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Implied discount rate and payback threshold of energy efficiency investment in the industrial sector

Yueming Qiu, Yi David Wang & Jianfeng Wang

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Abstract

The industrial sector is responsible for about a third of the energy usage in the United States, and there is significant energy saving potential from the industrial sector. However, the phenomenon of “energy efficiency gap” – the scenario in which cost-effective energy efficient technologies enjoy only limited market success – appears frequently in the industrial sector. This article tries to explain this efficiency gap in the industrial sector by empirically estimating the implied discount rates and payback thresholds industrial firms use to evaluate their energy efficiency investments. Using the Industrial Assessment Centers (IAC) database from 2002 to 2011, with more than 30 000 energy efficiency recommendations, this article builds structural models of firms’ evaluation of an energy efficiency project. The model results show that the

implied discount rates of medium to small industrial firms range from 40 to 45%, and the average payback threshold is about 9 months.

Keywords:

industrial firms | energy efficiency | implied discount rate | payback threshold

JEL Classification:

Q20 | Q40 | L20

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Notes

[1] The IAC's website is http://www1.eere.energy.gov/manufacturing/tech_deployment/iacs.html.

[2] The IAC database's website is http://iac.rutgers.edu/database.

[3] Based on the formula for geometric progression, we have $\sum_{t=1}^{T} \frac{1}{(1+r)^t} = \frac{1}{r} - \frac{1}{(1+r)^T}$.

Additional information

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