

Article

What Is the Critical Factor and Relationship of Urban Regeneration in a Historic District?: A Case of the Nanluoguxiang Area in Beijing, China

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Received: 6 November 2019; Accepted: 27 November 2019; Published: 29 November 2019



Abstract: Although investigations and evaluations are being carried out, there is little research on the relationship between urban regeneration factors, in which various stakeholders participate, and various projects are underway simultaneously. Therefore, this study aims to understand the critical factors and influence relationship among factors in urban regeneration projects in the Nanluoguxiang area, where such projects have been carried out for the historical and cultural preservation in Beijing, China. The implications of this study are as follows: First, both factor public space environmental improvement and building restoration and improvement were analyzed as the most important factors. Second, the elements of the public space environmental improvement and the building restoration and improvement were closely related, influenced by policies and plans, guidelines and criteria, investigation and research, and the subsidy support project. Third, despite the fact that the project was promoted with the aim of revitalizing culture, it was analyzed that the influence of cultural elements on other factors was very minimal because of excessive commercialization.

Keywords: urban regeneration in the Nanluoguxiang; historic-cultural conservation; culture-led regeneration; DEMATEL

1. Introduction

Cultural-led urban regeneration has been developed and reorganized by many scholars [1]. Scholars first learned that public support policies for art and culture had a positive economic effect on urban regeneration projects in England in the 1980s [2]. Frith (1991) has suggested that cultural industry policies could create a unique landscape in a city, making it beautifully decorated, with diverse tourist destinations [3]. Evans and Shaw (2004) found that policies such as creating a culture industry cluster and creating spaces for artists are catalysts for urban regeneration [4]. On the other hand, many studies have recently been published that have shown negative consequences for cultural-led urban regeneration policies, like excessive commercialization, rising land prices, and the outflow of artists [5,6].

In China, urban regeneration has been actively promoted as an important national policy since 2014. Since its reform and opening up in 1978, China has focused on improving its living environment to solve the problems of old housing and urban infrastructure. However, the Chinese government has recently forcefully pushed for urban regeneration projects to meet social and economic changes, as well as the needs of the people [7]. To address the rapid suburban expansion and the low efficiency of urban areas, the central government has recommended that urban regeneration be adopted as a national agenda and implemented for urban regeneration by local governments. Since then, urban

regeneration policies have become an important policy element not only for the state but also for local governments [8].

One of the most active sectors of urban regeneration projects is regional rehabilitation using cultural elements in a place with plentiful historical resources, and various related projects are being promoted in China to this aim. Since the reorganization of the social system in China, rapid urbanization has created an issue around the loss of local identity. In particular, large-scale urban development and renewal projects, which did not take into account regional history and cultural characteristics, have continuously raised the issue of urban social organization and the loss of local identity [9]. Due to the seriousness of social fabric destruction caused by such large-scale development, national interest and development policy has shifted its attention to the preservation and regeneration of historic areas [10]. Since then, China has been actively promoting urban regeneration beyond the city redevelopment stage and has created successful urban regeneration cases using historical and cultural resources such as 798 Art Zone and the Nanluoguxiang in Beijing, as well as Tianzifang, Red Town, and M50 in Shanghai [5].

Among them, the Nanluoguxiang area is one of the representative areas revitalized by culture-led urban regeneration projects in historic preservation areas. The Nanluoguxiang area is a cultural property that preserves the 850-year-old city construction history of Beijing City and is still part of the life of Beijing citizens. As such, the region has been evaluated as the first attempt in the urban regeneration project for the historical and cultural preservation in China and has thus been successful, despite some negative results, such as the rapid rise in land prices, the outflow of indigenous people, the social conflict of local people, regarding the regeneration of the city [1,6,11,12]. In addition, various stakeholders such as residents, government, merchants, and private developers participated in the project, making it highly worthwhile to study.

Since the previous study on the investigation on inter-project relationship on urban regeneration in China was unprecedented, the ultimate purpose of this study is to grasp important factors with preconditions of these factors and the impact relationship between project factors through the Nanluoguxiang Urban Regeneration Project in which various businesses were carried out comprehensively over a long period of time. To analyze which of the urban regeneration project components have a causal nature and effect on the consequential elements, Importance Performance Analysis (IPA) and Decision Making Trial and Evaluation Laboratory (DEMATEL) analysis methods are used to derive the influence relations between the elements. For this purpose, the process of the project was collected through one-year site visits, literature surveys, interviews with related persons, and analysis IPA and DEMATEL.

2. Urban Regeneration in Conservation Areas of Beijing

2.1. Rehabilitation Policy in Historic and Cultural Conservation Areas in Beijing

Since the 1990s, there has been a growing interest in preserving urban historic assets in developed countries [13]. Urban conservation and rehabilitation projects in the historic district have grown to include both physical, cultural, social, economic, and political issues [14,15]. The interest in commercialization and socioeconomic value of urban land, which is rich in monumental landmarks and buildings, is growing increasingly [15–17]. For example, the study on the economic development of the tourism industry by historical presentation continues to develop [18,19]. In addition, the preservation of the historic center can be used as a means to maintain the integrity of the community and the social organization [20,21].

Since 1978, Chinese socioeconomic change and urbanization have promoted large-scale redevelopment projects in old downtown areas in various ways, in accordance with market-oriented mechanisms. To reduce the conflict between development and conservation, the central government first designated the Historic-Cultural Preservation District in 1986. In addition, with the adverse effects of large-scale development and the continued spread of negative perceptions, the Chinese government put sustainable development at the forefront of its policy through China's Agenda 21 in 1992 [20].

In the case of Beijing, the state government designated some areas of historical and cultural landmarks as urban conservation areas in 1982. The state government approved a master plan that included provisions relating to the preservation of historic buildings and surrounding areas in the next year. In 1990, the Beijing government designated 25 historical and cultural preservation areas as a part of master plans. In 1993, the master plan for the preservation of the historic city was launched under the name “Preservation Planning of the Family Historical and Cultural City of Beijing,” although the related policy was not specific [22]. While more than half of the traditional residential areas disappeared under development pressure, in 1999 and 2004 the Beijing City Planning Commission established a conservation plan and designated a total of 40 historico-cultural conservation areas [23]. The guidelines for the “Conservation Planning of 25 Historic Areas in Beijing Old City” include overall conservation style, historical renovation, environmental quality, infrastructure, basic conditions of residents’ lives, and public participation [24]. Beijing’s urban conservation policy has continued since the 2000s with property-led redevelopment, as its historical and cultural heritage has the economic advantage of increasing urban amenity and raising the value of its surrounding real estate [13].

2.2. Culture-Led Urban Regeneration in Beijing

Cultural-led urban regeneration in China is still at an early stage, but its business and academic achievements are growing rapidly [5]. It is not only the cases of urban regeneration in Shanghai and Beijing being examined, but the cases of Hangzhou and Shenzhen are also being studied extensively [5]. Shanghai is actively researching Tianzifang, M50, and Red Town. Studies have shown that factors such as maintaining a physically good environment, expanding public participation, and promoting cultural identity and collective memory have led to successful urban regeneration in Tianzifang [20]. In the M50 study, it was said that the recognition of cultural assets, the network of artistic talents, and the sharing of opinions with artists about regional rehabilitation were important elements of urban regeneration [25]. The case study of the OCT Loft in Shenzhen showed the positive aspects of a top-down approach, through research on rigorous artist selection and management supervision [5].

Beijing has 798 Art Zone and the Nanluoguxiang area, which were studied mainly as urban regeneration projects. The 798 Art Zone has successfully regenerated cultural-led initiatives in abandoned cheap spaces through an environment conducive to creating, a flexible land system, and public policy [26,27]. Studies on urban regeneration in the Nanluoguxiang area revealed that the state and local governments’ policies for urban conservation and residential renovation contributed greatly to the creation of distinctive landscapes, improvement of residential and regional environment, and the investment of private real estate in the area [13,28]. It was also discovered that the perception and attitude of residents affected the sustainability of regional development [29], and the Nanluoguxiang area was well preserved and even commercialized through long-term community regeneration projects [28]. On the other hand, it has been researched that the commercialization of the Nanluoguxiang area has been intensified. This has had a negative effect on the preservation of history and the quality of life of residents in the area because of the culture-led urban regeneration project [6,13].

As shown in the previous investigations, urban regeneration projects utilizing historical and cultural resources are being vigorously promoted in the old urban areas of China, and their evaluations are being actively researched. In relation to culture-led urban regeneration in China, several factors were found to be important: the creation of unique landscape production through the preservation of historical assets, promotion of cultural identity, the reflection of the opinions of artists, and expansion of citizen participation. However, the urban regeneration project is a complex project in which various elements are carried out. Furthermore, diverse stakeholders with different interests—including local residents, merchants, artists, local activists, government officials, and experts—have participated in the project. However, a comprehensive study on the relationship between related elements is insufficient [24]. Therefore, in order to promote the urban regeneration project efficiently, it is necessary to elucidate the key factors and to verify the influence relation of the urban regeneration project elements. The purpose of this paper is to investigate the relationship between the elements of complex

urban regeneration projects through the Nanluoguxiang area, which is a representative example of urban regeneration in China. The principal focus of this study is to identify the important factors and the factors that are prerequisites for important factors.

3. Methods and Site Description

3.1. DEMATEL Method

DEMATEL is an analytical technique used to analyze the complicated relationships of elements and to find clues to their solutions [30,31]. DEMATEL is currently used in many fields, such as supplier selection, remanufacturing management, human resource management, and risk management [32]. This study used the DEMATEL method as the main analytical method because it is an appropriate tool to grasp the influence relationship between various elements of the urban regeneration project.

The strength of DEMATEL is that it can analyze the causal relationship as well as the influence between variables [33,34]. DEMATEL clearly shows the causative variables and the consequent variables, in addition to their effects on relationships on two-dimensional graphs. Furthermore, DEMATEL has the advantage of producing reliable results with fewer data [32].

DEMATEL has six stages [33,35]:

- (1) Deduce the measurement elements and prepare a matrix survey table to review the subjects closely related to the study. The survey consists of a matrix survey table with a cause axis in a row and a result axis in columns. The question “How much is the affecting other factors factor (Some factors have independent personalities, while others have dependent personalities. As a result of the DEMATEL analysis, factors of an independent nature will be measured with low association with other factors, and factors of a dependent nature will be measured with high association with other factors)?” is asked. It is evaluated on a four-point scale according to the degree of influence.
- (2) Data in the form of $n \times n$ matrix are collected through investigation. The cause matrix and generalization matrix (A) are established directly by calculating the average for each element.

$$A = \begin{bmatrix} \alpha_{11} & \cdots & \alpha_{1n} \\ \vdots & \ddots & \vdots \\ \alpha_{n1} & \cdots & \alpha_{nn} \end{bmatrix}$$

- (3) After the row and column sums of each matrix are obtained, a standardized matrix (X) is constructed by dividing the matrix by the largest of the two sum values. The largest of these is 1.

$$X = \frac{1}{\sum_{i=1}^n \alpha_{ij}} A$$

$$(i, j = 1, 2, \dots, n)$$

- (4) The total-relation matrix (T) is the calculated considering direct causation and indirect causation.

$$T = X + X^2 + \dots + X^m = X(I - X)^{-1}T = [t_{ij}]_{n \times n}$$

$$(i, j = 1, 2, \dots, n)$$

- (5) The relationship structure between elements is revealed by using the row and column sums of the total-relation matrix (T). The sum of rows (D) represents the influence on other elements, while the sum of the columns (R) indicates the extent to which other elements are affected. The importance of the whole element is calculated from the value of $D+R$. $D-R$ is a value that distinguishes

between causal and consequent tendency. If the value of D-R is positive, the causative tendency is strong. On the contrary, if the value of D-R is negative, the resultant tendency is strong.

$$D = \left[\sum_{i=1}^n t_{ij} \right]_{n \times 1} = [t_i]_{n \times 1}$$

$$R = \left[\sum_{i=1}^n t_{ij} \right]_{n \times 1} = [t_j]_{n \times 1}$$

$$(i, j = 1, 2, \dots, n)$$

- (6) To visually analyze the influence structure between the elements, a two-dimensional graph can be created with the value of D+R as the X-axis and the value of D-R as the Y-axis. Using Jenks Natural Break technique (this method is one of the optimized methods for grading based on quantitative homogeneity and statistical cluster concept [36,37]. This technique minimizes the mean deviation and maximizes the deviation of the grades. The interval is determined by minimizing the variance in the grades and maximizing the variance between grades [38,39]), all the data from the total-relation matrix (T) are classified by score intervals, and the influence relationship is plotted in a two-dimensional graph.

3.2. Site Analysis

3.2.1. Site Introduce

The Nanluoguxiang area is plentiful in historical and cultural resources and has been promoting various urban regeneration projects since the early 2000s. This area comprises Jiaodaokou Street (交道口街道), in Dongchen District (东城区) of Beijing, above Forbidden City in China (Figure 1). The total length of Nanluoguxiang Street is 787 m, and the average width is 6 m. The Nanluoguxiang area was built during the peak of the Yuan Dynasty and has a 740-year history [40].

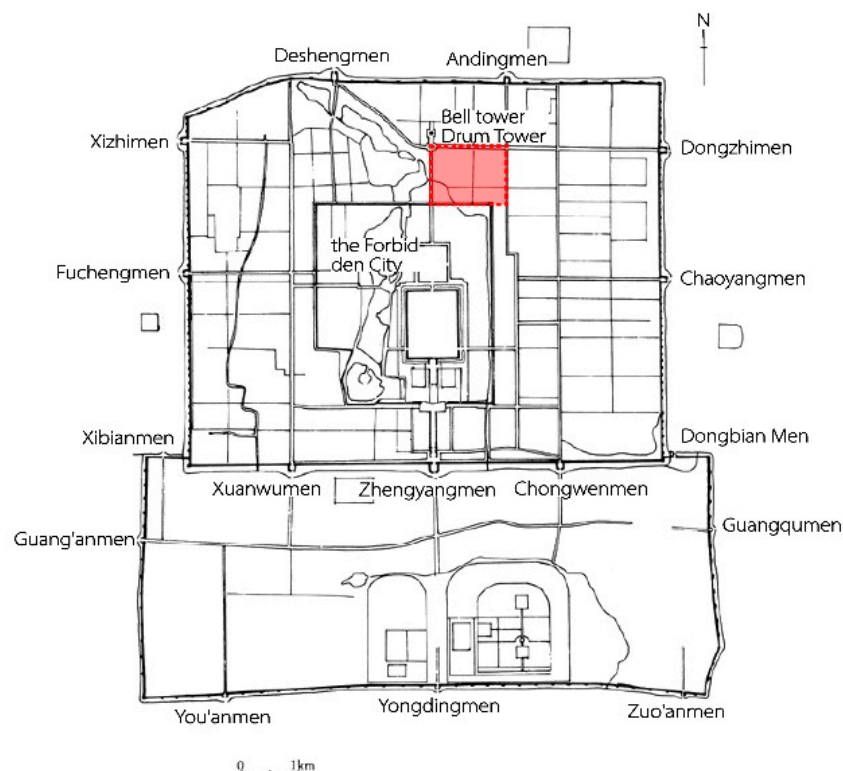


Figure 1. Nanluoguxiang's position in Beijing.

The Nanluoguxiang and the surrounding area completely preserve China's representative Siheyuan (四合院: historical courtyard house) and Hutong (胡同: historical alley). Because of its historic value, the Nanluoguxiang area was established as one of the 25 Historical and Cultural Reserves in Beijing in 1993 [41]. Prior to the full-scale urban regeneration business, the Nanluoguxiang area had a high residential density and a poor residential environment. However, since 2006, the area was gradually revitalized as a result of the urban regeneration project led by the local government [6].

3.2.2. Site Historicity

The Nanluoguxiang region was formed during the Yuan Dynasty and performed commercial functions as a part of the backsight of traditional Chinese urban planning: ancestors on the left and ancestral rites on the right (左祖右社), and Wages on the front and market of the rear (面朝后市) [28].

On both sides of the Nanluoguxiang, 16 hutongs are symmetrically constructed, preserving the essence of the capital city construction of the Yuan Dynasty. The Nanluoguxiang area is the only one in China where the Palmyoyuan (八亩院)-style hutong structure is completely preserved, and it has significant cultural and historical value (Figure 2). The hutong structure of the Nanluoguxiang area has been a suitably preserved historical landscape in the form of a fishbone with 16 auxiliary hutongs connected to the left and right sides around the center [42].

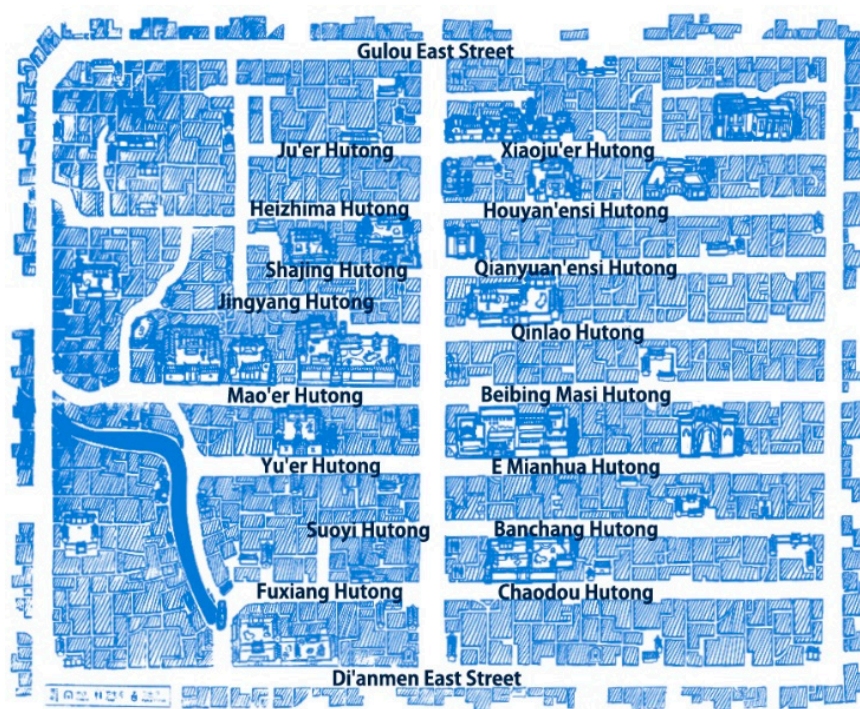


Figure 2. Hutong distribution in Nanluoguxiang.

The Nanluoguxiang region is rich in historical and cultural resources, as well as intangible cultural properties. There are also housing sites for people in various fields, and there are 19 cultural protection units designated in the area. The city of Beijing has designated the Nanluoguxiang area as the first historic cultural heritage protection zone and is managing the cultural assets in recognition of the value of the cultural properties [41].

3.2.3. Urban Regeneration Project

The urban regeneration project was implemented in various ways from 2004 to 2016 in the Nanluoguxiang area. In the early years of the project, urban regeneration projects focused on the illegal demolition of buildings, housing refurbishment projects, and gardening. From 2006 to 2010, the urban

regeneration project promoted a wide range of regeneration projects, ranging from the revitalization of commercial facilities to strengthening the capacity of residents. In 2006, urban regeneration projects established plans for the recovery and unification of the landscape, management of the industry, improvement of living conditions, and supervision of business management, in order to readjust the commercial street environment and induce the businesses that correspond with the commercial development of the region. In 2007, the urban regeneration project had induced the participation of citizens by organizing community residents and merchant municipalities in cooperation with nearby universities and NGOs.

The Nanluoguxiang area has an increased number of stores from two stores in 2006 to 115 stores in 2009 and 172 stores in 2010, with various industries related to creative arts. As of 2017, the number of businesses increased to approximately 200, of those being 40% food and beverage businesses, 35% small souvenir shops, and 25% culture and arts industries [29].

Since 2016, the Dongchen District government has established an “Ordinance on the Protection and Control of Historic and Cultural Streets” for the Nanluoguxiang region and carried out a pilot project. Through this ordinance and pilot project, the central streets and major hutongs of the Nanluoguxiang area were comprehensively reorganized to preserve historical and cultural features and to promote the vitality of the streets (Figure 3).



Figure 3. Streetscape after urban regeneration projects.

3.3. Analysis of Urban Regeneration Contents and Factors

The urban regeneration projects carried out in the Nanluoguxiang region are classified into four stages: the previous project stage, the preparation stage, the implementation stage, and the local residents and empowerment stage. Even before the substantive urban regeneration project began in 2004, the area had projects such as supporting arts activities, greening, and building new complexes in accordance with the relevant plans. While focusing on physical reconstruction projects, previous policies and plans (A), existing projects (B), and preliminary investigations (C) were also implemented in the previous project stage (Table 1).

The factors of the urban regeneration project in the Nanluoguxiang area are primarily classified as preparation stage projects, physical projects, and non-physical projects. The project elements of the preparation phase are divided into planning aspects and providing guidelines. The policies and plans (D) were established for the protection and development plan of the Nanluoguxiang area (2006–2020), the greening of the Nanluoguxiang area, the beautification design plan, and the improvement of the landscape of the Nanluoguxiang area. The guidelines and criteria (E) included the Nanluoguxiang Regional Historical and Cultural Reserve Investment Guide, the Nanluoguxiang Regional Commercial Sector Funding Guideline, and the Nanluoguxiang Regional Commercial Sector Optimal Compensation Guideline. Investigation and research (F) projects included measurements of historic buildings, collections of historical video data, surveys of local assets, and collections of changes through interviews with residents. The Subsidy Support Project (G) was subsidized to

attract relevant commercial industries and to support specialized commerce in order to revitalize the Nanluoguxiang streets.

Table 1. Urban regeneration factors and contents.

Classification		Project Factors	Major Contents
Previous project stage	A	Previous policies and plans	Old dangerous housing renovation plan, protection plan of 25 old towns in Beijing, the Nanluoguxiang regional integrated landscape plan, Beijing commercial specialized street development plan
	B	Existing projects	Hutong and building renovation projects, demolition and renovation of obsolete housing, local greening project, art creative project, Siheyuan renovation project, etc.
	C	Preliminary investigations	Measurement of Siheyuan, Satisfaction and Opinion Survey on Community Restoration Project
Preparation stage project	D	Policies and plans	5 Years National Economic and Social Development Plan in Dongcheng District, Beijing; Compensation policies to attract relevant business; the Nanluoguxiang Area Protection and Development Plan (2006–2020); The Nanluoguxiang Ordinance for Protection of Historical and Cultural Streets; etc.
	E	Guideline and criteria	Investment guide for historic and cultural protection areas, landscape protection plan execution criteria, guidelines for the protection of historic landscape and the modification of hazardous houses, criteria for the use of support and compensation for the guidance of commercial business, etc.
	F	Investigation and research	Survey and data collection for local buildings, regional asset research, survey and evaluation of local projects, research to protect historicity, and a sustainable urban regeneration and community awareness survey
	G	Subsidy Support Project	Financial support to improve infrastructure, subsidies, and rewards to attract businesses
Physical projects	H	Public Space Environmental Improvement Project	Public Space Environmental Improvement Project, hutong-area greening and beautification business, public safety project, lighting installation business, road improvement and historic restoration project of major streets, parking lot improvement business, etc.
	I	Building Restoration and Improvement Project	Comprehensive restoration project for local historical sites, old roads, and historical buildings, hutong restoration project, restoration project of central street environment, renovation of local assets, and demolition project of illegal buildings on Jiadaokou streets
Non-physical projects	J	Cultural Arts Project	Creative activities in collaboration with local arts organizations, exhibition and art sales, creative art market, sales of local residents' handicrafts, etc.
	K	Community Participation Support Project	Support group for the local elderly, good parent activity organizations, old neighborhood organizations, supporting environmental protections of public activities in old neighborhoods
Local residents participation and empowerment	L	Collecting residents' opinions	Open space resident meetings, community tea house forums, the Nanluoguxiang development seminars, the area construction management planning conferences
	M	Activities for self-governing residents' organizations	Merchants' associations, self-governing organization of local community, survey of Jiadaokou street residents' opinions, firefighting teams, security and traffic patrols, publicity handbooks and book publications, and website operation
	N	Empowerment for merchants and residents	Store system and policy education to strengthen merchant capacity, sign Language education, English conversation education, vocational and functional education for local residents, and startup programs

The physical projects were carried out through the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I), while the non-physical projects were carried out through the Cultural Art Project (J) and the Community Participation Support Project (K). The Public Space Environmental Improvement Project (H) was promoted for greening and beautifying public space, public safety business, lighting installation, and parking lot business. The Building Restoration and

Improvement Project (I) was implemented through the comprehensive restoration of historic monuments, hutongs, and buildings, as well as the renovation of historic houses and old streets. The Cultural Arts Project (J) worked with local arts organizations to carry out performances, exhibitions, art productions and sales, creative market operations, and a creative cultural subway. The Community Participation Support Project (K) has supported local civic groups such as community support groups for senior citizens, good mothers' associations, and old neighbor cooperation.

Projects related to residents' participation and empowerment were carried out by collecting residents' opinions (L), through activities for self-governing residents' organizations (M), and by the empowerment of merchants and residents (N). Collecting residents' opinions (L) has provided meetings and opportunities for dialogue with various stakeholders for the resolution and development of regional issues. This was seen through construction planning and management meetings, regional dialogues, and the open residents' councils. The activities for self-governing residents' organizations (M) were established by organizations involving citizens, such as the Nanluoguxiang regional merchants' association and the local residents' autonomous organization, and through activities such as local fire teams, police, and traffic patrols. Empowerment of merchants and residents (N) was provided through relevant system education, English conversation education, sign language education, vocational education programs, and start-up programs.

4. Result of Factors Causal Relationship Analysis

4.1. Data Collection and Respondents' Features

The questionnaire for the IPA and DEMATEL analysis was administered by working professionals, local officials, participating residents, and merchants who are involved in the urban regeneration project in the Nanluoguxiang. A total of 45 people were surveyed and 41 samples were analyzed. Of the respondents, 46.3% had the most experience over 15 years, and 56.1% of them were experts and urban planners (Table 2).

Table 2. Responder characteristic.

Responder Characteristic		Number	(%)
Length of career	Less than 5 years	2	4.9
	Less than 10 years	11	26.8
	Less than 15 years	9	22.0
	More than 15 years	19	46.3
Job type occupation	Experts (planner, professor, researcher)	10	24.4
	Working-level planner	13	31.7
	Local merchants, social enterprises	2	4.9
	Property owners, local residents	6	14.6
	Local officials	10	24.4

4.2. Importance and Performance of Factors

IPA was first used for precise DEMATEL analysis, excluding less important factors. The IPA was designed by Martilla and James in 1977 to measure the performance and importance of people using goods or services [43].

In terms of importance (Table 3), policies and plans (D) were the highest with 2.54 points, followed by the Public Space Environmental Improvement Project (H, 2.51), the Building Restoration and Improvement Project (I, 2.37), and the Subsidy Support Project (G, 2.35). In terms of performance, the Building Restoration and Improvement Project (I) had the highest score of 1.68, followed by investigation and research (F, 1.65), policies and plans (D, 1.62), guidelines and criteria (E, 1.62), and the Public Space Environmental Improvement Project (H, 1.62). Factors prior to the urban regeneration project and factors for residents' participation and capacity building were both assessed low in

importance and performance. The low assessment of the level of participation and capacity of residents was the same as the results of previous studies, which showed that residents' participation did not proceed smoothly [13,29]. In addition, despite the urban regeneration project aimed at revitalizing historical culture, the cultural art project (J) factor was underestimated because the cultural and artistic elements became blurred as a result of excessive commercialization [6,13].

Table 3. Importance and performance evaluation.

Factors of Urban Regeneration		Average Important	Average Performance
A	Previous policy and plan	1.81	1.45
B	Existing projects	1.64	1.34
C	Preliminary investigation	1.89	1.31
D	Policies and plans	2.54	1.62
E	Guideline and criteria	2.24	1.62
F	Investigation and research	2.27	1.65
G	Subsidy Support Project	2.35	1.57
H	Public Space Environmental Improvement Project	2.51	1.62
I	Building Restoration and Improvement Project	2.37	1.68
J	Cultural Arts Project	2.00	1.34
K	Community Participation Support Project	1.81	1.37
L	Collecting residents' opinions	2.24	1.31
M	Activities for self-governing residents' organizations	2.18	1.37
N	Empowerment for merchants and residents	1.37	0.97
Total average		2.09	1.44

To increase the resolution of the relationship between urban regeneration project factors through DEMATEL analysis, this study used IPA two-dimensional mattress results. The results of the IPA are as follows. The factors located in Quadrant 1 are policies and plans (D), public space environmental improvement (H), the Building Restoration and Improvement Project (I), the Subsidy Support Project (G), investigation and research (F), and guidelines and criteria (E). Factors in Quadrant 2 are collecting residents' opinions (L) and activities for self-governing residents' organizations (M). Factors in Quadrant 3 are existing projects (B), preliminary investigation (C), the Cultural Arts Project (J), the Community Participation Support Project (K), and the empowerment for merchants and residents (N). The factors in Quadrant 4 are previous policies and plans (A) (Figure 4).

4.3. Causal Relationship between Factors of Urban Regeneration Projects

4.3.1. Analysis of Influence Relationships between Important Factors before and after Urban Regeneration

The DEMATEL analysis was conducted on the basis of 41 expert responses on the interrelationship between the factors of the Nanluoguxiang urban regeneration activity. To clearly identify the relationship between the activities, DEMATEL was conducted on the remaining nine important factors (Table 4), with the exception of low-priority Quadrant 3, which is less important and had lower performance in the IPA analysis.

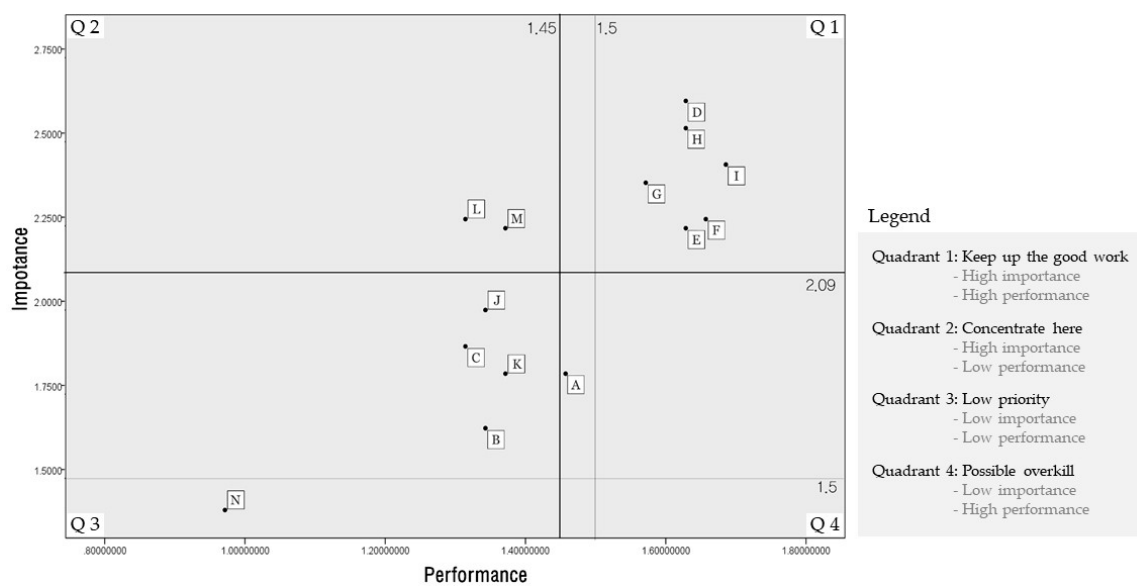


Figure 4. IPA matrix with a data-centered quadrant.

Table 4. Total-relation matrix excluding low priority factors.

	A	D	E	F	G	H	I	L	M	D	R	D + R	D – R
A	0.00	0.286	0.272	0.226	0.284	0.343	0.348	0.247	0.222	2.233	0.000	2.233	2.233
D	0.00	0.210	0.328	0.287	0.346	0.419	0.430	0.323	0.280	2.624	2.250	4.875	0.374
E	0.00	0.292	0.197	0.266	0.317	0.393	0.409	0.307	0.255	2.440	2.265	4.706	0.174
F	0.00	0.283	0.279	0.176	0.313	0.369	0.378	0.287	0.244	2.333	2.073	4.407	0.260
G	0.00	0.269	0.270	0.269	0.215	0.398	0.403	0.304	0.275	2.407	2.491	4.899	−0.084
H	0.00	0.232	0.225	0.208	0.259	0.216	0.336	0.249	0.221	1.950	3.070	5.021	−1.120
I	0.00	0.231	0.231	0.205	0.265	0.324	0.222	0.247	0.225	1.953	3.137	5.090	−1.183
L	0.00	0.244	0.252	0.232	0.266	0.323	0.321	0.179	0.236	2.057	2.392	4.450	−0.335
M	0.00	0.200	0.207	0.200	0.222	0.282	0.285	0.244	0.135	1.779	2.097	3.877	−0.318

Among the nine factors, the Building Restoration and Improvement Project (I) and the Public Space Environmental Improvement Project (H) were identified as the most important factors. In the case of importance (D+R), as the Building Restoration and Improvement Project (I) was 5.091 and the Public Space Environmental Improvement Project (H) was 5.021, the two factors played the most important role among the implementation factors of the regeneration of the Nanluoguxiang area. The results of previous studies prove through the analysis of the influence relations of this study that the restoration of the buildings, while maintaining the historical context, greatly contributed to revitalizing the area [28].

The analysis result of the relationship between the causes and the consequential aspects of urban renewal project elements is as follows. Factors corresponding to the cause ($D - R > 0$) were policies and plans (D, 0.374), investigation and research (F, 0.260), and guidelines and criteria (E, 0.174). The major contributors ($D - R < 0$) were the Building Restoration and Improvement Project (I, −1.183), and the Public Space Environmental Improvement Project (H, −1.120), which were more than influential in other factors ranging from policies and plans (D) to the Building Restoration and Improvement Project (I).

The impact of previous policies and plans (A) was 0.000, which resulted in weak causal and consequential relationships while collecting residents' opinions (L) and activities for self-governing residents' organizations (M) were found to be relatively low in relation to other factors. This was similar to the results of a study in 2010, which found that citizen participation and the opinions of residents were relatively less reflected [12,13].

To visually analyze the relationship of influence between the active factors, a two-dimensional graph was derived, with the values of the importance (D + R) and the cause (D – R) plotted on the

X-axes and Y-axes, respectively. Using the Jenks Natural Break technique, the total-relation matrix was classified into five classes. The graph shows that 0.3239~0.3296 has a strong influence and 0.3639~0.4304 has a strong relationship, considering 0.3239 is the upper threshold value among the five classes (Figure 5).

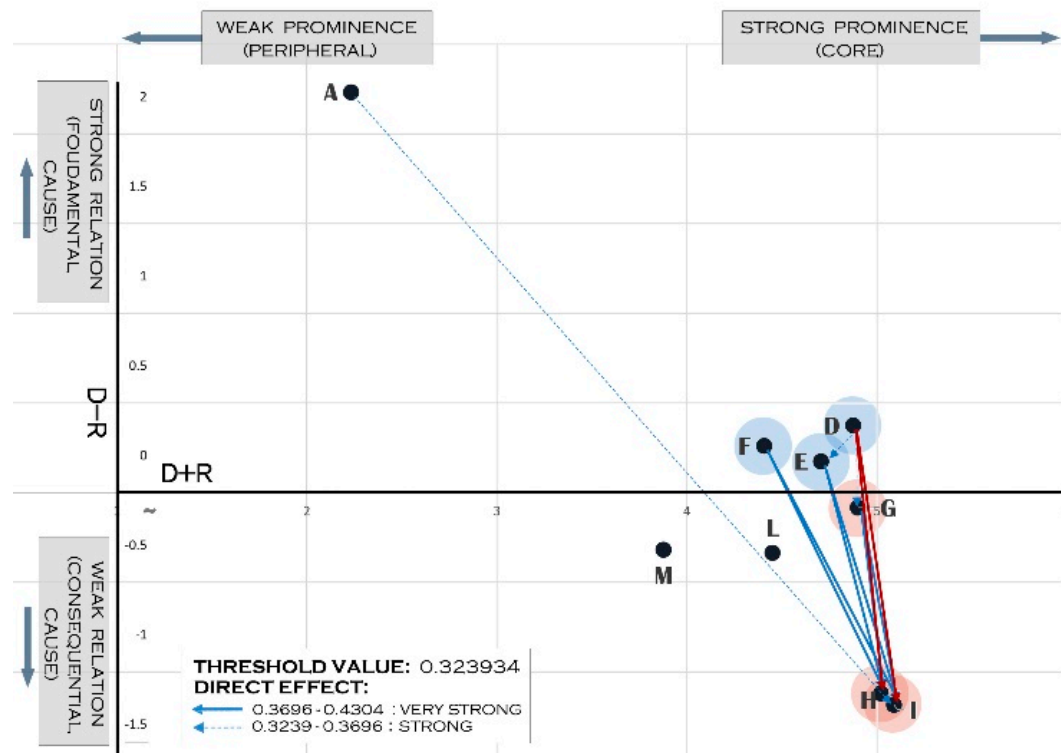


Figure 5. Two-dimensional graph excluding low priority factors.

The two-dimensional graph illustrates that policies and plans (D), guidelines and criteria (E), investigation and research (F), and the Subsidy Support Project (G) have a significant causal relationship to the Public Space Environmental Improvement Project (H), and the Building Restoration and Improvement Project (I). Policies and plans (D), guidelines and criteria (E), investigation and research (F), and the Subsidy Support Project (G) factors have been identified as factors that have a strong influence on the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I), respectively. Among the factors, policies and plans (D) were analyzed to have the strongest impact. On the other hand, the impact of previous policies and plans (A) on the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I) was minimal. Furthermore, collecting residents' opinions (L) and activities for self-governing residents' organizations (M) could visually confirm that there is little relation to other factors.

4.3.2. Analysis of Influence Relationship between Important Factors in the Urban Regeneration Project

As shown in the preceding DEMATEL two-dimensional graphs, the previous policies and plans (A) have little impact on the overall model and make it difficult to identify the structure between the other major influencers. Thus, to better understand the influence relationship between the key components, the DEMATEL analysis was conducted for eight factors. This excluded the pre-preparation dimension elements and the lower priority factors in the IPA analysis (Table 5).

Table 5. Total-relation matrix excluding factors previous project stage and low priority elements.

	D	E	F	G	H	I	L	M	D	R	D + R	D – R
D	0.347	0.478	0.425	0.511	0.621	0.637	0.482	0.419	3.924	2.943	6.868	0.980
E	0.429	0.327	0.395	0.471	0.582	0.603	0.456	0.385	3.650	2.986	6.636	0.664
F	0.415	0.413	0.292	0.462	0.549	0.563	0.429	0.369	3.495	2.768	6.263	0.727
G	0.403	0.406	0.397	0.356	0.584	0.593	0.451	0.405	3.598	3.305	6.904	0.293
H	0.342	0.337	0.311	0.382	0.358	0.492	0.370	0.327	2.923	4.075	6.999	–1.152
I	0.342	0.343	0.308	0.390	0.476	0.366	0.367	0.331	2.927	4.165	7.093	–1.238
L	0.361	0.371	0.342	0.396	0.482	0.483	0.297	0.349	3.082	3.212	6.295	–0.129
M	0.300	0.308	0.295	0.334	0.420	0.426	0.355	0.225	2.667	2.813	5.481	–0.146

The results of the DEMATEL analysis are as follows. In the analysis of importance (D + R), the Building Restoration and Improvement Project (I, 7.093) and the Public Space Environmental Improvement Project (H, 6.999) were identified as the most important factors, and the importance of these two factors was clearly identified in the previous DEMATEL results.

The core factors corresponding to the resultant (D – R < 0) were the Building Restoration and Improvement Project (I, –1.238), and the Public Space Environmental Improvement Project (H, –1.152). The influences of collecting the residents' opinions (L, –0.129) and the activities for self-governing residents' organizations (M, –0.146) were insignificant. As a result, the analysis of the causal relationship among the major factors of the urban regeneration project showed that the factors from policies and plans (D) to the Building Restoration and Improvement Project (I) were highly influential.

Another clear result from the 2nd DEMATEL analysis is that the Subsidy Support Project (G) element was derived from the resultant to the cause. As shown in the preceding DEMATEL two-dimensional graph, the Subsidy Support Project (G) is a factor that affects elements of the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I), but it is derived as a result in the first DEMATEL results. However, in the second DEMATEL results, the tendency of the Subsidy Support Project (G) was closer to the cause. Analysis of the influential relationships by increasing the resolution gave clearer results.

To produce visually higher resolution results than the previous two-dimensional graphs, a two-dimensional graph of the 2nd DEMATEL analysis was drawn, which classifies all data into four groups. Considering the upper threshold value of 0.4655, the two-dimensional graph is plotted as having a strong influence from 0.4656 to 0.5499 and a very strong influence from 0.5499 to 0.6371 (Figure 6).

Observing this graph in the cause and effect aspect shows that policies and plans (D), guideline and criteria (E), investigation and research (F), and the Subsidy Support Project (G) are affecting the Public Space Environmental Improvement Project (H) and Building Restoration and Improvement Project (I) are more clearly verified than in the previous graph. Similar to the first DEMATEL analysis results, policies and plans (D), guidelines and criteria (E), investigation and research (F), and the Subsidy Support Project (G) are factors affecting the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I). In addition, policies and plans (D) is found to have the strongest impact. As an exception, the two-dimensional graph illustrates that the collecting residents' opinions (L) is influenced by policies and plans (D), and affects the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I). As previously mentioned, urban regeneration projects are influenced by various actors [29]. Furthermore, as described in some studies, it is interpreted that the participation of artists, private developers, public institutions, and residents contributes to the influx of visitors [13].

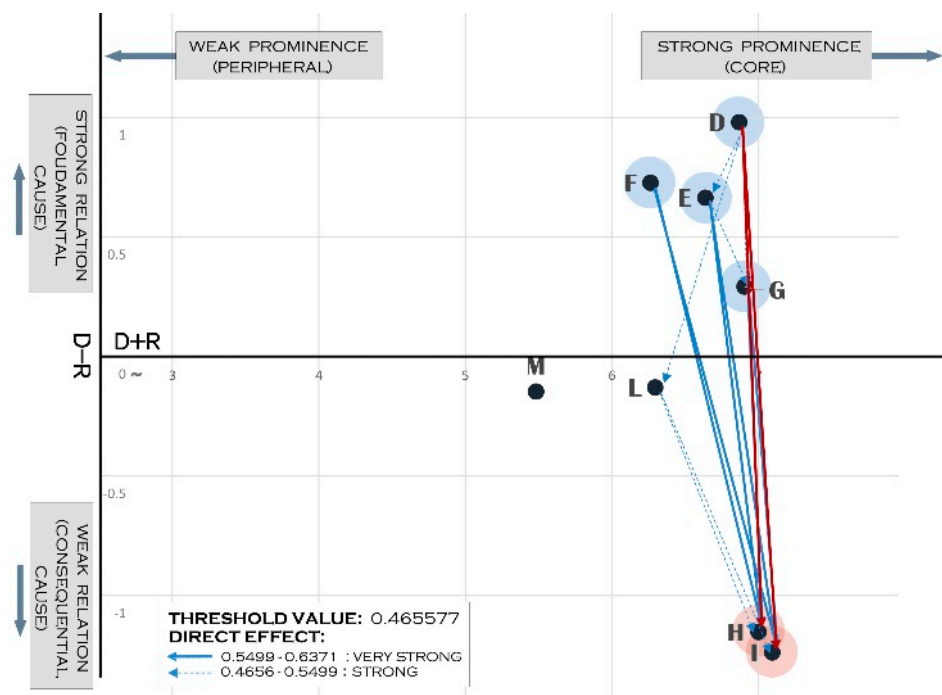


Figure 6. Two-dimensional graph excluding factors of previous project stage and low priority.

5. Conclusions and Discussion

The Nanluoguxiang area in Beijing has promoted various regeneration projects to maintain its historical appearance and promote regional economic revitalization. Consequently, this has achieved commercial revitalization. Comprehensive and long-term regeneration projects were carried out in the process of urban regeneration, involving a variety of related plans and various stakeholders. To analyze the influence on the relationship between the Nanluoguxiang Urban Regeneration Project factors, this study utilized IPA and DEMATEL analysis to derive the factors corresponding to the causes and to the results. These were then analyzed numerically to fully visualize the causal relationship among the factors.

The results of the study on the important factors and the factors that are prerequisites for important factors of urban regeneration projects in the Nanluoguxiang are as follows. First, the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I) were analyzed as the most important factors in both the IPA and DEMATEL analysis. Second, the above elements of the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I) were found to be closely related, influenced by policies and plans (D), guidelines and criteria (E), investigation and research (F), and the subsidy support project (G). In other words, the factors (D), (E), (F), and (G) were directly related to the results of the Public Space Environmental Improvement Project (H) and the Building Restoration and Improvement Project (I). Third, unlike the original purpose, the Cultural Arts Project (J) did not have a significant impact on other factors of the urban regeneration project in the Nanluoguxiang area and had a low impact on collecting residents' opinions (L), activities for self-governing residents' organizations (M), and the empowerment for merchants and residents (N). In particular, contrary to the original intention of the urban regeneration project, which was led by culture and arts, the cultural and Cultural Arts Project (J) was derived with low importance and influence relations. The progress of the project in a direction different from its actual purpose and the lack of citizen participation were both quantitatively reconfirmed through this analysis.

This study has the following significations through the analysis of causality among the urban regeneration project factors in the Nanluoguxiang area. First, the Public Space Environmental Improvement

Project (H) and the Building Restoration and Improvement Project (I) in the Nanluoguxiang Urban Regeneration Project are evaluated as successful results because policies and plans (D), guidelines and criteria (E), investigation and research (F), and the subsidy support project (G) had formed a solid foundation in advance. In other words, in order for a successful project result, the operation of the business factors related to the result is also important. In addition, it is shown that the close connection between the project factors is essential for the effective operation of the urban regeneration business. Second, even though the project started with the aim of urban regeneration led by history and culture, the culture and art project received low-performance evaluations and low causality with other business factors. This urban regeneration case and analysis show that the whole project can proceed in a different direction from its original intent and may have unexpected side effects. This is the case if it is not accompanied by the monitoring and management of rapid commercialization and private capital inflows in the course of the implementation of urban renewal. Zukin (1982) described a chain of effects in a study in New York that showed how cultural factors could revitalize regions, but how simultaneously the cultural activation could cause excessive commercialization leading to the loss of cultural features [44]. An example of this occurred in the Nanluoguxiang region after an influx of cultural art capital and commercialization, which had previously been seen mainly in Western society in the 1980s [45,46]. Third, efforts for governance in terms of operational management of the project as a whole should be accompanied. As the importance of citizen participation and capacity reinforcement has been proved in urban regeneration projects, relevant projects are inevitably applied and implemented. As such, various projects related to citizen participation have been promoted for successful urban regeneration projects in the Nanluoguxiang area. As a result of this study, the influence of the Community Participation Support Project (K), collecting residents' opinions (L), activities for self-governing residents' organizations (M), and empowerment for merchants and residents (N) for the Nanluoguxiang Urban Regeneration Project was found to be insufficient. Moreover, according to the related study, there was a negative evaluation that the project was not successful as a result of the difficulties in collecting and reflecting on the opinions of those involved in the culture and art projects. Therefore, governance for smooth operation and management of the project should also be considered important, because the lack of opinions and participation of stakeholders could negatively affect the overall project's image and cause side effects such as project delay and conflict.

The limitation of the study was that the DEMATEL analysis did not balance the groups of respondents. The analysis has limitations in that the proportion of merchants and residents is lower than that of experts and working-level planner. Additionally, although the Nanluoguxiang Urban Regeneration Project was carried out in the long term, this study has a limitation that the types of projects were not classified in detail in time. Finally, the future research task is as follows. In the Nanluoguxiang area, there were clear differences in perception for commercialization by urban regeneration projects among participants, such as residents' non-preferences and developers' preferences. In other words, by analyzing the perceptions of participation in urban regeneration by group, the differences, and characteristics of perceptions between groups will be found, which should be complemented by future studies.

Author Contributions: Conceptualization, Y.Z. and J.-H.K.; Data curation, Y.Z.; Formal analysis, Y.Z.; Investigation, Y.Z.; Methodology, Y.Z. and J.-H.K.; Project administration, S.K.; Resources, Y.Z.; Software, Y.Z.; Supervision, J.-H.K.; Validation, S.K. and J.-H.K.; Writing—original draft, Y.Z.; Writing—review & editing, S.K.

Funding: This research received no external funding.

Acknowledgments: We would like to thank Editage (especially Brenna) for English language editing.

Conflicts of Interest: The authors declare no conflict of interest.

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