

Supplementary Material

1. Spatial autocorrelation test

A spatial autocorrelation test was employed to determine whether the spatial econometric model is necessary. The global Moran's I and local Moran's I were applied to test the explanatory variables and core explanatory variables of the research samples, respectively. As demonstrated by the global Moran's I in Figure S1, the outputs for green technology innovation, agglomeration externalities, and network externalities were all positive and passed the 1% significance test. This indicates that each possessed significant positive spatial correlations.

To investigate the spatial autocorrelation characteristics of a specific region, this paper presents the local Moran's I diagrams of green technology innovation, agglomeration externalities, and network externalities (Figures S2–S4). The results reveal that the points corresponding to the local Moran's I of green technology innovation, agglomeration externalities, and network externalities were predominantly distributed in the first and third quadrants. This signifies that each city exerts a strong positive influence locally, which corroborates the test results from the global Moran's I . This demonstrates that green technology innovation, agglomeration externalities, and network externalities also possess potent correlations within local areas.

In light of the above results, green technology innovation, agglomeration externalities, and network externalities all exhibited significant spatial correlations, thus necessitating the spatial econometric model.

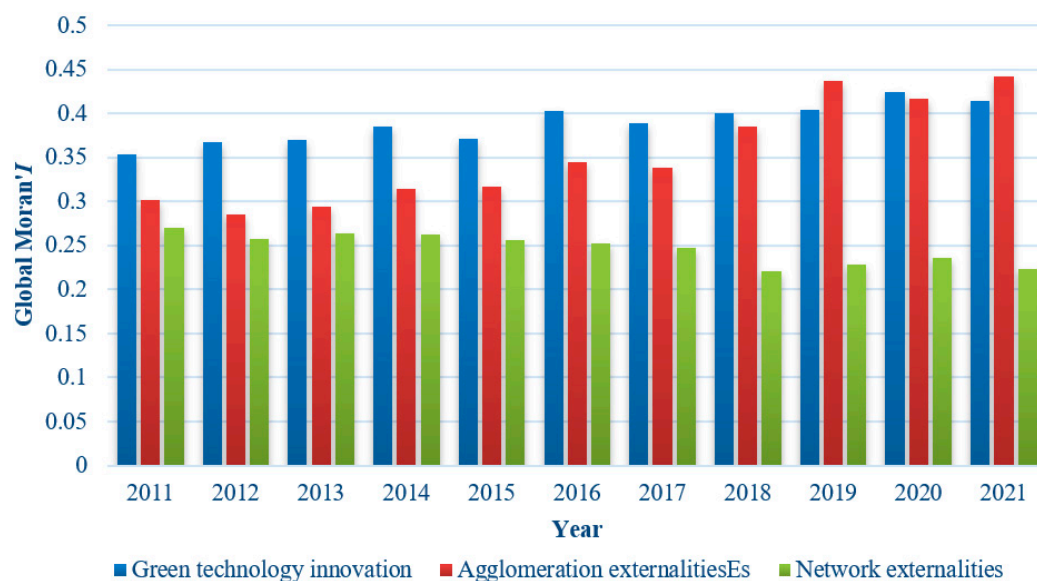


Figure S1. The global Moran's I .

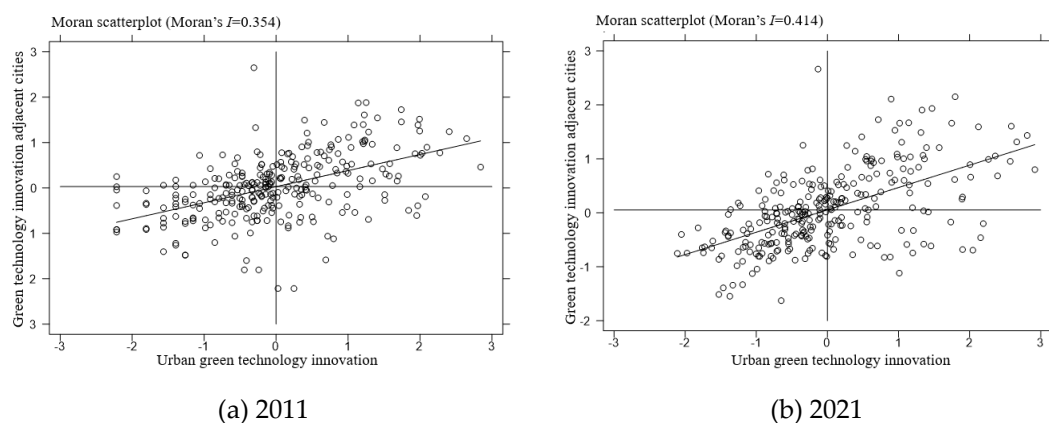


Figure S2. The local Moran's I of green technology innovation.

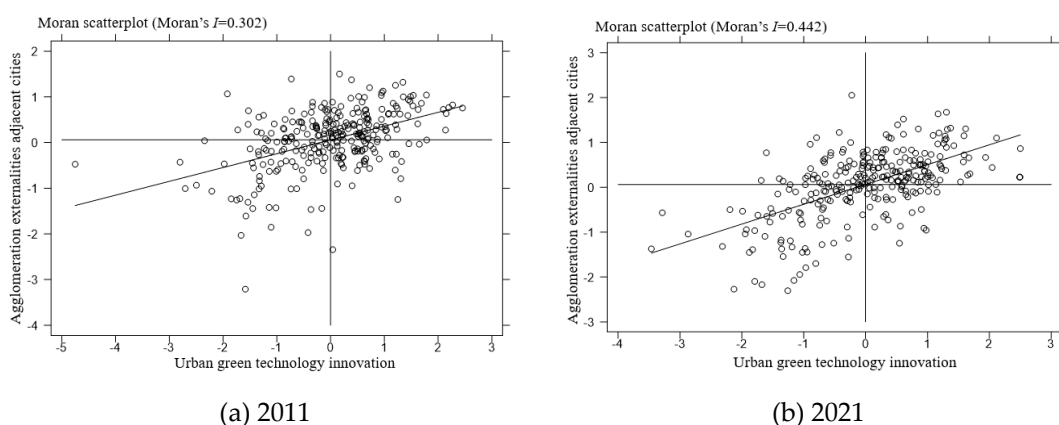


Figure S3. The local Moran's I of agglomeration externalities.

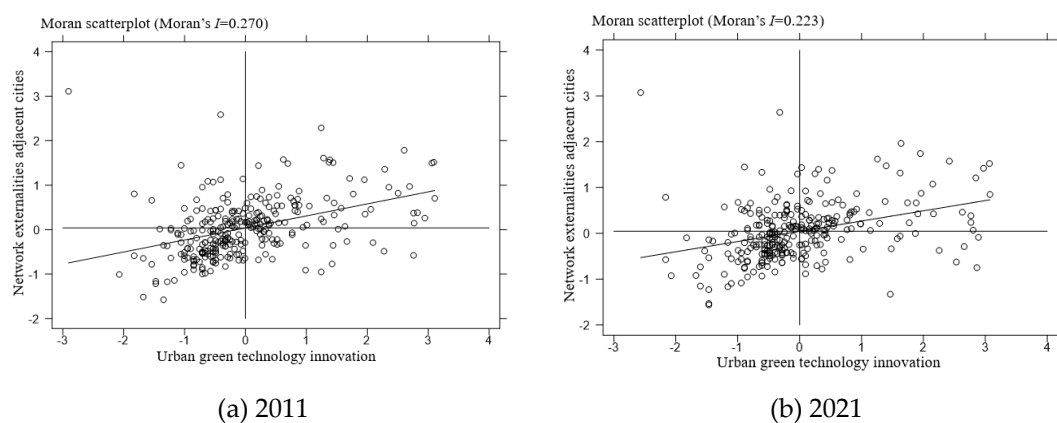


Figure S4. The local Moran's I of network externalities.

2. LM test

An LM test was conducted to ascertain the type of spatial effect. The results are depicted in Table S1. The LM-Lag test results for agglomeration externalities and network externalities were 222.622 and 204.852, respectively, while the LM-Error test results for them were 810.236 and 682.174, respectively. All of the tests rejected the null hypothesis at the 1% significance level, thus indicating that the samples chosen in this study

demonstrate dual influences of spatial lag and spatial error autocorrelation. Given that the SDM accounts for these two effects concurrently, this study opted for the SDM.

Table S1. The LM test results.

Test	Agglomeration externalities	Network externalities
LM-Lag test	222.622***	204.852***
Robust LM-Lag test	2.662*	3.268*
LM-Error test	810.236***	682.174***
Robust LM-Error test	590.275***	480.591***

Note: *, **, and *** represent $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively. The same applies below.

3. Wald test and LR test

The Wald test and LR test were performed to validate whether the SDM can be reduced to either a spatial lag model or a spatial error model. The results are presented in Table S2. The Wald test outcomes for agglomeration externalities and network externalities were 51.89, 41.03 and 44.69, 35.99, respectively, while the LR test outcomes for agglomeration externalities and network externalities were 51.54, 41.36 and 44.33, 36.16, respectively. All of the tests rejected the null hypothesis at the 1% significance level. This suggests that the SDM is robust and will not be simplified into either a spatial lag model or a spatial error model.

Table S2. The Wald and LR test results.

		Agglomeration externalities	Network externalities
Wald Test	SLM	51.89***	44.69***
	SEM	41.03***	35.99***
LR Test	SLM	51.54***	44.33***
	SEM	41.36***	36.16***

In light of the aforementioned tests, this study employed the SDM to investigate the influence of agglomeration externalities and network externalities on green technological innovation.

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