A quantitative exploration of digital nomads' location factors for destination countries

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Abstract

Digital nomadism is a growing phenomenon and is increasingly impacting local economies. This research investigates the factors influencing digital nomads' choice of destination countries and the implications for economic development. The study aims to explain the popularity of destination countries for digital nomads using economic geography theory, specifically examining amenities, digital factors of production, and policies (visas and strategies) through quantitative exploration and modeling. A dataset was compiled for destination countries using travel logs from Nomad List, a digital nomad social media platform, to determine the length of stay. Country indicators were added, such as temperature, number of coworking spaces, internet speeds, prior tourism volumes, and tourist visa-free days, among others. The study applies a regression model with individual and time fixed effects. Key findings reveal that enhancement of digital infrastructure, increasing coworking and coliving spaces, and targeting upper-middle-income countries would effectively increase digital nomadism. Additionally, governments are advised to develop and simplify digital nomad visa processes to track digital nomads more accurately. These empirical insights can be used by policymakers to better harness the economic potential of digital nomadism and by academia to further develop strategies to study digital nomadism quantitatively.

1. Introduction

The Fourth Industrial Revolution, the digitization of everything, gave rise to new working phenomena such as the gig-economy, remote working, and digital nomadism (Johnson, 2020; Thompson, 2018). Digital nomads are 'individuals who, taking advantage of portable computing technologies and widespread Internet access, can work remotely from any location and use this freedom to explore the world' (Mancinelli, p. 417, 2020). At this moment, digital nomadism starts to have its impacts on the economic development of countries. The digital nomad population's size is estimated to be comparable to the population of Canada or Morocco (A Brother Abroad, 2024). Many countries try to attract them, often under generous visa conditions. Currently (in 2022), 49 countries in the world offer special digital nomad visas. Cape Verde, for example, a small developing island nation in Africa, offers visas for a € 20 euro fee, if an individual can prove its monthly income of (only) €1,500 per month (NomadGirl, 2023). Countries use digital nomadism, and visas, in the hope to spin-off economic development. Spain, for example, tries to become a global business hub by attracting talented people and investment by offering a digital nomad visa (Broom, 2022). On the other hand, in other countries, digital nomads may have negative economic impacts as tensions rise. There are concerns in Portugal and Bali regarding gentrification because of digital nomads.

A Brother Abroad (2024), an online travel blog focused on digital nomadism, analyzed an online survey with over 4000 responses. The website states that the digital nomad population consists of over 35 000 000 individuals, who are estimated to spend over 787 million dollars annually. The size of the population is comparable to the size of the population of Canada or Morocco. Digital nomads primarily originate from the West, specifically the United States of America (31% of the population). Digital nomads tend to settle in warm, coastal countries that have a lower gross national income per capita than the average budget of a digital nomad according to the website. Digital nomads themselves report that they find cost of living and fast, accessible internet the most important factors for a location decision. On a micro level, digital nomads may tend to concentrate, as many express the need to work in a space with other people at least once per week.

Existing academic research about digital nomadism mainly investigates the lifestyles of digital nomads and adopts qualitative approaches. From an economic perspective, research revolves around digital factors of production, and government-digital nomad relationships (Wang et al., 2018). The field of Economic Geography gave the topic barely any attention. Gaining more understanding of this geography would greatly benefit literature that delves into the effects of the Fourth Industrial Revolution on space, such as by Friedmann (2006). Overall consensus may be that the Fourth Industrial Revolution changed the 'magnetic field', or weight of certain pull and push factors in space, and thereby rearranging the degree of stickiness of certain places. Digital nomads would be rather sensitive to these factors since they are freer movers in space (Dal Fiore et al., 2014). Additionally, there is an empirical gap in academic research on the topic, existing statistics about digital nomads' location preferences may be found on (popular) websites such as A Brother Abroad, but there is a clear lack of quantitative empirical work in academia. Therefore, many (empirical) relationships between potential factors remain unknown. The lack of explored relationships may come at the cost of the quality policies of countries that use digital nomadism to

try to stimulate economic growth. Finally, online quantitative studies (such as from A Brother Abroad) reveal some descriptive statistics about the digital nomad population, but fail to apply more advanced statistical techniques, for example to control for individual heterogeneity or other explanatory factors.

This research aims to uncover deeper knowledge about digital nomads by investigating where digital nomads settle and why in a quantitative fashion. It aims to do so by researching the factors that determine the popularity of destinations on a macro-scale, that is country level. This is because labor market policies are almost exclusively made on the country-level as well (Boeri, 2021).

The following questions are central to the research:

To what extent can quantitative data on length of stay and location factors of digital nomad destination countries help policymakers to attract digital nomads and spur economic development?

Additionally, the following sub questions are posed:

1. *How large is the role of amenities in explaining the length of stay of digital nomads in a destination country?*
2. *How large is the role of the availability of factors of production, especially coworking places, for digital nomads in explaining the length of stay for digital nomads in a destination country?*
3. *Which tools can policymakers use to increase the length of stay of digital nomads in a destination country?*

As such, the paper researches the location behavior of digital nomads. As a framework, the Sunbelt hypothesis is used to analyze digital nomad's location behavior. The Sunbelt hypothesis is relevant because it is a past (and still ongoing) migratory phenomenon in the United States, initiated by the Fourth Industrial Revolution as well. The hypothesis states that Americans have been moving to Southern states because they demand warmer weather, lower costs, and better amenities. Digital nomads seem to move to similar places as well; to countries that are warmer and less costly than the West. The research explains the popularity of a destination countries for digital nomads. To operationalize we specifically look at the length of stay in countries by digital nomads, and explanatory factors, such as PPP, internet speed, visa regulations, temperature, coworking spaces, and more. The research uses secondary data. The most important data source is a dataset with travel logs from Nomad List (2023), a social media platform for digital nomads. The dataset is essential for the research, as travels made by digital nomads are normally hard to track. The latter is arguably the reason why existing academic research barely use quantitative methods. This comes at the cost of knowledge about digital nomadism. The results may help policy makers looking to stimulate digital nomadism in the quest to economic development, and it helps academia to understand the effects of the Fourth Industrial Revolution on migration and space, specifically through the phenomenon of digital nomadism.

2. Theory

As noted, economic geography theory provides a valid benchmark to explore digital nomadism and location preferences. Section 2.1 delves into amenity theory with a specific role of the Sunbelt hypothesis. Section 2.2 uses the historical move to digital factors of production to benchmark digital nomads' location decisions. It should be noted that both paradigms are interrelated. The digital nomad location factors mentioned within one section are therefore not necessarily arbitrary from the other section.

2.1. The Fourth Industrial Revolution and the geography of amenities

In the US, the Fourth Industrial Revolution has set off migration towards Sunbelt states. The Fourth Industrial Revolution stands for the digitization of industrial processes (Bloem et al, 2014). Scholars recognized that the Sunbelt experienced population increases, while the Rustbelt suffered population losses (Strom, 2017; Watkins, 1978). The Fourth Industrial Revolution is said to have given workers and firms a free-choice to move to places with good weather, cheap housing and amenities (Hollander, 2011). Pike et al. (p. 87, 2017) call this a move away from the factors of production for industry to the factors of production for a happy life. Digital nomadism is also a phenomenon that is set off by the Fourth Industrial Revolution. Due to the availability of digital workplace technology, new working arrangements such as remote working and freelancing exist (Johnson, 2020). In terms of location decision by digital nomads, reliable internet, good weather and low cost of living are identified as important location factors (Kelly et al., 2021).

Preferences for amenities have strongly influenced the locational/migration choices of individuals and households (Kemeny & Storper, 2012). Patridge (2010) claims that 'the influence of amenities has been remarkable growth in the Sunbelt'. Amenities are important for the location decisions of digital nomads too, due to the possibility of remote work, workers can now (hypothetically) move to high-amenity places with low productivity (Kahn, 2022). Generally, amenities can be divided into two sub-groups: natural and man-made and are simply anything that shifts an individual's willingness to locate to a particular location (Partridge & Ali, 2008).

After World War Two, the United States started to experience migration towards natural amenity rich places (Patridge, 2010). In the 1970s these effects first started to be empirically analyzed by Graves (1976) (Patridge, 2010). Graves found that (natural) amenities are a superior good because they are more valued at higher income levels. Glaeser & Tobio (2007) verify that there is an effect of climate on the rise of the Sunbelt. Specifically, they find evidence that prior to 1970, the increasing population in the Sunbelt is almost entirely driven by the increasing association between warmth and economic productivity, while controlling for other factors. Weather, together with nature, is often emphasized in academic research with regards to digital nomads' location decisions. Lhakard (2022) finds that in Chiang Mai, Thailand, a popular digital nomad destination, the weather is attractive to digital nomads, because it offers a cooler climate than the rest of Thailand, which makes it more bearable for digital nomads (who primarily originate from the West), yet it is still warm. Lhakard states that climate and nature is a major factor for digital

nomads. Zhou et al. (2024) find that climate (and nature) is often referred to on the Web as a digital nomad attractor. An example quote from the Web is 'The country boasts a warm and sunny climate, making it an excellent location for those who enjoy outdoor activities'.

A specific man-amenity that caters to digital nomads would be co-living spaces. Co-living spaces are shared accommodations for digital nomads, enabling them to have multiple short-term tenancies across the globe (Bergan, 2021). Co-living spaces offer social, productive, and mobile accommodation for digital nomads, to counter loneliness and disconnection from the local community (Chevtaeva, 2021; Lee et al., 2019). As such, co-living spaces are more dynamic than a regular home. This is because, besides being a place for living, it is also a workplace, and a social place (Lee et al., 2019). Furthermore, the formation of nomad villages and hubs is an important practice for a digital nomad destination development (Zhou et al., 2024). A good example is Ponta do Sol, the world's first digital nomad village, located in Madeira, Portugal. Ponta do Sol offers participants free coworking space with necessary equipment and high-speed Internet (Getman, 2021).

Research on digital nomad amenities adopt non-quantitative place-based approaches such as from Lhakard (2022) or Getmann (2021), which makes it hard to find global trends or to extrapolate to other geographies. Other studies apply more quantitative Web analyses, like Zhou et al. (2024) or Lee et al. (2019). These studies may find global trends; however, content analysis of websites does not unravel digital nomads' actual movements in space. The studies are useful, but academic knowledge on digital nomads' actual moves and location decisions on a global scale is minimal, presumably due to lack of data.

2.1.2. Leisure strategies for digital nomad policies

Since the Covid pandemic countries are offering digital nomad visas. Pre-Covid, digital nomads used tourist visas that usually forbid working. However, by offering special digital nomad visas, countries can manage the entry and stay of digital nomads (Sanchez-Vergara et al., 2023). Mancinelli (2020), finds that digital nomads determine their length of stay in a country primarily by visa regimes. Digital nomad marketing with the support of digital nomad visas provides a clear branding of a digital nomad destination (Zhou et al., 2024). Some strategies are part of larger tourism strategies, and other strategies are part of business and entrepreneurship discourses (highlighted later) (Mancinelli & Germann Molz, 2023).

For example, Foley at al. (2022) say that the visa schemes represent a rebranding of a country's sun and beach product. Many of the countries that offer digital nomad visas, are island-nations such as in the Caribbean (Dominica, Barbados, Curaçao etc.), Mauritius, or Cape Verde, because they are tourist dependent. Zhou et al. (2024) also state that many island and beach destinations market their natural environment and island climate to attract digital nomads. Cape Verde's Remote Working Cabo Verde plan, states on why digital nomads should choose Cape Verde: 'Go on and google "Cesária Évora" right this moment – can you already feel the vibe? Now picture the sun setting over the sea… ah, how perfect.' (Turismo de Cabo Verde, 2020). Indonesia, with digital nomad hot spot Bali, launched through the Ministry of Tourism a digital nomad destination and

digitization program to attract digital nomads (Prabawa & Pertiwi, 2020). Many countries try to diversify their tourism segments by attracting digital nomads. This strategy was strengthened due to Covid-19, for example, in Japan villages attracting domestic remote workers to offset the decline in tourism demand (Matsushita, 2023). As such many studies analyze how destinations use tourism strategies to attract digital nomads, yet no study investigates how and if digital nomads respond to this type of marketing. There is hardly any empirical evidence to support whether digital nomads belong to the tourist population, or if they constitute a segment of it, to begin with. Yet, in some literature digital nomadism is defined as a tourism segment.

2.2. The Fourth Industrial Revolution and the geography of factors of production

The shift from natural factors of production towards digital factors of production has a spreading effect on workers and businesses. The Fourth Industrial Revolution brought the widespread and cheap availability of the internet since the 2000s, which makes that (digital) factors of production can be found everywhere (Friedmann, 2006). The availability of the internet keeps transaction costs cheap for digital nomads (Getman, 2021). One third of digital nomads work in the marketing or IT sector, which are sectors in which fully remote work is possible (A Brother Abroad, 2024). The digital nomad works with codified knowledge (to a certain degree), which maintains transaction costs of information low too. As such, the enhancement of portable internet connections, intern speeds and accessibility to technological services are important points regarding attracting digital nomads (Zhou et al., 2024). Hypothetically this would mean that digital nomads would work from anywhere in the world, which implies a spreading effect.

Workers in the US were pushed out of dense ‘concentric zone’ cities in the Rustbelt, such as Chicago or Detroit. Althoff et al. (2022) find that nowadays, companies in denser areas of cities are more likely to offer remote jobs. Digital workers are forced out of these diseconomies of agglomeration of successful cities in wealthy countries. New realities of employment such as rising housing costs and stagnant pay make relocation from these cities necessary (Holleran, 2022). Digital nomads mostly search for a lower cost of living in the Global South, while working for higher wages in developed countries (Holleran, 2022). The concept is called geoarbitrage. Hayes & Pérez-Gañán (2016) define geoarbitrage as migrants that search to maximize quality of life by moving consumption to the best value-for-money location.

2.2.1. Coworking places

Digital workers often use coworking spaces (Wang et al., 2020; Cevtaeva & Denizci-Guillet, 2021). Coworking spaces are mostly used by self-employed individuals (Spinuzzi, 2012). 83% of the digital nomads reports to be self-employed, of which 66% owns a business, and the remainder works as freelancer (A Brother Abroad, 2024). Coworking spaces are ‘open plan offices that mobile, independent knowledge workers share as places of work’ (Waters-Lynch et al., 2016). Spinuzzi acknowledges that the rise of coworking spaces is linked to the trend of increased flexible

work arrangements. Coworking spaces could be a means to attract digital nomads by policymakers, as they are creatable. Zhou et al. (2024) identify that encouraging the operation of commercial coworking spaces is an important practice to develop a digital nomad destination. Besides that, coworking places create opportunities for knowledge spillovers into the local economy. Capdevila (2013) stresses that coworking spaces should be seen as 'microclusters' in which knowledge circulates among the members of the network, but are also spaces of interaction between insiders and outsiders. This circulation of information leads to valuable outcomes (Gandini, 2015).

It can therefore be stated that coworking places serve two broader purposes regarding digital nomads/-ism: 1) the attraction of digital nomads; the coworking place as an amenity to attract people, and 2) the extraction of economic value from digital nomadism for economic development by knowledge spillovers.

Generally, the internet, as a factor of production, has a spreading effect, but coworking places have a concentration effect. Usage of coworking places show that digital nomads may need face-to-face interactions and knowledge spillovers to a certain extent. Yet to which extent is unclear. This is mainly because literature such as from Capdevila and Gandini research how coworking places function in themselves. Cevtaeva & Denizci-Guillet research digital nomads that use coworking places specifically, but fail to make a comparison with digital nomads that do not make use of them.

2.2.2. Entrepreneurship strategies for digital nomad policy

Sánchez-Vergara et al. (2023) state that to attract qualified workers, governments implement mechanisms for the stay of digital nomads to promote economic development. Countries use digital nomad visas as part of broader business and entrepreneurship strategies. Spain for example, formulated to want to become a 'global business hub' by offering a digital nomad visa scheme (Broom, 2022). Academia verify this discourse too. For example, Sanchez-Vergara et al. (2023), state that countries develop digital nomad policies to 'promote a business environment and strengthen a high-level entrepreneurial ecosystem'. Mancinelli & Germann Molz (2023) also stress that the visa schemes often intersect with 'talent retention initiatives' targeting business owners and start-ups. Again, the literature mentioned uses qualitative techniques, therefore it is hard to extrapolate the results to a global scale.

3. Data

3.1. Travel logs

To analyze the length of stay by digital nomads in different destination countries, a dataset is used from nomadlist.com. Nomad List (2023) is a social media platform for digital nomads. Specifically, the data is published by Aalborg University (2021). The dataset consists of travel logs by the website's users coupled to usernames, locations, coordinates, and dates. The data is useful as it is a unique quantitative source that maps and tracks the movements of the digital nomad population. Other online quantitative studies such as the one from A Brother Abroad (2024) have not published their datasets. In general, it is hard to track digital nomads' movements due to weak relationships with the state. Many enter countries on tourist visas (especially in the past), and do not hold citizen status in a destination country, which makes it hard to track the digital nomad population. The dataset is a unique opportunity to analyze digital nomads' location behavior globally. As identified before, much academic research adopts place-based qualitative approaches. The few studies that adapt quantitative approaches use websites, or interactions on social media, as a data source. Although useful, it does not uncover actual location behavior. The dataset from Nomad List (2023) may therefore unravel new knowledge about digital nomads. A main concern may be that the social media platform is also used by regular travelers or other individuals that are not digital nomads. The proxy may also be spatially inconsistent, for example, in some places individuals may be more motivated to use the platform and log their travel than others. The limitations are acknowledged by the website itself. The website also states that there may be a selection bias as membership is paid for. Meanwhile, the website also states that the paid membership requires a commitment to join, on the contrary for Facebook groups for digital nomads for example. The website suggests that aspirational digital nomads are likely not to pay for a membership, while on Facebook, they might be part of some groups. (Nomad List, 2023)

Based on the travel logs, the length of stay for each observation was computed. The raw dataset provides start and end dates in specific places. The length of stay variable is constructed by counting the days between the start and end date of a travel log. These days were then summed per:

- Username
- Country: summing the days spend in different places within the same country
- End year: variable constructed of the year of the end date of a travel log (also used for fixed effect)

928 observations had more than 365 days, these have been set to 365 days. Due to summing up the length of stay for each country and year, the number of observations have more than halved, from over 40 000 to 19 776. The 19 776 observations (travel logs) were made by 2,817 usernames in total. It is found that observations prior to 2014, and after 2020 are inconsistent, which is why cases outside this timespan have been deleted. A few observations have useless or wrong geotags, these have been deleted or moderated where possible.

3.1.1. Descriptive statistics of length of stay

The most travel logs were made in the United States, 1881 logs, followed by Thailand with 1340 logs. As shown in Table 1, of the 10 most popular countries, the most are in the West (7 countries), and some in east Asia (3 countries). In total 133 countries were visited, by 2 817 usernames. The average username has visited 7 countries, and stays on average 47 days in one county. Users of the social media platform stay the longest in Russia (94 days), and after that the United States (89 days). Generally, the most visited countries are different from the countries that the users stay the longest in.

Total of travel logs	
Country	Total
United States	1881
Thailand	1340
Spain	944
Germany	876
United Kingdom	857
Indonesia	707
France	674
Netherlands	525
Portugal	500
China	493
Total	19776
Obs. = 19,776	

Mean length of stay	
Country	Mean
Russia	93.955
United States	88.525
Brazil	76.522
Egypt	73.395
Australia	71.779
Canada	69.371
South Africa	63.452
Bahrain	61.857
Kenya	60.920
United Kingdom	60.348
Total	47.412
Obs. = 19,776	

Table 1. Most popular countries.

3.2. Factor variables

For all the countries in the cleaned dataset from nomadlist.com, country indicators have been added. A separate dataset has been manually made for these country indicators. Both datasets are merged by many-to-one, which gives the dataset for analysis.

First, the temperature is measured as the average year-round temperature of a country. The data comes from the World Bank's Climate Change Knowledge Portal (2023). To measure the effect of co-living spaces, a variable was created that indicates if a country has a co-living space listed on coliving.com (2023) or a Selina hostel (2023). Coliving.com is an online platform to book co-living spaces. Selina is an international hostel chain focused on accommodating digital nomads specifically. The variable may also reflect the quality of the business climate of a country. The variable co-living is thus a dummy that represents the presence of a co-living space on the platform or a Selina hostel. Temperature and co-living are amenity indicators.

Secondly, to research geo-arbitrage and a general cost-effect, PPP private consumption is added as a factor. The PPP conversion factor for private consumption is provided by World Bank Group (a, 2023). The indicator represents the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as the U.S. dollar would buy in the United States. Furthermore, internet speed investigates the effect of transaction costs of digital work for digital nomads. The data comes from the Speedtest Global Index on speedtest.net (2023). The variable measures the speed of the internet in Mbps with broadband connection. Additionally, a coworking variable represents the amount of coworking spaces in a country. It determines the effect on the attraction of digital nomads, but also showcases the potential to extract economic value for local economies as well as for digital nomads themselves. The variable is constructed of the amount of search results on coworker.com (2023), an online booking platform for coworking places. The three variables PPP consumer, internet speed, and coworking are categorized as production variables.

Thirdly, policy factors are added to determine trajectories for the development of digital nomad policies. As indicated before, some countries use tourism strategies and others entrepreneurship strategies. Therefore, the tourism volume 2013 variable indicates the number of international tourism arrivals in 2013, from the World Bank Group b (2023). The variable is used to determine if digital nomadism is a continuation/extension of tourism trends. A visa indicator is added to determine the effects of visas on the length of stay by digital nomads. Because the data on the travel logs is older data, the effect of digital nomad visas cannot be tested. Therefore the visa indicator represents the number of visa free days for tourists with US passports. For destinations that have the ESTA visa scheme (US territory destinations), specifically the United States, US Virgin Island, and Puerto Rico, the variable is calculated for German passport holders. The data is retrieved from www.passportindex.org (2023). For 32 of the 133 countries in the dataset alternative sources have been used due to lack of data from the main source.

Finally, to determine the potential of digital nomadism for economic development, World Bank Group's (c, 2023) income categories are added. World Bank classifies countries based on the GNI per capita in four income categories (development levels): low income, lower middle income, upper middle income, and high income. For the analyses, the low income category and lower middle income category are merged into one category due to multicollinearity issues.

3.2.1. Description with country indicators

The distribution of mean number of days spent in a country by username and year between income levels are found in Table 2. The mean number of days increases with a country's income level. High income countries on average have a mean length of stay of 50 days, while for low and lower middle income countries the mean is a 41 days. In upper middle income countries, digital nomads on average spend approximately 1.5 months per year.

	Length of stay	
	Mean	SE
Income category		
Low and Lower middle income	40.611	1.263
Upper middle income	45.783	0.974
High income	49.476	0.779
Obs. = 19,776		

Table 2. Distribution between income levels.

Table 3 shows a correlation table between all variables. The log of length of stay generally has very weak relationships with the country indicators, the strongest relationship is with the coworking variable but has a strength of only 16.9%.

The income category variable has a strong negative association with temperature, the coefficient is -0.607, as to be expected. It furthermore has a moderate positive association with internet speed and the tourist visa variables, and a moderate negative association with PPP private consumption variable. Tourism volumes in 2013 has a moderate positive association with internet speed, and a strong positive association with the amount of coworking spaces in a country.

	Length of stay (log)	Income category	PPP consumer	Internet speed	Tourist visa free days	Coworking	Coliving or Selina	Temperature	Volume tourism 2013
Length of stay (log)	1								
Income category	-0.071	1							
PPP consumer	0.045	-0.4923	1						
Internet speed	0.071	0.424	-0.253	1					
Tourist visa free days	-0.031	0.485	-0.344	0.007	1				
Coworking	0.169	0.295	-0.118	0.309	0.255	1			
Coliving or Selina	0.117	0.130	0.019	0.105	0.272	0.227	1		
Temperature	0.052	-0.607	0.295	-0.113	-0.392	-0.285	0.189	1	
Volume tourism 2013	0.097	0.332	-0.171	0.519	0.103	0.644	0.148	-0.314	1
Obs. = 19,776									

Table 3. Correlation matrix.

4. Method

The research methodology employed in this study relies on quantitative analysis, aiming to uncover overarching and global trends within the realm of digital nomadism. Existing research predominantly focuses on individual destination areas and applies qualitative techniques, posing challenges in extrapolating findings to a broader spectrum of digital nomad destinations. Besides that, the dataset from Nomad List (2023) should not be unutilized by academia. The dataset provides a unique opportunity to gain more knowledge on digital nomadism.

For analysis, a regression technique is used. Firstly, regression analysis allows for multiple factors to be analyzed. Regression analysis also corrects for other factors' effects, which is what is lacking in statistics on the Web, such as from A Brother Abroad. As such, possible relationships that are found will be cleaner than other statistics. Moreover, regression analysis allows for the incorporation of fixed effects, an essential consideration given the potential variability across different time periods and individuals. By accounting for these fixed effects, the analysis can more accurately capture the nuances of digital nomadism trends over time and across diverse individuals.

4.1. Model specifications

Individual and time fixed effects are added to the model, based on usernames and end year (of a travel log). As such, the model accounts for heterogeneity of individuals and time. Accounting for individual heterogeneity is important as there are likely to be unexplored factors, because digital nomadism is a newly researched phenomenon. Therefore, many factors are likely to be unknown yet by academia. Adding time fixed effects is important because digital nomadism is a growing phenomenon. It is therefore expected to have heterogeneity between years. Furthermore, it is found that the residuals of the model are not normally distributed, therefore the dependent variable is transformed to the log of the length of stay, for the model to make better predictions. Additionally, the data is heteroskedastic, for this reason results are estimated with clustered robust standard errors, the clusters are based on usernames. Clustered robust standard errors are assumed to be a better fit than robust standard errors because the research uses panel data. There is likely to have autocorrelation between the travel logs of individuals.

The model published in the Results section includes all variables, the model is tested for multicollinearity. The VIF for every variable is lower than 10. Nevertheless, since some relationships have been found in the correlation matrix (Table 3), especially for the income category and tourism volumes 2013 variables, two other models have been produced to check consistency. In Appendix A, one model can be found without the income category and tourism volumes 2013 variables, and another model that only excludes only the former variable. The temperature and internet speed coefficients are affected by the model changes. The specifics are discussed in the next section.

5. Regression analysis

19 776 travel logs by 2 817 different usernames are analyzed by the model. The model is found to be significant, but the model only explains 6.5 percent of the variance. The results can be found in Table 4.

Temperature, as a natural amenity, is found to have a significant impact on the length of stay by users in destination countries. Nevertheless, it contradicts Sunbelt and digital nomad literature, since the model suggests that digital nomads stay longer in colder places. The models without the income category variable showcase a positive coefficient for temperature. However, it is viable that the income category variables clean the effect of temperature, since warmer places tend to have lower incomes (Pike, 2011). This shows the importance of applying more advanced statistical techniques such as regression for digital nomadism. Online statistics, as mentioned before, do not use such techniques and are therefore not likely to find 'cleaned' effects. The coliving or Selina variable, being a man-made amenity, is found to have a significant impact on the length of stay too. Digital nomads tend to stay longer in countries that have a coliving space or a Selina hostel. The presence of a coliving space or a Selina hostel in a country increases the length of stay with 38%. This means that accommodation that specifically caters to digital nomads is a relatively important factor in the model that makes digital nomads stay longer in a country.

The relative cost of local consumer prices has a positive effect on the length of stay in countries. Yet, with a t-score of 2.286, the variable is relatively the least important in the model. The result implies that digital nomads are attracted to countries in which they have more buying power. This is in-line with the geo-arbitrage concept, though the geo-arbitrage concept is not lacks importance in determining a digital nomad's location decision. The low sensitivity to changes in consumer prices could nevertheless also be an argument in favor of the importance of geo-arbitrage. This could be the case if the actual income (from the West) of a digital nomad is well above the amount of income required to make a living in a destination country. This may affect the elasticity, because digital nomads are less price sensitive. The availability of fast internet increases the length of stay. Specifically, a digital nomad would increase its stay in a country by 1 percent for an additional 10 Mbps. As such, users of the digital nomad platform prefer places that keep the transaction costs lower. Nevertheless, the models published in Appendix A show that the income category variable and the volume of tourism in 2013 variable blow up the coefficient for internet speed. Specifically, the t-score increases from a t-score of 1.621 to 4.381 (and 2.555 for the model that only excludes income category). The results for internet speeds should therefore be interpreted with caution. Finally, the model finds strong support for the importance of coworking places. The coworking variable is the most important explainer in the model, with a t-score of 15.60. Yet, the coefficient for the variable is low, specifically it suggests that for one additional coworking space, digital nomads would increase their length of stay by 0.02 percent. Nevertheless, the model's results do support the findings in literature that coworking spaces attract digital nomads. Additionally, the finding of the model combined with the findings in literature, that coworking spaces function to extract economic value, means that coworking spaces would function well to induce economic development from digital nomadism.

In terms of policy making, the model suggests that applying tourism strategies to attract digital nomads is not useful. Prior tourism volumes have a negative relationship with the length of stay in a destination country by digital nomads. The result entails that digital nomads are a different population than regular tourists, with different preferences for destination countries. Digital nomads may search for countries that are off the 'regular' tourist radar. This combined with the negative relationship of temperature, suggests that island-nations, such as Cabo Verde, Mauritius, or Barbados, do not have a comparative advantage in attracting digital nomads. The most surprising results is the negative effect that tourist visa free days has on the length of stay. The results show that more restrictive tourism visa schemes has a positive impact on how long digital nomads stay in a country. The result contradicts literature. It is hard to explain why. Especially because the data is from before 2021, and special digital nomad visas were not a phenomenon. Digital nomads were more reliant on tourist visas than they are now. Yet, visas do not seem to condition digital nomadism in the way that would appear to be logical. This finding may entail that the dataset consists of many travel logs that have been made domestically, because then the length of stay wouldn't be conditioned by visa restrictions. Unfortunately, the dataset does not allow to distinct domestic and international digital nomad travel.

	VARIABLES	Log of length of stay
Amenities		
	Temperature	-0.0120***
		(-4.786)
	Coliving or Selina	0.383***
		(9.090)
Production		
	PPP consumer	1.38e-05**
		(2.286)
	Internet speed	0.00104***
		(4.381)
	Coworking	0.000204***
		(15.60)
Policy		
	Volume tourism 2013	-1.02e-09***
		(-3.232)
	Tourist visa free days	-0.00241***
		(-7.465)
Income category		
	Low and Lower middle	0.333***
		(5.459)
	Upper middle	0.435***
		(12.11)
	Constant	2.382***
		(31.76)
	Observations	19,776
	Number of usernames	2,817
	R-squared	0.065
	Individual FE	YES
	Year FE	YES
	SE	Clustered

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. Regression results.

To discuss the potential for economic development, different income categories are analyzed in respect to the length of stay by users. Compared to high income countries, countries in lower income categories have longer length of stays. Nevertheless, the results are more promising for upper middle income countries. The duration of stay in upper middle income countries strongly differs from the length of stay in high income countries as it has a t-score of 12.11, the second highest in the model. The difference with high income countries becomes less strong for lower income categories. The results imply that digital nomadism would have potential for catch-up development, because it is found that users of digital nomad website move from high income countries to lower income countries, especially upper middle income countries.

Finally, it should be noted that the model does not explain much variance in the length of stay by digital nomads in a country. This is reflected by the low coefficients. No factor has been found that increases the length of stay strongly (with a 'high' marginal number of days). The Rho in the model suggests that 37% of the variation in the model can be explained by individual fixed effects, suggesting that there is variation across the individual fixed effects in the regression model. It may suggest that locational choices by digital nomads are relatively subjective. The data does not allow to determine these subjective individual factors, the individual aspect does not go deeper than a username (without country of origin).

6. Conclusion

The research tried to investigate to what extent quantitative data on length of stay and location factors of digital nomad destination countries help policymakers to attract digital nomads and spur economic development. A dataset of travel logs from nomadlist.com with added country indicators has been analyzed. Specifically, the research applied a regression technique, with time and individual fixed effects.

It can be concluded that location decisions by digital nomads differ much between individuals, and are therefore personal, as is found by the model. Generally, this result questions the extent to which quantitative research techniques should be applied to digital nomadism, especially on a macro scale. This issue is more extensively laid out under Discussion. Nevertheless, based on the research results, the following can be concluded regarding factors that impact the popularity of digital nomad destination countries. Digital nomads tend to settle longer in colder places, in contrast with literature. The presence of coliving spaces or Selina hostels also proves influential, indicating that purpose-built accommodations for digital nomads contribute to extended stays. Additionally, the relative cost of local consumer prices, availability of fast internet, and presence of coworking spaces all exert effects on attracting digital nomads to specific countries. Especially coworking places would be a powerful tool to attract digital nomads, but also to spur (local) economic development.

Tourism strategies targeting digital nomads may not be effective, as indicated by the negative relationship between prior tourism volumes and length of stay. Furthermore, the research finds weak evidence for the interplay of visa restrictions and the duration of stay in a destination country. Finally, the analysis of income categories reveals digital nomads have a preference for lower and, especially, upper-middle-income countries relative to higher income countries, suggesting potential for catch-up development in these regions.

Although the dataset from nomadlist.com gives a(n) (rare) opportunity to analyze location behavior of digital nomads, the results should be interpreted with caution due to accuracy issues.

7. Discussion and policy advice

Certain results contradict findings in existing literature. For example, the research found that digital nomads tend to stay longer in colder countries. Meanwhile, existing research finds that digital nomads prefer warmer climates (Zhou et al., 2024). A Brother Abroad (2024) finds that the most popular countries for digital nomads are Mexico, Thailand, Indonesia, Colombia, Vietnam, Portugal, Turkey, Costa Rica, Brazil, and The Philippines. These countries are located on lower latitudes than the United States or Europe, where most digital nomads originate from. As stated before, the dataset from nomadlist.com potentially has accuracy issues. Another disadvantage of the dataset is that it cannot distinguish between domestic digital nomadism and international digital nomadism. For example, the research found that the United States is the most popular country for digital nomads, both for the number of observations and the mean length of stay. Potentially, these statistics include many domestic digital nomads. This is problematic, especially because the regression tests visa conditions. Domestic digital nomads are not conditioned by visa regulations. The latter may also explain the contradicting results for the visa indicator in the regression analysis. Lastly, the data on travel logs is old, as the maximum year of a travel log is 2020. The data on coworking places and co-living spaces is from 2023. The research found that the number of coworking places and the presence of a co-living space positively affects the length of stay in a destination country. Yet, the causation could very well be the other way around as well: the influx of digital nomads increases the amount of coworking and co-living spaces. It is only logical that an influx of digital nomads would increase coworking and co-living spaces.

The latter leads to the advice for governments to register incoming and outgoing digital nomads. The lack of accurate and precise data creates an issue for research and therefore for the amount of valuable information about the digital nomad population. The availability of digital nomad visas helps with this problem, as currently many digital nomads enter countries on a tourist visa, which makes them indistinguishable from regular tourists. Digital nomad visas should be issued under relaxed regulations, because if the process is lengthy and complicated, digital nomads might as well still enter a country on a tourist visa.

This research tried a new approach to investigating the location behavior of digital nomads, namely on a global scale using quantitative data and analysis. Generally, it is found that location factors are highly subjective, due to high levels of individual variance. This could suggest that quantitative approaches may not be the best fit for the research topic. Yet, the possibilities to extend quantitative research on the topic is interesting, for example spatial interaction effects could be added to the analysis, or time lacks if data is available. A macro approach may also not be the best fit for policy research. For example, this research found that tourism strategies should not be applied in digital nomad policy. The finding is useful in general, but that doesn't directly mean that certain countries shouldn't use tourism strategies. Policies should be developed with a place-based approach, and countries should still consider their unique selling points. Yet, the result still calls for country-level research regarding the effectiveness of digital nomad policies and strategies. For instance, researchers may adopt a comparative approach between a country with entrepreneurship strategies and one with tourism strategies, and then also consider more individual characteristics of the digital nomads residing in the countries.

Finally, the strength of the research is that it gives a quantitative exploration on the research topic, researchers can use this research to improve errors. It may also inspire researchers to explore certain research techniques, or more specific topics within the realm of digital nomadism and location preferences. For example, it would be interesting to associate certain individual characteristics of digital nomads, such as if one is entrepreneurial or the country of origin, to location behavior. I would like to especially encourage economic geographers to explore the topic, as economic geographical theory is an appropriate benchmark, as well as the knowledge on analysis techniques that the field possesses.

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Appendix A: different models

	1	2	3
VARIABLES	Log of length of stay	Log of length of stay	Log of length of stay
Income category			
Low and Lower middle			0.333***
			(5.459)
Upper middle			0.435***
			(12.11)
Temperature	0.00175	0.000718	-0.0120***
	(0.866)	(0.344)	(-4.786)
Coliving or Selina	0.281***	0.290***	0.383***
	(6.962)	(7.179)	(9.090)
PPP consumer	1.59e-05***	1.54e-05***	1.38e-05**
	(2.839)	(2.766)	(2.286)
Internet speed	0.000307	0.000518**	0.00104***
	(1.621)	(2.555)	(4.381)
Coworking	0.000172***	0.000187***	0.000204***
	(15.60)	(14.68)	(15.60)
Tourist visa free days	-0.00236***	-0.00249***	-0.00241***
	(-7.914)	(-8.258)	(-7.465)
Volume tourism 2013		-7.08e-10**	-1.02e-09***
		(-2.242)	(-3.232)
Constant	2.471***	2.486***	2.382***
	(34.87)	(34.56)	(31.76)
Observations	19,776	19,776	19,776
Number of encoded_usern	2,817	2,817	2,817
R-squared	0.053	0.053	0.065
Individual FE	YES	YES	YES
Year FE	YES	YES	YES

Robust t-statistics in parentheses

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

Table 5. Regression models.

*models based on relationships found in correlation matrix results (Table 3)

Appendix B: Stata code

```
sort country_slug

drop if missing( country_slug )

sort v1

gen date_end_date = date( date_end , "YMD")
* (214 missing values generated)

gen date_start_date = date( date_start , "YMD")
* (7 missing values generated)

gen days_between = date_end_date - date_start_date

total days_between

Total estimation                  Number of obs = 45,823

------------------------------------------------------------
             |     Total   Std. err.     [95% conf. interval]
-------------+----------------------------------------------
days_between |   5000798    1346377       2361878     7639718
------------------------------------------------------------

gen end_year = year( date_end_date )
```

```
collapse (sum) days_between, by( username country_slug end_year)

total days_between

Total estimation                  Number of obs = 23,749

------------------------------------------------------------
             |     Total   Std. err.     [95% conf. interval]
-------------+----------------------------------------------
days_between |   5000798    1346292       2361979     7639617
------------------------------------------------------------



drop if days_between < 0
(2 observations deleted)

replace days_between = 365 if days_between > 365
(928 real changes made)

total days_between

Total estimation                  Number of obs = 23,747

------------------------------------------------------------
             |     Total   Std. err.     [95% conf. interval]
-------------+----------------------------------------------
days_between |   1197036   13463.77       1170646     1223426
```

```
-----------------------------------------------------------

gen days_inlog = log( days_between )

drop if end_year < 2014
drop if end_year > 2022

sort username end_year country_slug
egen id = group(username end_year country_slug)



sort country_slug
egen country_id = group(country_slug)
drop if country_id < 10
* 9 obs deleted
drop if inlist( country_id , 14, 18, 23, 27, 50, 60, 68, 76, 98, 105, 114, 116, 123, 135, 170)
drop country_id
sort country_slug

egen country_n = group(country_slug)
tabulate country_slug, matcell(result)
export excel using
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\3_fix_collapse\countr
y_slug.xlsx", replace
drop if country_n == 119
drop if country_n == 129
drop if country_n == 160
drop country_n
```

```
 import excel
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\3_fix_collapse\countr
y_slug.xlsx", sheet("Sheet1") firstrow

 save "C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\4\merge.dta"


 import excel
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\3_fix_collapse\countr
y_slug.xlsx", sheet("Sheet1") firstrow


 . destring internet_speed , replace

internet_speed: all characters numeric; replaced as double

(32 missing values generated)


. destring coliving , replace

coliving: contains nonnumeric characters; no replace


. replace coliving = "0" in 41

(1 real change made)


. replace coliving = "3" in 156

(1 real change made)


. destring coliving , replace

coliving: all characters numeric; replaced as int


sort country_slug

egen country_n = group(country_slug)


save "C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\4\merge.dta"
```

```
cd"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\3_fix_collapse"

use checked_foranalysis

save"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\4\merged.dta",
replace


sort country_slug

egen country_n = group(country_slug)

merge m:1 country_n using
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\4\merge.dta"



encode username, generate(encoded_username)

encode Income_cat , generate(encoded_incomecat)


** after meeting


import excel
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\6_after_meeting\visa
_tourists.xlsx", sheet("Sheet3") firstrow

gen visa_free = (visa_US == "free")

replace visa_free = 1 if visa_US == "ESTA"

gen interaction_visa = visa_US_days * visa_free

gen visa_12 = visa_free + 1

sort country_slug

egen country_n = group(country_slug)

save
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\6_after_meeting\touri
st_visaus.dta"


cd "C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\5"
```

```
use analysis

save
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\6_after_meeting\6_analysis.dta"


merge m:1 country_n using
"C:\Users\fienk\OneDrive\Documenten\RUG\1.MASTER\thesis\data\stata\6_after_meeting\tourist_visaus.dta"


replace tourists_2013 = "" if tourists_2013 == "*"

replace visa_US_days = "" if visa_US_days == "*"


destring tourists_2013 , replace

tourists_2013: all characters numeric; replaced as double

(544 missing values generated)

destring visa_US_days , replace

visa_US_days: all characters numeric; replaced as int

(1 missing value generated)

drop alt_source


drop if end_year > 2020

(6 observations deleted)


label variable encoded_incomecat "Income category"

label variable ppp_pc "PPP consumer"

label variable internet_speed "Internet speed"

label variable interaction_visa "Visa: days x free"

label variable cowork "Coworking"

label variable CL_binary_OR "Coliving or Selina"

label variable temp "Average year-round temperature"
```

```
label variable tourists_2013 "Volume tourism 2013"


** start model specifications

xtset encoded_username

xtreg days_between i.encoded_incomecat ppp_pc internet_speed interaction_visa cowork
CL_binary_OR temp tourists_2013 i.end_year, fe

xttest3

*heterosk.

estimates store mainreg

outreg2 using mainreg.xls, replace stats(coef tstat) drop(i.end_year) addtext(Individual FE, YES,
Year FE, YES)

gen used_reg = e(sample)

assert !missing(used_reg)

keep if used_reg == 1


xtreg days_between i.encoded_incomecat ppp_pc internet_speed interaction_visa cowork
CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

predict residuals, residuals

corr residuals encoded_incomecat ppp_pc internet_speed interaction_visa cowork
CL_binary_OR temp tourists_2013

qnorm residuals

drop residuals

*for vif

reg days_between i.encoded_incomecat ppp_pc internet_speed interaction_visa cowork
CL_binary_OR temp tourists_2013 i.end_year

estat vif


xtreg days_inlog i.encoded_incomecat ppp_pc internet_speed interaction_visa cowork
CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

estimates store mainreg_inlog
```

outreg2 using mainreg_inlog.xls, replace stats(coef tstat) drop(i.end_year) addtext(Individual FE, YES, Year FE, YES)

predict residuals, residuals

corr residuals encoded_incomecat ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013

qnorm residuals

drop residuals

xtreg days_inlog i.encoded_incomecat ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

gen used_logreg = e(sample)

assert !missing(used_logreg)

keep if used_logreg == 1

***VIF

xtreg days_inlog i.incomecat_n ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

reg days_between i.incomecat_n ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year

estat vif

* incomecat_n has very high VIF

reg days_between i.encoded_incomecat ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year

estat vif

*encoded_incomecat has no high VIF

gen incomecat_n_merge = incomecat_n

tostring incomecat_n_merge, replace

```
replace incomecat_n_merge = "Low and Lower middle income" if inlist(incomecat_n_merge, "1", "2")

replace incomecat_n_merge = "Upper middle income" if incomecat_n_merge == "3"

replace incomecat_n_merge = "High income" if incomecat_n_merge == "4"


gen incomecat_n_merge_numeric = .

replace incomecat_n_merge_numeric = 1 if incomecat_n_merge == "Low and Lower middle income"

replace incomecat_n_merge_numeric = 2 if incomecat_n_merge == "Upper middle income"

replace incomecat_n_merge_numeric = 3 if incomecat_n_merge == "High income"

label define income_labels 1 "Low and Lower middle income" 2 "Upper middle income" 3 "High income"

label values incomecat_n_merge_numeric income_labels


drop incomecat_n_merge


reg days_between i.incomecat_n_merge_numeric ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year

estat vif

*merge categories works for vif!


gen encoded_incomecat_merge = encoded_incomecat

replace encoded_incomecat_merge = 2 if inlist( encoded_incomecat_merge , 2, 3)

replace encoded_incomecat_merge = 3 if encoded_incomecat_merge == 4


label define income_labels1 1 "High income" 2 "Low and Lower middle income" 3 "Upper middle income"

label values encoded_incomecat_merge income_labels1
```

```
** end model specifications


label variable encoded_incomecat_merge "Income category"


xtreg days_inlog i.encoded_incomecat_merge ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

gen used_reg = e(sample)

list if used_reg == 0


xtreg days_inlog i.encoded_incomecat_merge ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

estimates store reg

outreg2 using reg.xls, replace stats(coef tstat) drop(i.end_year) addtext(Individual FE, YES, Year FE, YES)


corr days_inlog incomecat_n_merge_numeric ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp tourists_2013


mean days_between, over( incomecat_n_merge_numeric)


tab country_n


egen unique_countries = group( country_n)

tab unique_countries


tab country

egen mean_days_between = mean(days_between), by(country_n)

table ( country_slug ) () (), statistic(mean  days_between)
```

**** for Appendix A

```
xtreg days_inlog ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp
i.end_year, fe vce(cluster encoded_username)

estimates store reg1

outreg2 using reg1.xls, replace stats(coef tstat) drop(i.end_year) addtext(Individual FE, YES,
Year FE, YES)


xtreg days_inlog i.encoded_incomecat_merge ppp_pc internet_speed interaction_visa cowork
CL_binary_OR temp tourists_2013 i.end_year, fe vce(cluster encoded_username)

estimates store reg2

outreg2 using reg2.xls, replace stats(coef tstat) drop(i.end_year) addtext(Individual FE, YES,
Year FE, YES)



xtreg days_inlog ppp_pc internet_speed interaction_visa cowork CL_binary_OR temp
tourists_2013 i.end_year, fe vce(cluster encoded_username)

estimates store reg3

outreg2 using reg3.xls, replace stats(coef tstat) drop(i.end_year) addtext(Individual FE, YES,
Year FE, YES)
```