CHAPTER FOUR

Financing

Innovation-friendly financing forms the third pillar of an innovation system, supported by the legal, regulatory, and business support systems. Recommended actions are in two domains:

- encouraging greater availability of innovation-oriented financing
- improving other forms of financing.

This chapter briefly describes the financing challenges for high-technology firms in GDD and Knowledge City. The recommended actions are designed to make available the necessary financing on a commercial basis with appropriate regard to risk.

GDD's Assets

GDD has worked hard to create financing opportunities for innovative companies. For example, it has set up Guangzhou GET Co. Ltd., GDD's venture capital firm, and the Zhongke Baiyun Fund. The four large state-owned commercial banks have branches in GDD and extensive branch networks throughout China. The global financial center of Hong Kong is a short drive away. Guangzhou is home to many investors with substantial fortunes, a potential untapped resource for providing financing for innovative businesses.

Encouraging Greater Availability of Innovation-Oriented Financing

Our case studies suggest that financing is an important component of a successful cluster. In Silicon Valley, early inventors were financed in part by government purchases of their products and in part by individual angel investors. More organized financing, including an organized angel investor group and small business investment companies, the predecessors of venture funds, became available at the start of the transistor era in the 1950s and 1960s. In Israel, the government's Yozma program to facilitate local venture funding coincided with the rapid growth of the ICT sector.

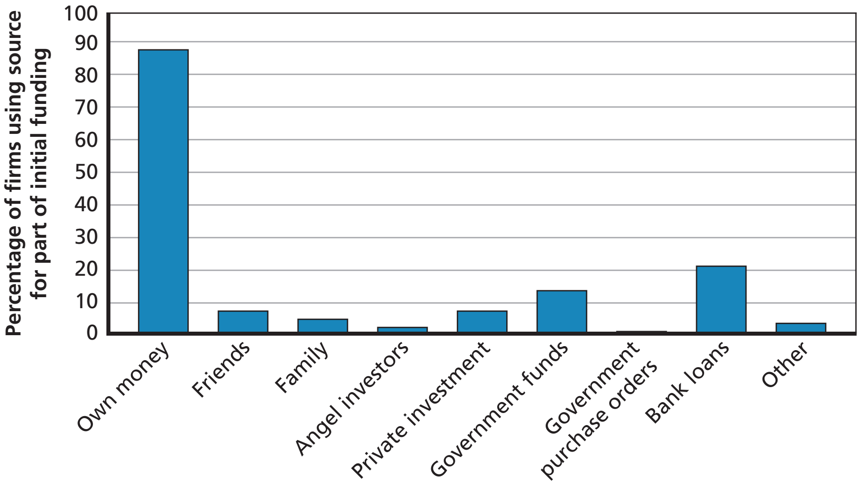
Firm financing can be divided conceptually into several broad stages. During the basic research or technology creation phase, most funding tends to come from government agencies, universities, or similar funding sources. As the firm begins to develop the technology prior to commercialization, it faces a "valley of death." This is the period when the entrepreneur may have to rely on personal funds, or funding from friends, family, or angel investors, to survive. Once the technology is ready for commercialization, venture capital firms may step in to fund some fraction of firms. Finally, a few firms progress to the point that they receive funding from public markets through an initial public offering or can support themselves through sales (Murphy and Edwards, 2003).

Local financiers can be valuable because they can more easily find and monitor potential and ongoing investments than can financiers from elsewhere. However, it is not clear that a cluster needs its own local venture capital industry at the start. In the Israeli case, the Yozma program leveraged foreign funding by creating ten private venture capital funds, which were required to combine money from well-established Israeli institutions with that from foreign financial institutions. In Maryland, many of the venture capital firms that invested in local companies during the 1980s and 1990s were not located in the state.

Conditions in GDD

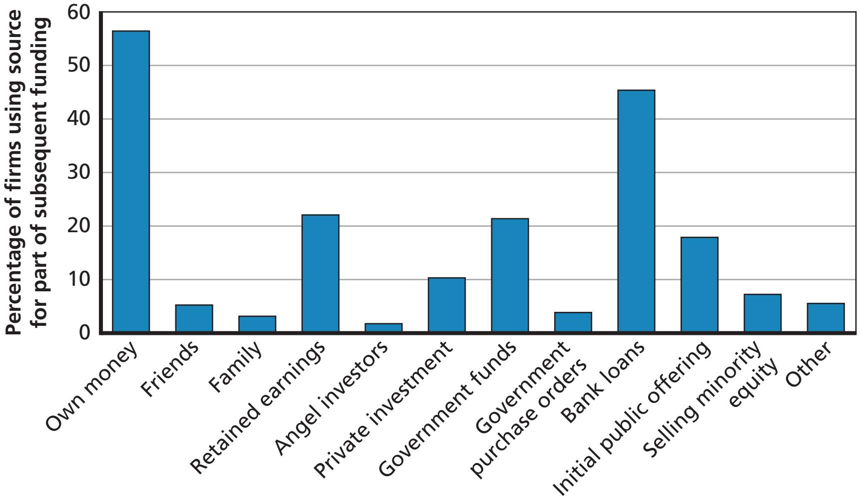
Our interviews suggest that entrepreneurs in GDD have challenges accessing early-stage financing, or financing at the point when a technology has been developed but is not yet commercialized. This will likely be the case for entrepreneurs in Knowledge City. We cannot verify whether this is so because such financing is unavailable, because the companies with promising prospects are rare, or because this is the normal state in most innovative areas. The GDD-RAND Knowledge City Project Survey shows that the vast majority of entrepreneurs used their own money as part of their initial funding and that subsequent funding, when it came from outside the firm, most often came from a bank rather than a more risk-oriented financial institution, such as an angel investor or a venture capital firm. Angel investors, in particular, appear to invest in a very small number of firms relative to the total population of high-technology firms in GDD (see Figures 4.1 and 4.2). Although this may be the case in most of China, our case studies of

Figure 4.1
Sources of Initial Funding



SOURCE: GDD-RAND Knowledge City Project Survey.
NOTE: Firms could give more than one answer to this question, so the total sums to more than 100 percent. Results are based on responses from 293 firms (out of 305 surveys received).
RAND *MG1240-4.1*

Figure 4.2
Sources of Subsequent Funding



SOURCE: GDD-RAND Knowledge City Project Survey.
NOTE: Firms could give more than one answer to this question, so the total sums to more than 100 percent. Results are based on responses from 290 firms (out of 305 surveys received).
RAND *MG1240-4.2*

Silicon Valley and Maryland showed that at least some innovative areas have active angel investment networks, which GDD lacks.

GDD does provide some early-stage funding in the form of research grants for companies. However, our interviews suggest that, although such funding is viewed as helpful, there are concerns among both entrepreneurs and individuals engaged in disbursing the grants. On the one hand, some entrepreneurs indicated that the amounts provided are insufficient to ensure the development of the firm. Some entrepreneurs reported difficulty obtaining sufficient amounts of these funds, particularly when they are targeted at specific types of projects. On the other hand, individuals engaged in disbursing grants have commented that outcomes from these grants were hard to measure, and the available data did not indicate that the program was highly successful. It was not clear from either entrepreneurs or grantmakers whether an innovation would have been developed even if the grant had not been made available. It was also not clear whether the innovations that were developed generated sales commensurate with the grant support received by the company. In other words, we cannot confirm that the current policy generates a satisfactory rate of return in terms of sales. This places GDD in a similar position to many other government entities. The research evidence is mixed regarding the success of government funding in the financing of innovative firms.

The Maryland case study offers some suggestions for how GDD might facilitate such investment. In Maryland, the Maryland Technology Development Corporation (TEDCO), an agency funded primarily by the state, and the Dingman Center for Entrepreneurship at the R. H. Smith School of Business at the University of Maryland have established angel investor groups. These organizations invite investors in their networks to attend regular sessions during which selected companies pitch their ideas. The angel investors are typically successful local entrepreneurs but may also include wealthy individuals who have not had previous entrepreneurial experience.

TEDCO invites approximately 20 companies from its portfolio of firms and incubators to pitch their ideas to TEDCO officials. These officials then select the top ten to pitch to the angel group. Approximately 25 angel investors attend each meeting; companies have ten minutes to pitch their ideas, followed by a networking event. Angel investors in the Dingman network pay a small fee to be part of the group, since their membership allows them access to a constant flow of high-quality deals.

GDD could set up such a forum to provide a platform for angel investors and entrepreneurs to meet on a regular basis. GDD could also hire advisers to educate entrepreneurs on how to prepare presentations. GDD leaders would need to attend these meetings to underline their importance to potential investors. To draw on existing investment efforts, GDD could coordinate with Guangzhou GET Co. Ltd. to identify individual investors, arrange meetings, and select firms to present. Companies invited to pitch their ideas to the angel investors could be selected from among the high-technology firms in GDD.

Actions for GDD

GDD should not try to fill the financing gap on its own. The record of successful government funding of small high-technology companies is often poor. Instead, we recommend the following actions:

- *Assist in the creation of angel investor networks.* GDD can assist in the formation of these networks by mobilizing the existing entrepreneur-investor base and engaging wealthy Guangzhou investors in these networks. We strongly recommend that GDD first seek advice and assistance from people who have already created such networks. Steps in creating an angel investor network would include
  - contacts between high-level GDD staff and wealthy individuals
  - regular meetings, perhaps monthly, between investors and entrepreneurs
  - coordination between GDD and entrepreneurs before meetings to ensure that proposal presentations are professional and attractive to investors
  - facilitation of follow-up meetings between investors and entrepreneurs
  - gathering feedback from the investors to improve the operation of the network.
- *Facilitate private venture capital.* Facilitation may include recruiting foreign or domestic venture capital firms to target companies located in Knowledge City. GDD may wish to pursue Israel's Yozma model, in which GDD would invest in foreign venture capital firms that would then make the investment decisions. For example, Guangzhou GET Co. Ltd., GDD's venture capital firm, might be encouraged to invest in several foreign or private venture capital firms that target high-technology companies in Knowledge City.

Other Types of Financing

Although we have concentrated on angel investments and venture capital, those are not the only forms of capital that growing firms in Knowledge City will need. They will still need other forms of financing, including regular commercial bank loans.

Conditions in GDD

As noted earlier, firms in GDD rely on bank loans for at least some of their external financing. Approximately 25 percent of GDD-RAND Knowledge City Project Survey respondents indicated that they had received some outside funding. Among these firms, banks and bank loans were the most common source in the initial round of outside funding, followed by investment funds, including venture capital, private equity, and other investment funds (see Figure 4.3). Five percent of respondents received their first round of outside funding from angel investors.

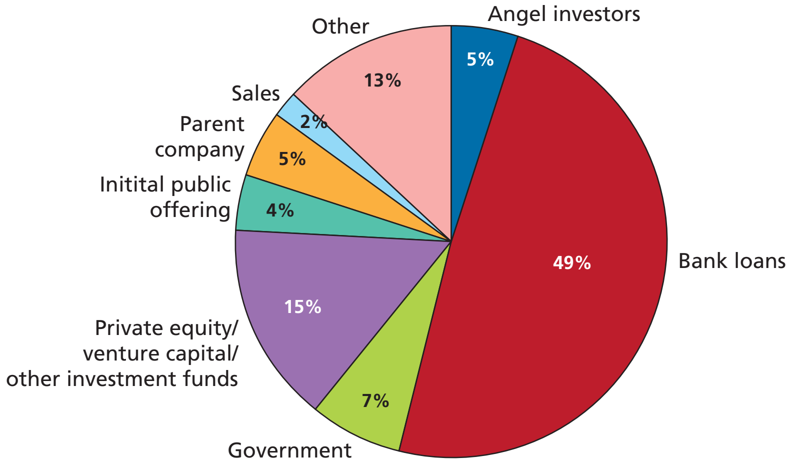
This suggests that commercial banks fill an important financing gap in GDD. Even if this gap is filled through more angel investment and venture capital opportunities, banks will continue to play a valuable financing role.

Actions for GDD

Guangzhou is home to several commercial banks. The challenge will be access to these banks by firms in Knowledge City. Therefore, we recommend the following action:

- *Bring commercial banking to Knowledge City.* Although commercial banks should not be a primary source of innovation-oriented financing, they are an important part of the financial ecosystem that enables innovation-oriented financing from angel investors and venture capital firms to be most effective. GDD is well supplied with commercial banking branches; Knowledge City will need such a network as well. GDD should ensure that Knowledge City companies have a choice of convenient commercial bank branches.

Figure 4.3
Sources of First-Round Outside Funding



SOURCE: GDD-RAND Knowledge City Project Survey.
NOTES: Results are based on responses from 75 firms (out of 82 that reported receiving outside funding, among a total of 305 surveys received). The "Other" category includes the following reported sources: "Britain," "legal entity," "loan guarantee," "self," and "friends."
RAND *MG1240-4.3*

Summary of Actions for Financing

The actions recommended in this chapter will help fill gaps in the weakest parts of the current GDD financing system, particularly at the points of precommercial technology development (angel investors) and at the first stage of commercialization (venture capital). These actions also support other measures to attract and foster high-technology companies and to attract and retain entrepreneurial people. Better financing to attract both companies and talented individuals will trigger a virtuous circle: These talented individuals will become prime candidates to participate in angel networks once they have succeeded in business and built up capital that can be invested.