services and products. On the other hand, those businesses accepted globalization as a development concept which also allowed for stronger position of the private sector. Deep recession in the early 1990`s brought a need for a change within Swedish economy that was then restructured into a more flexible and competitive one. Nowadays, it is a country that boasts with results usually higher than the OECD averages, especially in terms of employment, social rights, inequality or wage dispersion (OECD publication⁷). Strong foundations of Swedish economy are set on solid fiscal and financial base and diverse business sector. Such an economy proved to be resilient during the latest global economic crisis. As a matter of fact, Sweden is one of very few countries that has the output now set at much higher level than the one before the crisis started in 2008.

However, productivity growth in Sweden has been sluggish in recent years. This can be explained by cyclical changes, but also through structural changes led by increasing share of

⁶ The World Bank measurement for the year 2014, based on the World Development Indicators Database.

⁷ OECD Economic Survey of Sweden, Overview, March 2015. Available at: <http://www.oecd.org/sweden/economic-survey-sweden.htm>

service sector. Moreover, educational results of Swedish students have been in constant decrease since 2003⁸. In the moment when it seems structural reforms are needed, tourism stands out as one of the sectors that supports policy makers around the world in overcoming macroeconomic problems that have arisen from the latest crisis (Tugcu, 2014).

Although direct contribution of travel and tourism to GDP was 2.7% of total GDP in 2013 and 3.9% of total employment⁹, Sweden can still be regarded as a relatively underdeveloped tourist destination that has not fully exploited its potential. This is also confirmed by the fact that out of 184 countries, Sweden is ranked as 151st country by growth of travel and tourism total contribution to GDP¹⁰. One of the possible explanations for this backwardness is the lack of fruitful coordination among country's main entities in charge of tourism development and promotion of Sweden as a tourism destination. Euromonitor publication on tourism in Sweden¹¹ suggests that tourism issues are tackled separately from general development and investment discussions, making the recognition of tourism sector harder. Another sign of tourism negligence is seen through the fact that there are no specific government funds aimed at tourism: the budget for tourism comes from the general budget of the Swedish Agency for Economic and Regional Growth and there are no tourism specific taxes (OECD Tourism Trends and Policies, 2014).

By virtue of its natural beauties, Sweden has a potential for becoming more successful tourist destination: there are many possibilities for hiking, fishing, skiing, etc. In addition, unique cultural heritage (reindeer-sled, ice-sculpturing, etc.) and attractiveness of its welfare state system across the globe help Sweden stand out in the fierce tourism destination competition.

According to the Swedish Agency for Economic and Regional Growth, export value of tourism has been increasing since the beginning of the 21st century and this resulted in an increase of its share in total exports of goods and services. Namely, by 2014 the share of tourism in total exports went from 2.9% to 5.5%. As such, in recent years tourism export value by far exceeds

⁸ Ibid.

⁹ World Travel and Tourism Council publication: Travel and Tourism, Economic Impact 2014, Sweden. Available at: <http://www.wttc.org/research/economic-research/economic-impact-analysis/country-reports/>

¹⁰ Ibid.

¹¹ Passport, Travel and Tourism in Sweden, Euromonitor International, July 2014, available at: <http://www.euromonitor.com/sweden>

the value of exports of other industries, i.e. iron and steel by nearly two times or car exports by nearly three times (Terpstra, 2011).

Sweden has seen a drop in employment levels in many traditional industries, as a consequence of post-industrialization and orientation towards service and ICT sectors. Along with the increase of tourism share in total exports, the number of people employed in tourism sector has also increased. This upward trend is presented in Table 1. As it can be observed, total number of employees in this sector had increased by almost 40% from 2005 until 2012. However, further tourism development may jeopardize the long run economic growth through increased need for the low-skill workers or the rise in wage inequality.

	2005	2006	2007	2008	2009	2010	2011	2012
Total	121.5	130.3	143.8	150.8	159.8	152.2	158.9	167.9
Accommodation services for visitors (hotels and similar establishments)	48.9	54.4	63.4	26.5	26.6	27.9	28.6	28.0
Food and beverage serving activities	39.1	42.9	38.7	41.1	45.7
Passenger transportation	16.3	16.9	17.5	17.3	18.1	19.1	19.1	19.7
Travel agencies and other reservation services activities	10.0	9.8	11.4	13.0	11.9	11.9	12.4	13.0
Other tourism industries	46.3	49.1	51.5	54.9	60.3	54.6	57.7	61.5

Table 1: Number of employees within tourism industry ('000)

Source: World Tourism Organization (2014), Compendium of Tourism Statistics dataset

3.1 Development of Tourism Policies, Relevant Education and Research

Bohlin *et al.* (2014) made a clear distinction in development of tourism policies in Sweden from 1930s onwards, through three periods that are related to the broader economic and political context: pre-Fordism, Fordistic period and post-Fordism. Pre-Fordism period of the Swedish economy started in the second half of the 19th century and in terms of tourism it involved regulation of travel and transport, and investment in infrastructure that was used for general purposes of the society. After the Great Depression, Sweden entered in the Fordistic period which was characterized by stabilization of economic growth. Once the society accumulated wealth, the emphasis was put on the well-being and creation of the welfare state. More detailed analysis of the policies and regulations related to the welfare state emergence in Sweden would be very interesting; however, this falls out of the scope of

work of this paper. Nevertheless, public policies related to tourism have deep roots in concepts of the Swedish welfare state (Bohlin *et al.*, 2014, p. 34). Clear classification of these three eras with respect to tourism related changes is given in Table 2.

Period	Tourism Production	Tourism Consumption	Tourism Regulation
Pre-Fordism, prior to 1930s	Small size companies Resorts and spas	Mainly by upper class	Very scarce, since tourism is still not seen as important activity
Fordism, 1930-1980	Summer villages Campsites	Mass tourism Social tourism Self-catering	Switch to regional level policies Introduction of vacation laws Establishment of state agencies
Post-Fordism, after 1980	Larger companies International capital Niche markets	Experience type products Impactful consumption Advanced IT products	Greater involvement of market solutions and private sector Decentralization of services

Table 2: Classification of different eras in Swedish tourism policy development
Source: Bohlin *et al.* (2014)

From the 1960s there was a clear increase in activities related to policies concerned with tourism and leisure. However, 1970s brought slowing down of the economic growth (seen in Figure 2) that was followed by the restructuring of the public-private relationship within economic policies. This era belongs to the post-Fordistic period and in tourism it is characterized with a shift from the public sector welfare provision to competition solutions in the market, achieved by step-by-step deregulation.

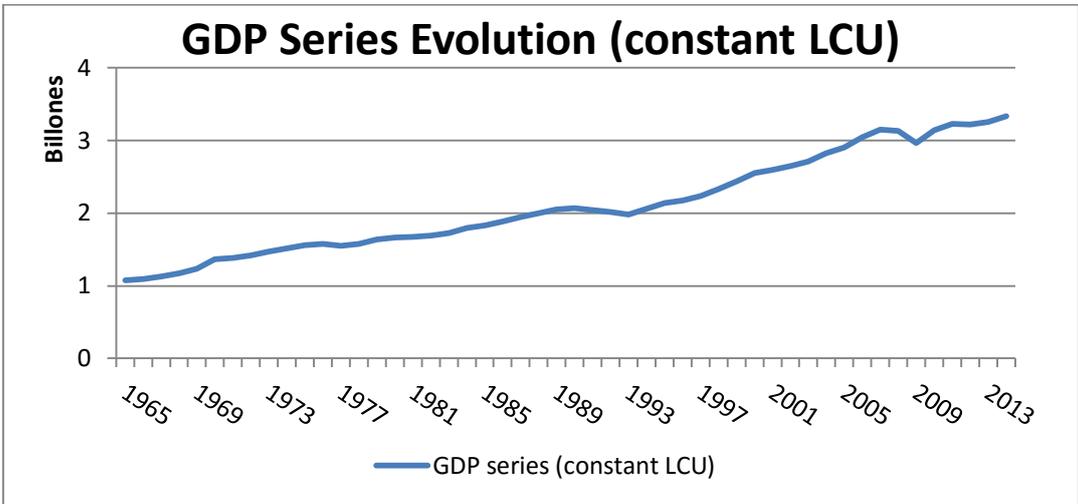


Figure 2: Evolution of the Swedish real GDP (in LCU) since 1965

After analyzing the development of tourism policies, it does not come as a surprise that tourism related education in Sweden was established relatively late in comparison to other modern economies. A valuable summary of development of tourism education was provided by Steene (2012). Namely, as Steene (2012) points out, tourism education started its development in the late 1970s. This is explained by the general opinion formed by both academia and politics already mentioned above: tourism was not considered to be a “job-creating activity” and as such, it was not contributing to the country's current account balance.

However, the first major step towards tourism industry consolidation was done in 1975 when the Swedish Government decided to establish a Tourism Council which would promote Sweden as a tourist destination (Regeringens proposition, 1975:9). In this sense, tourism was finally accepted as an important sector in the Swedish economy. By that time, Sweden was becoming known for winter tourism in the middle region of the country (for instance, Östersund and Borlänge), but also coastal tourism in more southern regions (Kalmar for example). Throughout the 1990`s official tourism and hotel management studies were established across the country as the public interest started increasing, and nowadays can be found on Bachelor and Master level.

In attempt to give tourism the appropriate research background, the Swedish government established the European Tourism Research Institute – ETOUR, backed up by the EU`s Structural Funds. This institute is exclusively dedicated to the research and transfer of knowledge in tourism, and it specializes in broad range of topics: destination development, experienced tourism (dealing with tourism innovations and customer satisfaction), nature and cultural resources. In addition to the work of this institute, Swedish tourism industry can rely on a Tourism Industry`s R & D Fund since 2009. However, the presence of a neglecting attitude towards tourism as a research field is still preventing the broader span of relevant studies (Steene, 2012).

At present, national tourism of Sweden is led by the Ministry of Enterprise, Energy and Communication within which it is the Swedish Agency for Economic and Regional Growth (Tillväxtverket) that is responsible for development of tourism related policies and initiatives (Terpstra, 2011). Furthermore, the agency is devoted to collection of tourism related

statistics and appropriate education development. In addition, partially state owned company VisitSweden AB (formerly the Swedish Travel and Tourism Council) is the one that is responsible for marketing activities in promoting Sweden as a tourism destination abroad.

Finally, it should be mentioned that Sweden was among the pioneers in the world when it comes to supporting and promoting eco-tourism. Namely, it was the second country in the world (following Australia) to introduce an eco-tourism charter (VisitSweden)¹². Furthermore, Sweden established the first eco-labeling system in Europe, "Nature`s best", with the goal of developing activities and establishing accommodations that are more environmentally friendly, based on responsible behaviour towards positive contribution to the environment, local people, their culture and business activities. Nowadays, eco-tourism in Sweden is organized and promoted by STF (Svenska Turistfoereningen).

3.2 Tourism Facts, the Latest Statistics and Figures

According to the survey performed by the Euromonitor International¹³, Sweden is perceived as a modern, child and environment friendly destination. However, as such, it is also competing for tourism dominance in Northern Europe with other neighboring countries: Denmark, Norway and Finland, with whom it shares similar natural beauties, climate, cultural and historic background, etc. Table 3 provides the SWOT analysis performed in this survey.

The following Figure 3 provides an insight into some of the indicators measured by the UNWTO: tourism openness measured as a ratio of inbound plus outbound tourism expenditure over GDP, carrying capacity measured as a ratio between arrivals and population, and inbound tourism expenditure over GDP (inbound tourism includes activities of a non-resident visitors within the country of reference¹⁴).

Sweden: SWOT analysis	
Strengths	Modern and progressive society, child friendly environment
Weaknesses	Expensive, cool climate
Opportunities	Ecotourism, gastronomy
Threats	The global economy, weak euro currency

*Table 3: SWOT analysis of Sweden`s tourism
Source: Euromonitor International*

¹² <http://www.visitsweden.com/sweden/Things-to-do/Nature--Outdoors/Eco-tourism/>
¹³ Passport, Travel and Tourism in Sweden, Euromonitor International, July 2014
¹⁴ UNWTO Basic Glossary: <http://media.unwto.org/en/content/understanding-tourism-basic-glossary>

Tourism related indicators, 2000-2012

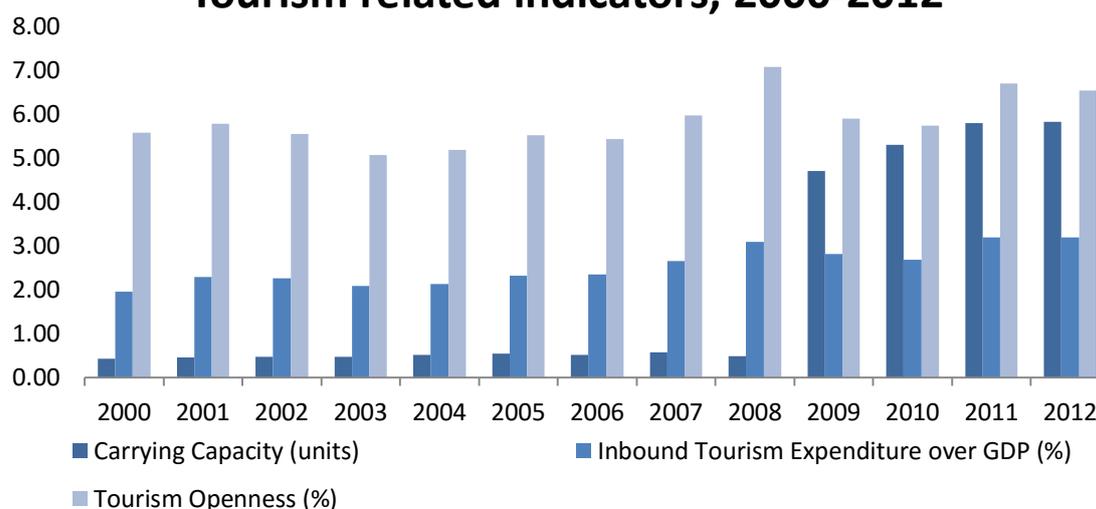


Figure 3: Indicators: carrying capacity, tourism openness and inbound tourism expenditure
Source: World Tourism Organization (2014), Compendium of Tourism Statistics dataset

In 2011, the Swedish Agency for Economic and Regional Growth (Tillväxtverket) started carrying out a national border survey - IBIS in order to gather information about foreign visits to Sweden. Their shares based on country of origin are shown in the Figure 4 from where we can conclude that the greatest number of visitors comes from the neighboring countries: Denmark, Norway and Finland. This was highly expected since visitors from these countries make large amount of same-day visits.

Origin of foreign visitors, 2011-2014

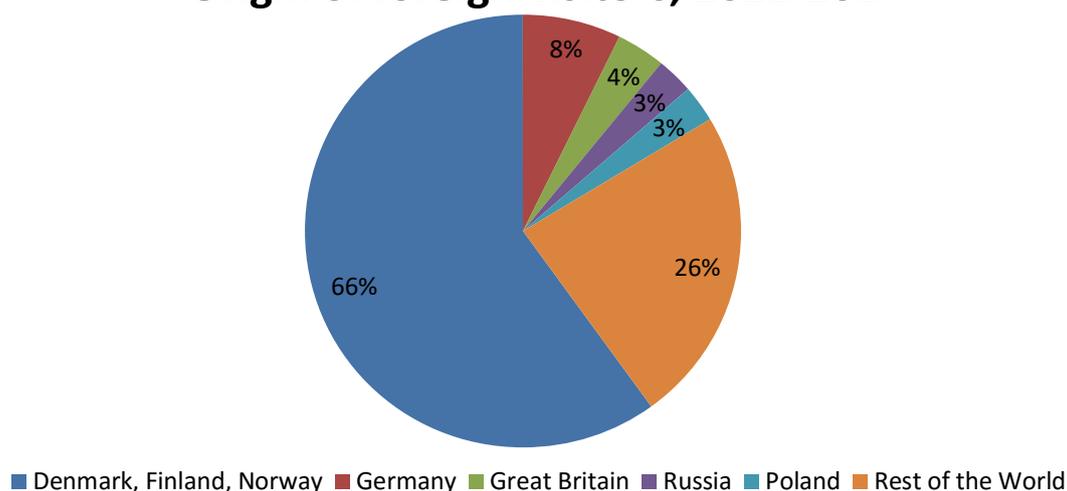


Figure 4: Share of foreign visitors by country of origin
Source: Swedish Border Survey IBIS 2014, Foreign visitors in Sweden¹⁵

¹⁵ IBIS 2014, inkommande besökare i Sverige, Rapport 0188 Rev A, found at: <http://www.tillvaxtverket.se/sidhuvud/englishpages/tourismindustryissuesandstatistics/swedishbordersurveyibis/ibis20112014.4.b5c1e11460ef4bead2eeb6.html>

According to the data provided by Tillväxtverket, in 2014 there were in total 56,593,860 guest nights realized in Sweden and their geographical dispersion can be observed in the Figure 5. Around 21% was realized in Stockholm country which also recieved the largest number of visits (7.4 million). Västra Götalands followed with 16% and 5 million visits; and Skåne with around 9% and 4.6 million visits. This ranking follows the counties in which the three biggest cities of Sweden are: Stockholm, Gothenburg and Malmö, respectively.

Number of guest nights per county in 2014

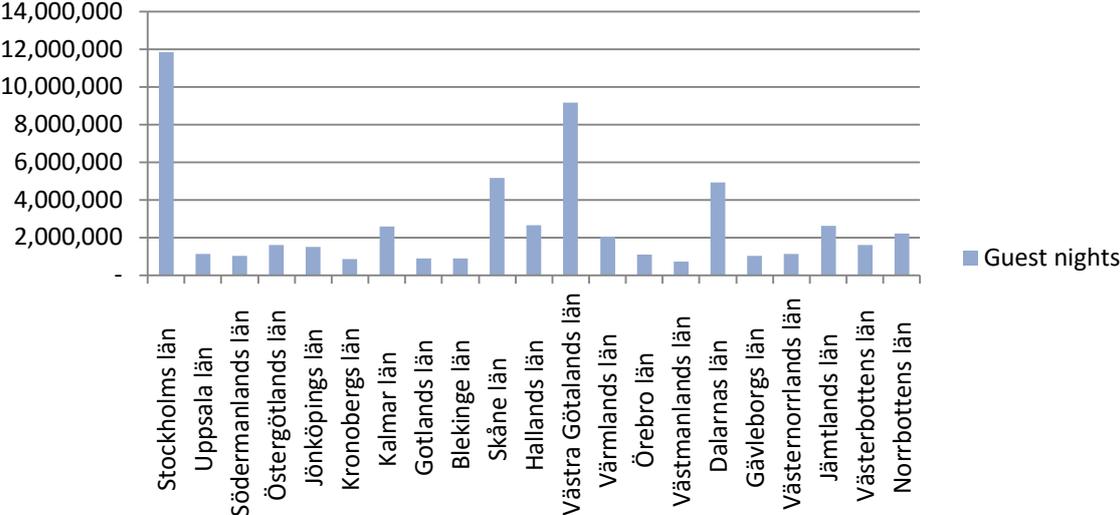


Figure 5: Number of guest nights per county in 2014

Source: Swedish Agency for Economic and Regional Growth (Tillväxtverket)

When it comes to the level of spending by international tourists (the so called visitor exports), this indicator has more than doubled in the last two decades (see Figure 6). In 2014, Sweden was ranked at 23rd place in the world (WTTC Economic Impact Survey).

Visitor Exports

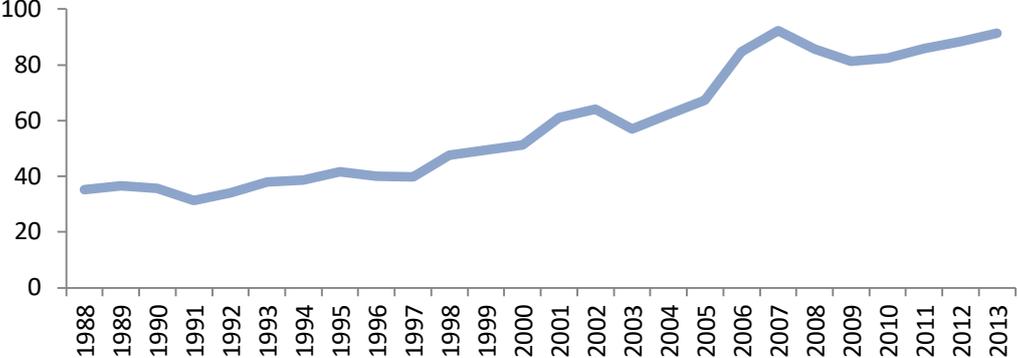


Figure 6: Foreign spendings in billions of LCU (real prices), 1988-2013

Source: World Travel and Tourism Council

3.3 Geographical division

Territory of Sweden is divided into 3 lands and 8 national areas¹⁶ which are further divided into administrative and political subdivisions - *counties* (in Swedish: *län*). There are 21 counties in total. In the following Table 4, general characteristics of those counties are given.

	County	Population	Land area (km ²)	Water area - inland and sea (km ²)	Value added – accommodation facilities ¹⁷ (mill.SEK)
1	Stockholms	2 198 044	6,526	10,015	4542
2	Uppsala	348 942	8,192	3,748	331
3	Södermanlands	280 666	6,076	2,620	286
4	Östergötlands	442 105	10,545	4,032	426
5	Jönköpings	344 262	10,438	1,255	411
6	Kronobergs	189 128	8,425	960	215
7	Kalmar	235 598	11,166	9,331	377
8	Gotlands	57 255	3,134	12,107	174
9	Blekinge	154 157	2,931	4,001	153
10	Skåne	1 288 908	10,969	6,065	1397
11	Hallands	310 665	5,427	3,284	491
12	Västra Götalands	1 632 012	23,797	10,538	2313
13	Värmlands	274 691	17,517	4,272	319
14	Örebro	288 150	8,504	1,129	254
15	Västmanlands	261 703	5,118	541	184
16	Dalarnas	278 903	28,030	2,193	538
17	Gävleborgs	279 991	18,119	6,880	254
18	Västernorrlands	243 061	21,552	6,444	245
19	Jämtlands	126 765	48,945	4,808	397
20	Västerbottens	262 362	54,672	12,059	318
21	Norrbottnens	249 987	97,257	14,825	628
Total	Sweden	9,747,355	407,340	121,108	14251

Table 4: Basic characteristics of Swedish counties

Source: Statistics Sweden

At this level, county councils and county administrative boards (government bodies in the counties) are responsible for regional planning, provision of health services, education, support to the business sector and public transportation¹⁸. In recent years, most of the county councils and regions have initiated different types of cooperation for more effective regional development.

¹⁶ Complete geographical division, followed by a map of counties is given in Appendix 1

¹⁷ Value added averaged for the period 2007-2013 for hotels, holiday villages, youth hostels, holiday cottages, camping sites etc.

¹⁸ Information provided by the Government Offices of Sweden (Regeringskansliet): <http://www.regeringen.se/>

4. Empirical Model and Data

4.1 Empirical model

The literature concerned with the estimation of growth models is extensive and there is no single right model to use. However, in the existing tourism literature most of the models suggest including physical capital and human capital formation, major forces behind economic growth (Gökovali and Bahar, 2006), followed by tourism as a growth explanatory variable. The model specification in this research will include these core determinants of growth and it will be based on a growth model similar to the Solow growth model (Solow, 1956; Mankiw *et al.*, 1992) with neoclassical Cobb-Douglas aggregate production function defined as a function of capital and labor:

$$Y(t) = F[K(t), L(t)] = K(t)^\alpha L(t)^{1-\alpha}$$

Barro and Sala-i-Martin (2004) suggest using standard empirical growth model augmented with extra variable which we assume to be determined within local economy. Therefore, our starting point in investigating the impact of tourism on economic growth includes the essential variables - physical and human capital approximations; however, we will also incorporate tourism as a growth determinant to test the hypothesis of its positive contribution to economic growth:

$$Y_{it} = F[K_{it}, H_{it}, T_{it}]$$

Lundgren (2005) argues that measuring economic growth in a region is hard due to the problem of choosing the best measure: total per capita income from employment or per capita gross regional product (GRP) which is measured as value added. Employment income measures income of municipality residents, while GRP measures value added for the firms in the region. In this study, we employ per capita gross regional product as the appropriate measure for regional economic activity.

Discussion about the right measurement of human capital is also very extensive. Most of the existing literature uses estimates of educational attainment as a proxy for human capital (Barro and Lee, 1993), or public expenditure on education as the percentage of GNP (Eugenio-Martin *et al.*, 2004). Lately, new measurement has been promoted by UNESCO ,

school life expectancy (SLE)¹⁹. It is worth mentioning that Sweden is among the highest ranked countries when it comes to SLE (in 2013, SLE was estimated at 18 years). Based on this fact, it was decided that in this study we will exploit the data on the number of people enrolled in postgraduate studies as a measurement for human capital variable.

With respect to tourism variable, many different formulations have been used in constructing the growth equation (Gunduz and Hatemi, 2005). One alternative is real expenditure in tourism (Brida *et al.*, 2010) or tourism receipts; another is the number of nights spent by international visitors. Eugenio-Martin *et al.* (2004) opted for the rate of growth of tourists per capita. Holzner (2011) used tourism capital stock (the share of travel services exports in GDP) although stressing out that possibly the best solution would be to use the number of star rated hotels or number of natural attractions as a proxy for tourism. However, this study makes use of regional accounts, namely the data on total revenue of all types of accommodation facilities (hotels, holiday villages and youth hostels).

Therefore, the model to be estimated includes regional GDP per capita, net investment in infrastructure as a proxy for physical capital formation, number of people enrolled in postgraduate education as a human capital proxy, tourism revenues by county as explanatory variables for the growth of regional GDP. Therefore, the basic model would be:

$$GDP = \beta_0 + \beta_1 Physical\ Capital + \beta_2 Human\ Capital + \beta_3 Tourism + \beta_4 X' + u$$

X' is a vector of other covariates that have been used in the tourism literature: real exchange rate, government liabilities and trade openness. Exchange rate measures the effective prices of goods and services in competing tourism destination countries (Dritsakis, 2004). Following Eugenio-Martin *et al.* (2004) and Sequeira and Nunes (2008) who include government consumption measured as the percentage of output in their growth equation, we decide to include current liabilities as an explanatory variable. Using trade intensity ratio as a measure of openness provides us with a proxy for other policy or institutional variables that have an independent effect on growth (Rodriguez and Rodrik, 2000). Finally, u is the error term. The main focus of the remaining discussion will be on the tourism coefficient β_3 , where we will try to capture the effect of tourism on economic growth.

¹⁹ The CIA World Factbook provides the following definition of SLE: the total number of years of schooling (primary to tertiary) that a child can expect to receive based on the current enrolment ratio. Available at: <https://www.cia.gov/library/publications/the-world-factbook/fields/2205.html>

The scatter plot of the relationship between our data for regional GDP and tourism is shown in Figure 7. Positive trend indicates positive relationship between the two variables. Complete pairwise correlation matrix is given in Appendix 2 where the correlation coefficient explains the extent to which a value of one variable can be guessed given a value of the other variable (no coefficients above 0.7).

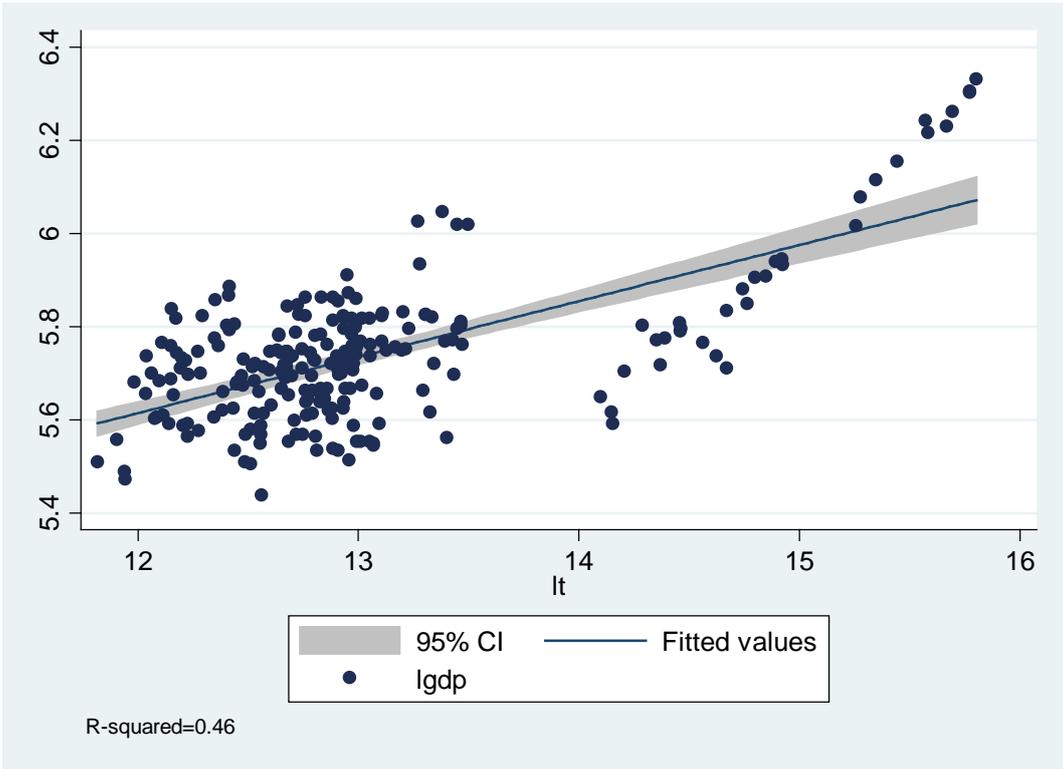


Figure 7: Positive correlation between GDP per capita and tourism development

4.2 The data

The data set used in this research is a panel made up of 21 counties in Sweden and 11 years beginning from 2003 to 2013. Most of the variables in the following analysis are county specific, but that does not imply that they cannot be affected by factors outside the counties (national policies).

In this analysis, economic growth was measured through county's equivalent to a country's gross domestic product called Regional Gross Domestic Product (GDPR), obtained from Statistics Sweden. Estimated from the production side, regional GDP is officially defined as the aggregate of value added in a region and its summation across all the regions equals to the GDP of the nation.

The proxy for physical capital formation is net investments in infrastructure, security, etc. per resident. This data was provided by Local Government database (Kommun- och landstingsdatabasen²⁰). Unfortunately, data for gross fixed capital formation was not available on a county level.

Human capital formation is presented through the number of people attending post-graduate education, obtained from Statistics Sweden. Although additional measure, number of people enrolled in higher education (first and second cycle studies), was also used, it did not change the results in any significant way. Therefore, the reported results in Section 5 are based on the first alternative.

Tourism development data was provided by Swedish Agency for Economic and Regional Growth, namely the data on total revenue of all types of accommodation facilities (hotels, holiday villages and youth hostels).

Government debt proxy was expressed through current liabilities of counties per resident – the liabilities due to payment within one year. This data was also provided by Local Government database. Trade intensity ratio was obtained through data provided in World Development Indicators Database, by summing imports and exports of goods and services, and dividing by GNI. The yearly averaged exchange rate between Swedish krona and Euro was obtained from the European Central Bank. All the units are expressed in Swedish kronas.

All the variables are expressed in natural logarithms so that elasticities can be determined. However, in the case of the exchange rate and trade intensity ratio data on Sweden as a whole was used, so for those variables only annual variation in data was possible. Descriptive statistics for all the variables in our model can be found in Appendix 2.

4.3 Estimation techniques

Panel data approaches, where the same cross-sectional units are followed over time (Wooldridge, 2009), have become inevitable for policy analyses. Panel data consists of repeated measures of individuals i over time t and as such it allows for more enhanced models and estimation methods. In our case, “counties” represent the entities or panels (i),

²⁰ Kommun- och landstingsdatabasen, available at: www.kolada.se

“year” represents the time variable (t) and our panel is characterized as short: data on more individual units than time periods. Our panel dataset is characterized as ideal - “strongly balanced” since all the counties have the data for the whole time period observed. In other words, our dataset has no missing values. Finally, the following model examines the impact of tourism on regional GDP in a panel dataset of 21 counties and 11 years (2003-2013):

$$GDP_{it} = \beta_0 + \beta_1 NetInvestments_{it} + \beta_2 Education_{it} + \beta_3 Tourism_{it} + \beta_4 X_{it} + \varepsilon_{it}$$

Estimating this equation might lead to several problems:

1) The issue of endogeneity usually arises in growth related models such as ours. Our tourism variable $Tourism_{it}$ is assumed to be endogenous. In other words, we suspect that it is correlated with the error term. One reason to suspect this is the possibility of omitted variables in our model, for instance risk of certain diseases, quality of institutions or level of political stability, which affect both economic growth and tourism (the relevant issue in this sense would be data unavailability). Another problem might result from its correlation with physical capital, human capital or from reverse causality: existence of bi-directional causality - from tourism to GDP growth, or from GDP growth to tourism.

2) Some other characteristics that are unobserved for researchers and that are correlated with the explanatory variables might exist. Those time-invariant characteristics, such as geography, climate, culture, demographics, distance to the top outbound tourism destinations, etc. are called fixed effects and are incorporated in the error term of the initial equation. Therefore, the error term is formed out of the unobserved country-specific effect α_i and the observation-specific error v_{it} .

$$\varepsilon_{it} = \alpha_i + v_{it}$$

3) It is often not possible nor realistic to treat the explanatory variable as given or exogenous due to statistical or economic reasons (Verbeek, 2012). The usual examples of these cases, other than endogeneity of regressors, include: measurement errors in independent variables, their simultaneity, or situation where there is a lagged dependent variable among explanatory variables which results in autocorrelation in the error term. All these examples ask for approaches and estimators different from OLS, since correlation between the explanatory variable and error term results in a biased and inconsistent OLS estimator.

Five different estimation methods will be considered in the continuation: pooled OLS, first differencing (FD), fixed effects (FE), instrumental variable (IV) and differenced GMM. The first step in the panel data estimation is to perform an ordinary least squares regression on the pooled data. In order to briefly explain the theoretical approach, we start with the following generalized framework:

$$Y_{it} = \beta_0 + \beta_1 \text{Tourism} + \beta' X'_{it} + \varepsilon_{it}$$

where our main assumption is that β_0 and β_1 are the same for all i and t while regressors can be time-invariant, individual-invariant or vary over both i and t . However, pooled OLS estimation requires assuming that the error term is uncorrelated with the explanatory variables, but when dealing with panel data one of the basic considerations is that errors are correlated. Therefore, since $\text{corr}(\text{Tourism}_{it}, \varepsilon_{it}) \neq 0$, OLS does not give us the causal effect. Furthermore, as it was already mentioned, the error term can be presented in the following way:

$$\varepsilon_{it} = \alpha_i + v_{it}$$

where α_i represents the fixed effect (or time invariant unobserved effect) that is by all means correlated with the explanatory variables. This results in biased and inconsistent pooled OLS estimator.

A possible solution to deal with endogeneity of *Tourism* variable, or the fact that $\text{corr}(\text{Tourism}_{it}, \varepsilon_{it}) \neq 0$, would be to use instrumental variable approach in panel data setting by using the lagged value(s) of the endogenous variable. IV method would allow estimation of consistent parameter even with the presence of endogenous variable(s)²¹. However, in order for this to be true, it is necessary (and challenging) to find an instrument that shows the following characteristics:

- An instrument is an exogenous variable that is assumed to be uncorrelated with the error term ε_{it} – Exclusion restriction
- An instrument is correlated with the endogenous regressor (*Tourism*) – Relevance condition

The first restriction cannot be tested directly, which is why we need to rely on economic theory and logical assumptions. Since we want to instrument *Tourism* with its lagged values, we assume that $\text{corr}(\text{Tourism}_{i,t-1}, \varepsilon_{it}) = 0$. Therefore, tourism from the previous period should

²¹ For more detailed explanation of the IV method, see Wooldridge (2009) or Verbeek (2012)

only affect economic growth today through tourism today.

The relevance condition is tested during the first stage 2SLS regression by checking the value of the F statistics. The reduced form or the first stage equation in our case is:

$$Tourism_{it} = \pi_0 + \pi_1 Tourism_{i,t-1} + \pi_2 Physical_{it} + \pi_3 Human_{it} + \pi_4 X' + v_{it}$$

The rule of thumb is that if the first-stage F statistics is larger than 10 (Stock *et al.*, 2002) then we have a good, strong instrument. In other words, if this is not the case, the instrument is weak and irrelevant, making our results biased. Furthermore, standard econometric procedure suggests performing Sargan's test of overidentifying restrictions (Sargan, 1958) once we have valid instrument(s). This test checks whether an explanatory variable is actually endogenous (uncorrelated with the error term) and whether our equation is well specified.

Although consistent IV estimator would give us the causal effect of tourism on economic growth, given the validity of the before mentioned assumptions, there are other methods that would increase the efficiency of the estimated parameters. Diversity of panel methods allows us to control for time invariant unobserved features of entities we are interested in and that we think could be correlated with the explanatory variables of our model. It is possible to deal with the unobserved effects by performing a pooled OLS analysis on the differenced data, under condition that we have more than two time periods in our data set (Wooldridge, 2009). This estimation is called first differences and it results in losing one observation per each county due to differentiating and all the variables that are constant over time. First differences estimation applies OLS to the first differenced data in the following way:

$$(Y_{it} - Y_{i,t-1}) = \beta(X_{it} - X_{i,t-1}) + (v_{it} - v_{i,t-1}), \quad t = 1, 2, \dots, N$$

However, this approach requires already mentioned assumptions (homoscedasticity and uncorrelated differenced errors, $\text{corr}(\Delta X_{it}, \Delta v_{it})=0$) in order to be able to rely on the usual t and F statistics and obtain causal effect. Therefore, following the existing literature on panel data estimation strategies, the next step was to estimate the model by using fixed effects (or within) estimation. Fixed effect method performs regression in deviations from individual

means (Verbeek, 2012) and it eliminates α_i (the assumption is that α_i is correlated with one or more of the explanatory variables) by doing so:

$$(Y_{it} - \bar{Y}_i) = \beta(X_{it} - \bar{X}_i) + (v_{it} - \bar{v}_i)$$

Within this framework, any time-invariant explanatory variable is again dropped from the analysis. On contrary, random effects model assumes that α_i is actually uncorrelated with each variable and for every time period (Wooldridge, 2009). Therefore, the random effect estimation is more appropriate if our data is randomly drawn from a large population. As suspected, the fixed effect estimation was chosen over random effects method although the latter is more efficient. This was decided after performing the Hausman test proposed by Hausman (1978) which in this case tests for statistical significant differences in the FE and RE coefficients on the time-varying explanatory variables (Wooldridge, 2009). In the case of large N and small T, the choice between FD and FE comes down to the relative efficiency: the FE estimator is more efficient when the idiosyncratic (or time-varying) errors are serially uncorrelated. This assumption is called the strict exogeneity assumption and it implies that v_{it} and x_{it} are not correlated. In practice, this assumption is often violated (we talked previously about the possible channels that make the tourism variable endogenous in our model) leading to inconsistent pooled OLS, FD and FE estimators. Moreover, admittedly, some of the exogenous variables are “quasi”-exogenous, in other words, they could very well be defined as endogenous (for instance, net investment or trade). However, any problem with endogeneity is assumed to vanish if we incorporate previous period (lagged) values of these variables into our econometric analysis.

An important break of the strict exogeneity assumption ($\text{corr}(v_{it}, x_{it})=0$) comes from introducing the lagged dependent variable into the model, turning it into a dynamic specification. Linear dynamic model comprises of regressors that include lagged dependent variable in the following way:

$$Y_{it} = \gamma Y_{i,t-1} + \beta X_{i,t} + \alpha_i + \varepsilon_{it}$$

In other words, in a case of dynamic panel models with individual specific effects, y_{it} is regressed on lags of y_{it} . In this case, autocorrelation is present due to the fact that we have included the lagged dependent variable $y_{i,t-1}$. Since y_{it} is serially correlated over time that

leads to a conclusion that FE estimation would result in inconsistent estimator. Therefore, the existing literature suggests using Arellano-Bond estimator (Arellano and Bond, 1991) Differenced GMM estimator which will be used as a robustness check to affirm previous estimation results and will also increase the efficiency of our tourism estimator (Holzner, 2011; Lundgren, 2005; Eugenio-Martin *et al.*, 2004; and others).

In order to eliminate fixed effects α_i this estimator uses first-differences in the following manner:

$$(Y_{it} - Y_{i,t-1}) = \gamma(Y_{i,t-1} - Y_{i,t-2}) + \beta(X'_{it} - X'_{i,t-1}) + (\varepsilon_{it} - \varepsilon_{i,t-1})$$

Since $(y_{i,t-1} - y_{i,t-2})$ is correlated with $(\varepsilon_{it} - \varepsilon_{i,t-1})$, OLS estimation would lead to biased results. However, $y_{i,t-2}$ is not correlated with $(\varepsilon_{it} - \varepsilon_{i,t-1})$ and therefore can be used as an instrument for $(y_{i,t-1} - y_{i,t-2})$. This is the core assumption behind the “GMM style” estimation. This Differenced GMM estimator uses all available moment conditions in which the instruments for the first-differenced equation are values of the dependent variable lagged two or more periods, and first differences of the exogenous variables. This makes the endogenous variables pre-determined and, therefore, not correlated with the error term (Verbeek, 2012). The dynamic model we will estimate is the following:

$$\begin{aligned} \Delta \ln GDP_{it} = & \beta_1 \Delta \ln GDP_{i,t-1} + \beta_2 \Delta \ln Tourism_{it} + \beta_3 \Delta \ln Investments_{it} \\ & + \beta_4 \Delta \ln Education_{it} + \beta_5 \Delta \ln Debt_{it} + \beta_6 \Delta \ln ExchangeRate_{it} \\ & + \beta_7 \Delta \ln Openness_{it} + \beta_8 \Delta d_{2008} + \Delta \varepsilon_{it} \end{aligned}$$

Note that addition of time periods increases the level of over identification (since the number of parameters to be estimated remains the same), and this usually increases the efficiency of the resulting estimator. Consistency of this Arellano-Bond estimator will depend on whether lagged values of the endogenous and exogenous variables are valid instruments in our regression (Garín-Muñoz and Montero-Martín, 2007)²². Along with already used variables, we add to this model a dummy variable d_{2008} to account for the effects of the global financial crisis.

²² For more detailed theoretical background of GMM estimators, consult Verbeek (2012) or Cameron and Trivedi (2009).

Post-estimation tools available in most of the statistical software packages allow us to test for serial correlation in the first-differenced residuals (this methodology assumes no second-order autocorrelation) and test the validity of the overidentifying restrictions (Sargan test derived by Arellano and Bond, 1991).

Improved version of the first-difference GMM estimator is the so-called system GMM estimator (Blundell and Bond, 1998). However, the usage of this more sophisticated system GMM estimator is beyond the scope of this research and it will be left for consideration in future research.

5. Results

In the previous subsection, we mentioned the five different methods applied in this research. We apply static panel data approaches: pooled OLS, fixed effects, first differencing and instrumental variable approach. Finally, we apply the first-differenced GMM estimation technique to the dynamic Solow growth model and then compare the results with the other panel data approaches.

First of all, since homogeneity of the variance of results is one of the main assumptions when performing OLS estimation, it is necessary to check for heteroscedasticity. This is done by plotting residuals against the fitted values to check for the existence of certain patterns:

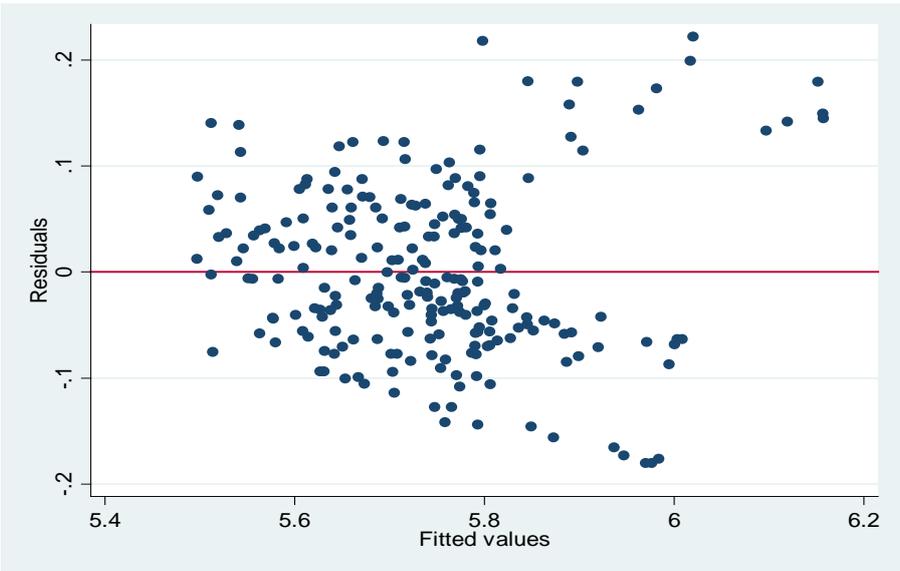


Figure 8: Residuals Vs. Fitted values

From Figure 8 we can conclude that there is an indication of heteroscedasticity which means that default OLS standard errors are not correct (Cameron and Trivedi, 2009). In order to confirm this, we follow suggestions of Cameron and Trivedi (2009) and perform Information matrix (IM) test and Breusch-Pagan Lagrange multiplier test that both test the null hypothesis of no heteroscedasticity. Since both tests reject the null hypothesis (both p-values are 0.000), there is a strong evidence of heteroscedasticity. Therefore, we performed estimations with robust standard errors to correct for this.

Since the regression model estimates of the coefficients may become unstable if two or more explanatory variables are (almost) perfect linear combination of one another (this situation is called collinearity), we also checked for multicollinearity by computing the variance inflation factor (VIF). In brief, VIF tells us about the extent to which the standard error of a certain coefficient had been inflated upwards compared to the value it would have in the case of no collinearity. A rule of thumb is that multicollinearity is present if VIF values is higher than 10 (O'Brien, 2007). The following Table 5 shows that our analysis did not suffer from this problem and that our model did not consist of redundant variables.

Variable	VIF	1/VIF
Tourism	2.98	0.335492
Investment	1.49	0.670360
Education	2.91	0.343548
Trade	1.77	0.566316
Debt	1.48	0.677594
Exchange Rate	1.22	0.819161
Mean VIF	1.97	

Table 5: Variance inflation factor values

Table 6 presents regression results from our static growth estimations. Time dummies are included to control for time specific effects in each county. The results for the pooled ordinary least squares (OLS) regression (columns 1 and 2) and RE (column 3) are reported for comparison purposes with respect to other models. Previously in Section 4, we pointed out that the FE model was selected over RE by the Hausman test. The results reveal that all the core estimates (for tourism, physical and human capital proxies) are in line with expectations: they positively contribute to economic growth.

Nevertheless, FE estimator produces a significant change of the magnitude of the tourism coefficient. However, the most striking change in FE estimation is seen for the exchange rate where the sign changes from negative (indicating that a stronger exchange rate is a sign of economic strength) to positive. In addition, FD estimator changes the sign of the municipal debt variable from positive to negative. However, the empirical results from the existing literature show ambiguous results when it comes to relationship between debt and economic growth.

Table 6: Pooled OLS, Random Effects, Fixed Effects, First Differences estimation results

Dependent variable:	GDP per capita (log)			GDP per capita (diff)		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	OLS	OLS	RE	FE	FD	FD
Tourism	0.084** (0.035)	0.089** (0.039)	0.093*** (0.029)	0.157*** (0.027)	0.046 (0.029)	0.055** (0.025)
Net investments	0.117*** (0.023)	0.041 (0.027)	0.002 (0.007)	0.009 (0.007)	0.007 (0.005)	0.007 (0.005)
Education	0.015 (0.017)	0.014 (0.016)	0.021 (0.016)	0.202*** (0.044)	0.230* (0.134)	0.189 (0.134)
Municipal debt		0.156 (0.104)	0.039 (0.038)	0.007 (0.019)	-0.049* (0.029)	-0.055* (0.031)
Exchange rate		-1.909*** (0.658)	-2.912*** (0.390)	0.151*** (0.038)	-0.077 (0.105)	
Openness		0.250 (0.249)	0.405*** (0.143)	0.967*** (0.094)	0.609*** (0.110)	0.669*** (0.123)
Time dummies	No	Yes	Yes	Yes	Yes	Yes
Constant	3.793*** (0.456)	24.552*** (8.004)	37.235*** (4.702)	0.567 (0.556)	0.009* (0.005)	0.011** (0.005)
Observations	229	229	229	229	208	208
R-squared	0.588	0.723		0.889	0.463	0.461

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Considerable variation of the tourism coefficients between FE and FD is probably a sign of endogeneity (Wooldridge, 2001). Therefore, we proceed with instrumental variable approach as one of the most common ways of dealing with the issue of endogeneity. Table 7 shows the results of fixed effects (within) IV regressions with the first and the second lag of tourism variable as an instrument for endogenous tourism. The first stage F statistics was higher than

10 in both estimations (51.17 and 48.31 respectively) which, by rule of thumb, confirms that our instrument is good. Moreover, since we used the lagged values as instruments, there was a high correlation between lags and current tourism variable.

Table 7: Estimation results for within IV regression

Dependent variable:	GDP per capita	
	(1)	(2)
VARIABLES	IV-lag1	IV-lag2
Tourism	0.165* (0.096)	0.176 (0.122)
Net investments	0.009 (0.007)	0.009 (0.007)
Education	0.208*** (0.050)	0.204*** (0.058)
Municipal debt	0.012 (0.049)	0.008 (0.055)
Exchange rate	0.124 (0.086)	0.133 (0.105)
Openness	0.904*** (0.086)	0.908*** (0.092)
Constant	0.674 (1.603)	0.501 (2.009)
Observations	228	227
F statistics	51.17	48.31
Number of counties	21	21

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Focusing on the coefficient of interest, we may observe that tourism proves to be positive and significant when instrumented with the first lag. However, once we use the second lag as an instrument, tourism remains positive and its magnitude change is quite modest, but it loses significance. This result is somewhat anticipated, since two years might seem like a long period for tourism variable to effectively determine its current value.

In order to perform a sort of robustness check, and in compliance with the econometric literature, we proceed by including dynamics in our model (described in the previous section). Consequently, the results of differenced GMM estimator of Arellano and Bond are presented in Table 8. This method allowed us to estimate ceteris paribus effects of tourism in the pres-

ence of endogeneity, similar to any other proper instrument usage. Initially, the growth model was estimated using the one-step GMM estimator with one lagged dependent variable. However, Sargan test shows that in this case we have overidentifying issues ($p=0.000$) which is why we turn to estimating more appropriate two-step GMM. Now Sargan test rejects H_0 ($p=0.2890$) confirming that we do not have problems with our instruments. Post-estimation tools available in most of the statistical software packages also allow us to test for serial correlation in the first-differenced residuals (this methodology assumes no second-order autocorrelation) and test the validity of the overidentifying restrictions (Sargan test derived by Arellano and Bond, 1991). Arellano and Bond test confirms that our model specification is good since we fail to reject the null hypothesis of no serial correlation at the second order at 5% significance level (p value= 0.0718).

Results from Column 2 corroborate that this model performs convincingly: signs and magnitudes of the coefficients seem to be theoretically reasonable and significant²³. The form of the model allows us to interpret the parameters as elasticities. In contrast to the results obtained by Lundgren (2005) where tourism is positive, but not significant, our estimated parameters are significant, positive and robust throughout different estimations²⁴. Therefore, we can deduce that a 10 per cent increase in tourism revenues on average increases economic growth in Sweden by 0.9 per cent.

Using this modelling approach allows us to estimate the coefficient of the lagged value of GDP per capita, indicating to what extent current GDP is determined by the value of previous GDP. More importantly, estimated parameter is negative that leads to conclusion that there is convergence among the counties in Sweden: those counties that initially had a lower level of output per capita grew at a faster pace during the observed period (Lundgren, 2005).

According to the expectations based on the previous empirical research, physical and human capital formation proxies are positive and significant. Similar is true for the openness coefficient whose significance is supported by majority of the empirical studies on openness and growth. Positive and significant coefficient of the exchange rate implies that devaluation of

²³ Garín-Muñoz and Montero-Martín (2007) note that the estimated coefficients are short-run elasticities that need to be transformed in order to obtain long-run elasticities (by dividing each of the coefficients by $(1-\beta_1)$, β_1 being the estimated parameter of $GDP_{i,t-1}$).

²⁴ STATA v.11 econometric software was used to obtain all the estimators.

Swedish krona causes a boost for economic growth. This is explained through “cheaper exports - more expensive import” mechanism that creates additional domestic demand which, in turn, increases economic growth. Moreover, the level of municipal current liabilities is negatively correlated with growth. Finally, the coefficient for dummy variable that reflects the impact of global financial crisis in 2008 shows a negative sign and it is significant for economic growth change.

In summary, the findings of this study consistently reveal that tourism receipts affect economic growth and, consequently, give support to the tourism-led growth hypothesis in Sweden.

Table 8: First-difference GMM estimation results

Dependent variable	GDP per capita	
	(1)	(2)
VARIABLES	GMM One-step estimator	GMM Two-step estimator
$GDP_{i,t-1}$	-0.191*** (0.073)	-0.164*** (0.033)
Tourism	0.095*** (0.037)	0.090*** (0.019)
Net investments	0.011 (0.007)	0.008** (0.003)
Education	0.432*** (0.066)	0.450*** (0.050)
Municipal debt	-0.051 (0.037)	-0.053*** (0.019)
Exchange rate	0.218*** (0.061)	0.181*** (0.039)
Openness	1.060*** (0.131)	0.997*** (0.106)
Dummy 2008	-0.013 (0.009)	-0.012*** (0.003)
Constant	0.610 (0.709)	0.885** (0.358)
Observations	188	188
Number of counties	21	21
Sargan test	72.7493*** 0.0000	18.6176 0.289

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6. Conclusions

Sweden has been one of the world's top economic performers in recent years. The growth of tourism has been noted in the last decades, but despite boasting with amazing potentials and natural diversity, Sweden has still not developed its tourism sector accordingly.

In general, the power of tourism is often neglected, especially its power in stimulating local economies. Tourism not only represents a source of income coming from foreign guests, but it also supplies local economies with great number of jobs. Moreover, these jobs are mainly entry level jobs, and could help solving employment difficulties of low-skilled youth and disadvantaged groups. In addition, existence of tourism related activities does matter for smaller communities since it can provide help in overcoming the gap resulting from decline in manufacturing sector.

In this paper we have studied the effects of tourism sector on economic growth, based on regional data for 21 counties in Sweden, from Kiruna to the north to Scania to the south. We used both static and dynamic panel estimation techniques, namely pooled OLS, fixed effects, first differences and first-difference GMM estimation techniques. We find that estimated tourism coefficient remains positive and significant throughout most of the estimations.

The purpose of this study was to provide empirical results that might serve as a guideline for policy makers and provide an orientation for future investments in tourism. It was shown that, if adequately guided, tourism can have a great impact on GDP: a 10 per cent increase in tourism revenues on average increases economic growth in Sweden by 0.9 per cent. What these results show is that governments interested in expanding their tourism sector will consequently contribute to overall levels of regional economic development.

A suggested (alternative) approach for further research would be to make use of time series properties and vector auto-regression methods, which, to our knowledge, has not been done for Swedish case. Furthermore, with increasing availability of relevant data, it would be possible to use other type of data as a proxy for tourism, such as number of establishments, bedrooms and bed-places. Assessing causality between tourism and economic growth in this way, we leave for some future research.

Based on the OECD's publications on tourism trends, the main goal of the Swedish tourism policy is based on the transformation of Sweden into "a highly attractive tourism destination with competitive long-term tourism, contributing to sustainable growth and increased employment throughout the country" (OECD Tourism trends and Policies²⁵). With that aim, the focus from here on should be on the tourism expansion from both demand and supply points of view. In practice, this could be accomplished by boosting the length of visits and the number of visits, but also by encouraging the level of spending by tourists. At the national level, governments can also introduce more open visa regimes and facilitation of travelling (by improving transport infrastructure and connectivity by land/air/water).

Currently, the Swedish currency is strong and that might hinder inbound tourism flows since Sweden is becoming more expensive destination in relative terms. One way to prevent the fall in inbound tourism flows could be to introduce less severe taxation policies. One of the major actions taken by the Swedish government towards achieving this goal was a reduction of value-added tax (VAT) on restaurant and catering services, performed in 2012. The tax was reduced from 25% to 12%, and its impact was evaluated to be positive: consumer prices in restaurants decreased by 3%, in the short term²⁶.

Another issue to have in mind is that in a country whose SME sector is constantly increasing its economic role (accounting for 65% of private sector jobs in 2013²⁷), tourism policy makers should work on boosting competitiveness of Swedish travel destinations and small and medium-sized companies in tourism. This should include start-up support, sharing of knowledge within the industry, reduction of bureaucracy hurdles, etc.

Finally, the quality of the tourism offer might affect the overall performance of tourism in an economy. Therefore, it is necessary to assess the competitiveness of the destinations and further invest in relevant education: languages, hospitality, management, etc. Furthermore, quality of the tourism offer will depend on environmental challenges that might arise with higher level of tourism activities. Therefore, including the long term effect of tourism on climate change into developing strategies must be another priority of Swedish policy makers.

²⁵ OECD iLibrary: OECD Tourism Trends and Policies 2014, Country profiles: Sweden, consult this publication on line at <http://dx.doi.org/10.1787/tour-2014-en>.

²⁶ Ibid.

²⁷ The Small Business Act (SBA) Fact Sheet Sweden, 2013 produced by the European Commission, DG Enterprise and Industry, as part of the SME Performance Review (SPR)

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Appendix 1: Regions and counties in Sweden

This geographical division is based on NUTS classification²⁸ (Nomenclature of Territorial Units for Statistics):

Level	Subdivision	Number of entities
NUTS 1	Lands (Swedish: Landsdelar)	3
NUTS 2	National areas (Swedish: Riksområden)	8
NUTS 3	Counties (Swedish: Län)	21

The following table provides more detailed insight into this division:

National Area	County	Administrative Center	Population	% of total population
Stockholm	Stockholm county	Stockholm	2 198 044	23
Östra Mellansverige	Uppsala County	Uppsala	348 942	3,6
	Södermanland County	Nyköping	280 666	2,9
	Östergötland County	Linköping	442 105	4,5
	Örebro County	Örebro	288 150	3
	Västmanland County	Västerås	261 703	2,7
Småland med öarna	Jönköping County	Jönköping	344 262	3,5
	Kronoberg County	Växjö	189 128	1,9
	Kalmar County	Kalmar	235 598	2,4
	Gotland County	Visby	57 255	0,6
Sydsverige	Blekinge County	Karlskrona	154 157	1,6
	Skåne County	Malmö	1 288 908	13,2
Västsverige	Halland County	Halmstad	310 665	3,2
	Västra Götaland County	Gothenburg	1 632 012	17
Norra Mellansverige	Värmland County	Karlstad	274 691	2,8
	Dalarna County	Falun	278 903	2,9
	Gävleborg County	Gävle	279 991	2,9
Mellersta Norrland	Västernorrland County	Härnösand	243 061	2,5
	Jämtland County	Östersund	126 765	1,3
Övre Norrland	Västerbotten County	Umeå	262 362	2,7
	Norrbottn County	Luleå	249 987	2,5
Total			9 747 355	100

²⁸ By definition provided by Eurostat, this is a geographical nomenclature system that divides the economic territory of the European Union (EU) into regions at three different levels (NUTS 1, 2 and 3 respectively, moving from larger to smaller territorial units).

Available at: <http://ec.europa.eu/eurostat/web/nuts/overview>



Map of Swedish counties

Source: World Atlas

Appendix 2: Pairwise correlation matrix

Pairwise correlation matrix with starred all correlation coefficients significant at the 5% level or better.

	Growth	Tourism	Physical capital	Human capital	Trade	Debt	Exchange rate
Growth	1.0000						
Tourism	0.6757*	1.0000					
Physical capital	0.5182*	0.2439*	1.0000				
Human capital	0.5989*	0.8128*	0.2037*	1.0000			
Trade	0.5112*	0.0794	0.4926*	0.0831	1.0000		
Debt	0.4676*	0.1175	0.4247*	0.1128	0.4722*	1.0000	
Exchange rate	-0.1022	-0.0374	-0.0906	-0.0092	-0.3176*	0.0849	1.0000

Appendix 3: Descriptive statistics of the variables used in regressions

Variable	Obs.	Mean	Std.Dev.	Min	Max
Regional GDP per capita	231	314.81	53.88	230	562
Tourism revenue	231	792702.2	1284528	135807	7290016
Net investment per resident	231	629.08	334.48	-1255	1874
Education*	231	2961.42	4922.06	122	23791
Current liabilities per resident	231	10253.77	1914.96	6257	16302
Exchange rate	231	9.290	0.507	8.652	10.619
Trade intensity**	231	0.854	0.041	0.768	0.905

* Number of postgraduate students

**Trade intensity is measured as a ratio between sum of imports and exports, and GNI