# Financing Innovation

### Why is finance important for innovation?

Finance plays a critical role in innovation as it allows organizations to conduct research, adopt technologies necessary for inventions as well as develop and commercialize innovations. Accessing external finance for innovation is an important challenge for firms . Firms can fund innovation activities using a variety of funding instruments provided by different types of financial intermediaries and investors. Access to external sources of finance is often particularly challenging at the seed and early stages of business development as at this stage companies face high barriers for accessing finance notably as they lack a track record.

### What is the role of finance for innovation?

Both funding needs and funding availability are closely related to the stage of development of the firm and its innovation projects.

- In the initial phase when inventions are developed and research conducted, there is still much uncertainty about what innovations will emerge, if any. This makes it very difficult to obtain funding. These financial constraints are one of the reasons why policy typically plays an important role at funding the early stages of technological development.
- At more advanced stages, with the development of prototypes and the commercialisation of inventions, specialized investors who are skilled in assessing new technologies and can handle risk, such as venture capitalists and business angels, become more willing to provide funding.
- In the final stages, at the level of technology diffusion and adoption, once both technological and market uncertainty have all but disappeared, more traditional suppliers can provide the required funding to scale up operations as well as to finance purchasers interested in adopting new innovations.

It is worth noting that even if the innovation process may involve the same stages in small start-up and a large multinational, the sources of finance that they have available vary significantly. Large firms can more easily finance their R&D activities, whether using internal resources, getting a loan from a bank (using their tangible assets as collateral if required), issuing bonds, or raising equity finance in the stock markets. Start-ups do not have as many assets to use as collateral and their innovation investment is less diversified, and may also represent a much larger share of their activities for really innovative firms. As a result, their funding options are much more limited, and often need to rely on friends and family before being able to access other sources of capital (see Demand for financing innovation [1] ).

### What are the sources of finance for innovation?

Firms can use either internal or external sources of finance to fund their innovation activities.

- The main internal source of finance is retained earnings, the profits accumulated over time which have not been returned to shareholders. Firms typically prefer to use internal financing rather than external financing as the latter can be very costly. As a result, there are projects that firms would choose to undertake if they had sufficient internal resources available, but which will not be taken forward if firms need to access external finance to develop them. In many cases firms do not have the option to access external financing.

- In contrast, external sources of financing includes debt and equity (as well as some hybrid forms), which can be provided by individual investors (such as business angels), venture capital funds, banks and capital markets (among others). Conditional on having to resort to external funds, debt is generally preferred to equity, since if available debt is typically a cheaper source of finance (even if still more expensive than internal funds).

### What is the framework for financing innovation?

Markets require a set of well-functioning institutions in order to work, so institutional failures can severely damage access to finance for innovators. This includes the following conditions:

- Intellectual property rights can facilitate access to finance for innovative firms, since they turn knowledge into a commodity that, among others, can be used as collateral to obtain funding, and also as an asset that can be salvaged by equity investors if the firm fails (see Intellectual Property Rights - FI [2]).
- The design of the bankruptcy code has an important influence on financiers' decisions to provide the funds to make it happen (see Bankruptcy regulation [3]).
- Developed financial institutions (see Financial market development [4]) are crucial for firms that need external funding to invest in innovation. Financial market regulation (see Financial market regulation [5]) can shape how financial intermediaries evolve, and the resulting structure of financial institutions in a country, which in turn may impact on the types and sources of innovation activity.

### Policy intervention on finance for innovation

Markets generally provide less finance for innovation than would be socially desirable. This is why many governments use different types of intervention to increase the amount of finance available for innovation activities. Government intervention is often justified on several grounds, such as market failures and system failures (see Policy rationales and objectives on finance for innovation [6]). There are several instruments that policy makers can use to increase the availability of finance for innovation. These include direct funding (see Direct funding of firms' R&D [7]), such as R&D grants and pre-commercial procurement contracts; debt risk-sharing schemes (see Debt and risk sharing schemes [8]), such as credit guarantees schemes; fiscal measures, such as R&D tax credits (see Fiscal measures [9]) and tax deductions for early stage investors; or other interventions to increase the availability of equity finance for innovative firms; such as venture capital schemes. Regardless of the rationale for intervention, the decision to intervene needs to weight both benefits and risks, since there are several government failures which can make public intervention impractical or even counterproductive.

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