# How the Location Selection of High-speed Railway Stations Influences Station Area Development in China?

During the fast process of urbanization in China, the construction of HSR (HSR) possessed great impact on the development of some regions. Moreover, on the city level, the exploitation of HSR station areas partly decided whether the city would make a new development. However, not all HSR stations' construction will promote the development of the areas around the stations. According to the analysis of 280 HSR stations built after 2008 and their surrounding areas, it is found that the location of the new station is one of the important factors which influenced the development of site areas. In this analysis, NPP-VIIRS nighttime data is used to evaluate the development of the surrounding areas and the result of multivariable regression shows that control variables such as the type of trains, the administrative level of the city, the population and GDP of the city all contributes differently to the site areas' development.
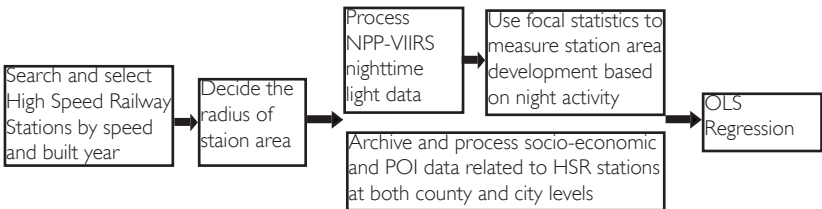
Station Area Development

This is Deqing city in Zhejiang Province. We can clearly see the area around the HSR station were growing brighter year by year and gradually connected to the original city

2012.4

2013.4

2014.4

2015.4
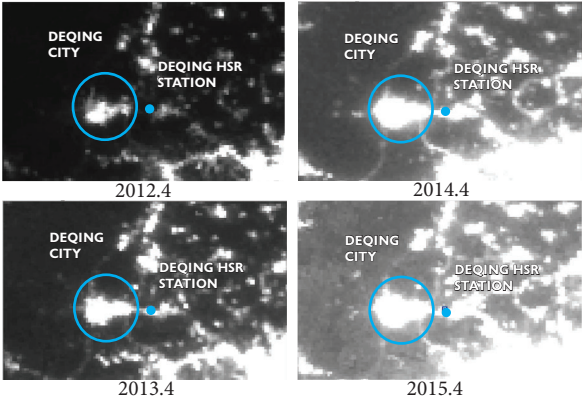
HSR Stations built in past several years
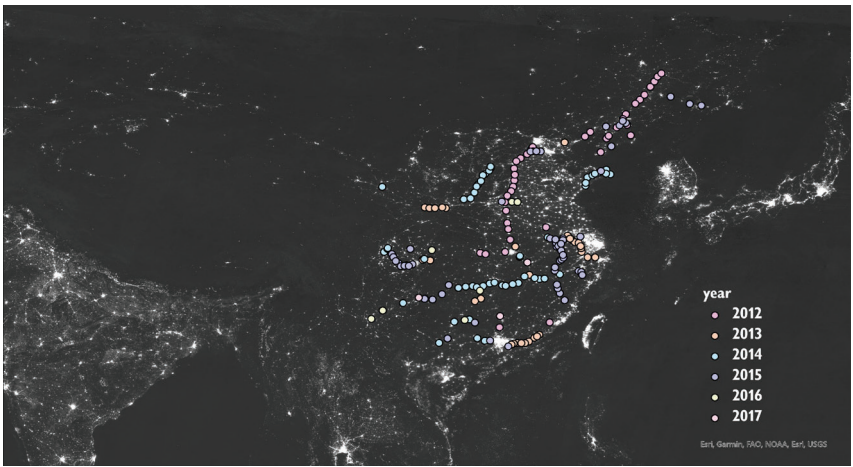
Research Procedure

Variables Explanations

Variables	Name	Meaning
Dependent variables	RS1	the average night time light data within 2km around HSR stations in April 2016
	RS2	the average night time light data within 4km around HSR stations in April 2016
	RS3	the average night time light data within 8km around HSR stations in April 2016
Core explanatory variables	distance	Distance from the center of the HSR station to the administrative center of county-level city/county or city government (km)
Other explanatory variables	pop	Registered Huji population of the prefectural-level municipality/county-level city/county to which the HSR station belongs at the end of 2015 (10,000 persons)
	grp	GDP (100 million yuan) of the prefectural-level municipality / county-level city / county to which the HSR station belongs in 2015
	district	district=1 when HSR station belongs to a prefectural-level city; district=0 when HSR station belongs to a county-level city or a county
	type	type=0 when the HSR station is only for G series trains to stop; type=1 under all other situations

Regression Model

In order to study the relationship between the development of station area and a variety of different factors, this paper chooses to use a multiple linear regression model for research, and constructs the following equation:

$$RS_i = \beta_1 distance + \beta_2 pop + \beta_3 grp + \mu_1 district + \mu_2 type + \varepsilon \quad (1)$$

In the formula: RSi is the development level around the HSR station, which is the night light brightness value of 2km or 4km or 8km around each HSR station in April 2016; beta_t (t=1,2,3,4) is the parameter vector of distance, pop and grp; μ_t (t=1,2) is the parameter vector of the dummy variables; epsilon e is the random error term.

Results and Discussion

Table3. Multiple variables regression results based on model (1)

VARIABLES	2km RS1	4km RS2	8km RS3
distance(km)	-0.0999***	-0.0884***	-0.0681***
	(0.0007)	(0.0003)	(0.0011)
pop	0.0219***	0.0182***	0.0138***
	(0.0076)	(0.0030)	(0.0048)
grp	0.0004	0.0004	0.0004*
	(0.2538)	(0.2003)	(0.0541)
district	5.4059***	4.6800***	3.4503***
	(0.0000)	(0.0000)	(0.0000)
type3	1.3697**	1.2160**	0.8270**
	(0.0195)	(0.0105)	(0.0238)
Constant	1.7007	1.2628	1.1116
	(0.1528)	(0.2134)	(0.1735)
Observations	280	280	280
R-squared	0.4045	0.4580	0.4946

Robust pval in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This article has the following two implications for guiding local governments in optimizing the site selection of HSR stations. First, the HSR station is not a sufficient condition to promote regional development. It has a series of restrictive conditions. Most regions choose to place HSR stations in new districts on the edge of the city, hoping that HSR stations can promote the formation of a polycentric pattern. However, if the distance factor is not considered, it is also difficult to achieve the desired results. Second, for the completed HSR station, the absolute distance cannot be changed, but local governments can improve the accessibility by developing the road network and public transportation between the HSR station and the city.