



## BACKGROUND NOTE

# Large and Small Firm Roles in Innovation

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# LARGE AND SMALL FIRM ROLES IN INNOVATION

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Both small and large firms innovate, yet their innovative activities differ. As already highlighted by Acs and Audretsch (1988), many regularities apply to this pattern. The relative share of large firms as innovators tends to go up when (i) the unit cost of innovation is higher, (ii) the number of patents required to introduce a new product innovation is higher, and (iii) during an industry consolidation phase generally.

Small and large firms also respond differently to technological disruptions and industry life cycles. New industries tend to be pioneered by small, entrepreneurial firms which are not invested in old technologies and, therefore, are more free to explore opportunities opened by technological advances. This is referred to as the 'preparadigmatic' phase of industry creation, when many different product concepts compete against one another with radically different product designs (Abernathy and Utterback 1978, and Suarez and Utterback 1995). The first electric car was invented in the late 1800s (as were the first steam car and the first mechanical spring-powered car), all by entrepreneurial businesses. It was not until the combustion-engine powered, metal chassis, and air-filled tyre car design became the dominant design that industry consolidation started and large firms took over as leading car innovators—helped by supporting innovations, such as Henry Ford's mass production concept.

Apple's early days illustrate this pattern. Apple was an early pioneer of the personal computer, and its keyboard-as-input and TV-screen-as-interface became the dominant design. Apple was able to exploit its early design advantage to become a lasting dominator of the new industry (alongside with the likes of Compaq, Dell, and others. IBM made the (in hindsight) mistake of outsourcing the design of the personal computer operating system to Microsoft, which seized upon its Windows-based user interface design to seize control of the industry, eventually forcing IBM out of this new, lucrative market.

Today, rapid advances in the internet keep opening up opportunities for new, entrepreneurial firms to challenge industry incumbents with new, radical business models. This is a novel form of innovation, whereby entrepreneurial entrants do not challenge incumbents as much with new products as they do with new service concepts and novel forms of organizing for their delivery. Given the potency of Moore's Law, this trend is likely to persist for some time, opening opportunities for entrepreneurial entrants to challenge established incumbents in virtually any sector. This trend emphasizes the importance of entrepreneurial ecosystems and entrepreneurial business model innovators as pioneers of the digital economy. By challenging established incumbents in different sectors with their digitally enhanced business models (e.g., the Grab Taxi or the AirBnB business model), entrepreneurial business model innovators force incumbents to either adapt to new digital realities or risk being driven out of business. It is because of Moore's Law and digitalization that entrepreneurial ecosystems should be a key focus of innovation and entrepreneurship policy today.

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## REFERENCES

- Abernathy, W. J. and J. UtterbackJ. 1978. Patterns of industrial innovation. *Technology Review*, 50: pp. 41–47.
- Acs, Z. J. and D. B. Audretsch. 1988. Innovation in large and small firms - An empirical analysis. *American Economic Review*, 78(4): pp. 678–690.
- Suarez, F. F. and J. M. Utterback. 1995. Dominant designs and the survival of firms. *Strategic management journal*, 16(6): pp. 415-430.