WHAT MAKES A CITY ATTRACTIVE FOR MULTINATIONAL ENTERPRISE HEADQUARTERS?

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Abstract

MNE headquarter location choice has been a long-debated issue for decades. This paper aims at the factors that could influence and alter MNEs' location decision from a city's perspective, tries to find the relationship between the important factors and city attractiveness. Firstly, previous literature about MNEs locating factors was reviewed, and the focus of this study locates on corporate tax rate, labour cost and inward FDI of the region or city. Multiple regression analysis was done, centered on the three core variables and controlled for other relevant variables that might have an impact on city attractiveness. After diagnosis and correction, two models with one interaction term were tested with a constraint of sample size. In conclusion, inward FDI is positively linked to city attractiveness, and corporate tax and labour cost were proved to be insignificant to affect MNE headquarter locational decisions.

Table of Contents

1 Introduction

The location of a corporate headquarter could be regarded as the place defined as the legal residence of stock trade and pay duty (Clausing, 2010). For many companies, choosing a headquarter location is more than a property purchase question, and the whole decision process could take up to more than a year (Klein, 2004). It is due to the complex factors that need to be carefully considered, and once the site is settled and put into use, it requires great amount of time, money and energy to alter (Duanmu, 2012). The location of the headquarters nationalises a company (Coeurderoy, 2016), and defines a policy constraint of it. The location of the headquarter decides corporates' operation costs, their access to desired labour pool, technology, social and financial resources; from a more general aspect, it influences corporate image and business strategy (Klein, 2004). For multinational enterprises (MNEs) especially, the headquarter site is important in the process of globalization (Wall, 2009), acting as the pivot and base of their expanding business map (Godfrey, 1999). Location choice could be accurate to city level, as cities are units of global network to some extent, as well as units which exchange information, products, services and resources with each other (Wall, 2009). Not only the city provides the companies with many goods, but having MNEs locating within the city border could benefit the city with considerable tax revenue, knowledge spillovers, and some other desirable agglomeration effects. Since 1990s, governments have realized that MNEs are generators of technology and trade, and the international business activities of MNEs have immensely accelerated local development (Van den Berghe, 2003). MNEs form business and agglomeration distribution in the city, and create a large amount of job opportunities (Pan, Guo, Zhang & Liang, 2015). For many reasons, it is desirable for the local government to be chosen as the headquarter location, in order to enhance local economies. There is evidence that regional and urban economies have taken actions to absorb MNEs headquarters in China. Many Chinese local governments tend to lower the policy difficulty for MNEs to locate in their urban area (Chan & Poon, 2012), and in the example of Beijing, it has successfully attracted regional headquarters of MNEs by its information advantage as the capital of China (Pan et al., 2015). The location choice of MNE headquarters is a topic of interest in many countries, some studies about MNEs in China (Duanmu, 2012; Pan et al., 2015), in U.S. (Nachum, Zaheer & Gross, 2008; Flores & Aguilera, 2007), in Australia (Tonts &

Taylor, 2010), and in Sweden (Strandell, 2008) have been examined by previous researchers. Nevertheless, no similar research has been done on a European scale, using recent data at both country and city levels, and without city size and population size effect. In light of this, this paper focuses on MNEs' city choices of locating headquarters in the selected sample of European countries, and tries to solve the following question:

What factors contribute to a city's attractiveness as a destination of MNE headquarters?

The answer of the research question conforms to social interest, because it will aid policy makers with more knowledge of essential criteria in MNE location choice, and developing strategic plans of improving cities' competitive power, and consequently attracting MNEs and enhance cities' competitive position in the long term. Besides, for corporates, this paper could act as a reference of city criteria that could be helpful to consider when picking a corporate or regional headquarter site. By exploring of determinants of European MNE headquarter geographical location, this paper could help later researchers and social scientists with further research about urban strategic planning that aims to the goal of attracting MNE headquarters. Hopefully, this paper adds value to existing literature by providing location determinants from different dimensions. This paper firstly reviews the past literature about MNEs' geographical distribution and some determinants of their location decisions discovered by previous researchers. Next, a data analysis follows, using cross-sectional data collected from 11 countries. Afterwards, the results and discussion sections are presented to display and explain the findings of this analysis, with comparison to previous discoveries of similar issues. In the end, some limitations of this paper are discussed, and some future research directions are suggested.

2 Theoretical Framework

The analysis of city attractiveness allocates to regional level and country level predictors. The research conducted by Duanmu (2012) employed country-level data such as local

exchange rate to study the decisive factors of Chinese MNE locations. Firm-level data was desired since it was proved to be important in the analyses of firm location choice but was only able to be obtained partially. Coeurderoy and Verbeke (2016) studied international MNE head office locations at country level, including variables such as GDP. Devereux and Griffith (1998) used both country-level and firm-level data when exploring the effects of tax rate in firm location choice. The study of Holt and the colleagues (2008) used collected survey results from a more local level, and variables such as "strong cultural links to region" were identified. It is interesting to compare the magnitude and importance of the impact from city-, regional and country-level factors on city attractiveness.

Three hypotheses have been formulated to answer the research question. In the study of Strandell (2008), there are four major reasons why MNEs relocate their headquarters in their Sweden-based research, which represents some important factors when MNEs consider a new city destination. The four reasons are foreign control, changes of ownership, proximity to customers, and lower tax. What is worth mentioning is the tax factor, in Strandell's paper it refers to personal income tax. This contrasts the findings of Meyer and Benito (2016), they pointed out that personal income tax as a factor of relocation in their investigation was barely mentioned by the companies, although the validity of the results was biased from small sample size and self-justification. In their research, corporate tax instead was regarded to be a significant cause for many companies, for example, Fiat-Chrysler's relocation from Italy to London. Alcacer and Delgado (2016) mentioned that companies tend to gather around the locations with plentiful resources provided at a low expense, and locations with specific policies benefit, such as taxation policies. Low tax burden could be a factor that motivates MNEs to relocate abroad, though their current development stage and attractiveness of current location need to be considered carefully before relocation (Baaij, Mom, Van den Bosch, & Volberda, 2015). One example of relocating for tax benefits happened in 2015, a marketing company WPP declared that they were thinking about moving back to their old location in the U.K. from Ireland, as new tax policies were published to retain companies like WPP (Trotman, 2012). Coeurderoy and Verbeke (2016) proved in their research that paying taxes significantly influence the density of MNE headquarters negatively, and as their research was carried out at country level, they found that countries characterized as tax haven were more favorable headquarter locations, as lower tax means higher profit. MNEs are

sensitive to taxations when locating their headquarters. In response to this, countries that desire to have MNE headquarters located in the country have tried to alter to more favorable taxation policy for MNEs (Voget, 2011). In general, taxation appears to be crucial in relocation decision making. Therefore, the first hypothesis is derived as following:

Hypothesis 1*: Corporate tax rate is negatively correlated with the city's attractiveness as a destination of MNE headquarters.*

Apart from operational expenses like taxes, labour cost of the headquarter location appears to be another main concern for MNEs. Markusen (1998) depicted the connection between labour cost and MNE headquarter locations by using a model developed by Markusen and the colleagues. Skilled labour and labour cost are parts of the factors in the model, and the model concluded the countries with intensive skilled labour resource to be the home country of MNEs. Disdier and Mayer (2004) conducted a relevant research using data from 1990s, pointing out that high labour costs had a significant negative impact on location choice for both Eastern and Western Europe. Basile, Castellani, and Zanfei (2008) found out in their analysis of eight European countries' MNEs in the 90s that higher wage was estimated to lead to lower chance of having European firms' headquarters. However, the preference for non-European firms was opposite, as they were shown to favor regions with higher wage level. This could be explained as higher-skilled labour could be attracted and gathered in the region due to higher wages, and high-skilled labour is required for managing and monitoring the headquarter operation. Flores and Aguilera (2007) discovered that U.S. MNEs preferred regions with high wage level, with other economic variables in their analysis controlled such as population. In a survey study of Holt, Purcell, Gray & Pedersen (2008), variables that influence location decision were ranked according to their relative importance. Among the total of 39 variables, "availability of high-skilled labour" ranked the second, while "low operational cost" and "competitive labour cost" were ranked 20 and 22, respectively. This means that the respondents, 57 chief executives of MNE regional offices from Australia and Europe, on average valued high-skilled labour force more than the costs they bring. There is also a view that MNEs locate their production in developing countries where labour cost is low, while the use of high-wage labour concentrate on developed areas (Van den Berghe, 2003). Tonts and Taylor (2010) noticed that in Australia large corporates seek access to

existing diversified and specialized labour resources and have tendency of shifting the high-skilled labour cost burden to regions with low-cost labour for manufacturing. Overall, the effect of labour costs on city attractiveness seems crucial but ambiguous. Hence, the second hypothesis tries to find out the sign of the correlation between labour costs and city attractiveness:

***Hypothesis 2**: Higher labour costs leads to an increase on city's attractiveness as a destination of MNE headquarters.*

Using the gravity model, Rugman and Oh (2013) explained that the Foreign direct investment (FDI) flows had been concentrated on resource-intensive areas of the world, instead of normally distributed over the lands. Similarly, another research shows that in order to obtain more and higher quality of business services that current locations fail to offer, corporates have incentives to relocate to new locations in seek of strategic FDI and better services to further develop (Baaij et al., 2015). It was pointed out that FDI is linked to MNE relocation incentives, and in capital-abundant economies, FDI largely increases the local investment flow, though is only to a small ratio of the total investment activities of experienced MNEs and their associated companies (Mudambi, 1995). According to a study of Driffield and Love in the United Kingdom (2007), inward FDI causes productivity growth only together with presence of local technology strength. Thus, inward FDI does not directly contributes to MNEs' favorable business environment. The explanation of the pattern of FDI flows is complicated as it involves national, regional and firm-level factors (Sethi, Guisinger, Phelan, & Berg, 2003). FDI has been tested to be an indicator of a region's availability of labour and demand of industries in Hungary, and MNEs tended to locate their headquarters in Budapest - the capital city - where the FDI flow is of high density (Boudier-Bensebaa, 2005). Zhao, Cai and Zhang (2005) shared this opinion that companies prefer resource-intensive areas, where companies could have easier access to labour pool, social network and financial resources via agglomeration. Yet, in the case of China, they found out that the MNE location decision was not necessary linked to FDI volume, but reliable information. Agglomeration economies were found to increase the chance for a region to get foreign investment (Dunning & Lundan, 2008). Hence, the quantity of FDI, in reverse, presents the level of development of local agglomeration economies. This was confirmed by other researchers that agglomeration

economies signal the level of technology externalities, stability of labour market and knowledge spillovers, which in turn attracts foreign investment (Basile et al., 2008). FDI increases when infrastructure of the city increases, and when the city environment is developing towards the business-friendly direction. In this sense, the level FDI in the city could be a good indicator of city attractiveness. In order to test the effect of FDI on location choices, the third hypothesis is thus:

***Hypothesis 3**: FDI inflows have a positive effect on city's attractiveness as a destination of MNE headquarters.*

Other than the three variables of interest, there are variables that are worthy to be discussed, as they have been mentioned in many researches to be important for MNEs. Human capital, or skilled labour force, are very much valued by many MNEs. The demand for skilled labour has risen sharply since 1980s (Katz & Murphy, 1992), even at the cost of higher wage expense (Holt et al., 2008; Tonts & Taylor, 2010). To cope with technology development, high-quality human capital is requisite during the business expansion and internalization of MNEs. Access to skilled labour pool has been one of the reasons why MNEs favor cities with a certain level of agglomeration (Basile et al., 2008; Dunning & Lundan, 2008; Zhao et al., 2015). A city which is good at developing and maintaining talents is therefore preferred by MNEs to locate. Furthermore, as globalization is an undeniable trend, building its own global business network is a major task of MNEs. The exchange and cooperation between cities and companies link them together, and business networks are formed through the social and business activities (Wall, 2009). The linked units, i.e. MNEs, are benefited from corporate networks, yet the networks are hard to acquire (Smith & Timberlake, 1995). The competition and performance of the networks are therefore essential for MNEs to consider (Wall, 2009). GDP per capita is a reliable reference of the affluence of the country, and GDP might be a good measurement of the destination market size for MNEs. It was suggested by Flores and Aguilera (2007) that market size was one of the key determinants in MNE location decision, and this belief was confirmed by Duanmu (2012) that market size was indeed relatively attractive to Chinese manufacturing MNEs to locate.

3 Data & Methodology

The MNEs for the analysis in this paper are selected from 2016 list of Fortune Global 500, which is an annually published list of the largest 500 corporates in the world ranked by revenue, that have their headquarters located in Europe. The geography of headquarters list by city is only published for 2016 by Geolounge. There are 226 cities on this list, of which 68 are European cities. Due to the unavailability of data, cities with missing data were dropped from the sample. MNEs which locate in, for instance, Switzerland, were excluded for this reason. After filtering, there are in total 47 observations in the dataset, they are cities from 11 European countries, including the United Kingdom (see table A.1 in appendix for list of cities and their number of headquarters). To reduce the estimation bias, London is dropped from the sample as an extreme outlier. To explore what factors affect the headquarter locating decisions regarding the city choice, the dependent variable used in the analysis is the ranking of the number of headquarters of city per capita. The ranking is based on the calculated result of the number of the headquarters located in the city divided by the population of the city. The ranking of the city reflects the its attractiveness, controlled for city size effect. The calculation of per capita could reduce the undesired effect of different city size. The cross-section population data was retrieved from the 2016 version in Eurostat, City Population and municipality official websites, such as Municipality of Amsterdam. The use of ranking is inspired by the research of Coeurderoy and Verbeke (2016), they included variables that are country rankings under 11 different criteria in their research. Besides, the study of Godfrey and Zhou (1999) focus on city ranking as destination of headquarter locations as well. Using the ranking instead of the number of headquarters per capita could decrease the effect of small cities, as some small cities get large calculated outcomes due to small population. Another reason is the p-value of F test of the model with the cities' number of headquarters per capita as dependent variable is 0.15 (>0.05), which indicates that the independent variables do not significantly influence the response variable. The F test p-value of model with ranking as the dependent variable is 0.0001, thus models with ranking is adopted. A Shapiro-Wilk W test was done to test the normality of ranking. Because the test p-value is 0.11, the hypothesis that the data is normally distributed is not rejected. Eight independent variables were included in the analysis, five of which are at country level, respectively are corporate tax

rate, inward FDI, Schwartz culture value, human capital index, and business sophistication index. The other 3 independent variables were retrieved from Eurostat at regional levels, which are disposable income, labour cost, and gross domestic product (GDP). The 8 independent variables are explained in more details in the following paragraph.

The *corporate tax rate* data was obtained according to the 2016 data from KPMG, shown in percentage. The data of *inward FDI*, which is also called direct investment in the reporting economy (FDI), was retrieved from Eurostat, it indicates the amount of direct investment flows from the non-resident investors from the rest of the world investing in this economy in 2016 (The World Bank, 2018). The variable used in the analysis is presented per capita in euro. It is calculated by the FDI divided by the population of the country in 2016. Country population data was obtained from Eurostat. *Schwartz culture value* in this dataset took the average of the 2 country-level cultural value orientation scores derived from Schwartz Value Survey (SVS) data. The scores were given by college students and school teachers to rate the importance of 57 value items, have been re-centered and range from -1 (opposite to my values) to 7 (of great importance). The score of one cultural orientation shows its relative importance compared to the other 6 cultural orientations in the societal group. For the countries where data sample of student or teacher was missing, the scores were predicted ground on the countries with both data sample by regression analysis. These scores aim to compare the cultural characteristics between countries (Schwartz, 2008). The 7 orientations are grouped into 3 opposite dimensions: embeddedness versus autonomy, hierarchy versus egalitarianism, and mastery versus harmony. The 2 chosen value orientations are egalitarianism and intellectual autonomy. Intellectual autonomy describes a culture orientation that encourages independent pursuit of intellectual goals and encourage curiosity and creativity. Egalitarianism emphasizes equality, one is obliged to commitment as human beings, should be responsible to cooperate to achieve social justice, and should concern for each other's benefit. Egalitarianism and intellectual autonomy both have underlying assumptions that people are responsible for their acts and make decisions according to personal belief (Schwartz, 2006). The value terms are selected because they likely align with corporates' values in business cooperation and team work aspects. A table of 7 cultural value orientation scores and the average of egalitarianism and intellectual autonomy of selected countries in the dataset could be found in table A.2 in appendix. *Human*

capital index data is from World Economic Forum Human Capital Report 2016, it reflects to what extent a country is good at developing its talent base. The scores are given based on the evaluation of learning and employment results of workforce in three different age groups. The raw data was standardized, thus the scores range from 0 to 100 (World Economic Forum, 2016). *Business sophistication index* data was retrieved from World Economic Forum, the Global Competitiveness Report 2016-2017. The index is expressed in ratings of quality of national business network and corporates' business operations and strategies on a 1-7 scale (Schwab, 2017). Business sophistication index accounts for evaluating the business environment of the destination country. *Disposable income* data presents the disposable income of private households in purchasing power standards (PPS) per inhabitant at the second regional level defined by Nomenclature of Territorial Units for Statistics (NUTS 2) in 2014. To avoid the effect brought by the difference in price levels of different countries, Eurostat defined PPS as the artificial currency that indicates the purchasing power parity and real final expenditures (Eurostat, 2016; OECD, 2007). Comparing the disposable income bases on per inhabitant could eliminate the regional size effect (Eurostat, 2016). NUTS is a commonly used guideline for subdividing European countries by geocoding. NUTS 2 divides the countries to an extent that each region can receive regional policy support (Eurostat, 2018), for example, provinces in the Netherlands. *Labour cost* is the hourly total labour costs per employee in full-time equivalent (i.e. hourly total labour costs in FTE) at NUTS 1 level in 2012. NUTS 1 defines the major regions, it is with few subdivisions compared to NUTS 2, thus NUTS 1 regions are broader, for example, the Netherlands is divided to northern, southern, western and eastern Netherlands in NUTS 1. *GDP* data used in this paper is the aggregate of the value of service and products produced within the region in a certain period of time, measured in PPS per inhabitant at NUTS 2 level (OECD, 2002). GDP data at NUTS 3 level could be found but not measured in PPS per inhabitant, hence it is not preferable to reduce the size effect. GDP denotes the economic development of the metropolitan region (Coeurderoy & Verbeke, 2016), and high development countries with high GDP may increase their attractiveness as destinations of corporate headquarters.

Table 3.1: Descriptive statistics of dependent and independent variables

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
ranking	25	25	14.29	1	49.00
Schwartz	4.98	5.03	0.11	4.77	5.11
human capital index	80.1	81.55	2.89	72.79	83.29
business sophistication	5.51	5.7	0.4	4.66	5.88
FDI (million euro)	5110.77	382.71	24282.70	-3710.37	170639.8
corporate tax	27.5	29.72	4.25	20	33.99
disposable income	19508.16	20000	3149.66	13500	29900
labour cost	31.41	32.43	5.87	19.03	45.90
GDP	43036.73	38700	21903.6	23900	178200

The descriptive statistics of the all the variables used in the analysis is presented in table 3.1. There are 48 observations for variable Schwartz, and 49 observations for the rest of the variables. What is worth mentioning, the observed value of FDI minimum is negative. The FDI variable measures the inward FDI flow, negative FDI means divestment is larger than investment in the reporting economy. Hence, negative value is valid in this case. From the value of standard deviation, it could be observed that the data of FDI is quite spread out. Moreover, for FDI and GDP, their means are higher than the medians, which means that there is a few large values in the dataset. The histograms figure A.1 and figure A.3 which illustrate the distributions of FDI and GDP are given in appendix. They show that the distributions of these two variables both skew to the right. Therefore, natural logarithm was taken for these two variables to reduce the skewness. The histograms of FDI and GDP after transformation are shown in figure A.2 and figure A.4 in appendix. Labour cost, disposable income were transformed to natural logarithm as well to increase the distribution normality.

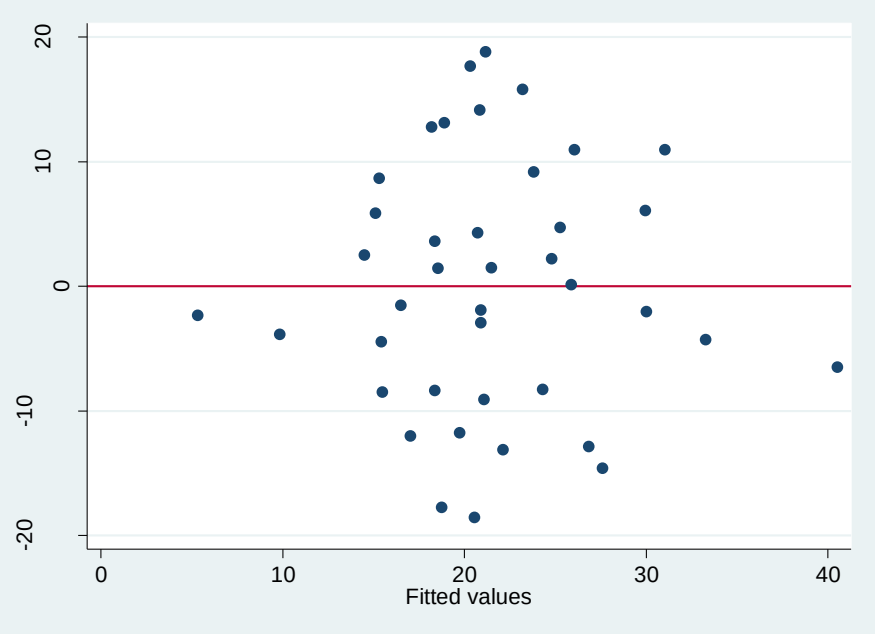

Figure 3.1: residual-versus-fitted plot of model with all 8 variables

To test the three hypotheses, multiple regression is applied using robust standard errors. All the regression and other tests were done on STATA. As mentioned, ranking is the dependent variable, and FDI (i.e. FDI in this dataset), labour cost and corporate tax rate are the independent variables of interest. To take the cultural environment, talent development ability, business environment of a country into account, Schwartz cultural value, human capital index, business sophistication index are three control variables that could be added, which might be of interest to management of MNEs during location decision making. Furthermore, disposable income and GDP could also be controlled for, because the disposable income of private household to a degree reflects the purchasing power of the people in that area, and GDP in PPS presents the wealth of the people in the region.

Before running the regression including three core variables and other control variables, some diagnoses need to be done. Figure 3.1 is a residual-versus-fitted scatterplot of the data, which visually presents the homoscedasticity of the model. Breusch-Pagan / Cook-Weisberg test was used to further test heteroskedasticity, since the result is not significant (0.4674), the null hypothesis is not rejected, the data is free of heteroskedasticity. Multicollinearity takes place when independent variables are correlated, and it affects the significance of variables and the preciseness of the estimated coefficients. Two tests were

done to test if multicollinearity occurs in the model. The first is examining correlations between variables and their respective significance. A correlation matrix demonstrating the correlation between independent variables is displayed below in table 3.1. When the value of correlation is high, the data is subject to multicollinearity. The correlation between human capital index and business sophistication index is significantly high (0.83), plus the correlation between log(labour cost) and corporate tax (0.54), log(labour cost) and human capital index (0.60), Schwartz and business sophistication index (0.61), Schwartz and corporate tax (0.57) are all above 0.5, meaning that the model is prone to multicollinearity.

Table 3.1: correlation matrix of all the independent variables

	Log (labour)	Log (FDI)	corporate tax	Schwartz	human capital	business sophistication	Log(GDP)	Log(income)
Log(labour)								
Log(FDI)	-0.0449							
corporate tax	0.5394*	-0.4775*						
Schwartz	0.0619	-0.4824*	0.5686*					
human capital	0.5988*	0.1436	-0.0354	0.4544*				
business sophistication	0.2435	0.1724	-0.4040*	0.6112*	0.8315*			
Log(GDP)	-0.0863	-0.1454	-0.0135	-0.2543	0.1367	0.1745		
Log(income)	0.4793*	-0.2718	0.2510	0.2595	0.1703	-0.0115	0.1129	

*p<0.05

Table 3.2: VIF of independent variables

Variable	VIF
business sophistication	11.88
human capital index	10.00
corporate tax	6.42
Log(labour cost)	4.39
Log(FDI)	3.46
Log(disposable income)	2.58
Schwartz	2.48
Log(GDP)	1.37

Table 3.3: VIF of independent variables without business sophistication

Variable	VIF
human capital index	4.3
corporate tax	3.59
Log(labour cost)	3.18
Log(FDI)	2.82
Log(disposable income)	2.58
Schwartz	2.39
Log(GDP)	1.37

To further examine multicollinearity in the sample, variance inflation factor (VIFs) is used to detect the amount of variance being influenced by multicollinearity. The higher the VIF value is, the heavier is the influence of multicollinearity on the model, and when the VIF value is above 10, it indicates that high level of multicollinearity exists and raises a concern (Belsley, Kuh, & Welsch, 1980). Table 3.2 displays the value of VIF for each independent variable. It is obvious that VIF of business sophistication index is over 10 (11.88), and VIF of human capital index is exactly 10. This implies that these two variables are highly-correlated with each other and/or the rest of the variables in the model, and there should be a concern for multicollinearity. Especially, the correlation between business sophistication and human capital index is outstandingly high. As one solution, variable business sophistication is dropped from the regression models to decrease the level of multicollinearity. The VIF values excluding business sophistication index from the analysis are shown in table 3.3. No outstanding high VIFs (no VIF is above 5) in the model means that the multicollinearity does not highly affect the estimated effect of the predictors. Additionally, the correlations between corporate tax and log(FDI), log(labour cost) and tax, human capital index and log (labour cost), Schwartz and log(FDI) and Schwartz and corporate tax are also high and significant. Therefore, they are suspected to have interactions, and their interaction terms need to be tested. The interaction terms were tested separately and together by a Wald Chi-Squared Test. When the null hypothesis "parameter = 0" is rejected, including the tested variable could statistically improve the model fit. Human capital*log(labour cost) turned out to be the only term that reject the null hypothesis. Thus, it is included in the testing model. Accordingly, the regression of the model has a general formula as below:

$$Y = \beta_0 + \beta_1 * T_1 + \beta_2 * T_2 + \beta_3 * T_3 + \beta_4 * X_1 + \beta_5 * X_2 + \beta_6 * X_3 + \beta_7 * X_4 + \beta_8 * Z + \varepsilon$$

Where in this case, Y is ranking, β_0 is constant, T_1, T_2 and T_3 represent three variables of interest, and β_1 to β_3 are respectively the coefficients of the three core variables. X_1 to X_4 are the control variables, and β_4 to β_7 are respectively the coefficient of the control variables. Z is the interaction term and β_8 is its corresponding coefficient. In the regressions, all the coefficients of independent variables are standardized to allow easier comparison and interpretation of the coefficients. The test results are presented in the next section.

4 Results

The final number of observations in the model is 46, since the logarithm transformation of FDI lost the observation Vienna whose inward FDI is negative. The result of regression including interaction term human capital*log(labour cost) is presented in table 4.1. Compared it to table 4.2 which provides the result of the model excluding the interaction term, there is a drastic change on the coefficient of log(labour cost). This rings an alarm for multicollinearity in the model. Hence, the VIF values were tested, and it is clear that the introduction of interaction term raises problem of high-level multicollinearity, as the VIF values are up to over 3000. To improve the estimation accuracy of the coefficients so to not bias the interpretation of the results, the interaction term is removed from the model.

Table 4.1: regression results of model with interaction term

ranking	Coefficient	Robust Standard Error	t	P> |t|
log(FDI)	-5.383891	2.269128	-2.37	0.023
log(labour cost)	460.6239	452.0938	1.02	0.315
corporate tax	-1.100634	0.6998688	-1.57	0.124
log(GDP)	-8.57923	7.363035	-1.17	0.251
log(income)	-35.87377	23.43381	-1.53	0.134
human capital	17.03384	18.19014	0.94	0.355
Schwartz	9.889631	32.23199	0.31	0.761
human*labour	-5.55733	5.600067	-0.99	0.327
constant	-931.351	1469.001	-0.63	0.530

Table 4.2: regression results of corrected model

ranking	Coefficient	Robust Standard Error	t	P> |t|
log(FDI)	-4.748702	2.290358	-2.07	0.045
log(labour cost)	10.16037	17.85423	0.57	0.573
corporate tax	-0.8231903	0.6482948	-1.27	0.212
log(GDP)	-9.092905	6.992517	-1.30	0.201
log(income)	-26.26089	23.24307	-1.13	0.266
human capital	-0.8792466	1.001461	-0.88	0.385
Schwartz	2.057844	32.00898	0.06	0.949
constant	457.8698	358.8824	1.28	0.210

R^2: 0.1915 F (7,38): 1.74 P>F: 0.1299

The regression result of model without interaction term is reported in table 4.2. At a significance level of 5%, only log(FDI) is significant. Note that the constant term is also not significant, implying that when the other variables are equal to zero, the constant does not significantly differ from zero. Ranking equals to zero has no meaning, and this is not likely to happen because log(FDI) is significant and can never be zero. The variables of interest log(labour cost) and corporate tax are not estimated to be significant factors to city attractiveness. Based on the regression results, it can be concluded that the hypotheses 1 and 2 are rejected. One per cent of increase in FDI leads to a decrease of ranking by around 5. Number 1 is the ranked as the highest, 46 is the lowest. Because the higher number of ranking means the lower it ranks, a decrease in the dependent variable ranking means an increase in city attractiveness. The hypothesis 3 is thus not rejected, as FDI shows significant positive relationship with city attractiveness.

5 Discussion and Conclusion

It has been tested in this paper that inward FDI gives positive contribution to city attractiveness. To some degree, volume of FDI signals the business environment of the region, thus cities with high FDI is desired by MNEs. The result is therefore in line with findings of previous researchers (Baaij et al., 2015; Boudier-Bensebaa, 2005; Zhao et al., 2005). Cities with a larger skilled labour pool, better infrastructure and richer business resources could get larger inward FDI (Dunning & Lundan, 2008), which supports the idea that large inward FDI is a favorable addition to city attractiveness. Earlier discoveries found out that the corporate tax rate has a significant effect on city attractiveness. Notwithstanding, in this paper the outcome of insignificance of corporate tax on city attractiveness is opposite to preceding literature (Coeurderoy & Verbeke, 2016; Baaij et al., 2015; Strandell, 2008; Vogt, 2011). Furthermore, while labour costs have been regarded as an influential variable for city attractiveness (Disdier & Mayer, 2004; Flores & Aguilera, 2007; Tonts & Taylor, 2010), it was proved to be insignificant in this paper. This contrast could be caused by the use of different statistical models and data. Since this study is based on MNE headquarters of in total 46 European cities, the estimated effects of factors of interest could differ from the U.S., Australia, or China. On top of this, the variables used in examining the factor impact are quite different. To the best knowledge of this author, there is no previous research trying to include human capital index and Schwartz cultural value together as control variables. The inconsistency of the effects with other researches may also origin from the statistical analysis. This is explained in more details in the section 6. Besides, it is more ideal if human capital index is replaced by another indicator that evaluates talent development ability of the region/city and is not highly correlated with business sophistication index. Two other candidates of this indicator, namely the 5th tier (higher education and training) from Global Competitiveness Index and the average of the 3rd (grow), 5th (vocational and technical skills) and 6th pillars (global knowledge skills) from the Global Talent Competitiveness Index, have been approved to be both highly correlated with business sophistication index as well during the research of this paper. The reason behind the correlations could be further studied to find an appropriate indicator. Since the inward FDI is at country level while the insignificant variable of interest labour cost is at a

regional level, it appears that the country-level variables are more influential to city attractiveness than region-level variable.

This paper starts with a review of the importance of the headquarters location to MNEs, then discusses what could be the criteria that make MNEs interested in locating or relocating their headquarters based on existing literature. To answer the central question: "What factors contribute to a city's attractiveness as a destination of MNE headquarters?" This paper then focuses on cities in 11 European countries, and tries to identify if corporate tax rate, labour costs and inward FDI have significant influence on the attractiveness of a city by a data analysis. This study is helpful for European municipalities and policy makers who are or are going to make strategic plans to absorb MNEs into their geographical border. This study is also a reference to the municipalities which not yet have a solid plan or direction but are aiming at an upgrade on city structure and/or an acceleration on city development, considering the amount of benefits that having MNEs inside the region could bring. Finally, to give answer the research question, it could be concluded from the results that country-level factor FDI is a significant factor that contribute to city attractiveness as a location of MNE headquarters, while corporate tax and labour cost have no influential impact.

6 Limitations and Recommendations

Regarding the data analysis of this paper, there are some limits to the current structure of the models. Due to limitations of the sample size (48), not many predictors can be included in the model. Otherwise a problem of overfitting the sample occurs. Supposing more control variables are included, the model would suffer from low accuracy of estimation. Nonetheless, current models are likely to be subject to omitted variable bias. For instance, there could be an indicator of political factors which evaluates the political environment for MNE in a region or country, as well as more economic factors such as exchange rate and proximity to markets. What's more, business sophistication index is dropped out of the sample because of its high correlation with other independent variables, thus it failed to be

included in the same model as desired. Apart from omitted variable bias, small sample size decreases the explanatory power of the analysis results, as it only represents a small proportion of the whole population. This consequently requires a more conservative and cautious interpretation of the research results. The current sample size is restrained by many unavailable or unpublished data of some European countries and cities, especially smaller municipalities such as Clichy in France. Partially available data cannot be used in the analysis to get a sufficient result, therefore the sample size was made smaller. In this light, in future studies, the request of the missing secondary data and the collection of primary data if necessary are recommended. Or alternatively, similar indicators from difference sources could be transformed and used as a supplement to the missing data. An expanded cross-sectional data set or panel data is preferred to study the pattern of MNE headquarter locating. Aside from this, there might be a need to reconsider the selection of cities. There are cities in the dataset that have same number of corporate headquarters but differ a lot in size. For instance, the population of city Trieste in Italy is less than half of the city Edinburgh, but they both have one headquarter. This results in a significant difference in ranking. It might be better to select cities whose population is within a proper range to avoid biased result. Lastly, there might be reverse causality existing in the analysis. As an example, countries with higher GDP could attract more MNE headquarters, but reversely, MNE headquarters create substantial amount of GDP for the cities they locate at. More advanced techniques are required to tackle this problem.

In addition, using multilevel independent variables in this paper brings limitation. In the current models, as Schwartz cultural value has been excluded, there are 4 predictors at country level, and 3 at regional level. The discussion of MNE headquarter locations in this paper focuses on city attractiveness, and how factors from regional to country-level scales could influence it. Ideally, city-level data could be added to the models to observe difference more precisely, as well as to balance the effect of the country-level predictors and achieve more precise results. The limitation arises because of the exclusive availability of data. Some important factors to city attractiveness such as FDI are only published for free in units of country, cities' FDI data need be obtained at a high expense (Statista, 2018). More importantly, as the data used in this paper is multilevel, employing a more complex econometrics model

is more ideal to analyze the data in a more accurate manner. Future researchers might want to consider, for instance, ordered logistic regression, for a similar analysis.

Last but not the least, there might be other factors that overweigh the variables which could be quantified and included in the analysis. One example about relocation cost is, since the cost of moving headquarter to another location is huge, MNEs might not choose to move to a city which better fulfill the locating criteria than the current city. Although the number of MNE relocation examples is increasing, the relocation cases are few compared to the number of MNEs (Strandell, 2008). Locating in a bigger city with better resources sounds attractive, but the operating expense could be many times more expensive, such as the rent of office space. Another more specific example is the case of Inditex, the biggest fashion group worldwide. It locates in A Coruña, because the founder has been living there since he was 14 years old. Other factors that are hard to be quantified are plenty. It might be that the city itself has cultural bonding with the founder of the company, or the nostalgia connected with the city outweighs realistic concerns about business. Factors from more qualitative dimensions can be taken into account, and more complex model or statistical methods could be employed to analyze in order to obtain a more precise conclusion in the future research.

Appendix

Table A.1: cities and the number of MNEs headquarters locating in the city

city	#headquarters	Country
Paris	17	France
Madrid	5	Spain
Munich	4	Germany
Courbevoie	3	France
Hanover	3	Germany
Essen	3	Germany

Rome	3	Italy
Amsterdam	3	Netherlands
Bonn	2	Germany
Stuttgart	2	Germany
Frankfurt	2	Germany
Turin / Torino	2	Italy
Milan	2	Italy
The Hague	2	Netherlands
Rotterdam	2	Netherlands
Bilbao	2	Spain
Stockholm	2	Sweden
Vienna	1	Austria
Leuven	1	Belgium
Brussels	1	Belgium
Copenhagen	1	Denmark
Kenilworth	1	England
Newbury	1	England
Hounslow	1	England
Edinburgh	1	England
Bradford	1	England
Clermont-Ferrand	1	France
St. Denis	1	France
Friedrichshafen	1	Germany
Wolfsburg	1	Germany
Leverkusen	1	Germany
Ludwigshafen	1	Germany
Mannheim	1	Germany
Karlsruhe	1	Germany
Dusseldorf	1	Germany
Cologne	1	Germany

Hamburg	1	Germany
Berlin	1	Germany
Trieste	1	Italy
Bologna	1	Italy
Zeist	1	Netherlands
Leiden	1	Netherlands
Utrecht	1	Netherlands
Diemen	1	Netherlands
Barcelona	1	Spain
Arteixo / A Coruña	1	Spain
Gothenburg	1	Sweden

Table A.2: Schwartz culture value scores of selected 10 European countries

Country	harmony	embedded	hierarchy	mastery	aff auton	intel auton	egalitar	average (intel auton, egalitar)
Austria	4.31	3.11	1.75	3.92	4.29	4.9	4.89	4.90
Belgium	4.35	3.25	1.69	3.84	3.94	4.64	5.2	4.92
Denmark	4.16	3.19	1.86	3.91	4.3	4.77	5.03	4.90
France	4.21	3.2	2.21	3.72	4.39	5.13	5.05	5.09
Germany e	4.46	3.16	1.77	4	4.28	4.68	4.95	4.82
Germany w	4.62	3.03	1.87	3.86	4.11	4.99	5.07	5.03
Italy	4.62	3.46	1.6	3.81	3.3	4.91	5.27	5.09
Netherlands	4.05	3.19	1.91	3.97	4.13	4.85	5.03	4.94
Spain	4.47	3.31	1.84	3.8	3.67	4.99	5.23	5.11
Sweden	4.46	3.12	1.83	3.81	4.24	5.09	4.9	5.00
UK	3.91	3.34	2.33	4.01	4.26	4.62	4.92	4.77

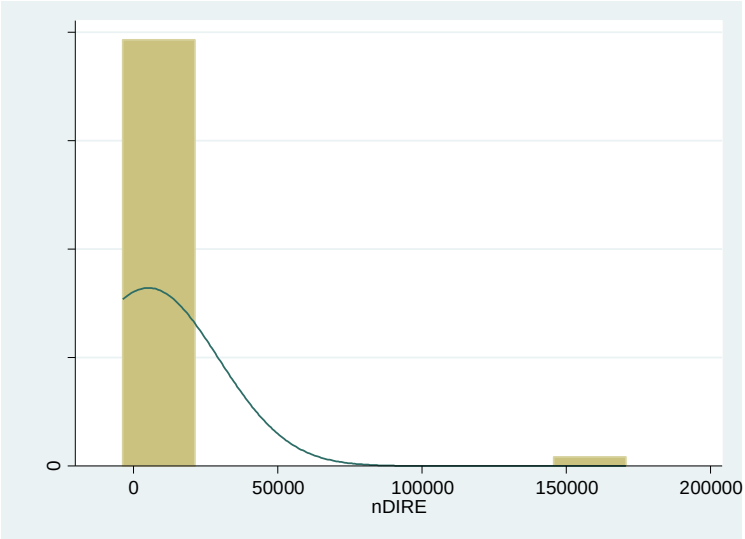

Figure A.1: distribution of FDI

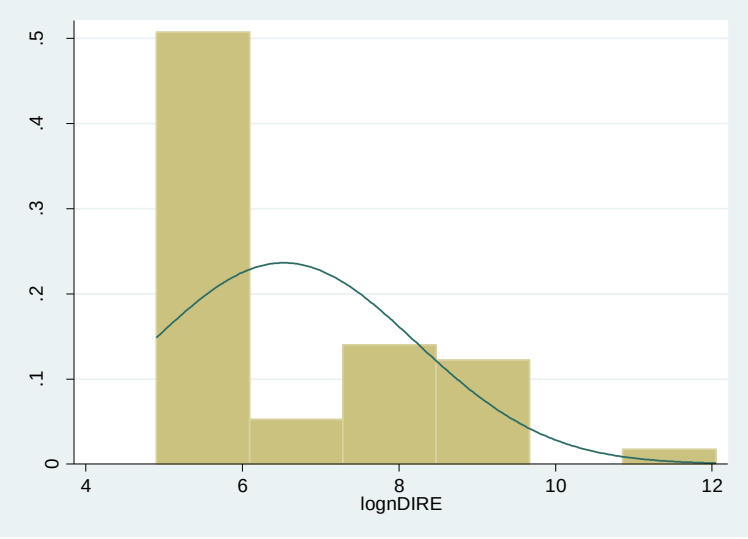

Figure A.2: distribution of log(FDI)

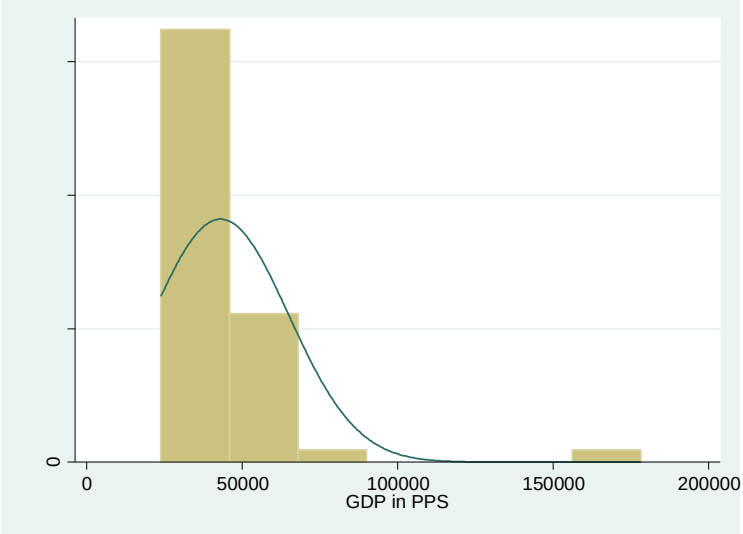

Figure A.3: distribution of GDP

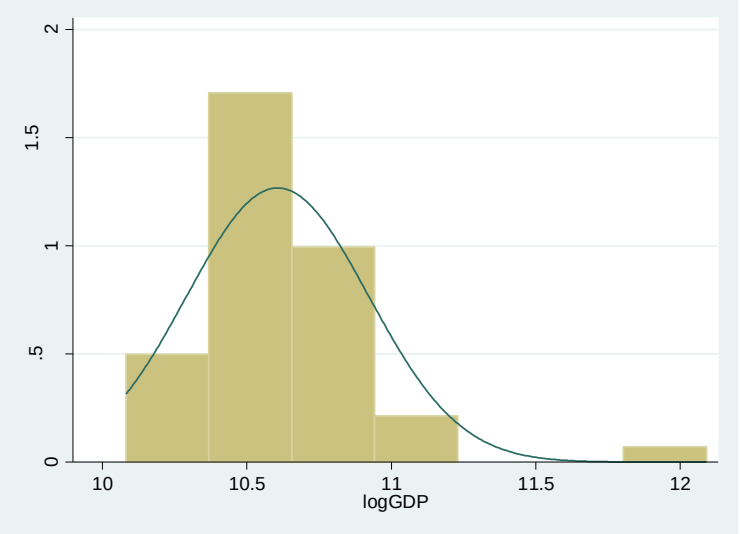

Figure A.4: distribution of log(GDP)

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