accelerated the industry blossom, almost overriding the Yangtze River Delta area.

4.2. Variance among cities with different AQI.

Based on the initial prediction, the correlation between operating HSR and lndomestic (which refers to the volume of domestic tourists) should be significantly positive, considering that HSR has been widely treated as a great measure to transport visitors. However, the regression result based on the DDD model shows an inverse result that the coefficient for cities with bad air quality is negative. The three factors listed below could be explanatory for this phenomenon.

First, after detecting the correlation between the sample cities' domestic tourists and AQI level (Figure 4), the number of domestic tourists is negatively correlated with AQI, which means those cities with inferior air quality are likely to have fewer initial visitors. The reason is that these cities are already highly developed, so those cities' railway networks tend to be pre-established. For instance, the rail connecting Shanghai and Nanjing (Hu-Ning line) overlapped with Jing-Hu HSR, which opened two years earlier than Hu-Ning-Hang and has been listed. Consequently, since establishing new rail mainly aims to share the burden of transportation of previous lines, it is hard to draw great advances for industrial progress. At the same time, those cities' tourism development may have reached saturation during the past years.

Second, high-speed rail has brought benefits to the development of rural areas. Due to the inconvenience of transportation in rural areas, fewer tourists initially went to the local areas. The completion of the Shanghai-Nanjing-Hangzhou Railway provides a more convenient way for tourists to transfer from other stations to the rural areas where they had previously visited difficultly. Therefore, the Hu-Ning-Hang HSR has promoted the integration of urban and rural areas to a certain extent and is conducive to the construction of the rural regions.

Third, concerning Zhejiang Province, Jiangsu Province, and Shanghai are among China's most economically developed areas, the population is mainly concentrated in large cities. The air quality in these cities is poor. Most people living in these large cities will choose the surrounding relatively small towns with good air quality as their travel destinations. Therefore, our results show that after opening the Hu-Ning-Hang HSR, the domestic tourists of cities with good air quality along the Shanghai-Nanjing-Hangzhou line have increased significantly. At the same time, the domestic tourists of cities with poor air quality have reduced due to competition.

4.3. Implications, limitations and future studies.

The results of this study apply to all regions with a high concentration of economic development. The construction of HSR will promote the development of small and medium-sized cities, improve the competitiveness of small towns, and promote rural development. In addition, the results also show that cities should pay attention to the improvement of air quality, especially for those vast cities. But our results may have potential limitations. First, due to the inconsistency of statistical caliber, our data was minimal before 2010, so we only limited the results to 2010-2019. Further research can analyze the long-term effects of this effect. Second, the article results are limited to the two levels of tourism and industrial added value and cannot reflect the overall changes adequately. Future articles can try to analyze this impact from other aspects.

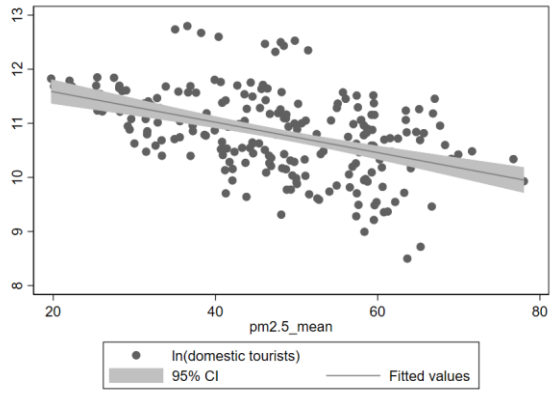

Figure 4. The relationship between domestic tourists and air quality. Notes: X-axis is the concentration of pm2.5. Y-axis is the ln(domestic tourists).

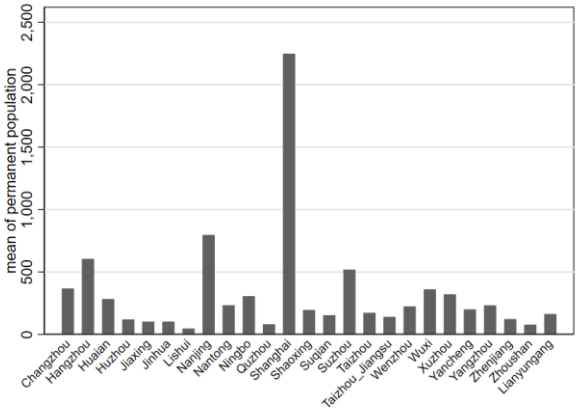

Figure 5. The relationship between population and cities.

5. CONCLUSION

Establishing HSR can promote staff mobility, cause industry agglomeration, and bring about spillover effects to the surrounding area. Although the HSR has been widely regarded as an effective way to drive

economic growth, little is known about its exact impact on tourism development in surrounding districts. Using the construction of Hu-Ning-Hang HSR as an instance, this paper investigates the role of HSR in motivating the development of domestic tourists, cultivating wholesale and retail sales and the industrial added value. The results indicate that the influence of opening the HSR on tourism and merchandise sales is notably discrepant among cities depends on their level of air quality. Compared with cities with bad air quality, cities obtaining good air quality are estimated to have a comparative advantage of a 12.2% larger amount of domestic visitors, and an 8.3% increase in wholesale and retail sales. However, the activated HSR has caused a 16.0% industrial added value growth for both kinds of cities.

The results also contribute to comprehending the function of setting up HSR to help develop tourism in nearby cities on account of their air quality. However, heterogeneous effects should not be neglected in the results. Only a proportion of cities' tourism could be beneficial from the transportation network expansion. HSR may even harm cities' tourism of cities with bad air quality since they have lost their bulge of travel convenience. Policymakers accordingly should generate additional consciousness of improving air quality to amplify profit gain from the added HSR.

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