**Supplement files**

**S1. GPT model promotion**

**S2. Variable description**

**S2. Complete version of Robustness tests (Table 3)**

**S1. Prompted** **GPT model**

We prompt the GPT 3.5 turbo models in the following steps:

First, we build the knowledge base of frugal innovation. It should be noted that our research context draws on the Chinese A-listed firms and their affiliated patents. The localized knowledge base contains the high-cited Chinese and English literature or review on frugal innovation (Agarwal et al., 2021; Bianchi et al., 2017; D'Angelo & Magnusson, 2021; Rossetto et al., 2023a, 2023b; Winterhalter et al., 2017; Xu et al., 2023; 陈劲 et al., 2014a, 2014b; 贾德普·普拉胡 & 吕文晶, 2016; 王楠 et al., 2024; 魏延辉 et al., 2020)[[1]](#footnote-0) and well-established measurement item of frugal innovation (Iqbal & Piwowar-Sulej, 2023; Lei et al., 2021).

Second, we prompted the GPT 3.5 turbo model through the localized knowledge base as shown in Figure S1.

A diagram of a procedure

描述已自动生成

Figure S1. The process of labelling corporate patents

Third, we first select 100 patents as the test sample and input it into the prompted 3.5 turbo model. After manually checked by three experts, the results verified the prompted model has sufficient capacity to identify frugal innovations. The selected patent sample is also listed in the same GitHub repository.

The prompted model is prepared and ready for further analysis.

**S2. Variable Definitions**

Table A1 Variable Definitions

|  |  |  |
| --- | --- | --- |
| Variables | Definition | Sources |
| *REM* | Real earnings management following 3.3 | CSMAR |
| FI1 | Firm frugal innovation measures based on patent applications | CNIPA |
| FI2 | Firm frugal innovation measures based on granted patents | CNIPA |
| SIZE | The natural logarithm value of the total assets | CSMAR |
| *ROA* | Return to assets | CSMAR |
| *LEV* | Total debts to total assets | CSMAR |
| *CFLOW* | Cash flow from operating activities to total assets | CSMAR |
| *TANG* | Tangible asset to total assets | CSMAR |
| *HHI* | Herfindahl-Hirschman Index of industry competition | CSMAR |
| *TOP10* | The sum of the shareholding percentage of the top ten shareholders | CSMAR |
| *DIRN* | The natural logarithm value of board size | CSMAR |
| *IND* | The proportion of independent directors | CSMAR |
| *EMP* | The natural logarithm value of employees’ amount | CSMAR |
| *PA* | The natural logarithm value of patent applications | CNIPA |
| *RDS* | The ratio of Research & Development spendings to operation revenue | CSMAR |
|  |  |  |

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1. To avoid the potential searching problems, we keep the Chinese reference without translation. [↑](#footnote-ref-0)