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Domestic migration, home rentals, and crime rates in China

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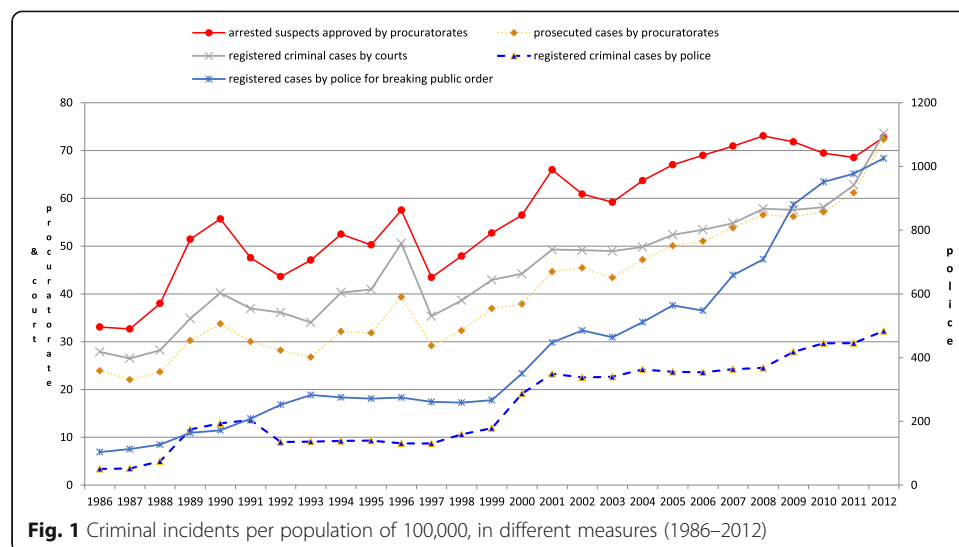
Abstract

Although it is commonly believed that immigration leads to a high crime rate, this relationship is far from conclusive. This paper contributes to this line of research by exploring the case of China, a country undergoing rapid and profound urbanization. We collected and analyzed the arrest and prosecution data from the procuratorates of 306 prefectures in China, combined with interviews with nine policemen and public procurators from five provinces. We found that domestic migration in different cities is significantly related to the prosecution rate, while home rentals provide a better predictor of the arrest rate. These findings imply that migration may introduce crime, but may partly through the rental-housing factor. Compared with prosecution cases that are broader in scope, arrest cases indicate graver crimes in China. This suggests that the rental factor may play an important role in the emergence and prevention of crime. The findings call for reflection on urbanization and its unintended consequences. Housing policies should not be considered merely in their economic sense; it should not be neglected as important social policy leverage in crime prevention and social inclusion.

Keywords: Domestic migration, Home rental, Crime, Defensible space, Crime pattern

Does domestic migration contribute to a high crime rate?

Criminal issues are related to public safety and social stability, and the containment of crime is a foundation for building an effective state. Data shows that China's gross crime rate has climbed since the early period of the Reform and Opening-Up (see Fig. 1). Crime rates differentiate by region, with the more developed coastal regions and inland cities having higher crime rates.¹ Some researchers have argued that "in the current period and for a long time in the future our country will experience strong within-people conflicts, high crime rates, and complicated struggles with enemies. Public safety will be a significant issue" (Zhang 2015). Meanwhile, China is in a process of urbanization with the largest scale and fastest speed in human history (Xinhua Net 2015). Unprecedented domestic migration applies pressure to host local governments and the public. Many regions view migration as a problem for social management, especially in regions with a large influx of immigrants. These regions simultaneously expect to set upper bounds of future population growth. For instance, Shenzhen and Suzhou set their bounds at about 11 million (Ye and Liu 2011; Chu 2011), while Dongguan's upper limitation is 6.5 million (Chen and Liu 2011). Local governments



deem that “once the economic structure is optimal, the scale of population will decrease and the quality of population will increase” (*Dongguan Daily* 2011).

On the other hand, the difficulties in controlling crime and the large scale of migration are also accompanied by incomplete urbanization and the temporary living status of a large population. The fact that “many people don’t have housing” coexists with the fact that “many houses are unoccupied” (Lu 2015). China’s central government has started to provide economic incentives for purchasing housing. Promoting the professionalization of housing management and improving housing quality have been some of the major tasks of the Central Economic Work Conference (*Beijing Times* 2015). Housing is not only relevant to the economy but also to the urbanization of “three hundred million people,” as pointed out by Premier Li Keqiang.² For local governments, the management of housing rentals is a major challenge but a key point in managing the migrant population (Zhuang 2015), which is referred to as managing people through housing. Is the correlation between the underdevelopment of housing conditions and the increase in the crime rate a coincidence or a real relationship? To prevent crime, is it more effective to control immigrants directly or through their living space? This is related to the choice of policy between checking and channeling. Theoretical inferences and empirical verification are needed to explore the effect of the scale of immigrants and local rentals on criminal incidents and their prevention.

Since the late 1800s, European and American academia, policy makers, and the public have paid significant attention to the relationship between the influx of immigrants and the crime rate. Probably influenced by the selective reporting of the mass media, the public and politicians are inclined to attribute crime and other negative consequences to new residents in cities. They try to dominate the policy process with this perspective, including but not limited to immigration policies (Schemer 2012). However, this attribution of crime to immigrants has not been consistently supported by empirical research in the West. Some studies even find that immigration may to some extent lead to a decrease in the crime rate (Wadsworth 2010; Zatz and Smith 2012).

Western research mainly focuses on the relationship between international immigration and the crime rate, while discussions of the relationship between domestic

migration and the crime rate are relatively limited. China turns out to be the largest “experimental field” for this. Chinese scholars empirically test the effect of social welfare on containing crime during social transformation (Chen 2010, 2012), and directly analyze the positive correlation between population flow and the crime rate (Chen et al. 2009). These efforts lay a good foundation for future research. In general, however, given the great importance of population and crime issues in social control and stability, the research on crime is not sufficient or diversified enough, either theoretically or methodologically. First, the mechanism of population migration (e.g., housing factors) needs to be specified. Second, the measurement of crime needs to be further clarified (e.g., lack of differences between the arrest rate and the prosecution rate). Third, many studies only conduct case studies based on one location or one legal institute.

The unique large-scale domestic migration in China provides a rich empirical field to study the relationship between migration and crime. Based on existing research, this study furthers this line of research from the aspects of independent variables, dependent variables, and unit of analysis. First, this study decomposes the domestic population flow into two factors, domestic migration and housing patterns, to stimulate a more accurate understanding of the mechanism and process between population migration and crime. Domestic migration is not only a shift in identity and social relationships but also a change in spatial and living conditions. Although living conditions (e.g., rental residences) draw attention from scholars (Rephann 2009), the proportion of home rentals in a regional population, its overall consequences, and its moderating effect on the relationship between population migration and crime need to be further tested via quantitative methods. The scale of domestic migration may represent the factors related to sociocultural structure, while home renting more likely represents the spatial condition and the relationship between humans and spaces.

Second, this study distinguishes between arrest rates and prosecution rates. These two indicators of crime rates indicate sensitivity to measuring crime. With empirical results and interviews of nine officials from public safety and prosecution departments from five provinces (or autonomous regions), this study deems that rented housing is a better predictor of the arrest rate, while the scale of domestic migration is a better predictor of the prosecution rate. The arrest rate may reflect more severe crimes, whereas the prosecution rate counts for a larger sum of criminal cases including that with a lower social threat, for example those under bail and residential surveillance (The National People’s Congress 2012). This means that different measures indicate different aspects of crime. Spatial structure can better predict more severe crime, while population structure can better predict overall crime. In other words, higher population heterogeneity increases the chance of conflicts, while they need to be reinforced by spatial conditions and other structural conditions to move to severe crime. Using the different measurements of crime rates can improve the robustness of our criminological analyses.

Third, this study increases the accuracy of analysis by using city-level data. Macrolevel data can mix different mechanisms, but can also capture the structural factors of a whole from the middle to macro levels (Messner and Sampson 1991). Therefore, it is an indispensable perspective of studying crime. For instance, the problems concurrent with population migration may not be directly caused by the migration population. Of

course, if the unit of analysis is too macro, a study could ignore the within-group differences and underestimate the between-group differences. Thus in addition to the existing research on provincial-level data (Chen et al. 2009; Chen 2012), this study collects and analyzes data from prosecution institutes in 306 Chinese cities in an effort to discuss the criminal effect of population migration, to analyze factors that catalyze or inhibit crimes, and to enhance the understanding of crime-rate variations in different Chinese regions. Because of the disparity of economic development in different regions, the increase in the crime rate across time mainly occurs in more-developed areas. Interpreting the differences in the crime rate across regions can also improve knowledge of why crime increases.

As the second-largest economy and with one-fifth population of the world, China is dramatically different from European countries or the USA. China not only has a larger scale of domestic migration but also has a higher speed of urbanization. Studying trends of crime and their driving forces in different regions cannot only deepen our understanding of crime formation but can also be helpful in enhancing the stability, public safety, and welfare of the whole society. For this reason, this study employs specific sources of the crime rate to analyze the effects of domestic migration and rented housing by using prefectural-level data, which may broaden our understanding of the dynamics of crime.

Literature review and research hypotheses

Population migration, rented homes, and crime

Although the assumption of biologically born criminals (Lombroso 2000/1878) has been less acceptable, the notion of criminal tendency from the sociological perspective has never disappeared (Birkbeck and Lafree 1993). Sociologists replaced the individual tendency with the group tendency. Given the background of urbanization and large-scale domestic migration, crimes are easily attributed to a new immigrant population. Shelley (1981) considers that the popular way of settling disputes in rural areas through violence easily leads to more crimes with the stimulation of an urban environment.

In Western countries, the perspective of “more immigration—more crime” has dominated research theory and public discourse for over a decade, although convincing empirical evidence is lacking (Wadsworth 2010). Empirical evidence rarely supports the view that immigrants are more inclined to crime (Butcher and Piehl 1998; Hagan and Palloni 1999; Mears 2001). An analysis based on data from Italy found that the association between immigrants and crime was no longer significant after improving the research methodology (Bianchi et al. 2012). With either micro or macro data, previous research either finds no relationship between immigrants and crime (Reid et al. 2005) or reveals a decline in crime due to immigrants (Martinez 1997). There is research indicating that the association between immigrants and crime is entirely misleading (Zatz and Smith 2012).

Criminology studies in China display another perspective. Some research argues that the major reason for the dramatic increase in the crime rate is the large-scale population migration (Chen et al. 2009). In some cities, the crime rates of immigrants are five to six times higher than those of nonimmigrants (The Study Group of Xiamen Public Safety Department 2011). However, other studies note that domestic migrants are more

likely to be victims than criminals. Having a lower class status, being exposed to a complicated environment, and susceptible to scams, migrants become the victims of a small group of criminals composed of both migrants and nonmigrants (Tong 2013). These findings seem to indicate that large-scale domestic migration is more likely to incur crime than international immigration in the West.

Combining housing issues with migration issues may be another distinction between Chinese and Western academia in criminology. Although studies in the West mainly support the positive effect of home ownership (Galster 1983; Green and White 1997; Glaeser and Sacerdote 1999), immigrants and their communities can also play a positive role. For instance, the housing transfer in a community is self-protective, decreasing the crimes that target immigrants and nonimmigrants (Martinez and Lee 2000).

The migrant population issue in China is usually discussed together with or even equalized to the issue of housing mode. Immigrants are seen as composing a larger proportion of criminals, and criminals usually reside in rented places (Pan and Qin 2010). The higher proportion of immigrants in rental housing, the higher the crime rate (Shi and Wu 2010). From the perspective of victims, the living conditions of migrants (e.g., corenting, renting rural housing) may increase their chance of being victims (Zhang 2012). Therefore, discussing the relationship between population migration and the crime rate in China cannot leave out the factor of living conditions. Given that the vast majority of immigrants are not criminals, the actual level of the crime rate may be more correlated to the susceptibility of immigrants' housing conditions. In other words, even if a positive correlation exists between the relative proportion of immigrants and the crime rate, researchers still need to consider the victimization effect for immigrants. The crime pattern theory provides systematic explanation for this.

Crime pattern theory

Even though we know that population migration and housing conditions may affect the crime rate, we still need to clarify why the chances of crime are different in different migration and housing situations. Crime pattern theory further provides a comprehensive explanation for crime formation, including how population migration coincides with crime.

The crime pattern theory is first concerned with why crimes are more likely to take place at certain places and among certain people, rather than why some people are more prone to committing crimes (Lammers et al. 2015; Brantingham and Brantingham 1993, 1995, 2011). It adopts the routine activity theory on how changes in human activities can affect crime rates (Cohen and Felson 1979; Felson and Cohen 1980), the analysis by school of rational choice on the decision mode of criminals (Becker 1968), and defensive space theory on the importance of space (Newman 1966). Therefore, this theory can better reach the core of crime formation, that is, the convergence of routine activities, potential sites, potential criminals, and victims. The theory especially emphasizes opportunities of crime, routine activity, and location of crime.

The major argument of the crime pattern theory is that potential criminals obtain information about achieving illegal goals from their legal daily life. Most criminals are normal people at first. Criminals spend most of their time on normal social activities rather than on committing crimes. Their familiarity with a city is achieved through

their legal and everyday activities. Therefore, victims are not chosen randomly; rather, they are chosen according to the psychological template of potential criminals (Brantingham and Brantingham 1993).

As in everyday activities, for potential criminals, the areas for committing crimes are concentrated and usually close to their living space or places they pass by, including nodes, paths, edges of various functional areas, and their awareness space. They conduct crime at places close to their living center, especially their homes, workplaces, and shopping and entertaining spaces. Among them, places close to their home is the primary choice because the living space is the center of all activities. Similarly, people also become victims at places close to their living center (Brantingham and Brantingham 1993, 1995, 2011).

The crime pattern theory greatly explains why potential criminals choose victims close to their living center rather than far from it. Although transportation conditions expand the span of people's activities, living space is unsurprisingly one of the most basic living structures. On the one hand, criminals are cohabiting or parasitic with victims under the same environment of crime. Crime can be at least partially explained by this naturally predatory relationship. This is not to subscribe to biological reductionism or to deny the characteristics of humans, but to reemphasize that criminal activities happen for more complicated reasons than any human crime-tendency theory will claim. On the other hand, the occurrence of crime is based on the overlapping of the living space of criminals and victims (Felson and Cohen 1980); in many such situations, the victims may have no choice. A recent study even finds that potential criminals and victims share some similarities such as lack of self-control and some similar living habits (Pratt et al. 2014). This leads to potential victims unconsciously placing themselves in dangerous circumstances, and some potential criminals becoming criminals.

The crime pattern theory throws light on the analysis of the relationship between population migration and crime. First, it emphasizes the importance of daily life in crime formation and crime analysis, especially living spaces and housing factors. Housing factors determine the chances of crime and the level of the gross crime rate. Moreover, the boundary between legal and potentially illegal activities blurs when people have limited knowledge of residents' identity and lack a basic sense of spatial boundaries. This provides more opportunities for potential lawbreakers and illegal activities, and even ignites the escalation of criminal behaviors. Furthermore, rented homes and the weakening of family structure debilitate the protective mechanisms that protect against crime, which can further strengthen the disparity between predator and defenders and spur crime rates. The weakening of home protection is shown by the lack of physical and symbolic facilities, whereas the weakening of family structure is reflected in the smaller size of families and life far from extended families. A larger number of immediate family members can provide alerts and support to neutralize the danger.

Population migration and the criminalizing effect of housing patterns: research hypotheses

The large-scale population migration is a product of rapid industrialization and urbanization. Immigrants are primarily seen as an economic means or source of labor.

They exhibit semi-integration and semi-socialization characteristics (Wang 2006; Li 2011). Their activities center on work, and the asymmetry of their work and life creates a vulnerable defensible space. Many families have incomplete migration because of high costs for the whole family. This increases their susceptibility. On the one hand, city immigrants have limited social resources and are not familiar with and only superficially acculturated into the urban environment. Their chances of being infringed on are relatively high, and the effectiveness of relief channels are thereby discounted. On the other hand, working outside and the difficulties of starting a new life in the city shakes the will of some people. After rational calculation, some engage in illegal activities. Since they are only familiar with the social ecology and everyday life of the migrant population, in their crime pattern, their first choice is the rented living places of migrants. The risk of committing crime in this group is relatively low, inducing the formation of a parasitic criminal group. According to the observations of western scholars, the increase in the crime rate is the result of a lag in the judicial system and social control compared to the greater crime stimulus nurtured by rapid changes in the social structure, among which changes in living habits and human activities play an important role (Felson and Cohen 1980).

For contemporary China, this change not only exists at the societal level but is also structurally embedded in the society. That is, the living pattern of migrants exposes them to greater risks. In the saying “Flies do not bite seamless eggs,” the seam refers to the consequence of various structural factors, including living and working patterns of migrants, rather than their personal failures. The crime rates of places with a population influx may increase as a result. We therefore expect that population migration increases the crime rate and thus formulate the first hypothesis:

Hypothesis 1: An increase in the population migration rate will lead to an increase in the crime rate at the regional level.

Crime pattern theory and routine activity theory both argue that habits and daily activities are very important. When people’s activities become more detached from the family, the number of single-person families increases, or monitors decrease, and infringers will have more available targets on which to commit crime (Lammers et al. 2015; Brantingham and Brantingham 2011; Cohen and Felson 1979; Sherman et al. 1989). This is partly the reason why a higher proportion of population migration can contribute to higher rates of victims and gross crimes. Similarly, an increase in family size can compensate for the loophole incurred by routine behaviors and living styles in the modern society. It can also increase the average ability of families to prevent crime and eventually decrease crime rates. This can be valid for both immigrants and nonimmigrants. We do not deny that increased family size can exert long-term influence on aspects of culture and social control. We thus formulate the second hypothesis:

Hypothesis 2: An increase in the average number of family members who stay at home can decrease the gross crime rate of a region.

According to crime pattern theory, though a migrant population may increase crime rates, this largely derives from their disadvantages, especially spatial disadvantages. In general, most migrants live in relatively simple and rudimentary conditions, and lack safety, standard living facilities, or enough space for entertainment. Because of the rental mode, long-term infrastructure investment is limited and protection is low

(Cohen et al. 1981). This space is short of physical or symbolic boundaries so it is easy for criminals to enter and trespass. Many potential criminals emerge from this type of environment. If criminals are successful the first time, they then focus on migrants and their living spaces. They will choose their victims from the environment they are familiar with. Humans are animals of territory and place. When people who obey laws do not possess clear boundaries of their living environment, lawbreakers will seek to trespass, obtaining the benefits of material goods or irrational psychological satisfaction. Although crime pattern theory proposes several different kinds of space (Brantingham and Brantingham 1993, 1995, 2011), in the urban mosaic, living space may come first as an anchoring effect for public safety. Because rental residents have different work and living schedules and their families lack members who care for the home, communities cannot match them to their addresses. Rental residents usually do not have the determination and ability to defend the safety of their territory, which is substantively different from nonrental residents. Nonrental residents can ally to “deport” suspicious people or ask administrators for support, which is not possible for rental residents. When rental residents are clustered, the situation is even worse (Velez et al. 2012). Policemen and government institutions usually entrust communities with issues related to rental residents because their management is difficult. However, communities usually pursue these issues only for economic benefits and lack the motivation to manage them. Once the broken-window effect is formed (Wilson and Kelling 1982), the management of rental residents is even worse. We therefore present our third hypothesis:

Hypothesis 3: The higher the level of local rental-home living, the higher the local crime rate.

This study focuses on domestic migration and home rentals, especially the weak crime-prevention effect of the latter. We do not deny that home ownership or renting may partially reflect differences in household socioeconomic status or community collective efficacy (Sampson et al. 1997). The housing pattern as an independent variable is an important predictor of crime and other social consequences (Kirk 2012; Lammers et al. 2015). After controlling for population structure, how housing renting or ownership affect crime still lacks empirical research. Assessing the association between regional home renting and the crime rate can help us better understand the comprehensive effects of how living patterns catalyze or prevent crimes. This also provides a useful perspective for understanding the regional differences in China’s crime rates or even the general causes for crime.

Analytical strategies, research subjects, and description of variables

Analytical strategies and measurement of crime

Scientific research needs to balance theoretical conclusiveness and empirical specificity. One question that criminology needs to answer is whether a general analysis of all crimes or a specific analysis of one type of crime is better. Although it is meaningful to categorize crimes into different types, for example violence and property crime, or into more detailed subtypes such as robbery and burglary, a general analysis on crime as a whole is also necessary. Crime reflects universal abnormality and deviance from normal social orders. Currently, the boundary between violent crime and property infringement

is blurred; their differences are not as significant as people think (Ehrlich 1973; Chen 2010). Analysis of specific types of crime can help us understand the different criminal mechanisms; however, it is at the cost of theoretical conciseness.

Some people claim the uniqueness and invisibility of high-intelligence or white-collar crime. First, this type of crime has a low percentage of all crimes; most crimes are ordinary crimes.³ Second, all crimes are difficult to find and detect, a characteristic that is not distinctive for any type of crime. For socially constructed crimes, we can only stick to the legal facts based on legal process and evidence since absolute objective facts are almost impossible to find, if they even exist.

Another relevant question is how to measure crime. Although undocumented crime or “dark figures” exist (undiscovered, unreported, and unfiled cases), they are usually related to relatively modest crimes (Skogan 1977). Therefore, adopting official records to measure crime is both feasible and acceptable (Levitt 1998). In China, crime-related records come primarily from public safety departments, courts, and procuratorates (Bai 2010). Previous data shows that their records are not only horizontally (Chen 2012) but also longitudinally highly correlated.⁴

Therefore, there are no significant differences in the quality of criminal records from these three major legal institutions in China. The number of arrests approved and charges executed by procuratorates and the number of filed and settled criminal cases of courts are mainly determined by the number of filed cases in public safety departments, but the higher numbers of cases in public safety departments do not mean they are more accurate. Procuratorates as legal jurisdiction institutions have relatively low fluctuation in records caused by human reason. At a minimum, the numbers in procuratorates reflect the relatively general criminal situations in different regions.⁵ Moreover, procuratorates usually have consistent data records, which increases the feasibility of the analysis.

In summary, this study adopts arrest rates (number of arrests per population of 100,000) and prosecution rate (charged people per population of 100,000) from procuratorates across different regions as two measurements of the crime rate. Arrest rates relatively reflect more severe criminal behaviors, while prosecution rates cover more cases (The National People’s Congress 2012).⁶

Research subjects and data sources

To systematically analyze the influential factors of the crime rates of different areas, we analyzed 306 units at the prefectural level or above (cities, regions, autonomous regions) in China in 2010. The population of these areas totals 1.259 billion, accounting from 93.98 to 94.47% of the Chinese population at that time. They cover all four provincial-level cities; 49 relatively large cities, including subprovincial cities, economic special-zone cities, and provincial capital cities; 217 ordinary cities; nine regions; and 27 autonomous regions. Although 31 cities or regions are not included, the included units are very representative in terms of various criteria such as the total scale and variety. This study also furthers the previous analyses that mainly focus on the provincial level, and from a systematic perspective also outperforms previous case studies.

The horizontal comparisons of different regions and data availability contribute to the use of 2010 cross-sectional data in this research. As complex social behaviors and

phenomena, any analysis of crime must be based on solid social population data. In 2010, the Sixth National Population Census of China (Sixth Census) is launched, which consumed a huge amount of money and labor, and the report “County-level materials of Chinese population census in 2010” was published in December 2012. These prepared the data for analyses on the county level and above, which was not available in noncensus years. The different developmental stages of regions in China and the cumulative differences across time indicate that this type of cross-sectional analysis can reflect the basic problems of recent China. Moreover, because of the unity of the judicial system in mainland China, cross-sectional data on prosecution institutes are comparable. Other data of this study are from yearbooks of respective cities and regions, annual work reports of prosecution institutes, “Annual statistics of Chinese regional economies (2011),” “Law Yearbook of China” (1987–2013), and interviews with nine people from public safety or prosecution institutions from five provinces or autonomous regions.

Independent variables and description of measures

The focus of this paper is to explain the variations in crime rates across different regions from the perspectives of domestic migration and home rentals. We first used the ratio of domestic immigrants (residents without local *hukou*) to permanent residents to measure the degree of population migration. The data is drawn from the Sixth National Population Census of China. Population migration can examine the impact of changes in population structure, which may include overall changes in life opportunities and potential cultural conflicts.

Moreover, for residents in rental housing (measuring the housing status with the ratio of nonself-owned housing), we used the data of 10% sampling from the Sixth Census, that is, the long-table data. Rental residential rates can largely reflect residents’ autonomy over their living space and environment. Although the rental rate is associated with the domestic migration rate that measures the extent of migration, they intersect but are not identical. After controlling for other factors, their net effects should be manifested. Although the immigration rate and the rental-housing rate can be further attributed to other factors, it does not discount their analytical value as independent variables.

Table 1 includes the major variables (initial status), including independent and dependent variables.⁷

For the descriptive statistics of initial variables (see Table 2), the minimum number of the arrest rate is 20.76 per population of 100,000, and the minimum number of the prosecution rate is 21.8 per population of 100,000. These indicate that the arrest rates and prosecution rates have large differences across the 306 prefectural-level units. The initial independent variables also have large variances.

Statistical testing

Methods and models

We applied OLS robust regression and FWLS regression methods to test the generalizability of the relationship patterns between the various factors and the crime

Table 1 Measures of variables

Variables ^d	Notes	Expected influence ^c
Dependent variables		
arre	Arrest rate (according to that approved by procuratorates)(persons/100,000 population)	
pros	Prosecution rate (according to procuratorates)(persons/100,000 population)	
Independent variables		
migr	Domestic immigrants/total regional population (decimal form)	+
rent	Rental households/all households (decimal form)	+
edu	Average education for population above 6 years old (years)	-
unwr ^a	Population able to work yet do not work among those aged 16 or above/total regional population	+
hc	Retired and self-home-caring population among those aged 16 or above/total regional population (decimal form)	-
youth	Population aged 15–29/total regional population (decimal form)	+
sex	Number of males/number of females (aged 15–29) (decimal form)	+
urban	Population living in urban areas/total regional population (decimal form)	/
pgdp	Per capita GDP (10,000 yuan)	+
pgex ^b	Per capita general budget expenditure of a regional fiscal year (1,000 yuan)	/

^aIncludes unemployment from four sources: unemployment since graduating from college, unemployment attributed to employer, unemployment attributed to personal reasons, and unemployment attributed to the expropriation of agricultural land

^bCan be the proxy for legal spending, which measures the scope of regional crime control and their gross effect

^c“+”, positive; “-”, negative; “/” indicates that the direction of a relationship is uncertain

^d“arre”, arrest rate; “pros”, prosecution rate; “migr”, domestic immigration rate; “rent”, rental household rate; “edu”, education level; “unwr”, unworked rate; “hc”, home-caring population rate; “youth”, young population rate; “sex”, sex ratio; “urban”, urban population ratio; “pgdp”, per capita GDP; “pgex”, per capita general expenditure

rate. To reduce heteroscedasticity, we took the logarithm of most initial variables. The OLS model is written as follows⁸:

$$l\text{arre}_i = \beta_0 + \beta_1 l\text{migr}_i + \beta_2 l\text{rent}_i + \beta_3 \text{edu}_i + \beta_4 l\text{unwr}_i + \beta_5 l\text{hc}_i + \beta_6 l\text{youth}_i + \beta_7 l\text{sex}_i + \beta_8 \text{urban}_i + \beta_9 l\text{pgdp}_i + \beta_{10} l\text{pgex}_i + \xi_i \tag{1}$$

$$l\text{pros}_i = \beta_0 + \beta_1 l\text{migr}_i + \beta_2 l\text{rent}_i + \beta_3 \text{edu}_i + \beta_4 l\text{unwr}_i + \beta_5 l\text{hc}_i + \beta_6 l\text{youth}_i + \beta_7 l\text{sex}_i + \beta_8 \text{urban}_i + \beta_9 l\text{pgdp}_i + \beta_{10} l\text{pgex}_i + \xi_i \tag{2}$$

Table 2 Descriptive statistics of variables $n = 306$

Variables ^a	Mean	Standard deviation	Minimum	Maximum
arre	67.50145	33.14021	20.76019	256.44310
pros	86.86706	38.38222	21.80490	262.26700
migr	.18016	.12609	.04363	.82204
rent	.10165	.09999	.00933	.73420
edu	8.84598	.94376	5.78000	11.71000
unwr	.02262	.01005	.00669	.06766
hc	.14661	.05225	.04717	.33896
youth	.23916	.04078	.15266	.44852
sex	1.03933	.06519	.87190	1.34070
urban	.48517	.17066	.12689	1.00000
pgdp	3.17809	2.27368	.51381	18.19270
pgex	4.90146	2.77757	1.60902	22.68034

Results of empirical analyses

Table 3 presents the results of OLS robust regression: models 4 and 9 in Table 3 are full models; models 1–3 and 6–8 examine the explanatory power of the domestic migration rate and home renting. Using the logarithm of the arrest rate as a dependent variable, the logarithm of the residential rental rate is significant at the 0.01 level, and the logarithm of the immigration rate is significant at the 0.05 level. In addition, in terms of *R* squared, the individual explanatory power of home renting exceeds that of the domestic migration rate. At the 0.01 level, significant variables further include the proportion of people who are able to work but do not work and the proportion of people caring for the home. Length of education, gender ratio among the youth, GDP per capita, and public spending per capita are significant at the 0.05 level. Basically, these findings and the directions of their effects matched the expectations. When using the logarithm of the prosecution rate as a dependent variable, the domestic migration rate has a higher explanatory power than the proportion of home renting; the proportion of people who do not work and the proportion of those caring for the home still play roles as a crime facilitator and suppressor, respectively. Additionally, an increase in GDP per capita can still predict an increase in crime.⁹

To improve robustness, we further used FWLS regression analysis. Models 5 and 10 in Table 3 are full models that include all variables. The results show that when the dependent variable is the logarithm of the arrest rate, the home-rental factor is more significant than the domestic-migration factor. When the dependent variable is the logarithm of the prosecution rate, the domestic migration rate has a slightly larger effect. The inconsistency in the results indicates the delicate differences between the arrest rate and the prosecution rate. To be cautious, we could not arbitrate whether the domestic-migration factor or the home-renting factor is superior in predicting crime. It may be that one of them is more useful or, more probably, that both factors are

Table 3 Regression of influential factors for the crime rate: OLS Robust and FWLS

Variables	larre				FWLS	lpros				
	OLS Robust					OLS Robust	FWLS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
lmigr	.516***		.253***	.194**	.192**	.511***		.475***	.253**	.233**
lrent		.404***	.226***	.222***	.198***		.367***	.031	.108*	.143**
edu				-.092**	-.073**				-.059	-.050
lunwr				.380***	.400***				.304***	.304***
lhc				-.363***	-.406***				-.251***	-.237**
lyouth				.228*	.162				-.192	-.134
lsex				.708**	.745**				.354	.484
urban				.064	.168				-.054	-.226
lpgdp				.127**	.092*				.208***	.222***
lpgex				-.117**	-.069				-.013	-.030
Constant	5.093***	5.165***	5.181***	6.957***	6.525***	5.346***	5.327***	5.358***	5.893***	6.072***
Observations	306	306	306	306	306	306	306	306	306	306
<i>R</i> squared	.482	.489	.510	.596	.650	.492	.416	.492	.546	.516

Note: ****p* < .01, ***p* < .05, **p* < .1

effective, which means that the vulnerable domestic migrant population and their vulnerable living space bring an accumulating crime effect and crime patterns.

We can see that the increase in the domestic migration rate (the proportion of domestic migrants), the home-renting factor, the proportion of people who can work but do not work, and GDP per capita, among others, can notably increase crime rates. An increase in the proportion of the retired and household personnel will lead to a decline in the crime rate. These five variables are highly significant and are relatively robust. An increase in the gender ratio of male to female in the youth can increase the crime rate, and an increase in average years of education and government public expenses will decrease the crime rate. The findings on these three variables are consistent in direction but not in significance. No clear evidence was found on whether an increase in the proportion of youth and the population's urbanization rate will decrease crime, which may be due to the existence of their simultaneous effects on increasing and decreasing crime.

The above analyses of variables that affect the crime rate, whether with OLS robust regression or the FWLS regression methods, all assumed independence among cities in explanatory variables or dependent variables, and did not consider the interdependence of neighboring areas in domestic migration and rental housing, or the spillover effect of the crime rate across different areas. To improve the robustness of the statistical results and reduce estimation errors, we fitted spatial regression models to the data as follows.

Since the spatial correlation in independent or dependent variables affects results not only through the spatial lag of the crime rate itself or cross-sectional errors but also through the spatial correlation in population migration and housing patterns, this study adopts the spatial lag model, the spatial error model, and the spatial-autoregressive model with spatial-autoregressive disturbances (SAMSAD model) to conduct spatial analyses on variables affecting the crime rate. Among them, the spatial lag model is mainly used to control the spatial correlation in population migration and housing patterns that may affect the regional crime rate, the Spatial Error Model is mainly used to control the effects due to spatial lag or cross-sectional error of the crime rate itself, while the SAMSAD model is used to control both aforementioned effects.

The results for the spatial regression analyses are presented in Table 4, in which models 11, 13, and 15 provide the estimation results of the influential factors on the arrest rate, while models 12, 14, and 16 provide the corresponding results of the influential factors on the prosecution rate. From these results, we observe that the immigration rate and the home-renting factor are significant factors regardless of whether the spatial lag model, the Spatial Error model, or the SAMSAD model is used. When using the logarithm of the arrest rate as a dependent variable the home-renting factor is more significant compared to the domestic population migration rate, while the reverse is true when using the logarithm of the prosecution rate as a dependent variable. This is fundamentally consistent with the conclusions obtained from OLS robust regression and FWLS regression methods.¹⁰

Theoretical exposition and reflection

The findings of this study empirically support the three hypotheses advanced in the second part of this paper, especially the effect of domestic migration and home renting on crime distribution. The accumulation of disadvantaged people and their vulnerable

Table 4 Regression of influential factors for crime rates: Spatial regression analysis

Variables	Spatial lag model		Spatial error model		Spatial-autoregressive model with spatial-autoregressive disturbances	
	(11)	(12)	(13)	(14)	(15)	(16)
lmigr	.154**	.219***	.152**	.218***	.151**	.217***
lrent	.245***	.120**	.247***	.126**	.248***	.126**
edu	-.090***	-.032	-.091***	-.031	-.089***	-.030
lunwr	.349***	.252***	.358***	.267***	.352***	.263***
lhc	-.348***	-.200**	-.355***	-.222***	.352***	-.219***
lyouth	.225*	-.180**	.221*	-.212*	.224*	-.210*
lsex	.695***	.717***	.713**	.749***	.697***	.738***
urban	.076	-.134	.073	-.141	.075	-.139
lpgdp	.137***	.196***	.135**	.191***	.135***	.191***
lpgex	-.108***	-.006**	-.109***	-.007	-.108**	-.006
Constant	6.525***	5.541***	6.820***	5.544***	6.753***	5.498***
lambda	.019	.012			.196	.013
rho			-.115	-.347	-.121	-.349

Standardized spatial contiguity weights matrices and maximum likelihood estimators are employed in these models

Note: *** $p < .01$, ** $p < .05$, * $p < .1$

space increases the crime rates of immigration regions. Home renting shapes the way of life of the domestic migrant population and induces the crime pattern of a transitional period. Comparatively speaking, the domestic migration rate is a stronger predictor for the regional prosecution rate, whereas the home-renting factor is a better predictor for the arrest rate. Population structure can better predict overall crime, while spatial structure can better predict severe crime. Higher population heterogeneity and incomplete social integration improve the chance of social conflicts, but the occurrence of severe crime usually needs to be strengthened by the structural conditions of the spatial environment.

On the one hand, domestic migration has a positive effect on regional crime rates, indicating that it indeed introduces some impacts on society. Together with incomplete social integration reflected by the segregation in residential registration, migrants have systematic disadvantages in living opportunities, social capital, and cultural adaption, increasing the difficulty in social management and the chance of social conflicts. A society flooded with an unstructured “floating” population makes the boundary of legal and illegal activities more obscure, and makes the identification, vigilance, and prevention of crimes more difficult. This is what crime pattern theory (Brantingham and Brantingham 1993, 1995, 2011) reminds us. Migrants are more likely to be victims of crimes, and a large scale of migrants provides a shelter for vagabond criminals.¹¹ This finding can help address the debate over the relationship between population migration and crime (Martinez and Lee 2000; Wadsworth 2010), but cannot indicate that migrants are more likely to commit crimes. People who are highly likely to be criminals are a small part of this group.

On the other hand, home rentals related to domestic migration plays a key role. Rented homes and the accompanying living pattern increase the chance of victimization or crime (Brantingham and Brantingham 1993, 1995, 2011). Property ownership can improve the ability for defense and indirectly plays a positive role

through influencing other factors (Glaeser and Sacerdote 1999). Good living space is not just a physical space but also expands the safety zone through social connections among members (Jacobs 1961; Newman 1966), which exerts an anchoring effect. In some areas, rental buildings or communities can be well managed and safe, such as the living areas and apartments of some educational or governmental institutions. However, from a more macro perspective, a city with a higher scale of rented homes usually experiences more difficulties in urban management and a higher overall crime rate, given its social management capacity.

When the owners of the houses and apartments do not live in the property themselves, they lack the motivation to improve housing function and often maintain the property at the lowest level. Rental residents have limited authorization to do so, and short-term benefits further constrain their motivation for investing in the improvement of housing conditions. Lease contracts and laws also cannot exhaustively cover the complicated practical relationship concerning rights and duties between tenants and owners. Especially when lawsuits are too expensive, the obscure responsibility sharing between tenants and owners increases the chance of conflicts. Scattered responsibilities also increase the difficulty in management concerning public safety and urban affairs.

The possible mechanisms for how home renting correlates with crime include the following. First, from the perspective of crime infusion, urban villagers, or property owners, the management of villages or communities and local governments are all devoted to developing rental economies out of economic motivation, and then to encouraging the mixed use of living and work spaces, forming various multifunctional buildings and spaces for living, manufacturing, and storage at the same time. These pose many potential threats in fire control, food safety, and public safety. The fragility of the residential space increases migrants' risk of being victims (Zatz and Smith 2012). Second, from the perspective of derivatives of crime, economic crime and ordinary crime can overlap or transformed into each other. The production and sales of fake goods, crime in food production, gambling and drugs, and pyramid sales can induce robbery and theft, violent protection, and organized crime. Reversely, organized crime can also catalyze money laundering and other aspects of the dark economy. Third, from the perspective of crime export, rental housing can incubate legal offenses and criminal behaviors. The narrowness and spatial constraints of rental apartments in many semi-urbanized areas of China set limits to the long-term commitment and investment of domestic immigrants, and impede their social communication, increasing the possibility of failing into criminal behavior.

Of course, rental housing may need some prerequisites to play such a role, such as certain managerial quality and rental habits. China achieved a relatively high rate of self-owned housing although at a large price, which may partially explain why China's public safety is generally under control (United Nations Office on Drugs and Crime 2011, 2014). However, the fast economic development and reconfiguration of producing power have introduced a huge housing rental market, while managerial ability on the property owner's side, the self-protection consciousness on the tenant's side, and local public management and service are all insufficiently prepared and developed. Therefore, other than increasing self-owned housing for certain cities and groups, the government could also increase managerial quality by improving the standards of the rental market in order to ameliorate social order. The recent Central Economic Work

Conference has created a series of policies to promote the real estate market and to encourage more professionalized rental-property management (Xinhua Net 2015). The healthier development of the housing market is becoming more important not only for the economy itself but also for the living quality and public safety of the whole society.

Conclusion and discussion

Economic development may have a basic level of stability as a prerequisite, but crime will not necessarily decrease accordingly as an economy grows. The difference in crime rates across regions accompanying the economic development and population migration in China is an important phenomenon that requires studies on existing or potential systematic criminal patterns related to large-scale population migration. Some regions have a large proportion of new migrants that may partially explain their high crime rates; but preventing crime by ascribing spatial advantage to vulnerable people is at least as important as deterring criminals. It is important to note the likely transformation of the previous rural-urban duality structure to a new dual separation between residents with city registration and the migrating population without, and to mitigate the phenomenon of alienation of migrants (Kang 2005). More important than the reform of the registration system is solving the substantial inequality problem, including urban housing disparity (Chen 2015). Besides reducing voluntary and nonvoluntary unemployment of all kinds, the government should pay attention to reducing the separation of family members so as to bring out the supportive function of families.

Existing studies show that other than directly combating crime, governments need to channel it with welfare and other social policies (Currie 2013; Chen 2010, 2012). Housing policies can kill two birds with one stone (Coulson 2002). This study supports the hypothesis that domestic migration increases the crime rate, deeming that the housing and living patterns (Lammers et al. 2015; Brantingham and Brantingham 1993, 1995, 2011) of migrants largely shape the crime distribution in transitional China. Housing coverage is related to social management and stability and becomes the primary concern of the public. A recent survey in Sichuan, a province with a large number of emigrants, shows that basic housing security is the primary concern of migrant workers, accounting for 50.9%, and senior pensions and compulsory education of children come next (The Statistics Bureau of Sichuan Province 2015).

Constrained by the nature and scope of the data, this paper has some limitations that could be further addressed in the future. First, though this paper incorporates multiple research methods including quantitative analysis, qualitative interviews, and observations, which makes us confident about the correlation between rented housing, spatial integration, and crime, we have not separated the two different mechanisms of defensive effects of victims and criminal effects of criminals. Thus the mechanism of how rented housing affects crime needs to be further explored. Second, although international and domestic migration have comparable consequences in criminal research, different explanatory frameworks ought to be applied to address their differences. The third potential problem is about the measurement of the crime rate. Measuring crime is a persistent challenge in criminology, and this paper has adopted two measures to increase the robustness of the dependent variable measurement. However, we have to admit that the real crime rates are larger than those registered by the judicial system, which may lead to underestimates of intercepts and coefficients of domestic migration

and rented housing factors in the OLS models.¹² Fourth, the use of prefectural-level data rather than provincial-level data in this paper could better capture the intraprovincial variations and a solid source of census data for cross-sectional analysis would improve the accuracy of measurement and reduce the omitted-variable bias. Nevertheless, future studies could utilize panel or time-series data to capture the longitudinal variations of crime rates when reliable data is available.

Endnotes

¹Measured by arrest rates and prosecution rates across all cities, the highest crime rate can be more than 12 times as high as the lowest crime rate (please refer to Table 2 for details.). In general, developed cities have large populations, high crime rates, and a large number of criminal cases.

²This indicates that to deal with the issues concerning a migrant population of one hundred million moving from villages to urban areas, one hundred million city residents living in shantytowns, and one hundred million peasants in midwestern China, the government should incorporate migrant population into urban housing system and raise their living conditions to meet modern standards. The government should also make efforts to gradually reduce large-scale periodic migration (Xinhua Agency 2014; Xinhua Net at Dalian 2015).

³Most crimes are ordinary crimes, making the general analysis reasonable. Future research should try to further differentiate crimes according to their potential degree of relevance to migration.

⁴The major sources include arrests and cases approved by procuratorates; charged suspects and cases by procuratorates; registered criminal cases by police departments; registered cases for the five common types of crime—homicide, assault, robbery, rape, and burglary/theft; filed criminal cases by courts; and terminated criminal cases by courts. We used data from the *Law Yearbook of China* from 1990 to 2012 to analyze the pairwise correlations of the eight aforementioned measures. We found that other than the correlation coefficients between filed cases of the five common crimes by police departments and the filed or terminated cases by courts, which are lower than 0.9 (0.8938 and 0.8951 respectively), all the correlations between other measures are larger than 0.9.

⁵According to a telephone interview with WL1, a prosecutor from Hangzhou, Zhejiang, on September 27, 2015.

⁶Based on telephone interviews with police officer LM in Guangxi on Sept. 4, 2015, police officer WL2 from Nanjing, Jiangsu on Nov. 13, 2015; police officer LJ from Xuzhou; police officer LF from Nanjing, Jiangsu on Nov. 15, 2015; prosecutor WL3 from Shaoxing, Zhejiang, on Nov. 14 and 16, 2015.

⁷Discussions of the education factor in crime can be found in Freeman (1996); Lochner and Moretti (2004). Although it is difficult to tell whether the relationship between the unemployment rate and the crime rate is causal or correlational, the unemployment rate is a good predictor of crime, especially of property crime (Cantor and Land 1985; Aaltonen et al. 2013). Marriage and families can make people happier and healthier (Waite 1995), and reduce crime (Laub et al. 1998; Sampson et al. 2006). Age is a commonly recognized factor in criminology (Hirschi and Gottfredson 1983; Farrington 1986). The gender ratio of males to females, especially when the proportion

of males among the young population is high, can increase crime on both the micro and macro level, though it has some reverse effect at the macro level through the increasing stability of the family (Messner and Sampson 1991). For China, research on both the macro level (Edlund et al. 2013) and the macro to micro level (Yang et al. 2016) find an association between gender ratio and crime. Some research notes the influence of urbanization on the crime rate, which to some extent can be attributed to the economic temptation in cities (Glaeser and Sacerdote 1999).

⁸No evidence in our preliminary analysis shows that there is any interaction effect between the domestic-migration factor and the rental-housing factor for the arrest rate or the prosecution rate, so we did not include this interaction item in the current models.

⁹Due to possible homogeneity in social management and the regional cultures of different cities within a same province, we reran a regression based on clustered standard errors at the provincial level. The results indicate that with respect to the arrest rate, the rental-housing factor is still significant at the 0.05 level; unemployment, an individual caring for the home and the guardian factors, are significant at the 0.01 level; the domestic-migration factor is significant at the 0.1 level. With respect to the prosecution rate, domestic migration and GDP per capita factors are significant at the 0.05 level; the rental-housing factor is not significant; the unemployment factor is significant at the 0.01 level; and the family guardian factor is significant at the 0.1 level. These imply that compared with models 4 and 9 in Table 3, the clustered standard errors at the provincial level did not significantly change the results. This further enhances the robustness of the current findings and strengthens the support for our main hypotheses. Since the clustered standard errors do not change the OLS regression coefficient, we omitted those results for brevity. We thank one of the reviewers for suggestions on checking by clustered regression.

¹⁰To further check the robustness of the models, we used multiple spatial weights matrices and estimation methods in processing the spatial regression data. For the spatial weights matrices, we employed both standardized spatial contiguity weights and Inverse Distance Weights. In terms of estimation methods, we used both maximum likelihood and generalized spatial two-stage least squares (gs2sls) estimators. However, regardless of which weights matrices or estimators are used (except for analyses of the prosecution rate using the spatial lag model with the inverse distance weights or the SAMSAD model with the inverse distance weights), we did not find significant results for whether the spatial lag of the crime rates (the magnitude of ρ and its significance) or the spatial correlation due to domestic migration and housing patterns (the magnitude of λ and its significance) influences regional crime rates. In fact, from our early exploratory analyses of spatial autocorrelation, we expected that such effects might not be significant. Moran's I for the logarithm of the arrest rate and the prosecution rate are -0.084 and -0.105 , respectively, with the corresponding two-tailed p values $.235$ and $.138$ (not significant) and one-tailed p value $.118$ and $.069$. Only the spatial autocorrelation of the prosecution rate is slightly significant (less than 0.1). More importantly, even if the spatial lag of the crime rate itself (mainly the prosecution rate) and the spatial correlation effect due to domestic migration and residential patterns are significant,

the domestic migration and home renting factors still have significant effects on the arrest rate and the prosecution rate, and the direction and magnitude of their effects are generally unchanged, so our conclusions still hold.

¹¹Based on a telephone interview with a leader of a street-level police department in Urumqi, YC, on November 14, 2015.

¹²The authors thank the two reviewers for noting the potential differences between domestic and international migration, and the possible limitations in the current crime measures.

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Authors' contributions

JC and JL are responsible for the overall design, data compiling, multivariate regression analyses, and writing of this study. JW is responsible for the spatial regression analyses of this study. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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