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Dialect Diversity and the Establishment of Free Trade Zones in China

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ABSTRACT. *This paper aims to investigate the economic consequence of cultural diversity, especially dialect diversity. This particular category of linguistic diversity can, to some extent, affect economic decisions such as the establishment of free trade zones. Two possible theories called Contact theory and Conflict theory are proposed to provide explanations for any pattern, either positive or negative correlation, behind this phenomenon. I collected data either by hand or from government websites. Results reveal that the more diversified the dialect within a city, the less the likelihood of establishing a free trade zone.*

KEYWORDS: *Dialect diversity, Establishment, Free trade zones*

1. Introduction

Culture can have essential implications in economic performance through directly or implicitly influencing particular economic decisions. In this paper, I investigate the relation between dialect diversity, an aspect of cultural diversity, and establishments of free trade zones (FTZ) in China.

A dialect is a form of a language that people speak in a particular part of a country, containing some different words and grammar [1]. It is, therefore, a crucial aspect of linguistic factors that potentially affect economic development. Specifically, the diversity I concern about is the number of dialects used within a region.

Trade liberalization has always been raising heated discussion among both domestic government or international bodies. Free trade zones refer to areas within which goods may be landed, handled, manufactured or reconfigured, and reexported without the intervention of the customs authorities. [2]

This study was inspired by Destmet, Gomes, and Ortuño-Ortín (2020) [3], which introduced two possible theories to hypothesize for his investigation into linguistic diversity and the provision of public goods. Desmet et al. (2020) used two theories, i.e., conflict theory and contact theory, to explain this relation and find mixed evidence.

There are two theories that predict distinct outcomes in the influence of the dialect diversity on the establishments of FTZs. The first is called *Conflict Theory* and was proposed by the German economist and sociologist Karl Marx. Intuitively, *Conflict Theory* states that tensions and conflicts arise when resources, status, and power are unevenly distributed between groups in society and that these conflicts become the engine for social changes. [4]

Obviously, linguistic divergence is categorized into one of the factors that arouse social tensions. Increased diversity between individual groups of society possibly fosters more severe hostility and leads to increased difficulty in reaching consensus, thereby creating an excess disturbance that negatively interferes with normal proceedings of socio-economic development.

Applying this theory to the topic I pay attention to, a higher degree of antagonism with society means reduced unity. The intentions of citizens to benefit from trade liberalization through establishing an FTZ, such as increased production efficiency, lower price, better resource allocation, are mitigated because they are reluctant to share them with a different group of people.

On the other hand, *Contact Theory* supports results indicating the exactly opposite pattern. First proposed by the Harvard psychologist Gordon Allport, *Contact Theory* suggests that interpersonal contact between groups can reduce prejudice by reducing feelings of anxiety when talking to unfamiliar groups of people and cultivating a sense of empathy in the process of understanding different groups.

In the field of my observation, this theory implies that reduced prejudice towards groups with a different linguistic preference or groups that speak “minority” dialects, dialects that are relatively marginalized and

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infrequently used, enhance the solidarity of society. The willingness to receive mutual benefits arising from trade liberalization will increase. The likelihood of a city applying for an FTZ increases along.

Though there were some readily available data, gathering all the essential data was still a significant challenge throughout this investigation. Macroeconomic statistics were found on the official websites of the Chinese National Bureau of Statistics. However, data on the aspect of FTZs, including the time of application, time of establishment, specific locations within provinces, etc., were hand-collected. All results support a negative correlation between the degree of diversity and the likelihood of establishing an FTZ.

One of the highlights is that I considered not only the actual establishment of FTZs but also their decisions to apply to be the host cities of FTZs. More specifically, I intended to see if dialect diversity could affect the government's decisions on whether to approve the application city approval. I find evidence supports the Conflict Theory in my setting. Results reveal that the more diversified the dialect within a city, the less the likelihood of establishing a free trade zone.

2. Summary Statistics

Among the data collected for this study, the establishment of FTZs in cities is of primary concern. Two columns of data are collected for the decision to establish a free trade zone, which includes the action of a city to apply for a free trade zone voluntarily and if the application succeeds.

Table 1 Summary Statistics of Data Collected

	Obs	Mean	Std	Min	20%	50%	75%	Max
apply	3167	0.010	0.102	0	0	0	0	1
succeed	3167	0.010	0.100	0	0	0	0	1
diversity	2613	0.274	0.224	0.001	0.036	0.256	0.488	0.752
Provincialcapital	3167	0.104	0.305	0	0	0	0	1
GDP	2873	6.877	0.983	3.969	6.221	6.827	7.463	10.130
population	2874	5.861	0.703	0.039	5.476	5.913	6.355	8.129
employment	2868	3.448	0.784	0.859	2.908	3.378	3.841	6.591
employment wage per capita	2851	10.370	0.426	8.509	10.060	10.420	10.690	12.680

The table above demonstrates the summary statistics of dialect diversity, the decision to establish FTZs, and other macroeconomic indexes.

One distinctive nature, which is related to the policy of the Chinese government on setting free trade zones, determined the method I use to gather the data. As background knowledge, the successful establishment of an FTZ requires the following processes: first, cities need to send formal application form to the State Council. Then the State Council will hold conferences to decide which ones to approve and which to deny. Therefore, even if some cities submitted their application, there's a high probability of being refused. As a result of this policy, I designate the year in which a city's application gets approved, instead of the time of application, to be the time of the establishment of FTZ. Therefore, the time of approval is recorded as “1”. The years after will all be marked as “1” since this would be a permanent decision. On the contrary, years before will all be marked as “0”.

During the simple period, only one city named Lanzhou was not granted approval yet. All the other cities were approved after they applied. So, the data for apply and succeed are almost the same. Therefore, I only focus on cities that succeeded for the reason of simplicity and interpretation.

Furthermore, the sample periods of these data range from 2006 to 2016. In fact, several FTZs are approved after the year 2016. However, data regarding population and GDP only include the years before 2016. This means that decisions after 2016 will not be considered due to insufficient data. No FTZs are approved before the year 2006, so the new limit won't affect the results.

According to the data, there were altogether 26 cities that established an FTZ during the time interval 2006~2016: one in 2013, seven in 2015, and seventeen in 2016. All the macroeconomic indexes have a sample period ranging from the year 2006 to 2016. Other factors, such as whether the city is a provincial capital, remain the same for considerably long periods, meaning that there are no variations from year to year. So, it remains the same for a specific city during the sample period.

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I then collected data for the dialect diversity in 277 cities in China[4]. Dialect diversity is a factor that's unlikely to be subjected to changes due to the cumulative and cultural nature of it. Therefore, I assume the variation in dialect diversity is negligible over the ten-year period I study, which is from 2006 to 2016.

3. Empirical Model

I used two models, including OLS and logistic regression model, to analyze the data. The independent variable is *dialect diversity*, following the measure developed by Xu, Liu, and Xiao (2015)[5], and the dependent variable is the presence or absence of FTZ.

The regression model is:

$$FTZ = \alpha + \beta Dialect\ Diversity + \gamma Controls + \varepsilon$$

If there is a negative correlation between the two variables, β will have a negative value. In contrast, if observing a positive correlation, β will have a positive value.

In the same spirit, I also use a Logistic regression model to address the binary nature of the dependent variable:

$$y = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x)}}$$

If there is a negative correlation between the two variables, β will have a negative value. In contrast, if observing a positive correlation, β will have a positive value.

4. Result Interpretation

Table 2 summarizes the regression results. The first three columns of the table demonstrate the relation between dialect diversity and the decision to establish an FTZ using an OLS model. In the first column, I only include dialect diversity as an explanatory variable. The coefficient of the variable of interests, *diversity*, is negative, suggesting that as dialect diversity increases, the likelihood of establishing an FTZ would decrease. The estimate is statistically significant at the 5% level. Translating the regression results into the economic magnitude, one standard deviation increase in dialect diversity is associated with a 0.538% decrease in the likelihood to establish a free trade zone. This magnitude is non-trivial, given the fact that the overall probability for a city to establish an FTZ is around 9 percent (18 out of 277 cities established an FTZ in my sample period).

Table 2 Regression Results Demonstration

	OLS model 1	OLS model 2	OLS model 3	logit model 1	logit model 2	Logit model 3
diversity	0.024**	-0.018*	-0.018*	0.894	0.734	0.807
std err	0.009	0.010	0.010	0.946	1.076	1.133
GDP		0.026***	-0.014**		6.230***	0.690
std err		0.003	0.007		0.274	0.602
population		-0.009**	-0.005		0.538**	0.325
std err		0.004	0.005		0.419	0.424
employment			0.041***			0.098
std err			0.008			0.537
employment wage pc			0.041***			0.950***
std err			0.008			0.613
provincial capital		0.017**	0.001		0.413	28.097
std err		0.008	0.008		0.494	0.705
constant	0.018**	-0.109***	-0.424***	0.980**	0.999***	1.000***
std err	0.003	0.021	0.078	0.242	2.542	7.522
R2	0	0.050	0.060	0.020	0.300	0.365
obs	2613	2375	2359	2613	2375	2359

*p<0.10, **p<0.05, ***p<0.01. The dependent variable is the decision to establish an FTZ, measured by whether they succeeded in applying FTZs. The independent variable is dialect diversity; specifically, the number of dialects used within a region.

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The second column includes the GDP and population. It also involves the identity of the city, more specifically, whether it is the provincial capital. When I add covariates, the coefficients are significant at the 10% percent level. One standard deviation increases in dialect diversity lower results in a 0.403% decrease in the likelihood to establish a free trade zone.

In the third column, I also concern about the total number of employment and the employment wage per capita. Microeconomics statistics are taken log to reduce the absolute value. I also lag the statistics by one year because the decision to establish an FTZ is usually based upon economic performances. Government decisions and policies take time to be formulated. So, the decision made in one year is likely to be based on a previous year's performance. When I add these covariates into the regression, the value of the coefficient remains the same as in the second column, indicating the same result.

OLS can be an effective model when describing the relationship between two continuous variables. However, data on FTZ are binary variables, which means they are discrete. As a result, some of the prerequisites of fitting an OLS model might not be satisfied. Furthermore, the probability of establishing an FTZ can exceed 1 in a linear model, which disobeyed the mathematical rule. Therefore, I fitted the Logistic regression model in addition to the OLS model.

In the last three columns, the data in the table are the odds ratio calculated from the coefficients of logit regression. In the fourth column, I only considered dialect diversity as the sole factor. The coefficient extracted directly from the regression results were -2.278, indicating a negative correlation between dialect diversity and the likelihood of establishing an FTZ. One standard deviation increases in dialect diversity result in a 2.376% decrease in the likelihood of establishing an FTZ.

In the fifth column, I took the GDP of the previous year and city identity into consideration. This time, the coefficient is -1.326; correlation remains negative. One standard deviation increases in dialect diversity result in a 5.964% decrease in the likelihood of establishing an FTZ.

In the sixth column, I further added city employment and employment wage. The coefficient of dialect diversity turns into -1.650. One standard deviation increases in dialect diversity result in a 4.328% decrease in the likelihood of establishing an FTZ.

From the above analysis, we can see that whether it is OLS or Logit model that I applied, the results of the correlation between dialect diversity and the likelihood of establishing an FTZ are consistent with each other. This negative correlation implies that the way dialect diversity influences the likelihood of establishing an FTZ can be properly explained by the Conflict Theory, according to which a higher degree of linguistic diversity makes a society's social environment go messy. The effectiveness of communication is reduced. Trade and transactions take more time and effort and encounter more obstacles. The State Council might have recognized this linguistic disadvantage and give up the decision to set up a free trade zone in cities with high dialect diversity.

5. Conclusion

In this study, I investigated the effect of dialect diversity on the establishment of free trade zones. After providing an empirical explanation for their relationship, a negative correlation is observed. The result is consistent with the Conflict theory, in which linguistic diversity is believed to foster a feeling of antagonism within different groups of individuals within a region, thereby negatively affecting the likelihood of establishing an FTZ.

The scope of research is focused specifically on cities in China, one of the countries with the leading trading amount. Besides, this culturally abundant country possesses an incredibly high degree of linguistic diversity, which can be fully manifested by the extensive branches of dialect. Both of these characteristics make it a perfect object of my research.

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