**Response Document for “Can environmental protection policies promote regional innovation efficiency: A difference-in-differences approach with continuous treatment”**

We thank the editors for their insightful and constructive comments on our submission. We have revised the manuscript to address these comments and responded to your comment in this document. We have proofread the manuscript thoroughly and believe that the revised manuscript reads more fluently. Should you have any other comments or suggestions, please let us know and we will be happy to make further changes.

**Responses to Editors**

Thank you for your comments concerning our manuscript ID: ESPR-D-22-0268. We have carefully reviewed your insightful comments and have made substantial revisions to the paper. The comments were valuable for revising and improving our paper as well as providing important guidance for our research. The text in the revised manuscript is marked in red. In addition, we have employed an English-language editing service to polish our language prior to this submission.

* **Specific Comment 1:** After a careful editing examination of your paper, I am sorry to inform you that your manuscript is not acceptable for publication by ESPR in the present format however I encourage you to resubmit after the appropriate changes. Indeed, we have identified that several parts of the manuscript are copied/pasted from previous published publications. Your manuscript exhibits a similarity percentage higher than 30% with already published papers. Please, note that self-plagiarism isn’t allowed. The manuscript contains a number of phrases taken from other published papers, most notably in the sections: Abstract, 1 [paragraph 4], 3.2 [paragraph 1 (line 8-15)], 4.1 [paragraph 1 (line 1-7)], 4.2 [paragraph 1 (line 1-7)], 4.3.1 [paragraph 1], 4.3.2 [paragraph 1 (line 1-4, 10-13)], 4.4 [paragraphs: 1, 2]. Due to the copyright rules, we are not allowed to accept your paper in its current form. I suggest you to modify several sentences and to resubmit the paper to the journal ESPR.
* **Response:** Thank you for raising this important issue. According to your suggestions, we have modified our manuscript. More detailed changes are presented in the manuscript. Here are selected examples as follows:

Abstract: Environmental regulation and innovative development are essential means to solve the negative externalities of environmental pollution. However, developing countries often face the dual pressures of environmental pollution and innovative development. This paper focuses on whether environmental protection policies (EPP) can achieve a win-win situation between green development and innovative development. Based on the panel data of 277 cities in China from 2006 to 2016, this paper studies the impact of China's EPP on urban innovation efficiency by using a time-varying difference-in-differences approach. Combined with the geographical features of Chinese cities, we further take urban form into the mediating effect analysis. The results show that: (1) EPP has a significant positive impact on innovation efficiency, and the result satisfies the parallel trend test. (2) The robustness test shows that EPP has technological innovation and diffusion effects. (3) The mediating effect test show that Urban form has a significant mediating effect on the impact of EPP on innovation efficiency. Therefore, environmental policies should be formulated considering the differences of urban form to achieve the optimal implementation effect.

3.2 [paragraph 1 (line 8-15)]:…Spatial DID methods based on spatial weight matrices are commonly used in city-level empirical studies. However, some scholars have started to focus on the endogeneity of the spatial weight matrix, which assumes that the spatial weight matrix is not exogenous given. They assume that the spatial weight matrix includes an unknown nonparametric function to be estimated by the model (Kelejian and Piras, 2014). Qu and Lee (2015) point out that the exogeneity of the spatial weight matrix is a key to ensure the accuracy of empirical results. If the spatial weight matrix is endogenous, then the empirical results will be biased. Therefore, referring to Qian (2008), the regression model is constructed by the DID method with continuous processing in this paper as shown in Equation (1):…

4.1 [paragraph 1 (line 1-7)]: …DID is an effective tool for policy effect evaluation. This paper will analyze the promotion effect of ER on innovation efficiency through double difference model. The principle is to observe the changes of dependent variables in the case of whether the policy occurs or not under the theoretical framework of counterfactual. The premise of using DID method is that the two groups of samples (control group and experimental group) must have the same development trend. If the development trend is different, it means that other factors affect the changes of the explained variables. In other words, parallel trend test is the basic premise of empirical research….

4.2 [paragraph 1 (line 1-7)]: …We conduct the baseline regression by using a panel fixed effects model, and the results are shown in Table 5. We include both year fixed effects and city fixed effects in the regression. Among them, the year fixed effects exclude the influencing factors that change over time, while the city fixed effects control for the heterogeneity of cities. Without including any control variables in column (1) of Table 5, the results show that the coefficient is positive and significant at the 1% level, which indicates that EPP significantly improves innovation efficiency. The quantity of innovation efficiency between cities increased by 9.5% after the implementation of the EPP…