

The Demanding Path of the Solar Technology Entrepreneur

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Introduction

The development of the most promising renewable technologies in solar photovoltaic involves agents discovering the new technologies and large user companies, as well as individual efforts from universities and academic stars maintaining momentum with major investments. Initiated and still dominated by the large firms, technological innovation in the solar PV industry is likely the game of the large firms. But the demand of the mass-market becoming more and more significant, knowledge spill-over effects becoming more widespread, the small or start-up firms are becoming important for the innovation in this specific industry. It is found that in contrast to the situation for biotechnology, star scientists, regardless of their contribution, are comparatively minor players in solar photovoltaic technology. So what kinds of the start-ups can achieve commercial success? what factors will influence their success? what is the difference between the start-ups in US and China? In this paper, these ideas are explored further by using the data from Small Business Innovation Research (SBIR) program.

The hypotheses and the method

We classified the SBIR supported start-ups as three groups: The successful companies & bankrupted companies & acquired companies, to see the performance difference for the above listed variables and define the supporting factors for the start-ups in the industry.

In the successful companies, the number of employees and the growth 2010-2015 in the number of employees will be the dependent variables; the following variables are the independent ones, in our search for the success factors:

- **Location:** whether the new form is located in the clusters; is clustering an advantage?
- **Age:** The existing years since foundation; is the liability of newness an obstacle to growth?
- **Type of entrepreneurship:** (1) academic, (2) employee (with the founders who worked for the solar firms before) and (3) non-related entrepreneurship (with the founders who did not work for the solar firms before, solar firms including the big firms who had branches or spin-offs in the solar domains). Are there differences in the types of founders giving the edge to some of them?
- **The type of markets targeted:** mass market, military markets, other niche market, supplier and user. Are some types of markets more suitable to achieve success?
- **Invested by VC:** are the few solar PV companies that have VC investment more successful?

- **The total amount of funds awarded by SBIR** for solar cell
- **The average amount of the awards from SBIR** for solar cell

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