

*JCER Working Paper*  
*AEPR series*  
No. 2018-2-4

This is the pre-peer- reviewed version of the following article:  
“North Korea”, *Asian Economic Policy Review*, vol. 14, issue 2, which  
has been published in final form at  
<https://onlinelibrary.wiley.com/doi/abs/10.1111/aepr.12261> and DOI:  
10.1111/aepr.12261.

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This paper was prepared for the Twenty-eighth Asian Economic Policy Review (AEPR) Conference  
“North Korea,” October 20, 2018, Tokyo.

July 2019

Asian Economic Policy Review  
Japan Center for Economic Research



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# Market Activities and Trust of North Korean Refugees

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## Abstract

This study investigates the effects of North Koreans' informal market activities on their generalized trust. Using the survey data of North Korean refugees living in South Korea, we find that North Korean refugees who previously traded goods at markets in North Korea have higher trust in most people. By contrast, the experience of trading at markets did not affect trust in other North Korean refugees, suggesting little evidence of in-group favoritism. Our main result is robust when we applied the instrument variable approach. This finding implies that increased marketization in North Korea will lead to a weakened control of the authorities over the North Korean society.

*JEL Classification Codes:* J46, O53, P26

*Keywords:* North Korea, Informal Economic Activities, Social Capital, North Korean Refugees

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## **I. Introduction**

The North Korean socialist economy has been experiencing widespread marketization of economic activities since the 1990s. Before the virtual breakdown of the Public Distribution System of food and consumer goods in the 1990s, the North Korean authorities strictly repressed informal economic activities that included market transactions. However, a great famine occurred in the early and the mid-1990s, called ‘Arduous March’, made such an anti-market policy difficult to be maintained. Households wanted to survive by exchanging anything they possessed for food. As a result, markets that had been previously repressed but subsequently tolerated due to such a famine were spontaneously established.

Currently at least 70 percent of income of North Korean households are estimated to originate from informal economic activities that include sales at markets, smuggling, individual provision of consumer services, cattle feeding, private plot activities, etc (Kim, 2017; Kim and Song, 2008; Noland, 2004). It is known that about 470 universal markets whose appearance is similar to covered markets in the West are scattered in most North Korean regions and officially recognized in a way that sellers pay fees to the authorities. These official markets coexist with unofficial ones where informal traders sell mostly food and consumer goods. The dominance of this marketization in North Korea can be accounted for by the virtual collapse of the integrated system of tax revenue and government expenditure. Hence, the government and state-owned enterprises are not able to pay wages and salaries sufficient for survival of their employees. The average wage of workers in official workplace is about 3,000 North Korean won while the typical expenditure of households comprising four members ranges between 240,000 and 400,000 North Korean won. Consequently, a majority of households prefer working at markets, if possible, as income from market activities are eighty times as much as official wages paid by the government (Kim, 2017).

Such prevalence of marketization in North Korea appears to be unprecedented in the history of the socialist economies. For instance, the share of income from informal economic activities in total household income in the Soviet Union was 16% on average from 1954 to 1991 according to Kim (2003). There is an estimate that Hungarian households earned about 25% of their income from the informal economy in 1989 (Salamin and Floro, 1993). To the best of the authors’

knowledge, no socialist country had experienced such a grand scale of marketization as North Korea has.

This marketization from below is likely to affect the North Korea economy and the society in various ways. Using the surveys of North Korean refugees living in South Korea, market activities are found to enhance human capital of and thus increase the probability of having stable jobs in South Korea (Kim and Kim, 2016). It is also found that participation in market activities is positively associated with support for market economy measured by the extent of support for private ownership, competition, and performance-based salary (Kim and Kim, 2018). The effects of market activities extend beyond the individual level. Working hours in official firms are reduced due to participation in the market sector, which indicates that marketization of the North Korean economy undermines the operation of the formal sector (Kim and Song, 2008). Furthermore, a collusion between households participating in market activities and government officials is made as the former pays bribes to the latter in return for business-related favor (Kim and Koh, 2011). Such a collusion may have a corrosive effect on the legitimacy of socialism.

This paper aims to investigate the effects of marketization on generalized trust of North Korean refugees who settled down in South Korea. The literature mostly using the data from economic experiments suggests that participation in market activities increases generalized trust through repeated interactions with strangers. However, it is difficult to obtain similar findings from the data from surveys because of the lack of real data. Marketization started rather recently in North Korea where such a phenomenon had been previously negligent. In this regard, the surveys of North Korean refugees can provide novel data on how market activities change social norms such as trust. Furthermore, the finding has important implications for the future of the North Korean regime. Intensifying market activities leads to rises in generalized trust, which may facilitate further marketization. In addition, generalized trust can contribute to spreading information within the country and thus to building-up consensus that may not necessarily corroborate with the official ideology and policies. If this process continues, the socialist regime could lose control not only on the economy but also on the society.

We used three waves of the surveys of 485 North Korean refugees who settled down in South Korea from 1997 to 2015 and find that market participation is positively associated with generalized trust. In particular, generalized trust increases with trading at markets, which is more

likely to facilitate interactions with strangers than other forms of involvement in the informal economy. Indeed, we find little correlation between other forms of participation in the informal economy and generalized trust. In addition, market participation does not affect in-group favoritism in a way that trust in other North Korean refugees is not associated with market activities. The positive association between trading at markets and generalized trust is confirmed when we use an instrument-variable approach.

This paper is organized as follows. Section II reviews the literature related to trust and its relationship with market participation. Section III describes the survey data we use and provide the summary statistics of the data. Section IV presents and discusses the results from empirical investigation and Section V summarizes the main findings from this research.

## **II. Literature on Trust and Market Experience**

Trust is known to play a role of a facilitator in economic transactions by reducing transaction costs and information asymmetry. Empirically proving its beneficial impact on economic growth was initiated by the seminal works by Knack and Keefer (1997) and La Porta et al. (1997), which provided cross-country evidence that trust promotes growth. Since then, multiple studies have discovered potential channels through which trust triggers economic growth, such as investments (Zak and Knack, 2001), financial development (Guiso, Sapienza, and Zingales, 2004), trade (Guiso, Sapienza, and Zingales, 2008), human capital (Dearmon and Grier, 2011), and entrepreneurship (Kim and Kang, 2014).

While there have been a number of efforts to examine the impact of trust on various outcomes that promote growth, relatively few literature explores mechanisms that form or destroy trust. The factors that form trust can be categorized into two branches, historical, or inherited, factor, and contemporaneous, or experiential, factor (Dineson and Sønderskov, 2018). Perhaps due to a more convenient way of identification, more literature has explored the effect of historical factors, such as the socialist regime (Lichter, Loeffler, and Siegloch, 2015) and slavery (Nunn and Wanchekon, 2011), that last even through generations. When comparing immigrants' trust to that of natives,

immigrants' trust is known to be correlated with ancestors' trust (Algan and Cahuc, 2010; Dineson, 2012; Helliwell, Wang, and Xu, 2016).

The persistent nature of a historical or inherited factor leaves us with a question whether immigrants can successfully integrate themselves into the society that they decide to settle in. This question is particularly important for the case of North Korean defectors—who can also be viewed as a type of immigrants—who are from a communist country that discourages or even obstructs trust among general people. Studies that compare social capital levels of immigrants from socialist countries to those of natives find that people from socialist countries exhibit lower trust, and the speed of convergence is rather slow (Rainer and Siedler, 2009; Heineck and Süßmuth, 2013). Given that North Korean defectors have lower trust stock compared to that of South Korean counterparts due to their experience in the communist regime, examining determinants of North Koreans' trust is an interesting task. Furthermore, by examining the role that the informal market sector's recent penetration in North Korea plays on trust, we provide empirical evidence that repeated market interactions form trust even for people who previously had long exposure to an environment that obstructs trust between people.

For a case like North Korea, where the capitalistic ideology is strictly banned, Fafchamps' (2002) theoretical model can be applied. Fafchamps (2002) considers a society where external contract mechanism is absent, and thus, informal mechanisms based on trust and reputation, also known as relational contracting, emerge. Since the rationing system more or less collapsed in the North Korean economy since the Arduous March, the role of the informal markets became immensely valuable. This implies that gains from trade became very large and that costs of screening cheaters low. Fafchamps (2002) demonstrates that in such conditions steady-state equilibria, where trading relationships are sustainable, exist.

According to the aforementioned theoretical model, trust is in the core of market transactions even in the informal economy setting. Empirical evidence that investigate the relationship between market activities and trust has also been accumulating during the past couple of decades. While some scholars contend a negative relationship between market participation and trust (Siziba and Bulte, 2012), most of the literature examining the relationship find positive correlation. For example, Henrich et al. (2001) find that a higher degree of market integration is associated with higher trust based on the experimental data gathered from small-scale societies that heavily rely

on the primary sector. Al-Ubaydli et al. (2011) compare the treatment group who were primed about market-related activities and the control group without priming find that the treatment group is more trusting than the control group.

Quite a few scholars argue that the underlying mechanism from market activities to generalized trust is environments facilitating transparency and efficiency. Berggren and Jordahl (2006), using a cross-country data, find that a country's degree of economic freedom enhances trust, especially through reliable legal system and property rights. Fischer (2008) also supports the argument by measuring competition with the gap between the countries' investment price and total price index. Yamamura (2010), based on the Japanese cross-sectional data, finds that the local government's size, which implies more bureaucracy and less efficiency, is negatively correlated with generalized trust for the sample of workers.

### **III. Data Descriptions and Summary Statistics of North Korean Respondents' Market Activities**

This study utilizes data from the surveys of the North Korean refugees, which were designed by a team of researchers in the Economics Department of Seoul National University.<sup>1</sup> The total of six waves were conducted from 2011 to 2016, among three of which contain variables on social capital. Thus, the data we use for the analysis originate from the 2011, 2014, and 2015 waves. The sample of the first wave was recruited via snowball method through personal contacts. The population of the first wave were the refugees who escaped from North Korea within a year before the survey date. The survey was conducted in the Economics Department of Seoul National University. The samples for the second and third waves, which were conducted by Nielsen Korea, were stratified by age, gender, and year of entry in South Korea from the population of South Korea-residing refugees aged 20 or older. All three waves applied gang survey methodology to facilitate interviews with refugees living in the Metropolitan Seoul Area.

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<sup>1</sup> The researchers involved in these surveys are Syngjoo Choi, Jungmin Lee, Sokbae Lee, and Byung-Yeon Kim, one of the authors of this paper.



One of the strengths of using this survey dataset is having access to a set of unique and concrete variables that reflect the respondents' experience while they were in North Korea, their current experience in South Korea, and their perceptions and attitudes towards the general South Korean society and fellow North Korean refugees. The survey design has a particular emphasis on investigating North Korea's informal market sector by including questions on the respondents' economic activities and income while they were in North Korea.

Specifically, they were asked whether they had had a second job, and if so, which activities they had engaged in at the time one year before their departure from North Korea.<sup>2</sup> Among those who indicated that they had had a second job, they were asked to choose from the following activities: market trades, cultivation in private plots, cattle farming, repair services, home production, smuggling, and other.

Table 1. Informal Activities by Survey Wave

Type	Survey Wave				Total
	2011	2014	2015		
No informal activity	N	33	92	113	238
	%	24.81	57.14	59.16	49.07
Selling	N	65	43	42	150
	%	48.87	26.71	21.99	30.93
Smuggling & repair	N	14	8	12	34
	%	10.53	4.97	6.28	7.01
Stock farm	N	5	6	5	16
	%	3.76	3.73	2.62	3.30
Cultivating private plots	N	9	9	16	34
	%	6.77	5.59	8.38	7.01
Home production & other	N	7	3	3	13
	%	5.26	1.86	1.57	2.68
Total	N	133	161	191	485
	%	100.00	100.00	100.00	100.00

<sup>2</sup> A second job does not necessarily mean a secondary job in addition to a main job. The North Korean refugees understand a second job as unofficial job regardless of working officially. The reason for asking job status one year before their departure from North Korea was to eliminate any possibility that their leaving would disrupt their economic activities. This reference year was applied to all relevant questions.

Table 1 presents the descriptive statistics of the respondents' market activities. Since the respondents of the first wave of the survey consisted of the North Korean refugees who had left North Korea less than a year prior to the survey date—that is, the first wave containing a bigger proportion of the recent refugees—almost three-fourths of them had experience in the informal market activities. In the later waves, for which respondents had been recruited via random sampling, over 40% of the respondents reported experience in the market activities. On average, 51% the respondents reported experience in the informal market sector.

Among the market activities, market trades—selling goods—were the most prevalent. Almost half of the first wave respondents and 31% of the overall respondents reported market trades as their second job. The second popular informal market activities were smuggling or providing repair services, the latter being only 27 cases throughout the three waves. The two activities are grouped together because of their “service-oriented” characteristics. An equal number of respondents reported private plot farming as their second job, with similar prevalence across all waves. On the other hand, more respondents reported home production and other activities as their second job in the first wave, implying that producing goods at home—a more discrete form of market activities—has become more popular in North Korea's informal sector recently.

In terms of interactions with strangers, trading at markets makes sellers meet more customers who they have not met before than the other forms of informal economic activities. In other words, it facilitates more open, objective, and indiscriminate interactions with strangers, which enable market traders to learn that strangers are trustworthy at least regarding on market transactions. By contrast, stock farming is the least associated with interacting customers. Home production may be related with interaction with other people if they need to purchase inputs. However, such acquaintances are likely to be confined to a small number of people and unlikely to expand beyond their controllable network. Smuggling and repair may be between market trades and home production, on average, in terms of possibility of interacting with strangers that depends upon the nature of the businesses.

Table 2. Descriptive Statistics

Category	Variable	N	Mean	SD
<b>Demographic Variables</b>				
	Age	485	38.17	11.90
	Male (%)	485	0.33	
	Female (%)	485	0.67	
	Married (%)	485	0.29	
	Not married (%)	485	0.71	
<b>North Korea-related variables</b>				
	From Hamkyung Province (%)	485	0.70	
	From other province (%)	485	0.30	
	Secondary education in NK (%)	485	0.70	
	Higher than secondary education in NK (%)	485	0.30	
	Served in military (%)	485	0.18	
	Workers' Party membership (%)	485	0.15	
	No informal activity (%)	485	0.49	
	Selling (%)	485	0.31	
	Smuggling & repair (%)	485	0.07	
	Stock farm (%)	485	0.03	
	Cultivating private plots (%)	485	0.07	
	Home production & other (%)	485	0.03	
	Duration of informal activities (years)	247	5.13	4.90
	Defected before 2000 (%)	485	0.21	
	Defected in 2000-2004 (%)	485	0.17	
	Defected in 2005-2009 (%)	485	0.23	
	Defected since 2010 (%)	485	0.39	
<b>South Korea-related variables</b>				
	Years lived in South Korea	485	5.39	4.16
	Household monthly income in SK (in 2015 KRW)	485	134.19	128.17
	Per capita household income in SK	485	67.21	74.51
	Secondary education or lower in South Korea	485	0.83	
	College or above and defected before 20 years old	485	0.04	
	College or above and defected after 20 years old	485	0.13	
<b>Perception variables</b>				
	Trust	485	3.55	0.96
	Trust in NK defectors	481	3.03	1.10
	Want to help NK defectors	485	3.97	0.98
	Want to socialize with NK defectors	484	3.02	1.15
	Think NK defectors are weak (reverse score)	483	3.36	1.17
	Attitudes toward NK defectors	478	13.40	2.71

Table 2 reports the descriptive statistics of the respondents of all three waves. The respondents' average age is 38.2. The gender composition is similar to that of the population of North Korean refugees, where 72% of them are female refugees (Ministry of Unification, 2018). The survey

sample reflects the total refugee population in terms of the province of origin as well. Approximately 70% of the respondents reported Hamkyung (North Hamkyung or South Hamkyung) as their origin, as does the total refugee population as of June 2017 (Ministry of Unification, 2017). Twenty-nine percent of the respondents were married or had experienced marriage. The overall education level of the sample, with approximately 70% of them with secondary or lower North Korean education, is higher than the education level of the total refugee population, with 6.9% having university or higher education and 9.5% having 2-year college education experience (Ministry of Unification, 2017). The percentage of respondents with Workers' Party membership, 15%, is similar to that of the population, which is estimated at 16% (Kim and Kim, 2016).

As can be inferred from Table 1, North Korea's informal sector is of a considerable size. Almost half of the respondents engaged in the informal sector with the average duration of 5.1 years while they were living in North Korea. The average length of settlement in South Korea is 5.39 years. The sample respondents' average monthly income is 134 million South Korean won (in 2015 KRW), approximately 1200 US dollars, which is considered low in the South Korean society. The refugees have lower education level, with only 17% of college or higher education, compared to their South Korean counterparts at 47% as of 2016 (Statistics Korea, 2018).

The key social capital variable, generalized trust, is measured with the prevalently used statement, "most people can be trusted." The respondents were asked to indicate their level of agreement in a 5-scale response, "Strongly disagree," "Disagree," "Neither disagree nor agree," "Agree," and "Strongly agree." The response was coded with a range from 1 to 5, with '1' corresponding to strong disagreement and '5' corresponding to strong agreement. The overall sample's response was 3.55, which can be translated as moderate generalized trust.

The respondents were also asked to indicate their level of trust in fellow North Korean refugees, which we regard as a form of particularized trust or in-group favoritism. It is measured with the following statement, "I trust a North Korean refugee that I meet for the first time." The average response level is 3.03, close to "neither agree or disagree." The survey also contained several statements to measure overall attitudes toward North Korean refugees—"I want to socialize with more North Korean refugees even if I do not know them," "In general, North Korean refugees are less willing to self-sustain," "I want to participate in helping new North Korean

refugees settle in the society.” The average attitudes toward North Korean defectors consisting of the above four statements, with the score 20 indicating the fully positive attitudes, is 13.4.

#### **IV. Determinants of Trust of North Korean Refugees**

##### **A. Logistic Regression Results**

The generalized trust is used as the depending variable in the following regression analyses. As trust is a 5-scale variable, the ordered logistic model is applied. Besides basic demographic variables—age, gender, and marital status—the control variables consist of the following sets. First, a set of variables reflecting the respondents’ life in North Korea are applied in the initial model. These variables include a type of informal activities that the respondents engaged in while they were residing in North Korea, an indicator of Workers’ Party membership, an indicator of military experience, per capita income level (adjusted in real terms), and education level.<sup>3</sup> The second set of variables reflects the refugees’ life in South Korea. These variables consist of the South Korean education level, years of settlement in South Korea, and real per capita income.

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<sup>3</sup> The respondents were asked about their total household income in North Korea and the sources of the income one year before their escaping from North Korea. This nominal income was converted to real income by the consumer price index computed by Kim and Kim (2016).

Table 3. Market Activities and Trust – Ordered Logit Estimation Results

	(1)	(2)	(3)	(4)
(ref: No informal market experience)				
Selling at markets	1.637** (2.298)	1.580** (2.106)	1.623** (2.246)	1.550** (2.017)
Cultivating in private plots	0.808 (-0.612)	0.856 (-0.442)	0.864 (-0.414)	0.852 (-0.451)
Stock farming	1.361 (0.654)	1.571 (0.916)	1.370 (0.636)	1.414 (0.701)
Smuggling & repair	1.697 (1.453)	1.527 (1.135)	1.955* (1.817)	1.710 (1.429)
Production & other	0.903 (-0.185)	0.866 (-0.259)	1.019 (0.034)	0.940 (-0.113)
Secondary education or lower in NK	1.077 (0.382)	1.127 (0.601)	1.111 (0.525)	1.145 (0.675)
Real total income per capita. (log)	0.977 (-0.652)	0.970 (-0.857)	0.973 (-0.780)	0.965 (-0.994)
Workers' Party membership	1.152 (0.466)	1.211 (0.621)	1.253 (0.732)	1.254 (0.732)
Served in military	1.386 (1.123)	1.283 (0.845)	1.383 (1.102)	1.320 (0.939)
(ref: Secondary or lower South Korean education)				
College or above and defected before 20		0.915 (-0.187)	0.778 (-0.539)	0.901 (-0.221)
College or above and defected after 20		1.106 (0.390)	1.047 (0.179)	1.090 (0.337)
Log of household income in SK		0.925 (-1.147)	0.879* (-1.891)	0.897 (-1.586)
Years lived in South Korea		0.937** (-2.181)		0.946* (-1.831)

Risk preference			3.415***	3.223***
			(3.605)	(3.423)
Male	0.707*	0.757	0.643**	0.685*
	(-1.655)	(-1.293)	(-2.052)	(-1.737)
Age	0.975	0.993	0.963	0.976
	(-0.489)	(-0.142)	(-0.725)	(-0.461)
Age-squared	1.000	1.000	1.001	1.000
	(0.781)	(0.466)	(1.012)	(0.796)
Married	1.093	1.137	1.199	1.200
	(0.460)	(0.656)	(0.921)	(0.924)
Observations	485	485	483	483

Notes: The models include survey wave dummies. Z-statistics are in the parentheses.

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

Column (1) of Table 3 reports the proportional odds ratio of the ordered logit model with a set of North Korean variables only. The odds of trusting in a higher degree are 1.64 times greater for the respondents who indicated that they had engaged in market trades as a second job, compared to the reference group which consists of respondents with no second job, while the other variables are held constant. On the other hand, other informal market activity variables and control variables are not statistically significantly correlated with trust. In general, male respondents are likely to report lower trust than female respondents. Column (2) reports the proportional odds ratio with an additional set of South Korean variables. The odds decrease slightly if compared to the first model's, but the odds of trust are still 1.58 times greater for the respondents who engaged in market trades. While other control variables have no statistically significant relationship, it seems that spending time in South Korea has a negative effect on the refugees generalized trust, with the odds 0.7 times lower for a year increase in South Korea.

Column (3) reports results when the degree of risk aversion is added as a control variable.<sup>4</sup> If trusting strangers was seen as a type of risk-taking activity, those who are more risk-taking can have higher trust. Similarly, more risk-taking individuals may engage in the informal market activities, as they are illegal and prone to be monitored and sometimes punished by government officials. Indeed, the odds of trust of a totally risk-taking person are 3.4 times greater compared to a totally risk-averse person, but the coefficient of market trades on trust is stable. Column (4) reports similar results when both settlement duration in South Korea and risk preference are included as controls.

Instead of using the ordered logit model, we collapse the dependent variable into a 2-scale variable and apply the logit model to check the robustness. The new dependent variable is an indicator variable that takes the value 1 if the respondent agreed to the statement "Most people can be trusted" by indicating either "Agree" or "Strongly agree," and the value 0 otherwise. Table 4 reports the odds ratio of the logistic model.

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<sup>4</sup> The risk preference is proxied by the following statement, "If I were to start a business and in need of money, I would borrow money from the bank."



Table 4. Market Activities and Trust – Logit Estimation Results

	(1)	(2)	(3)	(4)
(ref: No informal market experience)				
Selling at markets	1.662** (2.098)	1.625** (1.974)	1.669** (2.080)	1.611* (1.921)
Cultivating in private plots	0.811 (-0.546)	0.854 (-0.405)	0.888 (-0.303)	0.876 (-0.336)
Stock farming	1.449 (0.682)	1.583 (0.813)	1.438 (0.642)	1.447 (0.653)
Smuggling & repair	1.709 (1.331)	1.604 (1.133)	1.934 (1.605)	1.750 (1.331)
Production & other	0.688 (-0.612)	0.673 (-0.638)	0.789 (-0.382)	0.735 (-0.492)
Secondary education or lower in NK	0.948 (-0.246)	0.934 (-0.304)	0.907 (-0.434)	0.923 (-0.356)
Real total income per capita (log)	0.973 (-0.688)	0.963 (-0.921)	0.965 (-0.871)	0.958 (-1.033)
Workers' Party membership	1.352 (0.861)	1.419 (0.992)	1.466 (1.069)	1.478 (1.091)
Served in military	1.153 (0.451)	1.109 (0.323)	1.154 (0.444)	1.116 (0.339)
(ref: Secondary or lower South Korean education)				
College or above and defected before 20		0.880 (-0.226)	0.791 (-0.421)	0.884 (-0.219)
College or above and defected after 20		0.859 (-0.519)	0.802 (-0.749)	0.823 (-0.660)
Log of household income in SK		0.893 (-1.458)	0.858* (-1.951)	0.870* (-1.756)
Years lived in South Korea		0.954 (-1.391)		0.961 (-1.181)

Risk preference			2.762***	2.680***
			(2.663)	(2.576)
Male	0.721	0.765	0.674	0.705
	(-1.391)	(-1.106)	(-1.634)	(-1.425)
Age	0.994	1.010	0.987	0.995
	(-0.108)	(0.174)	(-0.231)	(-0.085)
Age-squared	1.000	1.000	1.000	1.000
	(0.353)	(0.062)	(0.445)	(0.328)
Married	1.090	1.145	1.207	1.198
	(0.395)	(0.604)	(0.834)	(0.799)
Observations	485	485	483	483

Notes: The models include survey wave dummies. Z-statistics are in the parentheses.

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

Column (1) of Table 4 reports the odds ratio when the set of North Korean variables is used only. Having a sales job in the informal market is statistically significantly correlated with generalized trust. The experience in market trades is associated with a 1.66 increase in the odds of trusting for North Korean refugees. Column (2) presents the results when the set of South Korean variables are additionally included. Compared with Table 3, the effect of time spent in South Korea on trust is no longer robust. Column (3) and (4) demonstrate that the association between risk-taking preference and trust is positive and statistically significant.

So far, not all informal sector activities are associated with trust of North Korean refugees. Among the possible informal market activities, only market trades have a positive and statistically significant correlation with North Koreans' trust. Selling in the informal market involves a large number of interactions with people, in particular, strangers. Compared to farming and home production, which involves fewer interactions, and compared to smuggling, which involves interactions with only a few trustworthy clients and suppliers, selling in the market entails repeated—as often as daily—exposure to transactions with various people. As proven in the related literature, an increase in interactions with other people through market activities fosters a notion that people in general are worth trusting. This mechanism seems to apply for the North Korean refugees as well.

As opposed to generalized trust, we investigate whether the refugees' experience in the informal market has association with particularized trust, especially in fellow North Korean refugees. We use the four variables introduced in Section III—trust in North Korean refugees, willingness to help them, willingness to socialize with them, and perception towards them. Table 5 reports the proportional odds ratios of variables when the respective dependent variable is used for each column.

Table 5. Market Activities and Attitudes towards Fellow North Korean Refugees

VARIABLES	(1) Trust	(2) Help	(3) Socialize	(4) Weak	(5) Overall Attitudes
(ref: No informal market experience)					
Selling at markets	1.075 (0.331)	1.111 (0.472)	0.907 (-0.448)	0.870 (-0.661)	0.995 (-0.024)
Cultivating in private plots	0.716 (-0.993)	0.995 (-0.016)	0.545* (-1.806)	1.135 (0.380)	0.668 (-1.231)
Stock farming	1.520 (0.864)	1.119 (0.234)	1.557 (0.876)	0.928 (-0.144)	1.283 (0.481)
Smuggling & repair	1.372 (0.849)	1.684 (1.392)	1.086 (0.232)	1.011 (0.030)	1.367 (0.839)
Production & other	1.525 (0.822)	2.098 (1.360)	2.891** (1.978)	2.422* (1.686)	3.640** (2.483)
Secondary education or lower in NK	1.526** (2.145)	0.658** (-2.077)	0.800 (-1.124)	1.039 (0.199)	0.942 (-0.316)
Real total income per capita (log)	1.046 (1.236)	0.961 (-1.089)	0.988 (-0.342)	1.035 (0.976)	1.023 (0.638)
Workers' Party membership	0.903 (-0.334)	1.363 (0.978)	0.771 (-0.863)	0.843 (-0.561)	0.902 (-0.356)
Served in military	1.557 (1.568)	0.932 (-0.243)	1.028 (0.101)	2.144*** (2.764)	1.707** (2.012)
(ref: Secondary or lower South Korean education)					
College or above and defected before 20	1.037 (0.079)	1.447 (0.787)	0.571 (-1.155)	1.223 (0.422)	0.990 (-0.022)
College or above and defected after 20	0.859 (-0.615)	1.361 (1.173)	1.372 (1.220)	1.146 (0.510)	1.233 (0.849)
Log of household income in SK	0.946 (-0.806)	0.864** (-2.018)	1.061 (0.863)	1.033 (0.486)	0.951 (-0.760)

Risk preference	2.411** (2.541)	2.862*** (3.029)	2.095** (2.167)	0.625 (-1.406)	2.152** (2.362)
Years lived in South Korea	0.945* (-1.901)	0.967 (-1.097)	0.962 (-1.281)	0.945* (-1.890)	0.935** (-2.303)
Observations	479	483	482	481	483

Notes: The models include survey wave dummies, age, age-squared, and gender dummies. Z-statistics are in the parentheses.

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

Column (1) presents the proportional odds ratio when trust in North Korean refugees is used as the dependent variable. Informal market activities are not statistically significantly associated with trust in North Korean refugees. On the other hand, a lower education level and more risk-taking behavior are positively correlated with trust in North Korean refugees. The second column reports results when the dependent variable is a proxy for willingness to help newly arrived North Korean refugees. This dependent variable may also reflect the degree of altruistic behavior. Experience in the informal sector is again not significantly correlated, although higher-educated North Korean respondents are more willing to help new refugees.

Column (3) presents the proportional odds ratio when the dependent variable is willingness to socialize with North Korean strangers. It can be a proxy for both trust and preference to expand ties in the North Korean refugee community. Experience in private farming is negatively associated with willingness to socialize. On the other hand, having had home producing and other second jobs is positively correlated to willingness to socialize. Column (4) contains results when an attitudinal variable is used as the dependent variable. Similar to the results of Column (3), the results indicate that the experience in home production is negatively associated with having negative attitudes, more specifically, perceiving the refugees as not self-sustaining. It seems that having engaged in a discrete and closed form of informal market activities is positively correlated with positive perception towards fellow North Korean refugees—a form of particularized trust or in-group favoritism. The overall attitudes towards North Korean refugees, are more favorable for people who have experience in production activities at home (Column 5). By contrast, market trades are little associated with particularized trust or any proxies for such trust. We interpret these results that trading at markets as an open and more frequent form of interactions with strangers increase generalized trust but not particularized one.

## B. Robustness Check Using the Instrument Variable Approach

Although we find positive correlation between market experience and trust based on the previous estimation results, we cannot argue for causality. In this section, we use the instrumental variable approach to provide evidence for the causal relationship. The instruments we use are the degree of private ownership of neighbors while the respondent was living in North Korea and the

percentage of arid land of the respondent's province of origin. The justification of our instruments is as follows. If more neighbors had private wealth, people are motivated to own private possessions, or increase wealth, through selling at informal markets. Also, if people lived in areas where aridity of land is high, they have less resources to sell in the informal market.

The degree of neighbors' private ownership is a 5-scale variable based on the question, "While you were living in North Korea, did people you know own private possessions (for example, cash or foreign currency) that the government was unaware of?" The respondents were asked to choose from the following answers. "Out of ten neighbors, 8 or more had private possessions," "Out of ten neighbors, 5-7 had private possessions," "Out of ten neighbors, 3-4 had private possessions," "Out of ten neighbors, 1-2 had private possessions," and "None." Unfortunately, the first wave of the survey conducted in 2011 does not include this variable and thus we use only the other two subsequent waves. As regards land aridity, we use data by Korea's Ministry of Unification which report the percentage of arid land of North Korean provinces in 2008.

The dependent variable of the first-stage, an indicator variable of selling activities at markets, is instrumented by the above instruments. The dependent variable of the second-stage is an indicator variable for generalized trust. The following table reports the instrumental variable results.

Table 6. The Effect of Selling Experience on Trust – Instrumental Variable Results

	(1) IV Probit	(2) Bivariate Probit
Selling at markets	0.575*** (0.101)	0.358* (0.197)
Secondary education or lower in NK	-0.008 (0.050)	-0.032 (0.061)
Served in military	-0.113 (0.072)	-0.102 (0.089)
Workers' Party membership	0.164** (0.076)	0.149 (0.096)
(ref: Secondary or lower South Korean education)		
College or above and defected before 20	-0.065 (0.101)	-0.086 (0.122)
College or above and defected after 20	-0.007 (0.056)	-0.034 (0.067)
Real total income per capita (log)	-0.006 (0.008)	-0.005 (0.010)
Log of household income in South Korea	-0.017 (0.018)	-0.020 (0.022)
Risk preference	0.165 (0.108)	0.273** (0.114)
Years lived in South Korea	0.001 (0.007)	-0.004 (0.008)
Age	-0.009 (0.013)	-0.002 (0.016)
Age-squared	0.000 (0.000)	0.000 (0.000)
Male	0.037 (0.053)	0.005 (0.066)
Observations	349	349

Notes: The figures report marginal effects when other variables are fixed. The models include survey wave dummies. Robust standard errors are in the parentheses.

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



Since both the first and second stages involve binary dependent variables, we find that binary dependent models are more appropriate for estimation.<sup>5</sup> The first column reports IV Probit estimation results. When other controls are fixed, the experience of selling at markets leads to a 57.5% point higher predicted probability of generalized trust. Since the binary nature of the first stage dependent variable can be inappropriate for the IV Probit model, we also apply the bivariate probit model as an additional analysis. Column (2) reports the bivariate probit estimation results. It predicts a 35.8% point higher probability of trust, a lower but still statistically significant and positive estimate.

## V. Conclusion

This study explores one of the potential effects that recent penetration of markets in North Korea has on North Koreans by focusing on North Korean refugees' trust. Our research is based on the survey data that reveal rare and valuable information of North Koreans' engagement in the informal market activities. Our analysis demonstrates that North Korean refugees' generalized trust is positively associated with—and even resulted from—their previous experience in selling in the informal markets, bottom-up and voluntary outlets for exchange between people that emerged to overcome the collapse of North Korea's rationing system. However, it is found that such activities are not associated with particularized trust in other North Korean refugees, suggesting little evidence of in-group favoritism. In addition, we find that the other forms of informal economic activities such as home production and stock farming are not correlated with generalized trust. This result indicates that generalized trust is nurtured by more open and indiscriminate interactions with strangers.

This finding has important implications for the future of the North Korean regime. Higher generalized trust caused by the market activities may facilitate further marketization and

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<sup>5</sup> We still find a positive and statistically significant effect of experience of selling at markets on generalized trust when the linear 2SLS model is applied, but we view that the linear model produces less reasonable estimates (a 84.2% point increase) than the binary models. Still, the instruments are relevant in the first stage—the more neighbors with private possessions, the higher probability of selling at markets, and the higher percentage arid land, the lower probability of selling at markets—with Kleibergen-Paap rk Wald F-statistics at 11.08. The instruments also pass the overidentification test, with the p-value of Sargan's J-statistics at 0.37.

information exchange, which can be incompatible with the official ideology and policies. If this process continues, the current socialist regime's weak control in the economy can extend to the society.

## References

- Algan, Y., and Cahuc, P., 2010. Inherited Trust and Growth. *American Economic Review*, 100(5), pp.2060-92.
- Al-Ubaydli, O., Houser, D., Nye, J. V., Paganelli, M. P., and Pan, X., 2011. The Causal Effect of Market Participation on Trust: An Experimental Investigation Using Randomized Control. GMU Working Paper in Economics No. pp.11-38.
- Berggren, N., and Jordahl, H., 2006. Free to Trust: Economic Freedom and Social Capital. *Kyklos*, 59(2), pp.141-169.
- Dearmon, J., and Grier, R., 2011. Trust and the Accumulation of Physical and Human Capital. *European Journal of Political Economy*, 27(3), pp.507-519.
- Dinesen, P. T., 2012. Parental Transmission of Trust or Perceptions of Institutional Fairness: Generalized Trust of Non-western Immigrants in a High-trust Society. *Comparative Politics*, 44(3), pp.273-289.
- Dinesen, P. T., and Sønderskov, K. M., 2018. Ethnic Diversity and Social Trust. *The Oxford Handbook of Social and Political Trust*.
- Fafchamps, M., 2002. Spontaneous Market Emergence. *Topics in Theoretical Economics*, 2(1).
- Fischer, J. A., 2008. Is Competition Good for Trust? Cross-country Evidence using Micro-data. *Economics Letters*, 100(1), pp.56-59.
- Guiso, L., Sapienza, P., and Zingales, L., 2004. The Role of Social Capital in Financial Development. *American Economic Review*, 94(3), pp.526-556.
- Guiso, L., Sapienza, P., and Zingales, L., 2008. Trusting the Stock Market. *the Journal of Finance*, 63(6), 2557-2600.
- Heineck, G., and Süssmuth, B., 2013. A Different Look at Lenin's Legacy: Social Capital and Risk-taking in the Two Germanies. *Journal of Comparative Economics*, 41(3), pp.789-803.
- Helliwell, J. F., Wang, S., and Xu, J., 2016. How Durable are Social Norms? Immigrant Trust and Generosity in 132 countries. *Social Indicators Research*, 128(1), pp.201-219.

- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., and McElreath, R., 2001. In Search of Homo Economicus: Behavioral Experiments in 15 Small-scale Societies. *American Economic Review*, 91(2), pp.73-78.
- Kim, B.Y., 2003. Informal Economy Activities of Soviet Households: Size and Dynamics. *Journal of Comparative Economics*, 31(3), pp.532-551.
- Kim, B.Y., 2017. *Unveiling the North Korean Economy: Collapse and Transition*. Cambridge University Press.
- Kim, B.Y., and Kang, Y., 2014. Social Capital and Entrepreneurial Activity: A Pseudo-panel Approach. *Journal of Economic Behavior and Organization*, 97, pp.47-60.
- Kim, B.Y., and Kim, D., 2018. Informal Economic Activities and Support for a Market Economy of North Korean Refugees. *The Comparative Economic Review*, 25(1), pp.1-28.
- Kim, B.Y. and Kim, S.H., 2016. Effects of Human Capital on the Economic Adjustment of North Korean Defectors. *Seoul Journal of Economics*, 29(4), pp. 505-528.
- Kim, B.Y. and Koh, Y.M., 2011. The Informal Economy and Bribery in North Korea. *Asian Economic Papers*, 10(3), pp.104-117.
- Kim, B.Y. and Song, D., 2008. The Participation of North Korean Households in the Informal Economy: Size, Determinants, and Effect. *Seoul Journal of Economics*, 21(2), pp.361.
- Knack, S. and Keefer, P., 1997. Does social Capital Have an Economic Payoff? A Cross-Country Investigation. *The Quarterly journal of economics*, 112(4), pp.1251-1288.
- La Porta, R., Lopez-De-Silanes, F., Shleifer, A., and Vishny, R., 1997. Trust in Large Organizations. *American Economic Review*, 87(2), pages 333-338, May
- Lichter, A., Loeffler, M., and Sieglöcher, S., 2015. *The Economic Costs of Mass Surveillance: Insights from Stasi spying in East Germany* (No. 9245). IZA Discussion Papers.
- Ministry of Unification, 2017. *Data on North Korean Defector Policies*. [online] Ministry of Unification (in Korean). Available at: <https://www.data.go.kr/dataset/15019661/fileData.do> [Accessed 10 Sep. 2018]
- Ministry of Unification, 2018. *North Korean Defectors: Recent Trends*. [online] Ministry of Unification (in Korean). Available at: <http://www.unikorea.go.kr/unikorea/business/NKDefectorsPolicy/status/lately/> [Accessed 10 Sep. 2018]
- Noland, M., 2004. Famine and reform in North Korea. *Asian Economic Papers*, 3(2), pp.1-40.
- Nunn, N., and Wantchekon, L., 2011. The Slave Trade and the Origins of Mistrust in Africa. *American Economic Review*, 101(7), pp.3221-52.
- Rainer, H., and Siedler, T., 2009. Does Democracy Foster Trust? *Journal of Comparative Economics*, 37(2), pp.251-269.

Salamin, J. and Floro, M., 1993. *Hungary in the 1980s: A Review of National and Urban Level Economic Reforms*. World Bank.

Siziba, S., and Bulte, E., 2012. Does Market Participation Promote Generalized Trust? Experimental Evidence from Southern Africa. *Economics Letters*, 117(1), pp.156-160.

Statistics Korea, 2018. *E-statistics: Population by Education Level*. [online] Statistics Korea (in Korean). Available at: [http://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx\\_cd=1530](http://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx_cd=1530). [Accessed 10 Sep. 2018]

Yamamura, E., 2010. Public Policy, Trust and Growth: Disclosure of Government Information in Japan. MPRA Paper No. 27708.

Zak, P. J., and Knack, S., 2001. Trust and Growth. *The Economic Journal*, 111(470), pp.295-321.