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How Headquarters Relocation is Affected by Rising Wages and Ownership

Evidence from China's Annual Survey of Industrial Enterprises, 1999–2008

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ABSTRACT

Industrial wages have increased significantly in China in recent years. At the same time, there have been widening gaps in wages across provinces. These trends are likely to prompt company headquarters to relocate. The relocation choices of headquarters are likely to change under different ownership, as a result of variations in their internal capabilities as well as the distinctive nature of their businesses. This paper is the first attempt to examine the effects of rising wages on headquarters' relocation by ownership. Data were obtained from the China Statistical Yearbook and the Annual Survey of Industrial Enterprises for the period 1998 through 2008. These data allow for differentiation among companies with regard to five types of enterprises: foreign owned, Sino-foreign owned, state owned, domestically joint owned, and privately owned. We use a conditional logit model to identify factors to determine which province headquarters chose to relocate. In addition, we consider the impact of these choices on the "minimum wage standard" introduced in 2004. Results indicate that wages insignificantly affected the relocation choice of all types of headquarters before 2004. After 2004, on average, headquarters were more likely to relocate to low-wage provinces, as predicted by "overall cost leadership." However, we also find that relocation choices are significantly affected by ownership type. While privately owned and state-owned enterprises are likely to relocate to areas with lower wages, foreign-owned headquarters tend to relocate to high-wage areas, as predicted by the "efficiency wage theory." Wages did not affect the relocation choices of Sino-foreign-owned companies, but had a negative effect on those of domestically joint-owned headquarters.

Keywords: headquarters, rising wages, ownership, relocation

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1. INTRODUCTION

Regardless of the type of business, its location and relocation is often instrumental in determining its success (Brouwer 2004). In the literature, discussions concerning relocation are often one-dimensional, focusing almost exclusively on the movement of manufacturing headquarters from developed countries to developing ones. For example, the most labor-intensive segments of the apparel commodity chain are located in countries with the lowest wages. This is supported by the sequential relocation of textile and apparel production from the United States and Western Europe to Japan, the Asian "Big Three," and China, given that each new tier of entrants to the production hierarchy had significantly lower wage rates than their predecessors (Gereffi 1999). Such analysis is inherently limited. The movement of headquarters from developed to developing countries is at an all-time low (De Jong and Gardner 2013). In contrast, there is a growing trend of companies relocating from one developing country to another, as well as movement within developing countries themselves.

On the other hand, the initiation by China of industrial wage reforms in 1977 sharply increased wages over the past decade (Walder 1987), an occurrence boosted by enactment of the "minimum wage standard" in 2004 (Cai 2011). Belman and Wolfson (1997) found evidence from U.S. data that headquarters in states with minimum wage laws had a positive impact on the wages of employees as well as companies' operation models. At the same time, the rapid growth of wage inequality and the sharp widening of wage structure have been quantified (Knight and Song 2003). As can be seen from Table 3.2 in Section 3, from 1998 to 2008 real wages in China dramatically increased more than three times—from 73 to 243, especially after 2004.

We are especially interested in seeing whether wages remain the dominant factor driving relocation in developing nations, especially given the plethora of strengthened regulation, special economic zones, and other changes. Yet, while numerous studies analyze the reasons why new headquarters are forming and established ones are growing, the issue of relocation in China is seldom investigated. Our data capture the relocation of headquarters in China from 1999 to 2008. Of more than 1 million headquarters surveyed, 1,682 relocated across provinces. While the numbers are small proportionally, they represent some of the largest headquarters by market cap and have only increased. In 1999, 93 companies relocated their headquarters, as did 351 in 2007. With total assets of at least 5 million RMB, these companies have significant sway in the market.

Why did these headquarters decide to relocate to China in the face of various economic factors, especially rising wages? This paper analyzes determinants of headquarter relocation within China to discover those factors leading the trend. As the "factory of the world," in the last few decades China has played host to a massive number of relocations by manufacturing headquarters in the last few decades seeking cheap labor and regulations that are less stringent than those of other countries. China's transformation into a country to which a significant number of companies are relocating makes it a fascinating area of study (Rosenthal and Strange 2004). This paper focuses exclusively on inter-China relocation, since our data is limited to large headquarters' movement among provinces. We address the question of how wage gaps can affect the relocation decision of operations with five different types of ownership: foreign owned, Sino-foreign owned, state owned, domestically joint owned, and privately owned.

Our research methodology seeks to create innovation in this field of research in three different ways. First, the study offers a model that explains regional factors affecting relocation. We recognize that a deeper decision tree motivates a headquarters' decision to move than do more traditional approaches (Yang and Jia 2011). Thus, we examine the decision in two tiers. We begin by selecting headquarters that have decided to relocate. Next, we focus on their destination by looking at factors in all other provinces that might influence companies and attract them to specific provinces (Van Dijk and Pellenbarg 2000). This allows a more nuanced measurement of different factors and their relative impacts on a headquarters' decision.

Second, we expand beyond the traditional focus on private manufacturing by exploring three major headquarter types that exist in China: state-owned enterprises (SOEs), privately and foreign-funded headquarters, respectively, and two varieties of joint headquarters: foreign private and state private (Gu and Lu 2014). These distinctions allow us to consider the possibility of intersectorial influences, such as the diverse priorities of different types of leadership. This is particularly important in the context of developing nations and in China, since SOEs play a dominant role and operate in response to the very different incentives offered by private enterprises (Nolan and Xiaoqiang 1999).

Third, our research analyzes the relocation of headquarters throughout the 31 provinces and five special administration zones of China (Pennings and Sleuwaegen 2000). Given that this stratified approach is well suited to the analysis of headquarter relocation, it is surprising that it has yet to be applied to China (Rosenthal and Strange 2004; Arauzo-Carod 2005).

The paper is organized as follows: Section 2 provides an overview of the theoretical framework. Section 3 discusses the data used in this study as well as some important caveats and assumptions. Section 4 introduces the model employed in the empirical analysis, while Section 5 discusses the results. Conclusions are provided in Section 6.

2. LITERATURE REVIEW

Companies often consider relocation as a strategy to obtain and maintain a competitive advantage, to occupy the leading position, and to enhance production and management. Several relocation options are available, such as establishing new research and development branches in other places and moving factories to countries or regions with low manufacturing costs, such as employee wages.

This paper considers mainly those factors that drive the decision about where to relocate (for example, conditions in other provinces). At the regional level, the relocation of headquarters is significantly connected to the attraction of familiar places and people (Mueller and Morgan 1962), local tax (Papke 1991), production costs, transportation costs, market size, and productivity level. The decision to relocate is not only a reaction to economic and political forces but also a response to the original noneconomic motives that led to its founding (Gregory, Lombard, and Seifert 2005). China's recent focus on environmental protection as an increasingly important part of a state's official promotion criteria has resulted in a small but noticeable rise in environmental enforcements (Wang 2013). Headquarters that move to a province with such an increase are expected to face a higher cost of compliance, be it in the form of bribes to officials or actual efforts to meet the demands of inspectors (Wang et al. 2004). The main branch of a company currently experiencing such changes is likely to have an easier time factoring these costs into their current expenditures. This is in contrast to, for instance, a decrease in regulation in other provinces. Headquarters that wish to take advantage of the decrease in regulation must consider the frequency of inspection, the duration of lax regulation, as well as the likelihood of policy changes; all these factors contribute to risk taking (Shin and Stulz 2000). Additionally, an enterprise might relocate to a province such as Tianjin, due to familiarity with the area or the abundance of recreational opportunities. As time goes on, these initial conditions are likely to change, recreational opportunities might lessen with increased development, and familiarity with other provinces is likely to increase. The cluster effect refers to a gathering of headquarters in one place; intermediate goods provided in clusters create both positive demand images and cost linkages among headquarters. The presence of these linkages means that agglomeration may occur, and this can have a dramatic effect on the relocation of industry (Hughes 1991).

Moreover, the average wage of headquarters could have a profound influence on the relocation choice. First, as Lu (2012) has shown, in the past three years, their nominal wages have been growing at a rate of 10 percent per annum. Real wages, adjusted by the consumer price index, experienced three stages of development. Further, Ezakai and Sun (1999) observed substantial wage differences among regions, with a high average growth rate of real wages in coastal regions. Second, manufacturing headquarters in general are sensitive to both labor costs and land costs since these tend to be among their largest expenses (Youndt, Snell et al. 1996; Wei and Bai, 2008; Wan, Lan, and Ye 2009). Companies typically relocate to metropolitan areas with good airport facilities. Benefits include low corporate taxes, low average wages, a high level of business services, same industry specialization, and an agglomeration of headquarters in the same sector of activity—with all agglomeration variables having an important and significant impact (Strauss-Kahn and Vives 2009). However, Wen (2001) indicated that with limited mobility of factors, the increase in the regional general price index and the high wage rates in the industrial regions have not significantly affected industrial relocation.

Furthermore, the headquarters' ownership may affect relocation decision. We can classify the hundreds of headquarters that migrate within China every year into five major categories of enterprises: foreign owned (FOE), Sino-foreign owned (FSE), state owned (SOE), domestically joint owned (DJE), and privately owned (POE [Harwit 2007]). FOE headquarters are manufacturing plants set up completely by the foreign capital; SFE headquarters are of mixed capital structures set by both foreign and domestic capital; SOE headquarters are enterprises set by domestic capital and among which the share of government capital takes a majority; DJE headquarters are other kinds of enterprises set by domestic capital, apart from SOEs; and POE headquarters are composed of private capital from Chinese citizens and families. In theory, each responds differently to economic motives, allowing for a finer level of control in our analysis.

FOEs are mostly skill- and knowledge-intensive manufacturing plants (for example, solar panels, microchips, and so forth). They use primarily skilled technicians and massive automated assembly lines, and are thus reliant on areas with high wages to provide the necessary labor. Given their reliance on highly skilled and specialized labor, FOEs will be attracted to areas with an abundance of skilled labor and an educated workforce (Girma and Görg 2004). The efficiency wage theory postulates that their presence in areas with abundant labor can dramatically reduce the costs associated with training and replacement.

SOEs are a mixture of knowledge- and labor-intensive production, and thus are likely to be affected more by government policy than measurable economic conditions. A key tenet of the Chinese government's economic policy is the development of the poorer western regions (Hay et al. 1994). Despite accounting for around 70 percent of China's land area, the contribution of these regions to total economic output is still a meager 20 percent. As such, there has been a concentrated effort to develop large infrastructure projects as well as economic incentives to attract foreign investment. In 2007, total Chinese investment in western regions totaled more than 1.3 trillion yuan, concentrated in railway lines, hydropower stations, and other public utilities. As such, these economic incentives can create migration to provinces situated in northwest and southwest China. The role of SOEs in relocation plays an important part of this research. In particular, this is because China is noticeably different from western nations in that it still retains control of large state-owned corporations like PetroChina and Sinopec. Beyond the role of policies, these large SOEs can often by themselves be responsible for jump-starting the economic development of a province independent of other policies. (Szamosszegi and Kyle 2011) Their role is limited to the economic activity that their presence alone can bring and is also tangentially related to an overall increase in investments (Lin, Cai, and Li 1998). Given that the actions of SOEs often herald changes in government policy, investors watch them very closely to capitalize on the large government spending that is sure to follow the relocation of SOEs (Boardman and Vining 1989). In effect, this hypothesis seeks to delineate the differences between direct policy incentives versus the external effects that a large SOE can create.

POEs are headquarters that are likely to be sensitive to wage changes, and that will actively seek out provinces with low average wages as a primary motivation for relocation. In comparison, private manufacturing enterprises in China represent headquarters that rely primarily on the mass of the undereducated labor force engaged in menial assembly-line labor (Garnaut et al. 2012) These industries are among the most affected by changes in economic conditions since they follow an overall cost strategy that seeks to minimize the costs of production. In addition, POEs tend to not have as much clout or funding as SOEs or FOEs, leading to inefficiency when accessing government resources.

Joint operations are likely to exhibit few noticeable trends: they are just as likely to be influenced by one party over another, and are unlikely to be consistent enough to create trends. Joint operations are defined as headquarters that have a mix of shareholders; for SFEs, these represent headquarters that are both owned and operated by the state but whose sizable percent of stocks is held by foreign investors. DJEs are the same with one exception—their stocks are held primarily by local rather than foreign investors. We predict that joint operations are likely to exhibit trends of both foreign and local headquarters since, by definition, they are operated by a mixture of both parties.

3. DATA SOURCE AND DESCRIPTION

The data employed in this study were obtained from the China Annual Survey of Industrial Enterprises, conducted by the National Bureau of Statistics of China (Nie, Jiang and Yang 2012). They include all manufacturing enterprises in China with total assets of more than RMB 5 million from 1998 to 2008. Before releasing these data to us, the NBS removed all "sensitive industries" from the sample; we excluded agriculture and extractive industries and services to focus on the manufacturing sector. Information on location, age, size, and debt of the headquarters is available. The address from NBS is widely used as the location variable of headquarters. Based on new economic geographic theory, Amiti and Javorcik (2008) examined the determinants of entry location by foreign firms, using 515 industries included in the China Annual Survey of Industrial Enterprises at the provincial level from 1998 to 2001. Wang, Xie, and Wang (2015) used 2003–2008 data from the NBS to explore how headquarters with different ownership, during different policy regimes, and from different industries might respond to environmental regulations. Therefore, the database from NBS is effective.

We consider that the headquarters of a company moved if its location is different during the two-year period examined. However, we cannot determine headquarter relocation in 1998. A conditional logit model is estimated (1 = headquarters chose the relocation province between 1999 and 2008; 0 = headquarters did not select the province). The variables employed in the analysis consist of regional characteristics and the cluster effect of the province in which the headquarters is located. Together they reflect the industry-specific values that drive location. Table 3.1 shows the 1,682 relocation samples for the period 1999–2009, among which (1) 93 are FOEs—5.53 percent of the total samples; (2) 83 are SFEs—4.93 percent; (3) 501 are SOEs— 29.79 percent; (4) 786 are DJEs—46.73 percent; and (5) 219 are POEs—13.2 percent. We also find that only two headquarters changed ownership type in the process of relocation, and only 12 relocated more than twice between 1998 and 2008.

A problem with the above relocation definition is the likelihood that some relocated headquarters may be missed. First, the enterprises can choose to set up branch factories and facilities without moving their headquarters. Given the high costs associated with relocation, headquarters have an incentive to avoid the bureaucratic difficulties and opt for new branch locations instead. A similar situation can occur if headquarters are bound to their location by reason of contract or other obligations. Second, companies may relocate their headquarters without actually moving their base of production. Due to benefits like tax cuts or subsidies that different provinces can offer to attract business, headquarters could make nominal relocations without actually moving. In particular, this can occur for political reasons. Headquarters may move to Beijing in order to be closer to the political center. Third, the survey looks only at the registered headquarters with a market cap of at least 5 million RMB. Due to the limitations inherent in the data, it is not possible to see whether a company is a "seed" corporation of another larger parent corporation. This means that we may fail to include the majority of movement where parent corporations establish a new branch without going through the process of creating a seed corporation. Nevertheless, our database remains relevant because it allows us to identify what motivates headquarters to move. In particular, our data permit us to do two things: first, capture large and dramatic incidents that lead to relocation, and second, extrapolate factors that affect not only relocation but also the formation of seed companies and the establishment of new branch locations.

When studying the effects of wages, the decision to choose a proper variable is controversial. Considering that the internal wages of a company's headquarters might be potentially endogenous, we use the real average wage of labors at the province level (drawn from the NBS) to partly reduce the possibility of biased estimates. According to Lu (2012), the real average wage of labors at the province level is defined as the following:

$$Real\ \ average\ \ wage_t = \frac{Average\ \ wage_t}{Price\ \ index_t} \tag{1}$$

The price index here is defined in relation to the base price of the Shanghai Index, which in 1998 was 100. And we also assume that：

$$W_t^e = Real\ \ average\ \ wage_t \tag{2}$$

As evident in Table 3.2, real wages in China underwent a dramatic increase more than three times over the past 11 years, from 73 to 243 as measured by the Shanghai index.

Table 3.1 Headquarter relocation decision across different ownerships (1998–2007)

	The origin of migration						*The destination of migration*					
	FOE	**FSE**	**SOE**	**DJE**	**POE**	**Total**	**FOE**	**FSE**	**SOE**	**DJE**	**POE**	**Total**
Province	**Number**											
Beijing	13	10	20	19	2	64	4	7	12	10	4	37
Shanghai	10	8	8	39	30	95	13	10	8	39	16	86
Tianjin	10	6	14	27	4	61	7	2	20	16	4	49
Chongqing	2	1	8	25	6	42	1	1	6	11	2	21
Inner Mongoria	0	1	21	22	5	49	0	1	15	11	3	30
Shanxi	0	2	17	17	2	38	0	1	12	18	3	34
Heibei	2	4	23	37	5	71	7	6	18	26	5	62
Liaoning	1	7	24	27	8	67	5	3	24	29	6	67
Jilin	1	2	5	19	6	33	1	2	4	24	4	35
Heilongjiang	0	0	15	13	3	31	1	0	20	18	8	47
Jiangsu	15	2	11	54	12	94	14	3	10	70	12	109
Anhui	3	1	19	39	11	73	3	3	11	33	6	56
Shandong	7	11	11	57	26	112	9	10	17	75	46	157
Zhejiang	1	2	11	29	8	51	6	9	13	52	12	92
Jiangxi	4	3	48	61	11	127	2	3	42	28	10	85
Fujian	3	1	10	19	2	35	2	2	11	17	0	32
Hunan	2	1	24	44	11	82	3	3	26	74	17	123
Hubei	2	5	26	44	14	91	2	2	23	36	11	74
Henan	0	0	10	17	17	44	0	0	12	13	10	35
Guangdong	13	7	27	52	12	111	11	2	37	53	12	115
Guangxi	0	2	18	17	1	38	1	2	17	18	3	41
Guizhou	1	0	14	7	6	28	1	0	8	10	5	24
Hainan	0	2	9	6	0	17	1	0	11	4	0	16
Sichuan	1	1	20	31	11	64	1	2	25	36	12	76
Yunnan	0	0	11	8	1	20	1	0	10	9	4	24
Shanxi	0	2	8	12	0	22	1	1	8	10	0	20
Gansu	0	0	4	6	2	12	0	2	5	6	1	14
Ningxia	0	1	6	12	2	21	0	1	7	23	0	31
Qinghai	2	0	6	6	0	14	2	2	5	4	1	14
Xinjiang	0	0	31	8	0	39	0	0	33	7	2	42
Tibet	0	1	22	12	1	36	2	1	18	11	2	34
Total	93	83	501	786	219	1682	101	81	488	791	221	1682

Source: China Annual Survey of Industrial Enterprises (Nie, Jiang and Yang 2012).

Notes: FOE = Foreign owned; FSE = Sino-foreign owned; SOE = state owned; DJE = domestically joint owned; POE = privately owned.

Table 3.2 Unequal regional wage

	Real average wage											
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Province	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Beijing	122.04	133.77	147.66	174.77	202.73	234.37	272.24	309.42	360.12	408.68	473.74	258.14
Shanghai	120.59	139.38	148.27	170.81	186.34	211.86	228.45	248.82	271.28	309.33	334.76	215.44
Tianjin	99.98	113.04	127.35	144.23	164.56	186.86	214.42	243.93	272.91	319.65	363.98	204.63
Chongqing	59.23	65.83	86.80	101.20	116.97	131.92	146.50	168.32	189.87	218.11	242.02	138.80
Inner Mongoria	58.33	64.05	69.46	81.68	95.68	109.08	125.34	147.06	167.60	190.63	216.71	120.51
Shanxi	57.21	61.76	67.76	79.71	93.29	105.08	121.87	144.19	165.61	187.01	211.19	117.70
Heibei	59.15	72.77	80.88	81.32	93.62	114.29	126.47	141.41	156.95	180.35	212.32	119.96
Liaoning	56.77	61.97	90.09	103.73	120.57	132.20	146.43	167.77	187.79	211.70	242.81	138.35
Jilin	66.04	73.64	82.71	90.33	103.42	113.30	121.99	139.35	160.81	186.31	203.87	121.98
Heilongjiang	62.13	72.98	82.04	92.52	103.83	114.38	125.19	142.44	159.62	178.51	201.80	121.41
Jiangsu	83.06	93.49	104.88	119.62	137.57	158.39	176.21	198.83	222.26	245.95	271.35	164.69
Anhui	54.91	58.97	70.95	79.88	94.86	106.13	124.07	145.21	168.06	200.07	222.85	120.54
Shandong	68.95	77.57	88.70	99.38	113.74	124.30	136.89	156.15	179.03	204.33	225.48	134.05
Zhejiang	92.87	107.94	131.42	165.01	190.90	213.03	225.59	245.46	260.98	280.56	294.87	200.78
Jiangxi	53.31	67.76	70.21	80.74	94.92	104.90	114.26	129.74	146.11	165.02	178.72	109.61
Fujian	85.83	96.05	104.90	120.61	134.27	143.24	150.17	161.60	180.71	198.78	220.24	145.13
Hunan	54.62	58.98	63.81	76.07	86.73	95.59	105.94	124.15	143.26	167.75	186.90	105.80
Hubei	65.41	72.67	79.46	90.25	101.06	109.89	116.00	126.83	150.40	156.03	166.36	112.22
Henan	59.29	65.61	74.04	83.95	98.89	111.97	119.47	137.99	162.03	189.97	211.74	119.54
Guangdong	104.21	127.02	141.34	161.50	186.14	207.54	222.72	235.82	253.25	274.91	293.79	200.75
Guangxi	59.58	71.55	71.74	95.53	114.50	125.56	136.34	151.58	174.87	200.17	218.94	129.12
Guizhou	57.69	66.42	75.59	89.37	98.49	109.49	118.62	135.58	156.42	181.46	202.49	117.42
Hainan	64.21	71.81	76.61	87.41	100.11	109.67	127.54	143.17	155.48	180.40	191.45	118.90
Sichuan	59.63	73.89	84.76	99.04	111.83	122.33	131.92	146.13	161.41	182.94	205.91	125.44

Table 3.2 Continued

	Real average wage											
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Province	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Yunnan	75.71	81.85	92.96	107.08	122.20	129.78	138.52	151.12	172.13	178.88	199.75	131.82
Shanxi	61.27	72.05	81.55	94.31	108.27	117.79	129.72	145.63	164.09	196.64	226.17	127.05
Gansu	64.83	71.72	82.34	99.39	111.36	121.61	131.62	134.72	155.54	180.46	200.31	123.08
Ningxia	68.22	76.49	88.31	105.32	118.06	129.27	140.49	162.06	196.48	230.72	251.59	142.46
Qinghai	79.55	90.63	100.80	126.16	138.36	144.05	156.91	172.55	202.13	220.07	240.18	151.94
Xinjiang	71.07	77.98	89.87	101.76	115.59	131.50	139.94	149.31	168.90	193.10	207.28	131.48
Tibet	109.11	128.72	148.87	190.11	244.97	264.03	279.77	272.60	292.83	413.07	403.07	249.74
Total	72.735	82.85	93.746	109.445	125.929	139.787	153.277	170.289	192.224	220.372	242.666	145.756

Source: China Annual Survey of Industrial Enterprises (Nie, Jiang and Yang 2012).

Notes: FOE = Foreign owned; FSE = Sino-foreign owned; SOE = state owned; DJE = domestically joint owned; POE = privately owned. Real average wage=Average wage/Price (Price of Shanghai in 1998=100).

Other control variables included in the paper are typical of those in the literature on headquarters' relocation choice, such as measures or proxies for factor prices, market size, infrastructure, industry clustering, and so forth. We use per capita GDP to measure the economic development of a region. The market size of the region is captured by the population and per capita consumption in each province. The proxies for infrastructure are the volumes of cargo, which can measure the total capacity of cargo transportation of a province and whether the province is located on the coast. The effect of industry clustering is an important factor in a company headquarters' location choice. We use the numbers of enterprises in the same industry and ownership type to control for the clustering effect and the agglomeration economies. The elimination rate of sulfur dioxide serves as an indicator for environmental regulation (Wang, Xie, and Wang 2015). We use the number of college graduates as an indicator for the human capital of the local labor force, capturing the quality of the labor input. Finally, the Fangang marketization index (Fan, Wang, and Zhu, 2003), is used to measure the degree of marketization, and a dummy variable of Special Economic Zone measures the degree of regional openness to foreign investments.

Additionally, Table 3.3 provides descriptive statistics: for the provincial level, the mean of the GDP per capita is 1.37 billion RMB, while the standard deviation is 1.1. Looking at the provincial-level data, we can see that the special economic zone and marketization index may be the leading cause of the relocation decision since they are the most direct link to economic policies. In addition, the measurement of same- industry and same-ownership headquarters shows a similar picture, in which general adoption of the market principle can lead to a high level of competition. Finally, given that the violation of independence of irrelevant alternatives (IIA)[1] results in inconsistent estimators, we use the region dummy variable to reduce the potential violations of the IIA assumption (Wang, Xie, and Wang 2015).

Table 3.3 Description of variables

Variables	Total				
	Count	Mean	Standard deviation	Specification	Source
Provincial level					
Average wage	341	145.76	69.43	Average wages of workers (the price effect has been eliminated)	National Bureau of Statistics
Gross domestic product per capita	341	1.37	1.10	Gross domestic product per capita (unit: billion yuan)	National Bureau of Statistics
Number of graduates	341	7.54	7.45	Number of college graduates (million person)	National Bureau of Statistics
Population	341	4118.94	2632.23	Resident population (unit: million)	National Bureau of Statistics
Volumes of cargo	341	54071.09	38564.99	Volume of cargo (million tons)	National Bureau of Statistics
Residents' consumption level	341	47.65	30.79	Resident average consumption (Yuan)	National Bureau of Statistics
Environment regulation	327	0.30	0.19	Rebatement rate of SO2	China Environment Yearbook
Fangang Index	338	5.69	2.13	Marketization level	National Economic Research Institute
Same industry headquarters	341	4397.31	6641.36	Number of same-industry headquarters in the location	China Annual Survey of Industrial Enterprises

[1] AII specifies that for any investor, the probability ratio of any two alternatives depends only on the attributes of the two alternatives and is independent of other available alternatives.

Table 3.3 Continued

Variables	Total				
	Count	Mean	Standard deviation	Specification	Source
Same ownership headquarters	341	2315.51	3843.24	Number of same-ownership headquarters in the location	China Annual Survey of Industrial Enterprises
Special Economic Zone	341	0.13	0.34	Whether the province is in Special Economic Zone	National Bureau of Statistics
Coastal	341	0.32	0.47	Whether the province is coastal	National Bureau of Statistics
Region					
Northeast				.	.
North	341	0.16	0.37	(1 = yes; 0 = otherwise)	National Bureau of Statistics
South central	341	0.19	0.40	(1 = yes; 0 = otherwise)	National Bureau of Statistics
East	341	0.23	0.42	(1 = yes; 0 = otherwise)	National Bureau of Statistics
Southwest	341	0.16	0.37	(1 = yes; 0 = otherwise)	National Bureau of Statistics
Northwest	341	0.16	0.37	(1 = yes; 0 = otherwise)	National Bureau of Statistics

Source: China Annual Survey of Industrial Enterprises (Nie, Jiang and Yang 2012).

Notes: FOE = Foreign owned; FSE = Sino-foreign owned; SOE = state owned; DJE = domestically joint owned; POE = privately owned. Real average wage=Average wage/Price (Price of Shanghai in 1998=100).

4. EMPIRICAL MODELS

To test the above hypotheses, we used a conditional logit regression model to estimate the decision models taken by a company's headquarters regarding its relocation. The conditional logistic regression model is well suited for the location choice framework since it exploits extensively detailed information on alternatives, can account for match-specific details, and allows for multiple alternatives. Known as McFadden's choice model (1973), the conditional logit has been used to study the choice of travel mode and occupation. While the form of the likelihood function of the conditional logit is similar to that of the multinomial logit, the variables of the conditional logit are choice-specific attributes rather than individual-specific characteristics. The multinomial logit model forces one to aggregate information about choices and enter it in a restrictive manner, making the conditional logit preferable for this application (Long 2004). Variation in the attributes of the province in headquarters' choice of relocation may drive the estimates.

With respect to the decision of where to relocate, headquarters that move to another province can choose between a maximum of 30 alternatives (31 provinces, excluding the province of origin). We assume that companies choose the location most beneficial to them. This implies that their headquarters decide on relocation by taking into account the attractiveness of moving to another province. If a company chooses to move to another province, it chooses its location by comparing the characteristics of all the provinces it could possibly relocate to.

Our conditional logit model assumes that company *i* would choose province *j* for its new plant only if this province could maximize its profits. We assume the expected profit depends only on the observable characteristics of each province. Mathematically, suppose that π_{ij}^{*} is the profit that a company i can reap by establishing its new headquarters in province j. We assume it can be written as:

$$\Pi_{ij}^{*} = \beta_0 + \beta X_j + \alpha Y_j + \varepsilon_{ij} \tag{3}$$

where X_i (provincial wage) is a vector of the independent variable that determines company *i* where to relocate, and Y_J (other region-specific characteristics) is a vector of explanatory variables that determine where to relocate. The probability of headquarter *i* choosing a particular province *j* can be mathematically expressed as follows:

$$P_{ij} = \frac{\exp(\beta_0 + \beta X_j + \alpha Y_j)}{\sum_{z=1}^{30} \exp(\beta_0 + \beta X_j + \alpha Y_j)} \tag{4}$$

5. ESTIMATION RESULTS

The following models are estimated using a conditional logit model. Regression results are shown in Table 5.1, which consists of six models of different ownership, respectively. After deciding to leave for another province, headquarters then choose where to relocate (Table 5.1). The results are discussed below.

Table 5.1 Conditional logit regression: Where to relocate (1999–2008)

Variable	Total	Foreign firms		Domestic firms		
		FOE	FSE	SOE	DJE	POE
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Average wage	-0.445*	0.450	-1.492	-0.276	-0.033	-2.551***
	(0.248)	(1.363)	(1.279)	(0.489)	(0.362)	(0.820)
Gross domestic product per capita	1.114***	-0.531	0.377	1.443***	0.434	2.239***
	(0.255)	(1.434)	(1.372)	(0.498)	(0.367)	(0.795)
Numbers of graduates	-0.120	0.654	-0.378	-0.080	-0.063	-0.131
	(0.119)	(0.646)	(0.554)	(0.232)	(0.176)	(0.378)
Population	0.624***	-0.393	1.144	0.966***	0.347	1.481***
	(0.169)	(0.820)	(0.808)	(0.329)	(0.252)	(0.538)
Volume of cargo	-0.045	-0.202	-0.391	-0.481***	0.186	0.206
	(0.089)	(0.430)	(0.420)	(0.174)	(0.131)	(0.285)
Residents' consumption level	0.205	0.183	1.948*	-0.519	0.351	1.290
	(0.240)	(1.138)	(1.181)	(0.473)	(0.354)	(0.791)
Environment regulation	0.198***	-0.567*	0.364	0.380***	0.061	0.144
	(0.055)	(0.319)	(0.298)	(0.094)	(0.084)	(0.178)
Fangang Index	-1.118***	2.112	0.377	-0.444*	-0.957***	-2.168***
	(0.160)	(1.966)	(1.441)	(0.254)	(0.296)	(0.809)
Same-industry headquarters	0.015	0.076	-0.048	-0.073*	0.049	0.045
	(0.025)	(0.112)	(0.118)	(0.044)	(0.037)	(0.078)
Same-ownership headquarters	0.068**	0.326**	-0.018	-0.046	0.094**	-0.150*
	(0.030)	(0.141)	(0.137)	(0.053)	(0.044)	(0.085)
Special Economic Zone	-0.096	-0.341	-1.481**	0.692***	-0.347**	-0.741*
	(0.106)	(0.490)	(0.633)	(0.193)	(0.162)	(0.407)
Coastal	-0.059	0.672*	0.552	-0.347**	-0.029	-0.413
	(0.083)	(0.403)	(0.411)	(0.151)	(0.123)	(0.308)
Region	include	include	include	include	include	include
Observations	47,633	2,802	2,258	13,864	22,481	6,228
Log likelihood	-3345.70	-236.12	-160.27	-547.70	-1803.00	-488.10
Pseudo R2	0.0715	0.1906	0.1453	0.0579	0.074	0.1807

Source: China Annual Survey of Industrial Enterprises (Nie, Jiang and Yang 2012).

Notes: FOE = Foreign owned; FSE = Sino-foreign owned; SOE = state owned; DJE = domestically joint owned; POE = privately owned.

Where to Relocate

First, we find that the aggregate of total headquarters have an increased propensity to relocate in a province in which average salaries are low, suggesting that an average company may indeed relocate to the place with low wages in order to save costs. For total headquarters, they can expect to generate savings by hiring cheaper labor elsewhere.

Second, we find that wage has a different effect on the relocation decision of headquarters with sole proprietorship. For FOEs and SOEs, the coefficient for headquarters' average wage is 0.45 and -0.276 and is statistically insignificant. One explanation is that FOEs are mainly high-tech and knowledge-

intensive headquarters, which are generally not affected by headquarter-specific labor costs. In contrast, the strategy used by SOEs is more likely to be influenced by the government, not the wage. However, for POEs, the effect is likewise negative and statistically significant. The coefficient for the wage of POEs is -2.551. To draw conclusions about these variables beyond their statistical significance, we must interpret the magnitudes. The marginal effect of POEs is -0.0026, with an average wage increase of 1 percent corresponding to about 0.26 percentage points' decrease for POEs in the probability of relocation decision.

Third, we check the differences between mixed- and single-ownership headquarters. According to the results of logit regression, the reaction pattern in wage of SFE headquarters lies about midway between that of FOE and SOE headquarters. However, the effect is insignificant. The behaviors of Sino-foreign joint headquarters are fairly reasonable; they show a pattern indicating that both parties have an equal say in the relocation decision of the headquarters. As a result of their complex capital structures, all the behaviors and decisions of Sino-foreign joint headquarters are supposed to stem from negotiations between foreign and domestic capital, indicating an equal status between the two overall.

Among the assorted variables examined, there are several that stand out.

1. **The propensity of headquarters to select a province increases if the location has a large population.**

   Coupled with an increase in market scale is an increase in population density. Urban population is therefore very useful as a proxy of general economic conditions (Arauzo-Carod, Liviano-Solis, and Manjon-Antolin 2010). Additionally, urban population also captures the additional factor of market scale, which can be a potential selling point for manufacturing headquarters.

2. **The propensity of FOEs to select a province decreases if it has strict environmental regulations in place.**

   In contrast to developed countries, where there tends to be a minimum level of regulation across states or provinces, there is not as of yet a well-enforced, unified system in China. Even though in principal there are national regulations, their application varies tremendously from province to province and even within different regions of the same province. For FOE manufacturers that produce a lot of emissions and have little relationship with local government, the strictness of the regulatory agency can be a source of significant costs. As a result, the propensity of FOEs to select a province will decrease with the strictness of a province's regulatory capacity.

3. **The propensity of headquarters to select a province increases with the specialization of the province as a base for same-ownership headquarters.**

   Specialized industries benefit tremendously from large-scale production. On one hand, the abundance of same-ownership headquarters within a province provides the opportunity to engage in lobbying efforts. These efforts can encourage the creation of policies designed to provide benefits in the form of subsidies or other favorable treatment. Given the importance of the government in guiding much of China's economic policy, such behavior on the part of headquarters is likely to produce excess benefits. On the other hand, the abundance of multiple headquarters can also act as a proxy for other variables that are more difficult to capture and that influence headquarters' behavior. For instance, it could measure the natural resources within a certain province for manufactures reliant on importing raw resources, or it could represent a beneficial policy already in place.

4. **The propensity of foreign headquarters to select a province increases if it is located in a coastal area.**

   Most foreign headquarters still rely primarily on exports as a major source of revenue, Therefore, being located beside convenient ports is a tremendous advantage in reducing transportation costs. This result is significant for all foreign headquarters.

6. FURTHER FINDINGS: IMPACT OF MINIMUM WAGE STANDARD

An important development has been the promulgation of the "minimum wage standard" in 2004. This system is now fully operational throughout China, which may have a positive impact on the average wage of provinces and above all contributes to the headquarters' relocation. Belman and Wolfson (1997) find evidence from US data that headquarters in states with minimum wage laws have a great impact on the wage of their employees as well as their operation model. For example, Pollin, Brenner, and Wicks-Lim (2004) found that to avoid increasing wages for low-wage workers, businesses in Florida relocated out of the state. Moreover, out-of-state headquarters chose not to relocate to Florida. According to Seguino (2002), this trend can be explained by employers' reluctance to pay the higher minimum wage. Headquarters located in the city or state will leave, and those companies considering moving into the area will be discouraged from doing so. Similarly, in China, headquarters will be affected by the minimum wage standard, which differs significantly across provinces. Thus, following Belman and Wolfson (1997), we also separate our sample into a subsample according to the minimum wage standard. We run a regression analysis on total samples as well as subsamples for all types of ownership to choose reasonable samples. The results are presented in Table 6.1.

Table 6.1 Conditional logit regression: Where to relocate for different years

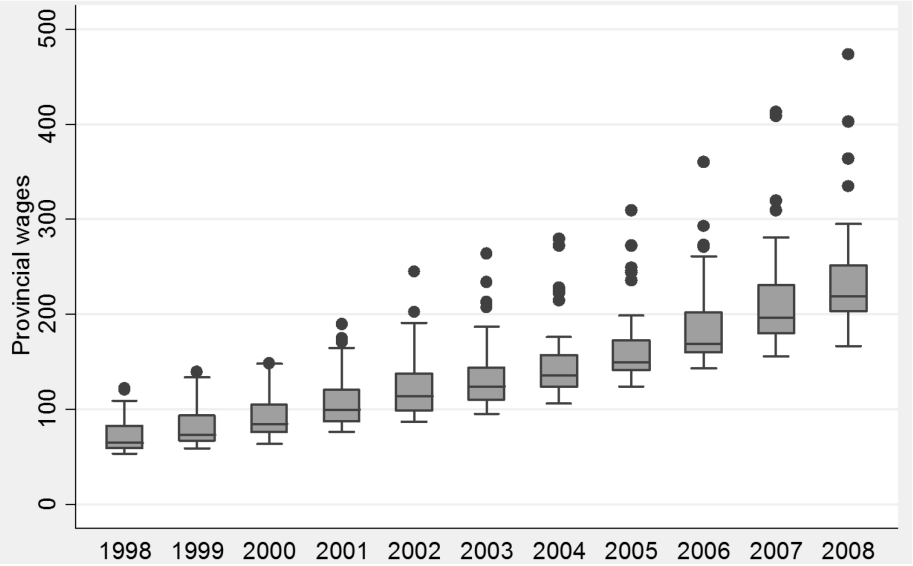
Variable	Total	Foreign firms		Domestic firms		
		FOE	FSE	SOE	DJE	POE
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Average wage *(1998–2008)*	-0.505**	0.427	-1.514	-0.204	-0.105	-2.551***
	(0.247)	(1.348)	(1.269)	(0.488)	(0.360)	(0.845)
Control Variables	Include	Include	Include	Include	Include	Include
Observations	47,633	2,802	2,258	13,864	22,481	6,228
Log likelihood	-3345.70	-236.12	-160.27	-547.70	-1803.00	-488.10
Pseudo R2	0.0715	0.1906	0.1453	0.0579	0.074	0.1807
Average wage *(1998–2003)*	0.724	-5.248	2.669	0.718	1.032	1.345
	(0.473)	(4.156)	(2.600)	(0.687)	(0.784)	(2.113)
Control Variables	Include	Include	Include	Include	Include	Include
Observations	16,990	314	664	8,947	5,895	1,170
Log likelihood	-1899.85	-23.20	-58.43	-971.88	-652.81	-123.35
Pseudo R2	0.0417	0.3706	0.2445	0.0676	0.0519	0.1022
Average wage *(2004–2008)*	-2.060***	2.812*	-2.828	-2.696***	-1.918***	-3.591***
	(0.384)	(1.590)	(1.860)	(0.912)	(0.537)	(1.141)
Control Variables	Include	Include	Include	Include	Include	Include
Observations	30,643	2,488	1,594	4,917	16,586	5,058
Log likelihood	-3345.70	-236.12	-160.27	-547.70	-1803.00	-488.10
Pseudo R2	0.0715	0.1906	0.1453	0.0579	0.074	0.1807

Source: China Annual Survey of Industrial Enterprises (Nie, Jiang and Yang 2012)

Notes: FOE = Foreign owned; FSE = Sino-foreign owned; SOE = state owned; DJE = domestically joint owned; POE = privately owned.

As can be seen from the tables, the effect of average wage on the relocation choice of headquarters is insignificant for all ownership types between 1998 and 2003. However, after the promulgation of the "minimum wage standard" in 2004, the influence of the average wage on relocation choice for a majority of headquarters becomes significant. Because of the difference in the minimum wage standard across provinces, promulgation of the law may increase the gap of average wage among the province. According to Figure 6.1, we can easily find that the standard deviation and range of mean wage every year become larger after enactment of the "minimum wage standard." Thus, we can easily conclude that it is intuitive that headquarters may be more sensitive to the level of wage after 2004. In other words, the wages of employees play a more important and elemental role in the cost and profit of headquarters after passage of the minimum wage standard than before it.

Figure 6.1 Distribution of provincial wages by year



Source: National Bureau of Statistics (various years).

Where to Relocate (2004–2008)

The remainder of the discussion focuses mainly on the samples from 2004 to 2008. Results are presented in Table 6.1. Across all ownership types, headquarters are drawn to low-wage provinces, suggesting that the level of the local average wage is a relevant factor in attracting businesses contemplating relocation. The wage has a negative and significant effect. By equation, we can get the coefficient for wage -2.060 and arrive at the marginal effect at 0.0023. An increase of 1 percent in the average wage decreases the probability of relocation by approximately 0.23 percentage points. Yet, while these findings contradict to our expectations regarding the choice of headquarters facing relocation, one may have expected them to eschew high-wage areas to avoid higher land prices and rents.

Additionally, we find that wage has a different effect on relocation choices according to ownership type. For FOEs, the effect of wage is significant and has the expected positive sign in all the regressions. An increase in wages raises the probability that headquarters will relocate to a particular province. The proposed positive effect of wage on the likelihood of relocating for FOEs is confirmed for headquarters in the knowledge-intensive sectors. Therefore, the positive effect is found for high-tech, high-wage labor. This finding also suggests that FOEs, which depend comparatively less than other ownership types on other, more knowledge-intensive sectors, may consider relocating to areas with high industry-specific wages in order to gain access to more high-tech laborers. However, for SOEs and POEs, the negative coefficient suggests that rising wages significantly crowd out the probability that companies will migrate to other locations (the coefficient is -2.696 [SOEs] and -3.591 [POEs]). Moreover, we find

that a wage increase of 1 percent leads to a decrease of about 30.80 percentage points in the probability of SOEs' relocation choice. At the same time, a wage increase of 1 percent leads to a decrease of about 0.14 percentage points in the probability of POEs' relocation choice. Compared with foreign headquarters, domestic headquarters are more likely to be engaged in a low-cost strategy. Moreover, one explanation for the results concerning SOEs may be their connections with the government. They seem to view a complex strategy as a social benefit. That is, they view a low wage as a way to reduce the cost of employees and increase the opportunity of employment. An understandable explanation for the statistical negative effect may be that POEs don't have positive technology advantages like FOEs, and operate in less knowledge-intensive sectors that are sensitive to high average wages, making the influence of wage negative.

Finally, holding all other parameters equal, the probability of FSEs and DJEs choosing to migrate would result in a decrease of possibility of relocation when wages go up. Since their preferences are more muted compared to the otherwise wholly owned headquarters, this illustrates the differences in the valuation of high-wage regions between headquarters in solely invested enterprises and those in joint venture headquarters, which also confirm what we have assumed.

7. CONCLUDING REMARKS

This paper investigates the drivers of headquarter relocation within China. Using data from the China Annual Survey of Industrial Enterprises, as well as the National Bureau of Statistics, we were able to identify key variables that impact the relocation decisions of company headquarters. In this study, we show compelling evidence that there is a marked difference in the factors that drive relocation for the five headquarter types we have identified.

We find the effect of average wage on relocation choice (where to relocate) of headquarters is significant for total headquarters from 1999 to 2008. In other words, total headquarters on average are more likely to migrate to a low-wage province. Further, there is a greater likelihood that privately owned enterprises will relocate to low-wage areas, coinciding with "overall cost leadership" from 1999 to 2008. Meanwhile, with rising wages and the increasing gap among provinces, the influence of the average wage on the relocation choice for FOEs and SOEs become more significant. Foreign-owned headquarters are more likely to transfer to high-wage areas, which coincides with the "efficiency wage theory." Similarly, following "overall cost leadership," state-owned enterprises tend to choose low-wage provinces. Further, jointly owned headquarters are just as likely to be influenced by either owner and were used to check the assumptions of sole proprietorship enterprises.

Our findings contribute to the existing literature by focusing on relocation within a developing country rather than the traditional model in which developed headquarters relocate to developing ones. By far the biggest and most significant motivations for a headquarters' choice of relocation destinations are indicators of economic conditions, such as average wages.

Moreover, we take "the minimum wage standard" into consideration and find that the standard increase in the average wage gap among the provinces has the greatest impact on the relocation strategy of headquarters. These relocation decisions create to job loss and fewer opportunities for the working poor in lower-wage provinces. Since the purpose of raising minimum wage laws is to improve living standards and to create better employment opportunities for this population, a rise in unemployment or business flight from a particular city or state would obviously be unintended and an undesirable consequence of passing such a measure into law. Thus, given the role played by manufacturers in jump-starting the economic development of a region, devising a policy that can enhance employees' welfare while encouraging the relocation of company headquarters into more disenfranchised provinces can be of tremendous value for these areas.

Beyond the general results outlined in the previous section, a notable achievement is the delineation of motivations among different headquarter ownership types. This is important because most developing countries still rely on a mix of foreign- and state-owned headquarters as the drivers of economic development. In particular, foreign headquarters are affected by wage discrepancies differently, even when these can vary by up to twice the amount. This study not only provides critical insight into the role of policy and economic factors in relocation, but also lays the groundwork for future researchers to explore the motivators of relocation from developing to developing countries.

However, this research also has several limitations, since our data are able to capture only headquarter relocations and not the establishment of seed corporations and branch factories, or the effects on companies that already operate in multiple provinces. While we make reasonable extrapolations about how significant factors affecting headquarters in our data are likely to affect other headquarters, we are unable to empirically demonstrate our hypotheses. Future work can be divided into efforts to increase the quality and diversity of data, as well as to strengthen the model. First, by including an analysis of headquarters that choose to establish seed corporations or that already operate in multiple provinces, we hope to increase the relevance of our results. Second, because firm relocation may occur across cities within a given province, we plan to explore city-level relocation choice to enhance our understanding. Third, separating relocating headquarters into specific industries when the data is available will allow for a more in-depth analysis. Finally, the model can be further strengthened through the use of nested logit model and by combining the multinomial and conditional logit model. For example, it would be useful to examine how much of a headquarters' relocation decision is dependent on its province of origin and how much of it is due to attractive conditions elsewhere.

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