

グリーン公共調達はいつエコ・イノベーションを刺激するのか？ 知的資本の役割を考える

When can green public procurement really stimulate eco-innovation?

Considering the role of intellectual capital

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1. はじめに

By wielding enormous purchasing power, government agencies can strategically use procurement activities to achieve specific objectives. Green public procurement (GPP) is such a policy tool in which the government purchases goods, services and works to ensure a greener future.

Evidence on the impact of general public procurement on innovation is widely discussed. We can also find detailed literature when narrowing the perspective on green procurement. However, both theoretical and empirical research on the relationship between GPP and innovation are still insufficient (Cheng *et al.*, 2018). Furthermore, previous studies have little concern about sectoral or regional heterogeneity. Having analyzed the impediments of the GPP, there is also no literature to further empirically test whether intellectual capital can contribute to its effectiveness.

2. 分析方法

This paper employs panel data for 29 European countries from 2007 to 2019 to empirically examine the impact of GPP on eco-innovation by the Poisson fixed-effects model and the role of intellectual capital by adding an interaction term:

$$E(y_{it}|x_{it}) = \exp(\beta_1 GPP_{it} + \beta_2 GPP_{it}^2 + \beta_3 Intellect_{it} + \beta_4 GPP_{it} \times Intellect_{it} + \gamma Control_{it} + \delta_i)$$

where y_{it} is defined as the number of environmental patents for country i in year t . GPP_{it} means the proportion of green procurement contracts in total procurement contracts. We identify green contracts by two ways. One is if the Main Activities of the contract contains environment, and the other is if the award criteria of the contract contains green keywords. $Intellect_{it}$ indicates human capital and social capital, in regressions we bring the green employment proportion and the social capital score into this variable separately for analysis. $Control_{it}$ refers to a set of control variables. δ_i is country-fixed terms, respectively, to control country-invariable factors. Core datasets come from the Tenders Electronic Daily (TED) database, OECD's patent statistics database, and The Legatum Prosperity Index. After obtaining the regression coefficients, we manually calculate the marginal effect of the independent variable on the dependent variable by using the one-sided derivative. In addition, we reconstructed the proportion of green contracts in each sector from the field Main Activities in the TED database. A sub-sample of the Western European region and the Central and Eastern European region was also divided according to country location.

3. 分析結果

The regression results show that the effect of GPP on eco-innovation in a country is U-shaped, with innovation being stimulated only when the proportion of green contracts is above 36%. The average share of green contracts in European countries is, however, only 19%, and the median is only 15%, well below 36%, which suggests that most European countries hold untapped

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opportunities for green procurement functions. In the sub-sector regressions, we find a significant result only in housing, general public, and education sectors, while transportation and electricity, where green procurement is also highly intense, are unexpectedly insignificant. A lower turning point is evidenced in Central and Eastern European Countries (CEEC) than in Western European countries, i.e., it is easier for CEEC to exert the GPP benefit. These results imply to some extent that the procurement intensity is a core factor in making the GPP work and that such green policies may be closer to those relying on government macro-regulation than to market-based environmental policies. Finally, despite our detailed theoretical discussion of the importance of intellectual capital, the regression results do not verify that it plays any moderating or complementary role in the GPP effect.

4. 結論

Our study partially supports Ma *et al.* (2021), Yu and Morotomi (2022), and Krieger and Zipperer (2022)'s conclusion that the use of some environmentally relevant criteria in procurement tenders does contribute to the performance of eco-innovation. However, the direction of what we derive differs from the above literature: while Ma *et al.* (2021) as well as Krieger and Zipperer (2022) argue that GPP has always been a facilitator of innovation, and Yu and Morotomi (2022) argue that there is a tendency to have a diminishing effect at the margin, our results emphasize that GPP can stimulate eco-innovation only when the proportion of green contracts in a country is greater than 36%. GPP itself tends to promote incremental eco-innovations, while radical eco-innovations are stimulated with the help of intellectual capital. The significant coefficient on GPP and the insignificant coefficient on intellectual capital in the regression results imply that it is more incremental innovations that are stimulated, which is consistent with Czarnitzki (2020)'s point that public procurement promotes naturally accumulating innovations rather than the creation of an entirely new market. Confusing policy information and lack of training of professionals are possible reasons to explain our regression results.

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