The impact of ethnic diversity on the quality of exports: the case from China *

This Version: January 2020

Abstract

In this paper, I investigate the impact of ethnic diversity on the quality of export in China. I employ the recent firm-level Chinese export data, merged with the Industrial Census and the National Population Census in 2000. My data shows that ethnically homogeneous provinces export products of 10% higher quality on average than ethnically heterogeneous provinces. More interestingly, this impact depends on the characteristics of the products. In particular, ethnic diversity has a negative impact on differentiated products but positive impact on homogeneous products.

Keywords: Quality; Exports; Ethnic Diversity; Product Differentiation; China

JEL Classifications: F14, O1, R23.

1 Structured abstract

1.1 Purpose

The quality of exports is an important indicator of the development of a country. It is therefore important to understand its determinants. Existing literature reveals a number of determinants such as the position of a country, the distance to the trading partner, the size of the firm, the productivity or the quality of inputs. In this study, I propose a new determinant, namely ethnic diversity.

1.2 Methodology

In the first stage of my research, I estimate the quality of exports following Berry (1994) approach. I also address the endogeneity problem as suggested by Khandelwal (2010). My measure of ethnic diversity follows Easterly and Levine (1997). In the second stage, I

regress the estimated quality on the measure of ethnic diversity, interacted by the degree of differentiation of the goods.

1.3 Findings

First I find that ethnic diversity in general reduces the quality of exports. Second I find that the impact varies with the degree of differentiation. In particular, while ethnic diversity decreases the quality of differentiated goods, it increases the quality of homogeneous goods.

1.4 Research limitations/implications

Because of data limitations, the research cannot investigate the impact of migration

1.5 Practical/Social implications

The findings of my paper show how we can improve the quality of products based on the characteristics of the population and of the products.

1.6 Originality/value

My paper is the first one to investigate the impact of ethnic diversity on the quality of products and how ethnic diversity interacts with the characteristics of the products. It reveals the channel through which ethnic diversity affect the quality.

2   Introduction

The notion of quality is of important interest in economics. According to the Linder's hypothesis (Linder, 1961), the quality of traded goods is an indicator of the country development, which is supported by evidence across the world (Hummels and Klenow 2005, Hallak 2006, Schott 2004). It is therefore not surprising that many studies have investigated the determinants of quality, such as the "position" of a country (Hidalgo et al., 2007), the distance to the trading partner (Bastos and Silva, 2010), the size of the firms (Verhoogen, 2008), their productivity (Johnson, 2012) or the quality of inputs (Manova and Zhang, 2012).

There is an emerging literature studying the role of ethnic diversity in economic performances. This factor has been shown to be a hindrance on economic growth (Easterly and Levine, 1997) but has a pro-trade effect on the extensive margin via the transaction costs reduction (Dunlevy 2005, Herander and Saavedra 2005, Rauch and Trindade 2005) or the preference channel (Head and Ries, 1998). In this paper I aim to answer the following question: *Does ethnic diversity have a statistically and economically significant impact on the quality of exports?*

Using the custom data from China, I find that ethnic diversity does have a significant impact on the quality of products. Export from a hypothetical, completely ethnically heterogeneous province (i.e. where everyone belongs to a different ethnic group) in general shows greater than 10% lower quality as compared to a completely homogeneous province (where everyone belongs to the same ethnic group). But diversity is not all bad. I find that its impact depends on the characteristics of the product. In particular, while ethnic diversity lowers the quality of the differentiated products, it can raise the quality of homogeneous goods. This result helps us to shed light on how ethnic diversity affects the quality of products in the region.

The organization of the paper is as follows. I lay out the background in China in the next Section, then introduce the data and measurement in Section 4. Section 5 presents the empirical specifications, results and robustness checks. I will discuss the results in Section 6 and conclude in Section 7 concludes.

3   Background: The case of China

China is an ethnically diverse country with 56 ethnic groups the in mainland, with 19 of the groups having more than 1 million members each. They occupy several autonomous regions such as the Inner Mongolia , Guangxi Zhuang, Tibet, Ningxia Hui and Xingjian Uygur Autonomous Regions. There are also sub-provincial autonomous prefectures, as well as autonomous prefectures, counties, townships and villages scattered in all parts of China. They all point to the fact that China is a good case to study the impact of diversity on their growing export.

The literature suggests that ethnic diversity is a hindrance to economic performances (Alesina and Ferrara (2005)). Linguistic and cultural difference are the communication barriers which make business cooperation harder. Moreover, ethnic fractionalization implies low level of institutional quality (Laporta et al. (1999)) and therefore less investment (Mauro (1995)).

On the other hand, different ethnicities possess different skills. For instance, the Jino ethnic group, which lives mostly in Yunnan province, is said to be great hunters. They are the experts in the use of traps and nooses to catch wild animals. The Hezhe group is skilled at carpentry, tanning and iron smelting. The women in the Daur group are renowned for their needlework, decorating clothing with fine patterns. Perhaps the most famous anecdote is the Mongol group, with their leader Genghis Khan who established one of the largest empires in the history. The Mongols are said to be very skillful in horse riding. They can travel in large distance with very light supplies. An example of their skills is that they can drink horse blood if water is in short supply. These stories are consistent with the idea that some ethnic groups dominate certain trades (Churchill (2017)). Ethnic diversity also allows a larger talent pool (Fafchamps (2000)).

4 Data and measurement

4.1 China custom data

In this project I employ customs data, provided by China Custom Office, on the universe of exporting firms in China in 2000. It records all types of trade, including processing trade, exchanges between international organizations, required materials and machines in an oversea contract, etc. However, as Dai, Maitra and Yu (2016) suggested, it is crucial to separate the processing trade away from other exporters in China. Indeed, they documented that, unlike other countries processing trade exporters, the Chinese processing trade firms are less productive and create less value added per worker than other industries. For this reason, I eliminate processing trade from my study. Moreover, I drop other forms of trade such as gifts and exchanges which are less likely to be decided by the production source. At the end, I put my focus on general trade which accounted for 55% of the total export from China in 2000.

In order to limit my study to manufacturing firms, and also to include the enterprises' characteristics into my project, I merge this dataset with data from an industrial survey on manufacturing firms in China conducted by the National Bureau of Statistics. This survey covers all enterprises with annual revenue greater than CNY 5 million (or equivalently USD 800,000). This merged data accounts for 31% of the total export in 2000 and 10% of the companies in the industrial data. Finally I add the National Population Census which provides information about the ethnic distribution to form my main dataset in this project.

4.2 National Population Census

I will use the population distribution, which is calculated from the National Population Census in China in 2000. This census has been carried every ten years. In this Census, people have to declare their ethnic origin (minzu). The formation of minzu only started formally in 1953 when the Communist Party of China (CPC) constructed a census to determine the national identity after the birth of the People's Republic of China. More than 400 minorities were received. This was not a surprise given the government policies to give benefits to minority groups such as a seat in the National People's Congress for every ethnicity. The CPC then dispatched a team, called the Yunnan Ethnic Classifica-

Table 1: Ethnic Diversity

Province	ELF	PI	Province	ELF	PI
Jiangxi	0.00621	0.01434	Heilongjiang	0.09447	0.18254
Shanxi	0.00633	0.01269	Sichuan	0.09661	0.18814
Jiangsu	0.00710	0.01428	Tibet	0.13568	0.26943
Shaanxi	0.00993	0.01986	Gansu	0.16486	0.32206
Shanghai	0.01260	0.02522	Jilin	0.17143	0.31489
Anhui	0.01340	0.02680	Hunan	0.18939	0.33890
Shandong	0.01398	0.02799	Liaoning	0.27855	0.51502
Zhejiang	0.01713	0.03782	Hainan	0.29322	0.55650
Henan	0.02480	0.04939	Inner Mongolia	0.34329	0.62663
Guangdong	0.02950	0.05865	Ningxia	0.45643	0.89708
Fujian	0.03393	0.07733	Guangxi	0.51400	0.87828
Tianjin	0.05313	0.10413	Yunnan	0.53971	0.70491
Beijing	0.08378	0.16103	Guizhou	0.58795	0.72694
Hubei	0.08401	0.16496	Xinjiang	0.62428	0.88224
Hebei	0.08408	0.16358	Qinghai	0.63254	0.83549

tion Team, to determine once and for all the number of formally recognized ethnicities in 1954. Based on the assumption that there is a strong correlation between language and ethnicity, the team reduced the number of ethnicities to 56, which is still used today.

An advantage of using the cross-section data relative to the panel data is that it is not subject to the issue of migration. In order to measure the fractionalization across provinces, I follow Easterly and Levine (1997) and the literature to compute the ethno-linguistic fractionalization:

$$Div_p = 1 - \sum_k n_{pk}^2$$

where n_{pk} is the population share of group k in province p. This index represents the probability that two randomly selected individuals in the same region belong to different ethnic groups. In other words, a high Div_p index indicates that province p is ethnically diverse. This variable takes the value 1 when the province is completely heterogeneous and 0 when the province is completely homogeneous.

4.3 The quality of Exports in China

I follow Berry (1994) suggestion that quality can be estimated as the excess sales after controlling for price, an idea that has been used widely (for instance, Hallak and Schott (2011); Khandelwal (2010)). In particular I estimate the following demand function:

$$q_{ijc} = \alpha + \beta p_{ijc} + \gamma pop_c + I_j + u_{ijc} \tag{1}$$

In the above equaiton, sales of a product j by company i to country c depends on

its price p_{ijc}, the market size (controlled by the country population pop_c) and the price index (controlled by the industry fixed effect I_j) which represents the business condition. The quality of the product is not observable and treated as the error term.

A problem with this estimation is the endogeneity of the unit price p_{ijc}. Indeed, unit price are often positively correlated with unobserved quality components creating an upward bias. To correct for this problem, I need to determine causality with an instrumental variable (IV). Khandelwal (2010) suggests transportation costs should be included in the IV but unfortunately they are not available in China. I must then use two dummy variables: the country of destination dummy and another dummy which indicates whether the province where the firm is located in has a major port. Intuitively, these two instruments capture how remote the firm is (indicated by the availability of a major port in the province where the firm is located) and how close to China the export market is. In other words, the two instruments capture the transport costs from the firm to the destination.

Before applying the instrumental variable approach, I need to check the relevance and the validity of the instruments. In particular, I need to check: (i) if the instruments are correlated with the endogenous variable (i.e. the unit price); (ii) if they are uncorrelated with the error terms (the exogeneity condition). To be more precise, the error terms here are the demand shocks. It is clear that the distance between China and the destination country, as well as the availability of a major port in a province are not related to the demand shocks. And significance of the instrument coefficients in the first stage[1] indicates the relevance of my instruments.

With these instruments at my disposal, I run the regression (1) for 94 of the total 98 HS two-digit level categories [2]. Out of the remaining 94 sectors, 9 have positive own-price elasticity[3].

I then only consider categories with negative own-price elasticity β. In order to confirm my quality estimation, I compared my own-price elasticity statistics with other studies, in particular Khandelwal (2010) using U.S. data. Table 2 shows that my statistics do not differ significantly from Khandelwal (2010) findings.

5 The impact of ethnic diversity on the quality of exports

5.1 Empirical specifications

To investigate the impact of ethnic diversity on the quality of exports, I run the following reduced form estimation:

---

[1]Since I run the quality of estimation for each HS-2 digit sector, I cannot report all the first stage results here. These results are available upon request.

[2]There are 4 sectors that have no observations or less than 10 observations. These sectors are Live Animals; Pulp of Wood, Waste and Scrap of Paper; Aircraft, Spacecraft and Parts Thereof; Business services, Health, Financial/Insurance Legal/Real Estate, Hotels, and Misc repair Business services.

[3]These sectors are Sugars and Sugar Confectionery; Cocoa and Cocoa preparations; Photographic or Cinematographic goods; Cork and Articles of Cork; Silk, Inc.Yarns and Woven Fabrics Thereof; Carpets and other Textile Floor Coverings; Zinc and Articles Thereof; Tin and Articles Thereof; Ships, Boats, and Floating Structures.

Table 2: Own Price Elasticity

	Mean	Median	First quartile	Third quartile
Without IV	-0.74	-0.71	-0.87	-0.49
With IV	-1.04	-0.94	-1.30	-0.48
Khandelwal estimates	-1.28	-0.58	-1.44	-0.20

Note: My estimates are taken from equation (1). To be consistent with Khandelwal (2010), the statistics are calculated conditional on negative own price elasticity

$$Quality_{ijpc} = \alpha + \beta Div_p + \varsigma X + \gamma I + \delta_{ijpc} \tag{2}$$

$Quality_{ijpc}$ is the estimated quality (in log terms) of a product j, produced by the firm i that is located in the province p and exported to the country c. The vector $X = (X_i, X_p)$ controls the time-invariant characteristics. In particular, X_i is the vector of firm characteristics such as firm's age, ownership, input expenses and productivity. I also control for the provincial factors by the vector X_p such as economic growth (GDP per capita), geography (Coastal dummy), transportation, investment and urbanization (city population). The vector $I = (I_s, I_c)$ control for any sectoral effect (I_s) or destination effect (I_c, also known as the Alchian-Allen effect see Bastos and Silva, 2010). The coefficient of interest is the coefficient of diversity (in log terms) β. As in the growth literature, I expect diversity to have a negative impact ($\beta < 0$) on the quality of exported goods.

In order to gauge more understanding of how ethnic diversity impacts quality, I investigate how the impact changes with the product characteristics. In particular, I interact the diversity index with the degree of product differentiation

$$Quality_{ijpc} = \alpha + \phi Div_p + \theta Div_p * Diff_j + \varsigma X_i + \upsilon X_p + \delta_{ijpc} \tag{3}$$

Here I borrow the idea of quality ladder as product differentiation from Khandelwal (2010). In particular, I calculate the quality dispersion as a proxy of product differentiation. The marginal effect of diversity is then written as:

$$\frac{\delta Quality_{ijpc}}{\delta Div_p} = \phi + \theta Diff_j \tag{4}$$

Equation 4 implies that for differentiated products (when $Diff_j$ is high enough) the impact of diversity on product quality is the sign of the coefficient θ. Our conjecture is that θ is significantly negative. Moreover, the impact of diversity on homogeneous goods (when $Diff_j$ is close to 0) is the sign of the coefficient ϕ. If ϕ is significantly positive then ethnic diversity can have a positive impact on the quality of homogeneous goods.

5.2 Empirical results

We can see that from Column 1 to Column 3 in Table 3 where I subsequently add firm characteristics, provincial characteristics and destination effect, the coefficient of interest

Table 3: The impact of Diversity

Dependent variable: Quality					
	(1)	(2)	(3)	(4)	(5)
Diversity	-0.109***	-0.174***	-0.212***	-0.389***	-0.391***
	(0.027)	(0.028)	(0.040)	(0.092)	(0.054)
Firms' characteristics	x	x	x	x	x
Provinces' characteristics		x	x	x	x
Country of destination fixed effect			x	x	x
Observations	147,245	147,245	147,245	147,245	147,245
R-squared	0.01	0.01	0.02	0.08	0.16

Note: The firms' characteristics included are the firm's age, the firm's status (foreign invested, State-owned), input expenses and productivity. The provinces' characteristics included are the GDP per capita, the amount of transported goods per kilometers, the number of investment projects, the city size (population). The random effect estimator is employed in all Columns except Column 4 where I use the fixed effect estimator. The fractionalization index is employed as the degree of diversity in all Columns except Column 5 where I use the polarization index.

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

β is significantly negative, confirming my prediction that in provinces that are ethnically diverse, the quality of the exported products are generally lower. It is consistent with the findings in the growth literature that ethnic diversity is in general a hindrance to economic performances (Alesina and Ferrara (2005)).

We then can make the following claim:

Claim 1. In multi-ethnic regions the average quality of exported goods is lower.

5.3 The heterogeneous impact of ethnic diversity

Column 1 in Table 4 reveals some interesting results. The interaction term of Diversity and Product Differentiation (coefficient θ in Equation 3) is significantly negative. It shows that the negative impact of diversity increases with the degree of product differentiation. However, the coefficient ϕ is insignificant. It prompts the result that ethnic diversity could have a positive impact on the quality of homogeneous goods. To verify this I limit my sample data to products with the quality dispersion lower than 4.18 (10th percentile) and rerun the empirical exercise as in Equation 2. The impact of ethnic diversity (the coefficient β) is now significantly positive. More checks will be carried in the next section. I then state the second finding:

Claim 2. The impact of ethnic diversity varies across products: it is positive among homogeneous goods but negative among differentiated goods.

5.4 Robustness check

In the previous section, my regression results suggest that the negative impact of diversity on quality is robust to various specifications. In this section, I will check for robustness

Table 4: The impact of Diversity across products

Dependent variable: Quality						
	(1)	(2)	(3)	(4)	(5)	(6)
Div	-0.129	0.904***	0.495***	-0.00851	0.0136	0.603**
	(0.316)	(0.311)	(0.186)	(0.130)	(0.122)	(0.238)
Div*Diff	-0.180***	-0.200***	-0.148***	-0.0972***	-0.0562***	
	(0.0509)	(0.0502)	(0.0299)	(0.0340)	(0.0172)	
Diff	0.124***		0.127***	-0.0288***	0.00897***	
	(0.00479)		(0.00493)	(0.00310)	(0.00125)	
Div*WorkSubs						-1.191***
						(0.308)
WorkSubs						-0.958***
						(0.0324)
Observations	147,245	147,245	147,245	147,245	146,327	147,245
R-squared	0.014	0.014	0.013	0.02	0.02	0.01

NOTE: In all specifications, I include the firm characteristics such as the firm's age, the firm's status (foreign invested, State-owned) input expenses and productivity. The province characteristics such as GDP per capita, the amount of transported goods per kilometers, the number of investment projects are also included. Div is the ethnic Diversity index whereas Diff measures the Product Differentiation. WorkSubs is the degree of substitutability among workers.

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

with other methods. Firstly in the benchmark regression, I apply the random effects estimator. While this estimator is more efficient, one could worry about its inconsistency. Being aware of this concern, I will cross-reference with the fixed effects model. Column 4 in Table 3 shows that my results are still robust with this estimator, although the coefficient is slightly smaller in absolute term. Indeed, provinces that are ethnically homogeneous export products of quality 5% higher than multi-ethnic provinces. I can also use the fixed effects estimator when I check the impact of diversity across different products. Results reported in Column 2 in Table 4 confirm Claim 2 that ethnic diversity could have a positive impact on homogeneous products but its impact becomes negative with differentiated products.

Another concern is the measure of my independent variables, in particular the diversity index. Beside the group fragmentation as the Div index provides us, I can also look at the polarization of the group. I then borrow the polarization index (PI) suggested by Reynal-Querol (1998), calculated as:

$$PI_i = 1 - \sum_j \left(\frac{0.5 - n_{ij}}{0.5} \right)^2 n_{ij}$$

This index measures how polarized the group is. In other words, PI reaches its maximum value when there are two or more ethnic groups of equal size. The corresponding values of this index across provinces are shown in Table 1. Column 5 in Table 3 and Column 3 in Table 4 suggest that my results are robust with this measure of diversity[4].

---

[4]One could raise the concern of migration which could influence my measures of diversity. But as Dincer and Wang (2011) reported, the index does not change significantly over the period of 1978 to

Finally, I want to test if my results are robust to a different measure of differentiation. Instead of the quality dispersion, I use two alternative measures, the price dispersion and the elasticity of substitution taken from Broda, Greenfield and Weinstein (2006). While the dispersion of quality (and price) represent the vertical differentiation, the elasticity of substitution represents the horizontal differentiation. Column 4 and 5 in Table 4 confirm that my results survive this test.

6   Discussion

How do we explain the finding that ethnic diversity is good for homogeneous goods but reduces the quality of differentiated goods?. According to Lazear (1999), people from different groups have disjoint information sets which are possibly relevant to the job. People from different ethnic races, especially local people can bring their knowledge and experience to the team. This is what Lazear (1999) calls "knowing the ropes". For instance, a company might want to hire local people because of their understanding of the local weather and natural resources. Also people from a particular ethnic group possess the required skill for certain tasks, a phenomenon called "best practices" by Lazear (1999). A diverse team is more likely to have the necessary person than a homogenous team.

However, to realize the gains of diversity, the information from different groups must be relevant and easily learned or transferred. "Knowing the ropes" and "best practices" are more likely to be relevant in homogenous sectors such as agriculture. Western provinces such as Sichuan where many ethnic groups live are well known for their traditional food. In differentiated sectors such as manufacturing, local experience and culture are of less importance. Whether the disjoint information can be easily learned or transferred depends on how people communicate. People with different background and culture face more difficulty when they engage in conversation and discussion. Indeed, according to the linguistic relativity principle, or the Sapir–Whorf hypothesis, speakers of different languages tend to think and behave differently depending on the language they use. A common object is therefore interpreted in different ways across different groups. This divergence is exacerbated by the complexity of the ideas. In my context, heterogeneous goods are more complex than homogeneous goods because they have different varieties, thus more characteristics than the latter.

To illustrate the effect of diversity on the good quality and the interaction with good differentiation, let me take an example. Suppose we have two regions. In the first region, the workers are homogeneous whereas in the second region, there is a degree of diversity. More particularly, the characteristic in region 1 of worker A and worker B are as follows:

$$x_A = x_B = 0.5$$

In region 2, the characteristic of worker A and worker B are as follows:

$$x_A = 0.9$$
$$x_B = 0.1$$

2002. This guarantees us that the index is exogenous. Since this is a cross sectional data, I can rule out the impact of migration: in any case, this is a snapshot of the impact of the distribution of ethnic diversity on quality of exports

Here a high value number indicates the worker has high skill. In both regions, two goods can be produced by the workers and the quality of the goods depends on the characteristics of both workers. It shows that the characteristic is relevant. To show the idea that the skill is more transferable in the case of homogeneous good, we assume that the quality of the homogeneous good l is given by:

$$q_l = max(x_A, x_B) \tag{5}$$

Here the worker with low skill can learn from the one with a higher level of skill. In other words, the highly skilled worker can transfer his/her characteristic to his/her colleague. By contrast, the skill is not transferable in the case of the differentiated good h. Its quality is given by:

$$q_h = x_A * x_B \tag{6}$$

We can see that the quality of good l are 0.5 and 0.9 in regions 1 and 2, respectively. In other words, the diversity of workers in region 2 induces high quality of the homogeneous good l. By contrast, the quality of good h are 0.25 and 0.09 in regions 1 and 2, respectively. In this case the diversity in region 2 implies low quality of good h.

In addition to the good differentiation, the problem of ethnic diversity is also aggravated by the worker's complementarity. This complementarity among workers requires all of them to perform their task well, which is more difficult when they cannot communicate efficiently. Another point I can make here is that people from different groups have less sympathy towards each other than if they belong to the same ethnic group. Again, if the workers are substitutable, this causes little problem to the team. But when they are complementary, the disharmony problem becomes more serious.

We can employ the previous example to illustrate this point. In the previous example, there is a degree of complementarity between workers. If we remove this complementarity and assume that workers are perfectly substitutable, i.e.:

$$q = x_A + x_B \tag{7}$$

then there is no difference in quality of the good produced in the two regions. Diversity has no role when workers are substitutable.

I then can check if this hypothesis is correct, that when the workers are complementary ethnic heterogeneity affects negatively the quality of products produced by the firm. I measure the degree of substitutability among workers by the wage dispersion across industries: the lower the wage dispersion the more substitutable the workers are or the less complementary the workers are. I then run the following regression:

$$Quality_{ijpc} = \alpha + \beta Div_p + \delta Div_p * Comp_j + \varsigma X_i + \upsilon X_p + \delta_{ijpc} \tag{8}$$

Column 5 in Table 4 shows that the interaction term is negative, confirming my hypothesis. This result is consistent with Bombardini, Gallipoli and Pupato (2012) when they show that countries with a dispersed skill distribution specialize in products with less worker skill complementarity. Moreover, my data shows that wage dispersion is positively

correlated with my two measures of differentiation, namely quality dispersion and price dispersion. Indeed the correlations are 0.07 and 0.09 respectively. These results then explain the heterogeneous impact of ethnic diversity on quality as I find in the previous section.

7   Conclusion

Ethnic diversity is claimed to have a significant impact on economic growth. In this study I investigate the impact of ethnic diversity on another dimension, or the depth of economic growth: the quality of products. I use customs data and the manufacturing survey in China to estimate the quality of exported goods from China in 2000. My finding is that products from a completely homogeneous province are more than 10% higher quality than those from a completely heterogeneous province. While the impact of ethnic diversity is negative for differentiated sectors, it could be positive for homogeneous sectors. This result allows us to propose a channel for which diversity influences quality. Indeed, workers in differentiated sectors are complementary, which means they need to work in tandem and communication is very important. That explains why diverse provinces where people might have difficulty in communication do not produce differentiated goods of high quality in my data. However, in homogeneous goods where experience and knowledge from ancestors can be relevant, diverse provinces can have an advantage in producing high quality goods.

These results prompt a clear policy recommendation. Ethnic diversity should be a factor in designing industrial development policy. More precisely, homogeneous sectors should be promoted in regions with a high level of ethnic diversity whereas differentiated sectors should be developed in regions with a low level of ethnic diversity. My paper contributes therefore to the understanding of the impact of diversity. It is exciting to follow this road as others have shown that diversity can be a new source of comparative advantage

References

Alesina, Alberto, and Eliana La Ferrara. 2005. "Ethnic Diversity and Economic Performance." *Journal of Economic Literature*, XLIII: 762–800.

Bastos, Paulo, and Joana Silva. 2010. "The quality of a firm's exports: Where you export to matters." *Journal of International Economics*, 82(2): 99–111.

Berry, Steven T. 1994. "Estimating Discrete-Choice Models of Product Differentiation." *RAND Journal of Economics*, 25(2): 242–62.

Bombardini, Matilde, Giovanni Gallipoli, and German Pupato. 2012. "Skill Dispersion and Trade Flows." *American Economic Review*, 102(5): 2327–48.

Broda, Christian, Joshua Greenfield, and David Weinstein. 2006. "From Groundnuts to Globalization: A Structural Estimate of Trade and Growth." NBER Working Paper No.12512.

Churchill, A. 2017. "Micro-finance and ethnic diversity." *Economic Records*, 93(300): 112–141.

Dai, Mi, Madhura Maitra, and Miaojie Yu. 2016. "Unexceptional Exporter Performance in China? The Role of Processing Trade." *Journal of Development Economics*, 121: 177–189.

Dincer, Oguzhan, and Fan Wang. 2011. "Ethnic diversity and economic growth in China." *Journal of Policy Reform*, 14(1): 1–10.

Dunlevy, J. A. 2005. "The influence of corruption and language on the protrade effect of immigrants: Evidence from the American states." *Review of Economics and Statistics*, 88(1): 182–186.

Easterly, William, and Ross Levine. 1997. "Africa's Growth Tragedy: Policies and Ethnic Divisions." *The Quarterly Journal of Economics*, 112(4): 1203–50.

Fafchamps, A. 2000. "Ethnicity and credit in African manufacturing." *Journal of Development Economics*, 61: 205–35.

Hallak, Juan Carlos. 2006. "Product Quality and the Direction of Trade." *Journal of International Economics*, 68(1): 238–65.

Hallak, Juan Carlos, and Peter Schott. 2011. "Estimating Cross-Country Differences in Product Quality." *Quarterly Journal of Economics*, 126(1): 417–74.

Head, K., and J. Ries. 1998. "Immigration and Trade Creation: Econometric evidence from Canada." *Canadian Journal of Economics*, 31(1): 47–62.

Herander, M.G., and L.A. Saavedra. 2005. "Exports and the structure of immigrant-based network: The role of geographic proximity." *Review of Economics and Statistics*, 87(2): 323–335.

Hidalgo, C.A., B.Klinger, A.L. Barabsi, and R. Hausmann. 2007. "The Product Space Conditions the Development of Nations." *Science*, 317(5837): 482–87.

Hummels, David, and Peter Klenow. 2005. "The Variety and Quality of a Nations Exports." *American Economics Review*, 95(3): 704–23.

Johnson, Robert. 2012. "Trade and prices with heterogeneous firms." *Journal of International Economics*, 86: 43–56.

Khandelwal, Amit. 2010. "The Long and Short (of) Quality Ladders." *Review of Economic Studies*, 77(4): 1450–76.

Laporta, R., F. Lopez de Silanes, A. Shleifer, and R. Vishny. 1999. "The quality of government." *Journal of Law, Economics and Organization*, 15(1): 222–279.

Lazear, Edward P. 1999. "Globalisation and the Market for Team-Mates." *The Economic Journal*, 109(454): 15–40.

Linder, Staffan Burenstam. 1961. "An Essay on Trade and Transformation." PhD diss. Stockholm Almqvist and Wicksell.

Manova, Kalina, and Zhiwei Zhang. 2012. "Export Prices across Firms and Destinations." *Quarterly Journal of Economics*, 127: 379–436.

Mauro, P. 1995. "Corruption and Growth." *Quarterly Journal of Economics*, 110(3): 681–712.

Rauch, J.E., and V. Trindade. 2005. "Ethnic Chinese networks in international trade." *Review of Economics and Statistics*, 84(1): 116–130.

Reynal-Querol, Marta. 1998. "Religious Conflict and Growth." mimeo.

Schott, Peter K. 2004. "Across-Product versus Within-Product Specialization in International Trade." *Quarterly Journal of Economics*, 119(2): 647–78.

Verhoogen, Eric. 2008. "Trade, Quality Upgrading and Wage Inequality in the Mexican Manufacturing Sector." *Quarterly Journal of Economics*, 123(2): 489–530.