Inclusive Urban Societies

Towards inclusive urban societies: Addressing labour and housing precarity based on advanced Geographical Information knowledge

[IncUrSoc]

Deliverable 3

Empirical report on the spatial links between touristification and precarious labour

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Executive Summary

The relevant literature attributes the intensification of tourism activity in recent years to globalisation, deindustrialisation, and a relatively stable geopolitical order. Moreover, the effect of the recent 2008/2009 Crisis and the Great Recession that followed pushed regions into deeper touristification trajectories. In the EU, the abovementioned parallel forces of globalization, deindustrialization, and recession, reshaped power dynamics and created new productive paths for many economies and especially those of the EU South. The latter, specifically, in coping against the Great Recession, sought to attract circulating transnational capital flows through multiple measures, spearheaded for instance by residence-by-investment programs, i.e., Golden Visas, and by facilitating the operation of the market of short-term rentals via online peer-to-peer platforms. These strategies significantly lowered entry barriers for institutional investors and global capital into local housing and tourism markets. Remarkably, despite the pandemic's critical impact as an exogenous factor, the EU's geography of tourism was not fundamentally disrupted and the aforementioned trajectories unfolded further. As a result, multiple Southern EU regions have developed a heavy dependence on tourism, lacking any substantial alternative activity in their economic base.

Against this backdrop, the report at hand presents in detail a composite indicator-based empirical analysis on touristification at the regional level. Specifically, our original composite indicator incorporates three dimensions: tourism's (i) social and (ii) territorial impact in terms of both demand and supply, as well as the (iii) dependence regions develop in relation to tourism, in terms of employment and output. Tourism supply is measured by bed places and demand by visitor numbers, whilst social and territorial pressure refers to their adjustment by population and area, respectively. In this framework, arrivals are preferred over the nights spent so as to filter out longer stays that are not necessarily related to the type of touristification investigated here (e.g., digital nomadism). The third dimension is assessed in terms of the employment proportion of tourism workers within the total workforce, as well as tourism's direct contribution to GDP, which is the only variable referring to the national scale. To ensure methodological rigor, the study adheres to guidelines set by the OECD and the European Commission's Joint Research Centre. The index is calculated and mapped for (nearly) all EU NUTS 2 regions for the years between 2009 and 2022. Subsequently, index scores are correlated with a range of other metrics, namely GDP (regional/national, total/per capita), urbanization levels (population density), employment quality, and the balance between industrial production and construction.

Despite its methodological soundness, the TAIDD CI is limited by three crucial conditions. First, it does not account for the entirety of the short-term rental market, as Eurostat data on arrivals and bed places, although covers all types of accommodation, may omit accommodation units with less 10 bed places. Second, it does not consider cruise tourism, which is a type of tourism that significantly affects certain parts of the EU like Venice, Lisbon, Barcelona, Santorini, and Bergen. Third, the level of analysis is the NUTS-2, which may allow for comparability across geographical contexts, but it is not the most appropriate for investigating types of tourism such as urban, which concentrates in cities within regions, and even parts of them.

The study finds three primary zones of touristification: the core sunlust destinations of the EU South, the Alpine areas of Italy and Austria, and several urban heritage hotspots and/or global cities across Central and Northern EU. More specifically, the study highlights that two Greek insular regions, South Aegean and the Ionian Islands, top the list of the EU's touristified areas in all years. It underscores that the EU's geography of touristification was established during the deep recession years (2009-2014), and these trends have extended until today. Specifically, the Great Recession drove a deepening polarization between the EU North and South, as well as within the latter, with destinations in Greece, Croatia and Portugal touristifying exponentially as compared to those in France, Italy, and Spain. Crucially, the study highlights a direct correlation between touristification, GDP shrinkage, deindustrialization, and the deteriorating employment conditions. Specifically, the touristification of the EU South does not bring any significant (positive) economic effect; the regions that extend and deepen their touristification trajectories do not see increase in their GDP, but quite the opposite.

Keywords: EU NUTS 2 regions, 2008/2009 Global Crisis, COVID-19 pandemic, deindustrialisation, labour precarity

Introduction

In the first report of IncUrSoc, we analysed Greece's growth models and instances of capital switching at the national scale, while we laid out a chronology of Athens's gentrification and touristification. Following the conceptualisations and methodology included in the first report, here we adapt our analysis's scope from to the regional level and develop an original composite indicator.

Specifically, we construct an original **Tourism Activity Intensity, Density and Dependence Composite Index (TAIDD CI)**. The index is calculated for all NUTS 2 regions of the EU, and for the period 2009-2022 (specifically for the years 2009, 2014, 2019, and 2022), allowing this way for a comprehensive assessment of touristification tendencies and the position of Greek regions within the broader context. Specifically, we propose an original composite indicator, which encompasses the dimensions of tourism activity's intensity[1] and density in terms of supply and demand, as well as regional dependence on it in terms of output and labour, drawing from the indicators proposed in the relevant literature (e.g., Peeters et al., 2018). To clearly define the subject of research, we utilise the concept of touristification (Gourzis et al., 2022; Tulumello & Allegretti, 2021; Alexandri & Janoschka, 2020), although this has mainly focused on the urban context. After implementing the guidelines delineated by OECD/EU/JRC (2008) as to build a composite indicator, the index is then calculated for (almost all) the EU's NUTS 2 regions and for the years between 2009 and 2022. Subsequently, index scores are correlated with a range of other metrics, including GDP, urbanization levels, employment quality, and the balance between industrial production and construction. Overall, our index's structure and our analysis's geographical and temporal scope allows us to examine the socio-spatial patterns of various aspects tourism activity over a large area and during a turbulent period of successive crises (financial, economic, health emergencies, inflation, geopolitical, and so on).

Doing the above, the study identifies the spatio-temporal patterns of touristification in the EU during the past 15 years. Specifically, the study finds three primary zones of touristification. First, the coastal and insular regions of the EU South. Second, the Alpine areas spanning Italy, Austria, and France. Third, a "dispersed zone" consisting of several urban tourism hotspots in Central and Northern EU. Furthermore, the study reveals that a deepening polarization reached its height just before the COVID-19 pandemic, with destinations in Greece, Croatia and Portugal intensifying tourism activity and increasing their dependence on the industry whilst others like the French Riviera and southern Spain losing relative significance. The research also indicates that regional patterns of touristification were established during the deep recession years (2009-2014), and these trends have continued to this day. Lastly, the study highlights a direct correlation between the expansion of touristification, deindustrialization, and the deterioration of employment conditions.

In what follows, we lay out the ways the Tourism Studies have measured tourism activity, also covering the increasing use of Big Data on tourism research in recent years. In the Methodology Section, we lay out in detail the way we chose appropriate data for our composite indicator, our geographical and

[1] Or as Peeters et al., 2018, call, tourism penetration.

temporal scope, our data sources, and the whole process of processing our data: normalization, multicollinearity and dimensionality checks, weighing and aggregation methods, backward decomposition processes, linkages to other data, and robustness, sensitivity and validity checks. In the Empirical Section we present our index results, draw correlations with other data (regarding output, urbanization, labour conditions, and growth models), we decompose our index to revisit its initial variables, we calculate alternative structures to ensure robustness and low sensitivity, and look into similar studies to compare our results to ensure the validity of ours. We close the study with brief conclusions.

Overview of quantitative methodologies in Tourism Studies

Conventional quantifications of tourism activity

A significant part of the literature that measures tourism has focused on its impact, studying overtourism, sustainable tourism, and the competitiveness of tourist destinations. This literature emerged as early as the 1960s, when the correlation between tourism supply—in the form of overall bed capacity—and local population was studied, as a measure of tourism activity's impact on the local level. Soon, classifications of destinations according to the intensity of tourism activity appeared. To account for tourism's spatial effects, the number of visitors was weighed by area, and by population, so as to measure its socio-cultural impact. At the same time, other indicators were used to measure demand in the frame of tourism's economic impact, such as tourist expenditure and tourism's contribution to GDP. Alternatively, demand was measured through multiplying visitors by length of stay, or more accordingly, by calculating bed nights by population and/or area (Mashkov & Shoval, 2023). Overall, the literature quantifying various aspects of tourism has become quite voluminous. Demand is mostly examined to this day through the number of tourists/visitors, overnight stays, and bed-nights, as well as the share of tourism in GDP, tourism expenditure, and tourist receipts. On the other hand, supply is mostly examined through the number of accommodation units of various types, beds, and bed places, as well as the share of tourism-related employment. When the above measures are weighed by population, this is usually referred to as tourism intensity, whereas when they are weighed by area it is referred to as tourism density (Buitrago & Iniguez, 2021).

One of the most comprehensive studies in the literature is the recent one by Peeters et al. (2018), who measured overtourism using a wide array of indicators calculated at the regional level for all European regions (i.e., the entirety of the EU, plus the UK, Switzerland, and the European Economic Area countries: Iceland, Norway, and Liechtenstein). Specifically, their study examined the density, intensity, and seasonality of bed-nights, air passengers, and cruise passengers, the share of tourism revenues in regional GDP, the share of short-term rentals' bed capacity within that of all accommodation units, the average shortest distance between short-term rentals and conventional accommodation (e.g., hotels), and, lastly, closeness to airports, cruise ports, and World Heritage Sites. At the same time, the study also included more detailed research on 41 case studies. These case studies are not limited to EU destinations but extend beyond that, representing four types of global destinations: urban, rural, coastal/insular, and heritage/attractions. The study concluded that overtourism itself should be addressed with a qualitative logic instead of imposing a common threshold for all geographical contexts beyond which a destination should be considered over-touristy. Specifically, the authors proposed a case-specific approach using a checklist that is completed through qualitative assessment.

Another indicative study is by McKinsey & Company and the World Travel & Tourism Council (2017), which quantified overtourism at the national level based on five main associated problems: alienation of the local population, poor tourist experience, overuse of local infrastructure, environmental impact, and cultural impact. The study proposed nine metrics across six dimensions, five of which directly addressed the above problems, plus one reflecting the phenomenon's broader context. Specifically, the last dimension comprised indicators for understanding the importance of tourism (i.e., tourism's share in

output and employment) and measuring tourism growth (i.e., rate of change in tourist arrivals). The dimension related to alienation of the population was quantified by calculating the number of visitors per area and per inhabitant. The measure of poor tourist experience was represented by the share of low-rated reviews for the top 10 attractions on TripAdvisor for a given destination. The overuse of infrastructure was addressed by measuring the seasonality of tourist arrivals and the overconcentration of visitors at specific attractions. The environmental impact of tourism was assessed by measuring air pollution, specifically the annual mean concentrations of PM10 particulate matter. Lastly, the cultural impact of tourism was evaluated by quantifying the prevalence of historical landmarks in a given destination, measured as the share of these landmarks within the top 20 TripAdvisor attractions.

Among the most influential proposed sets of indicators for monitoring tourism sustainability in a destination is the European Commission's European Tourism Indicator System (ETIS) [2], which—in its current version—comprises 43 indicators. These are divided into four main pillars: (i) destination management, (ii) economic value, (iii) social and cultural impact, and (iv) environmental impact. Economic value is the most relevant section for the current report, as it includes the following indicators: number of bed nights and same-day visitors per month, daily spending per overnight tourist and same-day visitor, average length of stay, occupancy rate in commercial accommodation per month and year, percentage of direct tourism employment in total employment, share of seasonal jobs within tourism employment, and the percentage of local products (food, drink, goods, and services) sourced by tourism enterprises. Similarly, social and cultural impact is significant as it includes indicators such as the number of tourists and accommodation establishments per resident, the share of second homes within the total number of houses, the share of tourism employment, and the percentage of residents satisfied with the tourism impact. In addition to ETIS, other proposals include those from the Green Destinations database, which consists of around 100 indicators.

However, the level of analysis in these propositions is not clear. Indicatively, the reports produced in the frame of ETIS dedicate a distinct chapter to define what a destination, but they do so in a somewhat vague manner. Specifically, a destination is defined in terms of its attractiveness (*"a geographic area that is currently or potentially attractive to visitors/tourists"*); its delineatedness (*"a place or area which is recognised and can easily be defined as a visitor destination"*); its branding (*"a place or area which is promoted as a destination"*); its scale so that it renders data collection feasible (*"a place or area where it is possible to measure the supply of and demand for tourism services"*); and its ecosystem of stakeholders (*"a place or area where the visitor management process usually includes a range of public and private sector stakeholders together with the host community"*) (European Commission, 2016, p.10). As the above indicates, a common issue in quantitative tourism research is determining the most appropriate level of analysis. Given the nature of tourism, which can be concentrated in very specific parts of a region or country, many studies have gone beyond national and regional levels to calculate the above indicators for urban tourism at the city level. For instance, González et al. (2018) assessed overtourism by examining tourism's contribution to GDP, arrivals, and bed-nights, both in absolute terms and weighted

[2] Available at: https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/funded-projects/sustainable/indicators_en

by population and area, for 11 European cities: Amsterdam, Barcelona, Berlin, Brussels, Copenhagen, Dublin, Lisbon, London, Paris, Vienna, and Reykjavik.

Quantifications of tourism activity through composite indicators

Another common problem of the quantitative literature on tourism is that the use of the abovementioned measurements separately leads to research that can be one-dimensional, unable to account for the complexity of tourism (Mashov & Shoval, 2023). As a result, many have called for the adoption of composite indicators. For instance, Amore et al. (2020) underline that the use of composite indicators is scarce, especially when it comes to measuring the extent and magnitude of overtourism. For this, they develop a composite indicator for measuring overtourism in 15 established European urban destinations: Amsterdam, Barcelona, Berlin, Copenhagen, Edinburgh, Florence, Lisbon, London, Madrid, Paris, Prague, Rome, Seville, Venice and Vienna. Specifically, their index comprises four variables: overnight stays per area, museum visits per population, (the growth in the) total number of nights spent, and foreign nights per population. Interestingly, to consider the concentration of tourists' activity in specific parts of a given city, they go one step further than most other studies in terms of their scale of analysis, weighing their variables using only the surface of the city center. In fact, for specific variables, area solely accounts for the surface of the top-10 attractions and their surrounding space.

However, in other literature strands within Tourism Studies composite indicators are more common, as for measuring tourism destination competitiveness (Mendola & Volo, 2017). In this context, studies mostly measure tourism product's complexity and heterogeneity in a given region, providing the literature with a robust set of indicators that are of high relevance to the report at hand. Specifically, the Travel & Tourism Development Index (TTDI) by the World Economic Forum is among the most common tools for ranking countries according to the competitiveness of their tourism market. The TTDI, being a renewed version of the older Travel and Tourism Competitiveness Index, comprises 5 dimensions, 17 pillars, and 102 individual indicators. The dimensions are: (i) enabling environment dimension (articulated in the pillars business environment, safety and security, health and hygiene, human resources and labour market, and ICT readiness), (ii) travel and tourism policy and enabling conditions (articulated in the pillars prioritization of travel and tourism, openness to travel and tourism, and price competitiveness), (iii) infrastructure and services (articulated in the pillars air transport, ground and port, and tourist services' infrastructure), (iv) travel and tourism resources (articulated in the pillars natural, cultural, and non-leisure resources), and (v) travel and tourism sustainability (articulated in the pillars environmental sustainability, travel and tourism socioeconomic impact, and travel and tourism demand sustainability). Many of these indicators refer to secondary quantitative data (e.g., tourist arrivals), while others constitute quantified soft data like opinion surveys. Moreover, this composite indicator and its variables have spurred additional measurements in the literature. For instance, based on the raw indexes of the World Economic Forum's TTDI, Gómez-Vega & Picazo-Tadeo (2019) constructed a composite indicator so as to rank 136 global destinations. The notable aspect of this indicator which distinguishes it from its original source is that the weight of each variable is endogenously generated and destination-specific; i.e., measures in which a destination has low values get a smaller weight, while

those that it has higher values get a greater weight. This way, destinations are assessed based on their competitive advantages and not a common set of characteristics.

However, the TTDI has been extensively criticised for various reasons. For one, a significant part of the necessary data is almost impossible to produce. Second, many of its variables are arbitrarily linked to competitiveness. A characteristic case is that of a country's prices, which is considered as an obstacle to competitiveness; yet the dominance of developed countries—hence pricier destinations—in the rankings is not adequately explained (Croes & Kubickova, 2013). Moreover, this assumption (prices as an obstacle to competitiveness) comes in clear contrast to earlier studies which reached the opposite conclusion; specifically, the study by Zhang & Jensen (2007) did not find price competitiveness to be a significant variable for the overall performance of a tourism market. In fact, the same study asserted that for the OECD area in particular, pricier markets attracted more tourists. Third, the TTDI appears to be overlooking differences in market size and maturity within the sample of 130 countries for which it is calculated. On a wider note, studies of destination competitiveness are limited by several crucial problems. First, this strand in the literature is characterised by a definitional conflation, which affects measurements profoundly, as the problem at hand is outlined in variating ways; as a result, the results of these measurements are equally varying and contradictory (Croes & Kubickova, 2013). Second, it is often that many of the components within composite indicators are irrelevant to the question at hand, i.e., destination complexity (Mendola & Volo, 2017). This, to our view, can be related to both the aforementioned definitional conflation, as well as a third problem, the lack of relevant robust datasets. Specifically, it has been noted how important precise and reliable data are for constructing a composite index, the lack of which becomes an unsurmountable obstacle especially in developing countries (Croes & Kubickova, 2013). However, to our knowledge, this is a problem even when studying EU countries, at least regarding specific aspects of tourism activity. For instance, comparable data across the countries and regions of the EU regarding the short-term rentals market became available only recently via Eurostat's experimental statistics on short-stay accommodation offered via collaborative economy[3] and do not go further back than 2018. Fourth, these indexes ignore the context-sensitive characteristics of destinations under study, such as the size of the market inquired, the size of the area, the specific growth model of the country where a destination is located, and others (Mendola & Volo, 2017). Lastly, few of the studies in the tourism destination complexity literature have followed a meticulous methodology in constructing their composite indicators (Croes, 2011). As becomes clear, many of the abovementioned problems are not limited just to research on destination competitiveness, but they are characterising much of quantitative research through composite indicators in Tourism Studies in general.

Against this backdrop, Croes & Kubickowa (2013) proposed their own competitiveness index, which they experimentaly calculated for 7 countries in Central America. Specifically, after measuring the competitiveness level of the overall Central America tourism market using the Herfindahl–Hirschman Index[4], they calculate a composite index which comprises four indicators: (i) tourism market size, as an

[3] Coded as tour_ce. Available at: https://ec.europa.eu/eurostat/web/main/search/-/search/estatsearchportlet_WAR_estatsearchportlet_INSTANCE_bHVzuvn1SZ8J?text=tour_ce

[4] Using tourism output as an indicator of competitiveness and summing up the squares of each country's output share.

indicator of a market's performance in the global market, and therefore demand; (ii) tourism receipts (specifically, their growth rate), as a key indicator of productivity; (iii) tourism added value (specifically, as a percentage of the GDP), as an indicator of tourism's significance in the overall economic structure, thus, an additional indicator of productivity; and (iv) quality of life, measured through the United Nation's Human Development Index. The last indicator (quality of life) is what distinguishes this study from most others, reflecting the authors' position that, given that tourism generates income, competitive destinations should exhibit a correlation between increased tourism receipts and high quality of life.

Beyond the studies on destination competitiveness, another field where composite indicators are being used is that of tourism sustainability. Specifically, one of the most relevant approaches to the report at hand is the Global Destination Sustainability (GDS) Index[5], which comprises 77 indicators pertaining to environmental, social, supplier, and destination management performance. As with the World Economic Forum's TTDI, the GDS Index uses a simple aggregating technique based on a point system depending on the answer to each question/indicator. As this is a common feature in this type of studies, Mendola & Volo (2017) point out that most of the published composite indicators have not followed a clear methodological process, adhering to the appropriate statistical advancements. Specifically, published studies do not clarify their methodology on imputing missing data, while they set weights arbitrarily without conducting robustness and sensitivity tests to assess the impact of their methodological choices. Since the databases that are available are mostly related to tourist destinations' management, competitiveness and sustainability, methodological and data limitations become a much greater problem when it comes to measuring and mapping tourism activity per se. In this field, most studies examine indicators separately, or they implement a methodology that does not pertain to that of composite indicators (see Peeters et al., 2018). Moreover, most also have a rather limited temporal and geographical scope, covering short periods of time (or even a specific year) and/or a small number of destinations (or even a specific case study). This is directly related to the scarcity of appropriate data, which, as noted above, concerns not only developing countries but EU ones as well (Batista e Silva et al., 2018).

The use of Big Data in tourism research

Some of the aforementioned difficulties and shortcomings have been tackled through the use of Big Data. Specifically, as noted above, most quantitative studies rely on conventional secondary data collected by National and International Statistical Authorities and Organisations. Given the scarcity of tourism-related data, especially at the appropriate scales, as well as the frequency of data across countries/regions/cities being non-comparable, recent years (already since the mid-2000s) have seen the increasing use of Big Data (Batista e Silva et al., 2018). One characteristic study is that by Mashkov & Shoval (2023) which, departing from the assertion that existing analyses lack adequate spatial and temporal disaggregation, uses high-resolution GPS data in order to calculate a composite intensity-density index. Given that this work covers a dual gap, that of spatially and temporally granular

[5] Available at: https://www.gds.earth/index/

studies, as well as that of well-developed composite indicators, it is highly important. Methodology-wise, the authors use the Old City of Jerusalem as a case study and movement data collected from almost 1,500 volunteers in the context of a survey conducted for Jerusalem's Transportation Master Plan. With this data, they calculate a composite index based on two dimensions: tourist density ratio (comprising two variables: passage per area and duration per area) and tourist intensity ratio (comprising passage per inhabitants and duration per inhabitants). By area, the authors use lone cells of 50 by 50 meters, for which they also have the true population.

Another indicative study is that by Batista e Silva et al (2018), the study of whom covers a large area (the whole of the EU) and is characterised by an increased temporal granularity, as data are broken down on a monthly basis. As in other studies, the authors combine conventional sources, i.e., Eurostat and National Statistical Authorities, with Big Data ones, i.e., online peer-to-peer accommodation booking platforms. Specifically, from Eurostat and National Statistical Authorities they acquire nights spent, bed places, and arrivals at tourist accommodation establishments per region (NUTS 2 and 3) and month. From online platforms (Booking.com and TripAdvisor), they acquire accommodation units' location and capacity. Using the whole dataset, they then measure tourism activity's density at the level of cells of 100 by 100 meters. Upon measuring tourism density, they proceed with combining metrics of tourism intensity (data weighed by population) and seasonality (data variation by month) to define tourism vulnerability; specifically, *"regions with both high tourism intensity and high seasonality are deemed to be more vulnerable to the tourism sector and any shocks that may affect it"* (p. 109). To actually depict vulnerability, the authors provide a bivariate map simultaneously showing the transnational Location Quotient of tourism intensity[6] and the Coefficient of Variation of tourists per month.

In general, Big Data in Tourism Studies can be generated by three sources. First, by users so as to measure tourists' satisfaction and experience, with such data as reviews (of lodgings, restaurants, and attractions/landmarks), blog/social media posts, and geo-tagged photos. Specifically, photos have been analysed not only in terms of their location, so as to identify popular landmarks, but also in terms of their visual elements, so as to identify specific cues boosting a destination's image and attractiveness (Li et al., 2018). For instance, the study of McKinsey & Company and World Travel & Tourism Council (2017) greatly relies upon reviews posted in TripAdvisor. Second, by devices like GPS data, so as to understand visitors' routes on a large scale, RFID/Bluetooth/WIFI data, used for similar purposes but for finer scales, or mobile roaming data, so as to calculate the volume of phones used in a given place but registered elsewhere and thus identify the volume of tourists/visitors (Shovas & Ahas, 2016). The rise of such approaches has allowed for a more granular take on the spatial activity of tourists, which can be then used to explain seasonality fluctuations, variations in tourism expenditure, and others (Sciortino et al., 2022). Third by operations, with such data as web searches, so as to understand tourists' online behaviour and decision making, online bookings of conventional accommodation (e.g., hotels) and other types (e.g., short-term rentals through online platforms) so as to understand demand, seasonality, economic impact, etc., attractions' tickets such as museums' so as to improve destination management, and others (Li et al., 2018). For instance, this source has provided a solid database for studies on hotel prices (Goni et al., 2017). Within a field where data scarcity is often referred to as a common problem,

[6] Tourists per population in a given region divided by the respective rate across all EU regions.

Big Data have posed a promise for larger sample sizes and diversity of information (Yang et al., 2015), becoming more commonly used and crucial for tourism research. However, Big Data have also been accused of blurring research objectives. Specifically, Weaver (2021, p.9) argues that their uncritical use resonates with an almost century-old trend of pursuing an elusive goal *"towards a final, quantifiable form of accuracy"*, all while *"the aggregate exists in tension with the importance of the individual"*. More prosaic criticism has been raised as well, with the wide availability of data leading studies to include indicators not directly related to their objectives (Mendola & Volo, 2017) or indicators being constructed with little epistemological underpinning (Croes & Kubickova, 2013). Moreover, the experimental approach of many such studies inevitably leads to a series of shortcomings. First, Big Data often occur through conducting web scrapping in websites (e.g., reviews from TripAdvisor, tweets from Twitter, listings on Airbnb, etc.), which implies a rather limited temporal scope. Second, in cases where Big Data are combined with conventional sources, this also implies the use of data with different years of reference; for instance, Batista e Silva et al. (2018, p. 102) use data on nights spent from 2016, on bed places from 2011, and on the location and capacity of online accommodation listings from 2017. Third, spatial and temporal disaggregation techniques are often providing just an approximate measurement of tourism activity at finer scales; for instance, Batista e Silva et al. (2018) calculate the number of nights spent at the NUTS-3 level on the basis of nights spent at the NUTS-2 level, which are available, and in proportion to the number of bed places at the NUTS-3 level, which again are available. Similarly, the breakdown the annual number of nights spent into monthly variations is done in proportion to monthly numbers of nights spent, which are taken from other sources. Fourth, many studies using Big Data do not clarify another crucial aspect of their methodology, i.e. the way of taking out duplicate listings when drawing data from multiple online accommodation booking platforms (Mendola & Volo, 2017).

Definitional considerations around tourism, overtourism and touristification

Tourism, overtourism, and overcrowding

According to Bianchi (2015), one of the prominent problems around the study of tourism is that there are multiple definitional obscurities. According to Goeldner & Ritchie (2011, p.6) tourism can be defined as *"the sum of the phenomena and relationships arising from the interaction of tourists, business suppliers, host governments and host communities in the process of attracting and hosting these tourists and other visitors"*. Therefore, tourism involves movement, as implied through the term "tourists", however it is not clear what is the purpose of movement. For its part, UNWTO defines tourism as *"a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes"*.[7] According to this definition, business is considered one of the most important purposes for travel that can potentially lead to tourism-related mobility. Making distinctions between business- and leisure-related mobility has become an increasingly risky task so much that the term "bleisure", which combines the words business and leisure, has been recently introduced to the literature (Mercan & Sandıkcı, 2024).

The proliferation of multiple types of tourism, which goes hand in hand with increased numbers of tourists overall, as well as the expanding activity of the short-term rentals market, have exacerbated the phenomenon of overtourism. Albeit this phenomenon is nothing new, the use of the term itself is quite recent; due to this, as well as its overuse, it has become contested, with many definitions appearing in the literature since the term's introduction in the mid-2010s being contradictory to each other (Koens et al., 2019). UNWTO (2018) defines it as the *"impact of tourism on a destination, or parts thereof, that excessively influences perceived quality of life of citizens and/or quality of visitors experiences in a negative way."* This definition sets some thresholds beyond which tourism is no longer sustainable for the destination's local economy and population. Similarly, Peeters et al. (2018) describe overtourism as *"the situation in which the impact of tourism, at certain times and in certain locations, exceeds physical, ecological, social, economic, psychological, and/or political capacity thresholds."* Overtourism refers to a much more complex phenomenon than overcrowding, with which it has been associated. Rather, overtourism refers to a strategic choice which has turned "sour" due to an "*absence of good management and uncontrolled (tourism) development."* (UNWTO, 2018). Nevertheless, two basic problems arise from the above definitions. First, quantifying the extent of overtourism turns into slippery ground considering that there is no clear threshold beyond which tourism becomes unsustainable (Peeters et al., 2018); moreover, such threshold cannot be the same across destinations, since some have larger tourism capacity than others (UNWTO, 2022). Second, assessing the extent of overtourism is highly subjective. Indicatively, the Responsible Tourism Partnership, a platform for bringing together responsible tourism businesses and initiatives, defines overtourism as the situation in *"destinations where hosts or guests, locals or visitors, feel that there are too many visitors and that the quality of life in the area or the quality of the experience has deteriorated unacceptably."*[8] As such, overtourism may be delineated through the subjective experience of alienated residents and unsatisfied tourists, the

[7] UNTWO, Glossary of tourism terms. Available at: https://www.unwto.org/glossary-tourism-terms#O
[8] Responsible Touris Partnership. Overtourism: what is it and how do we address it? Available at: https://responsibletourismpartnership.org/overtourism/

perceptions of whom change according to many factors, such as their age, class, nationality, experience abroad, etc. (Szormek et al., 2021); for frustrated workers in particular, delineating the thresholds of overtourism is closely associated with the quality of their employment (Walmsley et al., 2022; Gourzis et al., 2022).

Touristification and its operationalization in the research at hand

Attempting to overcome the above-mentioned problems, the report at hand will mostly refer to the problem under study as touristification. Although the term has been used by geographers already since the late 1990s to indicate an ever-growing reorientation of economies towards tourism (Ojeda and Kieffer, 2020), it has gained traction in the field of Urban Studies in recent years. For instance, Peeters et al. (2018) define it as the altering of socio-spatial patterns in urban destinations due to tourism. More broadly, touristification is often linked to other transformative processes in the urban context such as gentrification (Estevens et al., 2023; Gourzis et al., 2022). Nevertheless, since one of the main effects of intensified tourism activity is the urbanisation of the countryside (Randelli & Martellozzo, 2019), it is still being used in the rural context too (see Lorenzen, 2021 for touristification in rural Mexico; Coll-Ramis et al., 2023, for touristification in Mallorca).

The operationalisation of research in the report based on this concept has been deemed appropriate as it allows for covering the complex nature of intensified tourism activity and the multiple aspects of tourism itself. More specifically, the TAIDD CI is not limited to examining overtourism, i.e., the increasing supply and demand for tourism product leading to a series of negative consequences in the absence of planning. Moreover, it will not focus solely on the extent of regions' economic dependency from tourism. To cover all of these issues at the same time and retain the capacity to be implemented on a wide range of contexts, i.e., from densely-populated metropolitan areas to insular tourism-orientated regions and other rural destinations, the TAIDD CI has to rest upon a coherent conceptual and definitional framework. Thus, it is necessary to hereby provide clearly the articulation mechanisms of touristification.

Touristification's first and most important characteristic is that it stems from capital invested in the built environment so as to exploit the favourable position of underutilised areas. Maximising rent yields are mainly ensured by converting long-term accommodation into tourism-related lodging and by aligning recreation with tourists' preferences and aesthetics (Cocola-Gant, 2018). The catalyst for the large-scale conversion of housing into tourist accommodation has been online peer-to-peer booking platforms like Airbnb.com (Wachsmuth & Weisler, 2018), although the lodging sector as a whole plays a key role (Estevens et al., 2023). The above delineates that the first articulation mechanism of touristification is the (abrupt) increase of supply of the tourism product, mainly through investment in the built environment.

Second, touristification stems from explicit and implicit state intervention. Explicit state strategies include changes in legislation so as to facilitate investment in tourism-related real estate (Lee, 2016); implicit strategies include a tolerance towards recreational uses regarding labour legislation, permits, etc. (Gourzis et al., 2022). This is despite recent years' efforts to limit overtourism. For instance, the metropolitan governments of Barcelona, London, Munich and Amsterdam have taken measures to limit

the activity of the short-term rental market, imposing a maximum number of days per year that a listing can operate, beyond which a special permit is required, while those of Lisbon and Palma have promulgated that in certain areas and types of buildings it is not allowed for short-term listings to operate. Still, such measures are mostly fragmented and fail to bring results (Hubscher & Kallert, 2023). At the EU level, the Tourist services - short-term rental initiative has not yet led to tangible policies, as tourism is widely seen as a panacea against deindustrialisation and unemployment (Alexandri & Janoschka, 2024). Thus, the second articulation mechanism of touristification is a multifarious long-term state intervention towards increasing visitor volume.

Beyond its underlying causes, touristification is also articulated by its results. Third then is the large influx of visitors and/or tourists (Sigler & Wachsmuth, 2016). These are not only attracted by the aesthetics of touristification (see above) and the increased options in recreation, but from the affordability of accommodation options even in once expensive destinations. Thus, the third articulation mechanism of touristification is the (abrupt) increase in demand for the tourism product.

A direct effect of the third articulation element (or a distinct fourth element in the context of other studies) is the displacement of lower-income households residing in touristifying areas. Typically, this displacement stems from two main conditions. For one, rented dwellings are converted into short-term rentals and tenants are forced to leave. With the latter typically yielding significantly higher revenues compared to long-term leases (Wachsmuth & Weisler, 2018), standalone dwellings, apartments, or entire buildings are withdrawn from the long-term rental market. This leads housing demand to surpass supply, tightening housing markets, thus leading to an unchecked surge in rents and property values, especially in contexts where rent control legislation is not implemented (Horn & Merante, 2017). As a result, even those households that do not see their rented house being converted into an Airbnb listing, are threatened by a widespread increase in rents. Interestingly, touristification's displacement effect extends to higher-income residents as well, as the latter choose in many cases to leave their dwelling not because of rent rises but due to the erosion of neighbourhood identity and the nuisance caused by tourism activity (Gourzis et al., 2022).

Methodology for building the TAIDD CI

In what follows, we justify our methodological choices. In constructing the TAIDD CI, we followed OECD's guidelines, as will be described in detail below. Specifically, we begin with justifying the selection of data to inquire the research problem, define our geographical and temporal scope including the methods for filling out missing values, build the appropriate variables and dimensions so as to measure touristification according to its definition given above, lay out our methods for normalisation, check for issues of multicollinearity between the chosen variables, check for issues of dimensionality, i.e., having redundant data/variables/dimensions, clarify our weighting approach at the level of dimensions and variables, and lay out our aggregation method so as to eventually calculate the TAIDD CI. Upon calculation, we lay out our mapping/classification approach, clarify its backward decomposition, justify the additional data with which the TAIDD CI is correlated and define the correlation method, and eventually, clarify the ways we have checked for our index's sensitivity and validity.

Choice of appropriate data

Essentially, the TAIDD CI has been conceptualised for incorporating the aspect of supply and demand of tourism, as well as the dependence that regions develop upon it. Ultimately, four specific types of data were used: (a) arrivals at all types of tourist accommodation establishments, (b) bed places in all types of tourist accommodation, (c) total employment in accommodation and catering (NACE I), and (d) tourism's direct GDP. Below, we break down our approach in choosing the appropriate data.

According to Eurostat, from which this type of data was retrieved, an arrival is defined as *"a person […] who arrives at a tourist accommodation establishment and checks in […]. No age limit is applied: children are counted as well as adults, even in the case when the overnight stays of children might be free of charge. Arrivals are registered by country of residence of the guest and by month. The arrivals of same-day visitors spending only a few hours during the day (no overnight stay, the date of arrival and departure are the same) at the establishment are excluded from accommodation statistics."* Although people who arrive at non-rented accommodation are also defined as arrivals, *"in the scope of the Regulation concerning European statistics on tourism, this variable is not collected…".*[9] The above definition of arrivals marks clear that they refer to the arrival of travellers rather than visitors or

[9] Eurostat Metadata. Occupancy of tourist accommodation establishments (tour_occ). Available at: https://ec.europa.eu/eurostat/cache/metadata/en/tour_occ_esms.htm

"tourists"; the term "tourist arrivals" then refers to the arrival of people at tourist accommodation units, and not the arrival of tourists per se. Eurostat (2015) is very cautious in distinguishing the traveller from the visitor, with the former being *"someone who moves between different geographic locations, for any purpose and any duration"*, while the latter being *"a traveller 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."* As indicated by the above, a visitor must be documented when arriving at their main destination; however, transit stops in trips, including for tourism, can be as burdened as main destinations. For instance, Athens, being for many years a transit stop before tourists continue their trip to an island, was just as congested as the main destinations (Gourzis et al., 2022).

Bed places in tourist accommodation, according to Eurostat from which they have been retrieved, are defined as *"the number of persons who can stay overnight in the beds set up in the establishment […] ignoring any extra beds that may be set up by customer request. The term bed place applies to a single bed, double beds are counted as two bed places. The unit serves to measure the capacity of any type of accommodation. A bed place is also a place on a pitch or in a boat on a mooring to accommodate one person. One camping pitch should equal four bed places if the actual number of bed places is not known."* However, it should be noted that in some cases, in order to reduce the burden of national statistical authorities, Eurostat allows certain exclusions to the abovementioned definition of bed places: specifically, *"Member States can opt to exclude from the scope of observation those establishments having less than ten bed places."*, while small tourism markets, namely *"Member States accounting for less than 1% of nights spent in the EU can increase this threshold to twenty bed places)".*[10]

Both arrivals and bed places refer to all three (3) categories of tourist accommodation defined by Eurostat. Specifically, according to the NACE Rev.2 classification, tourist accommodation is classified in hotels and similar accommodation (I55.1), holiday and other short-stay accommodation (I55.2), and camping grounds, recreational vehicle parks and trailer parks (I55.3).

Total employment in accommodation and catering refers to the number of workers in NACE Rev. 2 sector I, which includes all activities related to *"the provision of short-term (less than one year) accommodation for visitors and other travelers, temporary accommodation in single or shared rooms or dormitories for students, seasonal workers and other individuals, as well as the provision of meals and drinks fit for immediate consumption."* Among the above, NACE I includes intermediation service activities for accommodation (NACE I55.4), as well as intermediation service activities for food and beverage services activities (NACE I56.4).[11]

[10] Eurostat Metadata. Occupancy of tourist accommodation establishments (tour_occ). Available at: https://ec.europa.eu/eurostat/cache/metadata/en/tour_occ_esms.htm

[11] ESTAT: Statistical Classification of Economic Activities in the European Community (NACE Rev. 2.1). Available at: https://showvoc.op.europa.eu/#/datasets/ESTAT_Statistical_Classification_of_Economic_Activities_in_the_European_Community_Rev._2.1._%28NACE_2.1%29/data?resId=http:%2F%2Fdata.europa.eu%2Fux2%2Fnace2.1%2Fl

Lastly, according to the UNWTO, tourism Direct GDP (TDGDP) *"is defined as the sum of the part of gross value added (at basic prices) generated by all industries in response to internal tourism consumption plus the amount of net taxes on products and imports included within the value of this expenditure at purchasers' prices"*. […] W*hen a country does not measure the Tourism direct GDP but measures the Tourism Direct Gross Value Added (TDGVA), the indicator Tourism Direct Gross Value Added as a proportion of total Gross Value Added (in %) is used as a proxy".* [12]

The choice of these specific data was made on the basis of them being (a) highly relevant, as all four types of data are directly associated with tourism, (b) analytically sound, as they are highly appropriate in assessing tourism demand, supply and dependence, (c) available throughout study period, as missing values were limited to a couple of cases, in which data could be retrieved from alternative sources, and (d) comparable across regions, as the vast majority of data was retrieved from a single source—Eurostat—which ensures a uniform methodology in their collection and a strict alignment in the definition of their subject, i.e., each type (bed places, tourist arrivals, tourism employment, and tourism's direct GDP) refers to the same thing across all study regions/countries.

Bed places were preferred over establishments as they reflect the actual capacity of a given region for accommodating tourists, whereas the number of establishments alone obscures their size/capacity. Ideally, beds would be the best type of data, since most double rooms (rooms with a double bed or twin beds) in hotels and similar kinds of establishments commonly accommodate one person as well. However, this data has many missing values in Eurostat's database.[13]

Arrivals were preferred over the nights spent and net occupancy rate since they reflect the actual attractiveness of a given region, whether this refers to short stays, or longer vacation. In other words, regions exhibiting lower numbers of nights spent at tourist accommodation establishments do not necessarily suffer a less significant extent of overtourism, since the numbers of nights spent there could concentrate in specific days of the year. Relatedly, UNTWO (2018) stresses that the aggravation caused by the number of tourists depends on seasonality. This is particularly evident in the urban context, as many European capitals have become international weekend destinations. In comparison to destinations preferred for longer stays, the former are no less touristified despite exhibiting lower numbers of nights spent. More importantly, this choice filters out longer stays that are not necessarily related to the type of touristification investigated here (e.g., digital nomadism; Alexandri & Janoschka, 2024). For their part, net occupancy rate of bed-places and bedrooms in hotels and similar accommodation only refers to the first type of tourist accommodation noted above (NACE Rev. 2 activity I55.1), thus it was avoided for its limited scope. More importantly, it was deemed as a conceptually redundant type of data, in the sense that it is directly linked to arrivals, while it does not hold the latter's analytical capacity. Similarly, bed

[12] UNWTO, SDG indicator metadata. Available at: https://pre-webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2024-04/Metadata-08-09-01%202_3_april2024_updated.pdf

[13] As can be seen in the respective page of the Eurostat database: Establishments, bedrooms and bed-places in tourist accommodation, by NUTS 2 regions. Available at: https://ec.europa.eu/eurostat/databrowser/view/tour_cap_nuts2__custom_12314426/default/table?lang=en

nights[14] were avoided for similar reasons. Nevertheless, it must be stressed that arrivals themselves, is a type of data that, as noted above, excludes residential tourism, i.e., visitors staying in their own property (e.g., foreign pensioners having a second home in the country/region), as well as the people who are hosted by friends or stay at informal accommodation.

Labour in NACE I was preferred over other relevant data such as the "direct employment in tourism" data series (collected by Eurostat and UNTWO), as the latter cover a very limited period and most of them refer to the national level. However, it must be noted that the tourism industry can be broken down into a wide array of sub-industries, including Accommodation services, Real estate activities with own leased property, Food and beverage serving services, Railway passenger transport, Road and local transport, Water passenger transport, Air passenger transport, Car rental industry, Travel agencies and tour operators, Cultural, sports and recreational services, Bussiness support activities, Health activities, Sale of motor vehicles and other retail activities, and many others. Therefore, focusing on NACE I leaves out other key activities. Still, NACE I is one of the most closely associated with tourism, making it a sufficient proxy for measuring labour markets' dependence on tourism at the regional level.

Lastly, the direct contribution of tourism to the national GDP was preferred over other metrics, for instance the gross value added of accommodation and catering, retail, wholesale and transportation (NACE codes I-K), which is available from Eurostat at the regional level. However, the latter sectors' grouping would include multiple activities that they are not directly related to tourism. The scarcity of such data at the regional level is so evident that relevant analyses have resorted to proxies. For instance, Peeters et al. (2018) have used the share of tourism revenues in the NUTS 2 regional GDP by calculating a regional proxy for revenues. Specifically, *"(a)s tourism revenues are only known at the country level, first the average revenues per bed-night per country were calculated and then multiplied by the NUTS 2 number of bed-nights to find a proxy for the NUTS 2 tourism revenues. The indicator was calculated by dividing these revenues by the NUTS 2 GDP"* (Peeters et al., 2018, p. 72).

In addition to the eventually chosen data (tourist arrivals, bed places in all tourist accommodation, NACE I employment, tourism's direct GDP), however, there is a series of additional data that could prove insightful for scrutinising touristification. One such type of data is the number of short-term rentals offered through online peer-to-peer platforms (e.g., Airbnb, Booking). However, this type of data is not available for all the EU NUTS 2 regions throughout the study period (2009-2022). Eurostat has only recently started collecting it as part of its experimental statistics, covering the years from 2018 onwards.[15] However, these platforms operate already since the early 2010s, thus it was deemed that

[14] i.e., the total number of beds occupied divided by the total number of beds available in a given accommodation unit. The main difference with occupancy rate (the share of occupied rooms in a given accommodation unit) is that bed nights consider the bed places within each room instead of the room per se.

[15] As can be seen in the respective page of the Eurostat database: Guest nights spent at short-stay accommodation offered via collaborative economy platforms by NUTS 3 regions - experimental statistics. Available at: https://ec.europa.eu/eurostat/databrowser/view/tour_ce_oan3__custom_12314710/default/table?lang=en

including these data in the TAIDD CI only for the years that they are available (2019, 2022), would diminish the comparability of the index. Still, although bed places have been included so as to refer to all types of tourist accommodation, as noted above, many Member States have excluded establishments of less than 10 bed places from their observations; many of the excluded establishments are expected to be short-term rentals. Nevertheless, not all are excluded, meaning that Eurostat's data on arrivals that are being used in the report at hand cover to some extent the activity of the short-term accommodation offered via collaborative economy platforms. At the same time, this shortcoming affects the examination of demand as well, as Eurostat (2015, p.55) underlines that arrivals at rented tourist accommodation establishments gives only a fraction of the whole picture; indicatively, it is mentioned that such arrivals represent half of the actual tourism flows, whereas the other half is channeled into smaller-size accommodation, secondary residences, and less formal arrangements (friends' or relatives' houses).

Lastly, another type of data that the index should ideally incorporate is these about cruise tourism; in its current form, the variables of TAIDD CI do not account for this type of tourism at all. Specifically, cruise tourism is not reflected in arrivals, since the latter type of data refers to arrivals at tourist accommodation establishments, nor is it reflected in establishments for obvious reasons. Moreover, with most tourists in cruises limiting their expenses onboard, making very few expenses at the places cruise ships dock, this type of tourism is largely unrelated to labour in catering (Larsen et al., 2013). Similarly, cruise tourism is unrelated to tourism direct GDP; not only it does not leave considerable cash in destinations, but also the base of cruise companies is most often located in countries other than the destination one (Daly et al., 2017). Nevertheless, cruise tourism leaves a prevalent footprint upon regions' touristification and is closely associated with overtourism by locals and officials (Constantoglou & Klothaki, 2021), while it also has a multitude of negative consequences on air and water pollution (Lloret et al., 2021). Overlooking this type of tourism unfortunately weakens any touristification index, especially in the study of areas with no other types of mass tourism, such as the Nordic countries (Larsen & Wolff, 2016). However, no comparable data are available covering the report's geographical (EU regions) and temporal scope (2008-2022).

Geographical and temporal scope, data sources and limitations

The temporal scope of the analysis covers the years between 2009 and 2022; specifically, the TAIDD CI has been calculated for the years 2009, 2014, 2019 and 2022. These exact study years were chosen based on their significance during the previous turbulent decade, while also slight adaptations were made due to missing data. Specifically, 2009 marks the onset of the 2008/2009 Global Crisis for most European countries and 2014 the peak of recession, especially for the Southern European ones (Gourzis & Gialis, 2019). Ideally, 2013 would be chosen as the peak of recession as this was the case in most European economies outside the EU South (Herod et al., 2022); however, for this year Eurostat's tourism data have many missing values. 2019 serves as a baseline year for studying the impact of the pandemic-induced recession, since COVID-19 broke out in Europe by early 2020. 2022 is the most recent year with available data at the time of the writing of this report's analysis; specifically, although tourist arrivals and bed places, as well as labour in NACE I are available for 2023 as well, tourism's direct

contribution to GDP, which is a crucial part of the index, was not.[16] Further, we have calculated changes in the values of the TAIDD CI between 2009 and 2014, 2014 and 2019, and 2019 and 2022. The 2009-2014 period marks the years of deep recession, the 2014-2019 period marks the years of an (anaemic) recovery, while the 2019-2022 period delineates the pandemic-induced crisis and allows for its study, which is particularly important considering its impact on tourism worldwide.

The geographical scope of the analysis is all EU27 NUTS 2 regions except for some that were deemed geographically irrelevant to the report at hand (i.e., French overseas regions, Spanish autonomous cities in northern Africa) and FI20 (i.e., Åland in Finland) that constantly exhibited missing values. Moreover, the set of NUTS 2 regions used in the analysis at hand does not correspond to the actual NUTS 2 regions currently in Eurostat's database. This is because there occurred many changes in regional classification during the study period (2009-2023). Specifically, in the case of mere code replacement (as in France and Greece) we have used the new codes. In the case where one initial NUTS 2 region breaks down in two or more (as in Croatia, Poland, Lithuania and Hungary), we have used the initial classification. Thus, in Croatia the initial HR04 is kept by summing up HR02, HR05 and HR06 (from 2019 onwards); in Poland, the initial PL12 is kept by summing up PL91 and PL92 (from 2013 onwards); in Lithuania, the initial LT00 is kept by summing up LT01 and LT02 (from 2013 onwards); in Hungary, the initial HU10 is kept by summing up HU11 και HU12 (from 2013 onwards). For its part, Ireland is a more complex case, as its post-2012 NUTS 2 regions occurred by moving borders and dividing previous NUTS 2 regions; to keep the country as part of the analysis and still have comparable data throughout the study period, we decided to treat it as a one-region country (following the methodological choice by Kelly et al., 2022).

All data used for the TAIDD CI have been retrieved from Eurostat except for tourism's direct GDP, which was drawn from the World Bank. In cases of missing values various methods were implemented, as analysed below. Specifically, data on arrivals and bed places were drawn from Eurostat's tourism data; missing values were observed in a few cases and data were mostly retrieved from alternative, official sources. Specifically, for 2009, data on tourists' arrivals were missing for Germany (as a whole) and DE14 (Tübingen), as well as the Dutch regions NL31 (Utrecht) and NL32 (Noord-Holland). For the former, data were retrieved from the German Statistical Authority[17] and for the latter, data were retrieved from the Dutch Statistical Authority.[18] In 2014, data on arrivals in the German regions DE50 (Bremen) and DEG0 (Thüringen) and the Portuguese region PT20 (Região Autónoma dos Açores) were missing. For the former, data were retrieved from the German Statistical Authority[19] and for the latter, data were inferred

[16] June-July 2024.

[17] https://www-genesis.destatis.de/genesis/online?operation=abruftabelleBearbeiten&levelindex=1&levelid=1685446912698&auswahloperation=abruftabelleAuspraegungAuswaehlen&auswahlverzeichnis=ordnungsstruktur&auswahlziel=werteabruf&code=45412-0011&auswahltext=&wertauswahl=397&wertauswahl=396&werteabruf=Value+retrieval#abreadcrumb

[18] Specifically, guests in hotels were retrieved from **https://opendata.cbs.nl/#/CBS/en/dataset/70022eng/table?searchKeywords=tourist%20arrivals** and guests in other types of leisure accommodation from https://opendata.cbs.nl/#/CBS/en/dataset/70021eng/table?searchKeywords=tourist%20arrivals and then these two types were added.

[19] https://www-genesis.destatis.de/genesis/online?operation=abruftabelleBearbeiten&levelindex=2&levelid=

by deducting the sum of the rest of the Portuguese regions from national figures. Data series for 2019 were complete. In 2022, data on bed places were missing for Ireland; in this case, since it was not possible to retrieve missing values from other official sources, the 2021 value was used calculating a slight increase between 2021 and 2022 aligned with the respective increase of bed places in the EU as a whole (2.5%).

For employment in NACE I, microdata from Eurostat's Labour Force Surveys were used. Missing values were again observed in some cases. Specifically, as noted above data for FI20 (Åland) were missing in multiple cases; as a result, it was decided to keep that region out of the index's calculation. The latter constitutes an archipelago between Finland and Sweden, with missing data occurring mainly due to its very small population; however, it must be noted that it is an economy that relies on tourism (apart from shipping companies)[20] and ideally, it should be included in the calculation of such indexes. The French region FRM0 (Corse) lacked data on employment in NACE I in 2009; in this case, since it was just once and the region is a significant insular destination in Southern France, with its labour market relying heavily on tourism[21], missing values were filled out based on the 2010 value and calculating a slight change, adjusted by the respective change in employment in NACE I in the whole country (6.3% increase from 2009 to 2010). In 2022 missing values were observed in the German region DEC0 (Saarland) and the Polish regions PL52 (Opolskie), PL72 (Swietokrzyskie) and PL84 (Podlaskie). In this case, considering that 2021 constituted an emergency due to the pandemic, using it as a base year would not be safe. Thus, 2019 was used instead, calculating a change that aligned with the respective change in employment in NACE I in the whole countries (-16.9% for Germany and -2.9% for Poland).

Tourism's direct contribution to GDP was retrieved from the World Bank's Prosperity Data360° database.[22] Unfortunately, it was not possible to retrieve this from UNWTO, since there are no consistent data series for the whole study period (2009-2023): many countries have data for very few years and/or last available data go back to 2019-2021.[23] This is so despite tourism's direct GDP (TDGDP) constitutes indicator 8.9.1 of UN's Sustainable Goal Indexes, reflecting a general lack of data around tourism due to inherent difficulties in their collection. This is underlined in all Tourism Satellite Accounts; indicatively, it is not easy to distinguish between international and domestic arrivals at a given place, or to decipher the complexity of the tourism industry and measure its contribution to the GDP.[24] Still, due to the above limitations, World Bank's data do not always correspond to data reported in the Tourism Satellite

1685451358350&auswahloperation=abruftabelleAuspraegungAuswaehlen&auswahlverzeichnis=ordnungsstruktur&auswahlziel=werteabruf&code=45412-0020&auswahltext=&

[20] European Employment Services. Labour market information: Finland. Available at: https://eures.europa.eu/living-and-working/labour-market-information/labour-market-information-finland_en

[21] European Employment Services. Labour market information: France. Available at: https://eures.europa.eu/living-and-working/labour-market-information/labour-market-information-france_en

[22] https://tcdata360.worldbank.org/indicators/tot.direct.gdp?country=SVK&indicator=24648&countries=SVN&viz=line_chart&years=2008,2022

[23] As can clearly be seen here: https://www.unwto.org/tourism-statistics/economic-contribution-SDG

[24] UNWTO. Measuring the Sustainability of Tourism (MST): Estimating Tourism Direct GDP with limited data. Available at: https://webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2022-12/Measuring_TDGDP.pdf

Accounts Reports, even in cases where both databases contain such data for a given year. While noting the frequency of conflicting and/or contradicting data, UNWTO states that the data in question are not to be published; however, these data are still used *"in the calculation of aggregates"*.[25] Drawing from this approach, we have checked the TDGDP data used here for significant deviations from those of UNWTO (i.e., Indicator 8.9.1 of UN's SDGs) and Eurostat (as laid out in Tourism Satellite Accounts) for the years that they are all available. In most cases, no significant discrepancies were observed. For the rest, data is used with caution, and as part of a broader aggregate.

[25] Noted here, in page 5: https://pre-webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2024-04/Metadata-08-09-01%202_3_april2024_updated.pdf

Development of appropriate variables and index structure

Dimension	Variable	Calculation	Weight	
Intensity	BEDS/POP	Bed places per inhabitant	0.3	0.15
	ARRIV/POP	Tourist arrivals per inhabitant		0.15
Density	BEDS/AREA	Bed places per square kilometer	0.3	0.15
	ARRIV+POP/AREA	Tourist arrivals plus inhabitants per square kilometer		0.15
Dependence	EMPL%	Share of NACE I (accommodation and catering) in total employment	0.4	0.20
	TDGDP%	Share of tourism's direct contribution to GDP		0.20

Table 1: TAIDD CI dimensions, variables, and weights

Based on the above-analysed methodological choices and data limitations, the TAIDD CI comprises three dimensions with two variables each (six in total). The index's dimensions, variables, calculation, and weight are shown in *Table 1*. Despite its articulation upon four types of data, being in this sense simple, the index is built in a way that it addresses the multifaceted nature of tourism.

Specifically, the social pressure exerted by tourism on regions (the "Tourism's social pressure" dimension of the TAIDD CI) is assessed through (a) the number of bed places per inhabitants, covering in this way the intensity of the tourism product, and through (b) the number of arrivals per inhabitants, covering in this way the pressure exerted to local societies by the presence of tourists. Weighing supply and demand of tourism by area and population separately instead of simultaneously (i.e., dividing supply and demand by local population density) constitutes an explicit methodological choice. Specifically, although the latter approach has been followed by Canale & De Siano (2021) for quantifying tourism's territorial pressure, the TAIDD CI does not blend area and population as it would obscure the different magnitudes and types of regional tourism markets across the EU. Namely, metropolitan regions would exhibit low territorial pressure if tourism-related data were to be weighed by population density, as it is much higher there than in rural regions. In this way, overtourism in the urban context would be overlooked. Instead, calculating tourism's social intensity and territorial pressure separately, makes the TAIDD CI a more appropriate tool for assessing touristification in both the urban and the rural context.

For its part, the territorial pressure exerted by tourism (the "tourism density" dimension of the TAIDD CI) is assessed through (a) the number bed places per square kilometer, covering in this way the supply of the tourism product, and through (b) the number of tourists' arrivals plus local inhabitants per square kilometer, covering in this sense the demand for space in tourist destinations. The reason inhabitants are counted in this calculation along with tourists is because tourism congestion refers to a problem that exceeds tourism; in other words, already heavily populated areas such as large cities face greater problems from the territorial pressure exerted by tourism. According to UNWTO (2018), for resources and infrastructure to be put under pressure, it is not only the number of tourists that matters, but also that of residents and commuters, who also *"compete for the use of the space and services with those temporarily visiting the city".*

Our approach, accounting for both tourism's spatial density and socioeconomic intensity, adheres to recent studies on overtourism, such as McKinsey & Company, & World Travel & Tourism Council (2017), Peeters et al. (2018), and the methodological propositions made by the European Tourism Indicators System for sustainable destination management (ETIS).[26] Intensity referring to the social pressure and density referring to the territorial pressure exerted by tourism follow the terminology used by Peeters et al. (2018).

Lastly, the extent of tourism "monoculture", i.e., the dominance of tourism in local/regional productive structures, is assessed through (a) the share of workers in accommodation and catering in total employment, covering in this way the dependence of labour markets from tourism, and through (b) tourism's direct contribution to the GDP, covering in this way the dependence of national growth models from tourism. The development of a dependence upon a single activity is closely related to the notions of "compositional complexity" and "related variety", prevalent in Evolutionary Economic Geography, which postulates that the lack of them is a good predictor of regional underdevelopment (Kogler et al., 2023). The methodological choice of focusing on NACE I instead of including all activities related to tourism was analysed in the previous Section. For its part, tourism's direct contribution to GDP (%) is the most widely accepted metric for measuring the industry's impact on the economy (UNWTO, 2018). Unfortunately, this data only refers to the national level and a suitable proxy at the regional level was not available. For this, as well as due to the aforementioned data scarcity mentioned above, as part of the sensitivity tests (described below), a version of the TAIDD CI will be calculated without tourism's direct GDP.

Overall, the TAIDD CI was built based on having a small number of comprehensive variables so that it retains a level of transparency and that its results can be read efficiently (OECD/EU/JRC, 2008).

Normalisation of values and check for correlations between variables

The method of normalising the data was through z-scores. This method is greatly affected by extreme values; as such, it is not preferrable in analyses where outliers distort the results (OECD/EU/JRC, 2008). In contrast, as our analysis focuses on touristification, a phenomenon which describes an exceptional behaviour in the first place, this method was deemed as the most appropriate. The above are highlighted by the correlation check between the variables of the TAIDD CI, which as a univariate analysis method served in choosing the most appropriate normalisation method (Mendola & Volo, 2017).

As becomes evident from the above, there are cause-effect links and other types of interdependencies between the selected data. Specifically, tourist arrivals are linked to bed places (accommodation capacity), since increased demand pushes supply to follow; conversely, scarce demand gradually drives supply down. At the same time, the finite number of bed places in tourist establishments puts a limit on the number of documented arrivals a region can receive – especially since Eurostat counts arrivals as

[26] European Tourism Indicators System for sustainable destination management (ETIS). Available at: https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/funded-projects/sustainable/indicators_en

those in tourist establishments. For its part, employment in NACE I is closely associated with bed places since this group of activities includes accommodation. Lastly, accommodation capacity, arrivals, and workers in accommodation and catering affect the direct GDP resulting from tourism. Therefore, the correlation matrix (Table 2) expectedly indicates some instances of high correlation (Pearson correlation coefficients R above 0.6) between variables: specifically, between bed places and arrivals when weighed by inhabitants and when weighed by area, as well as between employment in NACE I and bed places and arrivals when weighed by population. The correlation between bed places and tourist arrivals indicates a strong connection between supply and demand, which in fact tightens over time (both in terms of area and population); in other words, tourism markets in the EU regions gradually balanced supply and demand. Although keeping both in the TAIDD CI introduces *"an element of double counting"*, it should be noted that they account for different aspects of *"the phenomenon they aim to picture"* (OECD/EU/JRC, 2008, p. 21). In other words, this approach allows us to distinguish the regions that have maximised both supply and demand from those that have a high supply of accommodation but lower demand for it and vice versa – albeit the correlation matrix indicates that these cases (of unbalanced supply and demand) are relatively few. In any case, as part of the sensitivity tests that will follow the analysis (described below), two additional versions of the TAIDD CI will be calculated, one without the supply side variables (beds per area and population) and another without the demand side variables (arrivals per population and arrivals plus population per area). Similarly, correlations are observed between the employment share of NACE I and arrivals as well as bed places per population. The first case again demonstrates the correlation between supply (labour) and demand (arrivals), whereas the second is expected since both employment and bed places refer to the same sector (NACE I). However, the latter is only but a fraction of NACE I, which further comprises activities related to catering. Moreover, as a metric, bed places pertain to businesses, while employment pertains to workers; keeping both puts emphasis on both labour- and capital-intensive tourism markets. In any case, as part of the sensitivity tests that will follow the analysis (described below), a version of the TAIDD CI will be calculated without the employment share of NACE I. Having made the above methodological assumptions, it must be noted that well-established composite indexes such as OECD's "e-business readiness" also comprise sub-indicators with strong correlations; therein, the "percentage of firms using Internet" and the "percentage of enterprises that have a web site" exhibit a correlation of nearly 0.9 (in 2003) but still, both are kept in the final calculation of the index since they stand for crucial parameters of the phenomenon under study (OECD/EU/JRC, 2008).

Apart from above, no other multicollinearity issues were observed. In total, of the 15 combinations between the index's variables, 2 exhibit a strong correlation and another 2 a very strong correlation. In one case (the year 2019) a Pearson R above 0.6 is observed between tourism's direct GDP and employment share of NACE I.

Closing it must be noted that according to OECD/EU/JRC (2008) methodology for building composite indexes, the correlation between variables is checked before normalising their values. Here, however, we followed the methodology by Gialis & Taylor (2016) and Kapitsinis & Gialis (2023), who calculated the Pearson correlation coefficients R after calculating z scores. Thus, Table 2 shows the correlation between the normalised values of TAIDD CI's variables.

2009	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL %	TDGDP
BEDS/POP	1.000					
ARRIV/POP	0.883	1.000				
BEDS/AREA	0.267	0.375	1.000			
ARRIV+POP/AREA	-0.041	0.124	0.871	1.000		
EMPL %	0.717	0.732	0.347	0.108	1.000	
TDGDP	0.292	0.338	0.164	0.056	0.505	1.000

2014	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL %	TDGDP
BEDS/POP	1.000					
ARRIV/POP	0.868	1.000				
BEDS/AREA	0.247	0.393	1.000			
ARRIV+POP/AREA	-0.035	0.159	0.905	1.000		
EMPL %	0.732	0.701	0.310	0.087	1.000	
TDGDP	0.346	0.353	0.141	0.034	0.596	1.000

2019	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL %	TDGDP
BEDS/POP	1.000					
ARRIV/POP	0.912	1.000				
BEDS/AREA	0.237	0.366	1.000			
ARRIV+POP/AREA	-0.023	0.141	0.920	1.000		
EMPL %	0.756	0.755	0.295	0.079	1.000	
TDGDP	0.372	0.378	0.143	0.027	0.619	1.000

2022	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL %	TDGDP
BEDS/POP	1.000					
ARRIV/POP	0.928	1.000				
BEDS/AREA	0.220	0.319	1.000			
ARRIV+POP/AREA	-0.015	0.106	0.927	1.000		
EMPL %	0.761	0.752	0.270	0.063	1.000	
TDGDP	0.382	0.371	0.150	0.033	0.584	1.000

Legend		
Very Weak	0.0 ≤ |R| < 0.2	
Weak	0.2 ≤ |R| < 0.4	
Moderate	0.4 ≤ |R| < 0.6	
Strong	0.6 ≤ |R| < 0.8	
Very Strong	0.8 ≤ |R| < 1.0	

Table 2: Pearsons' R between TAIDD CI variables

The project is carried out within the framework of the National Recovery and Resilience Plan Greece 2.0, funded by the European Union - NextGenerationEU (Implementation Body: HFRI).

Check for redundant variables

2009	Variance	Proportion	Cum. Proportion	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL%	TDGDP
PC(1)	3,012	50,202	50,202	0,477	0,511	0,360	0,213	0,488	0,312
PC(2)	1,664	27,736	77,938	-0,289	-0,180	0,581	**0,704**	-0,173	-0,146
PC(3)	0,829	13,813	91,751	-0,355	-0,295	-0,053	0,034	0,119	**0,877**
PC(4)	0,307	5,124	96,874	0,278	0,310	0,033	0,027	**-0,845**	0,333
PC(5)	0,120	1,999	98,873	0,532	**-0,655**	0,434	-0,309	-0,044	0,039
PC(6)	0,068	1,127	100,000	0,450	-0,306	-0,584	0,601	0,039	0,016

2014	Variance	Proportion	Cum. Proportion	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL%	TDGDP
PC(1)	3,074	0,512	0,512	0,479	0,505	0,339	0,205	0,496	0,335
PC(2)	1,726	0,288	0,800	0,260	0,118	-0,597	**-0,698**	0,195	0,193
PC(3)	0,795	0,133	0,933	-0,381	-0,358	-0,017	0,084	0,146	**0,836**
PC(4)	0,239	0,040	0,972	0,145	0,412	-0,014	0,013	**-0,814**	0,383
PC(5)	0,115	0,019	0,992	**-0,675**	**0,650**	-0,266	0,114	0,179	-0,077
PC(6)	0,051	0,008	1,000	0,283	-0,106	**-0,676**	**0,671**	0,019	0,000

2019	Variance	Proportion	Cum. Proportion	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL%	TDGDP
PC(1)	3,141	0,523	0,523	0,487	0,511	0,313	0,186	0,501	0,343
PC(2)	1,764	0,294	0,817	0,232	0,117	**-0,615**	**-0,701**	0,178	0,176
PC(3)	0,772	0,129	0,946	-0,378	-0,356	-0,008	0,067	0,133	**0,842**
PC(4)	0,202	0,034	0,980	0,258	0,309	0,011	0,010	**-0,834**	0,378
PC(5)	0,080	0,013	0,993	**-0,630**	**0,686**	-0,310	0,186	0,050	-0,018
PC(6)	0,041	0,007	1,000	0,322	-0,181	**-0,654**	**0,659**	0,034	0,004

2022	Variance	Proportion	Cum. Proportion	BEDS/POP	ARRIV/POP	BEDS/AREA	ARRIV+POP/AREA	EMPL%	TDGDP
PC(1)	3,105	0,518	0,518	0,499	0,513	0,295	0,173	0,502	0,344
PC(2)	1,790	0,298	0,816	-0,219	-0,131	**0,628**	**0,703**	-0,164	-0,140
PC(3)	0,769	0,128	0,944	-0,345	-0,355	-0,013	0,036	0,111	**0,861**
PC(4)	0,227	0,038	0,982	0,278	0,311	0,006	0,012	**-0,840**	0,347
PC(5)	0,067	0,011	0,993	**0,648**	**-0,684**	0,277	-0,184	-0,041	-0,005
PC(6)	0,042	0,007	1,000	0,294	-0,171	**-0,665**	**0,664**	0,041	0,005

Table 3: Principal Component Analysis, TAIDD CI variables

The next step that is crucial for properly building a composite index is to check for redundant variables, i.e., check for the chance for dimensionality reduction without limiting the hermeneutical and prediction capacity of the index. For doing so, we implement Principal Components Analysis (PCA), which essentially transforms *"correlated variables into a new set of uncorrelated variables"*. This will elucidate the structure of the TAIDD CI in the sense that it will *"reveal how different variables change in relation to*

each other and how they are associated". In this sense, PCA is used in the report at hand as a confirmatory factor analysis for assessing the efficiency of the TAIDD CI given that an initial set of variables has already been selected. The eigenvalues of the correlation matrix (Table 3) of the six variables comprising the TAIDD CI reveal that all six variables have a strong or very strong component loading (i.e., above 0.6 in absolute value) for all years except 2009 (then, bed places per inhabitants and arrivals plus inhabitants per area do not have a strong component loading). As a result, it is concluded that all variables of the TAIDD CI are significant and there is no need for reducing their number.

Weighting of dimensions and variables

Since *"weights are essentially value judgments"*, there is no consensus among researchers regarding the ideal weighting methodology (European Commission, 2020). For the TAIDD CI, which attempts to measure the extent of touristification at the regional level, a slightly increased focus is put on a specific dimension that refers directly to the nature of the phenomenon under study. Specifically, whereas a weight of 0.3 is attributed to the variables "tourism's social pressure" and "tourism's territorial pressure", a weight of 0.4 is attributed to the "tourism monoculture". The variables of each dimension share its total weight equally, therefore, as shown in Table 1 above, the variables of the first two dimensions (tourism's social and territorial pressure) have a weight of 0.15 while the variables of the third dimension (tourism monoculture) have a weight of 0.2. Nevertheless, given that equal weighting is considered the most commonly used weighting method (Gialis & Taylor, 2016), it will be implemented in an alternative version of the TAIDD CI in the context of the sensitivity tests that will follow the analysis.

Aggregation method

Regarding aggregating the variables of the TAIDD CI, a linear method is adopted. That is because a high extent of complementarity is identified between the different dimensions and variables comprising the index and trade-offs among them are acceptable (Mendola & Volo, 2017). Namely, we admit that a given region that has low values in supply-related variables and high values in demand-related ones can be as touristified as another that exhibits an opposite balance (high supply/ low demand). Moreover, we admit that a capital-intensive tourism market (high share of tourism output in total GDP) can be as touristified as another that is labour intensive (large share of NACE I in total employment).

Mapping and data clustering methodology

In the Analysis Section, we map the index's results for 2009, 2014, 2019 and 2022, as well as the changes between 2009-2014, 2014-2019 and 2019-2022. Regarding the data clustering methods for dividing features into classes, most recent tourism-related studies use the quantile classification method, which divides features into classes of equal observation numbers (e.g. World Travel & Tourism Council, 2017; Peeters et al., 2018). One fair point raised in favor of this method is that variables related to overtourism, such as bed nights per inhabitant might vary between 2-3 orders of magnitude, making the reading of maps with different classification methods problematic (Peeters et al., *ibid*, p.51). Alternatively, other

studies use the equal or defined interval, meaning that each class has the same size – e.g., 0–100, 101–200, 201–300 and so on. However, in this report we have implemented the natural breaks Jenks classification method, which is one of the most commonly used in cartography in general. With this method, *"class breaks are created in a way that best groups similar values together and maximizes the differences between classes".*[27] Specifically, as a data clustering method the Jenks Natural Breaks algorithm has been used (De Smith et al., 2007). This method works only because the TAIDD CI results are normalised, therefore, the problems mentioned by Peeters et al. (2018) have been overcome.

Backward decomposition

After calculating correlations, we proceed with what OECD/EU/JRC (2008) mentions as "back to the real data", meaning that composite indicators should be decomposed to their original variables. On a wider note, referring back to the initial variables of a composite index contributes to its transparency, i.e., gaining a better understanding of the underlying mechanisms leading to its results. Additionally, this process allows for the study of a phenomenon not only through a comprehensive approach, but also through its components (Mendola & Volo, 2017). On a more specific note, backward decomposition allows the researcher to shed light upon the reasons behind the performance of a given country/region; for instance, a region might have a high TAIDD CI score because of high values in density-related variables, whereas another region might have an equally high index score because of intensity-related variables. After looking into the individual variables, the analysis lays out a correlation matrix between the index and them. This is done so as to assess the relationship between the TAIDD CI and its variables (following the proposition of Mendola & Volo, 2017).

Correlation with other variables

Following the guidelines of OECD/EU/JRC (2008), we juxtapose the TAIDD CI to a series of variables pertaining to output, urbanisation, gross fixed capital formations, and labour precarity, through a correlation analysis. Specifically, the methodology to check potential linear correlation with the above metrics is through calculating the Pearson correlation coefficient (r); employing a simple correlation analysis cannot unveil causal relationships, nor can account for modelling and predicting the relationship between a dependent variable and a series of independent ones. However, it helps to contextualise the index's results and aligns with the relevant literature's propositons (OECD/EU/JRC, 2008; Mendola & Volo, 2017). The measurements juxtaposed with the TAIDD CI are as follows: regional GDP, regional GDP per capita, national GDP, and national GDP per capita, in order to identify potential links between our index's scores and growth at the national and regional level; population density, in order to identify potential links with urbanisation levels; the share of gross fixed capital formations (GFCF onwards) in

[27] ESRI, Data classification methods. Available at: https://pro.arcgis.com/en/pro-app/latest/help/mapping/layer-properties/data-classification-methods.htm

industry[28], in order to identify potential links with de/industrialization trends; the Building Share Index (see Christophers, 2011; Kutz, 2016; Gourzis & Gialis, 2019), in order to identify potential links of touristification with capital switching from industrial production to the production of space[29]; and lastly, the vFCA Composite Index (as has been calculated and provided in Kapitsinis & Gialis, 2023), in order to identify potential links with labour precarity within regional labour markets.[30] All the above correlations are calculated for both individual years (2009, 2014, 2019, 2022), as well as changes over time (2009-2014, 2014-2019, 2019-2022, 2009-2022).[31] Unfortunately, data on GFCF by fixed asset type and labour expenditure are not available at the regional level, therefore the Building Share is the same for all regions of a given country. Opting for GFCF by asset type instead of sector, despite the former being provided at the national level and the latter at the regional level, is based on the fact that GFCF in all sectors include investment in the built environment, and not only those in constructions; therefore, GFCF in construction cannot account by itself as a proxy of capital switching.

Robustness and sensitivity tests

Subsequently, the composite index is recalculated in various ways so as to check for its robustness and sensitivity. This is a necessary step for developing a credible composite index that does not give critically different results when part of its variables is removed or recalculated (Mendola & Volo, 2017). Specifically, four additional versions of the index will be calculated. First, a version where all six variables of the original TAIDD CI have an equal weight. This is done so as to check for substantial differences and ensure that the subjective weighting of variables we adopted does not affect results in an unwanted way. Second, a version which does not include the TDGDP (tourism's direct GDP) variable; in terms of weights, the remaining variables have the same. This version was deemed as important since TDGDP is the only one referring to the national level, whereas all the rest refer to the regional; this detail may lead to distorted results, i.e., regions which are not particularly touristy scoring high in the TAIDD CI due to their country's high TDGDP. Third, a version where only the supply-related variables (the ones that are calculated based on bed places) are kept and the ones related to demand (tourist arrivals) are not considered; the dimension of tourism monoculture is kept intact (NACE I employment [EMPLI %] and TDGDP), while also the five remaining variables of this version share the same weight. This recalculation was deemed as appropriate since the supply- and demand-related variables have been found to be heavily correlated (see above). Similarly, a fourth version has been calculated where only the demand-related variables are kept and the ones related to supply are not considered; again, the

[28] This includes NACE codes B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply) and E (Water Supply, Sewerage, Waste Management and Remediation Activities)

[29] Building Share= GFCF in the built environment (housing plus other construction)total GFCF - GFCF in Cultivated biological resources + wages and salaries.

[30] Both versions of the vFCA have been used here, one including OECD's Employment Legislation (EPL) Index and the other excluding it. Since the EPL index refers to the national level, the second version of the vFCA is much more sensitive to the local context.

[31] 2022 data on GFCF in industry were not available at the time of writing, therefore we used data for 2021. The vFCA index was calculated in Kapitsinis & Gialis (2023) up to 2020, therefore its 2019 calculation is the most recent year we use here.

dimension of tourism monoculture is kept intact, and the five remaining variables of this version share an equal weight. The specific structures and weights of the alternative indexes calculated as part of the robustness and sensitivity tests are shown in Table 4 below.

Alternative CI	Variable	Weight
Equal weights version	BEDS/POP	1/6
	ARRIV/POP	1/6
	BEDS/AREA	1/6
	TOUR+POP/ AREA	1/6
	EMPLI %	1/6
	TDGDP	1/6
Without tourism's direct GDP version	BEDS/POP	1/5
	ARRIV/POP	1/5
	BEDS/AREA	1/5
	TOUR+POP/ AREA	1/5
	EMPLI %	1/5
Supply only variables version	BEDS/POP	1/4
	BEDS/AREA	1/4
	EMPLI %	1/4
	TDGDP	1/4
Demand only variables version	ARRIV/POP	1/4
	TOUR+POP/ AREA	1/4
	EMPLI %	1/4
	TDGDP	1/4

Table 4: Structure and weights of the alternative TAIDD CI versions

Validity tests

Finally, in order to assess the soundness of the TAIDD CI results, we conclude with a validity test. Specifically, this test refers to juxtaposing the results of our analysis, which is based on the TAIDD CI, and the results of similar studies in literature. However, since the TAIDD CI constitutes a novel index in the sense that, to our knowledge, no other composite indexes have been calculated in order to assess the extent of touristification at the regional level, we use the most relevant study available. Namely, this is that by Peeters et al. (2018). This study, which was commissioned by the Transport and Tourism (TRAN) Committee of the European Parliament, examined the impact and suitable policy responses of overtourism through calculating a series of indicators for all EU regions and focusing on a series of case studies that exceed the boundaries of the European continent. Specifically, case studies included cities and rural areas from most EU. The study finds that the most pertinent quantitative measures of overtourism are the following 8: (i) bed-nights weighed by area and (ii) population, (iii) the share of short-term rentals' bed capacity within the total bed capacity, (iv) the share of tourism revenue in regional GDP, (v) arrivals by air weighed by population, as well as closeness to an (vi) airport, (vii) cruise ports, and (viii) UNESCO World Heritage Sites. The study concludes with a series of key recommendations to the TRAN Committee, including more systematic research on the phenomenon of overtourism,

especially regarding rural, coastal and insular areas, which are often overlooked in the relevant literature, more systematic collection of data, especially regarding new modes of accommodation (platform-mediated short-term rentals) as well as transportation (e.g. Uber) and at finer scales (NUTS 3), and a shift in the agenda around overtourism from a maximisation of arrivals to profitability and the production of good quality employment.

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Touristification in the EU during the 2010s: a composite indicator analysis

The study finds three primary zones of touristification: the core sunlust destinations of the EU South, the Alpine areas of Italy and Austria, and several urban heritage hotspots and/or global cities across Central and Northern EU. More specifically, the study highlights that two Greek insular regions, South Aegean and the Ionian Islands, top the list of the EU's touristified areas in all years.

It underscores that the EU's geography of touristification was established during the deep recession years (2009-2014), and these trends have extended until today. Specifically, the Great Recession drove a deepening polarization between the EU North and South, as well as within the latter, with destinations in Greece, Croatia and Portugal touristifying exponentially as compared to those in France, Italy, and Spain.

Crucially, the study highlights a direct correlation between touristification, GDP shrinkage, deindustrialization, and the deteriorating employment conditions. Specifically, the touristification of the EU South does not bring any significant (positive) economic effect; the regions that extend and deepen their touristification trajectories do not see increase to their GDP, but quite the opposite.

TAIDD CI results

In what follows, we scrutinise the index's results for each year and the index's changes over the course of the study period. At this point we must underline that the composite index provides a relative picture of touristification, as for any given year the average value of all TAIDD CI scores is 0. Equally, we must further note that changes in TAIDD CI scores do not indicate an absolute increase in a region's touristification, but rather an increase in its significance among all others in terms of touristification. Moreover, in the analysis that follows we use tables that feature the top 25 regions in the category displayed (e.g., TAIDD CI scores in a given year); however, full datasets for individual years are provided in Appendixes 1-4 and for changes over periods of time in Appendixes 5-8 (see Appendix).

Looking at Figures 1a and 1b three main touristification zones can be identified in the EU throughout the whole study period (2009-2022). The first is undoubtedly the EU South, which consistently constitutes the most touristified part of the EU. Specifically, the TAIDD CI exhibits high values in Greece's insular regions South Aegean, the Ionian Islands and Crete, as well as in Malta, coastal Croatia, Cyprus, insular Spain (the Balearic and Canary Islands), and insular, southern and metropolitan Portugal (i.e. Madeira, Algarve and Lisbon). Moreover, the index distinguishes as touristified the insular and coastal regions of eastern and southern Spain (Catalonia, Valencia, Andalucia), southern France (Corsica, Cote d' Azur and Languedoc-Roussillon), and northern Italy (Liguria, Toscana, Veneto). The second touristification zone is the Alpine regions of Italy and Austria; specifically, those are Tirol, Trento, and Aosta Valley in Italy, and Tirol and Salzburg (followed by Karnten and Voralberg) in Austria. The third is not a zone per se, but certain metropolitan regions in Central/Northern Europe act as islands of touristification; specifically, these cities are Brussels in Belgium, Wien in Austria, Prague in Czech Republic, Berlin and Hamburg in Germany, as well as Amsterdam (Noord-Holland) in the Netherlands. Moreover, Paris (Ile-de-France) exhibits high TAIDD CI scores, especially at the start of the study period (2009), as well as certain seaside regions in Northern Europe, which exhibit consistently notable TAIDD CI values. This mainly refers to Zeeland in the Netherlands, but also to a lesser extent Limburg (in the same country but not in the coast), as well as the coastal regions Schleswig-Holstein and Mecklenburg-Vorpommern in Germany.

What is remarkable is that South Aegean and the Ionian Islands (both Greek insular regions) rank first in all years with a notable distance from the trailing Balearic Islands in Spain, Brussels in Belgium, Jadranska Hrvatska in Croatia, and Malta. The exact order of the latter depends on the study year (see Table 5). On a wider note, it must be noted that the top-20 positions are occupied by almost the same regions

throughout the study period (2009, 2014, 2019, 2022) with only one region –Karnten in Austria– being replaced by the French region of Corse after 2009. Beyond these top 20 positions, regions change each study year, with North Aegean (Greece) being one of the few exceptions that steadily featuring there. Again, it is remarkable that Greek regions that are not deemed as touristified by the national standards (North Aegean, Peloponnese, Epirus) appear in the top-25 of the most touristified regions in the EU (see Table 5). The above indicates that the 2010s recession did not subvert touristification trends but rather reinforced them.

In contrast, the northern and eastern parts of the EU periphery steadily exhibit the lowest TAIDD CI values throughout the study period – specifically, almost all Eastern EU (Poland, Romania, Bulgaria and Czechia except for Prague), Baltic (Lithuania, Latvia, Estonia) and Nordic countries (Sweden, Finland and Denmark). Indeed, the bottom-20 list steadily features regions only from Poland, Romania and Lithuania, with one exception – the Belgian region of Hainaut Province.

Despite the above, subtle but important changes over the whole study period (2009-2022) are revealed by carefully looking at the maps (Figures 1a and 1b). Specifically, multiple touristified regions in northern, southern and eastern Spain (Asturias, Valencia, Andalucia) and western and southern France (Normandy, Pays de la Loire, Poitou-Charentes, Cote d' Azur and Languedoc-Roussillon) gradually lose their comparative significance as touristification further intensifies in other regions. Specifically, the French ones recede even more so than those in Spain, although the Balearic Islands is among the top-5 in terms of having its TAIDD CI score decrease. However, when looking at absolute changes in Table 6 rather than maps, it becomes evident that the losses of Alpine regions are much more prominent. Specifically, those regions are Tirol (-0.57), Salzburg (-0.49), Kärnten (-0.46), Burgenland (-0.36), and Vorarlberg (-0.29). Apart from those, many German regions like Mecklenburg-Vorpommern (-0.34), Saarland (-0.34), Trier (-0.27), Koblenz (-0.25), Niederbayern (-0.24), Kassel (-0.20), and Braunschweig (-0.19) display notable losses, marking Germany's receding touristification. Notably, even Berlin (-0.19) follows this trend, as do many other important urban destinations such as Prague (-0.25) and Paris (-0.19). The latter cases may indicate one of the inherent shortcomings of the TAIDD CI, which does not consider short-term rentals market data, although this gap also affects rural destinations too. Relatedly, Malta (-0.27) is one of the most notable cases of score losses. Overall, a quick look at the bottom positions regarding index scores' changes over the whole study period reveals that most are occupied by Austrian and German regions. In contrast, already top scoring coastal and insular regions solidify their score further; such examples are Jadranska Hrvatska (0.85) and the Ionian Islands (0.72), followed by regions such as Madeira (0.5) and Corsica (0.4). Moreover, regions that were already touristified but to a lesser extent saw underlying trends intensifying. For instance, more and more regions in Greece (North Aegean, Eastern Macedonia and Thrace, and Epirus) and Portugal (Norte, Lisbon, Azores) emerge as such. Overall, a quick look at the top positions regarding index scores' changes over the whole study period reveals that most are occupied by Portuguese and Greek regions. Apart from them, Spanish regions do not exhibit any notable changes (apart from the Balearic Islands, which, as noted above, see their TAIDD CI score drastically decreasing), whereas most Italian regions exhibit slight increments (by 0.1-0.2), with Puglia, Marche and Sardegna standing out. Similar increments are also exhibited by most Polish and Romanian regions, although almost all fall under the less touristified class in the maps. Specifically, the Romanian regions in the north Nord-Est and Nord-Vest are standing out, as does Zachodniopomorskie in Poland. The above mark an increasing tourism activity and dependence in both countries, despite their overall less

significant scores. After all, in this part of the EU (eastern EU) the Bulgarian regions close to the Black Sea exhibit much higher scores, being secondary loci of touristification for at least the first half of the 2010s (although Severoiztochen kept being one afterwards as well).

When breaking down the study period into sub-periods, it becomes evident that each one exhibits different characteristics. Specifically, changes between 2009 and 2014 show that touristification intensified (see Table 7). In fact, a closer look at the maps shows that these increments refer especially to the regions of Southern EU, and more specifically, to almost the entirety of Greece and Portugal, which trail behind Jadranska Hrvatska (0.55) and Corse (0.51) that also stand out. Specifically, the Portuguese regions featuring in the top-20 positions in terms of score change during this sub-period are Algarve (0.43), Centro (0.31), Alentejo (0.26), Norte (0.25), Lisbon (0.24), and Azores (0.20). For their part, the Greek regions featuring in the top-20 positions are South Aegean (0.28), Crete (0.27), North Aegean (0.18), Epirus (0.17), Central Macedonia (0.16), Western Macedonia (0.13), Western Greece (0.13), and Peloponnese (0.12). With the above, we observe that Greece and Portugal made a complete turn towards touristification during these years, with most of their regions being involved in this process. In contrast, many of the Alpine (e.g. Tirol, Salzburg, Bolzano, and Karnten), insular (Malta, the Balearic Islands) or metropolitan (Paris) regions, the touristification of which receded in significance during the whole study period, also saw this trend solidifying during the first sub-period. However, despite these regions' significant losses during the years of deep recession (2009-2014) or over the course of the whole decade (2009-2022), their TAIDD CI scores remained high. Overall, we found a high correlation of the trends during the years of deep recession and those of the whole study period; in other words, regions' touristification solidified during those defining years. Specifically, Jadranska Hrvatska, Corsica, Centro (PT) or Algarve constitute cases of extreme score gains both during 2009-2014 and 2009-2022; conversely, Karnten, Tirol, Salzburg, and Malta similarly constitute cases of extreme losses in both periods. Very few regions saw stark differences in their TAIDD CI change between those two periods; this is mostly the case with the Ionian Islands and Berlin, with the former receding in score significance during 2009-2014 but emerging as one of the most touristified regions overall, whereas the latter followed the opposite course. A last important finding is that the 2009 scores exhibit a much greater degree of homogeneity in comparison to 2014, as standard deviation in the full sample of regions increased, as well as the maximum and minimum values (see Table 8). Thus, 2009 found EU's southern regions significantly more orientated towards tourism than the rest of the Union, but the deep recession that followed intensified this preexisting trend and led to a polarisation between the touristification regions and the rest, rather than subverting the 2009 situation.

The trend of touristification intensifying and polarising among EU's regions continued during the next period (2014-2019). Regarding touristification's intensification, this can partially be attributed to the consolidation of tourism's digitalisation through the rise of short-term rentals through online P2P accommodation platforms (e.g. Airbnb, Booking.com), which occurred at the time (Gourzis et al., 2019). It must be noted here that Eurostat's conventional data on tourist accommodation mostly misses these rentals (see the Methodology Section), although the increasing tourism activity is indirectly capturing their impact; specifically, labour in accommodation and catering increased, as did tourism's direct GDP, as a direct result of tourism's digitalisation (Gourzis et al., 2022). Despite the data's shortcomings then, metropolitan regions like Lisbon exhibited a notable score increase during this period (0.19); apart from this however, most cases of extreme score increases refer to rural regions already dependent on tourism like the Ionian Islands (0.63 increase), Azores (0.34), South Aegean (0.30), Jadranska Hrvatska (0.24), and

Madeira (0.16). As with the previous one, this period (2014-2019) saw Greece and Portugal solidifying their already apparent turn towards touristification as their regions dominate the top-15 positions regarding 2014-2019 TAIDD CI changes. Following them, however, we observe many eastern European regions from Poland and Romania like Pomorskie (0.11) and Wielkopolskie (0.10), as well as Sud-Est (0.11) and Bucharest (0.10) respectively. Overall, these changes led to 2019 which can be described as the peak of touristification within the study period. Specifically, not only South Aegean's 4.15 that year is the highest score among all regions and study years, but in general the average score of the top-25 regions is higher (1.64) than in other years (e.g. 1.63 in 2022, 1.60 in 2009; see Table 8). At the same time, as noted above, these trends led to a profound polarisation in 2019; specifically, within the full sample, the standard deviation increased in comparison to the previous period from 0.70 to 0.71 (see Table 7). The same can be deduced from the maps, as in 2019 much fewer regions fall under the first two classes (with the highest values); indicatively, whereas for 2019 13 regions fall under the first class (coloured red), the respective number in 2014 is 16 (see Figure 1b).

The period that followed (2019-2022) saw a decrease in the maximum TAIDD CI score (again, South Aegean with 3.88) but also the minimum one (-0.83; see Table 7). These trends reflect the stress the COVID-19 pandemic did put upon tourism. Moreover, the pandemic caused a "downwards convergence", as the standard deviation within the full sample decreased (0.70). To contextualize the above, overly touristified economies saw the abrupt halt of tourism activity, while others less popular destinations received those that sought to avoid the crowds of mainstream "sun-sea-sand" and city-break destinations (Falk et al., 2022). It is indicative that South Aegean displayed a -0.27 decrease in its score, as did many other prominent destinations of the same kind, as Algarve (-0.21). Similarly, prominent urban destinations like Berlin (-0.22), Prague (-0.17), Wien (-0.07) and Lisbon (-0.07) saw their scores decreasing. In contrast, Madeira (0.25), the Ionian Islands (0.19) and Bolzano (0.17) standed out in terms of score gains. Overall, unlike previous periods, the most notable increments are not limited to Greek and Portuguese regions, as many French ones like Languedoc-Roussillon (0.13), Nord-Pas-de-Calais (0.10), Auvergne (0.10), Centre - Val de Loire (0.08), Basse-Normandie (0.07), and Picardie (0.07), Dutch ones like Friesland (0.08), Overijssel (0.08), Zuid-Holland (0.08), and Zeeland (0.08), Belgian ones like Limburg (0.10), Prov. Luxembourg (0.09), and Namur (0.07), Spanish ones like Murcia and the Balearic Islands (both by 0.10), and Italian ones like Bolzano (0.17) and Puglia (0.08) occupied the top-20 positions regarding TAIDD CI absolute score changes. Following, many Nordic regions saw their TAIDD CI scores increasing, like Etelä-Suomi (0.07) and Länsi-Suomi (0.06) in Finland, Norra Mellansverige (0.07) and Östra Mellansverige (0.06) in Sweden and Hovedstaden (0.07) in Denmark. Still, however, southern European destinations topped the rankings, being all regions that had already displayed notable increments during the previous periods (see Table 6). Apart from the apparent cases, the 2019-2022 period saw a rebound of less Greek touristified regions such as North Aegean (0.09) and Central Macedonia (0.07), which reemerged as important loci of touristification; in fact, even more Greek regions like Central Greece and Eastern Macedonia and Thrace reemerged, given that they saw milder decreases in their TAIDD CI scores compared to the full sample. This has led Greece being an exceptional case in 2022, as the only multi-region country that has almost all of them scoring notably high (another example is Croatia).

To better analyse the above, we have divided the study countries into 4 distinct groups, each one representing a characteristic European area. Specifically, the Northern and Central EU includes the core EU countries Austria, Belgium, Germany, France, The Netherlands and Luxemburg, plus Ireland. The

Nordic EU group includes the Scandinavian countries Denmark and Sweden, plus Finland. The Southern EU cluster includes the Mediterranean EU countries Malta, Cyprus, Greece, Spain, Croatia and Italy, plus Portugal. Lastly, the Eastern EU cluster includes Bulgaria, Romania, Hungary, Czech Republic, Slovenia, Slovakia and Poland, plus the Baltic countries Estonia, Latvia and Lithuania. This clustering follows well-established approaches in relevant fields, such as the literature on youth transition regimes (e.g., O'Reilly et al., 2018).

Looking into the 4 clusters we see that Southern EU exhibits the highest average TAIDD CI scores for all study years, as well as the highest maximum and minimum ones (see Table 8a). This marks clear that this country cluster has undergone touristification with the highest intensity, at least as measured by the TAIDD CI. This can be also verified by looking the top-25 rankings (see Table 5), where more than half positions are steadily occupied by regions from this cluster, especially the Greek and Portuguese regions plus the French region of Corse, which is typically part of another cluster but is still located in the EU South. At the same time, this group of countries exhibits the greatest variance compared to the rest, as reflected by standard deviation, the values of which are the highest for this group again for all study years. One reason for that is that this cluster is the second largest one (62 regions in total) only trailing Northern and Central EU. However, more significantly, this cluster comprises regions and one-region countries that are considerably touristified, especially the coastal/insular ones as well as those around the Alps in northern Italy. At the same time, it includes regions where tourism activity is much less intense, such as those in central Italy (e.g., Molise and Basilicata), northern Portugal (i.e., Norte), and central and northern Spain (e.g., Castilla-la Mancha and Extremadura), with most of the latter constitute agricultural regions with underdeveloped tourism infrastructure.[32] Besides TAIDD CI scores per se, this cluster also stands out in terms of TAIDD CI score changes (see Table 8b). Specifically, it exhibits the greatest score increases for all sub-periods, including the whole study period; these changes are mostly observed in regions which are already touristified (e.g. the Ionian Islands, Jadranska Hrvatska, or Madeira), reflecting this area's trajectory towards over-touristification. At the same time, Southern EU exhibits some of the greatest losses in TAIDD CI scores, signifying the diverse and often opposing trajectories of regions within this cluster. However, as some of these losses are observed in the touristified regions of this cluster, this underlines the overall volatility of tourism-dependent economies. This can also be seen through the standard deviation of changes, which is the highest in this cluster during all sub-periods. Average changes in the TAIDD CI values are among the highest in this cluster and especially the average change of the TAIDD CI values during 2009-2014 (0.07), which came at a period where all the other country clusters displayed negative or negligible changes, shows that Southern EU regions consolidated their position as tourism destinations and saw their dependence from the relevant industry increasing at an alarming rate during the years of the deepest recession. For its part, the Northern and Central EU exhibits the second highest average values in the TAIDD CI (see Table 8a). As noted above, this cluster includes metropolitan regions which exhibit intense touristification, with Wien in Austria, Brussels in Belgium, and Berlin in Germany standing out; at the same time, some of the highest index values can be found in the Austrian Alpine regions (e.g., Salzburg, Tirol). Although being the largest cluster (94 regions in total), as well as including heavily touristified regions, the Northern and Central EU exhibit a lower standard deviation in comparison to the Southern EU. This is because the

[32] European Commission, European Innovation Scoreboard 2024. Available at: https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

highest TAIDD CI values there are not as high as in the previous cluster, while more importantly, most regions in this cluster do not exhibit particularly heavy touristification or lack thereof. At the same time, the average TAIDD CI score change in this cluster is the strongly negative, surpassing all other clusters, signifying its regions' receding touristification, especially in comparison to Southern EU; this becomes apparent when looking at the average TAIDD CI change over the whole study period (-0.09), which is the largest loss among all clusters (see Table 8b). Of course, this does not mean a shrinking tourism activity, but rather a lower dependence from it. Overall, of all the countries in this cluster, the Alpine regions of Austria stand out, as well as the southern coastal and insular French regions (which should typically be labelled as southern EU).

The Nordic EU cluster follows Northern and Central EU in terms of average TAIDD CI scores (see Table 8a). No region from this cluster can be found in the top-25 positions as it displays low maximum values for all study years. At the same time, however, minimum values are not the lowest out of all clusters, signifying that no region is particularly touristified, but also that most have some sort of tourism activity. In terms of TAIDD CI score changes, Nordic EU displayed no notable ones (see Table 8b). However, this does not apply to changes during the COVID-19 pandemic (2019-2022), as this cluster was the only one with a positive average absolute change (0.02), reflecting the Nordic countries' more relaxed pandemic-mitigation policies at the time (Herod et al., 2022). Moreover, such changes reflect the appeal of nature tourism in remote areas during the pandemic, as many vacationers preferred rural and remote areas instead of mainstream "sun-sea-sand" and popular urban destinations during 2020 and 2021 (Falk et al., 2022). The variance of the index's scores and their changes appears low, but this can mainly be attributed to the low number of this cluster's regions. Overall, touristification in Nordic EU showed a notable dynamism during COVID-19, which is expected to extend in the following years, considering that the climate change and the resulting surging temperatures in the South have fueled a wave of "coolcation", i.e., travellers seeking cooler climates for their summer vacation (Enlund et al., 2024).

Lastly, Eastern EU exhibits the lowest average TAIDD CI scores for all sub-periods, as well as the lowest minimum scores (see Table 8a). Notably, no region in this cluster appears to be particularly touristified with the exception of Prague in Czech Republic and the coastal Bulgarian regions Severoiztochen and Yugoiztochen, both siding with the Black Sea. However, when looking at the TAIDD CI score changes, touristification in the Eastern EU exhibits some sort of dynamism over the whole study period, which can mainly be attributed to the positive average score change during 2014-2019 (see Table 8b). As noted above, this period saw certain Romanian (e.g., Sud-Est, Bucharest, Sud-Vest Oltenia, Sud - Muntenia) and Polish (e.g., Podkarpackie, Wielkopolskie, Dolnoslaskie, Swietokrzyskie, Podkarpackie) regions following a trajectory of increasing tourism dependence.

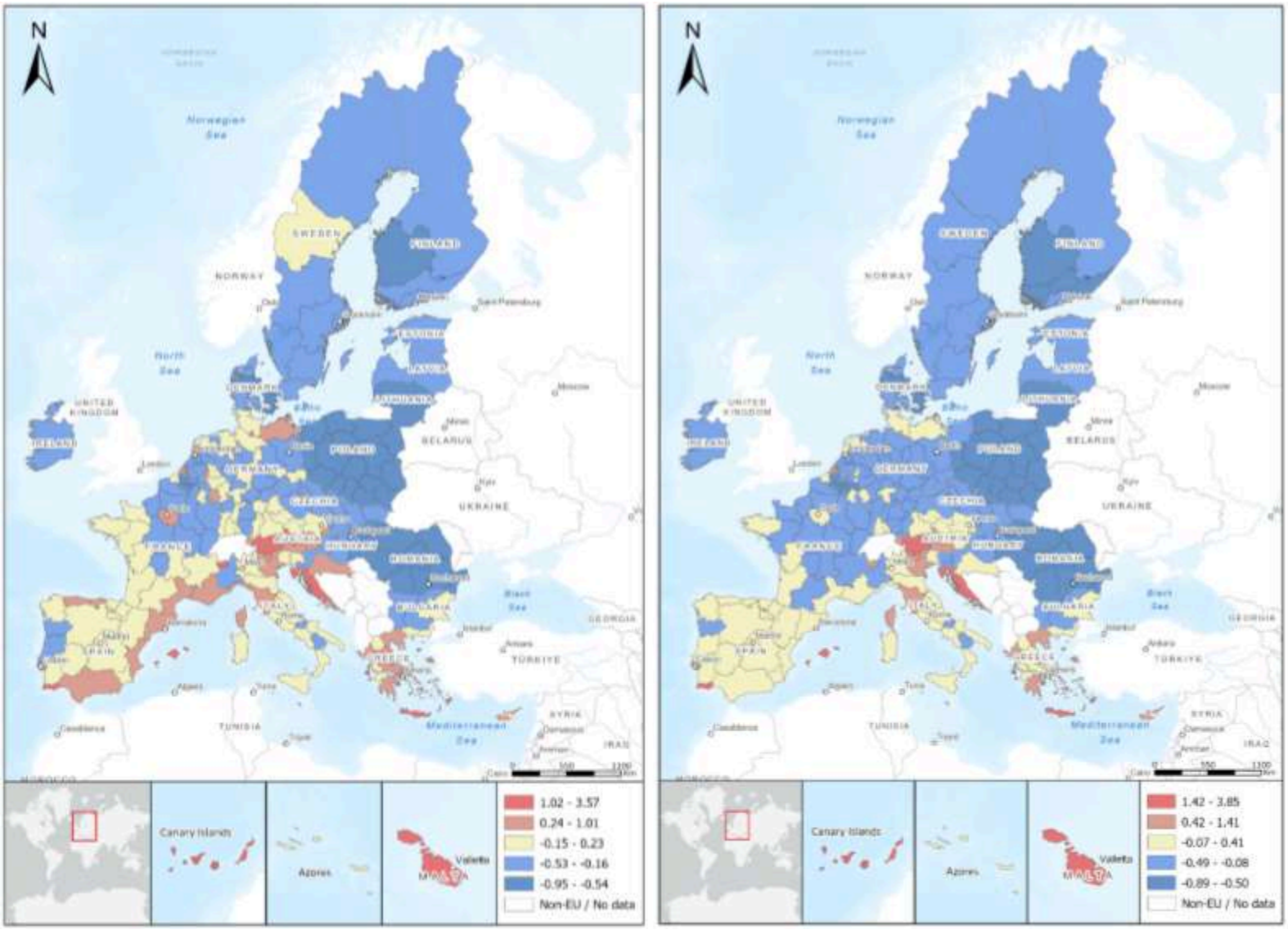

Figure 1a: TAIDD CI results for 2009 (left) and 2014 (right)

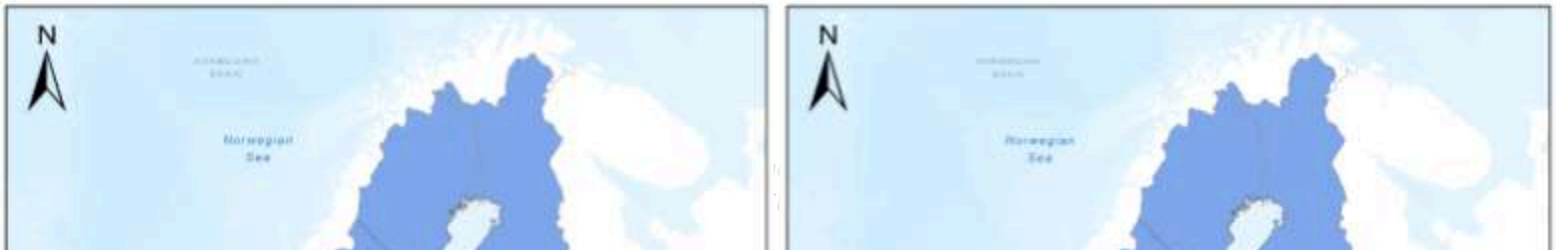

Figure 1b: TAIDD CI results for 2019 (left) and 2022 (right)

The project is carried out within the framework of the National Recovery and Resilience Plan Greece 2.0, funded by the European Union - NextGenerationEU (Implementation Body: HFRI).

2009				2014				2019				2022			
1	EL42	Notio Aigaio	3.57	1	EL42	Notio Aigaio	3.85	1	EL42	Notio Aigaio	4.15	1	EL42	Notio Aigaio	3.88
2	EL62	Ionia Nisia	2.86	2	EL62	Ionia Nisia	2.77	2	EL62	Ionia Nisia	3.40	2	EL62	Ionia Nisia	3.58
3	ES53	Illes Balears	2.54	3	BE10	Bruxelles	2.43	3	HR03	Jadranska Hrvatska	2.57	3	HR03	Jadranska Hrvatska	2.63
4	BE10	Bruxelles	2.48	4	ES53	Illes Balears	2.36	4	BE10	Bruxelles	2.27	4	BE10	Bruxelles	2.26
5	MT00	Malta	2.48	5	HR03	Jadranska Hrvatska	2.33	5	AT13	Wien	2.19	5	MT00	Malta	2.21
6	AT13	Wien	2.15	6	MT00	Malta	2.27	6	MT00	Malta	2.16	6	ES53	Illes Balears	2.14
7	AT33	Tirol	2.00	7	AT13	Wien	2.20	7	ES53	Illes Balears	2.04	7	AT13	Wien	2.11
8	ITH1	Bolzano	1.99	8	PT15	Algarve	2.02	8	PT15	Algarve	2.03	8	ITH1	Bolzano	1.87
9	CZ01	Praha	1.80	9	ITH1	Bolzano	1.82	9	EL43	Kriti	1.80	9	PT15	Algarve	1.81
10	HR03	Jadranska Hrvatska	1.78	10	DE30	Berlin	1.80	10	CZ01	Praha	1.72	10	EL43	Kriti	1.77
11	AT32	Salzburg	1.69	11	EL43	Kriti	1.75	11	ITH1	Bolzano	1.71	11	CZ01	Praha	1.55
12	ES70	Canarias	1.67	12	CZ01	Praha	1.75	12	DE30	Berlin	1.67	12	ES70	Canarias	1.51
13	DE30	Berlin	1.64	13	AT33	Tirol	1.69	13	ES70	Canarias	1.57	13	DE30	Berlin	1.45
14	PT15	Algarve	1.59	14	ES70	Canarias	1.68	14	AT33	Tirol	1.45	14	PT30	Madeira	1.45
15	EL43	Kriti	1.48	15	AT32	Salzburg	1.41	15	ITC2	Valle d'Aosta	1.35	15	AT33	Tirol	1.43
16	ITC2	Valle d'Aosta	1.29	16	ITC2	Valle d'Aosta	1.32	16	AT32	Salzburg	1.30	16	ITC2	Valle d'Aosta	1.37
17	AT21	Kärnten	1.01	17	FRM0	Corse	1.05	17	PT30	Madeira	1.20	17	AT32	Salzburg	1.19
18	PT30	Madeira	0.96	18	PT30	Madeira	1.04	18	DE60	Hamburg	0.94	18	DE60	Hamburg	0.95

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19	ITH2	Trento	0.90	19	DE60	Hamburg	0.92	19	ITH2	Trento	0.90	19	FRM0	Corse	0.95
20	DE60	Hamburg	0.85	20	ITH2	Trento	0.89	20	FRM0	Corse	0.90	20	ITH2	Trento	0.94
21	AT34	Vorarlberg	0.79	21	NL34	Zeeland	0.83	21	EL41	Voreio Aigaio	0.83	21	EL41	Voreio Aigaio	0.92
22	NL34	Zeeland	0.72	22	EL41	Voreio Aigaio	0.81	22	NL34	Zeeland	0.78	22	NL34	Zeeland	0.86
23	EL41	Voreio Aigaio	0.63	23	AT21	Kärnten	0.69	23	EL54	Ipeiros	0.73	23	EL65	Peloponnisos	0.67
24	FRM0	Corse	0.55	24	AT34	Vorarlberg	0.63	24	PT17	Lisboa	0.68	24	EL54	Ipeiros	0.65
25	ITH3	Veneto	0.49	25	EL65	Peloponnisos	0.60	25	EL65	Peloponnisos	0.66	25	PT17	Lisboa	0.62

Table 5: Top-25 regions ranking, TAIDD CI, 2009, 2014, 2019 and 2022

2009-2014				2014-2019				2019-2022				2009-2022			
1	HR03	Jadranska Hrvatska	0.55	1	EL62	Ionia Nisia	0.63	1	PT30	Madeira	0.25	1	HR03	Jadranska Hrvatska	0.85
2	FRM0	Corse	0.51	2	PT20	Azores	0.34	2	EL62	Ionia Nisia	0.19	2	EL62	Ionia Nisia	0.72
3	PT15	Algarve	0.43	3	EL42	Notio Aigaio	0.30	3	ITH1	Bolzano	0.17	3	PT20	Azores	0.59
4	PT16	Centro (PT)	0.31	4	HR03	Jadranska Hrvatska	0.24	4	FRJ1	Languedoc-Roussillon	0.13	4	PT30	Madeira	0.49
5	ITI3	Marche	0.29	5	PT17	Lisbon	0.19	5	ES62	Región de Murcia	0.10	5	PT11	Norte	0.41
6	EL42	Notio Aigaio	0.28	6	PT30	Madeira	0.16	6	FRE1	Nord-Pas-de-Calais	0.10	6	FRM0	Corse	0.40
7	EL43	Kriti	0.27	7	EL54	Ipeiros	0.15	7	BE22	Limburg	0.10	7	PT16	Centro (PT)	0.38
8	PT18	Alentejo	0.26	8	EL61	Thessalia	0.14	8	ES53	Illes Balears	0.10	8	PT17	Lisbon	0.36
9	PT11	Norte	0.25	9	CY00	Kypros	0.14	9	FRK1	Auvergne	0.10	9	EL42	Notio Aigaio	0.31
10	PT17	Lisbon	0.24	10	PT11	Norte	0.13	10	EL41	Voreio Aigaio	0.09	10	EL41	Voreio Aigaio	0.30
11	PT20	Azores	0.20	11	ITF1	Abruzzo	0.13	11	BE34	Prov. Luxembourg	0.09	11	PT18	Alentejo	0.29
12	EL41	Voreio Aigaio	0.18	12	SI04	Zahodna Slovenija	0.13	12	NL12	Friesland	0.08	12	EL43	Kriti	0.29
13	EL54	Ipeiros	0.17	13	HR04	Kontinentalna Hrvatska	0.12	13	ITF4	Puglia	0.08	13	DK01	Hovedstaden	0.24
14	EL52	Kentriki Makedonia	0.16	14	EL51	Anatoliki Makedonia, Thraki	0.12	14	NL21	Overijssel	0.08	14	EL54	Ipeiros	0.23
15	DE30	Berlin	0.16	15	PL63	Pomorskie	0.11	15	PL71	Lódzkie	0.08	15	PT15	Algarve	0.22
16	DK01	Hovedstaden	0.13	16	RO22	Sud-Est	0.11	16	NL33	Zuid-Holland	0.08	16	ITF4	Puglia	0.22
17	EL53	Dytiki Makedonia	0.13	17	RO32	Bucuresti - Ilfov	0.10	17	FRB0	Centre - Val de Loire	0.08	17	RO21	Nord-Est	0.20
18	EL63	Dytiki Ellada	0.13	18	ITF5	Basilicata	0.10	18	NL34	Zeeland	0.08	18	EL51	Eastern Macedonia and Thrace	0.20

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19	EL65	Peloponnisos	0.12	19	PT16	Centro (PT)	0.10	19	FRD1	Basse-Normandie	0.07	19	EL65	Peloponnisos	0.19
20	RO11	Nord-Vest	0.11	20	PL41	Wielkopolskie	0.10	20	FRE2	Picardie	0.07	20	EL52	Kentriki Makedonia	0.18
21	EE00	Eesti	0.11	21	NL32	Noord-Holland	0.10	21	BE35	Prov. Namur	0.07	21	ITI3	Marche	0.18
22	NL34	Zeeland	0.11	22	PL51	Dolnoslaskie	0.10	22	DK01	Hovedstaden	0.07	22	RO11	Nord-Vest	0.18
23	ES62	Región de Murcia	0.10	23	PT18	Alentejo	0.10	23	SE31	Norra Mellansverige	0.07	23	ITG2	Sardegna	0.18
24	RO42	Vest	0.10	24	ITF3	Campania	0.10	24	EL52	Kentriki Makedonia	0.07	24	NL32	Noord-Holland	0.17
25	ITF4	Puglia	0.10	25	PL72	Swietokrzyskie	0.10	25	FI1C	Etelä-Suomi	0.07	25	ITF5	Basilicata	0.16

Table 6: Top-25 regions ranking, TAIDD CI absolute changes, 2009-2014, 2014-2019, 2019-2022 and 2009-2022

	2009	2014	2019	2022	2009-2014	2014-2019	2019-2022	2009-2022
sample size	227							
average value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
standard deviation	0.69	0.70	0.71	0.70	0.11	0.09	0.06	0.17
max value	3.57	3.85	4.15	3.88	0.55	0.63	0.25	0.85
min value	-0.95	-0.89	-0.80	-0.83	-0.32	-0.32	-0.27	-0.57

Table 7: TAIDD CI descriptive statistics for full samples per year and period

Geographical context	Year	Regions ' count	Maximum value	Minimum value	Average	Standard Deviation
Northern and Central EU	*2009*	94	2.48	-0.69	0.03	0.56
	2014		2.43	-0.63	-0.02	0.55
	2019		2.27	-0.59	-0.06	0.53
	2022		2.26	-0.59	-0.06	0.51
Eastern EU	*2009*	54	1.80	-0.95	-0.51	0.40
	2014		1.75	-0.89	-0.50	0.37
	2019		1.72	-0.80	-0.47	0.35
	2022		1.55	-0.83	-0.48	0.33
Southern EU	*2009*	62	3.57	-0.34	0.49	0.81
	2014		3.85	-0.15	0.56	0.81
	2019		4.15	-0.12	0.60	0.84
	2022		3.88	-0.11	0.60	0.85
Nordic EU	*2009*	17	-0.09	-0.61	-0.35	0.15
	2014		-0.19	-0.57	-0.36	0.13
	2019		-0.16	-0.54	-0.36	0.12
	2022		-0.09	-0.50	-0.34	0.12

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Table 8a: TAIDD CI descriptive statistics per cluster of countries and year

Geographical context	Period	Regions ' count	Maximum value	Minimum value	Average	Standard Deviation
Northern and Central EU	*2009-2014*	94	0.51	-0.32	-0.05	0.10
	2014-2019		0.10	-0.24	-0.04	0.06
	2019-2022		0.13	-0.22	0.00	0.06
	2009-2022		**0.40**	**-0.57**	**-0.09**	**0.14**
Eastern EU	*2009-2014*	54	0.11	-0.17	0.01	0.06
	2014-2019		0.13	-0.05	0.03	0.05
	2019-2022		0.08	-0.17	-0.01	0.05
	2009-2022		**0.20**	**-0.25**	**0.03**	**0.10**
Southern EU	*2009-2014*	62	0.55	-0.21	0.07	0.14
	2014-2019		0.63	-0.32	0.04	0.13
	2019-2022		0.25	-0.27	0.00	0.08
	2009-2022		**0.85**	**-0.40**	**0.11**	**0.21**
Nordic EU	*2009-2014*	17	0.13	-0.10	0.00	0.06
	2014-2019		0.07	-0.07	-0.01	0.03

	2019-2022		0.07	-0.03	0.02	0.03
	2009-2022		**0.24**	**-0.09**	**0.01**	**0.09**

Table 8b: TAIDD CI changes' descriptive statistics per cluster of countries and period

TAIDD CI decomposition

At this point, we take a few steps back and look at the decomposed structure of the TAIDD CI so as to decipher the underlying trends. Specifically, below we lay out Table 9, which showcases the top-25 rankings of regions according to each variable, and Table 10, which showcases the correlations between TAIDD CI scores and the index's variables. Moreover, Figures 2-7 map the individual variables for 2009 and 2022 for all EU regions. Full datasets on individual variables for each year of calculation are provided in the Appendixes 1-4, as well as for changes over periods of time in the Appendixes 5-8 (see Appendix).

When looking at the index's six variables before their values being normalised, a series of observations can be extracted. For one, TAIDD CI scores are determined through quite different paths depending on the regional context. Specifically, metropolitan regions with high index scores such as Wien, Brussels, Prague, Berlin, Hamburg, Amsterdam (Noord-Holland), Venice, Bremen, Bruges (Limburg), and Paris (Île de France) exhibit similarly significant spatial concentrations of tourist arrivals (plus local inhabitants) and/or bed places. Therefore, it can be noted that urban destinations owe their touristification to the pressure tourism exerts upon space. Given however that not many metropolitan regions feature at the top positions regarding TAIDD CI scores, the rate of tourist arrivals plus population to area is among the least significant for the index (i.e., their correlation is not as strong). On the other hand, mainland rural regions such as Salzburg, Tirol, Kärnten, Valle d'Aosta, Bolzano, Trento, Zeeland, Algavre and Jadranska Hrvatska mostly owe their touristification to the pressure tourism exerts upon local populations. The reason behind this focal difference behind urban and rural touristified regions is that the former have a larger population in comparison to the latter, thus tourism numbers do not stand out when weighed by inhabitants. Similarly, when tourism numbers are weighed by area, they do not stand out in rural regions since these are typically characterised by ample space. The same trait is also shared by larger insular regions such as Corsica in France, Sardinia in Italy, and Cyprus, which all exhibit higher tourism intensity (pressure upon population) than density (pressure upon space). Given the dominance of rural regions regarding the index's scores noted above, it comes to no surprise that the correlations between the final index scores and the rate of tourist arrivals per population appear to be among the strongest. However, most other touristified insular regions constitute a distinct segment within rural regions, since they are characterized by both limited space as well as small numbers of inhabitants. As a result, there are many cases in this cluster where both dimensions of tourism intensity and density display high scores, such as in South Aegean, Crete, the Ionian Islands, the Balearic and Canary Islands. Since the high density of bed places characterises both touristified metropolitan regions and small insular ones, this variable's correlation with the final scores of the TAIDD CI is among the strongest. Beyond bed places, these regions display high densities of tourist arrivals when combined with the local population; in fact, although high values of the ARRIV+POP/AREA variable is—as noted above—a common trait among metropolitan touristified regions, the largest increments are found among small insular ones. Specifically,

whereas cities such as Brussels and Berlin saw increases around 40% over the whole study period, the insular regions of Greece or the coastal part of Croatia saw this density doubling from 2009 to 2022. At the same time, many regions which did not score high in the TAIDD CI saw increments much larger than 40% (e.g., Zahodna Slovenija in Slovenia or Hovedstaden in Germany), resulting in a low correlation between this variable and the index itself. Read otherwise, this finding indicates a more widespread consolidation of accommodation of tourism traffic even in hitherto less attractive destinations (e.g., coastal Bulgaria, scenic cities of inland Germany, etc.). Although such parts of the EU see the density of tourism activity increasing, they score low in other crucial variables. Namely, the share of accommodation and catering in total employment is particularly high in small insular regions, since most of them refer to small economies with limited alternative outlets for generating income – thus, more prone to develop a dependency from tourism. For instance, beyond displaying high numbers of arrivals and bed places in relation to their local inhabitants, regions such as South Aegean and the Ionian Islands also exhibit large shares of employment in the abovementioned activities (24% and 30% respectively in 2022). Although smaller, the respective shares in the Spanish insular regions of the Balearic and Canary Islands are also concerning (18% and 19% in 2022). As a result, the correlations between the final index scores and the share of NACE I in total employment are the strongest. Malta constitutes a unique case, being one of the most densely populated in the world and at the top of the relevant list in the EU, with above 1,500 inhabitants per sq km (almost 15 times higher than the EU average).[33] As a result, this region mostly owes its high TAID CI score to the high density of tourism activity, exhibiting in this sense a "metropolitan-characteristic" trait. It is indicative that another insular metropolitan region of the EU, the Canary Islands, which is one of the most densely populated Spanish autonomous communities, does not see its (relatively) large population pan out the effect of tourism and owes its touristification to both tourism intensity and density – sharing this trait with most other small insular regions. Lastly, high shares of tourism within the national GDP can be found among many different types of touristified regions. Specifically, apart from the insular and coastal regions of the European South, which are located in countries where tourism's direct GDP is particularly high, the Austrian and Italian regions around the Alps which similarly boast high TAIDD CI scores are located in countries with high values TDGDP – albeit not as high as in the latter cluster of regions. However, since this metric refers to the national level and within a given country regions with low and high TAIDD CI scores share the same value of TDGDP, the correlation between the two is reduced.

Closing, it must be noted that the decomposition of the TAIDD CI also brings forth some of the index's inherent shortcomings. For one, the abovementioned differences between metropolitan and rural regions should be read with caution, as they are significantly affected by the level of analysis (i.e., NUTS2). With this, we note that overtourism, in the sense of exceeding spatial concentration of tourism, is typically a problem concerning certain pockets of land rather than regions/cities in their entirety. Thus, had the analysis been conducted at a finer scale (e.g., postal code, city/settlement), it would clearly pinpoint cases of exceeding spatial concentration of tourism in both cities as well as smaller-size

[33] Times of Malta, Fact-check: Does Malta have the highest population density in Europe? Available at: https://timesofmalta.com/article/factcheck-does-malta-highest-population-density-europe.1049809

settlements. While in most cases the index succeeds in showcasing the level of a region's touristification, there are others where it may obscure it. Such cases are regions where tourism activity is extremely spatially concentrated, while their area and population are relatively large. For instance, the index fails to reflect Sicily's and Sardinia's touristification in comparison to that of the Alpine regions of Italy.

Bed places per inhabitants				Tourist arrivals per inhabitant				Bed places per square kilometer				Tourist arrivals plus inhabitants per square kilometer				Share of workers in NACE I to total employment			
1	EL42	Notio Aigaio	0.93	1	EL42	Notio Aigaio	21.92	1	BE10	Brussels	250.96	1	BE10	Brussels	27,092	1	EL62	Ionia Nisia	0.30
2	HR03	Jadranska Hrvatska	0.82	2	ITH1	Bolzano	14.89	2	AT13	Wien	211.69	2	AT13	Wien	18,632	2	EL42	Notio Aigaio	0.24
3	EL62	Ionia Nisia	0.78	3	EL62	Ionia Nisia	13.65	3	CZ01	Praha	211.35	3	DE30	Berlin	16,650	3	ES70	Canarias	0.19
4	ITC2	Valle d'Aosta	0.47	4	AT33	Tirol	12.30	4	DE30	Berlin	170.60	4	CZ01	Praha	14,970	4	ES53	Illes Balears	0.18
5	FRM0	Corse	0.46	5	HR03	Jadranska Hrvatska	12.03	5	MT00	Malta	162.88	5	DE60	Hamburg	12,214	5	PT15	Algarve	0.16
6	ITH1	Bolzano	0.45	6	AT32	Salzburg	11.10	6	DE60	Hamburg	111.02	6	MT00	Malta	7,460	6	PT30	Madeira	0.15
7	EL43	Kriti	0.39	7	ES53	Illes Balears	10.43	7	ES53	Illes Balears	92.99	7	NL32	Noord-Holland	5,711	7	EL43	Kriti	0.14
8	NL34	Zeeland	0.38	8	PT15	Algarve	10.30	8	NL32	Noord-Holland	87.98	8	DE50	Bremen	5,075	8	EL41	Voreio Aigaio	0.14
9	ES53	Illes Balears	0.38	9	ITC2	Valle d'Aosta	9.68	9	NL34	Zeeland	81.68	9	FR10	Île de France	3,986	9	ITH1	Bolzano	0.14
10	AT33	Tirol	0.37	10	EL43	Kriti	9.47	10	EL62	Ionia Nisia	70.21	10	PT17	Lisboa	3,762	10	ITC2	Valle d'Aosta	0.12
11	PT15	Algarve	0.37	11	FRM0	Corse	9.08	11	NL42	Limburg (NL)	59.87	11	NL33	Zuid-Holland	3,204	11	HR03	Jadranska Hrvatska	0.11
12	AT32	Salzburg	0.33	12	ITH2	Trento	8.29	12	EL42	Notio Aigaio	58.50	12	ES53	Illes Balears	2,814	12	AT33	Tirol	0.10
13	ITH2	Trento	0.31	13	NL34	Zeeland	7.68	13	ES70	Canarias	58.16	13	NL42	Limburg (NL)	2,473	13	EL54	Ipeiros	0.10
14	AT21	Kärnten	0.25	14	PT30	Madeira	6.26	14	PT30	Madeira	55.16	14	DK01	Hovedstaden	2,456	14	EL65	Peloponnisos	0.10
15	NL13	Drenthe	0.20	15	ES70	Canarias	5.91	15	PT17	Lisboa	52.06	15	ES30	Madrid	2,433	15	ES61	Andalucía	0.09
16	ES70	Canarias	0.19	16	AT34	Vorarlberg	5.05	16	HR03	Jadranska Hrvatska	43.32	16	NL31	Utrecht	2,406	16	ES13	Cantabria	0.09
17	DE80	Mecklenburg-Vorpommern	0.19	17	AT21	Kärnten	4.93	17	ITH3	Veneto	42.73	17	RO32	Bucuresti - Ilfov	2,339	17	EL61	Thessalia	0.09
18	FRJ1	Languedoc-Roussillon	0.18	18	CZ01	Praha	4.69	18	DE50	Bremen	42.70	18	PT30	Madeira	2,282	18	ES52	Comunitat Valenciana	0.09
19	EL41	Voreio Aigaio	0.18	19	DE80	Mecklenburg-Vorpommern	4.48	19	DK01	Hovedstaden	40.21	19	EL30	Attiki	2,234	19	EL52	Kentriki Makedonia	0.09
20	PT30	Madeira	0.18	20	NL32	Noord-Holland	4.40	20	NL22	Gelderland	40.00	20	DEA1	Düsseldorf	2,145	20	ITG2	Sardegna	0.09
21	AT34	Vorarlberg	0.17	21	SE32	Mellersta Norrland	4.26	21	NL13	Drenthe	38.19	21	ES70	Canarias	2,097	21	EL51	Anatoliki Makedonia, Thraki	0.08
22	NL12	Friesland (NL)	0.16	22	NL13	Drenthe	4.08	22	NL33	Zuid-Holland	38.15	22	NL34	Zeeland	1,862	22	EL64	Sterea Ellada	0.08
23	BE34	Luxembourg (BE)	0.16	23	SI04	Zahodna Slovenija	4.03	23	NL21	Overijssel	35.54	23	BE25	West-Vlaanderen	1,719	23	CY00	Kypros	0.08
24	ITI1	Toscana	0.16	24	SE33	Övre Norrland	3.92	24	PT15	Algarve	34.58	24	DE71	Darmstadt	1,701	24	ITC3	Liguria	0.08
25	SE33	Övre Norrland	0.15	25	BE34	Luxembourg (BE)	3.91	25	FR10	Île de France	34.00	25	SE11	Stockholm	1,519	25	AT32	Salzburg	0.08

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Table 9: Top-25 regions ranking, TAIDD CI individual variables (minus TDGDP), 2022

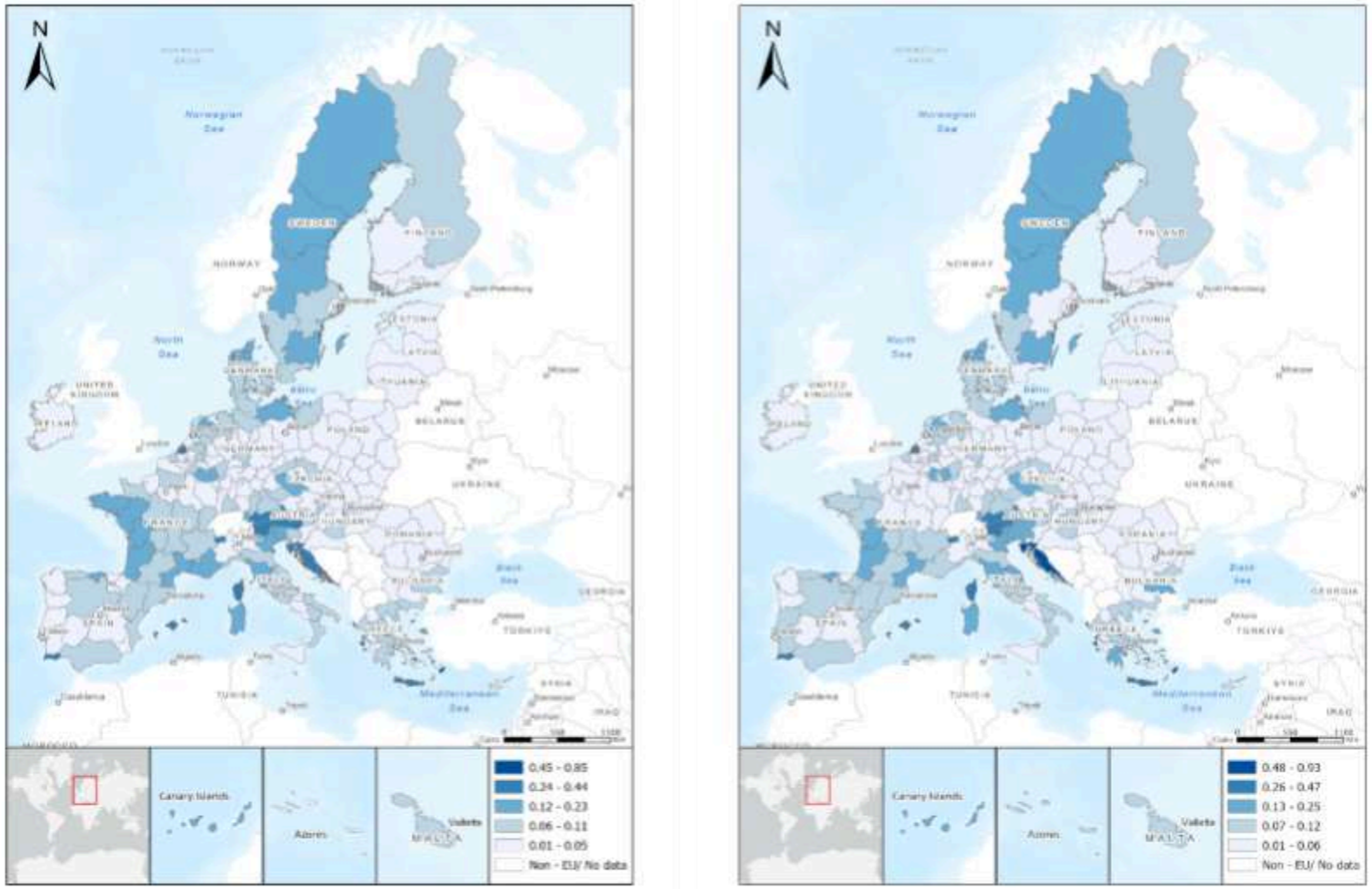

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Figure 2: Bed places per inhabitant, 2009 (left), 2022 (right).

The project is carried out within the framework of the National Recovery and Resilience Plan Greece 2.0, funded by the European Union - NextGenerationEU (Implementation Body: HFRI).

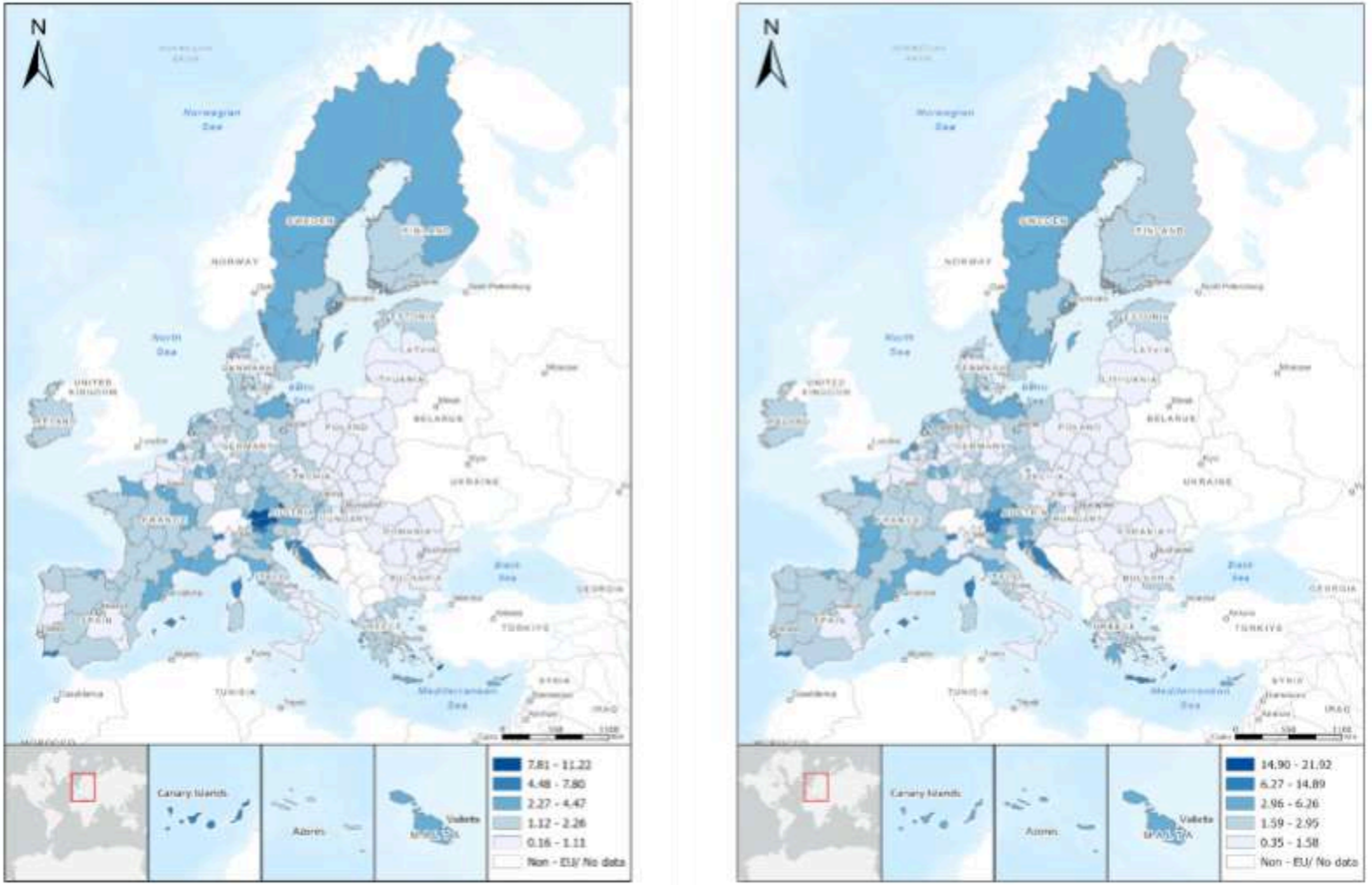

Figure 3: Bed places per inhabitant, 2009 (left), 2022 (right).

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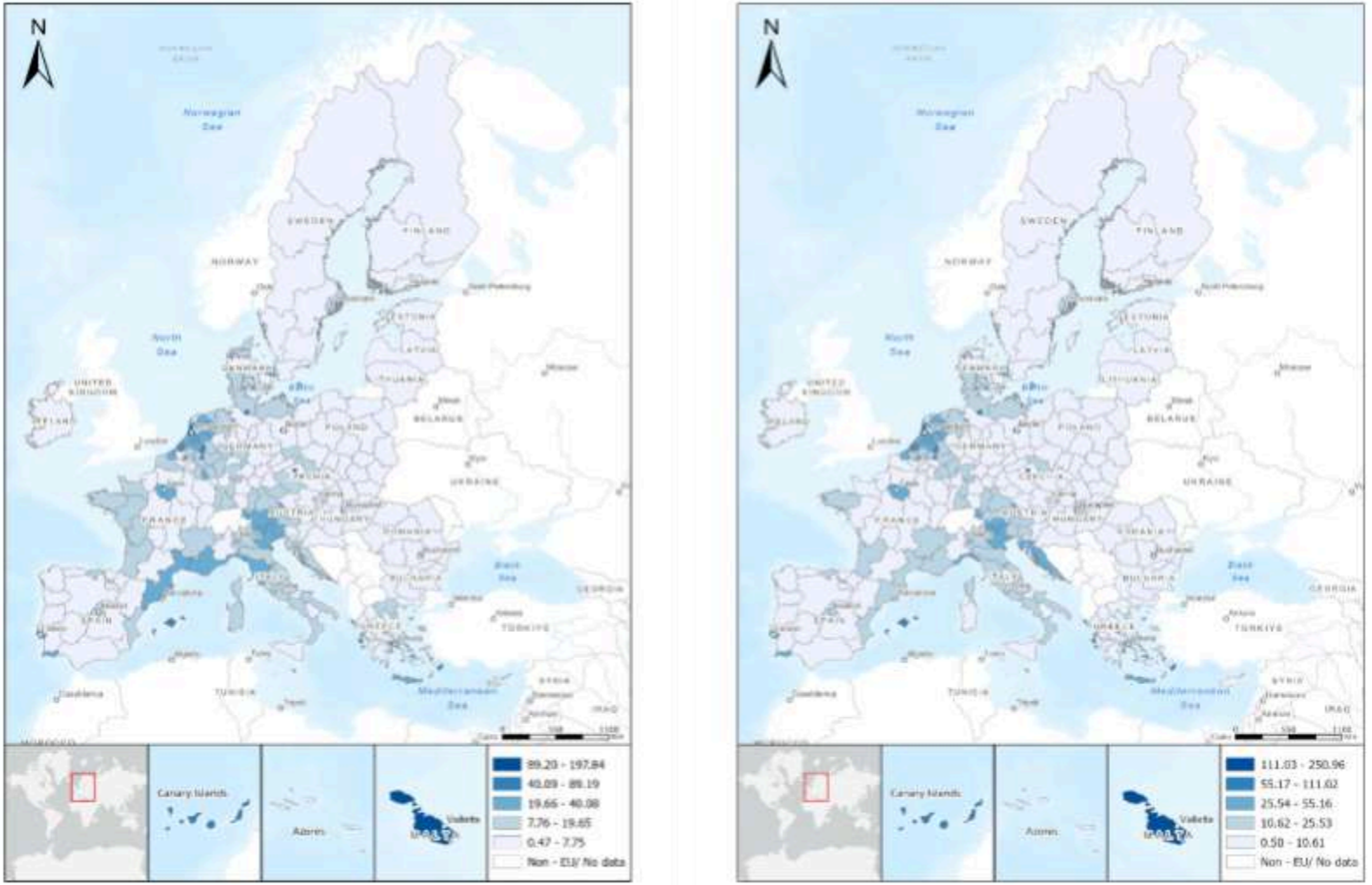

Figure 4: Bed places per square kilometer, 2009 (left), 2022 (right).

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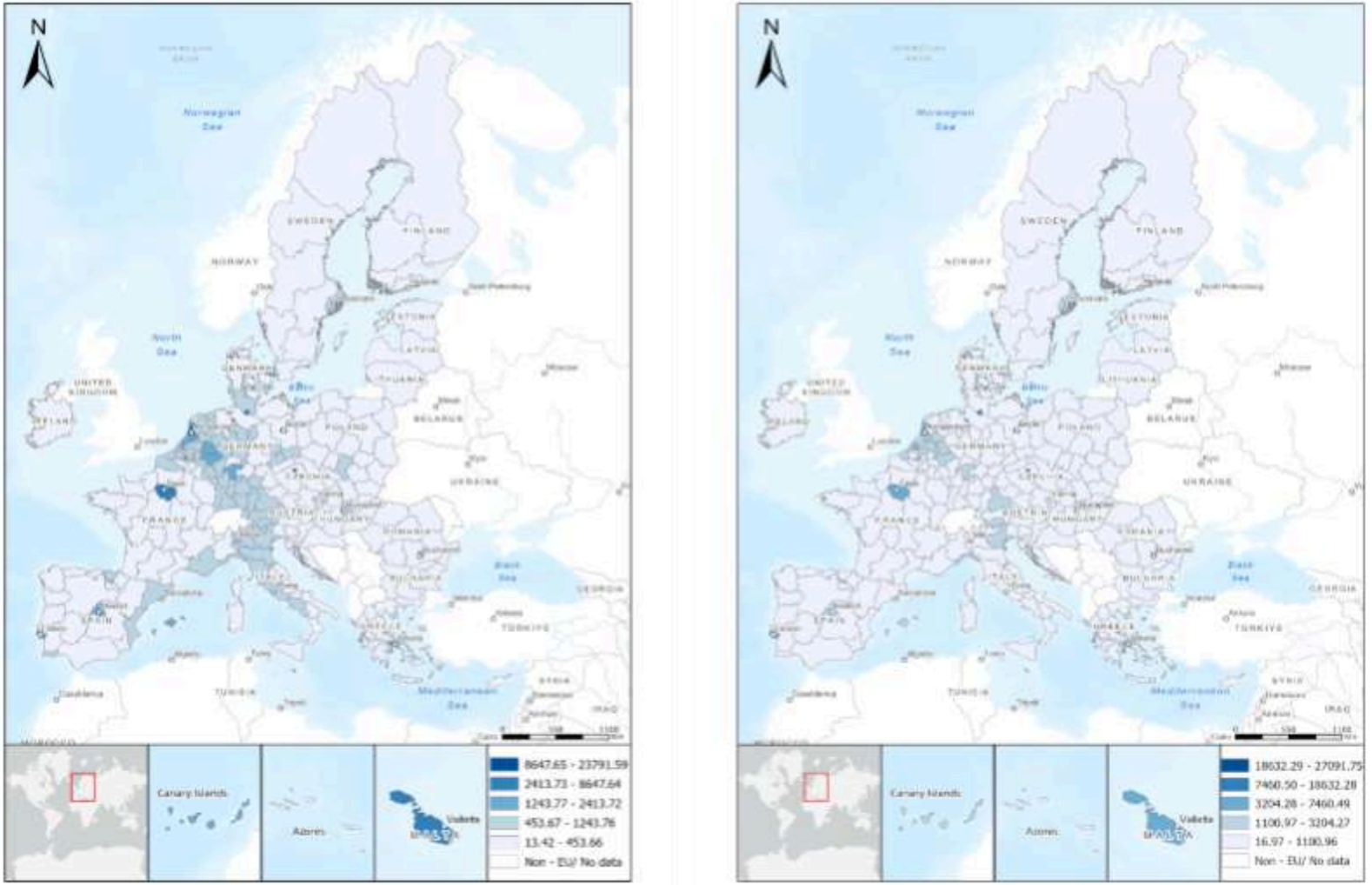

Figure 5: Tourist arrivals per square kilometer, 2009 (left), 2022 (right)

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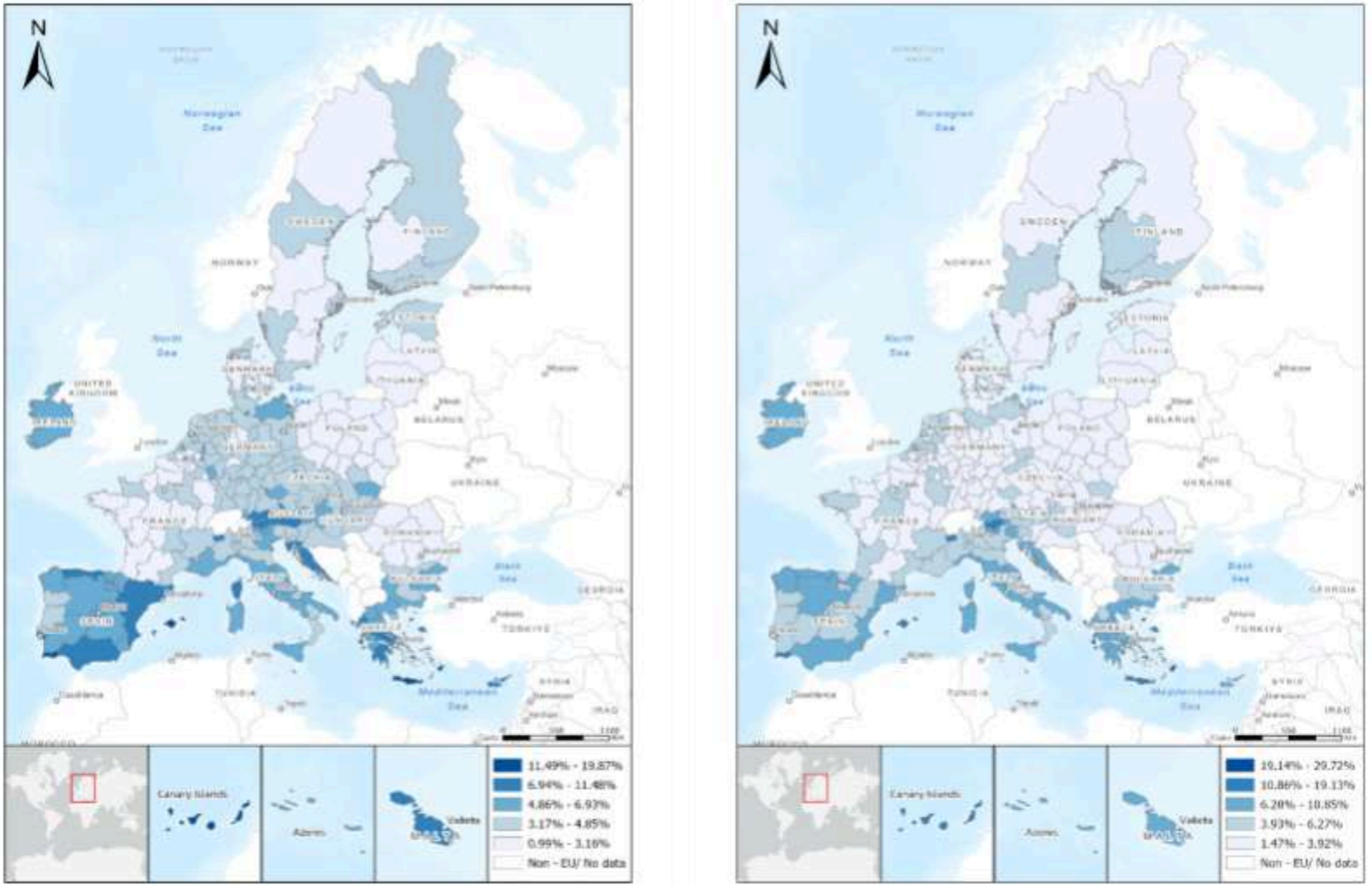

Figure 6: Share of NACE I in total employment, 2009 (left), 2022 (right)

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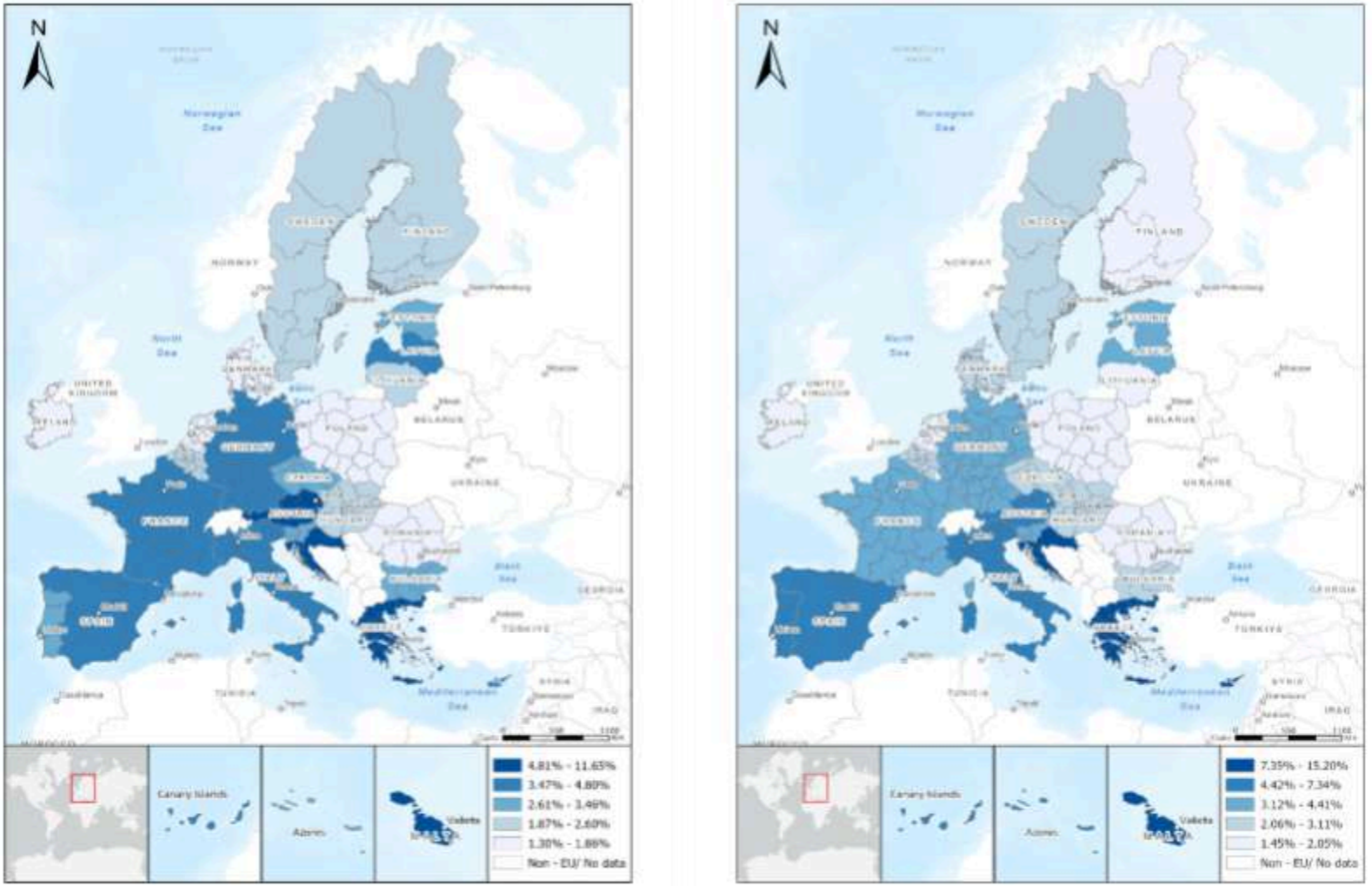

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Figure 7: Tourism's direct contribution to national GDP, 2009 (left), 2022 (right)

	TAIDD CI (2009)	TAIDD CI (2014)	TAIDD CI (2019)	TAIDD CI (2022)
BEDS/POP (2009)	0.734	0.739	0.740	0.751
BEDS/POP (2014)	0.730	0.751	0.759	0.768
BEDS/POP (2019)	0.723	0.751	0.768	0.777
BEDS/POP (2022)	0.724	0.752	0.768	0.779
ARRIV/POP (2009)	0.812	0.792	0.768	0.772
ARRIV/POP (2014)	0.828	0.816	0.794	0.797
ARRIV/POP (2019)	0.830	0.832	0.831	0.831
ARRIV/POP (2022)	0.808	0.815	0.816	0.820
BEDS/AREA (2009)	0.689	0.678	0.654	0.652
BEDS/AREA (2014)	0.676	0.671	0.650	0.646
BEDS/AREA (2019)	0.678	0.675	0.657	0.653
BEDS/AREA (2022)	0.670	0.666	0.649	0.645
ARRIV+POP/AREA (2009)	0.470	0.464	0.444	0.432
ARRIV+POP/AREA (2014)	0.472	0.467	0.447	0.435
ARRIV+POP/AREA (2019)	0.484	0.480	0.461	0.449
ARRIV+POP/AREA (2022)	0.492	0.487	0.469	0.458
EMPL % (2009)	0.840	0.850	0.856	0.852
EMPL % (2014)	0.808	0.845	0.850	0.845
EMPL % (2019)	0.794	0.827	0.856	0.851
EMPL % (2022)	0.773	0.802	0.829	0.842
TDGDP (2009)	0.616	0.594	0.582	0.578
TDGDP (2014)	0.631	0.641	0.648	0.645
TDGDP (2019)	0.614	0.635	0.651	0.649
TDGDP (2022)	0.616	0.636	0.652	0.650

Legend		
Very Weak	0.0 ≤ |R| < 0.2	
Weak	0.2 ≤ |R| < 0.4	
Moderate	0.4 ≤ |R| < 0.6	
Strong	0.6 ≤ |R| < 0.8	
Very Strong	0.8 ≤ |R| < 1.0	

Table 10: Pearson's R between the TAIDD CI scores and its variables, 2009, 2014, 2019, 2022.

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The correlation of touristification with output and level of urbanisation

At this point, we calculate the correlations of the composite index's results with a series of data so as to add more context to the analysis's results. Specifically, here we will examine how do a given region's TAIDD CI values correlate with its level of urbanisation[34] and its GDP (total and per capita), as well as the national GDP (again, total and per capita). Correlations shown in the matrix of Table 11 refer to both separate years as well as the study sub-periods. With a first look at the matrix, it becomes clear that

[34] Essentially calculated as population density, i.e., a region's population divided by its (land) area.

Pearson's R values do not indicate any strong correlations (above 0.6) at any point. However, milder correlations are of high interest.

First, the TAIDD CI values are loosely linked with urbanisation levels for all study years. However, there are no indications that this link consolidates over time, since the Pearson's R value between the index's value and the level of urbanisation in 2009 (0.378) is higher than the respective one in 2022 (0.357). This can also be verified by looking at the rankings of the most touristified regions (Table 5), where most positions are occupied by non-metropolitan regions. Specifically, regions such as South Aegean, Crete, and the Ionian Islands in Greece, Malta, the Balearic and Canary Islands in Spain, Algarve and Madeira in Portugal, and the Adriatic Croatia constitute rural destinations, namely insular and coastal, which represent the 3S (sun, sea, sand) type of tourism. In fact, from 2014 onwards, another such destination appearing in the top positions is the island of Corse in France. Moreover, the presence of mountainous destinations in the top rankings is strong throughout the study period, with regions such as Tirol, Carinthia, and Salzburg in Austria, as well as the Aosta Valley, Trento, and Bolzano in Italy, all of which are located at the wider Alps area and represent winter and/or nature (e.g., hiking) types of tourism. Unfortunately, the current study's scope includes EU counties only, thus we do not have a clear view of Switzerland's Alpine destinations in comparison to Italian and Austrian ones. For their part, German alpine regions do not appear in the top positions, indicating that these have alternative sources of income too, rather than having less intense tourism activity. In contrast, top positions feature only but a few metropolitan regions destinations. Specifically, 5 cities occupy some of the top positions, being Wien in Austria, Brussels in Belgium, Prague in Czech Republic, and Berlin and Hamburg in Germany. In addition, Lisbon in Portugal appears in this list but only after 2014. Here it must be noted that the fact that such a touristified city such as Lisbon, that has been extensively studied in the relevant literature (e.g., see Estevans et al., 2023; Tulumello & Allegretti, 2021) is so low in the rankings (25th in 2019), signifies an inherent shortcoming of the TAIDD CI, i.e. the absence of short-term rental data. As noted in the methodology, this constitutes an explicit methodological choice since detailed and comparable data at the regional level for all of the EU were not available at the time of this report's writing.[35] Thus, one can speculate that had data on short-term rentals been included, more urban destinations would be featured in the top positions regarding their values in the TAIDD CI. Nevertheless, this is only a speculation for two reasons: first, many other urban destinations like Brussels, Wien, Prague, Berlin, and Hamburg, occupy higher places in the relevant ranking; second, rural destinations have also seen the proliferation of this type of tourism accommodation. Beyond the study of separate years, correlations between the values of the TAIDD CI and changes in levels of urbanisation reveal that for a given region, its score regarding the index (regardless of the year) was influenced by its urbanisation level changes during the 2009-2014 period rather than the following ones (see Table 11). At the same time, notable negative correlations appear between TAIDD CI score changes during 2014-2019 and changes in urbanisation levels; as such, they signify a loss of permanent population over the study period in many coastal/insular destinations such as South Aegean (-1.3%), the Ionian Islands (-2.0%), Jadranska Hrvatska (-8.4%), Madeira (-5.3%), or the Azores (-4.1). However, this correlation is not strong as other similar

[35] June-July 2024.

destinations saw their population density increasing, such as Malta (26.8%), Cyprus (13.5%), Corsica (14.1%), the Balearic Islands (14.4%), or the Canary Islands (11.2%). At the same time, prominent urban destinations also saw their population density increasing, such as Brussels (15.0%), Wien (15.0%), Berlin (7.2%), Hamburg (4.6%) and Prague (5.0%). All in all, our findings go in contrast with accounts in the literature highlighting the touristification of urban destinations at the expense of the furthering of tourism dependence in non-metropolitan areas. The TAIDD CI highlights that rural touristification remains of the utmost importance.

More interesting findings can be extracted from the study of correlations between TAIDD CI scores and GDP data. For one, the correlation matrix shows that there are no strong links between the absolute volume of a region's output and its level of touristification (see Table 11). Thus, regions that are affluent or lagging behind can display touristification tendencies alike. At the same time, although the TAIDD CI and regional GDP do not correlate when seen for separate years, their (negative) correlation become much stronger when looking into regional GDP changes over time. In other words, the wider the output losses, the more probable that a region would exhibit touristification tendencies. This is particularly prevalent with regional GDP changes between 2009 and 2014, which are strongly correlated with TAIDD CI values regardless of the year. As such, a region's touristification is found to be strongly linked to its loss of regional GDP in the aftermath of the 2008/2009 Global Crisis and during the years of deep recession (2009-2014). This is so regardless of its output changes in subsequent periods; namely, the values of the Pearson's R for the correlation between TAIDD CI scores and changes of regional GDP during 2014-2019, 2019-2022, and the whole study period (2009-2022) are significantly lower. Similar findings can be extracted when linking regional GDP changes and TAIDD CI score changes; namely, changes in regional GDP during 2009-2014 affected the index's score changes during all periods except for that of the pandemic (2019-2022). In other words, regions that lost parts of their GDP between 2009 and 2014 tend to have higher TAIDD CI values throughout the whole study period. In fact, the correlation matrix reveals that GDP losses during the 2009-2014 period affected the index's values in 2019 and 2022 more than they did for 2009, 2014. Seen conversely, noting that changes in regional GDP between 2009-2014 are more mildly correlated with TAIDD CI scores for 2009 than for the subsequent study years (2014, 2019, 2022) indicates that already touristified regions and countries at the onset of the recessionary period lost relatively smaller parts of their GDP; this finding resonates with similar insight in the literature regarding the better performance of tourism-orientated regions' labour markets (in terms of employability and not quality of employment; Gourzis & Gialis, 2019). However, that is not the case when looking into GDP per capita, where it is showcased that the population in already touristified regions was not shielded against recessive pressures. In fact, TAIDD CI scores correlate significantly more with per capita GDP figures than with total ones. Overall, the correlation between both total and per capita regional GDP changes during 2009-2014 on the one hand, and TAIDD CI scores for 2009, 2014, 2019 and 2022 on the other, becomes stronger over time, signifying that regions that saw their GDP shrinking gradually resorted—or were pushed—to touristification. Similar findings can be found when looking into the links between regional GDP per capita for specific years and TAIDD CI score changes; specifically, the index's changes during 2014-2019 are negatively correlated with regional GDP per capita,

especially in 2014, 2019 and 2022. Again, TAIDD CI score changes during 2019-2022 cannot be linked to GDP, marking the more complex and chaotic trajectories that unraveled during the pandemic. All in all, a safe conclusion is that regional trajectories around touristification were carved during the years of deep recession (2009-2014), with these effects persisting until today.

On a wider note, similar correlations can be observed when looking at changes in the national GDP (both total and per capita) vis-à-vis TAID CI scores. Therefore, beyond losses in regional output, a given region's touristification is also strongly linked with losses in the wider country's output. In fact, these correlations are overall the strongest in the matrix, exceeding -0.5 in some cases. As above, the years of deep recession appear to have left the most decisive effect in regional trajectories, since changes during 2009-2014 have a stronger correlation with TAIDD CI scores regardless of the year than GDP changes in the subsequent periods, although at the national level, GDP changes over the whole study period (2009-2022) appear to have an equally strong effect. The above underlines two focal findings. First, that the effect of economic performance at the national level upon regional trajectories has been decisive. An eloquent example of that is Greece, where even its less touristy regions started exhibiting strong signs of touristification after the onset of the 2008/2009 Global Crisis. Second, that when it comes to changes in national GDP, countries' performance over the whole study period played an equally key role for regions' touristification. Similar observations are reached when looking into changes of national GDP per capita; in fact, the correlations between the latter and TAIDD CI scores are overall the strongest, especially regarding GDP changes during 2009-2014.

Turning to the link between Gross Fixed Capital Formations in industry and the TAIDD CI, the matrix shows that they are particularly strong for all separate years. In fact, these (negative) correlations are among the strongest in the matrix (Table 11), indicating a strong inverse link between touristification and investment in fixed assets in industry – an activity including manufacturing, energy production, resource extraction, etc. In other words, the less a region invests in industrial activity, the more likely it is to follow a path towards touristification. This is also reflected in the (milder) correlation between decrease in GFCF in industry between 2009 and 2014 (and not the subsequent ones) and its TAIDD CI score in all years of study. This shows that regions that displayed greater deindustrialisation trends during the first, deeply recessionary period, tend to couple this with strong touristification trends.

Regarding investment in the built environment, the correlation matrix shows a strong inverse link between the TAIDD CI and the Building Share Index (which is calculated at the national level). This has occurred because countries with high scores in both indexes at the onset of the Great Recession (2009), such as Greece and Portugal, saw their Building Share plummeting afterwards; as a result, the (negative) correlation between the two indexes increases by 2014. In contrast, countries with low scores in both indexes in 2009, such as Hungary and Poland, saw their Building Share expanding in 2014. The above delineates a situation where the most touristified countries tended to have construction-driven models at the onset of the Great Recession but saw them being dismantled in the following period (2009-2014). It is indicative that the values of the Building Share in 2014 appear to have the strongest correlations with the values of the TAIDD CI regardless of the latter's year of calculation; in other words, the collapse

of a country's construction-driven model during the first period (2009-2014) carved its touristification path for the years to come. The above are also reflected in the notable negative correlation between the TAIDD CI scores in 2019 and 2022 and the change of the Building Share scores between 2009 and 2014.

Lastly, the TAIDD CI appears to have notable links with the vFCA CI. Specifically, correlations between the two are in general not as strong as with the Building Share or GFCF in industry, however, some of the highest Pearson's R values are noted when coupling vFCA scores in 2019 and changes in TAIDD CI scores over the whole study period (2009-2022). Similar observations can be made for the links between the TAIDD CI and the vFCA CI, when the latter is calculated without the variable of the Employment Protection Index (which is calculated at the national level). In other words, the version of the vFCA which is more sensitive to the regional context is more strongly correlated with the TAIDD CI; specifically, values of this version of the vFCA in 2014 and 2019 are strongly correlated with the change of the TAIDD CI during 2009-2022. The above indicates that as a given region follows a path towards touristification, the worse labour conditions it tends to exhibit. Unfortunately, a calculation of the vFCA index for 2022 is not available to check the latter postulation for this year as well. Equally important is that the link between touristification and precarity tends to deepen and consolidate over time; Pearson's R between vFCA and TAIDD is low when both indexes are calculated for 2009 and increases for the calculations for 2014 and 2019. Lastly, it must be noted that there is a notable correlation between vFCA (no EPL version) for 2019, and the change in TAIDD CI score between 2009-2014, underpinning that a region's path towards touristification during the period of deep recession affected the quality of its labour market for many years to come.

	TAIDD CI (2009)	TAIDD CI (2014)	TAIDD CI (2019)	TAIDD CI (2022)	TAIDD CI (2009-14)	TAIDD CI (2014-19)	TAIDD CI (2019-22)	TAIDD CI (2009-22)
URB(2009)	0.378	0.378	0.362	0.351	0.011	-0.099	-0.158	-0.100
URB(2014)	0.380	0.379	0.363	0.352	0.008	-0.102	-0.151	-0.101
URB(2019)	0.385	0.384	0.367	0.356	0.006	-0.105	-0.153	-0.104
URB(2022)	0.386	0.385	0.368	0.357	0.005	-0.106	-0.151	-0.105
URB(2009-14)	0.314	0.297	0.269	0.280	-0.054	-0.200	0.150	-0.087
URB(2014-19)	0.282	0.236	0.188	0.187	-0.244	-0.356	0.005	-0.343
URB(2019-22)	0.056	0.015	-0.027	-0.026	-0.235	-0.330	0.046	-0.309
URB(2009-22)	0.276	0.235	0.189	0.194	-0.207	-0.347	0.082	-0.287
regGDP(2009)	0.040	0.023	0.008	0.005	-0.119	-0.113	-0.020	-0.143
regGDP(2014)	0.023	0.002	-0.014	-0.018	-0.140	-0.127	-0.022	-0.165
regGDP(2019)	0.018	-0.001	-0.017	-0.023	-0.134	-0.125	-0.038	-0.165
regGDP(2022)	0.008	-0.010	-0.025	-0.032	-0.127	-0.123	-0.043	-0.162
regGDP(2009-14)	-0.358	-0.406	-0.435	-0.442	-0.315	-0.255	-0.044	-0.353
regGDP(2014-19)	-0.199	-0.196	-0.188	-0.200	-0.006	0.048	-0.113	-0.018
regGDP(2019-22)	-0.266	-0.258	-0.241	-0.247	0.022	0.112	-0.041	0.058
regGDP(2009-22)	-0.350	-0.369	-0.372	-0.383	-0.142	-0.052	-0.094	-0.152
regGDPpc(2009)	0.303	0.265	0.226	0.227	-0.220	-0.285	0.030	-0.281
regGDPpc(2014)	0.212	0.165	0.121	0.120	-0.285	-0.329	0.010	-0.354
regGDPpc(2019)	0.203	0.157	0.113	0.110	-0.286	-0.325	-0.017	-0.361
regGDPpc(2022)	0.179	0.135	0.095	0.091	-0.268	-0.304	-0.017	-0.339
regGDPpc(2009-14)	-0.426	-0.467	-0.488	-0.497	-0.286	-0.192	-0.082	-0.315
regGDPpc(2014-19)	-0.281	-0.265	-0.243	-0.255	0.068	0.153	-0.108	0.086
regGDPpc(2019-22)	-0.256	-0.237	-0.209	-0.215	0.089	0.200	-0.052	0.145
regGDPpc(2009-22)	-0.429	-0.434	-0.423	-0.435	-0.068	0.059	-0.110	-0.052
natGDP(2009)	0.059	0.015	-0.027	-0.033	-0.254	-0.324	-0.064	-0.357
natGDP(2014)	0.034	-0.014	-0.055	-0.063	-0.272	-0.325	-0.079	-0.374
natGDP(2019)	0.026	-0.022	-0.064	-0.072	-0.278	-0.326	-0.087	-0.382
natGDP(2022)	0.018	-0.030	-0.071	-0.080	-0.280	-0.324	-0.090	-0.383
natGDP(2009-14)	-0.418	-0.465	-0.492	-0.497	-0.316	-0.241	-0.034	-0.343
natGDP(2014-19)	-0.283	-0.285	-0.277	-0.286	-0.036	0.044	-0.096	-0.034
natGDP(2019-22)	-0.311	-0.296	-0.267	-0.274	0.062	0.203	-0.067	0.123
natGDP(2009-22)	-0.420	-0.438	-0.438	-0.447	-0.146	-0.030	-0.084	-0.139
natGDPpc(2009)	0.182	0.140	0.095	0.102	-0.239	-0.347	0.118	-0.295
natGDPpc(2014)	0.089	0.039	-0.012	-0.006	-0.304	-0.387	0.093	-0.367
natGDPpc(2019)	0.072	0.020	-0.031	-0.028	-0.312	-0.398	0.078	-0.384
natGDPpc(2022)	0.042	-0.006	-0.053	-0.050	-0.293	-0.370	0.072	-0.359
natGDPpc(2009-14)	-0.452	-0.491	-0.509	-0.517	-0.268	-0.179	-0.068	-0.291
natGDPpc(2014-19)	-0.306	-0.289	-0.268	-0.278	0.072	0.148	-0.102	0.089
natGDPpc(2019-22)	-0.300	-0.276	-0.239	-0.247	0.114	0.268	-0.082	0.185

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natGDPpc(2009-22)	-0.438	-0.440	-0.427	-0.438	-0.050	0.072	-0.105	-0.031

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	TAIDD CI (2009)	*TAIDD CI (2014)*	*TAIDD CI (2019)*	*TAIDD CI (2022)*	*TAIDD CI (2009-14)*	*TAIDD CI (2014-19)*	*TAIDD CI (2019-22)*	*TAIDD CI (2009-22)*
indGFCF (2009)	-0.468	-0.480	-0.480	-0.489	-0.133	-0.033	-0.091	-0.135
indGFCF (2014)	-0.467	-0.466	-0.464	-0.470	-0.047	-0.015	-0.054	-0.057
indGFCF (2019)	-0.413	-0.411	-0.409	-0.419	-0.038	-0.014	-0.091	-0.064
indGFCF (2021)	-0.415	-0.414	-0.409	-0.420	-0.041	0.004	-0.101	-0.060
indGFCF (2009-14)	-0.234	-0.256	-0.272	-0.272	-0.130	-0.140	0.001	-0.157
indGFCF (2014-19)	0.023	0.031	0.029	0.020	0.050	-0.019	-0.093	-0.010
indGFCF (2019-21)	0.138	0.160	0.187	0.196	0.142	0.222	0.093	0.241
indGFCF (2009-21)	-0.060	-0.069	-0.074	-0.078	-0.044	-0.042	-0.027	-0.060
BuildShare(2009)	-0.050	-0.012	0.025	0.025	0.233	0.284	-0.016	0.294
BuildShare(2014)	-0.442	-0.451	-0.447	-0.446	-0.066	-0.004	0.021	-0.038
BuildShare(2019)	-0.378	-0.391	-0.406	-0.398	-0.085	-0.144	0.139	-0.082
BuildShare(2022)	-0.334	-0.332	-0.342	-0.337	-0.002	-0.095	0.097	-0.017
BuildShare(2009-14)	-0.253	-0.299	-0.335	-0.335	-0.289	-0.298	0.031	-0.333
BuildShare(2014-19)	-0.015	-0.022	-0.047	-0.036	-0.041	-0.196	0.170	-0.070
BuildShare(2019-22)	0.131	0.158	0.170	0.162	0.159	0.105	-0.094	0.125
BuildShare(2009-22)	-0.151	-0.180	-0.214	-0.212	-0.181	-0.273	0.067	-0.236
vFCA(2009)	0.086	0.115	0.137	0.140	0.176	0.177	-0.041	0.196
vFCA(2014)	0.149	0.203	0.237	0.245	0.324	0.275	0.018	0.366
vFCA(2019)	0.181	0.243	0.282	0.291	0.385	0.311	0.025	0.429
vFCA(2009-14)	0.140	0.194	0.222	0.233	0.324	0.226	0.107	0.373
vFCA(2014-19)	0.147	0.188	0.211	0.216	0.286	0.190	0.030	0.300
vFCAnoEPL(2009)	0.150	0.195	0.234	0.234	0.281	0.306	-0.087	0.317
vFCAnoEPL(2014)	0.179	0.239	0.284	0.292	0.365	0.359	0.003	0.434
vFCAnoEPL(2019)	0.214	0.286	0.336	0.348	0.451	0.400	0.044	0.526
vFCAnoEPL(2009-14)	0.061	0.090	0.105	0.119	0.170	0.114	0.159	0.231
vFCAnoEPL(2014-19)	0.120	0.160	0.180	0.191	0.277	0.163	0.102	0.306

Legend		
Very Weak	0.0 ≤ |R| < 0.2	
Weak	0.2 ≤ |R| < 0.4	
Moderate	0.4 ≤ |R| < 0.6	

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Strong	0.6 ≤ |R| < 0.8	
Very Strong	0.8 ≤ |R| < 1.0	

Table 11: Pearson's R between TAIDD CI scores for individual years and level of urbanisation, GDP, share of GFCF in industry, the Building Share index, and the vFCA index.

Robustness and sensitivity tests

At this point, we look into the four alternative versions of the composite index as laid out in the Methodological Section. Specifically, the four versions that will be considered are (a) one with all six variables of the original TAIDD CI sharing equal weights, (b) one without including the variable on tourism's direct GDP, (c) one keeping only the supply-side variables (bed places) and the tourism monoculture dimension and (d) one keeping only the demand-side variables (tourist arrivals) and the tourism monoculture dimension (see Table 12).

A quick look at Table 12 below shows that the values of all four versions for each year are highly correlated with the values of the original TAIDD CI index for the same year. Pearson's R values range between 0.96 to 0.99, with the version without tourism's direct GDP being the one correlating the least with the original TAIDD CI. That means that all versions give relatively similar results, validating the index's robustness, namely that its insight does not drastically alter when part of it is changed. However, a closer look at the regions' scores in each version provide additional insight regarding touristification in the EU. Based on table 13 below, which shows the top-25 scoring regions for each alternative version of the index for 2022, we extract the following findings.

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	TAIDD CI (2009)		*TAIDD CI (2019)*
EQUAL WEIGHTS (2009)	0.997	EQUAL WEIGHTS (2019)	0.997
W/OUT TDGDP (2009)	0.958	W/OUT TDGDP (2019)	0.959
SUPPLY ONLY (2009)	0.984	SUPPLY ONLY (2019)	0.986
DEMAND ONLY (2009)	0.986	DEMAND ONLY (2019)	0.990
	TAIDD CI (2014)		*TAIDD CI (2022)*
EQUAL WEIGHTS (2014)	0.997	EQUAL WEIGHTS (2022)	0.997
W/OUT TDGDP (2014)	0.958	W/OUT TDGDP (2022)	0.959
SUPPLY ONLY (2014)	0.983	SUPPLY ONLY (2022)	0.987
DEMAND ONLY (2014)	0.988	DEMAND ONLY (2022)	0.991

Table 12: Pearson's R between TAIDD CI and the alternative CI versions' scores, 2009, 2014, 2019, 2022.

Regarding the version where all variables share equal weights, we see that the regions in countries with lower contribution of tourism to the total GDP and/or lower shares of accommodation and catering in total employment display higher scores (than in the original version; see Table 13). Such regions include the Belgian capital Brussels, which is characterised by tourism's intense territorial pressure without NACE I having an extensive share in total employment neither tourism contributing a large part to Belgium's GDP. Similar cases are the metropolitan regions of Prague, Berlin, Hamburg, and Noord-Holland.

Nevertheless, most of the other regions do not display radically different values, hence the high correlation between the original CI and this version. Comparing the original TAIDD CI and the version without the TDGDP variable, we see more notable differences. Specifically, the touristified regions of countries where tourism does not directly contribute to the GDP as much score much higher. Such regions are again, Brussels, Prague, Berlin, and Hamburg, or even Bucharest in Romania and Stockholm in Sweden. However, the same elevated values can also be observed within the countries with high TDGDP, but only in their most touristified regions. For instance, in this version the Greek regions South Aegean and the Ionian Islands, the Balearic and Canary Islands in Spain, or Bolzano, Trento and Valle d'Aosta in Italy score much higher compared to the original TAIDD CI. In contrast, the less touristified regions within the same countries display somewhat lower scores. Moreover, abruptly lower values are displayed in the regions of countries that are extremely dependent upon tourism such as Malta and Croatia, and to a lesser extent Cyprus.

Interesting findings can be extracted when comparing the original index with the ones without either their demand- or supply-related variables. Specifically, it becomes evident that certain regions score high mostly because of one of the two. For instance, metropolitan regions such as Wien, Brussels, and Prague, score significantly lower in the “supply only” version. This of course can be attributed to shortcomings regarding the data on bed places, which, as stated in the methodology, may miss a large part of the short-term rentals market. The same applies to mountainous regions in Italy and Austria. In contrast, rural regions with large hotels such as the Greek or the Spanish islands, as well as coastal Croatia, score much higher in this version regardless of the fact that these two have a booming short-term rentals market. The opposite occurs when looking into the “demand only” version, which highlights the intensity of arrivals in metropolitan and mountainous touristified regions.

Overall, the above findings mark clear that no significant changes are observed when recalculating the TAIDD CI, meaning that it passes the sensitivity check. It is indicative that the top scoring regions in all versions remain more or less the same: South Aegean, the Ionian Islands, Jadranska Hrvatska, Brussels, Malta, the Balearic Islands, Wien, Bolzano, Prague, Algarve, Crete and so on. In fact, the first two dominate all versions. At the same time, however, the differences between the chosen version and the alternative ones highlight the rationale behind our choices regarding the variables, as well as their weighing method.

First, in comparison to the “equal weights” version, our TAIDD CI highlights the regions where accommodation and catering dominates the labour market as well as tourism overshadows all other types of output. Second, the version without TDGDP marks metropolitan regions such as Berlin and Prague as more reliant upon tourism in comparison to Algarve, Canarias and Malta. Third, the “supply only” and “demand only” versions overestimate and underestimate respectively the touristification of rural regions with large hotel units at the expense of other types of regions where short-term rental are much more prevalent in their accommodation capacity; in other words, the original TAIDD CI is more balanced in this regard considering supply as well as demand, and highlighting those regions that have maximised them both. Having said the above, it must be noted that the original TAIDD CI may

overestimate the touristification of less relevant regions within hyper touristified countries, as in the case of the Peloponnese and Epirus in Greece. Nevertheless, the calculation of alternative versions highlighted that other regions within the same countries are touristified beyond any shadow of doubt, and not because of the latter (being part of a hyper touristified country). Such case is Northern Aegean, which is not typically considered among the most attractive tourism destinations in Greece, but our analysis showed that it is among the most touristified in the EU.

TAIDD CI (original index)				EQUAL WEIGHTS VERSION				WITHOUT TOURISM'S DIRECT GDP VERSION				SUPPLY ONLY VARIABLES VERSION				DEMAND ONLY VARIABLES VERSION			
1	EL42	Notio Aigaio	3.89	*1*	EL42	Notio Aigaio	3.90	*1*	EL42	Notio Aigaio	4.28	*1*	EL62	Ionia Nisia	4.15	*1*	EL42	Notio Aigaio	3.77
2	EL62	Ionia Nisia	3.60	*2*	EL62	Ionia Nisia	3.49	*2*	EL62	Ionia Nisia	3.79	*2*	EL42	Notio Aigaio	3.97	*2*	EL62	Ionia Nisia	3.38
3	HR03	Jadranska Hrvatska	2.63	*3*	HR03	Jadranska Hrvatska	2.63	*3*	BE10	Brussels	3.23	*3*	HR03	Jadranska Hrvatska	3.06	*3*	HR03	Jadranska Hrvatska	2.21
4	BE10	Brussels	2.26	*4*	BE10	Brussels	2.56	*4*	AT13	Wien	2.52	*4*	MT00	Malta	2.55	*4*	BE10	Brussels	2.15
5	MT00	Malta	2.21	*5*	AT13	Wien	2.26	*5*	ES53	Illes Balears	2.43	*5*	ES53	Illes Balears	2.29	*5*	MT00	Malta	2.08
6	ES53	Illes Balears	2.14	*6*	MT00	Malta	2.14	*6*	HR03	Jadranska Hrvatska	2.42	*6*	EL43	Kriti	1.92	*6*	ES53	Illes Balears	2.02
7	AT13	Wien	2.11	*7*	ES53	Illes Balears	2.14	*7*	CZ01	Praha	2.28	*7*	PT15	Algarve	1.90	*7*	AT13	Wien	1.99
8	ITH1	Bolzano	1.88	*8*	ITH1	Bolzano	1.91	*8*	ITH1	Bolzano	2.15	*8*	AT13	Wien	1.79	*8*	ITH1	Bolzano	1.99
9	PT15	Algarve	1.82	*9*	CZ01	Praha	1.77	*9*	DE30	Berlin	1.95	*9*	ES70	Canarias	1.72	*9*	PT15	Algarve	1.93
10	EL43	Kriti	1.77	*10*	PT15	Algarve	1.76	*10*	PT15	Algarve	1.81	*10*	ITH1	Bolzano	1.67	*10*	EL43	Kriti	1.83
11	CZ01	Praha	1.54	*11*	EL43	Kriti	1.70	*11*	EL43	Kriti	1.64	*11*	PT30	Madeira	1.58	*11*	ES70	Canarias	1.61
12	ES70	Canarias	1.52	*12*	DE30	Berlin	1.63	*12*	ES70	Canarias	1.58	*12*	BE10	Brussels	1.49	*12*	PT30	Madeira	1.58
13	PT30	Madeira	1.45	*13*	AT33	Tirol	1.45	*13*	AT33	Tirol	1.55	*13*	ITC2	Valle d'Aosta	1.45	*13*	AT33	Tirol	1.55
14	DE30	Berlin	1.45	*14*	ES70	Canarias	1.43	*14*	MT00	Malta	1.54	*14*	AT33	Tirol	1.26	*14*	DE30	Berlin	1.36
15	AT33	Tirol	1.43	*15*	ITC2	Valle d'Aosta	1.38	*15*	ITC2	Valle d'Aosta	1.52	*15*	EL41	Voreio Aigaio	1.25	*15*	ITC2	Valle d'Aosta	1.28
16	ITC2	Valle d'Aosta	1.38	*16*	PT30	Madeira	1.37	*16*	NL34	Zeeland	1.41	*16*	CZ01	Praha	1.21	*16*	AT32	Salzburg	1.26
17	AT32	Salzburg	1.19	*17*	AT32	Salzburg	1.22	*17*	PT30	Madeira	1.34	*17*	AT32	Salzburg	1.03	*17*	CZ01	Praha	1.19
18	DE60	Hamburg	0.95	*18*	DE60	Hamburg	1.08	*18*	DE60	Hamburg	1.30	*18*	DE30	Berlin	1.01	*18*	EL41	Voreio Aigaio	1.05
19	FRM0	Corse	0.94	*19*	FRM0	Corse	1.01	*19*	AT32	Salzburg	1.28	*19*	FRM0	Corse	0.95	*19*	DE60	Hamburg	0.99

PAGE * MERGEFORMAT2

20	ITH2	Trento	0.94	*20*	NL34	Zeeland	0.99	*20*	FRM0	Corse	1.25	*20*	NL34	Zeeland	0.92	*20*	ITH2	Trento	0.91
21	EL41	Voreio Aigaio	0.93	*21*	ITH2	Trento	0.97	*21*	ITH2	Trento	1.02	*21*	ITH2	Trento	0.92	*21*	EL65	Peloponnisos	0.85
22	NL34	Zeeland	0.86	*22*	EL41	Voreio Aigaio	0.78	*22*	NL32	Noord-Holland	0.91	*22*	EL65	Peloponnisos	0.86	*22*	EL54	Ipeiros	0.85
23	EL65	Peloponnisos	0.68	*23*	PT17	Lisboa	0.59	*23*	NL42	Limburg	0.54	*23*	EL54	Ipeiros	0.83	*23*	FRM0	Corse	0.73
24	EL54	Ipeiros	0.65	*24*	NL32	Noord-Holland	0.58	*24*	EL41	Voreio Aigaio	0.54	*24*	EL52	Kentriki Makedonia	0.72	*24*	CY00	Kypros	0.71
25	PT17	Lisboa	0.62	*25*	EL65	Peloponnisos	0.56	*25*	AT21	Kärnten	0.45	*25*	CY00	Kypros	0.67	*25*	PT17	Lisboa	0.69

Table 13: Alternative TAIDD CI versions, Top 25 regions in original ranking, 2022

Validity tests

To check for the validity of the results of TAIDD CI, we examine the results of a similar study, that of Peeters et al. (2018). Although stating that it is not possible to impose a common threshold for the aforementioned measures so as to declare a region as destinations in a state of overtourism, the study finds at least 15 more regions in the EU which can be identified as "at a high risk of overtourism": Valencia, Andalucía and the Canary Islands in Spain, Languedoc-Roussillon and Burgundy in France, Trento in Italy, Madeira and Algarve in Portugal, and the Ionian Islands and the Peloponnese in Greece. More specifically, Peeters et al. (2018) use a different set of measures to quantify overtourism in comparison to the report at hand. First and foremost, their main type of metric is bed-nights instead of bed; the reasons why the latter was preferred here over the former were analysed in the Methodology Section. Moreover, their study considers listings uploaded to P2P online accommodation platforms. Specifically, the authors rely on a large-scale web scrapping of the Airbnb platform in 2018 and they juxtapose these short-term rentals with more conventional accommodation uploaded to Booking.com. The significance of this type of accommodation has been stressed here in the Methodology Section, although it was not possible to consider them in our analysis. Then, Peeters et al. (2018) have incorporated two types of arrivals (air and cruise passengers), whereas the report at hand considers arrivals at tourist accommodation units. Moreover, they have calculated the number of UNESCO's World Heritage Sites by NUTS 2 area, which has not been considered in the report at hand. Lastly, they have also calculated tourism's contribution to GDP in a significantly different way; namely, through a proxy of tourism revenues at the regional level, which is calculated as "*the average revenues per bed-night per country* […] *and then multiplied by the NUTS 2 number of bed-nights"* (Peeters et al., 2018, p. 72). Ultimately, Peeters et al. (2018) do not calculate a composite index as the report at hand, but as the averaged 5th percentiles of the eight indicators mentioned above, which are plotted into a single Map.

Despite the above—and that Peeters et al. (2018) aim at examining overtourism and not touristification (see Definitions Section for the aims of the report at hand)—their study and ours reach some common key conclusions. First, Southern EU for its most part abounds in destinations at risk of overtourism; a similar finding was reached in the report at hand. Moreover, their study finds specific destinations that were not considered to be at risk of overtourism to eventually fall under that category: such regions are the Ionian Islands and the Peloponnese in Greece. Actually, in our study, the Ionian Islands appear to be one of the most touristified regions in the EU. Second, their study highlights the occurrence of overtourism in multiple Alpine destinations in Austria, France, Italy, but also Switzerland (for which they have data). Moreover, multiple cities in central and northern EU appear to be destinations at risk of overtourism, such as Amsterdam, Venice, and Brussels. Third, most of Eastern EU appears non touristy in both studies.

However, the two studies also reach a series of contradicting findings. First and foremost, the two methods of measurement give quite variating results for the Nordic countries; specifically, regions in Denmark (e.g. Syddanmark) or in southern Sweden (e.g. Vastsverige – West Sweden) appear as destinations at risk of overtourism in Peeters et al. (2018) where as in the report at hand their TAIDD CI scores are low. Similarly, the TAIDD CI has almost all regions in Southern EU falling in the fourth and fifth

quantiles whereas the combined measurement of the eight indicators in Peeters et al. (2018) provides a more nuanced picture. Namely, regions such as Epirus and Western Macedonia in Greece, or Castilla-La Mancha and Extremadura in Spain are much more noticeable in the report at hand. Lastly, our study fails to grasp overtourism tendencies in Polish and Lithuanian regions adjacent to the Baltic Sea. Most of the above should be attributed to the different method and level of analysis in calculating tourism's contribution to the GDP.

All in all, the two approaches give crucial common results despite their different methods and aims of analysis.

Conclusions

What we sought with the above is revisit the geography of tourism in the EU through a heterodox perspective. The analysis above highlights three main zones of touristification throughout the study period. The first is across the EU South, which is consistently the most touristified and it comprises most Greek regions (especially the insular ones), southern and insular Portuguese regions, coastal and insular Spanish regions, the Adriatic Croatia, Malta, and Cyprus. The second zone, which is almost as equally touristified but comprises much fewer regions, is the Alps area, including much of northern Italy and almost all of Austria; at the same time, southeastern France is not as much touristified, whilst southern Germany is even less. This zone could possibly include Switzerland, but it is outside the scope of this study. The third is not a zone per se, as it consists of specific metropolitan regions across central and northern EU, which act as "islands of touristification"; cities like Brussels, Wien, Prague, Berlin and Hamburg stand out, followed by Amsterdam, Lisbon, and Bruges.

In fact, these three zones do not shift substantially during the study period. The trends observed at the onset of the 2008/2009 Global Crisis were not overturned during the 2010s, although this decade started with an unfolding deep recession, especially in the EU South, which was followed by a period of anaemic recovery before the outbreak of the COVID-19 pandemic, a health emergency of unprecedented scale that halted mobility globally for almost two years (Herod et al., 2022). In this context, the rise of the online platforms for short-term accommodation does not seem to have favored urban destinations over rural ones, at least in terms of visitor numbers and tourism-related GDP and employment – specific urban destinations remained amongst the most touristified in the EU, but no substantial correlations were observed with urbanisation levels. However, this should be postulated with caution, as, due to data limitations, the exact numbers of short-term rentals were not considered in the TAIDD CI; nevertheless, some of their capacity is reflected in Eurostat data.

Despite the relatively stable geography of tourism, over the course of the decade subtle changes occurred. Specifically, some important tourist destinations such as the French Riviera and Alps, as well as southern Spain, certainly lost their relative significance over time, whilst other regional trajectories were

led into deeper touristification, with these polarisation/intensification trends culminating in 2019. Overall, for the regions displaying intensifying trends the effect of negative GDP changes during the years of deep recession (2009-2014) has been decisive. Furthermore, touristification trends have even been stronger in the regions within countries with equally deep GDP losses during this period and/or if the latter were also construction-driven economies at the onset of the 2008/2009 Global Crisis that saw their growth models dismantled during the first years of deep recession. The above outlines in a way that the collapse of their national growth model and loss of GDP pushed many regions further deep into touristification. The result of this was an erosion of their labour market, with working conditions at the peak of touristification trends (2019) being a good indicator of their prior and subsequent trajectories. An eloquent example of the above is Greece, which saw even less touristy regions exhibiting strong signs of touristification after 2009. On the contrary, regardless of the geographical and temporal context, industrialisation appears as a counterbalance to touristification.

Juxtaposing our results with the relevant literature's central themes and assertions, we should note here that despite their overcommercialisation and lack of diversity, Southern EU destinations have seen exponential tourism development in recent years, although this growth may prove to be short-lived, especially given the tendency away from scorching summers of the South, similarly to Alpine tourism being threatened by the melting of glaciers (Gibson, 2021). Moreover, despite the dominance of urban destinations in recent overtourism literature, our analysis did not confirm its growth at the expense of rural tourism. Of course, we should note here that the level of our analysis (NUTS 2), as well as the lack of comparable data on short-term rentals (which have mainly reconfigured urban tourism), certainly constitute notable shortcomings in examining this type of tourism; however, weighing by area and population was chosen so that these differences are balanced out.

Today, a series of movements have spurred across the continent calling for more just cities, essentially demanding affordable housing and more equitable access to urban amenities. In cities like Lisbon, Barcelona, Venice, Berlin, and Amsterdam, co-operative housing appears to provide some sort of solution to the housing problem, which has escalated into a full-blown housing crisis from the emergence of peer-to-peer accommodation platforms (e.g., Airbnb) in the mid-2010s onwards. However, more equitable access to amenities remains unattainable, in a context of continuously increasing urban tourism flows. In light of strong responses against overtourism in both urban and rural destinations (Peeters et al., 2018), we call for the strengthening of the literature on rural touristification.

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Appendix

GEO Codes	GEO Labels	BEDS/POP (2022)	ARRIV/POP (2022)	BEDS/ AREA (2022)	ARRIV+POP / AREA (2022)	EMPL % (2022)	TDGDP (2022)	TAIDD CI (2022)
AT11	Burgenland (AT)	0.10	3.12	7.48	324.67	4%	6%	0.10
AT12	Niederösterreich	0.04	1.41	3.73	216.55	4%	6%	-0.10
AT13	Wien	0.04	2.82	211.69	18632.28	7%	6%	2.11
AT21	Kärnten	0.25	4.93	14.86	357.47	6%	6%	0.54
AT22	Steiermark	0.11	2.94	8.16	303.48	5%	6%	0.16
AT31	Oberösterreich	0.05	1.77	6.37	355.80	4%	6%	-0.07
AT32	Salzburg	0.33	11.10	26.45	964.87	8%	6%	1.19
AT33	Tirol	0.37	12.30	22.51	812.05	10%	6%	1.43
AT34	Vorarlberg	0.17	5.05	26.66	959.97	5%	6%	0.49
BE10	Brussels	0.03	2.57	250.96	27091.75	5%	2%	2.26
BE21	Prov. Antwerpen	0.03	1.20	21.31	1482.13	4%	2%	-0.33
BE22	Prov. Limburg (BE)	0.06	1.73	22.48	1016.77	4%	2%	-0.29
BE23	Prov. Oost-Vlaanderen	0.02	0.91	10.86	992.42	3%	2%	-0.50
BE24	Prov. Vlaams-Brabant	0.02	0.98	11.48	1100.96	3%	2%	-0.47
BE25	Prov. West-Vlaanderen	0.07	3.47	28.61	1718.52	4%	2%	-0.10
BE31	Prov. Brabant wallon	0.01	0.73	3.90	646.63	2%	2%	-0.59
BE32	Prov. Hainaut	0.01	0.48	3.61	526.11	4%	2%	-0.55
BE33	Prov. Liège	0.03	1.08	8.71	604.18	3%	2%	-0.50
BE34	Prov. Luxembourg (BE)	0.16	3.91	10.53	324.07	5%	2%	-0.06
BE35	Prov. Namur	0.05	1.20	6.61	302.06	4%	2%	-0.45
BG31	Severozapaden	0.01	0.45	0.50	54.20	3%	3%	-0.55
BG32	Severen tsentralen	0.02	0.59	0.87	81.40	3%	3%	-0.54
BG33	Severoiztochen	0.10	1.58	6.44	162.06	7%	3%	-0.11
BG34	Yugoiztochen	0.15	2.06	7.65	157.66	5%	3%	-0.13
BG41	Yugozapaden	0.02	0.94	2.43	198.68	5%	3%	-0.39
BG42	Yuzhen tsentralen	0.03	1.00	1.80	125.60	4%	3%	-0.43
CY00	Kypros	0.10	3.12	9.60	404.55	8%	8%	0.55
CZ01	Praha	0.08	4.69	211.35	14969.50	4%	3%	1.55
CZ02	Strední Cechy	0.05	0.83	5.84	237.40	4%	3%	-0.47
CZ03	Jihozápad	0.14	1.90	9.58	205.44	3%	3%	-0.32
CZ04	Severozápad	0.07	1.61	9.37	332.79	4%	3%	-0.34
CZ05	Severovýchod	0.11	2.06	12.96	373.91	3%	3%	-0.35
CZ06	Jihovýchod	0.06	1.56	7.86	315.33	2%	3%	-0.46

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CZ07	Střední Morava	0.06	1.28	7.38	298.24	3%	3%	-0.45
CZ08	Moravskoslezsko	0.03	0.84	7.64	408.58	3%	3%	-0.49
DE11	Stuttgart	0.02	1.21	9.66	869.28	2%	4%	-0.35
DE12	Karlsruhe	0.03	1.57	11.82	1053.12	4%	4%	-0.24
DE13	Freiburg	0.06	2.95	14.99	974.00	4%	4%	-0.09
DE14	Tübingen	0.04	1.79	8.78	602.18	3%	4%	-0.29
DE21	Oberbayern	0.06	3.26	16.31	1170.86	4%	4%	-0.05
DE22	Niederbayern	0.06	2.17	7.89	387.86	4%	4%	-0.18
DE23	Oberpfalz	0.04	1.65	4.98	306.29	3%	4%	-0.32
DE24	Oberfranken	0.04	1.78	6.16	408.57	3%	4%	-0.31
DE25	Mittelfranken	0.04	2.11	9.43	765.78	3%	4%	-0.26
DE26	Unterfranken	0.04	1.83	6.72	439.64	3%	4%	-0.30
DE27	Schwaben	0.06	2.66	11.68	709.41	3%	4%	-0.19
DE30	Berlin	0.04	2.83	170.60	16649.65	4%	4%	1.45
DE40	Brandenburg	0.05	1.83	4.39	247.90	3%	4%	-0.32
DE50	Bremen	0.02	1.93	42.70	5075.50	4%	4%	0.18
DE60	Hamburg	0.04	3.68	111.02	12214.30	3%	4%	0.95
DE71	Darmstadt	0.03	2.12	18.85	1701.41	4%	4%	-0.12
DE72	Gießen	0.03	0.98	5.07	386.35	2%	4%	-0.40
DE73	Kassel	0.06	2.28	9.05	483.01	3%	4%	-0.23
DE80	Mecklenburg-Vorpommern	0.19	4.48	13.62	390.84	4%	4%	0.13
DE91	Braunschweig	0.04	1.55	7.55	501.97	3%	4%	-0.32
DE92	Hannover	0.03	1.35	7.05	561.70	3%	4%	-0.31
DE93	Lüneburg	0.06	1.82	6.21	317.46	4%	4%	-0.23
DE94	Weser-Ems	0.06	1.85	10.91	489.24	3%	4%	-0.25
DEA1	Düsseldorf	0.02	1.13	18.35	2144.93	3%	4%	-0.22
DEA2	Köln	0.02	1.44	14.00	1493.47	3%	4%	-0.24
DEA3	Münster	0.02	0.73	5.92	659.52	2%	4%	-0.41
DEA4	Detmold	0.02	0.80	5.79	568.29	2%	4%	-0.43
DEA5	Arnsberg	0.02	0.98	8.94	886.82	3%	4%	-0.36
DEB1	Koblenz	0.06	1.94	11.02	550.51	3%	4%	-0.24
DEB2	Trier	0.12	3.84	13.29	529.92	5%	4%	0.07
DEB3	Rheinhessen-Pfalz	0.03	1.29	8.00	695.84	3%	4%	-0.30
DEC0	Saarland	0.02	1.01	9.28	768.30	3%	4%	-0.51
DED2	Dresden	0.04	2.10	9.00	631.29	4%	4%	-0.19
DED4	Chemnitz	0.03	1.01	5.67	433.98	3%	4%	-0.38
DED5	Leipzig	0.03	2.04	8.74	823.83	3%	4%	-0.24
DEE0	Sachsen-Anhalt	0.03	1.42	3.62	258.86	3%	4%	-0.35
DEF0	Schleswig-Holstein	0.11	2.97	20.92	753.30	4%	4%	-0.02

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DEG0	Thüringen	0.05	1.54	6.52	332.11	3%	4%	-0.31
DK01	Hovedstaden	0.05	2.20	40.21	2455.69	4%	2%	-0.09
DK02	Sjælland	0.06	0.76	7.19	209.18	3%	2%	-0.50
DK03	Syddanmark	0.11	1.74	11.26	281.18	4%	2%	-0.33
DK04	Midtjylland	0.06	0.98	6.67	207.70	3%	2%	-0.48
DK05	Nordjylland	0.14	1.72	10.61	208.40	3%	2%	-0.35
EE00	Eesti	0.05	2.44	1.44	106.35	3%	4%	-0.31
EL30	Attiki	0.02	1.22	21.08	2234.18	7%	8%	0.42
EL41	Voreio Aigaio	0.18	2.53	9.07	181.15	14%	8%	0.92
EL42	Notio Aigaio	0.93	21.92	58.50	1434.88	24%	8%	3.88
EL43	Kriti	0.39	9.47	29.44	786.13	14%	8%	1.77
EL51	Anatoliki Makedonia, Thraki	0.08	1.50	3.08	100.32	8%	8%	0.41
EL52	Kentriki Makedonia	0.10	2.18	9.43	307.45	9%	8%	0.53
EL53	Dytiki Makedonia	0.03	0.55	0.80	42.77	6%	8%	0.13
EL54	Ipeiros	0.11	2.91	3.89	137.48	10%	8%	0.65
EL61	Thessalia	0.07	1.83	3.67	139.31	9%	8%	0.46
EL62	Ionia Nisia	0.78	13.65	70.21	1313.46	30%	8%	3.58
EL63	Dytiki Ellada	0.04	1.17	2.57	127.08	8%	8%	0.31
EL64	Sterea Ellada	0.09	1.77	2.96	91.19	8%	8%	0.44
EL65	Peloponnisos	0.13	3.11	4.45	143.17	10%	8%	0.67
ES11	Galicia	0.06	2.45	5.28	315.93	6%	6%	0.08
ES12	Principado de Asturias	0.08	2.42	8.03	325.50	7%	6%	0.16
ES13	Cantabria	0.13	3.52	14.95	500.90	9%	6%	0.45
ES21	País Vasco	0.03	1.91	8.95	882.36	6%	6%	0.02
ES22	Comunidad Foral de Navarra	0.07	2.71	4.29	236.53	6%	6%	0.10
ES23	La Rioja	0.06	2.43	4.03	215.28	5%	6%	-0.01
ES24	Aragón	0.09	2.77	2.40	104.50	6%	6%	0.08
ES30	Comunidad de Madrid	0.02	1.86	20.76	2432.55	6%	6%	0.17
ES41	Castilla y León	0.07	2.68	1.87	93.27	7%	6%	0.12
ES42	Castilla-la Mancha	0.04	1.38	1.07	61.60	6%	6%	-0.04
ES43	Extremadura	0.05	1.78	1.17	71.45	5%	6%	-0.07
ES51	Cataluña	0.10	3.23	24.99	1016.54	7%	6%	0.36
ES52	Comunitat Valenciana	0.08	2.44	17.87	754.69	9%	6%	0.32
ES53	Illes Balears	0.38	10.43	92.99	2813.52	18%	6%	2.14
ES61	Andalucía	0.07	2.68	6.62	361.35	9%	6%	0.28
ES62	Región de Murcia	0.04	1.10	4.72	283.56	7%	6%	-0.02

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ES70	Canarias	0.19	5.91	58.16	2096.76	19%	6%	1.51
FI19	Länsi-Suomi	0.04	1.85	0.96	67.45	4%	2%	-0.47
FI1B	Helsinki-Uusimaa	0.03	2.00	5.13	565.65	4%	2%	-0.46
FI1C	Etelä-Suomi	0.03	1.60	1.25	94.85	4%	2%	-0.47
FI1D	Pohjois- ja Itä-Suomi	0.08	2.75	0.53	23.44	4%	2%	-0.39
FR10	Île de France	0.03	2.86	34.00	3985.51	4%	4%	0.13
FRB0	Centre - Val de Loire	0.05	2.17	3.12	207.67	4%	4%	-0.27
FRC1	Bourgogne	0.05	2.78	2.68	193.18	3%	4%	-0.29
FRC2	Franche-Comté	0.05	1.61	3.87	189.70	3%	4%	-0.33
FRD1	Basse-Normandie	0.08	3.12	6.96	341.17	4%	4%	-0.16
FRD2	Haute-Normandie	0.03	1.45	4.35	371.20	3%	4%	-0.37
FRE1	Nord-Pas-de-Calais	0.02	1.12	6.94	695.12	4%	4%	-0.34
FRE2	Picardie	0.03	1.40	3.38	238.16	4%	4%	-0.34
FRF1	Alsace	0.05	2.66	10.54	856.04	3%	4%	-0.22
FRF2	Champagne-Ardenne	0.04	1.93	1.91	150.52	2%	4%	-0.39
FRF3	Lorraine	0.03	1.46	3.28	242.96	4%	4%	-0.33
FRG0	Pays-de-la-Loire	0.09	2.13	10.42	377.92	3%	4%	-0.25
FRH0	Bretagne	0.11	2.59	13.59	447.24	4%	4%	-0.09
FRI1	Aquitaine	0.15	3.06	12.61	347.35	5%	4%	0.01
FRI2	Limousin	0.08	1.79	3.30	118.64	4%	4%	-0.28
FRI3	Poitou-Charentes	0.12	3.05	8.79	286.27	3%	4%	-0.12
FRJ1	Languedoc-Roussillon	0.18	3.44	19.37	473.78	6%	4%	0.16
FRJ2	Midi-Pyrénées	0.09	2.11	6.04	215.34	3%	4%	-0.24
FRK1	Auvergne	0.09	2.37	4.63	177.40	4%	4%	-0.21
FRK2	Rhône-Alpes	0.09	2.71	14.03	568.68	4%	4%	-0.11
FRL0	Provence-Alpes-Côte d'Azur	0.12	3.52	19.14	743.16	5%	4%	0.06
FRM0	Corse	0.46	9.08	18.67	405.06	8%	4%	0.95
HR03	Jadranska Hrvatska	0.82	12.03	43.32	689.04	11%	12%	2.63
HR04	Kontinentalna Hrvatska (NUTS 2016)	0.03	0.85	2.08	151.03	4%	12%	0.37
HU10	Közép-Magyarország (NUTS 2013)	0.03	1.27	12.59	1014.65	4%	2%	-0.38
HU21	Közép-Dunántúl	0.06	1.30	5.78	226.90	4%	2%	-0.44
HU22	Nyugat-Dunántúl	0.05	1.97	4.57	265.08	6%	2%	-0.26
HU23	Dél-Dunántúl	0.07	1.34	4.30	146.74	4%	2%	-0.40

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HU31	Észak-Magyarország	0.04	1.04	2.93	169.17	4%	2%	-0.49
HU32	Észak-Alföld	0.03	0.63	2.25	133.61	3%	2%	-0.55
HU33	Dél-Alföld	0.03	0.73	1.83	115.91	4%	2%	-0.53
IE00	Ireland	0.04	1.96	3.22	218.25	7%	2%	-0.29
ITC1	Piemonte	0.05	1.23	8.01	377.93	5%	6%	-0.07
ITC2	Valle d'Aosta/Vallée d'Aoste	0.47	9.68	17.83	406.10	12%	6%	1.37
ITC3	Liguria	0.10	3.23	28.50	1180.40	8%	6%	0.43
ITC4	Lombardia	0.04	1.49	17.79	1072.38	5%	6%	0.03
ITF1	Abruzzo	0.09	1.25	10.94	266.15	6%	6%	0.06
ITF2	Molise	0.04	0.46	2.59	95.96	6%	6%	-0.11
ITF3	Campania	0.04	0.92	17.12	791.62	6%	6%	0.06
ITF4	Puglia	0.08	1.11	16.35	428.37	7%	6%	0.13
ITF5	Basilicata	0.07	1.38	3.74	128.39	6%	6%	-0.01
ITF6	Calabria	0.10	0.82	12.23	222.67	6%	6%	0.07
ITG1	Sicilia	**0.04**	**1.01**	**8.38**	**378.25**	**7%**	**6%**	**0.01**
ITG2	Sardegna	**0.14**	**2.15**	**9.29**	**209.23**	**9%**	**6%**	**0.31**
ITH1	Provincia Autonoma di Bolzano	0.45	14.89	32.51	1148.31	14%	6%	1.87
ITH2	Provincia Autonoma di Trento	0.31	8.29	27.25	816.27	8%	6%	0.94
ITH3	Veneto	0.15	3.74	42.73	1325.18	5%	6%	0.46
ITH4	Friuli-Venezia Giulia	0.13	2.18	20.72	501.41	7%	6%	0.26
ITH5	Emilia-Romagna	0.10	2.41	20.44	683.49	5%	6%	0.16
ITI1	Toscana	0.16	3.54	25.49	729.44	7%	6%	0.44
ITI2	Umbria	0.10	2.63	10.31	375.60	7%	6%	0.20
ITI3	Marche	0.12	1.65	19.22	419.27	7%	6%	0.22
ITI4	Lazio	0.08	1.59	25.53	873.25	7%	6%	0.19
LT00	Lietuva (NUTS 2013)	0.04	1.36	1.76	105.86	3%	2%	-0.59
LU00	Luxembourg	0.09	1.81	22.58	700.96	3%	2%	-0.35
LV00	Latvija	0.03	1.16	0.77	63.96	3%	4%	-0.37
MT00	Malta	0.10	3.48	162.88	7460.49	7%	15%	2.21
NL11	Groningen	0.05	1.19	11.74	547.14	4%	2%	-0.43
NL12	Friesland (NL)	0.16	3.09	31.20	787.06	5%	2%	-0.05
NL13	Drenthe	0.20	4.08	38.19	946.24	5%	2%	0.11
NL21	Overijssel	0.10	2.10	35.54	1082.22	4%	2%	-0.16
NL22	Gelderland	0.09	2.11	40.00	1311.90	5%	2%	-0.13

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NL23	Flevoland	0.08	1.71	23.80	821.31	4%	2%	-0.33
NL31	Utrecht	0.03	1.47	30.37	2405.52	4%	2%	-0.29
NL32	Noord-Holland	0.08	4.40	87.98	5711.35	5%	2%	0.48
NL33	Zuid-Holland	0.03	1.46	38.15	3204.27	4%	2%	-0.18
NL34	Zeeland	0.38	7.68	81.68	1862.17	6%	2%	0.86
NL41	Noord-Brabant	0.06	1.80	29.73	1463.62	5%	2%	-0.23
NL42	Limburg (NL)	0.12	3.77	59.87	2472.60	6%	2%	0.21
PL12	Mazowieckie (NUTS 2013)	0.01	1.09	1.80	320.42	2%	2%	-0.63
PL21	Malopolskie	0.03	1.54	6.51	569.82	3%	2%	-0.52
PL22	Slaskie	0.01	0.60	3.93	582.50	2%	2%	-0.64
PL41	Wielkopolskie	0.01	0.55	1.36	182.11	2%	2%	-0.70
PL42	Zachodniopomorskie	0.09	1.97	6.56	224.75	4%	2%	-0.40
PL43	Lubuskie	0.02	0.64	1.23	117.70	2%	2%	-0.66
PL51	Dolnoslaskie	0.03	1.31	3.67	332.75	3%	2%	-0.55
PL52	Opolskie	0.01	0.36	0.74	135.82	2%	2%	-0.83
PL61	Kujawsko-Pomorskie	0.02	0.68	1.76	193.29	2%	2%	-0.66
PL62	Warminsko-Mazurskie	0.03	0.87	1.71	112.65	2%	2%	-0.64
PL63	Pomorskie	0.05	1.42	6.27	317.00	3%	2%	-0.53
PL71	Lódzkie	0.01	0.50	1.13	199.73	2%	2%	-0.68
PL72	Swietokrzyskie	0.01	0.52	1.49	155.96	3%	2%	-0.81
PL81	Lubelskie	0.01	0.56	1.02	128.97	2%	2%	-0.71
PL82	Podkarpackie	0.02	0.59	1.86	185.10	2%	2%	-0.66
PL84	Podlaskie	0.01	0.50	0.68	85.24	2%	2%	-0.82
PT11	Norte	0.03	1.76	5.67	468.80	4%	7%	0.07
PT15	Algarve	0.37	10.30	34.58	1066.84	16%	7%	1.81
PT16	Centro (PT)	0.06	1.94	4.90	234.91	5%	7%	0.13
PT17	Área Metropolitana de Lisboa	0.05	2.68	52.06	3761.52	6%	7%	0.62
PT18	Alentejo	0.08	2.57	1.71	81.19	5%	7%	0.16
PT20	Região Autónoma dos Açores	0.09	3.39	9.25	450.37	8%	7%	0.44
PT30	Região Autónoma da Madeira	0.18	6.26	55.16	2282.12	15%	7%	1.45
RO11	Nord-Vest	0.02	0.68	1.46	124.60	3%	1%	-0.70
RO12	Centru	0.03	1.28	2.30	152.91	2%	1%	-0.64
RO21	Nord-Est	0.01	0.44	1.00	126.84	2%	1%	-0.73
RO22	Sud-Est	0.05	0.80	3.84	125.90	3%	1%	-0.62
RO31	Sud - Muntenia	0.01	0.35	0.93	113.84	2%	1%	-0.76
RO32	Bucuresti - Ilfov	0.01	0.81	16.18	2338.69	3%	1%	-0.46

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RO41	**Sud-Vest Oltenia**	0.01	0.42	0.86	92.70	1%	1%	-0.79
RO42	**Vest**	0.02	0.50	1.00	78.62	2%	1%	-0.74
SE11	**Stockholm**	0.04	3.10	15.44	1519.22	3%	3%	-0.25
SE12	**Östra Mellansverige**	0.05	2.10	2.40	141.36	3%	3%	-0.45
SE21	**Småland med öarna**	0.14	3.52	3.60	119.80	3%	3%	-0.28
SE22	**Sydsverige**	0.06	2.47	6.48	390.06	3%	3%	-0.37
SE23	**Västsverige**	0.09	3.43	6.29	316.29	3%	3%	-0.30
SE31	**Norra Mellansverige**	0.13	3.41	1.78	59.50	4%	3%	-0.22
SE32	**Mellersta Norrland**	0.15	4.26	0.78	28.06	3%	3%	-0.19
SE33	**Övre Norrland**	0.15	3.92	0.53	16.97	3%	3%	-0.22
SI03	**Vzhodna Slovenija**	0.06	1.64	4.93	236.41	4%	4%	-0.31
SI04	**Zahodna Slovenija**	0.13	4.03	16.48	646.65	4%	4%	0.01
SK01	**Bratislavský kraj**	0.04	1.49	15.85	892.16	4%	3%	-0.34
SK02	**Západné Slovensko**	0.03	0.46	3.21	178.88	3%	3%	-0.56
SK03	**Stredné Slovensko**	0.05	1.20	4.07	178.20	3%	3%	-0.45
SK04	**Východné Slovensko**	0.03	0.76	3.39	178.48	4%	3%	-0.45

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Appendix 1: TAIDD CI scores and individual variables (raw data), Full dataset, 2022

GEO Codes	GEO Labels	BEDS/ POP (2019)	ARRIV/ POP (2019)	BEDS/ AREA (2019)	ARRIV+POP / AREA (2019)	EMPL % (2019)	TDGDP (2019)	TAIDD CI (2019)
AT11	Burgenland (AT)	0.09	3.44	7.25	344.30	5%	6%	0.13
AT12	Niederösterreich	0.04	1.76	3.61	245.29	4%	6%	-0.09
AT13	Wien	0.04	4.06	200.11	24238.64	7%	6%	2.19
AT21	Kärnten	0.25	5.22	14.96	372.65	7%	6%	0.57
AT22	Steiermark	0.10	3.10	7.93	313.62	6%	6%	0.15
AT31	Oberösterreich	0.05	2.03	5.97	383.57	4%	6%	-0.06
AT32	Salzburg	0.33	12.97	26.31	1099.08	9%	6%	1.30
AT33	Tirol	0.37	13.92	22.05	900.28	11%	6%	1.45
AT34	Vorarlberg	0.16	5.44	24.84	1003.51	6%	6%	0.49
BE10	Brussels	0.03	3.22	252.59	31693.88	6%	2%	2.27
BE21	Prov. Antwerpen	0.03	1.16	19.31	1432.16	4%	2%	-0.36
BE22	Prov. Limburg (BE)	0.05	1.62	19.26	960.48	3%	2%	-0.39
BE23	Prov. Oost-Vlaanderen	0.02	0.82	8.67	930.11	3%	2%	-0.55
BE24	Prov. Vlaams-Brabant	0.02	1.18	10.79	1181.85	3%	2%	-0.49
BE25	Prov. West-Vlaanderen	0.07	3.57	27.20	1735.46	4%	2%	-0.14
BE31	Prov. Brabant wallon	0.01	0.76	3.35	650.25	4%	2%	-0.55
BE32	Prov. Hainaut	0.01	0.46	3.56	517.49	3%	2%	-0.59
BE33	Prov. Liège	0.03	1.03	8.21	585.90	4%	2%	-0.50
BE34	Prov. Luxembourg (BE)	0.17	3.65	10.68	299.00	4%	2%	-0.15
BE35	Prov. Namur	0.05	1.17	6.52	294.01	3%	2%	-0.52
BG31	Severozapaden	0.01	0.38	0.44	54.47	4%	3%	-0.51
BG32	Severen tsentralen	0.02	0.67	0.88	89.35	4%	3%	-0.50
BG33	Severoiztochen	0.11	1.92	7.13	186.39	8%	3%	-0.03
BG34	Yugoiztochen	0.14	2.02	7.21	159.30	7%	3%	-0.08
BG41	Yugozapaden	0.02	1.06	2.13	214.53	6%	3%	-0.36
BG42	Yuzhen tsentralen	0.02	0.90	1.46	121.03	5%	3%	-0.41
CY00	Kypros	0.10	3.70	9.79	447.07	9%	8%	0.61
CZ01	Praha	0.08	6.15	203.17	19284.45	6%	3%	1.72
CZ02	Střední Cechy	0.04	0.86	5.37	237.18	4%	3%	-0.48
CZ03	Jihozápad	0.13	2.17	9.30	226.80	3%	3%	-0.32
CZ04	Severozápad	0.07	1.66	8.70	350.00	5%	3%	-0.34
CZ05	Severovýchod	0.10	1.94	12.34	363.65	3%	3%	-0.35
CZ06	Jihovýchod	0.06	1.62	7.43	323.91	3%	3%	-0.44
CZ07	Střední Morava	0.05	1.29	6.72	305.39	3%	3%	-0.51
CZ08	Moravskoslezsko	0.03	0.84	7.57	417.58	4%	3%	-0.46

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DE11	Stuttgart	0.02	1.54	9.26	998.33	3%	4%	-0.31
DE12	Karlsruhe	0.03	1.90	12.22	1186.32	4%	4%	-0.22
DE13	Freiburg	0.06	3.15	14.70	1014.24	4%	4%	-0.10
DE14	Tübingen	0.04	1.96	8.55	632.37	4%	4%	-0.24
DE21	Oberbayern	0.06	3.92	15.72	1342.33	4%	4%	-0.02
DE22	Niederbayern	0.07	2.57	8.24	431.72	4%	4%	-0.19
DE23	Oberpfalz	0.04	1.86	5.07	329.09	3%	4%	-0.32
DE24	Oberfranken	0.04	1.95	5.76	436.84	5%	4%	-0.22
DE25	Mittelfranken	0.03	2.40	8.54	835.00	3%	4%	-0.26
DE26	Unterfranken	0.04	2.13	6.53	485.37	3%	4%	-0.28
DE27	Schwaben	0.06	3.04	11.70	770.99	4%	4%	-0.13
DE30	Berlin	0.04	3.83	181.84	20791.96	6%	4%	1.67
DE40	Brandenburg	0.05	2.03	4.20	262.25	3%	4%	-0.29
DE50	Bremen	0.02	2.21	43.40	5600.73	4%	4%	0.15
DE60	Hamburg	0.04	4.14	102.50	13320.55	5%	4%	0.94
DE71	Darmstadt	0.03	2.77	18.74	2036.54	4%	4%	-0.07
DE72	Gießen	0.03	1.12	5.51	413.49	3%	4%	-0.36
DE73	Kassel	0.06	2.62	9.39	534.72	4%	4%	-0.16
DE80	Mecklenburg-Vorpommern	0.20	5.09	14.05	434.18	6%	4%	0.23
DE91	Braunschweig	0.04	1.85	7.78	562.66	3%	4%	-0.30
DE92	Hannover	0.03	1.58	6.90	616.66	3%	4%	-0.32
DE93	Lüneburg	0.06	2.00	6.25	333.75	3%	4%	-0.28
DE94	Weser-Ems	0.07	2.04	11.07	515.77	4%	4%	-0.22
DEA1	Düsseldorf	0.02	1.38	17.71	2391.75	4%	4%	-0.21
DEA2	Köln	0.02	1.74	13.65	1679.98	4%	4%	-0.22
DEA3	Münster	0.01	0.80	5.62	683.24	3%	4%	-0.41
DEA4	Detmold	0.02	0.95	6.05	617.49	3%	4%	-0.39
DEA5	Arnsberg	0.02	1.15	9.01	964.65	3%	4%	-0.34
DEB1	Koblenz	0.06	2.36	12.10	626.31	4%	4%	-0.19
DEB2	Trier	0.13	4.11	14.32	553.99	5%	4%	0.09
DEB3	Rheinhessen-Pfalz	0.03	1.48	7.91	749.72	4%	4%	-0.28
DEC0	Saarland	0.02	1.08	8.58	803.85	4%	4%	-0.32
DED2	Dresden	0.05	2.59	9.35	738.87	4%	4%	-0.20
DED4	Chemnitz	0.03	1.23	5.84	492.24	3%	4%	-0.38
DED5	Leipzig	0.03	2.33	8.48	891.59	5%	4%	-0.18
DEE0	Sachsen-Anhalt	0.03	1.59	3.66	283.00	3%	4%	-0.35
DEF0	Schleswig-Holstein	0.11	3.02	20.04	756.51	4%	4%	-0.03
DEG0	Thüringen	0.05	1.79	6.19	370.66	4%	4%	-0.29
DK01	Hovedstaden	0.05	2.06	35.13	2308.60	5%	2%	-0.16

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DK02	Sjælland	0.06	0.70	7.20	201.58	4%	2%	-0.50
DK03	Syddanmark	0.11	1.53	11.14	257.75	4%	2%	-0.35
DK04	Midtjylland	0.06	0.84	6.50	190.38	3%	2%	-0.52
DK05	Nordjylland	0.14	1.57	10.75	196.49	4%	2%	-0.33
EE00	Eesti	0.05	2.86	1.40	117.67	5%	4%	-0.22
EL30	Attiki	0.02	1.37	20.44	2343.92	8%	8%	0.47
EL41	Voreio Aigaio	0.17	2.52	9.83	204.78	13%	8%	0.83
EL42	Notio Aigaio	0.99	22.40	65.33	1539.16	28%	8%	4.15
EL43	Kriti	0.38	9.68	29.22	816.29	16%	8%	1.80
EL51	Anatoliki Makedonia, Thraki	0.07	1.60	3.21	111.34	9%	8%	0.41
EL52	Kentriki Makedonia	0.10	2.29	9.84	332.74	8%	8%	0.45
EL53	Dytiki Makedonia	0.03	0.65	0.80	47.74	7%	8%	0.17
EL54	Ipeiros	0.12	2.99	4.32	146.74	12%	8%	0.73
EL61	Thessalia	0.08	2.09	4.23	159.17	8%	8%	0.44
EL62	Ionia Nisia	0.81	14.65	72.96	1401.79	26%	8%	3.40
EL63	Dytiki Ellada	0.04	1.23	2.52	132.50	9%	8%	0.35
EL64	Sterea Ellada	0.09	1.79	3.35	100.76	9%	8%	0.46
EL65	Peloponnisos	0.12	3.40	4.63	163.52	10%	8%	0.66
ES11	Galicia	0.05	1.89	4.62	265.97	8%	5%	0.07
ES12	Principado de Asturias	0.08	2.31	7.81	320.11	8%	5%	0.17
ES13	Cantabria	0.13	3.49	14.44	495.89	10%	5%	0.44
ES21	País Vasco	0.03	1.78	7.96	840.61	7%	5%	0.06
ES22	Comunidad Foral de Navarra	0.06	2.28	3.96	205.86	7%	5%	0.05
ES23	La Rioja	0.06	2.61	3.80	224.82	7%	5%	0.08
ES24	Aragón	0.08	2.89	2.23	108.15	7%	5%	0.10
ES30	Comunidad de Madrid	0.02	2.07	19.54	2561.00	7%	5%	0.20
ES41	Castilla y León	0.07	2.70	1.74	94.87	7%	5%	0.10
ES42	Castilla-la Mancha	0.04	1.42	1.01	62.18	6%	5%	-0.09
ES43	Extremadura	0.04	1.82	1.10	73.40	7%	5%	0.01
ES51	Cataluña	0.10	3.46	24.77	1055.00	8%	5%	0.37
ES52	Comunitat Valenciana	0.08	2.49	16.99	749.46	9%	5%	0.29
ES53	Illes Balears	0.39	10.46	94.05	2737.58	17%	5%	2.04
ES61	Andalucía	0.06	2.87	6.25	376.01	10%	5%	0.30
ES62	Región de Murcia	0.03	1.13	4.56	280.13	5%	5%	-0.12
ES70	Canarias	0.19	6.10	57.83	2112.43	21%	5%	1.57
FI19	Länsi-Suomi	0.04	1.83	0.95	67.06	4%	2%	-0.53

FI1B	Helsinki-Uusimaa	0.03	2.45	4.77	633.33	4%	2%	-0.42
FI1C	Etelä-Suomi	0.03	1.63	1.26	96.52	4%	2%	-0.54
FI1D	Pohjois- ja Itä-Suomi	0.09	2.89	0.55	24.54	4%	2%	-0.41
FR10	Île de France	0.03	3.30	34.01	4410.27	4%	4%	0.10
FRB0	Centre - Val de Loire	0.05	2.21	3.21	210.24	3%	4%	-0.34
FRC1	Bourgogne	0.05	2.83	2.73	196.80	4%	4%	-0.27
FRC2	Franche-Comté	0.06	1.71	4.07	196.88	3%	4%	-0.36
FRD1	Basse-Normandie	0.08	3.25	6.91	351.82	3%	4%	-0.24
FRD2	Haute-Normandie	0.03	1.49	4.40	376.26	3%	4%	-0.41
FRE1	Nord-Pas-de-Calais	0.02	1.21	6.63	722.64	2%	4%	-0.44
FRE2	Picardie	0.03	1.41	3.25	240.02	3%	4%	-0.42
FRF1	Alsace	0.04	2.97	10.18	914.47	4%	4%	-0.21
FRF2	Champagne-Ardenne	0.04	1.95	1.91	152.22	5%	4%	-0.27
FRF3	Lorraine	0.03	1.65	3.40	262.00	4%	4%	-0.36
FRG0	Pays-de-la-Loire	0.09	2.16	10.42	373.14	4%	4%	-0.22
FRH0	Bretagne	0.11	2.50	13.33	428.05	5%	4%	-0.11
FRI1	Aquitaine	0.15	3.15	12.70	347.12	5%	4%	-0.02
FRI2	Limousin	0.08	1.82	3.47	121.14	3%	4%	-0.34
FRI3	Poitou-Charentes	0.13	2.95	8.89	276.13	3%	4%	-0.16
FRJ1	Languedoc-Roussillon	0.19	3.35	19.54	452.55	4%	4%	0.04
FRJ2	Midi-Pyrénées	0.09	2.23	6.21	218.23	4%	4%	-0.23
FRK1	Auvergne	0.09	2.36	4.71	176.34	3%	4%	-0.30
FRK2	Rhône-Alpes	0.09	2.74	14.05	563.77	4%	4%	-0.15
FRL0	Provence-Alpes-Côte d'Azur	0.12	3.57	19.74	740.49	5%	4%	0.01
FRM0	Corse	0.48	8.48	18.90	373.79	8%	4%	0.90
HR03	Jadranska Hrvatska	0.79	12.31	44.09	745.96	12%	11%	2.57
HR04	Kontinentalna Hrvatska (NUTS 2016)	0.03	0.98	2.45	170.25	4%	11%	0.34
HU10	Közép-Magyarország (NUTS 2013)	0.02	1.78	11.14	1240.06	5%	2%	-0.34
HU21	Közép-Dunántúl	0.07	1.43	6.54	240.49	4%	2%	-0.44
HU22	Nyugat-Dunántúl	0.06	2.11	5.41	274.65	5%	2%	-0.31
HU23	Dél-Dunántúl	0.09	1.35	5.55	150.49	4%	2%	-0.39
HU31	Észak-Magyarország	0.04	1.16	3.39	182.92	4%	2%	-0.48
HU32	Észak-Alföld	0.03	0.70	2.66	142.03	3%	2%	-0.57

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HU33	Dél-Alföld	0.03	0.77	2.23	120.70	4%	2%	-0.50
IE00	Ireland	0.04	2.43	3.03	245.03	8%	2%	-0.23
ITC1	Piemonte	0.05	1.24	7.92	385.10	5%	6%	-0.08
ITC2	Valle d'Aosta/Vallée d'Aoste	0.46	10.11	17.80	430.19	12%	6%	1.35
ITC3	Liguria	0.10	3.13	28.13	1170.64	9%	6%	0.44
ITC4	Lombardia	0.04	1.75	16.86	1194.09	5%	6%	0.04
ITF1	Abruzzo	0.09	1.26	10.62	272.32	8%	6%	0.14
ITF2	Molise	0.04	0.45	2.56	99.13	6%	6%	-0.11
ITF3	Campania	0.04	1.09	16.51	881.56	7%	6%	0.10
ITF4	Puglia	0.07	1.07	14.76	426.67	6%	6%	0.05
ITF5	Basilicata	0.07	1.69	3.72	149.97	6%	6%	0.01
ITF6	Calabria	0.10	0.99	12.64	250.90	6%	6%	0.04
ITG1	Sicilia	**0.04**	**1.04**	**8.21**	**390.20**	**7%**	**6%**	**0.02**
ITG2	Sardegna	**0.13**	**2.12**	**9.13**	**212.84**	**9%**	**6%**	**0.30**
ITH1	Provincia Autonoma di Bolzano/Bozen	0.43	14.51	30.86	1115.93	13%	6%	1.71
ITH2	Provincia Autonoma di Trento	0.32	8.33	27.96	823.90	8%	6%	0.90
ITH3	Veneto	0.16	4.13	45.78	1445.66	7%	6%	0.56
ITH4	Friuli-Venezia Giulia	0.13	2.19	20.80	509.99	6%	6%	0.22
ITH5	Emilia-Romagna	0.10	2.60	20.85	726.78	6%	6%	0.18
ITI1	Toscana	0.16	3.88	25.21	791.42	7%	6%	0.42
ITI2	Umbria	0.10	2.79	10.64	398.64	8%	6%	0.23
ITI3	Marche	0.13	1.59	21.30	419.56	6%	6%	0.19
ITI4	Lazio	0.07	2.23	24.16	1098.64	6%	6%	0.19
LT00	Lithuania	0.04	1.45	1.73	109.06	3%	2%	-0.59
LU00	Luxembourg	0.10	1.90	24.21	687.99	4%	2%	-0.33
LV00	Latvija	0.03	1.49	0.88	75.42	4%	4%	-0.33
MT00	Malta	0.10	4.10	153.66	8039.84	8%	14%	2.16
NL11	Groningen	0.05	1.38	12.23	587.95	4%	2%	-0.47
NL12	Friesland (NL)	0.17	2.74	31.67	712.48	4%	2%	-0.14
NL13	Drenthe	0.22	3.99	39.94	919.15	4%	2%	0.05
NL21	Overijssel	0.10	2.03	35.26	1042.61	4%	2%	-0.24
NL22	Gelderland	0.10	2.10	41.04	1286.36	4%	2%	-0.19
NL23	Flevoland	0.07	1.59	21.02	751.02	4%	2%	-0.36
NL31	Utrecht	0.03	1.26	30.93	2105.44	4%	2%	-0.35
NL32	Noord-Holland	0.08	5.45	86.90	6681.93	5%	2%	0.49
NL33	Zuid-Holland	0.03	1.49	34.71	3200.57	4%	2%	-0.26

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NL34	Zeeland	0.39	7.03	82.85	1705.46	6%	2%	0.78
NL41	Noord-Brabant	0.06	1.72	30.35	1397.49	5%	2%	-0.28
NL42	Limburg (NL)	0.12	3.77	61.72	2470.42	6%	2%	0.18
PL12	Mazowieckie (NUTS 2013)	0.01	1.03	1.83	309.77	2%	2%	-0.67
PL21	Malopolskie	0.03	1.67	6.98	595.97	3%	2%	-0.52
PL22	Slaskie	0.01	0.65	4.25	608.26	2%	2%	-0.67
PL41	Wielkopolskie	0.01	0.61	1.46	190.11	2%	2%	-0.69
PL42	Zachodniopomorskie	0.09	1.92	6.66	223.67	4%	2%	-0.42
PL43	Lubuskie	0.02	0.72	1.44	124.90	2%	2%	-0.71
PL51	Dolnoslaskie	0.02	1.37	3.59	343.81	3%	2%	-0.58
PL52	Opolskie	0.01	0.47	1.05	149.58	2%	2%	-0.71
PL61	Kujawsko-Pomorskie	0.02	0.66	1.81	194.25	2%	2%	-0.70
PL62	Warminsko-Mazurskie	0.03	0.98	1.87	121.20	3%	2%	-0.60
PL63	Pomorskie	0.05	1.41	6.76	313.35	3%	2%	-0.51
PL71	Lódzkie	0.01	0.58	1.33	214.07	1%	2%	-0.76
PL72	Swietokrzyskie	0.02	0.54	1.59	161.82	3%	2%	-0.68
PL81	Lubelskie	0.01	0.55	1.12	130.16	2%	2%	-0.72
PL82	Podkarpackie	0.02	0.62	2.02	191.12	2%	2%	-0.69
PL84	Podlaskie	0.01	0.60	0.75	92.04	2%	2%	-0.72
PT11	Norte	0.03	1.71	5.37	458.27	5%	7%	0.04
PT15	Algarve	0.40	11.38	35.86	1101.23	19%	7%	2.03
PT16	Centro (PT)	0.06	2.05	4.97	241.27	6%	7%	0.16
PT17	Área Metropolitana de Lisboa	0.04	2.92	45.44	3967.45	8%	7%	0.68
PT18	Alentejo	0.08	2.71	1.73	84.32	6%	7%	0.23
PT20	Região Autónoma dos Açores (PT)	0.08	3.11	8.33	432.70	8%	7%	0.39
PT30	Região Autónoma da Madeira (PT)	0.16	5.08	52.03	1933.93	14%	7%	1.20
RO11	Nord-Vest	0.02	0.69	1.16	126.63	3%	1%	-0.72
RO12	Centru	0.03	1.35	1.98	160.67	3%	1%	-0.65
RO21	Nord-Est	0.01	0.42	0.83	124.10	2%	1%	-0.77
RO22	Sud-Est	0.04	0.79	3.20	127.49	3%	1%	-0.64
RO31	Sud - Muntenia	0.01	0.37	0.88	118.26	2%	1%	-0.79
RO32	Bucuresti - Ilfov	0.01	0.97	13.85	2595.11	5%	1%	-0.44
RO41	Sud-Vest Oltenia	0.01	0.40	0.78	94.40	2%	1%	-0.80
RO42	Vest	0.02	0.60	0.94	89.31	2%	1%	-0.75
SE11	Stockholm	0.04	3.46	14.62	1602.68	4%	2%	-0.25

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SE12	**Östra Mellansverige**	0.05	2.09	2.39	137.40	2%	2%	-0.51
SE21	**Småland med öarna**	0.14	3.40	3.65	114.80	3%	2%	-0.29
SE22	**Sydsverige**	0.06	2.51	6.22	384.62	3%	2%	-0.39
SE23	**Västsverige**	0.09	3.31	6.12	300.50	3%	2%	-0.33
SE31	**Norra Mellansverige**	0.13	3.50	1.79	60.46	3%	2%	-0.29
SE32	**Mellersta Norrland**	0.15	4.25	0.82	28.00	4%	2%	-0.17
SE33	**Övre Norrland**	0.15	4.06	0.51	17.33	4%	2%	-0.19
SI03	**Vzhodna Slovenija**	0.05	1.70	4.85	239.34	4%	3%	-0.31
SI04	**Zahodna Slovenija**	0.13	4.42	16.22	684.97	4%	3%	-0.02
SK01	**Bratislavský kraj**	0.05	2.38	15.38	1102.69	4%	3%	-0.28
SK02	**Západné Slovensko**	0.03	0.65	3.50	203.60	4%	3%	-0.50
SK03	**Stredné Slovensko**	0.05	1.48	4.12	205.45	4%	3%	-0.41
SK04	**Východné Slovensko**	0.03	0.93	3.61	200.76	4%	3%	-0.46

Appendix 2: TAIDD CI scores and individual variables (raw data), Full dataset, 2019

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GEO Codes	GEO Labels	BEDS/ POP (2014)	ARRIV/ POP (2014)	BEDS/ AREA (2014)	ARRIV+POP/ AREA (2014)	EMPL% (2014)	TDGDP (2014)	TAIDD CI (2014)
AT11	Burgenland (AT)	0.10	3.06	7.59	308.47	6%	6%	0.27
AT12	Niederösterreich	0.04	1.40	3.62	206.01	4%	6%	-0.07
AT13	Wien	0.04	3.51	177.15	20104.02	7%	6%	2.20
AT21	Kärnten	0.27	4.52	15.81	327.33	6%	6%	0.69
AT22	Steiermark	0.09	2.60	6.61	268.97	6%	6%	0.21
AT31	Oberösterreich	0.05	1.68	5.80	325.64	4%	6%	0.02
AT32	Salzburg	0.32	10.74	24.11	888.67	8%	6%	1.41
AT33	Tirol	0.38	11.96	21.92	748.28	10%	6%	1.69
AT34	Vorarlberg	0.16	4.99	23.04	887.92	6%	6%	0.63
BE10	Brussels	0.03	2.92	236.17	28351.51	5%	2%	2.43
BE21	Prov. Antwerpen	0.02	0.96	15.85	1264.56	3%	2%	-0.43
BE22	Prov. Limburg (BE)	0.05	1.28	17.42	816.46	3%	2%	-0.37
BE23	Prov. Oost-Vlaanderen	0.01	0.64	7.02	812.45	3%	2%	-0.56
BE24	Prov. Vlaams-Brabant	0.02	1.04	9.83	1071.18	3%	2%	-0.47
BE25	Prov. West-Vlaanderen	0.07	2.91	26.36	1462.55	5%	2%	-0.07
BE31	Prov. Brabant wallon	0.01	0.68	3.00	600.62	3%	2%	-0.61
BE32	Prov. Hainaut	0.01	0.35	2.42	475.60	3%	2%	-0.63
BE33	Prov. Liège	0.03	0.83	9.24	522.65	3%	2%	-0.50
BE34	Prov. Luxembourg (BE)	0.16	2.72	10.16	231.98	5%	2%	-0.07
BE35	Prov. Namur	0.05	0.93	6.53	256.74	3%	2%	-0.51
BG31	Severozapaden	0.01	0.32	0.46	56.82	3%	3%	-0.58
BG32	Severen tsentralen	0.01	0.47	0.79	83.79	4%	3%	-0.47
BG33	Severoiztochen	0.10	1.32	6.41	152.06	8%	3%	-0.03
BG34	Yugoiztochen	0.12	1.39	6.54	129.84	7%	3%	-0.06
BG41	Yugozapaden	0.02	0.77	2.20	185.71	5%	3%	-0.37
BG42	Yuzhen tsentralen	0.02	0.64	1.26	107.52	5%	3%	-0.40
CY00	Kypros	0.10	2.76	9.51	350.33	8%	6%	0.48
CZ01	Praha	0.07	4.90	188.89	15132.40	6%	3%	1.75
CZ02	Střední Cechy	0.04	0.61	5.22	196.09	4%	3%	-0.45
CZ03	Jihozápad	0.13	1.44	8.94	172.40	4%	3%	-0.27
CZ04	Severozápad	0.06	1.07	7.55	275.43	5%	3%	-0.34
CZ05	Severovýchod	0.10	1.33	12.11	285.92	3%	3%	-0.34
CZ06	Jihovýchod	0.06	1.16	7.53	264.71	3%	3%	-0.44
CZ07	Střední Morava	0.05	0.89	6.25	253.64	4%	3%	-0.46

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CZ08	Moravskoslezsko	0.03	0.58	6.97	362.22	4%	3%	-0.50
DE11	Stuttgart	0.02	1.35	8.27	886.74	3%	4%	-0.27
DE12	Karlsruhe	0.03	1.69	11.76	1059.58	4%	4%	-0.18
DE13	Freiburg	0.06	2.69	13.96	866.20	5%	4%	0.00
DE14	Tübingen	0.04	1.58	7.53	529.25	3%	4%	-0.27
DE21	Oberbayern	0.05	3.25	14.15	1105.04	5%	4%	0.04
DE22	Niederbayern	0.08	2.27	9.06	379.49	5%	4%	-0.07
DE23	Oberpfalz	0.05	1.65	5.13	295.67	3%	4%	-0.27
DE24	Oberfranken	0.04	1.61	5.59	381.85	4%	4%	-0.24
DE25	Mittelfranken	0.03	2.08	7.80	729.75	3%	4%	-0.21
DE26	Unterfranken	0.04	1.86	6.21	437.12	4%	4%	-0.20
DE27	Schwaben	0.06	2.40	11.04	621.87	4%	4%	-0.08
DE30	Berlin	0.04	3.47	165.15	18061.62	6%	4%	1.80
DE40	Brandenburg	0.05	1.74	4.09	231.54	4%	4%	-0.24
DE50	Bremen	0.02	1.83	35.36	4760.30	4%	4%	0.15
DE60	Hamburg	0.03	3.47	79.13	10983.25	5%	4%	0.92
DE71	Darmstadt	0.03	2.43	16.81	1771.33	4%	4%	-0.02
DE72	Gießen	0.03	1.02	5.30	384.44	3%	4%	-0.36
DE73	Kassel	0.06	2.40	9.25	493.56	4%	4%	-0.09
DE80	Mecklenburg-Vorpommern	0.17	4.44	11.89	384.54	5%	4%	0.27
DE91	Braunschweig	0.04	1.56	7.28	498.94	3%	4%	-0.26
DE92	Hannover	0.03	1.38	6.51	556.14	3%	4%	-0.29
DE93	Lüneburg	0.06	1.76	6.10	299.52	3%	4%	-0.26
DE94	Weser-Ems	0.06	1.77	10.11	454.15	3%	4%	-0.23
DEA1	Düsseldorf	0.02	1.21	16.01	2177.33	4%	4%	-0.17
DEA2	Köln	0.02	1.56	13.39	1520.90	4%	4%	-0.19
DEA3	Münster	0.01	0.70	5.34	635.52	3%	4%	-0.36
DEA4	Detmold	0.02	0.87	6.18	581.12	3%	4%	-0.37
DEA5	Arnsberg	0.02	0.99	9.02	884.92	3%	4%	-0.32
DEB1	Koblenz	0.07	2.20	12.18	588.09	4%	4%	-0.12
DEB2	Trier	0.14	3.77	15.05	505.09	6%	4%	0.22
DEB3	Rheinhessen-Pfalz	0.02	1.32	7.29	682.40	4%	4%	-0.26
DEC0	Saarland	0.02	0.91	8.18	738.59	3%	4%	-0.33
DED2	Dresden	0.05	2.33	9.23	682.82	4%	4%	-0.11
DED4	Chemnitz	0.03	1.09	6.26	472.25	3%	4%	-0.33
DED5	Leipzig	0.03	1.98	6.92	754.62	4%	4%	-0.22
DEE0	Sachsen-Anhalt	0.03	1.31	3.36	256.10	3%	4%	-0.32
DEF0	Schleswig-Holstein	0.09	2.34	16.05	611.32	5%	4%	-0.01
DEG0	Thüringen	0.05	1.60	6.09	347.48	4%	4%	-0.24

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DK01	Hovedstaden	0.04	1.60	31.45	1864.91	4%	2%	-0.20
DK02	Sjælland	0.06	0.67	7.05	192.29	3%	2%	-0.57
DK03	Syddanmark	0.11	1.34	10.77	234.96	4%	2%	-0.35
DK04	Midtjylland	0.06	0.74	6.35	173.90	3%	2%	-0.52
DK05	Nordjylland	0.14	1.40	10.81	180.93	4%	2%	-0.30
EE00	Eesti	0.04	2.35	1.34	101.30	4%	4%	-0.19
EL30	Attiki	0.02	1.00	19.98	2039.35	7%	7%	0.41
EL41	Voreio Aigaio	0.19	2.42	9.87	178.92	10%	7%	0.81
EL42	Notio Aigaio	0.92	12.42	58.59	858.74	26%	7%	3.85
EL43	Kriti	0.35	6.37	26.63	559.89	15%	7%	1.75
EL51	Anatoliki Makedonia, Thraki	0.07	1.20	3.03	95.72	6%	7%	0.30
EL52	Kentriki Makedonia	0.09	1.68	9.22	275.98	8%	7%	0.51
EL53	Dytiki Makedonia	0.03	0.54	0.86	46.41	8%	7%	0.25
EL54	Ipeiros	0.11	1.79	4.00	105.04	9%	7%	0.58
EL61	Thessalia	0.08	1.43	4.14	128.60	6%	7%	0.29
EL62	Ionia Nisia	0.71	8.71	64.55	885.91	17%	7%	2.77
EL63	Dytiki Ellada	0.04	0.92	2.71	118.04	8%	7%	0.34
EL64	Sterea Ellada	0.10	1.17	3.51	78.52	7%	7%	0.37
EL65	Peloponnisos	0.12	2.25	4.52	123.15	9%	7%	0.60
ES11	Galicia	0.05	1.49	4.57	233.13	7%	5%	0.09
ES12	Principado de Asturias	0.08	1.80	7.54	281.04	8%	5%	0.20
ES13	Cantabria	0.13	2.65	14.11	407.72	8%	5%	0.36
ES21	País Vasco	0.02	1.34	7.06	704.30	6%	5%	0.03
ES22	Comunidad Foral de Navarra	0.06	1.91	3.56	179.26	7%	5%	0.08
ES23	La Rioja	0.06	2.25	3.51	203.63	6%	5%	0.07
ES24	Aragón	0.08	2.12	2.13	87.41	6%	5%	0.10
ES30	Comunidad de Madrid	0.02	1.72	18.10	2173.57	5%	5%	0.12
ES41	Castilla y León	0.06	2.08	1.70	81.81	8%	5%	0.17
ES42	Castilla-la Mancha	0.04	1.10	0.98	55.22	7%	5%	-0.03
ES43	Extremadura	0.04	1.36	1.07	63.31	7%	5%	0.04
ES51	Cataluña	0.10	2.83	24.16	889.53	7%	5%	0.41
ES52	Comunitat Valenciana	0.07	1.88	15.09	617.85	9%	5%	0.37
ES53	Illes Balears	0.41	9.06	92.39	2258.19	17%	5%	2.36
ES61	Andalucía	0.06	2.19	5.78	308.11	9%	5%	0.31
ES62	Región de Murcia	0.04	0.92	4.55	248.61	7%	5%	0.05
ES70	Canarias	0.20	5.73	57.68	1918.94	18%	5%	1.68

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FI19	Länsi-Suomi	0.04	1.63	0.93	62.07	3%	2%	-0.52
FI1B	Helsinki-Uusimaa	0.02	2.01	4.09	525.20	4%	2%	-0.43
FI1C	Etelä-Suomi	0.03	1.55	1.28	93.99	3%	2%	-0.53
FI1D	Pohjois- ja Itä-Suomi	0.09	2.49	0.55	22.30	3%	2%	-0.41
FR10	Île de France	0.03	2.94	32.70	3964.55	4%	4%	0.15
FRB0	Centre - Val de Loire	0.05	1.95	3.09	193.51	2%	4%	-0.34
FRC1	Bourgogne	0.05	2.61	2.70	187.85	3%	4%	-0.25
FRC2	Franche-Comté	0.06	1.51	4.17	182.31	3%	4%	-0.33
FRD1	Basse-Normandie	0.08	2.75	6.60	312.95	3%	4%	-0.18
FRD2	Haute-Normandie	0.03	1.37	4.04	359.45	3%	4%	-0.37
FRE1	Nord-Pas-de-Calais	0.02	1.11	6.57	691.53	3%	4%	-0.39
FRE2	Picardie	0.03	1.35	3.16	233.97	4%	4%	-0.33
FRF1	Alsace	0.04	2.51	9.89	795.95	5%	4%	-0.10
FRF2	Champagne-Ardenne	0.03	1.84	1.81	148.64	3%	4%	-0.35
FRF3	Lorraine	0.03	1.39	3.27	237.64	4%	4%	-0.30
FRG0	Pays-de-la-Loire	0.09	1.80	10.47	320.96	3%	4%	-0.20
FRH0	Bretagne	0.12	2.15	13.95	377.40	4%	4%	-0.07
FRI1	Aquitaine	0.15	2.72	12.40	300.76	3%	4%	-0.04
FRI2	Limousin	0.08	1.62	3.69	113.87	3%	4%	-0.25
FRI3	Poitou-Charentes	0.13	2.54	8.84	245.66	4%	4%	-0.07
FRJ1	Languedoc-Roussillon	0.19	3.09	19.29	411.09	6%	4%	0.24
FRJ2	Midi-Pyrénées	0.10	2.09	6.48	202.95	3%	4%	-0.22
FRK1	Auvergne	0.09	2.07	4.87	160.11	5%	4%	-0.11
FRK2	Rhône-Alpes	0.10	2.47	14.27	506.51	3%	4%	-0.10
FRL0	Provence-Alpes-Côte d'Azur	0.13	3.32	20.90	689.13	5%	4%	0.14
FRM0	Corse	0.46	8.05	17.28	338.23	7%	4%	1.05
HR03	Jadranska Hrvatska	0.61	8.05	35.09	519.08	12%	10%	2.33
HR04	Kontinentalna Hrvatska (NUTS 2016)	0.01	0.55	1.07	140.35	3%	10%	0.22
HU10	Közép-Magyarország (NUTS 2013)	0.02	1.37	10.32	1033.51	5%	2%	-0.36
HU21	Közép-Dunántúl	0.06	0.99	5.71	199.30	5%	2%	-0.40
HU22	Nyugat-Dunántúl	0.06	1.57	5.25	225.79	6%	2%	-0.28
HU23	Dél-Dunántúl	0.12	1.15	7.82	143.14	4%	2%	-0.37
HU31	Észak-Magyarország	0.04	0.84	3.64	162.71	3%	2%	-0.55

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HU32	Észak-Alföld	0.03	0.52	2.94	129.99	4%	2%	-0.55
HU33	Dél-Alföld	0.03	0.51	2.14	107.04	4%	2%	-0.55
IE00	Ireland	0.04	2.23	3.00	218.50	7%	2%	-0.18
ITC1	Piemonte	0.04	1.00	7.66	353.02	5%	5%	-0.09
ITC2	Valle d'Aosta/Vallée d'Aoste	0.42	7.67	16.49	343.59	10%	5%	1.32
ITC3	Liguria	0.10	2.55	28.05	1046.40	8%	5%	0.41
ITC4	Lombardia	0.03	1.41	15.04	1044.12	4%	5%	-0.02
ITF1	Abruzzo	0.08	1.06	10.15	253.99	5%	5%	0.00
ITF2	Molise	0.04	0.47	2.63	103.92	5%	5%	-0.15
ITF3	Campania	0.03	0.79	14.15	770.23	6%	5%	0.00
ITF4	Puglia	0.07	0.80	13.96	381.45	6%	5%	0.01
ITF5	Basilicata	0.07	1.00	3.86	115.52	5%	5%	-0.10
ITF6	Calabria	0.09	0.71	12.37	222.85	6%	5%	0.05
ITG1	Sicilia	**0.04**	**0.91**	**8.08**	**378.05**	**5%**	**5%**	**-0.06**
ITG2	Sardegna	**0.12**	**1.44**	**8.69**	**170.38**	**8%**	**5%**	**0.23**
ITH1	Provincia Autonoma di Bolzano/Bozen	0.42	11.90	29.65	903.01	12%	5%	1.82
ITH2	Provincia Autonoma di Trento	0.31	6.52	27.25	655.39	6%	5%	0.89
ITH3	Veneto	0.14	3.30	40.49	1221.38	6%	5%	0.54
ITH4	Friuli-Venezia Giulia	0.12	1.69	18.92	436.42	6%	5%	0.22
ITH5	Emilia-Romagna	0.10	2.07	20.40	617.52	6%	5%	0.21
ITI1	Toscana	0.14	3.30	23.57	707.58	7%	5%	0.48
ITI2	Umbria	0.10	2.59	10.64	387.37	6%	5%	0.17
ITI3	Marche	0.17	1.46	27.52	406.72	7%	5%	0.33
ITI4	Lazio	0.05	1.77	18.47	957.46	6%	5%	0.16
LT00	Lithuania	0.02	0.91	1.16	89.66	3%	2%	-0.67
LU00	Luxembourg	0.12	2.08	25.08	654.51	3%	2%	-0.27
LV00	Latvija	0.02	1.05	0.62	64.78	3%	4%	-0.38
MT00	Malta	0.10	3.62	133.35	6318.80	8%	14%	2.27
NL11	Groningen	0.05	0.98	12.47	488.10	4%	2%	-0.47
NL12	Friesland (NL)	0.17	2.47	31.94	660.69	5%	2%	-0.03
NL13	Drenthe	0.23	3.49	42.97	821.51	3%	2%	0.10
NL21	Overijssel	0.10	1.51	35.14	850.05	3%	2%	-0.26
NL22	Gelderland	0.10	1.67	39.70	1077.26	4%	2%	-0.18
NL23	Flevoland	0.09	1.63	23.71	733.92	4%	2%	-0.31
NL31	Utrecht	0.03	1.07	25.26	1846.74	4%	2%	-0.37
NL32	Noord-Holland	0.07	4.13	71.28	5105.01	5%	2%	0.39

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NL33	Zuid-Holland	0.03	1.22	35.32	2758.45	3%	2%	-0.28
NL34	Zeeland	0.38	6.05	80.83	1488.58	5%	2%	0.83
NL41	Noord-Brabant	0.06	1.37	30.31	1183.94	4%	2%	-0.30
NL42	Limburg (NL)	0.13	3.14	65.12	2148.82	5%	2%	0.21
PL12	Mazowieckie (NUTS 2013)	0.01	0.73	1.36	259.92	2%	2%	-0.71
PL21	Malopolskie	0.03	1.13	5.80	470.03	4%	2%	-0.54
PL22	Slaskie	0.01	0.44	3.70	540.29	2%	2%	-0.72
PL41	Wielkopolskie	0.01	0.51	1.44	176.58	1%	2%	-0.79
PL42	Zachodniopomorskie	0.07	1.33	5.57	180.29	4%	2%	-0.47
PL43	Lubuskie	0.02	0.59	1.32	116.19	2%	2%	-0.73
PL51	Dolnoslaskie	0.02	0.84	3.05	267.35	2%	2%	-0.68
PL52	Opolskie	0.01	0.30	0.85	134.24	2%	2%	-0.77
PL61	Kujawsko-Pomorskie	0.01	0.45	1.53	170.56	2%	2%	-0.77
PL62	Warminsko-Mazurskie	0.03	0.77	1.73	109.89	3%	2%	-0.67
PL63	Pomorskie	0.04	0.97	5.49	252.22	2%	2%	-0.62
PL71	Lódzkie	0.01	0.48	1.28	203.84	2%	2%	-0.78
PL72	Swietokrzyskie	0.01	0.38	1.28	148.71	2%	2%	-0.77
PL81	Lubelskie	0.01	0.36	0.83	116.29	2%	2%	-0.77
PL82	Podkarpackie	0.01	0.42	1.56	167.05	2%	2%	-0.78
PL84	Podlaskie	0.01	0.51	0.64	88.26	2%	2%	-0.77
PT11	Norte	0.02	0.99	3.99	343.26	4%	6%	-0.09
PT15	Algarve	0.32	8.02	28.79	808.78	20%	6%	2.02
PT16	Centro (PT)	0.05	1.26	4.04	183.89	6%	6%	0.06
PT17	Área Metropolitana de Lisboa	0.03	1.92	33.48	2914.93	7%	6%	0.49
PT18	Alentejo	0.06	1.51	1.38	60.02	7%	6%	0.13
PT20	Região Autónoma dos Açores (PT)	0.04	1.44	4.25	262.13	6%	6%	0.05
PT30	Região Autónoma da Madeira (PT)	0.13	3.92	42.20	1609.22	12%	6%	1.04
RO11	Nord-Vest	0.01	0.37	0.84	104.67	3%	1%	-0.76
RO12	Centru	0.03	0.83	1.76	126.56	3%	1%	-0.69
RO21	Nord-Est	0.01	0.25	0.71	111.92	2%	1%	-0.84
RO22	Sud-Est	0.04	0.47	2.99	109.47	2%	1%	-0.74
RO31	Sud - Muntenia	0.01	0.23	0.83	111.92	1%	1%	-0.87
RO32	Bucuresti - Ilfov	0.01	0.71	11.96	2231.03	3%	1%	-0.54
RO41	Sud-Vest Oltenia	0.01	0.24	0.65	87.76	1%	1%	-0.89
RO42	Vest	0.01	0.40	0.83	79.88	2%	1%	-0.78
SE11	Stockholm	0.04	2.94	12.92	1306.09	4%	2%	-0.23

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SE12	**Östra Mellansverige**	0.06	1.81	2.35	117.30	3%	2%	-0.46
SE21	**Småland med öarna**	0.15	2.93	3.65	97.09	3%	2%	-0.25
SE22	**Sydsverige**	0.06	2.04	5.85	311.93	4%	2%	-0.38
SE23	**Västsverige**	0.09	2.96	6.04	260.55	3%	2%	-0.30
SE31	**Norra Mellansverige**	0.14	3.12	1.86	53.72	4%	2%	-0.21
SE32	**Mellersta Norrland**	0.15	3.50	0.77	23.53	4%	2%	-0.19
SE33	**Övre Norrland**	0.16	3.35	0.52	14.61	3%	2%	-0.22
SI03	**Vzhodna Slovenija**	0.04	1.12	3.22	188.28	4%	3%	-0.33
SI04	**Zahodna Slovenija**	0.07	2.33	8.55	411.44	5%	3%	-0.15
SK01	**Bratislavský kraj**	0.04	1.54	13.28	777.41	5%	2%	-0.28
SK02	**Západné Slovensko**	0.02	0.40	2.98	173.71	5%	2%	-0.47
SK03	**Stredné Slovensko**	0.04	0.82	3.44	151.51	4%	2%	-0.47
SK04	**Východné Slovensko**	0.04	0.55	3.61	159.97	6%	2%	-0.40

Appendix 3: TAIDD CI scores and individual variables (raw data), Full dataset, 2014

GEO Codes	GEO Labels	BEDS/ POP (2009)	ARRIV/ POP (2009)	BEDS/ AREA (2009)	ARRIV+POP/ AREA (2009)	EMPL% (2009)	TDGDP (2009)	TAIDD CI (2009)
AT11	Burgenland (AT)	0.10	2.82	7.73	285.98	6%	5%	0.46
AT12	Niederösterreich	0.04	1.32	3.51	196.48	4%	5%	0.02
AT13	Wien	0.03	2.61	143.33	15314.59	7%	5%	2.15
AT21	Kärnten	0.28	4.28	16.46	315.48	8%	5%	1.01
AT22	Steiermark	0.08	2.26	5.80	241.37	6%	5%	0.30
AT31	Oberösterreich	0.05	1.54	5.94	304.86	5%	5%	0.12
AT32	Salzburg	0.32	9.18	23.73	759.54	10%	5%	1.69
AT33	Tirol	0.39	10.74	21.68	659.21	11%	5%	2.00
AT34	Vorarlberg	0.15	4.41	21.86	784.16	7%	5%	0.79
BE10	Brussels	0.03	2.61	197.84	23791.59	6%	2%	2.48
BE21	Prov. Antwerpen	0.02	0.85	15.24	1141.62	3%	2%	-0.42
BE22	Prov. Limburg (BE)	0.05	1.36	19.16	821.38	3%	2%	-0.36
BE23	Prov. Oost-Vlaanderen	0.01	0.48	6.17	709.87	2%	2%	-0.60
BE24	Prov. Vlaams-Brabant	0.02	0.76	9.09	887.86	3%	2%	-0.49
BE25	Prov. West-Vlaanderen	0.07	2.39	27.22	1243.76	4%	2%	-0.09
BE31	Prov. Brabant wallon	0.01	0.56	2.77	535.79	3%	2%	-0.61
BE32	Prov. Hainaut	0.01	0.26	2.36	434.00	2%	2%	-0.69
BE33	Prov. Liège	0.04	0.81	9.96	498.76	4%	2%	-0.45
BE34	Prov. Luxembourg (BE)	0.18	2.87	11.06	231.57	3%	2%	-0.07
BE35	Prov. Namur	0.05	0.90	6.89	243.12	3%	2%	-0.51
BG31	Severozapaden	0.01	0.25	0.47	58.52	5%	3%	-0.41
BG32	Severen tsentralen	0.01	0.36	0.77	82.12	4%	3%	-0.47
BG33	Severoiztochen	0.08	1.08	5.66	139.19	7%	3%	-0.03
BG34	Yugoiztochen	0.10	0.90	5.76	106.04	7%	3%	-0.05
BG41	Yugozapaden	0.02	0.53	1.90	161.00	5%	3%	-0.31
BG42	Yuzhen tsentralen	0.02	0.43	1.24	96.78	5%	3%	-0.38
CY00	Kypros	0.11	2.85	9.64	332.79	8%	5%	0.49
CZ01	Praha	0.07	3.58	183.88	11466.27	5%	3%	1.80
CZ02	Střední Cechy	0.04	0.52	4.77	175.00	4%	3%	-0.40
CZ03	Jihozápad	0.12	1.16	8.43	151.60	4%	3%	-0.20
CZ04	Severozápad	0.05	0.88	7.27	252.17	5%	3%	-0.25
CZ05	Severovýchod	0.10	1.19	11.90	268.36	3%	3%	-0.24
CZ06	Jihovýchod	0.05	0.84	6.06	223.80	3%	3%	-0.38
CZ07	Střední Morava	0.04	0.67	5.19	225.37	3%	3%	-0.40
CZ08	Moravskoslezsko	0.03	0.47	5.95	344.06	3%	3%	-0.45

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DE11	Stuttgart	0.02	1.05	7.75	779.51	3%	4%	-0.23
DE12	Karlsruhe	0.03	1.37	12.19	945.94	4%	4%	-0.12
DE13	Freiburg	0.06	2.23	13.81	766.11	5%	4%	0.08
DE14	Tübingen	0.04	1.31	7.29	480.51	3%	4%	-0.19
DE21	Oberbayern	0.06	2.59	14.07	904.43	4%	4%	0.06
DE22	Niederbayern	0.08	2.00	9.62	348.12	5%	4%	0.07
DE23	Oberpfalz	0.05	1.40	5.24	269.38	4%	4%	-0.15
DE24	Oberfranken	0.04	1.39	5.87	359.24	3%	4%	-0.21
DE25	Mittelfranken	0.03	1.66	7.70	630.26	4%	4%	-0.11
DE26	Unterfranken	0.04	1.53	6.18	394.62	4%	4%	-0.17
DE27	Schwaben	0.06	1.95	11.01	534.02	4%	4%	-0.01
DE30	Berlin	0.03	2.41	127.37	13819.12	6%	4%	1.64
DE40	Brandenburg	0.05	1.42	4.00	210.51	4%	4%	-0.16
DE50	Bremen	0.02	1.38	28.87	4026.28	3%	4%	0.13
DE60	Hamburg	0.02	2.46	60.54	8647.64	5%	4%	0.85
DE71	Darmstadt	0.03	1.90	15.53	1482.03	4%	4%	0.01
DE72	Gießen	0.03	0.91	5.64	372.36	3%	4%	-0.28
DE73	Kassel	0.06	2.13	9.46	466.28	4%	4%	-0.03
DE80	Mecklenburg-Vorpommern	0.16	4.06	11.89	373.36	7%	4%	0.48
DE91	Braunschweig	0.04	1.36	7.68	473.73	4%	4%	-0.13
DE92	Hannover	0.03	1.16	6.21	516.19	3%	4%	-0.26
DE93	Lüneburg	0.06	1.61	6.15	287.50	4%	4%	-0.13
DE94	Weser-Ems	0.06	1.55	10.02	423.77	4%	4%	-0.11
DEA1	Düsseldorf	0.01	0.93	14.98	1935.66	4%	4%	-0.10
DEA2	Köln	0.02	1.17	11.36	1305.62	4%	4%	-0.14
DEA3	Münster	0.01	0.62	5.03	610.24	3%	4%	-0.30
DEA4	Detmold	0.02	0.77	6.43	559.60	3%	4%	-0.29
DEA5	Arnsberg	0.02	0.82	8.59	845.31	3%	4%	-0.25
DEB1	Koblenz	0.07	1.94	12.28	549.31	4%	4%	0.01
DEB2	Trier	0.14	3.61	14.74	484.44	5%	4%	0.34
DEB3	Rheinhessen-Pfalz	0.02	1.14	7.11	634.28	3%	4%	-0.22
DEC0	Saarland	0.02	0.65	7.05	661.10	4%	4%	-0.19
DED2	Dresden	0.04	1.86	8.85	603.69	5%	4%	-0.03
DED4	Chemnitz	0.03	0.97	6.38	461.81	3%	4%	-0.25
DED5	Leipzig	0.03	1.51	6.41	625.28	4%	4%	-0.15
DEE0	Sachsen-Anhalt	0.03	1.11	3.48	247.90	3%	4%	-0.25
DEF0	Schleswig-Holstein	0.09	2.01	15.87	553.56	4%	4%	0.05
DEG0	Thüringen	0.04	1.42	6.16	339.98	4%	4%	-0.16
DK01	Hovedstaden	0.04	1.20	26.31	1498.92	3%	2%	-0.33

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DK02	Sjælland	0.06	0.65	7.14	191.42	3%	2%	-0.57
DK03	Syddanmark	0.10	1.22	10.05	222.14	3%	2%	-0.44
DK04	Midtjylland	0.06	0.66	5.94	162.40	3%	2%	-0.61
DK05	Nordjylland	0.14	1.34	10.38	175.85	3%	2%	-0.34
EE00	Eesti	0.04	1.61	1.14	80.13	3%	3%	-0.29
EL30	Attiki	0.02	0.86	20.52	1962.14	6%	6%	0.34
EL41	Voreio Aigaio	0.19	2.14	9.80	164.70	7%	6%	0.63
EL42	Notio Aigaio	0.85	11.01	53.96	761.67	20%	6%	3.57
EL43	Kriti	0.32	4.22	23.98	388.81	12%	6%	1.48
EL51	Anatoliki Makedonia, Thraki	0.06	1.19	2.57	95.15	6%	6%	0.21
EL52	Kentriki Makedonia	0.09	1.54	9.40	262.55	6%	6%	0.35
EL53	Dytiki Makedonia	0.03	0.80	0.85	55.82	6%	6%	0.12
EL54	Ipeiros	0.09	1.60	3.43	98.98	8%	6%	0.42
EL61	Thessalia	0.07	1.57	3.99	137.25	6%	6%	0.31
EL62	Ionia Nisia	0.66	7.26	60.53	755.35	18%	6%	2.86
EL63	Dytiki Ellada	0.04	1.23	2.62	140.02	6%	6%	0.21
EL64	Sterea Ellada	0.09	1.35	3.37	84.89	7%	6%	0.36
EL65	Peloponnisos	0.11	2.21	4.18	121.90	7%	6%	0.49
ES11	Galicia	0.05	1.39	4.26	224.87	6%	4%	0.06
ES12	Principado de Asturias	0.07	1.68	6.77	272.78	9%	4%	0.33
ES13	Cantabria	0.12	2.78	13.54	419.79	8%	4%	0.49
ES21	País Vasco	0.02	1.07	5.63	626.07	6%	4%	0.02
ES22	Comunidad Foral de Navarra	0.05	1.55	2.94	154.71	6%	4%	0.04
ES23	La Rioja	0.05	2.07	2.95	194.85	5%	4%	0.06
ES24	Aragón	0.07	1.86	1.89	80.98	7%	4%	0.20
ES30	Comunidad de Madrid	0.02	1.49	16.48	1976.01	6%	4%	0.23
ES41	Castilla y León	0.05	2.01	1.48	81.93	7%	4%	0.14
ES42	Castilla-la Mancha	0.03	1.10	0.81	54.85	5%	4%	-0.06
ES43	Extremadura	0.03	1.27	0.92	60.85	6%	4%	0.03
ES51	Cataluña	0.10	2.36	22.94	780.92	7%	4%	0.46
ES52	Comunitat Valenciana	0.06	1.69	13.64	578.23	8%	4%	0.32
ES53	Illes Balears	0.41	7.80	89.19	1893.54	17%	4%	2.54
ES61	Andalucía	0.06	1.96	5.24	280.54	8%	4%	0.28
ES62	Región de Murcia	0.04	0.85	4.50	236.20	5%	4%	-0.05
ES70	Canarias	0.21	4.92	57.05	1614.69	15%	4%	1.67
FI19	Länsi-Suomi	0.03	1.62	0.80	60.73	3%	2%	-0.54

FI1B	Helsinki-Uusimaa	0.02	1.75	3.84	453.66	4%	2%	-0.45
FI1C	Etelä-Suomi	0.03	1.45	1.07	89.54	4%	2%	-0.49
FI1D	Pohjois- ja Itä-Suomi	0.07	2.37	0.47	21.50	4%	2%	-0.36
FR10	Île de France	0.04	2.61	35.09	3546.99	4%	4%	0.32
FRB0	Centre - Val de Loire	0.05	1.73	3.52	176.82	2%	4%	-0.29
FRC1	Bourgogne	0.06	2.39	3.04	176.28	3%	4%	-0.19
FRC2	Franche-Comté	0.06	1.35	4.63	169.07	3%	4%	-0.28
FRD1	Basse-Normandie	0.11	2.37	8.86	279.20	4%	4%	0.02
FRD2	Haute-Normandie	0.04	1.10	5.43	314.78	3%	4%	-0.33
FRE1	Nord-Pas-de-Calais	0.05	0.94	14.89	631.15	3%	4%	-0.26
FRE2	Picardie	0.06	1.06	5.47	202.83	2%	4%	-0.33
FRF1	Alsace	0.05	2.04	11.13	677.59	4%	4%	-0.07
FRF2	Champagne-Ardenne	0.04	1.63	2.02	137.69	4%	4%	-0.23
FRF3	Lorraine	0.04	1.06	4.30	205.78	3%	4%	-0.33
FRG0	Pays-de-la-Loire	0.12	1.51	13.12	275.59	3%	4%	-0.09
FRH0	Bretagne	0.14	1.71	16.04	314.45	3%	4%	-0.03
FRI1	Aquitaine	0.18	2.10	14.28	240.17	3%	4%	0.04
FRI2	Limousin	0.09	1.54	4.01	111.20	3%	4%	-0.24
FRI3	Poitou-Charentes	0.16	2.14	10.80	213.19	3%	4%	-0.04
FRJ1	Languedoc-Roussillon	0.23	2.66	22.32	349.15	4%	4%	0.27
FRJ2	Midi-Pyrénées	0.10	1.96	6.48	186.88	3%	4%	-0.15
FRK1	Auvergne	0.10	1.84	5.30	146.43	4%	4%	-0.10
FRK2	Rhône-Alpes	0.11	1.79	15.01	389.24	4%	4%	-0.02
FRL0	Provence-Alpes-Côte d'Azur	0.15	2.47	22.85	543.63	6%	4%	0.28
FRM0	Corse	0.41	6.57	14.52	266.71	7%	4%	0.55
HR03	Jadranska Hrvatska	0.33	5.09	19.06	351.49	9%	9%	1.78
HR04	Kontinentalna Hrvatska (NUTS 2016)	0.01	0.39	0.85	128.18	4%	9%	0.42
HU10	Közép-Magyarország (NUTS 2013)	0.02	0.91	7.66	824.91	4%	2%	-0.40
HU21	Közép-Dunántúl	0.05	0.67	4.71	172.33	4%	2%	-0.49
HU22	Nyugat-Dunántúl	0.05	1.29	4.26	204.23	6%	2%	-0.31
HU23	Dél-Dunántúl	0.05	0.78	3.66	122.95	4%	2%	-0.44
HU31	Észak-Magyarország	0.03	0.52	2.61	139.80	3%	2%	-0.57
HU32	Észak-Alföld	0.03	0.42	2.28	122.52	4%	2%	-0.58

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HU33	Dél-Alföld	0.02	0.33	1.49	97.65	4%	2%	-0.58
IE00	Ireland	0.05	1.88	3.20	189.66	7%	2%	-0.22
ITC1	Piemonte	0.04	0.89	7.21	326.95	4%	4%	-0.17
ITC2	Valle d'Aosta/Vallée d'Aoste	0.42	7.24	16.49	320.80	8%	4%	1.29
ITC3	Liguria	0.10	2.31	30.02	965.30	7%	4%	0.38
ITC4	Lombardia	0.04	1.20	14.50	909.18	4%	4%	-0.08
ITF1	Abruzzo	0.08	1.03	9.96	244.79	5%	4%	-0.03
ITF2	Molise	0.03	0.58	2.46	112.98	5%	4%	-0.22
ITF3	Campania	0.03	0.75	14.54	738.41	5%	4%	-0.04
ITF4	Puglia	0.06	0.74	11.91	364.26	5%	4%	-0.09
ITF5	Basilicata	0.07	0.80	3.85	104.88	4%	4%	-0.17
ITF6	Calabria	0.10	0.78	13.03	230.53	5%	4%	-0.04
ITG1	Sicilia	**0.04**	**0.82**	**7.29**	**353.78**	**5%**	**4%**	**-0.12**
ITG2	Sardegna	**0.12**	**1.49**	**8.36**	**171.83**	**6%**	**4%**	**0.14**
ITH1	Provincia Autonoma di Bolzano/Bozen	0.44	11.22	29.70	820.07	11%	4%	1.99
ITH2	Provincia Autonoma di Trento	0.32	6.11	26.79	594.57	5%	4%	0.90
ITH3	Veneto	0.14	2.89	40.08	1082.07	6%	4%	0.49
ITH4	Friuli-Venezia Giulia	0.13	1.61	20.69	420.30	5%	4%	0.12
ITH5	Emilia-Romagna	0.10	2.03	19.65	586.87	5%	4%	0.13
ITI1	Toscana	0.14	2.95	22.35	631.46	6%	4%	0.41
ITI2	Umbria	0.10	2.25	10.45	342.96	6%	4%	0.14
ITI3	Marche	0.09	1.32	14.73	379.60	5%	4%	0.04
ITI4	Lazio	0.05	1.90	17.28	922.59	6%	4%	0.12
LT00	Lithuania	0.01	0.39	0.57	70.74	2%	2%	-0.71
LU00	Luxembourg	0.13	1.84	25.54	541.78	3%	2%	-0.19
LV00	Latvija	0.02	0.52	0.51	51.77	3%	4%	-0.46
MT00	Malta	0.10	2.72	127.74	4864.28	8%	12%	2.48
NL11	Groningen	0.05	0.94	11.32	470.84	4%	2%	-0.44
NL12	Friesland (NL)	0.15	2.36	28.85	637.32	4%	2%	-0.07
NL13	Drenthe	0.21	3.05	37.75	742.72	4%	2%	0.10
NL21	Overijssel	0.09	1.38	31.37	795.37	4%	2%	-0.24
NL22	Gelderland	0.09	1.44	34.90	970.86	4%	2%	-0.17
NL23	Flevoland	0.06	1.18	15.99	581.64	4%	2%	-0.39
NL31	Utrecht	0.03	0.89	23.88	1627.10	4%	2%	-0.34
NL32	Noord-Holland	0.06	3.13	61.19	3967.84	4%	2%	0.31
NL33	Zuid-Holland	0.03	1.00	30.62	2413.72	3%	2%	-0.27

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NL34	Zeeland	0.34	4.47	72.82	1155.73	4%	2%	0.72
NL41	Noord-Brabant	0.06	1.16	27.87	1060.44	4%	2%	-0.28
NL42	Limburg (NL)	0.10	2.84	53.84	1996.66	5%	2%	0.25
PL12	Mazowieckie (NUTS 2013)	0.01	0.54	1.16	224.68	2%	2%	-0.74
PL21	Malopolskie	0.02	0.83	4.58	399.72	3%	2%	-0.59
PL22	Slaskie	0.01	0.36	3.23	521.60	2%	2%	-0.76
PL41	Wielkopolskie	0.01	0.43	1.30	164.63	2%	2%	-0.79
PL42	Zachodniopomorskie	0.06	1.05	5.01	158.62	3%	2%	-0.55
PL43	Lubuskie	0.02	0.61	1.69	117.33	2%	2%	-0.73
PL51	Dolnoslaskie	0.02	0.63	2.59	236.67	3%	2%	-0.65
PL52	Opolskie	0.01	0.22	0.84	135.63	2%	2%	-0.81
PL61	Kujawsko-Pomorskie	0.01	0.37	1.48	161.26	2%	2%	-0.77
PL62	Warminsko-Mazurskie	0.03	0.60	1.67	99.21	3%	2%	-0.67
PL63	Pomorskie	0.04	0.73	4.60	216.48	2%	2%	-0.65
PL71	Lódzkie	0.01	0.36	1.00	192.77	2%	2%	-0.81
PL72	Swietokrzyskie	0.01	0.30	0.94	143.20	2%	2%	-0.82
PL81	Lubelskie	0.01	0.30	0.76	113.59	1%	2%	-0.83
PL82	Podkarpackie	0.01	0.31	1.26	156.68	2%	2%	-0.79
PL84	Podlaskie	0.01	0.36	0.57	81.96	2%	2%	-0.81
PT11	Norte	0.02	0.75	3.41	307.46	4%	3%	-0.34
PT15	Algarve	0.28	6.28	25.25	648.98	17%	3%	1.59
PT16	Centro (PT)	0.05	1.09	3.82	174.62	5%	3%	-0.25
PT17	Área Metropolitana de Lisboa	0.03	1.38	30.67	2366.35	8%	3%	0.25
PT18	Alentejo	0.05	1.17	1.11	53.37	7%	3%	-0.13
PT20	Região Autónoma dos Açores (PT)	0.04	1.31	3.89	247.54	6%	3%	-0.15
PT30	Região Autónoma da Madeira (PT)	0.12	3.50	39.85	1492.60	13%	3%	0.96
RO11	Nord-Vest	0.01	0.27	0.82	101.55	2%	1%	-0.87
RO12	Centru	0.02	0.42	1.13	105.95	3%	1%	-0.77
RO21	Nord-Est	0.01	0.18	0.58	119.88	1%	1%	-0.93
RO22	Sud-Est	0.05	0.41	4.00	118.07	2%	1%	-0.77
RO31	Sud - Muntenia	0.01	0.18	0.64	114.35	2%	1%	-0.91
RO32	Bucuresti - Ilfov	0.01	0.44	11.64	1848.86	3%	1%	-0.60
RO41	Sud-Vest Oltenia	0.01	0.16	0.54	91.49	1%	1%	-0.95
RO42	Vest	0.01	0.30	0.72	78.48	2%	1%	-0.88
SE11	Stockholm	0.04	2.53	11.31	1072.95	4%	2%	-0.19

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SE12	**Östra Mellansverige**	0.06	1.71	2.37	108.84	3%	2%	-0.42
SE21	**Småland med öarna**	0.15	2.84	3.65	93.53	3%	2%	-0.20
SE22	**Sydsverige**	0.06	1.93	5.58	288.33	3%	2%	-0.35
SE23	**Västsverige**	0.09	2.66	5.91	232.20	3%	2%	-0.22
SE31	**Norra Mellansverige**	0.14	3.08	1.86	52.82	3%	2%	-0.20
SE32	**Mellersta Norrland**	0.15	3.27	0.77	22.43	4%	2%	-0.09
SE33	**Övre Norrland**	0.15	3.02	0.49	13.42	3%	2%	-0.21
SI03	**Vzhodna Slovenija**	0.03	0.99	2.72	177.00	4%	3%	-0.30
SI04	**Zahodna Slovenija**	0.06	1.87	6.66	343.67	4%	3%	-0.14
SK01	**Bratislavský kraj**	0.04	1.28	10.63	672.19	5%	3%	-0.24
SK02	**Západné Slovensko**	0.02	0.39	2.77	173.01	4%	3%	-0.47
SK03	**Stredné Slovensko**	0.04	0.73	3.15	144.63	4%	3%	-0.43
SK04	**Východné Slovensko**	0.03	0.54	3.34	156.91	5%	3%	-0.36

Appendix 4: TAIDD CI scores and individual variables (raw data), Full dataset, 2009

GEO Codes	GEO Labels	BEDS/POP (2009-2022)	ARRIV/POP (2009-2022)	BEDS/AREA (2009-2022)	ARRIV+POP/ AREA (2009-2022)	EMPL % (2009-2022)	TDGDP (2009-2022)	TAIDD CI (2009-2022)
AT11	Burgenland (AT)	-8.0%	10.7%	-3.2%	13.5%	-2.5%	0.8%	-0.36
AT12	Niederösterreich	0.3%	7.0%	6.3%	10.2%	-0.1%	0.8%	-0.13
AT13	Wien	28.5%	8.1%	47.7%	21.7%	0.1%	0.8%	-0.04
AT21	Kärnten	-10.5%	15.2%	-9.7%	13.3%	-2.1%	0.8%	-0.46
AT22	Steiermark	35.2%	30.2%	40.6%	25.7%	-0.6%	0.8%	-0.13
AT31	Oberösterreich	0.3%	15.2%	7.2%	16.7%	-1.1%	0.8%	-0.19
AT32	Salzburg	4.3%	21.0%	11.4%	27.0%	-1.9%	0.8%	-0.49
AT33	Tirol	-4.6%	14.5%	3.8%	23.2%	-0.7%	0.8%	-0.57
AT34	Vorarlberg	11.4%	14.6%	22.0%	22.4%	-1.3%	0.8%	-0.29
BE10	Brussels	10.3%	-1.3%	26.9%	13.9%	-0.4%	0.1%	-0.22
BE21	Prov. Antwerpen	28.0%	41.1%	39.8%	29.8%	0.8%	0.1%	0.09
BE22	Prov. Limburg (BE)	10.0%	27.8%	17.3%	23.8%	0.9%	0.1%	0.06
BE23	Prov. Oost-Vlaanderen	61.7%	87.3%	76.0%	39.8%	0.4%	0.1%	0.10
BE24	Prov. Vlaams-Brabant	15.0%	30.0%	26.3%	24.0%	-0.1%	0.1%	0.02
BE25	Prov. West-Vlaanderen	0.3%	45.2%	5.1%	38.2%	0.1%	0.1%	-0.01
BE31	Prov. Brabant wallon	28.9%	28.8%	40.9%	20.7%	-0.4%	0.1%	0.01
BE32	Prov. Hainaut	47.0%	79.8%	52.7%	21.2%	1.5%	0.1%	0.15
BE33	Prov. Liège	-16.9%	33.7%	-12.5%	21.1%	-0.6%	0.1%	-0.05
BE34	Prov. Luxembourg (BE)	-13.6%	36.3%	-4.8%	39.9%	1.5%	0.1%	0.01
BE35	Prov. Namur	-10.7%	33.1%	-4.1%	24.2%	1.1%	0.1%	0.07
BG31	Severozapaden	33.3%	80.7%	6.3%	-7.4%	-1.6%	0.0%	-0.14
BG32	Severen tsentralen	33.3%	63.5%	13.1%	-0.9%	-0.7%	0.0%	-0.07
BG33	Severoiztochen	21.4%	47.1%	13.7%	16.4%	0.1%	0.0%	-0.08
BG34	Yugoiztochen	43.8%	129.0%	32.7%	48.7%	-1.4%	0.0%	-0.08
BG41	Yugozapaden	31.6%	77.8%	28.0%	23.4%	-0.5%	0.0%	-0.08
BG42	Yuzhen tsentralen	56.8%	133.9%	45.3%	29.8%	-0.5%	0.0%	-0.05
CY00	Kypros	-12.3%	9.6%	-0.4%	21.6%	0.4%	3.6%	0.06
CZ01	Praha	9.4%	31.1%	14.9%	30.6%	-1.2%	-0.4%	-0.25
CZ02	Střední Čechy	8.6%	59.2%	22.4%	35.7%	-0.1%	-0.4%	-0.07
CZ03	Jihozápad	12.4%	63.4%	13.6%	35.5%	-0.9%	-0.4%	-0.11
CZ04	Severozápad	35.2%	81.9%	28.9%	32.0%	-0.7%	-0.4%	-0.09
CZ05	Severovýchod	9.5%	74.1%	8.8%	39.3%	-0.9%	-0.4%	-0.11
CZ06	Jihovýchod	28.1%	85.6%	29.8%	40.9%	-1.0%	-0.4%	-0.08
CZ07	Střední Morava	46.5%	90.2%	42.3%	32.3%	-0.5%	-0.4%	-0.05
CZ08	Moravskoslezsko	35.6%	78.9%	28.5%	18.8%	0.0%	-0.4%	-0.04

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DE11	Stuttgart	20.3%	14.9%	24.6%	11.5%	-0.9%	0.2%	-0.12
DE12	Karlsruhe	-5.5%	14.6%	-3.0%	11.3%	-0.1%	0.2%	-0.12
DE13	Freiburg	4.3%	32.1%	8.6%	27.1%	-1.0%	0.2%	-0.17
DE14	Tübingen	16.0%	36.6%	20.4%	25.3%	-0.6%	0.2%	-0.10
DE21	Oberbayern	6.3%	25.9%	16.0%	29.5%	-0.1%	0.2%	-0.11
DE22	Niederbayern	-22.0%	8.9%	-18.0%	11.4%	-1.0%	0.2%	-0.24
DE23	Oberpfalz	-7.8%	17.8%	-5.0%	13.7%	-1.2%	0.2%	-0.17
DE24	Oberfranken	7.0%	27.4%	5.0%	13.7%	-0.5%	0.2%	-0.10
DE25	Mittelfranken	17.9%	27.3%	22.4%	21.5%	-1.2%	0.2%	-0.15
DE26	Unterfranken	9.2%	19.8%	8.6%	11.4%	-0.6%	0.2%	-0.12
DE27	Schwaben	-1.2%	35.9%	6.1%	32.8%	-1.4%	0.2%	-0.18
DE30	Berlin	25.0%	17.6%	33.9%	20.5%	-1.5%	0.2%	-0.19
DE40	Brandenburg	9.0%	29.1%	9.7%	17.8%	-1.4%	0.2%	-0.16
DE50	Bremen	44.7%	40.3%	47.9%	26.1%	1.2%	0.2%	0.06
DE60	Hamburg	75.3%	49.2%	83.4%	41.2%	-1.5%	0.2%	0.10
DE71	Darmstadt	14.1%	12.1%	21.4%	14.8%	-0.4%	0.2%	-0.13
DE72	Gießen	-10.3%	7.5%	-10.1%	3.8%	-0.6%	0.2%	-0.12
DE73	Kassel	-3.2%	7.0%	-4.3%	3.6%	-1.0%	0.2%	-0.20
DE80	Mecklenburg-Vorpommern	18.3%	10.1%	14.5%	4.7%	-2.5%	0.2%	-0.34
DE91	Braunschweig	0.2%	14.1%	-1.8%	6.0%	-1.4%	0.2%	-0.19
DE92	Hannover	13.5%	16.4%	13.5%	8.8%	0.5%	0.2%	-0.04
DE93	Lüneburg	-1.1%	13.3%	1.0%	10.4%	0.2%	0.2%	-0.10
DE94	Weser-Ems	5.6%	19.7%	8.9%	15.4%	-0.8%	0.2%	-0.14
DEA1	Düsseldorf	22.3%	22.1%	22.5%	10.8%	-0.6%	0.2%	-0.12
DEA2	Köln	20.8%	22.6%	23.2%	14.4%	-0.6%	0.2%	-0.11
DEA3	Münster	16.6%	18.3%	17.7%	8.1%	-0.8%	0.2%	-0.11
DEA4	Detmold	-10.2%	2.8%	-9.9%	1.6%	-1.0%	0.2%	-0.14
DEA5	Arnsberg	8.0%	19.7%	4.0%	4.9%	-0.6%	0.2%	-0.11
DEB1	Koblenz	-10.5%	0.0%	-10.3%	0.2%	-1.4%	0.2%	-0.25
DEB2	Trier	-13.5%	6.4%	-9.8%	9.4%	-0.4%	0.2%	-0.27
DEB3	Rheinhessen-Pfalz	9.6%	13.0%	12.4%	9.7%	0.1%	0.2%	-0.08
DEC0	Saarland	38.1%	55.8%	31.7%	16.2%	-1.4%	0.2%	-0.31
DED2	Dresden	5.3%	12.6%	1.7%	4.6%	-0.6%	0.2%	-0.17
DED4	Chemnitz	-3.1%	5.0%	-11.2%	-6.0%	-0.6%	0.2%	-0.13
DED5	Leipzig	25.1%	34.7%	36.4%	31.8%	-0.4%	0.2%	-0.08
DEE0	Sachsen-Anhalt	14.3%	27.9%	4.1%	4.4%	-0.5%	0.2%	-0.10
DEF0	Schleswig-Holstein	27.9%	48.0%	31.8%	36.1%	-0.5%	0.2%	-0.07
DEG0	Thüringen	13.7%	8.6%	5.8%	-2.3%	-0.8%	0.2%	-0.15
DK01	Hovedstaden	36.0%	84.1%	52.8%	63.8%	1.1%	0.4%	0.24

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DK02	Sjælland	-2.0%	16.2%	0.7%	9.3%	0.3%	0.4%	0.07
DK03	Syddanmark	9.5%	43.0%	12.1%	26.6%	0.7%	0.4%	0.11
DK04	Midtjylland	4.3%	47.5%	12.2%	27.9%	0.9%	0.4%	0.13
DK05	Nordjylland	0.3%	28.4%	2.2%	18.5%	-0.5%	0.4%	0.00
EE00	Eesti	25.6%	51.9%	26.3%	32.7%	-0.1%	0.3%	-0.01
EL30	Attiki	7.9%	42.5%	2.7%	13.9%	0.8%	2.8%	0.08
EL41	Voreio Aigaio	-5.5%	18.2%	-7.5%	10.0%	6.3%	2.8%	0.30
EL42	Notio Aigaio	9.8%	99.1%	8.4%	88.4%	4.2%	2.8%	0.31
EL43	Kriti	21.7%	124.2%	22.8%	102.2%	2.0%	2.8%	0.29
EL51	Anatoliki Makedonia, Thraki	30.2%	26.5%	20.0%	5.4%	2.5%	2.8%	0.20
EL52	Kentriki Makedonia	7.2%	41.5%	0.3%	17.1%	2.5%	2.8%	0.18
EL53	Dytiki Makedonia	5.8%	-30.4%	-6.3%	-23.4%	-0.2%	2.8%	0.01
EL54	Ipeiros	22.5%	81.5%	13.3%	38.9%	2.8%	2.8%	0.23
EL61	Thessalia	-0.2%	16.8%	-8.2%	1.5%	2.6%	2.8%	0.15
EL62	Ionia Nisia	18.3%	88.0%	16.0%	73.9%	11.9%	2.8%	0.72
EL63	Dytiki Ellada	4.9%	-5.0%	-2.1%	-9.2%	1.5%	2.8%	0.10
EL64	Sterea Ellada	-3.6%	31.5%	-12.2%	7.4%	1.3%	2.8%	0.08
EL65	Peloponnisos	16.4%	40.9%	6.6%	17.5%	2.8%	2.8%	0.19
ES11	Galicia	27.4%	76.5%	23.9%	40.5%	0.3%	1.2%	0.02
ES12	Principado de Asturias	26.8%	44.1%	18.6%	19.3%	-1.7%	1.2%	-0.17
ES13	Cantabria	10.5%	26.3%	10.4%	19.3%	1.4%	1.2%	-0.04
ES21	País Vasco	58.7%	78.8%	58.9%	40.9%	-0.3%	1.2%	0.00
ES22	Comunidad Foral de Navarra	39.0%	74.8%	46.0%	52.9%	0.7%	1.2%	0.06
ES23	La Rioja	38.1%	17.6%	36.4%	10.5%	-0.5%	1.2%	-0.07
ES24	Aragón	29.9%	48.9%	27.2%	29.0%	-1.4%	1.2%	-0.11
ES30	Comunidad de Madrid	17.7%	25.2%	25.9%	23.1%	-0.2%	1.2%	-0.06
ES41	Castilla y León	35.9%	33.1%	26.7%	13.8%	0.3%	1.2%	-0.03
ES42	Castilla-la Mancha	33.3%	25.2%	32.2%	12.3%	0.8%	1.2%	0.02
ES43	Extremadura	32.2%	39.3%	27.2%	17.4%	-1.1%	1.2%	-0.10
ES51	Cataluña	5.4%	36.9%	9.0%	30.2%	0.0%	1.2%	-0.10
ES52	Comunitat Valenciana	28.7%	44.9%	31.1%	30.5%	0.8%	1.2%	0.00
ES53	Illes Balears	-8.8%	33.8%	4.3%	48.6%	1.2%	1.2%	-0.40
ES61	Andalucía	21.8%	36.5%	26.3%	28.8%	1.2%	1.2%	0.00
ES62	Región de Murcia	-0.8%	29.8%	4.8%	20.1%	1.3%	1.2%	0.04
ES70	Canarias	-8.3%	20.2%	1.9%	29.9%	3.9%	1.2%	-0.16
FI19	Länsi-Suomi	17.6%	13.6%	20.5%	11.1%	1.1%	0.0%	0.07
FI1B	Helsinki-Uusimaa	17.0%	14.4%	33.6%	24.7%	0.0%	0.0%	-0.01

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FI1C	Etelä-Suomi	17.2%	10.8%	16.7%	5.9%	0.5%	0.0%	0.02
FI1D	Pohjois- ja Itä-Suomi	13.6%	15.8%	11.4%	9.0%	-0.1%	0.0%	-0.03
FR10	Île de France	-7.8%	9.5%	-3.1%	12.4%	0.1%	0.1%	-0.19
FRB0	Centre - Val de Loire	-12.7%	25.1%	-11.5%	17.4%	1.7%	0.1%	0.02
FRC1	Bourgogne	-10.1%	16.3%	-11.6%	9.6%	0.1%	0.1%	-0.09
FRC2	Franche-Comté	-17.0%	19.9%	-16.5%	12.2%	0.6%	0.1%	-0.05
FRD1	Basse-Normandie	-21.3%	31.9%	-21.5%	22.2%	-0.6%	0.1%	-0.18
FRD2	Haute-Normandie	-20.8%	31.9%	-20.0%	17.9%	0.5%	0.1%	-0.04
FRE1	Nord-Pas-de-Calais	-53.8%	19.2%	-53.4%	10.1%	1.1%	0.1%	-0.08
FRE2	Picardie	-38.4%	32.6%	-38.1%	17.4%	1.3%	0.1%	-0.01
FRF1	Alsace	-9.6%	30.7%	-5.3%	26.3%	-0.8%	0.1%	-0.15
FRF2	Champagne-Ardenne	-3.4%	18.4%	-5.2%	9.3%	-1.3%	0.1%	-0.16
FRF3	Lorraine	-22.7%	38.3%	-23.7%	18.1%	1.2%	0.1%	0.00
FRG0	Pays-de-la-Loire	-27.6%	41.6%	-20.6%	37.1%	-0.3%	0.1%	-0.15
FRH0	Bretagne	-21.2%	51.2%	-15.3%	42.2%	1.2%	0.1%	-0.06
FRI1	Aquitaine	-19.9%	46.0%	-11.7%	44.6%	1.9%	0.1%	-0.03
FRI2	Limousin	-15.6%	15.7%	-17.7%	6.7%	1.0%	0.1%	-0.05
FRI3	Poitou-Charentes	-21.6%	42.9%	-18.5%	34.3%	0.8%	0.1%	-0.09
FRJ1	Languedoc-Roussillon	-22.3%	29.5%	-13.2%	35.7%	2.0%	0.1%	-0.11
FRJ2	Midi-Pyrénées	-15.2%	7.5%	-6.9%	15.2%	0.7%	0.1%	-0.09
FRK1	Auvergne	-14.5%	28.9%	-12.7%	21.1%	0.2%	0.1%	-0.10
FRK2	Rhône-Alpes	-14.9%	51.4%	-6.5%	46.1%	0.3%	0.1%	-0.09
FRL0	Provence-Alpes-Côte d'Azur	-20.3%	42.2%	-16.2%	36.7%	-0.5%	0.1%	-0.22
FRM0	Corse	12.7%	38.1%	28.6%	51.9%	0.5%	0.1%	0.40
HR03	Jadranska Hrvatska	148.1%	136.4%	127.3%	96.0%	2.0%	2.8%	0.85
HR04	Kontinentalna Hrvatska (NUTS 2016)	176.7%	117.4%	145.3%	17.8%	-0.1%	2.8%	-0.05
HU10	Közép-Magyarország (NUTS 2013)	58.5%	39.1%	64.3%	23.0%	-0.6%	0.3%	0.02
HU21	Közép-Dunántúl	28.0%	93.5%	22.6%	31.7%	-0.3%	0.3%	0.05
HU22	Nyugat-Dunántúl	7.4%	53.2%	7.3%	29.8%	0.6%	0.3%	0.05
HU23	Dél-Dunántúl	29.4%	72.3%	17.3%	19.4%	-0.2%	0.3%	0.04
HU31	Észak-Magyarország	24.4%	100.4%	12.1%	21.0%	0.1%	0.3%	0.08
HU32	Észak-Alföld	4.1%	51.0%	-1.3%	9.1%	-0.2%	0.3%	0.03
HU33	Dél-Alföld	34.2%	118.4%	22.9%	18.7%	-0.2%	0.3%	0.05

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IE00	Ireland	-10.1%	4.3%	0.6%	15.1%	0.0%	0.2%	-0.07
ITC1	Piemonte	13.8%	38.9%	11.2%	15.6%	0.6%	1.8%	0.11
ITC2	Valle d'Aosta/Vallée d'Aoste	10.7%	33.8%	8.1%	26.6%	3.1%	1.8%	0.09
ITC3	Liguria	-0.8%	39.8%	-5.0%	22.3%	1.3%	1.8%	0.05
ITC4	Lombardia	17.8%	24.3%	22.7%	18.0%	0.7%	1.8%	0.11
ITF1	Abruzzo	12.4%	22.3%	9.8%	8.7%	0.9%	1.8%	0.10
ITF2	Molise	14.5%	-21.3%	5.5%	-15.1%	1.0%	1.8%	0.11
ITF3	Campania	20.4%	22.4%	17.8%	7.2%	1.0%	1.8%	0.11
ITF4	Puglia	41.5%	50.0%	37.3%	17.6%	2.1%	1.8%	0.22
ITF5	Basilicata	4.7%	72.0%	-2.9%	22.4%	1.4%	1.8%	0.16
ITF6	Calabria	-0.3%	5.9%	-6.1%	-3.4%	1.6%	1.8%	0.11
ITG1	Sicilia	18.7%	23.1%	14.9%	6.9%	1.4%	1.8%	0.13
ITG2	Sardegna	15.4%	44.3%	11.1%	21.8%	2.3%	1.8%	0.18
ITH1	Provincia Autonoma di Bolzano	1.6%	32.7%	9.5%	40.0%	2.1%	1.8%	-0.12
ITH2	Provincia Autonoma di Trento	-3.2%	35.7%	1.7%	37.3%	2.3%	1.8%	0.05
ITH3	Veneto	6.1%	29.6%	6.6%	22.5%	-0.2%	1.8%	-0.03
ITH4	Friuli-Venezia Giulia	2.4%	35.7%	0.2%	19.3%	2.1%	1.8%	0.14
ITH5	Emilia-Romagna	0.5%	18.8%	4.0%	16.5%	0.5%	1.8%	0.03
ITI1	Toscana	13.3%	19.8%	14.0%	15.5%	0.9%	1.8%	0.03
ITI2	Umbria	0.6%	16.8%	-1.3%	9.5%	1.1%	1.8%	0.05
ITI3	Marche	34.8%	24.8%	30.5%	10.5%	1.8%	1.8%	0.18
ITI4	Lazio	39.7%	-16.1%	47.8%	-5.3%	1.0%	1.8%	0.07
LT00	Lietuva (NUTS 2013)	248.3%	247.8%	207.0%	49.6%	0.3%	-0.2%	0.13
LU00	Luxembourg	-32.4%	-1.6%	-11.6%	29.4%	0.3%	-0.4%	-0.16
LV00	Latvija	73.4%	124.8%	50.3%	23.5%	0.4%	0.8%	0.09
MT00	Malta	0.3%	28.2%	27.5%	53.4%	-1.5%	3.6%	-0.27
NL11	Groningen	0.8%	27.0%	3.6%	16.2%	0.1%	0.1%	0.01
NL12	Friesland (NL)	6.7%	31.1%	8.1%	23.5%	0.8%	0.1%	0.02
NL13	Drenthe	-0.4%	33.7%	1.2%	27.4%	1.4%	0.1%	0.01
NL21	Overijssel	8.8%	53.0%	13.3%	36.1%	0.9%	0.1%	0.08
NL22	Gelderland	8.1%	46.5%	14.6%	35.1%	0.5%	0.1%	0.04
NL23	Flevoland	31.3%	45.4%	48.8%	41.2%	-0.1%	0.1%	0.07
NL31	Utrecht	12.4%	65.2%	27.2%	47.8%	-0.3%	0.1%	0.05
NL32	Noord-Holland	30.7%	40.7%	43.8%	43.9%	0.8%	0.1%	0.17
NL33	Zuid-Holland	15.6%	46.4%	24.6%	32.8%	0.7%	0.1%	0.09

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NL34	Zeeland	10.5%	71.9%	12.2%	61.1%	1.8%	0.1%	0.14
NL41	Noord-Brabant	0.2%	55.1%	6.7%	38.0%	0.7%	0.1%	0.05
NL42	Limburg (NL)	11.6%	32.9%	11.2%	23.8%	0.2%	0.1%	-0.05
PL12	Mazowieckie (NUTS 2013)	48.3%	101.0%	56.1%	42.6%	0.1%	0.2%	0.11
PL21	Malopolskie	38.8%	86.4%	42.2%	42.6%	-0.4%	0.2%	0.07
PL22	Slaskie	27.9%	65.7%	21.5%	11.7%	0.5%	0.2%	0.11
PL41	Wielkopolskie	2.2%	27.5%	4.4%	10.6%	0.2%	0.2%	0.09
PL42	Zachodniopomorskie	34.1%	88.3%	30.9%	41.7%	0.8%	0.2%	0.16
PL43	Lubuskie	-26.0%	6.1%	-27.5%	0.3%	0.4%	0.2%	0.07
PL51	Dolnoslaskie	43.3%	109.4%	41.7%	40.6%	0.1%	0.2%	0.11
PL52	Opolskie	-2.6%	62.8%	-12.5%	0.1%	0.5%	0.2%	-0.02
PL61	Kujawsko-Pomorskie	21.6%	82.4%	19.2%	19.9%	0.4%	0.2%	0.11
PL62	Warminsko-Mazurskie	5.8%	46.4%	2.4%	13.5%	-0.6%	0.2%	0.03
PL63	Pomorskie	30.4%	95.5%	36.2%	46.4%	0.3%	0.2%	0.12
PL71	Lódzkie	21.0%	40.2%	13.3%	3.6%	0.8%	0.2%	0.13
PL72	Swietokrzyskie	69.7%	72.2%	58.5%	8.9%	1.0%	0.2%	0.01
PL81	Lubelskie	42.7%	88.3%	34.6%	13.5%	0.4%	0.2%	0.13
PL82	Podkarpackie	51.7%	89.3%	48.1%	18.1%	0.6%	0.2%	0.13
PL84	Podlaskie	26.3%	37.4%	19.5%	4.0%	0.2%	0.2%	-0.01
PT11	Norte	71.9%	134.9%	66.1%	52.5%	-0.1%	4.2%	0.41
PT15	Algarve	29.4%	64.2%	37.0%	64.4%	-0.9%	4.2%	0.22
PT16	Centro (PT)	34.2%	78.5%	28.1%	34.5%	0.2%	4.2%	0.38
PT17	Área Metropolitana de Lisboa	65.2%	94.2%	69.7%	59.0%	-1.7%	4.2%	0.36
PT18	Alentejo	67.1%	120.5%	54.2%	52.1%	-1.7%	4.2%	0.29
PT20	Região Autónoma dos Açores	148.0%	158.1%	137.8%	81.9%	1.7%	4.2%	0.59
PT30	Região Autónoma da Madeira	46.1%	78.9%	38.4%	52.9%	2.2%	4.2%	0.49
RO11	Nord-Vest	91.4%	152.4%	77.5%	22.7%	0.7%	0.2%	0.18
RO12	Centru	126.1%	202.5%	103.5%	44.3%	-0.5%	0.2%	0.12
RO21	Nord-Est	99.0%	147.1%	72.5%	5.8%	1.2%	0.2%	0.20
RO22	Sud-Est	14.6%	93.6%	-3.9%	6.6%	0.8%	0.2%	0.15
RO31	Sud - Muntenia	67.7%	94.1%	46.0%	-0.4%	0.5%	0.2%	0.15
RO32	Bucuresti - Ilfov	38.0%	84.0%	38.9%	26.5%	0.5%	0.2%	0.14
RO41	Sud-Vest Oltenia	89.6%	160.3%	57.0%	1.3%	0.5%	0.2%	0.16
RO42	Vest	58.9%	67.3%	37.8%	0.2%	0.3%	0.2%	0.13
SE11	Stockholm	12.0%	22.5%	36.6%	41.6%	-0.7%	0.1%	-0.06

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SE12	Östra Mellansverige	-10.8%	23.1%	1.2%	29.9%	0.0%	0.1%	-0.03
SE21	Småland med öarna	-9.3%	24.0%	-1.4%	28.1%	-0.2%	0.1%	-0.08
SE22	Sydsverige	1.8%	28.0%	16.2%	35.3%	-0.1%	0.1%	-0.02
SE23	Västsverige	-5.5%	28.8%	6.4%	36.2%	-0.5%	0.1%	-0.08
SE31	Norra Mellansverige	-8.1%	10.8%	-4.3%	12.6%	1.3%	0.1%	-0.02
SE32	Mellersta Norrland	-0.8%	30.1%	0.8%	25.1%	-0.5%	0.1%	-0.09
SE33	Övre Norrland	4.0%	29.9%	7.4%	26.5%	0.5%	0.1%	-0.01
SI03	Vzhodna Slovenija	80.0%	65.4%	81.4%	33.6%	-0.3%	0.2%	0.00
SI04	Zahodna Slovenija	131.0%	116.2%	147.4%	88.2%	-0.4%	0.2%	0.14
SK01	Bratislavský kraj	22.6%	16.2%	49.1%	32.7%	-1.4%	0.1%	-0.10
SK02	Západné Slovensko	17.7%	18.7%	15.6%	3.4%	-1.4%	0.1%	-0.09
SK03	Stredné Slovensko	32.8%	63.6%	28.9%	23.2%	-0.6%	0.1%	-0.02
SK04	Východné Slovensko	1.8%	39.9%	1.5%	13.7%	-0.9%	0.1%	-0.09

Appendix 5: Changes in TAIDD CI scores and individual variables (raw data), Full dataset, 2009-2022

GEO Codes	GEO Labels	BEDS/POP (2019-2022)	ARRIV/POP (2019-2022)	BEDS/AREA (2019-2022)	ARRIV+POP/AREA (2019-2022)	EMPL % (2019-2022)	TDGDP (2019-2022)	TAIDDCI (2019-2022)
AT11	Burgenland (AT)	1.8%	-9.1%	3.2%	-5.7%	-1.2%	0.4%	-0.04
AT12	Niederösterreich	2.1%	-20.1%	3.4%	-11.7%	-0.6%	0.4%	-0.01
AT13	Wien	3.9%	-30.5%	5.8%	-23.1%	-0.3%	0.4%	-0.07
AT21	Kärnten	-1.3%	-5.6%	-0.7%	-4.1%	-1.1%	0.4%	-0.03
AT22	Steiermark	2.1%	-5.3%	2.9%	-3.2%	-0.4%	0.4%	0.02
AT31	Oberösterreich	5.1%	-12.9%	6.8%	-7.2%	-0.8%	0.4%	-0.01
AT32	Salzburg	-0.8%	-14.4%	0.5%	-12.2%	-1.2%	0.4%	-0.10
AT33	Tirol	0.8%	-11.7%	2.1%	-9.8%	-0.3%	0.4%	-0.02
AT34	Vorarlberg	5.4%	-7.2%	7.4%	-4.3%	-1.0%	0.4%	0.00
BE10	Brussels	-1.7%	-20.2%	-0.6%	-14.5%	-0.5%	0.1%	-0.01
BE21	Prov. Antwerpen	8.6%	3.4%	10.4%	3.5%	-0.5%	0.1%	0.03
BE22	Prov. Limburg (BE)	15.0%	7.0%	16.7%	5.9%	0.5%	0.1%	0.10
BE23	Prov. Oost-Vlaanderen	22.9%	10.4%	25.3%	6.7%	-0.1%	0.1%	0.05
BE24	Prov. Vlaams-Brabant	4.0%	-16.7%	6.5%	-6.8%	-0.1%	0.1%	0.02
BE25	Prov. West-Vlaanderen	4.0%	-2.7%	5.2%	-1.0%	-0.1%	0.1%	0.04
BE31	Prov. Brabant wallon	14.7%	-4.8%	16.5%	-0.6%	-1.4%	0.1%	-0.05
BE32	Prov. Hainaut	0.8%	3.2%	1.5%	1.7%	0.1%	0.1%	0.04
BE33	Prov. Liège	5.5%	5.1%	6.0%	3.1%	-0.7%	0.1%	0.00
BE34	Prov. Luxembourg (BE)	-4.0%	7.1%	-1.4%	8.4%	0.7%	0.1%	0.09
BE35	Prov. Namur	0.0%	2.6%	1.3%	2.7%	0.8%	0.1%	0.07
BG31	Severozapaden	21.4%	18.4%	14.9%	-0.5%	-1.2%	0.1%	-0.04
BG32	Severen tsentralen	3.5%	-12.1%	-0.9%	-8.9%	-1.0%	0.1%	-0.04
BG33	Severoiztochen	-8.1%	-17.6%	-9.7%	-13.1%	-1.3%	0.1%	-0.07
BG34	Yugoiztochen	8.4%	1.7%	6.1%	-1.0%	-1.7%	0.1%	-0.05
BG41	Yugozapaden	16.2%	-11.6%	14.4%	-7.4%	-1.0%	0.1%	-0.03
BG42	Yuzhen tsentralen	24.4%	11.0%	22.7%	3.8%	-1.1%	0.1%	-0.02
CY00	Kypros	-5.0%	-15.7%	-1.9%	-9.5%	-1.4%	0.5%	-0.07
CZ01	Praha	6.7%	-23.7%	4.0%	-22.4%	-1.8%	0.0%	-0.17
CZ02	Střední Cechy	7.3%	-2.5%	8.7%	0.1%	-0.3%	0.0%	0.01
CZ03	Jihozápad	4.0%	-12.6%	3.0%	-9.4%	-0.2%	0.0%	0.00
CZ04	Severozápad	11.1%	-3.2%	7.8%	-4.9%	-0.5%	0.0%	0.00
CZ05	Severovýchod	6.3%	6.3%	5.0%	2.8%	-0.7%	0.0%	0.00
CZ06	Jihovýchod	6.4%	-3.5%	5.9%	-2.6%	-0.8%	0.0%	-0.02
CZ07	Střední Morava	11.6%	-1.2%	9.8%	-2.3%	0.4%	0.0%	0.06
CZ08	Moravskoslezsko	3.2%	-0.1%	1.0%	-2.2%	-1.0%	0.0%	-0.03

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DE11	Stuttgart	4.2%	-21.6%	4.3%	-12.9%	-0.9%	0.1%	-0.05
DE12	Karlsruhe	-3.5%	-17.5%	-3.3%	-11.2%	-0.4%	0.1%	-0.02
DE13	Freiburg	1.1%	-6.4%	2.0%	-4.0%	-0.1%	0.1%	0.01
DE14	Tübingen	1.7%	-8.7%	2.7%	-4.8%	-1.3%	0.1%	-0.05
DE21	Oberbayern	2.8%	-17.0%	3.7%	-12.8%	-0.4%	0.1%	-0.03
DE22	Niederbayern	-5.4%	-15.6%	-4.2%	-10.2%	0.2%	0.1%	0.01
DE23	Oberpfalz	-2.4%	-11.6%	-1.8%	-6.9%	-0.2%	0.1%	-0.01
DE24	Oberfranken	7.5%	-9.0%	6.9%	-6.5%	-1.9%	0.1%	-0.09
DE25	Mittelfranken	10.0%	-12.2%	10.4%	-8.3%	-0.4%	0.1%	-0.01
DE26	Unterfranken	2.6%	-14.2%	2.9%	-9.4%	-0.5%	0.1%	-0.02
DE27	Schwaben	-1.8%	-12.5%	-0.2%	-8.0%	-1.1%	0.1%	-0.06
DE30	Berlin	-7.0%	-26.0%	-6.2%	-19.9%	-1.7%	0.1%	-0.22
DE40	Brandenburg	3.5%	-9.6%	4.6%	-5.5%	-0.8%	0.1%	-0.03
DE50	Bremen	-0.7%	-12.4%	-1.6%	-9.4%	0.1%	0.1%	0.03
DE60	Hamburg	7.6%	-11.1%	8.3%	-8.3%	-1.6%	0.1%	0.01
DE71	Darmstadt	-0.1%	-23.2%	0.6%	-16.5%	-0.7%	0.1%	-0.05
DE72	Gießen	-8.2%	-13.0%	-7.9%	-6.6%	-0.9%	0.1%	-0.04
DE73	Kassel	-3.4%	-13.1%	-3.5%	-9.7%	-1.2%	0.1%	-0.07
DE80	Mecklenburg-Vorpommern	-3.2%	-12.0%	-3.1%	-10.0%	-1.5%	0.1%	-0.10
DE91	Braunschweig	-2.7%	-16.2%	-3.0%	-10.8%	-0.4%	0.1%	-0.02
DE92	Hannover	2.3%	-14.6%	2.3%	-8.9%	0.0%	0.1%	0.01
DE93	Lüneburg	-1.7%	-9.0%	-0.5%	-4.9%	0.6%	0.1%	0.05
DE94	Weser-Ems	-2.5%	-9.3%	-1.4%	-5.1%	-0.8%	0.1%	-0.03
DEA1	Düsseldorf	3.7%	-17.7%	3.6%	-10.3%	-0.5%	0.1%	-0.01
DEA2	Köln	2.4%	-17.6%	2.5%	-11.1%	-0.6%	0.1%	-0.02
DEA3	Münster	5.0%	-8.5%	5.3%	-3.5%	-0.5%	0.1%	-0.01
DEA4	Detmold	-4.3%	-16.5%	-4.2%	-8.0%	-0.9%	0.1%	-0.04
DEA5	Arnsberg	-0.3%	-14.3%	-0.8%	-8.1%	-0.5%	0.1%	-0.02
DEB1	Koblenz	-9.4%	-17.8%	-9.0%	-12.1%	-0.8%	0.1%	-0.06
DEB2	Trier	-8.1%	-6.7%	-7.1%	-4.3%	-0.3%	0.1%	-0.02
DEB3	Rheinhessen-Pfalz	0.7%	-12.7%	1.1%	-7.2%	-0.5%	0.1%	-0.02
DEC0	Saarland	9.1%	-7.0%	8.2%	-4.4%	-0.6%	0.1%	-0.18
DED2	Dresden	-2.9%	-19.1%	-3.8%	-14.6%	0.2%	0.1%	0.00
DED4	Chemnitz	-0.6%	-17.5%	-3.0%	-11.8%	-0.1%	0.1%	0.00
DED5	Leipzig	1.6%	-12.6%	3.0%	-7.6%	-1.3%	0.1%	-0.06
DEE0	Sachsen-Anhalt	0.7%	-11.2%	-1.1%	-8.5%	-0.2%	0.1%	0.00
DEF0	Schleswig-Holstein	3.5%	-1.7%	4.4%	-0.4%	-0.5%	0.1%	0.01
DEG0	Thüringen	7.0%	-13.9%	5.3%	-10.4%	-0.5%	0.1%	-0.02
DK01	Hovedstaden	12.5%	6.7%	14.5%	6.4%	-0.4%	0.1%	0.07

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DK02	Sjælland	-1.0%	7.1%	-0.2%	3.8%	-0.6%	0.1%	-0.01
DK03	Syddanmark	0.7%	14.3%	1.1%	9.1%	-0.4%	0.1%	0.02
DK04	Midtjylland	1.0%	16.2%	2.6%	9.1%	0.2%	0.1%	0.05
DK05	Nordjylland	-1.6%	9.3%	-1.3%	6.1%	-0.9%	0.1%	-0.02
EE00	Eesti	1.1%	-14.6%	2.5%	-9.6%	-1.5%	0.0%	-0.09
EL30	Attiki	1.4%	-10.9%	3.2%	-4.7%	-1.4%	0.2%	-0.05
EL41	Voreio Aigaio	4.5%	0.3%	-7.7%	-11.5%	1.0%	0.2%	0.09
EL42	Notio Aigaio	-5.9%	-2.2%	-10.5%	-6.8%	-4.4%	0.2%	-0.27
EL43	Kriti	2.6%	-2.2%	0.7%	-3.7%	-1.7%	0.2%	-0.04
EL51	Anatoliki Makedonia, Thraki	2.6%	-5.9%	-4.1%	-9.9%	-0.3%	0.2%	0.00
EL52	Kentriki Makedonia	0.3%	-4.8%	-4.2%	-7.6%	1.0%	0.2%	0.07
EL53	Dytiki Makedonia	5.5%	-14.7%	0.3%	-10.4%	-0.9%	0.2%	-0.04
EL54	Ipeiros	-5.8%	-2.7%	-9.9%	-6.3%	-1.6%	0.2%	-0.08
EL61	Thessalia	-9.2%	-12.4%	-13.3%	-12.5%	0.5%	0.2%	0.02
EL62	Ionia Nisia	-3.9%	-6.8%	-3.8%	-6.3%	3.7%	0.2%	0.19
EL63	Dytiki Ellada	3.1%	-5.1%	1.7%	-4.1%	-1.1%	0.2%	-0.04
EL64	Sterea Ellada	-3.3%	-1.2%	-11.8%	-9.5%	-0.6%	0.2%	-0.02
EL65	Peloponnisos	2.7%	-8.4%	-3.8%	-12.4%	0.0%	0.2%	0.01
ES11	Galicia	14.8%	29.3%	14.4%	18.8%	-1.2%	0.2%	0.00
ES12	Principado de Asturias	4.4%	4.7%	2.8%	1.7%	-0.8%	0.2%	0.00
ES13	Cantabria	3.0%	0.7%	3.5%	1.0%	-0.5%	0.2%	0.02
ES21	País Vasco	12.4%	7.8%	12.3%	5.0%	-1.5%	0.2%	-0.04
ES22	Comunidad Foral de Navarra	6.7%	19.1%	8.3%	14.9%	-0.2%	0.2%	0.05
ES23	La Rioja	5.2%	-6.9%	6.0%	-4.2%	-1.9%	0.2%	-0.09
ES24	Aragón	8.1%	-3.9%	7.6%	-3.4%	-0.9%	0.2%	-0.02
ES30	Comunidad de Madrid	4.3%	-10.1%	6.3%	-5.0%	-1.3%	0.2%	-0.04
ES41	Castilla y León	9.0%	-0.5%	7.6%	-1.7%	-0.2%	0.2%	0.02
ES42	Castilla-la Mancha	5.4%	-2.8%	6.2%	-0.9%	0.4%	0.2%	0.04
ES43	Extremadura	7.2%	-2.4%	6.0%	-2.7%	-1.8%	0.2%	-0.07
ES51	Cataluña	-0.6%	-6.5%	0.9%	-3.6%	-0.6%	0.2%	-0.01
ES52	Comunitat Valenciana	3.2%	-1.7%	5.2%	0.7%	-0.2%	0.2%	0.03
ES53	Illes Balears	-4.0%	-0.3%	-1.1%	2.8%	0.7%	0.2%	0.10
ES61	Andalucía	4.7%	-6.7%	5.9%	-3.9%	-0.8%	0.2%	-0.02
ES62	Región de Murcia	1.0%	-2.1%	3.4%	1.2%	1.3%	0.2%	0.10
ES70	Canarias	-1.5%	-3.2%	0.6%	-0.7%	-1.9%	0.2%	-0.06
FI19	Länsi-Suomi	1.1%	0.6%	1.3%	0.6%	0.4%	0.1%	0.06
FI1B	Helsinki-Uusimaa	4.7%	-18.3%	7.5%	-10.7%	-0.8%	0.1%	-0.03

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FI1C	Etelä-Suomi	-0.2%	-1.9%	-0.7%	-1.7%	0.6%	0.1%	0.07
FI1D	Pohjois- ja Itä-Suomi	-2.5%	-5.0%	-3.2%	-4.5%	-0.1%	0.1%	0.02
FR10	Île de France	-0.6%	-13.3%	0.0%	-9.6%	0.2%	0.1%	0.03
FRB0	Centre - Val de Loire	-3.0%	-2.0%	-2.9%	-1.2%	1.0%	0.1%	0.08
FRC1	Bourgogne	-1.0%	-1.7%	-1.5%	-1.8%	-0.6%	0.1%	-0.01
FRC2	Franche-Comté	-4.9%	-5.6%	-5.0%	-3.6%	0.2%	0.1%	0.02
FRD1	Basse-Normandie	0.6%	-4.0%	0.6%	-3.0%	0.9%	0.1%	0.07
FRD2	Haute-Normandie	-1.0%	-2.1%	-1.1%	-1.3%	0.3%	0.1%	0.04
FRE1	Nord-Pas-de-Calais	4.7%	-6.8%	4.6%	-3.8%	1.3%	0.1%	0.10
FRE2	Picardie	4.5%	-0.7%	4.1%	-0.8%	0.9%	0.1%	0.07
FRF1	Alsace	2.1%	-10.3%	3.6%	-6.4%	-0.4%	0.1%	-0.01
FRF2	Champagne-Ardenne	0.7%	-1.2%	0.3%	-1.1%	-2.5%	0.1%	-0.12
FRF3	Lorraine	-3.6%	-11.4%	-3.7%	-7.3%	0.4%	0.1%	0.04
FRG0	Pays-de-la-Loire	-2.1%	-1.3%	0.0%	1.3%	-1.0%	0.1%	-0.03
FRH0	Bretagne	-0.1%	3.5%	1.9%	4.5%	-0.4%	0.1%	0.01
FRI1	Aquitaine	-2.8%	-2.8%	-0.7%	0.1%	0.1%	0.1%	0.03
FRI2	Limousin	-4.1%	-1.9%	-4.9%	-2.1%	0.6%	0.1%	0.05
FRI3	Poitou-Charentes	-2.0%	3.6%	-1.1%	3.7%	0.1%	0.1%	0.04
FRJ1	Languedoc-Roussillon	-3.2%	2.8%	-0.9%	4.7%	1.7%	0.1%	0.13
FRJ2	Midi-Pyrénées	-5.0%	-5.2%	-2.8%	-1.3%	-0.4%	0.1%	-0.01
FRK1	Auvergne	-1.8%	0.8%	-1.8%	0.6%	1.3%	0.1%	0.10
FRK2	Rhône-Alpes	-2.0%	-1.3%	-0.1%	0.9%	0.4%	0.1%	0.05
FRL0	Provence-Alpes-Côte d'Azur	-4.4%	-1.4%	-3.0%	0.4%	0.5%	0.1%	0.05
FRM0	Corse	-3.1%	7.1%	-1.2%	8.4%	-0.4%	0.1%	0.05
HR03	Jadranska Hrvatska	4.2%	-2.3%	-1.8%	-7.6%	-1.1%	0.7%	0.06
HR04	Kontinentalna Hrvatska (NUTS 2016)	-10.8%	-13.3%	-15.3%	-11.3%	-0.1%	0.7%	0.03
HU10	Közép-Magyarország (NUTS 2013)	13.0%	-28.4%	13.0%	-18.2%	-0.9%	0.0%	-0.05
HU21	Közép-Dunántúl	-11.5%	-9.3%	-11.7%	-5.7%	-0.1%	0.0%	0.00
HU22	Nyugat-Dunántúl	-16.1%	-6.2%	-15.5%	-3.5%	0.8%	0.0%	0.05
HU23	Dél-Dunántúl	-21.3%	-1.3%	-22.6%	-2.5%	-0.1%	0.0%	-0.01
HU31	Észak-Magyarország	-11.8%	-10.2%	-13.7%	-7.5%	-0.4%	0.0%	-0.02
HU32	Észak-Alföld	-13.8%	-10.0%	-15.4%	-5.9%	0.2%	0.0%	0.02
HU33	Dél-Alföld	-16.1%	-4.8%	-17.7%	-4.0%	-0.8%	0.0%	-0.03

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IE00	Ireland	2.9%	-19.3%	6.2%	-10.9%	-1.3%	0.1%	-0.06
ITC1	Piemonte	2.9%	-0.4%	1.2%	-1.9%	-0.2%	0.1%	0.01
ITC2	Valle d'Aosta/Vallée d'Aoste	2.0%	-4.2%	0.2%	-5.6%	-0.3%	0.1%	0.03
ITC3	Liguria	2.9%	3.2%	1.3%	0.8%	-1.0%	0.1%	-0.01
ITC4	Lombardia	6.3%	-15.1%	5.6%	-10.2%	-0.6%	0.1%	-0.02
ITF1	Abruzzo	5.0%	-0.7%	3.0%	-2.3%	-1.8%	0.1%	-0.07
ITF2	Molise	5.5%	2.1%	1.4%	-3.2%	-0.5%	0.1%	-0.01
ITF3	Campania	5.8%	-16.0%	3.7%	-10.2%	-1.0%	0.1%	-0.04
ITF4	Puglia	12.3%	3.4%	10.8%	0.4%	0.6%	0.1%	0.08
ITF5	Basilicata	3.6%	-18.5%	0.4%	-14.4%	-0.4%	0.1%	-0.02
ITF6	Calabria	-0.3%	-17.2%	-3.2%	-11.3%	0.2%	0.1%	0.02
ITG1	Sicilia	3.7%	-3.0%	2.1%	-3.1%	-0.4%	0.1%	0.00
ITG2	Sardegna	4.4%	1.2%	1.8%	-1.7%	-0.5%	0.1%	0.01
ITH1	Provincia Autonoma di Bolzano	4.9%	2.6%	5.4%	2.9%	0.7%	0.1%	0.17
ITH2	Provincia Autonoma di Trento	-2.1%	-0.5%	-2.6%	-0.9%	0.1%	0.1%	0.04
ITH3	Veneto	-6.0%	-9.5%	-6.7%	-8.3%	-1.5%	0.1%	-0.10
ITH4	Friuli-Venezia Giulia	0.9%	-0.6%	-0.4%	-1.7%	0.3%	0.1%	0.04
ITH5	Emilia-Romagna	-1.2%	-7.2%	-2.0%	-6.0%	-0.5%	0.1%	-0.02
ITI1	Toscana	2.2%	-8.6%	1.1%	-7.8%	0.1%	0.1%	0.02
ITI2	Umbria	-1.4%	-5.6%	-3.0%	-5.8%	-0.8%	0.1%	-0.03
ITI3	Marche	-7.7%	3.5%	-9.8%	-0.1%	0.4%	0.1%	0.03
ITI4	Lazio	6.8%	-28.6%	5.7%	-20.5%	0.2%	0.1%	0.00
LT00	Lietuva (NUTS 2013)	1.0%	-5.7%	1.4%	-2.9%	-0.2%	0.0%	0.01
LU00	Luxembourg	-11.3%	-4.7%	-6.7%	1.9%	-0.5%	0.1%	-0.02
LV00	Latvija	-10.4%	-22.1%	-12.4%	-15.2%	-0.6%	0.1%	-0.04
MT00	Malta	0.4%	-15.0%	6.0%	-7.2%	-1.1%	1.0%	0.05
NL11	Groningen	-5.0%	-13.7%	-4.0%	-6.9%	0.5%	0.1%	0.04
NL12	Friesland (NL)	-2.4%	12.8%	-1.5%	10.5%	0.5%	0.1%	0.08
NL13	Drenthe	-5.4%	2.2%	-4.4%	2.9%	0.6%	0.1%	0.06
NL21	Overijssel	-0.5%	3.6%	0.8%	3.8%	0.6%	0.1%	0.08
NL22	Gelderland	-4.3%	0.2%	-2.5%	2.0%	0.5%	0.1%	0.06
NL23	Flevoland	8.5%	7.8%	13.2%	9.4%	-0.6%	0.1%	0.03
NL31	Utrecht	-6.3%	16.1%	-1.8%	14.3%	0.0%	0.1%	0.06
NL32	Noord-Holland	-0.7%	-19.2%	1.2%	-14.5%	0.0%	0.1%	-0.01
NL33	Zuid-Holland	8.6%	-1.8%	9.9%	0.1%	0.1%	0.1%	0.08

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NL34	Zeeland	-2.4%	9.3%	-1.4%	9.2%	-0.2%	0.1%	0.08
NL41	Noord-Brabant	-3.9%	4.4%	-2.1%	4.7%	0.2%	0.1%	0.05
NL42	Limburg (NL)	-3.2%	-0.1%	-3.0%	0.1%	-0.2%	0.1%	0.03
PL12	Mazowieckie (NUTS 2013)	-1.6%	6.1%	-1.3%	3.4%	0.0%	0.1%	0.03
PL21	Malopolskie	-7.0%	-7.4%	-6.7%	-4.4%	-0.4%	0.1%	0.00
PL22	Slaskie	-6.0%	-6.6%	-7.6%	-4.2%	0.1%	0.1%	0.03
PL41	Wielkopolskie	-6.4%	-11.0%	-6.5%	-4.2%	-0.6%	0.1%	-0.01
PL42	Zachodniopomorskie	-0.1%	2.9%	-1.5%	0.5%	-0.2%	0.1%	0.03
PL43	Lubuskie	-13.4%	-10.6%	-14.6%	-5.8%	0.5%	0.1%	0.05
PL51	Dolnoslaskie	2.8%	-4.4%	2.1%	-3.2%	0.2%	0.1%	0.04
PL52	Opolskie	-28.5%	-23.2%	-29.9%	-9.2%	-0.1%	0.1%	-0.11
PL61	Kujawsko-Pomorskie	-1.4%	2.3%	-2.7%	-0.5%	0.2%	0.1%	0.04
PL62	Warminsko-Mazurskie	-7.1%	-11.1%	-8.6%	-7.1%	-1.0%	0.1%	-0.04
PL63	Pomorskie	-7.7%	1.0%	-7.2%	1.2%	-0.8%	0.1%	-0.02
PL71	Lódzkie	-13.4%	-13.1%	-15.1%	-6.7%	1.1%	0.1%	0.08
PL72	Swietokrzyskie	-3.8%	-3.7%	-6.0%	-3.6%	-0.1%	0.1%	-0.13
PL81	Lubelskie	-7.1%	3.2%	-8.9%	-0.9%	-0.1%	0.1%	0.02
PL82	Podkarpackie	-6.9%	-5.9%	-7.8%	-3.1%	0.1%	0.1%	0.03
PL84	Podlaskie	-7.9%	-16.2%	-9.2%	-7.4%	-0.1%	0.1%	-0.10
PT11	Norte	5.2%	3.0%	5.6%	2.3%	-0.2%	0.2%	0.02
PT15	Algarve	-9.1%	-9.5%	-3.6%	-3.1%	-3.0%	0.2%	-0.21
PT16	Centro (PT)	-2.2%	-5.2%	-1.4%	-2.6%	-0.8%	0.2%	-0.02
PT17	Área Metropolitana de Lisboa	13.6%	-8.0%	14.6%	-5.2%	-2.4%	0.2%	-0.06
PT18	Alentejo	-1.3%	-5.1%	-1.3%	-3.7%	-1.5%	0.2%	-0.06
PT20	Região Autónoma dos Açores	14.1%	9.1%	11.1%	4.1%	-0.3%	0.2%	0.05
PT30	Região Autónoma da Madeira	7.2%	23.1%	6.0%	18.0%	1.3%	0.2%	0.25
RO11	Nord-Vest	27.0%	-1.2%	25.6%	-1.6%	-0.2%	0.0%	0.02
RO12	Centru	18.4%	-5.1%	16.1%	-4.8%	-0.3%	0.0%	0.01
RO21	Nord-Est	19.0%	5.0%	19.8%	2.2%	0.3%	0.0%	0.04
RO22	Sud-Est	21.9%	0.5%	20.2%	-1.2%	-0.4%	0.0%	0.02
RO31	Sud - Muntenia	8.9%	-4.5%	6.1%	-3.7%	0.1%	0.0%	0.03
RO32	Bucuresti - Ilfov	19.2%	-16.3%	16.8%	-9.9%	-1.1%	0.0%	-0.03
RO41	Sud-Vest Oltenia	12.9%	4.2%	9.6%	-1.8%	-0.1%	0.0%	0.02
RO42	Vest	12.9%	-16.7%	6.0%	-12.0%	-0.1%	0.0%	0.01
SE11	Stockholm	2.5%	-10.3%	5.7%	-5.2%	-0.5%	0.1%	0.00

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SE12	Östra Mellansverige	-2.0%	0.5%	0.5%	2.9%	0.4%	0.1%	0.06
SE21	Småland med öarna	-3.2%	3.5%	-1.6%	4.4%	-0.4%	0.1%	0.01
SE22	Sydsverige	1.6%	-1.6%	4.3%	1.4%	-0.3%	0.1%	0.02
SE23	Västsverige	0.4%	3.8%	2.7%	5.3%	-0.3%	0.1%	0.03
SE31	Norra Mellansverige	-1.1%	-2.6%	-0.6%	-1.6%	0.7%	0.1%	0.07
SE32	Mellersta Norrland	-4.8%	0.1%	-4.7%	0.2%	-0.9%	0.1%	-0.02
SE33	Övre Norrland	2.5%	-3.4%	3.2%	-2.1%	-1.2%	0.1%	-0.03
SI03	Vzhodna Slovenija	0.8%	-3.3%	1.6%	-1.2%	-0.5%	0.2%	0.00
SI04	Zahodna Slovenija	-0.2%	-8.8%	1.5%	-5.6%	0.0%	0.2%	0.02
SK01	Bratislavský kraj	-6.0%	-37.3%	3.1%	-19.1%	-0.6%	0.1%	-0.06
SK02	Západné Slovensko	-7.6%	-29.0%	-8.3%	-12.1%	-1.2%	0.1%	-0.06
SK03	Stredné Slovensko	0.9%	-19.0%	-1.3%	-13.3%	-0.9%	0.1%	-0.04
SK04	Východné Slovensko	-3.8%	-18.6%	-6.0%	-11.1%	-0.1%	0.1%	0.01

Appendix 6: Changes in TAIDD CI scores and individual variables (raw data), Full dataset, 2019-2022

GEO Codes	GEO Labels	BEDS/POP (2014-2019)	ARRIV/POP (2014-2019)	BEDS/AREA (2014-2019)	ARRIV+POP/ AREA (2014-2019)	EMPL % (2014-2019)	TDGDP (2014-2019)	TAIDD CI (2014-2019)
AT11	Burgenland (AT)	-6.5%	12.4%	-4.5%	11.6%	-0.4%	0.0%	-0.14
AT12	Niederösterreich	-3.5%	26.4%	-0.4%	19.1%	0.6%	0.0%	-0.02
AT13	Wien	5.2%	15.8%	13.0%	20.6%	0.6%	0.0%	-0.01
AT21	Kärnten	-6.2%	15.7%	-5.4%	13.8%	0.9%	0.0%	-0.12
AT22	Steiermark	17.3%	19.4%	20.0%	16.6%	0.0%	0.0%	-0.07
AT31	Oberösterreich	-1.0%	21.2%	2.9%	17.8%	-0.2%	0.0%	-0.07
AT32	Salzburg	5.0%	20.8%	9.1%	23.7%	1.2%	0.0%	-0.11
AT33	Tirol	-3.8%	16.4%	0.6%	20.3%	0.8%	0.0%	-0.24
AT34	Vorarlberg	2.6%	9.1%	7.8%	13.0%	0.3%	0.0%	-0.13
BE10	Brussels	3.2%	10.6%	7.0%	11.8%	0.2%	-0.1%	-0.15
BE21	Prov. Antwerpen	18.3%	20.3%	21.8%	13.3%	1.3%	-0.1%	0.07
BE22	Prov. Limburg (BE)	8.3%	27.1%	10.6%	17.6%	-0.1%	-0.1%	-0.02
BE23	Prov. Oost-Vlaanderen	19.8%	28.4%	23.5%	14.5%	0.2%	-0.1%	0.02
BE24	Prov. Vlaams-Brabant	6.1%	13.0%	9.8%	10.3%	0.1%	-0.1%	-0.01
BE25	Prov. West-Vlaanderen	1.6%	22.6%	3.2%	18.7%	-0.4%	-0.1%	-0.07
BE31	Prov. Brabant wallon	8.0%	12.0%	11.5%	8.3%	1.3%	-0.1%	0.06
BE32	Prov. Hainaut	45.7%	29.9%	47.0%	8.8%	0.8%	-0.1%	0.05
BE33	Prov. Liège	-12.3%	23.5%	-11.1%	12.1%	0.6%	-0.1%	0.01
BE34	Prov. Luxembourg (BE)	2.1%	34.3%	5.1%	28.9%	-0.7%	-0.1%	-0.07
BE35	Prov. Namur	-2.2%	25.0%	-0.1%	14.5%	0.2%	-0.1%	-0.01
BG31	Severozapaden	3.1%	19.2%	-5.6%	-4.1%	1.5%	-0.1%	0.07
BG32	Severen tsentralen	19.0%	42.7%	11.6%	6.6%	-0.4%	-0.1%	-0.04
BG33	Severoiztochen	14.3%	45.6%	11.2%	22.6%	0.6%	-0.1%	-0.01
BG34	Yugoiztochen	13.5%	45.5%	10.1%	22.7%	0.2%	-0.1%	-0.02
BG41	Yugozapaden	-2.2%	39.0%	-3.4%	15.5%	0.8%	-0.1%	0.02
BG42	Yuzhen tsentralen	19.4%	41.2%	15.8%	12.6%	0.2%	-0.1%	-0.01
CY00	Kypros	0.9%	34.1%	3.0%	27.6%	1.4%	1.6%	0.14
CZ01	Praha	2.2%	25.4%	7.6%	27.4%	-0.3%	-0.1%	-0.03
CZ02	Střední Cechy	-2.2%	39.5%	2.9%	21.0%	-0.4%	-0.1%	-0.04
CZ03	Jihozápad	2.6%	50.4%	4.0%	31.6%	-0.8%	-0.1%	-0.05
CZ04	Severozápad	16.3%	54.4%	15.2%	27.1%	-0.1%	-0.1%	0.00
CZ05	Severovýchod	1.4%	46.6%	1.9%	27.2%	-0.1%	-0.1%	-0.01
CZ06	Jihovýchod	-2.3%	39.4%	-1.4%	22.4%	0.1%	-0.1%	0.00
CZ07	Střední Morava	8.2%	44.8%	7.6%	20.4%	-0.9%	-0.1%	-0.05
CZ08	Moravskoslezsko	10.2%	46.7%	8.5%	15.3%	0.6%	-0.1%	0.04

DE11	Stuttgart	7.4%	13.8%	12.0%	12.6%	-0.1%	0.1%	-0.03
DE12	Karlsruhe	0.1%	12.5%	3.9%	12.0%	0.1%	0.1%	-0.04
DE13	Freiburg	1.1%	17.0%	5.3%	17.1%	-0.8%	0.1%	-0.10
DE14	Tübingen	8.9%	23.9%	13.5%	19.5%	0.9%	0.1%	0.04
DE21	Oberbayern	6.0%	20.7%	11.1%	21.5%	-0.3%	0.1%	-0.06
DE22	Niederbayern	-12.7%	13.3%	-9.0%	13.8%	-0.7%	0.1%	-0.12
DE23	Oberpfalz	-3.9%	13.1%	-1.2%	11.3%	-0.2%	0.1%	-0.05
DE24	Oberfranken	2.0%	21.4%	3.0%	14.4%	0.9%	0.1%	0.02
DE25	Mittelfranken	5.6%	15.3%	9.5%	14.4%	-0.2%	0.1%	-0.05
DE26	Unterfranken	3.6%	14.5%	5.1%	11.0%	-0.6%	0.1%	-0.08
DE27	Schwaben	1.4%	26.4%	6.0%	24.0%	-0.2%	0.1%	-0.05
DE30	Berlin	3.4%	10.4%	10.1%	15.1%	-0.4%	0.1%	-0.12
DE40	Brandenburg	0.2%	16.4%	2.8%	13.3%	-0.3%	0.1%	-0.05
DE50	Bremen	18.1%	20.5%	22.7%	17.7%	0.1%	0.1%	0.00
DE60	Hamburg	22.9%	19.4%	29.5%	21.3%	-0.4%	0.1%	0.02
DE71	Darmstadt	6.6%	14.0%	11.5%	15.0%	-0.1%	0.1%	-0.05
DE72	Gießen	1.6%	10.1%	4.0%	7.6%	0.4%	0.1%	0.00
DE73	Kassel	-0.1%	9.3%	1.5%	8.3%	-0.2%	0.1%	-0.07
DE80	Mecklenburg-Vorpommern	17.2%	14.7%	18.1%	12.9%	0.2%	0.1%	-0.04
DE91	Braunschweig	5.4%	18.5%	6.8%	12.8%	-0.2%	0.1%	-0.04
DE92	Hannover	3.5%	14.3%	6.0%	10.9%	0.0%	0.1%	-0.03
DE93	Lüneburg	-0.1%	13.8%	2.4%	11.4%	0.2%	0.1%	-0.02
DE94	Weser-Ems	6.1%	15.7%	9.5%	13.6%	0.7%	0.1%	0.01
DEA1	Düsseldorf	8.2%	13.6%	10.6%	9.8%	-0.1%	0.1%	-0.04
DEA2	Köln	-1.1%	11.7%	1.9%	10.5%	0.2%	0.1%	-0.03
DEA3	Münster	3.3%	13.2%	5.3%	7.5%	-0.4%	0.1%	-0.04
DEA4	Detmold	-3.6%	10.0%	-2.1%	6.3%	0.0%	0.1%	-0.02
DEA5	Arnsberg	-0.9%	16.2%	-0.1%	9.0%	0.0%	0.1%	-0.03
DEB1	Koblenz	-2.0%	7.2%	-0.6%	6.5%	0.0%	0.1%	-0.06
DEB2	Trier	-7.0%	9.1%	-4.8%	9.7%	-0.3%	0.1%	-0.14
DEB3	Rheinhessen-Pfalz	5.5%	12.0%	8.5%	9.9%	0.2%	0.1%	-0.02
DEC0	Saarland	4.9%	18.6%	4.9%	8.8%	0.5%	0.1%	0.01
DED2	Dresden	0.9%	11.0%	1.3%	8.2%	-0.5%	0.1%	-0.09
DED4	Chemnitz	-4.6%	12.6%	-6.7%	4.2%	-0.4%	0.1%	-0.05
DED5	Leipzig	16.0%	17.7%	22.6%	18.2%	1.1%	0.1%	0.04
DEE0	Sachsen-Anhalt	10.8%	21.7%	9.0%	10.5%	-0.2%	0.1%	-0.03
DEF0	Schleswig-Holstein	21.4%	29.0%	24.8%	23.8%	-0.3%	0.1%	-0.02
DEG0	Thüringen	2.5%	12.3%	1.6%	6.7%	-0.2%	0.1%	-0.05
DK01	Hovedstaden	6.5%	29.2%	11.7%	23.8%	0.5%	0.1%	0.04

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DK02	Sjælland	-0.2%	5.8%	2.2%	4.8%	1.2%	0.1%	0.07
DK03	Syddanmark	1.6%	13.7%	3.4%	9.7%	0.3%	0.1%	0.00
DK04	Midtjylland	-0.9%	13.9%	2.4%	9.5%	-0.1%	0.1%	-0.01
DK05	Nordjylland	-2.0%	12.0%	-0.5%	8.6%	0.0%	0.1%	-0.03
EE00	Eesti	4.2%	21.9%	4.9%	16.2%	0.4%	-0.1%	-0.03
EL30	Attiki	5.6%	37.3%	2.3%	14.9%	1.5%	0.8%	0.07
EL41	Voreio Aigaio	-10.6%	4.0%	-0.5%	14.5%	2.7%	0.8%	0.02
EL42	Notio Aigaio	8.5%	80.4%	11.5%	79.2%	2.7%	0.8%	0.30
EL43	Kriti	9.0%	51.9%	9.7%	45.8%	1.2%	0.8%	0.05
EL51	Anatoliki Makedonia, Thraki	7.6%	32.9%	6.1%	16.3%	2.3%	0.8%	0.12
EL52	Kentriki Makedonia	8.5%	35.8%	6.8%	20.6%	-0.5%	0.8%	-0.05
EL53	Dytiki Makedonia	-3.6%	21.2%	-7.6%	2.9%	-0.9%	0.8%	-0.08
EL54	Ipeiros	10.3%	66.6%	8.0%	39.7%	2.6%	0.8%	0.15
EL61	Thessalia	4.9%	46.0%	2.2%	23.8%	2.6%	0.8%	0.14
EL62	Ionia Nisia	15.1%	68.2%	13.0%	58.2%	8.8%	0.8%	0.63
EL63	Dytiki Ellada	-3.5%	33.6%	-6.7%	12.3%	0.8%	0.8%	0.01
EL64	Sterea Ellada	-4.0%	54.0%	-4.5%	28.3%	2.0%	0.8%	0.09
EL65	Peloponnisos	4.3%	50.9%	2.4%	32.8%	1.3%	0.8%	0.06
ES11	Galicia	2.8%	26.8%	1.1%	14.1%	0.4%	0.4%	-0.02
ES12	Principado de Asturias	7.4%	28.0%	3.7%	13.9%	0.1%	0.4%	-0.03
ES13	Cantabria	3.4%	31.5%	2.4%	21.6%	2.1%	0.4%	0.07
ES21	País Vasco	12.2%	32.8%	12.8%	19.4%	0.9%	0.4%	0.03
ES22	Comunidad Foral de Navarra	8.9%	19.0%	11.2%	14.8%	0.1%	0.4%	-0.03
ES23	La Rioja	8.9%	15.9%	8.4%	10.4%	0.8%	0.4%	0.01
ES24	Aragón	5.9%	36.4%	5.0%	23.7%	0.5%	0.4%	0.01
ES30	Comunidad de Madrid	3.7%	20.8%	7.9%	17.8%	2.0%	0.4%	0.09
ES41	Castilla y León	6.1%	29.9%	2.3%	16.0%	-0.5%	0.4%	-0.07
ES42	Castilla-la Mancha	4.7%	28.3%	2.7%	12.6%	-0.7%	0.4%	-0.06
ES43	Extremadura	5.9%	33.5%	2.9%	15.9%	0.0%	0.4%	-0.03
ES51	Cataluña	0.5%	22.0%	2.5%	18.6%	0.5%	0.4%	-0.04
ES52	Comunitat Valenciana	12.2%	31.9%	12.6%	21.3%	-0.7%	0.4%	-0.08
ES53	Illes Balears	-4.4%	15.4%	1.8%	21.2%	-0.1%	0.4%	-0.32
ES61	Andalucía	7.7%	31.3%	8.2%	22.0%	0.6%	0.4%	-0.01
ES62	Región de Murcia	-1.4%	22.4%	0.4%	12.7%	-2.3%	0.4%	-0.17
ES70	Canarias	-3.9%	6.5%	0.3%	10.1%	2.9%	0.4%	-0.11
FI19	Länsi-Suomi	1.7%	12.3%	2.1%	8.0%	0.2%	0.0%	0.00
FI1B	Helsinki-Uusimaa	10.8%	21.6%	16.8%	20.6%	0.3%	0.0%	0.01

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FI1C	Etelä-Suomi	-1.3%	5.8%	-2.1%	2.7%	0.2%	0.0%	-0.01
FI1D	Pohjois- ja Itä-Suomi	0.8%	16.3%	-0.7%	10.0%	0.5%	0.0%	0.00
FR10	Île de France	2.1%	12.3%	4.0%	11.2%	0.6%	-0.1%	-0.05
FRB0	Centre - Val de Loire	4.2%	13.6%	3.9%	8.6%	0.6%	-0.1%	-0.01
FRC1	Bourgogne	2.0%	8.3%	0.8%	4.8%	0.6%	-0.1%	-0.02
FRC2	Franche-Comté	-2.5%	13.3%	-2.5%	8.0%	0.3%	-0.1%	-0.03
FRD1	Basse-Normandie	5.5%	18.1%	4.7%	12.4%	-0.2%	-0.1%	-0.06
FRD2	Haute-Normandie	9.0%	8.4%	8.8%	4.7%	-0.1%	-0.1%	-0.04
FRE1	Nord-Pas-de-Calais	1.2%	9.0%	1.0%	4.5%	-0.3%	-0.1%	-0.05
FRE2	Picardie	2.9%	4.6%	2.8%	2.6%	-0.6%	-0.1%	-0.08
FRF1	Alsace	1.2%	18.2%	2.9%	14.9%	-0.9%	-0.1%	-0.11
FRF2	Champagne-Ardenne	7.1%	6.3%	5.4%	2.4%	2.2%	-0.1%	0.08
FRF3	Lorraine	4.9%	19.3%	4.0%	10.3%	-0.4%	-0.1%	-0.06
FRG0	Pays-de-la-Loire	-3.3%	20.1%	-0.4%	16.3%	0.6%	-0.1%	-0.02
FRH0	Bretagne	-6.4%	16.1%	-4.4%	13.4%	0.7%	-0.1%	-0.04
FRI1	Aquitaine	-1.0%	15.8%	2.4%	15.4%	1.5%	-0.1%	0.02
FRI2	Limousin	-4.7%	12.5%	-5.9%	6.4%	-0.5%	-0.1%	-0.09
FRI3	Poitou-Charentes	-0.3%	16.0%	0.6%	12.4%	-0.4%	-0.1%	-0.09
FRJ1	Languedoc-Roussillon	-2.1%	8.4%	1.3%	10.1%	-1.6%	-0.1%	-0.21
FRJ2	Midi-Pyrénées	-7.1%	6.4%	-4.2%	7.5%	1.0%	-0.1%	-0.01
FRK1	Auvergne	-4.0%	13.9%	-3.3%	10.1%	-2.2%	-0.1%	-0.20
FRK2	Rhône-Alpes	-4.5%	11.2%	-1.5%	11.3%	0.4%	-0.1%	-0.05
FRL0	Provence-Alpes-Côte d'Azur	-7.1%	7.4%	-5.6%	7.5%	-0.1%	-0.1%	-0.13
FRM0	Corse	3.6%	5.3%	9.4%	10.5%	1.1%	-0.1%	-0.15
HR03	Jadranska Hrvatska	28.6%	52.9%	25.7%	43.7%	0.1%	1.5%	0.24
HR04	Kontinentalna Hrvatska (NUTS 2016)	140.1%	77.5%	128.4%	21.3%	0.5%	1.5%	0.12
HU10	Közép-Magyarország (NUTS 2013)	5.6%	30.1%	8.0%	20.0%	0.2%	0.2%	0.02
HU21	Közép-Dunántúl	15.8%	44.0%	14.7%	20.7%	-1.1%	0.2%	-0.04
HU22	Nyugat-Dunántúl	2.4%	34.5%	2.9%	21.6%	-0.4%	0.2%	-0.03
HU23	Dél-Dunántúl	-25.9%	18.1%	-29.0%	5.1%	0.6%	0.2%	-0.02
HU31	Észak-Magyarország	-2.5%	38.3%	-6.7%	12.4%	1.0%	0.2%	0.08
HU32	Észak-Alföld	-7.4%	34.2%	-9.5%	9.3%	-0.4%	0.2%	-0.01
HU33	Dél-Alföld	7.8%	48.9%	4.2%	12.8%	0.6%	0.2%	0.06

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IE00	Ireland	-4.5%	8.8%	1.0%	12.1%	0.5%	-0.1%	-0.05
ITC1	Piemonte	5.9%	23.6%	3.4%	9.1%	0.2%	0.5%	0.00
ITC2	Valle d'Aosta/Vallée d'Aoste	10.4%	31.8%	7.9%	25.2%	1.5%	0.5%	0.03
ITC3	Liguria	4.1%	22.5%	0.3%	11.9%	1.4%	0.5%	0.02
ITC4	Lombardia	11.6%	23.8%	12.0%	14.4%	1.0%	0.5%	0.06
ITF1	Abruzzo	7.3%	19.4%	4.6%	7.2%	2.6%	0.5%	0.13
ITF2	Molise	0.6%	-3.7%	-2.9%	-4.6%	1.0%	0.5%	0.04
ITF3	Campania	19.3%	38.6%	16.7%	14.5%	1.6%	0.5%	0.10
ITF4	Puglia	8.8%	33.9%	5.8%	11.9%	0.9%	0.5%	0.04
ITF5	Basilicata	0.0%	68.8%	-3.4%	29.8%	1.5%	0.5%	0.10
ITF6	Calabria	5.8%	40.1%	2.2%	12.6%	0.1%	0.5%	0.00
ITG1	Sicilia	5.4%	15.0%	1.5%	3.2%	1.6%	0.5%	0.08
ITG2	Sardegna	7.8%	47.7%	5.1%	24.9%	1.5%	0.5%	0.07
ITH1	Provincia Autonoma di Bolzano	1.2%	21.9%	4.1%	23.6%	1.3%	0.5%	-0.11
ITH2	Provincia Autonoma di Trento	1.2%	27.7%	2.6%	25.7%	1.5%	0.5%	0.01
ITH3	Veneto	14.0%	25.3%	13.1%	18.4%	0.5%	0.5%	0.01
ITH4	Friuli-Venezia Giulia	11.7%	29.8%	9.9%	16.9%	0.2%	0.5%	0.00
ITH5	Emilia-Romagna	1.9%	25.7%	2.2%	17.7%	-0.1%	0.5%	-0.04
ITI1	Toscana	8.4%	17.4%	7.0%	11.8%	-0.2%	0.5%	-0.07
ITI2	Umbria	2.6%	7.8%	0.0%	2.9%	1.9%	0.5%	0.05
ITI3	Marche	-20.9%	9.1%	-22.6%	3.2%	-0.1%	0.5%	-0.14
ITI4	Lazio	33.0%	26.1%	30.8%	14.7%	0.1%	0.5%	0.02
LT00	Lietuva (NUTS 2013)	56.7%	59.1%	48.8%	21.6%	0.3%	0.1%	0.08
LU00	Luxembourg	-13.6%	-8.7%	-3.5%	5.1%	0.7%	-0.1%	-0.06
LV00	Latvija	48.9%	41.7%	42.8%	16.4%	0.3%	0.4%	0.05
MT00	Malta	-0.1%	13.2%	15.2%	27.2%	-0.2%	0.7%	-0.12
NL11	Groningen	-2.2%	40.9%	-2.0%	20.5%	-0.2%	0.1%	0.00
NL12	Friesland (NL)	-1.0%	10.8%	-0.9%	7.8%	-0.7%	0.1%	-0.10
NL13	Drenthe	-7.7%	14.4%	-7.1%	11.9%	1.0%	0.1%	-0.05
NL21	Overijssel	-1.1%	34.7%	0.3%	22.7%	0.4%	0.1%	0.02
NL22	Gelderland	0.7%	26.2%	3.4%	19.4%	0.0%	0.1%	-0.01
NL23	Flevoland	-14.9%	-2.8%	-11.3%	2.3%	0.4%	0.1%	-0.05
NL31	Utrecht	17.4%	18.1%	22.4%	14.0%	-0.1%	0.1%	0.02
NL32	Noord-Holland	17.1%	31.9%	21.9%	30.9%	0.3%	0.1%	0.10
NL33	Zuid-Holland	-5.2%	21.7%	-1.7%	16.0%	0.7%	0.1%	0.03

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NL34	Zeeland	1.9%	16.1%	2.5%	14.6%	1.4%	0.1%	-0.04
NL41	Noord-Brabant	-2.4%	26.0%	0.1%	18.0%	0.7%	0.1%	0.03
NL42	Limburg (NL)	-4.9%	20.3%	-5.2%	15.0%	0.9%	0.1%	-0.04
PL12	Mazowieckie (NUTS 2013)	32.2%	40.8%	34.4%	19.2%	0.1%	0.1%	0.05
PL21	Malopolskie	18.7%	47.4%	20.3%	26.8%	-0.3%	0.1%	0.03
PL22	Slaskie	16.3%	45.8%	14.8%	12.6%	0.2%	0.1%	0.05
PL41	Wielkopolskie	-0.2%	19.7%	0.7%	7.7%	1.1%	0.1%	0.10
PL42	Zachodniopomorskie	20.7%	44.2%	19.6%	24.1%	0.1%	0.1%	0.05
PL43	Lubuskie	9.4%	21.7%	8.8%	7.5%	-0.1%	0.1%	0.03
PL51	Dolnoslaskie	17.8%	63.0%	17.6%	28.6%	0.8%	0.1%	0.10
PL52	Opolskie	25.3%	56.4%	23.5%	11.4%	0.2%	0.1%	0.05
PL61	Kujawsko-Pomorskie	19.2%	47.1%	18.5%	13.9%	0.4%	0.1%	0.07
PL62	Warminsko-Mazurskie	9.3%	26.6%	8.0%	10.3%	0.8%	0.1%	0.07
PL63	Pomorskie	20.9%	44.8%	23.1%	24.2%	1.1%	0.1%	0.11
PL71	Lódzkie	5.9%	21.6%	4.0%	5.0%	-0.3%	0.1%	0.02
PL72	Swietokrzyskie	26.5%	40.6%	23.8%	8.8%	0.9%	0.1%	0.10
PL81	Lubelskie	36.7%	52.8%	34.3%	11.9%	-0.1%	0.1%	0.04
PL82	Podkarpackie	29.2%	48.3%	29.4%	14.4%	0.8%	0.1%	0.09
PL84	Podlaskie	18.4%	16.2%	17.0%	4.3%	0.2%	0.1%	0.04
PT11	Norte	37.3%	72.8%	34.6%	33.5%	0.4%	1.3%	0.13
PT15	Algarve	25.6%	41.9%	24.6%	36.2%	-1.0%	1.3%	0.01
PT16	Centro (PT)	26.5%	62.9%	22.9%	31.2%	0.0%	1.3%	0.10
PT17	Área Metropolitana de Lisboa	33.9%	52.1%	35.7%	36.1%	0.8%	1.3%	0.19
PT18	Alentejo	32.4%	79.9%	25.6%	40.5%	-0.3%	1.3%	0.10
PT20	Região Autónoma dos Açores	99.7%	115.5%	96.0%	65.1%	2.6%	1.3%	0.34
PT30	Região Autónoma da Madeira	26.9%	29.7%	23.3%	20.2%	1.8%	1.3%	0.16
RO11	Nord-Vest	39.7%	83.6%	37.6%	21.0%	0.0%	0.1%	0.05
RO12	Centru	14.6%	64.1%	12.8%	27.0%	-0.1%	0.1%	0.04
RO21	Nord-Est	20.7%	67.9%	17.9%	10.9%	0.4%	0.1%	0.07
RO22	Sud-Est	11.9%	68.7%	6.9%	16.5%	1.0%	0.1%	0.11
RO31	Sud - Muntenia	11.1%	60.7%	5.5%	5.7%	0.6%	0.1%	0.08
RO32	Bucuresti - Ilfov	14.2%	35.3%	15.8%	16.3%	1.2%	0.1%	0.10
RO41	Sud-Vest Oltenia	26.6%	70.3%	20.0%	7.6%	0.5%	0.1%	0.09
RO42	Vest	16.2%	50.3%	13.6%	11.8%	-0.3%	0.1%	0.02
SE11	Stockholm	4.4%	17.7%	13.1%	22.7%	-0.1%	0.1%	-0.02

SE12	**Östra Mellansverige**	-4.5%	15.6%	1.7%	17.1%	-0.7%	0.1%	-0.05
SE21	**Småland med öarna**	-5.1%	16.2%	0.1%	18.2%	-0.1%	0.1%	-0.04
SE22	**Sydsverige**	-0.4%	23.3%	6.3%	23.3%	-0.1%	0.1%	-0.01
SE23	**Västsverige**	-4.5%	11.6%	1.4%	15.3%	0.0%	0.1%	-0.04
SE31	**Norra Mellansverige**	-6.8%	12.0%	-3.8%	12.5%	-0.4%	0.1%	-0.07
SE32	**Mellersta Norrland**	4.8%	21.5%	6.8%	19.0%	0.8%	0.1%	0.03
SE33	**Övre Norrland**	-3.5%	21.2%	-1.6%	18.6%	1.1%	0.1%	0.03
SI03	**Vzhodna Slovenija**	50.5%	51.3%	50.5%	27.1%	-0.1%	0.0%	0.02
SI04	**Zahodna Slovenija**	85.9%	90.3%	89.8%	66.5%	-0.6%	0.0%	0.13
SK01	**Bratislavský kraj**	8.6%	54.4%	15.8%	41.8%	-0.8%	0.3%	0.00
SK02	**Západné Slovensko**	17.8%	62.2%	17.1%	17.2%	-1.1%	0.3%	-0.03
SK03	**Stredné Slovensko**	20.3%	80.8%	19.6%	35.6%	0.1%	0.3%	0.06
SK04	**Východné Slovensko**	-0.8%	69.2%	-0.1%	25.5%	-1.3%	0.3%	-0.05

Appendix 7: Changes in TAIDD CI scores and individual variables (raw data), Full dataset, 2014-2019

GEO Codes	GEO Labels	BEDS/POP (2009-2014)	ARRIV/POP (2009-2014)	BEDS/AREA (2009-2014)	ARRIV+POP / AREA (2009-2014)	EMPL % (2009-2014)	TDGDP (2009-2014)	TAIDDCI (2009-2014)
AT11	Burgenland (AT)	-3.4%	8.3%	-1.8%	7.9%	-0.9%	0.5%	-0.18
AT12	Niederösterreich	1.8%	6.0%	3.2%	4.8%	-0.2%	0.5%	-0.09
AT13	Wien	17.5%	34.4%	23.6%	31.3%	-0.3%	0.5%	0.05
AT21	Kärnten	-3.3%	5.5%	-3.9%	3.8%	-1.9%	0.5%	-0.32
AT22	Steiermark	12.9%	15.1%	13.9%	11.4%	-0.1%	0.5%	-0.08
AT31	Oberösterreich	-3.6%	9.2%	-2.4%	6.8%	-0.2%	0.5%	-0.11
AT32	Salzburg	0.2%	17.0%	1.6%	17.0%	-1.9%	0.5%	-0.28
AT33	Tirol	-1.6%	11.4%	1.1%	13.5%	-1.3%	0.5%	-0.31
AT34	Vorarlberg	3.1%	13.2%	5.4%	13.2%	-0.6%	0.5%	-0.16
BE10	Brussels	8.8%	11.9%	19.4%	19.2%	-0.2%	0.2%	-0.06
BE21	Prov. Antwerpen	-0.3%	13.4%	4.0%	10.8%	0.0%	0.2%	-0.01
BE22	Prov. Limburg (BE)	-11.7%	-6.0%	-9.1%	-0.6%	0.6%	0.2%	-0.02
BE23	Prov. Oost-Vlaanderen	9.8%	32.2%	13.7%	14.5%	0.2%	0.2%	0.04
BE24	Prov. Vlaams-Brabant	4.3%	38.0%	8.1%	20.6%	-0.1%	0.2%	0.01
BE25	Prov. West-Vlaanderen	-5.0%	21.7%	-3.1%	17.6%	0.7%	0.2%	0.02
BE31	Prov. Brabant wallon	4.0%	20.9%	8.5%	12.1%	-0.3%	0.2%	0.00
BE32	Prov. Hainaut	0.1%	34.0%	2.4%	9.6%	0.6%	0.2%	0.06
BE33	Prov. Liège	-10.2%	3.1%	-7.2%	4.8%	-0.5%	0.2%	-0.05
BE34	Prov. Luxembourg (BE)	-11.9%	-5.2%	-8.2%	0.2%	1.5%	0.2%	0.00
BE35	Prov. Namur	-8.7%	3.7%	-5.3%	5.6%	0.2%	0.2%	0.00
BG31	Severozapaden	6.6%	28.0%	-2.1%	-2.9%	-1.9%	-0.1%	-0.17
BG32	Severen tsentralen	8.3%	30.3%	2.3%	2.0%	0.7%	-0.1%	0.01
BG33	Severoiztochen	15.6%	22.6%	13.1%	9.2%	0.9%	-0.1%	0.00
BG34	Yugoiztochen	16.9%	54.9%	13.6%	22.4%	0.2%	-0.1%	-0.02
BG41	Yugozapaden	15.9%	44.7%	15.7%	15.4%	-0.3%	-0.1%	-0.06
BG42	Yuzhen tsentralen	5.6%	49.1%	2.3%	11.1%	0.4%	-0.1%	-0.02
CY00	Kypros	-8.4%	-3.0%	-1.4%	5.3%	0.4%	1.5%	-0.01
CZ01	Praha	0.3%	37.0%	2.7%	32.0%	0.9%	-0.4%	-0.05
CZ02	Strední Cechy	3.4%	17.0%	9.5%	12.0%	0.5%	-0.4%	-0.04
CZ03	Jihozápad	5.3%	24.2%	6.0%	13.7%	0.1%	-0.4%	-0.07
CZ04	Severozápad	4.7%	21.6%	3.8%	9.2%	-0.1%	-0.4%	-0.09
CZ05	Severovýchod	1.5%	11.7%	1.7%	6.5%	-0.1%	-0.4%	-0.10
CZ06	Jihovýchod	23.3%	38.0%	24.3%	18.3%	-0.3%	-0.4%	-0.06
CZ07	Strední Morava	21.2%	33.0%	20.5%	12.5%	0.0%	-0.4%	-0.05
CZ08	Moravskoslezsko	19.2%	22.1%	17.2%	5.3%	0.3%	-0.4%	-0.05

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DE11	Stuttgart	7.6%	28.7%	6.7%	13.8%	0.1%	0.1%	-0.05
DE12	Karlsruhe	-2.2%	23.5%	-3.5%	12.0%	0.2%	0.1%	-0.06
DE13	Freiburg	2.1%	20.5%	1.1%	13.1%	0.0%	0.1%	-0.08
DE14	Tübingen	4.8%	20.8%	3.2%	10.1%	-0.3%	0.1%	-0.08
DE21	Oberbayern	-2.4%	25.7%	0.6%	22.2%	0.6%	0.1%	-0.02
DE22	Niederbayern	-5.7%	13.9%	-5.9%	9.0%	-0.6%	0.1%	-0.14
DE23	Oberpfalz	-1.6%	17.8%	-2.1%	9.8%	-0.7%	0.1%	-0.12
DE24	Oberfranken	-2.4%	15.3%	-4.7%	6.3%	0.5%	0.1%	-0.03
DE25	Mittelfranken	1.5%	25.9%	1.2%	15.8%	-0.6%	0.1%	-0.10
DE26	Unterfranken	2.7%	22.0%	0.5%	10.8%	0.5%	0.1%	-0.03
DE27	Schwaben	-0.8%	23.0%	0.3%	16.5%	0.0%	0.1%	-0.07
DE30	Berlin	30.0%	44.0%	29.7%	30.7%	0.6%	0.1%	0.16
DE40	Brandenburg	5.1%	22.6%	2.1%	10.0%	-0.3%	0.1%	-0.08
DE50	Bremen	23.3%	32.8%	22.5%	18.2%	0.9%	0.1%	0.02
DE60	Hamburg	32.6%	40.6%	30.7%	27.0%	0.4%	0.1%	0.07
DE71	Darmstadt	7.2%	28.0%	8.2%	19.5%	0.4%	0.1%	-0.03
DE72	Gießen	-3.8%	12.2%	-6.2%	3.2%	-0.1%	0.1%	-0.08
DE73	Kassel	0.3%	12.7%	-2.3%	5.8%	0.4%	0.1%	-0.06
DE80	Mecklenburg-Vorpommern	4.3%	9.2%	0.0%	3.0%	-1.3%	0.1%	-0.20
DE91	Braunschweig	-2.3%	14.9%	-5.2%	5.3%	-0.8%	0.1%	-0.13
DE92	Hannover	7.2%	19.2%	4.7%	7.7%	0.5%	0.1%	-0.02
DE93	Lüneburg	0.7%	9.5%	-0.8%	4.2%	-0.7%	0.1%	-0.12
DE94	Weser-Ems	2.2%	14.1%	0.9%	7.2%	-0.7%	0.1%	-0.12
DEA1	Düsseldorf	9.0%	30.6%	6.9%	12.5%	0.0%	0.1%	-0.07
DEA2	Köln	19.3%	33.2%	17.9%	16.5%	-0.1%	0.1%	-0.05
DEA3	Münster	7.5%	14.2%	6.2%	4.1%	0.1%	0.1%	-0.06
DEA4	Detmold	-2.7%	11.9%	-3.9%	3.8%	-0.2%	0.1%	-0.08
DEA5	Arnsberg	9.3%	20.1%	4.9%	4.7%	-0.1%	0.1%	-0.07
DEB1	Koblenz	0.8%	13.5%	-0.9%	7.1%	-0.7%	0.1%	-0.13
DEB2	Trier	1.3%	4.5%	2.0%	4.3%	0.2%	0.1%	-0.12
DEB3	Rheinhessen-Pfalz	3.1%	15.5%	2.5%	7.6%	0.4%	0.1%	-0.04
DEC0	Saarland	20.7%	41.3%	16.0%	11.7%	-1.3%	0.1%	-0.14
DED2	Dresden	7.4%	25.3%	4.3%	13.1%	-0.3%	0.1%	-0.08
DED4	Chemnitz	2.2%	13.1%	-1.8%	2.3%	-0.1%	0.1%	-0.08
DED5	Leipzig	6.2%	31.0%	8.0%	20.7%	-0.2%	0.1%	-0.06
DEE0	Sachsen-Anhalt	2.4%	18.3%	-3.5%	3.3%	0.0%	0.1%	-0.06
DEF0	Schleswig-Holstein	1.8%	16.7%	1.1%	10.4%	0.3%	0.1%	-0.07
DEG0	Thüringen	3.8%	12.4%	-1.1%	2.2%	0.0%	0.1%	-0.07
DK01	Hovedstaden	13.6%	33.5%	19.5%	24.4%	0.9%	0.3%	0.13

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DK02	Sjælland	-0.7%	2.6%	-1.3%	0.5%	-0.3%	0.3%	0.01
DK03	Syddanmark	6.9%	10.1%	7.2%	5.8%	0.8%	0.3%	0.09
DK04	Midtjylland	4.3%	11.5%	6.8%	7.1%	0.7%	0.3%	0.09
DK05	Nordjylland	4.0%	4.9%	4.1%	2.9%	0.4%	0.3%	0.05
EE00	Eesti	19.2%	46.0%	17.4%	26.4%	0.9%	0.5%	0.11
EL30	Attiki	0.8%	16.4%	-2.6%	3.9%	0.7%	1.8%	0.06
EL41	Voreio Aigaio	1.2%	13.4%	0.7%	8.6%	2.5%	1.8%	0.18
EL42	Notio Aigaio	7.6%	12.8%	8.6%	12.7%	5.9%	1.8%	0.28
EL43	Kriti	8.9%	50.9%	11.1%	44.0%	2.4%	1.8%	0.27
EL51	Anatoliki Makedonia, Thraki	18.0%	1.2%	17.9%	0.6%	0.5%	1.8%	0.08
EL52	Kentriki Makedonia	-1.4%	9.4%	-1.9%	5.1%	2.1%	1.8%	0.16
EL53	Dytiki Makedonia	4.0%	-32.7%	1.1%	-16.9%	1.6%	1.8%	0.13
EL54	Ipeiros	17.9%	12.0%	16.5%	6.1%	1.8%	1.8%	0.17
EL61	Thessalia	4.8%	-8.7%	3.6%	-6.3%	-0.5%	1.8%	-0.02
EL62	Ionia Nisia	6.9%	20.0%	6.6%	17.3%	-0.6%	1.8%	-0.10
EL63	Dytiki Ellada	5.6%	-25.0%	3.2%	-15.7%	1.8%	1.8%	0.13
EL64	Sterea Ellada	3.9%	-13.6%	4.3%	-7.5%	0.0%	1.8%	0.01
EL65	Peloponnisos	8.6%	2.0%	8.2%	1.0%	1.5%	1.8%	0.12
ES11	Galicia	8.0%	7.6%	7.2%	3.7%	1.2%	0.7%	0.03
ES12	Principado de Asturias	13.1%	7.5%	11.2%	3.0%	-1.0%	0.7%	-0.13
ES13	Cantabria	3.6%	-4.6%	4.2%	-2.9%	-0.3%	0.7%	-0.13
ES21	País Vasco	25.8%	24.9%	25.4%	12.5%	0.4%	0.7%	0.00
ES22	Comunidad Foral de Navarra	19.6%	23.4%	21.3%	15.9%	0.8%	0.7%	0.04
ES23	La Rioja	20.5%	8.9%	18.7%	4.5%	0.6%	0.7%	0.01
ES24	Aragón	13.5%	13.6%	12.5%	7.9%	-1.0%	0.7%	-0.10
ES30	Comunidad de Madrid	8.9%	15.2%	9.8%	10.0%	-0.9%	0.7%	-0.11
ES41	Castilla y León	17.5%	3.0%	15.1%	-0.1%	1.1%	0.7%	0.02
ES42	Castilla-la Mancha	20.8%	0.5%	21.3%	0.7%	1.1%	0.7%	0.04
ES43	Extremadura	16.5%	6.9%	16.7%	4.0%	0.7%	0.7%	0.00
ES51	Cataluña	5.5%	20.0%	5.3%	13.9%	0.0%	0.7%	-0.05
ES52	Comunitat Valenciana	11.2%	11.8%	10.7%	6.9%	1.6%	0.7%	0.05
ES53	Illes Balears	-0.6%	16.2%	3.6%	19.3%	0.6%	0.7%	-0.18
ES61	Andalucía	8.0%	11.4%	10.3%	9.8%	1.4%	0.7%	0.03
ES62	Región de Murcia	-0.4%	8.3%	1.0%	5.3%	2.2%	0.7%	0.10
ES70	Canarias	-3.2%	16.6%	1.1%	18.8%	2.9%	0.7%	0.01
FI19	Länsi-Suomi	14.4%	0.6%	16.5%	2.2%	0.5%	-0.1%	0.02
FI1B	Helsinki-Uusimaa	0.8%	15.1%	6.4%	15.8%	0.4%	-0.1%	0.02

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FI1C	Etelä-Suomi	19.0%	6.8%	20.1%	5.0%	-0.3%	-0.1%	-0.03
FI1D	Pohjois- ja Itä-Suomi	15.5%	4.8%	15.9%	3.7%	-0.5%	-0.1%	-0.05
FR10	Île de France	-9.1%	12.4%	-6.8%	11.8%	-0.7%	0.1%	-0.17
FRB0	Centre - Val de Loire	-13.6%	12.3%	-12.3%	9.4%	0.1%	0.1%	-0.05
FRC1	Bourgogne	-10.9%	9.3%	-10.9%	6.6%	0.1%	0.1%	-0.06
FRC2	Franche-Comté	-10.6%	12.1%	-9.8%	7.8%	0.2%	0.1%	-0.05
FRD1	Basse-Normandie	-25.9%	16.3%	-25.5%	12.1%	-1.3%	0.1%	-0.19
FRD2	Haute-Normandie	-26.6%	24.3%	-25.6%	14.2%	0.4%	0.1%	-0.03
FRE1	Nord-Pas-de-Calais	-56.4%	17.3%	-55.9%	9.6%	0.0%	0.1%	-0.13
FRE2	Picardie	-42.7%	27.7%	-42.2%	15.4%	1.0%	0.1%	-0.01
FRF1	Alsace	-12.5%	23.2%	-11.1%	17.5%	0.5%	0.1%	-0.03
FRF2	Champagne-Ardenne	-10.4%	12.7%	-10.3%	8.0%	-1.0%	0.1%	-0.12
FRF3	Lorraine	-23.6%	30.8%	-23.8%	15.5%	1.2%	0.1%	0.03
FRG0	Pays-de-la-Loire	-23.5%	19.4%	-20.2%	16.5%	0.0%	0.1%	-0.11
FRH0	Bretagne	-15.7%	25.8%	-13.0%	20.0%	0.9%	0.1%	-0.03
FRI1	Aquitaine	-16.8%	29.7%	-13.2%	25.2%	0.3%	0.1%	-0.08
FRI2	Limousin	-7.7%	4.8%	-8.1%	2.4%	0.9%	0.1%	-0.01
FRI3	Poitou-Charentes	-19.8%	18.9%	-18.1%	15.2%	1.1%	0.1%	-0.03
FRJ1	Languedoc-Roussillon	-18.0%	16.1%	-13.6%	17.7%	1.9%	0.1%	-0.03
FRJ2	Midi-Pyrénées	-4.0%	6.6%	0.0%	8.6%	0.1%	0.1%	-0.07
FRK1	Auvergne	-9.2%	12.4%	-8.1%	9.3%	1.1%	0.1%	0.00
FRK2	Rhône-Alpes	-9.1%	38.0%	-4.9%	30.1%	-0.5%	0.1%	-0.08
FRL0	Provence-Alpes-Côte d'Azur	-10.3%	34.2%	-8.5%	26.8%	-0.9%	0.1%	-0.14
FRM0	Corse	12.2%	22.5%	19.0%	26.8%	-0.2%	0.1%	0.51
HR03	Jadranska Hrvatska	85.3%	58.2%	84.1%	47.7%	3.0%	0.7%	0.55
HR04	Kontinentalna Hrvatska (NUTS 2016)	29.2%	41.3%	26.8%	9.5%	-0.5%	0.7%	-0.20
HU10	Közép-Magyarország (NUTS 2013)	32.8%	49.4%	34.6%	25.3%	0.1%	0.1%	0.05
HU21	Közép-Dunántúl	24.9%	48.2%	21.1%	15.7%	0.8%	0.1%	0.09
HU22	Nyugat-Dunántúl	25.0%	21.5%	23.3%	10.6%	0.2%	0.1%	0.03
HU23	Dél-Dunántúl	121.8%	47.9%	113.5%	16.4%	-0.8%	0.1%	0.07
HU31	Észak-Magyarország	44.8%	61.3%	39.3%	16.4%	-0.5%	0.1%	0.02
HU32	Észak-Alföld	30.5%	25.0%	28.9%	6.1%	0.0%	0.1%	0.02
HU33	Dél-Alföld	48.4%	54.2%	43.2%	9.6%	-0.1%	0.1%	0.03

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IE00	Ireland	-8.6%	18.9%	-6.3%	15.2%	0.8%	0.2%	0.04
ITC1	Piemonte	4.3%	12.8%	6.3%	8.0%	0.6%	1.2%	0.09
ITC2	Valle d'Aosta/Vallée d'Aoste	-1.7%	6.0%	0.0%	7.1%	1.9%	1.2%	0.03
ITC3	Liguria	-7.4%	10.6%	-6.5%	8.4%	1.0%	1.2%	0.03
ITC4	Lombardia	-0.7%	18.2%	3.8%	14.8%	0.2%	1.2%	0.06
ITF1	Abruzzo	-0.2%	3.1%	1.9%	3.8%	0.1%	1.2%	0.03
ITF2	Molise	7.9%	-20.0%	7.2%	-8.0%	0.5%	1.2%	0.07
ITF3	Campania	-4.6%	5.1%	-2.6%	4.3%	0.4%	1.2%	0.05
ITF4	Puglia	15.8%	8.3%	17.2%	4.7%	0.6%	1.2%	0.10
ITF5	Basilicata	1.1%	25.0%	0.2%	10.1%	0.3%	1.2%	0.08
ITF6	Calabria	-5.5%	-8.7%	-5.1%	-3.3%	1.3%	1.2%	0.09
ITG1	Sicilia	8.6%	10.4%	10.9%	6.9%	0.2%	1.2%	0.06
ITG2	Sardegna	2.6%	-3.5%	3.9%	-0.8%	1.3%	1.2%	0.09
ITH1	Provincia Autonoma di Bolzano	-4.3%	6.1%	-0.2%	10.1%	0.1%	1.2%	-0.17
ITH2	Provincia Autonoma di Trento	-2.3%	6.8%	1.7%	10.2%	0.7%	1.2%	-0.01
ITH3	Veneto	-1.0%	14.3%	1.0%	12.9%	0.9%	1.2%	0.05
ITH4	Friuli-Venezia Giulia	-9.1%	5.1%	-8.5%	3.8%	1.6%	1.2%	0.09
ITH5	Emilia-Romagna	-0.1%	1.8%	3.8%	5.2%	1.2%	1.2%	0.09
ITI1	Toscana	2.4%	11.8%	5.4%	12.1%	1.0%	1.2%	0.08
ITI2	Umbria	-0.7%	14.8%	1.8%	13.0%	0.0%	1.2%	0.03
ITI3	Marche	84.8%	10.5%	86.8%	7.1%	1.5%	1.2%	0.29
ITI4	Lazio	-1.6%	-6.9%	6.9%	3.8%	0.7%	1.2%	0.04
LT00	Lietuva (NUTS 2013)	120.1%	131.7%	103.5%	26.7%	0.1%	-0.3%	0.04
LU00	Luxembourg	-11.8%	13.1%	-1.8%	20.8%	0.1%	-0.3%	-0.09
LV00	Latvija	29.9%	103.6%	20.2%	25.1%	0.8%	0.3%	0.07
MT00	Malta	-0.1%	33.3%	4.4%	29.9%	-0.3%	1.9%	-0.21
NL11	Groningen	8.5%	4.4%	10.1%	3.7%	-0.2%	-0.1%	-0.03
NL12	Friesland (NL)	10.5%	4.9%	10.7%	3.7%	1.0%	-0.1%	0.04
NL13	Drenthe	14.1%	14.4%	13.8%	10.6%	-0.2%	-0.1%	0.00
NL21	Overijssel	10.6%	9.6%	12.0%	6.9%	-0.1%	-0.1%	-0.02
NL22	Gelderland	12.2%	15.9%	13.8%	11.0%	0.0%	-0.1%	0.00
NL23	Flevoland	42.2%	38.8%	48.2%	26.2%	0.1%	-0.1%	0.08
NL31	Utrecht	2.2%	20.5%	5.8%	13.5%	-0.2%	-0.1%	-0.03
NL32	Noord-Holland	12.5%	31.9%	16.5%	28.7%	0.5%	-0.1%	0.08
NL33	Zuid-Holland	12.3%	22.5%	15.4%	14.3%	-0.1%	-0.1%	-0.01

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The project is carried out within the framework of the National Recovery and Resilience Plan Greece 2.0, funded by the European Union - NextGenerationEU (Implementation Body: HFRI).

NL34	Zeeland	11.1%	35.4%	11.0%	28.8%	0.6%	-0.1%	0.11
NL41	Noord-Brabant	6.8%	17.9%	8.8%	11.6%	-0.1%	-0.1%	-0.02
NL42	Limburg (NL)	21.2%	10.6%	21.0%	7.6%	-0.5%	-0.1%	-0.04
PL12	Mazowieckie (NUTS 2013)	14.0%	34.5%	17.6%	15.7%	0.0%	0.0%	0.03
PL21	Malopolskie	25.6%	36.6%	26.7%	17.6%	0.3%	0.0%	0.05
PL22	Slaskie	17.0%	21.7%	14.6%	3.6%	0.2%	0.0%	0.03
PL41	Wielkopolskie	9.4%	19.6%	10.8%	7.3%	-0.3%	0.0%	0.00
PL42	Zachodniopomorskie	11.2%	26.9%	11.1%	13.7%	0.9%	0.0%	0.08
PL43	Lubuskie	-21.9%	-2.5%	-21.9%	-1.0%	0.0%	0.0%	0.00
PL51	Dolnoslaskie	18.3%	34.4%	18.0%	13.0%	-0.8%	0.0%	-0.03
PL52	Opolskie	8.7%	35.5%	1.1%	-1.0%	0.3%	0.0%	0.05
PL61	Kujawsko-Pomorskie	3.4%	21.2%	3.4%	5.8%	-0.3%	0.0%	0.00
PL62	Warminsko-Mazurskie	4.2%	30.1%	3.8%	10.8%	-0.4%	0.0%	-0.01
PL63	Pomorskie	16.9%	33.7%	19.3%	16.5%	0.0%	0.0%	0.03
PL71	Lódzkie	31.9%	32.7%	28.4%	5.7%	0.0%	0.0%	0.03
PL72	Swietokrzyskie	39.4%	27.2%	36.2%	3.8%	0.2%	0.0%	0.04
PL81	Lubelskie	12.3%	19.5%	10.0%	2.4%	0.6%	0.0%	0.07
PL82	Podkarpackie	26.2%	35.6%	24.1%	6.6%	-0.3%	0.0%	0.01
PL84	Podlaskie	15.9%	41.1%	12.5%	7.7%	0.2%	0.0%	0.04
PT11	Norte	19.0%	32.1%	16.8%	11.6%	-0.2%	2.7%	0.25
PT15	Algarve	13.4%	27.8%	14.0%	24.6%	3.1%	2.7%	0.43
PT16	Centro (PT)	8.5%	15.6%	5.7%	5.3%	0.9%	2.7%	0.31
PT17	Área Metropolitana de Lisboa	8.6%	38.8%	9.2%	23.2%	-0.1%	2.7%	0.24
PT18	Alentejo	27.9%	29.1%	24.3%	12.4%	0.0%	2.7%	0.26
PT20	Região Autónoma dos Açores	8.8%	9.8%	9.2%	5.9%	-0.6%	2.7%	0.20
PT30	Região Autónoma da Madeira	7.4%	12.1%	5.9%	7.8%	-0.9%	2.7%	0.08
RO11	Nord-Vest	7.9%	39.1%	2.7%	3.1%	0.9%	0.0%	0.11
RO12	Centru	66.6%	94.3%	55.3%	19.4%	-0.1%	0.0%	0.07
RO21	Nord-Est	38.6%	40.2%	22.1%	-6.6%	0.5%	0.0%	0.09
RO22	Sud-Est	-16.0%	14.2%	-25.2%	-7.3%	0.1%	0.0%	0.02
RO31	Sud - Muntenia	38.6%	26.5%	30.3%	-2.1%	-0.2%	0.0%	0.04
RO32	Bucuresti - Ilfov	1.4%	62.6%	2.7%	20.7%	0.4%	0.0%	0.06
RO41	Sud-Vest Oltenia	32.7%	46.6%	19.5%	-4.1%	0.1%	0.0%	0.06
RO42	Vest	21.2%	33.7%	14.5%	1.8%	0.7%	0.0%	0.10
SE11	Stockholm	4.7%	16.0%	14.3%	21.7%	0.0%	-0.2%	-0.04

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SE12	Östra Mellansverige	-4.7%	6.0%	-1.0%	7.8%	0.3%	-0.2%	-0.03
SE21	Småland med öarna	-1.3%	3.2%	0.1%	3.8%	0.3%	-0.2%	-0.05
SE22	Sydsverige	0.5%	5.5%	4.9%	8.2%	0.4%	-0.2%	-0.03
SE23	Västsverige	-1.6%	11.2%	2.2%	12.2%	-0.2%	-0.2%	-0.07
SE31	Norra Mellansverige	-0.3%	1.6%	0.2%	1.7%	0.9%	-0.2%	-0.02
SE32	Mellersta Norrland	-0.5%	7.0%	-0.9%	4.9%	-0.4%	-0.2%	-0.10
SE33	Övre Norrland	5.1%	10.9%	5.7%	8.9%	0.5%	-0.2%	-0.01
SI03	Vzhodna Slovenija	18.7%	13.0%	18.6%	6.4%	0.3%	0.0%	-0.02
SI04	Zahodna Slovenija	24.4%	24.6%	28.4%	19.7%	0.1%	0.0%	-0.01
SK01	Bratislavský kraj	20.1%	20.1%	24.8%	15.7%	0.1%	-0.3%	-0.04
SK02	Západné Slovensko	8.2%	3.2%	7.6%	0.4%	1.0%	-0.3%	0.00
SK03	Stredné Slovensko	9.4%	11.7%	9.2%	4.8%	0.2%	-0.3%	-0.05
SK04	Východné Slovensko	6.7%	1.6%	8.1%	1.9%	0.5%	-0.3%	-0.04

Appendix 8: Changes in TAIDD CI scores and individual variables (raw data), Full dataset, 2009-2014