Mining innovation, technological diversification and profitability

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This paper examines how the economic performance of firms engaged in mining innovation is affected by their portfolios of patents. Combining WIPO data on the patenting activities of over 245,000 firms with specific reference to nine mining technologies for the period 1970-2015 with Orbis data on these firms profitability over the period 2010-2018, we find that mining companies' innovative activities have on average a negative effect on their profitability, presumably reflecting the high costs of innovation in this field. Innovation in blasting and metallurgy technologies is an exception to this rule, as patenting in this field appears to have a strong and significantly positive effect on firms' profits. This may relate to the nature of such technologies which are both cost-cutting and applicable in a variety of different contexts within and across the boundaries of the mining industry. Conversely, environmental technologies have a negative impact on profitability. We also find that being technologically diversified in terms of innovation activities across different stages of the mining value chain negatively affects the companies' profits, potentially indicating that it is less costly to develop mining innovations that are related to the firms' core technological competencies.