

Chapter 5

Dealing with Uncertainty

Abstract In this chapter we will see that, when uncertainty arises from lack of information about both the state of the world *and* the agents' behavior, a remedy to a lack of experience cannot be bought. We will introduce, then, a more complex trap model assuming that innovation (a way out of the trap) can occur through a process that is unsure and made up of small steps, by way of experiment. Some indications emerge regarding the policy design required to get out of the trap of under-valored local resources. Intervention should not entail direct public involvement in starting and managing productive activities, nor should it entail providing boundless grants and incentives to private agents. Wage reduction is not a good approach neither. Intervention should be designed with the goal of increasing the difference between the net return of new risky activities and the safe return of traditional ones. The ability to choose the most promising project, however, is not very realistic. The outcome of any new project is uncertain. If this were not the case, there would be no traps to deal with. This leads to the use of cost as a lever rather than selection. Policy makers should provide public goods and services selected from those best able with certainty to reduce costs to those actors who are engaging in new activities.

5.1 Credit and Credit Rationing

In the big push hypothesis, the State was required to intervene for as long as necessary (and nobody knew for how long). The wage flexibility hypothesis called for a drop in wages to the level required in order to get out of the trap, no matter how low. Both these solutions have severe limits.

Considering the nature of the problem at stake, we could propose the remedy of the financial system. In a trap situation, after all, there are always expected *future* gains, even though firms have no idea how many of them need to take action and move in order to effectively exploit an opportunity. It would be natural to think that these firms could pay a bank to anticipate future revenues, thus sharing the

risk among all the firms that are individually unable to deal with it. The solution would be as simple as buying the information needed.

However, when uncertainty arises from lack of information about both the “state of the world” and the agents’ behavior, the *Greenwald-Stiglitz’s theorem*—which states that a remedy to a lack of information cannot be bought—holds. Greenwald-Stiglitz’s (1986) theorem first defines a constraint Pareto inefficient state as a state of allocation of resources in which it would be possible to make one individual better off without making any other worse off by means of allowed (general and impersonal) rules. It then states that there is indeed a link between imperfect information and constrained Pareto inefficiency. Typically, imperfect information affects the buyer of a good or service whose features he or she can only discover after having purchased it, while the seller knows the features before selling it. As the buyer knows that the seller has better information and can use it against him, a useful effective exchange of information is impossible. The buyer will never know if the seller is telling the truth or not.

Countless personal examples as well as a number of researched examples show a link between imperfect information and incomplete markets. One of these examples relates to banks. Credit rationing often prevents good ideas and projects—that would be able to repay the required investments—from being implemented. This means that credit risk-sharing is not the most effective way to get out of trap. It is useful to analyze why it is not effective because it allows to identify what conditions may make it effective.

5.1.1 Asymmetric Information

Credit rationing is linked to asymmetric information because it produces both *adverse selection* (a pre-contract agency problem) and *moral hazard* (a post-contract agency problem). These problems create an “agency dilemma”. There are inherent difficulties involved in motivating one party (the borrower) to act in the best interests of another party (the bank) rather than in their own interest against the other. Adverse selection takes place because borrowers who know that they cannot be detected *ex ante* and who are either unwilling or unable to repay their loans, are more likely to receive credit. Moral hazard takes place because, knowing that their effort cannot be observed, borrowers may use funds in ways that are inconsistent with the interest of the lenders once they have received a loan (Stiglitz and Weiss 1981). That is, they are tempted to use their own funds for more serious and promising activities and the borrowed money for less serious initiatives (but perhaps the most striking and prestigious) in which there is a high risk of waste.

Communication does not solve these problems. Since the source of information is the party with the greatest interest in communicating something favorable, the party receiving the information should rationally be wary of the possible negative consequences. This is the why it is impossible to remedy lack of information by buying it. Even a third party commissioned and paid to gather information never provides an absolute guarantee of objectivity.

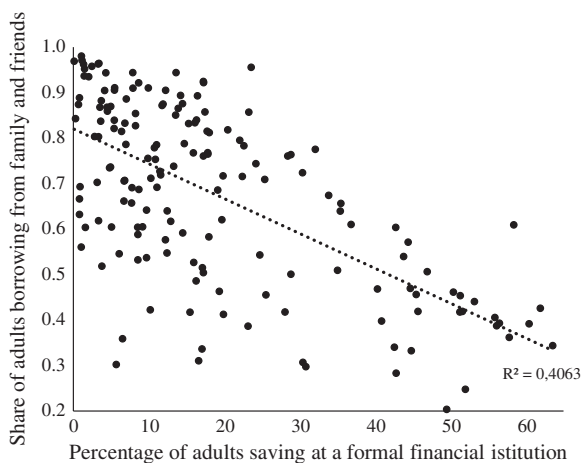
On the other hand, agents involved in dealings affected by lack of information, indirect defend themselves. Lack of information tends to make money-lending institutions raise the amount of collateral they require. Banks expect the worst borrowers to seek their support and they protect themselves by demanding additional guarantees, beyond those related to the project itself. This leads to a *self-fulfilling prophecy*. Owing to the behavior of banks, local economic initiatives are based largely on the support of families and the informal credit sector, which provide credit and forms of insurance in case of difficulty. However, this encourages banks to believe that customers who turn to them—rather than to families, friends, and the informal credit sector who know them well—must be the worst borrowers. This self-fulfilling prophecy nips any economic resourcefulness in the bud. Banks will not offer loans for new, technologically advanced projects even when they are economically viable. They will only offer loans when the borrower's guarantees are more than proportionate to the risk involved, that is, when there is low risk and low growth potential.

5.1.2 Some Empirical Evidence

One symptom of credit rationing is financial exclusion. Let us therefore consider research results concerning financial inclusion, and attempt to identify the factors behind borrower's access to formal financial institutions. Far-reaching research using data for 123 countries and over 124,000 individuals, tried to understand what factors were correlated with the use of formal bank accounts. «We find that greater financial inclusion is associated with a better enabling environment to access financial services, such as lower banking costs, greater proximity to branches, and fewer documentation requirements to open an account» (Allen et al. 2012, 34). These factors can be considered costs. Access to credit could thus be considered absent where its cost is high in relation to the ability to pay for it. Yet the “greater proximity to branches” variable could also indicate another factor that facilitates access to credit. That is, a bank's better understanding of its customers owing to the proximity of a branch. This factor entails *knowledge and information*, and therefore suggests that financial exclusion, and thus credit rationing, also arises from a lack of information.

We may consider an econometric exercise showing that signals of this mechanism are detectable even using data at country level. The 2011 Global Findex data for 164 developed and developing countries takes the frequencies of loans originating from family and friends as a credit rationing proxy. The percentage of adults originating a new loan from family and friends, out of the total of adults originating a new loan (from family and friends, and from a bank), is shown in Fig. 5.1 in relation to the percentage of adults with savings in a financial institution. There is a significant negative correlation between these two variables, suggesting a probable credit rationing in those countries where fewer people keep their savings in a bank. This latter variable will depend in part on a

Fig. 5.1 Share of informal borrowing correlated to the share of formal saving, 164 countries 2010–2011. *Source* Figure obtained by processing data from Global Findex data-base 2011 (<http://datatopics.worldbank.org/financialinclusion/>)



low general ability to save, in part on the weakness of the banking system, and in part on an information factor. The mutual information exchange among banks and customers, in fact, varies greatly, depending on the characteristics of the banking system, including the organization and territorial distribution of its branches.

We can make a three equation system assuming that the percentage of adults originating a loan at a formal financial institution negatively depends on borrowing from family and friends (first equation). Informal borrowing negatively depends on adults' percentage saving at a bank (second equation). This last variable depends positively on total savings (percentage of adults saving anyway) and on percentage of adults using a bank account for business (third equation).

These results (Table 5.1) indicate that comparing different countries, the use of banks to deposit savings is 1.1 % points higher with each point increase in the

Table 5.1 System estimations' results, dependent variable "Loan from a financial institution in the past year (% age 15+)", cross-country, 164 countries 2010–2011

Independent variables	Coefficient of elasticity ^a	t-Statistics	Probability ^b (%)
Constant	+1.68	+10	0.01
1. Loan from family and friends % age 15+	-0.37	-4	0.1
2. Savings at a financial institution % age 15+ (effect on 1)	-0.21	-5	0.01
3. Saving any money % age 15+ (effect on 2)	+1.10	+10	0.01
4. Account used for business % age 15+ (effect on 2)	+0.58	+11	0.01

^aPercentage change in the dependent variable (Loan from a financial institution in the past year, % age 15+) divided by the percentage change in the dependent variable calculated by regression on logarithms

^bSignificance level at which the hypothesis that the elasticity coefficient is zero is rejected

overall capacity of saving (which depends on per capita income). This use is also 0.6 points higher with each point increase in the use of a bank account for business (which also depends on the development level). The use of banks for deposits, in turn, affects the use of informal loans to the extent of 0.2 points less per percentage point. The use of informal loans ultimately reduces the use of formal loans to about 0.4 % points each. This last result indicates the existence of credit rationing due to lack of reciprocal knowledge between banks and people.

5.1.3 A Simulation

An in-depth analysis is useful to demonstrate out the link between information asymmetries and credit rationing. This analysis will reveal the conditions under which it can be assumed that credit rationing is avoidable. Let us consider a numerical exercise built to simplify the explanation but coherent with Keiding’s (2013) analysis, while taking into account Arnold and Riley’s (2009) model. Let us assume a given set of 650 project-investors, each requiring the same loan, let’s say 1 unit of money. The bank has a supply function of loans in relation to the bank’s yield (π), a function that we assume monotonically increasing (Fig. 5.2):

$$0 \leq S(\pi) \leq 650S' > 0$$

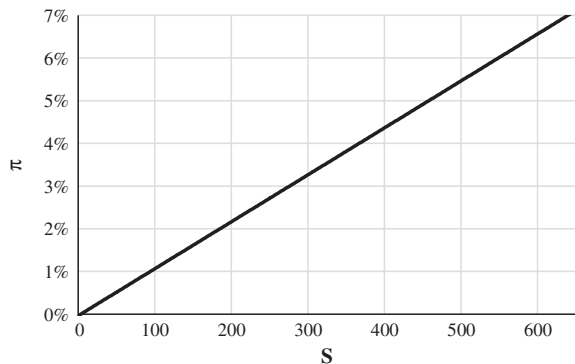
If the bank knows the risk of insolvency of each investor $(1-q_i) i = 1 \dots 650$, will charge an interest rate equal to the reference rate on the loan without risk (r) divided by the probability of regular payments that is one less the probability of default:

$$\frac{r}{1 - 1 - q_i} = \frac{r}{q_i} \tag{5.1}$$

Since from each investor the bank will get:

$$q_i \frac{r}{q_i} = r \tag{5.2}$$

Fig. 5.2 Credit supply



The bank’s yield from each project-investor will be:

$$\pi = r \tag{5.3}$$

And the bank’s loan supply will be a function of r .

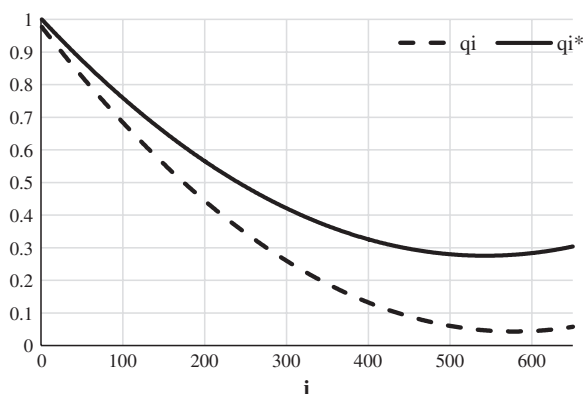
Let us suppose instead that the bank does not know the $1 - q_i$ default probabilities, due to asymmetric information. Its loan supply will still be an increasing function of the bank’s yield, but this will no longer be equal to r . For each r , the investors’ behavior determines the bank’s yield. This is detected by the bank’s day by day accounting for gains and losses.

Let us order the 650 projects-investors according to their presence in the set that requests funding at each level of the interest rate required by the bank. With a very low interest rate near to zero, all 650 projects will request funding. Then, increasing the interest rate, projects with little or no risk will come to the fore. Subsequently those with limited risk will emerge, later, those with average risk, and so on. At a very high interest rate, very few risky projects will remain. This gives rise to a distribution of probability to pay (q_i) of each of these 650 projects arranged in a way out order. However, we must distinguish between at least two cases depending on the rapidity with which the marginal probability of default increases with the interest rate. As we will see, this difference will have a critical impact on credit rationing.

Adverse selection and moral hazard act to delay the exit of projects with high default probability. For the opportunistic investor, who has already planned to pay only a few debt installments (adverse selection), even a high rate of interest may be too low to constitute an adequate deterrent. The same is true, to a certain extent, for the moral hazard concerning those borrowers who do not exert much effort in pursuing project outcomes. We may assume, therefore, two different trends in the probability distribution q_i , depending on the number of bad borrowers among the whole set. These are the two cases we will deal with: q_i trend is related to *many bad borrowers*, q_i^* is the trend relative to a *smaller number of bad borrowers*.

The little recovery at the end of the probability distribution shown in Fig. 5.3 is explained by considering adverse selection and moral hazard together. At very

Fig. 5.3 Probability to collect the debt service on the part of the bank from every project-investors ordered from the first to the last leaving the demand for loans when the interest rate is creasing



high interest rates, close to the maximum, risky projects presented by opportunistic investors come out too. Indeed, taking adverse selection and moral hazard together, we have to consider that several borrowers who have no intention of working hard to pay back interests and debt, will prefer not even to ask for the loan if the interest is very high. Paying back even a few installments may be too high a cost for them. At that point only very objectively risky (with high return if successful) projects remain. At the end of the probability distributions, as Fig. 5.3 shows, there is a little recovery in the probability loans will be re-paid (Arnold and Riley’s 2009).

There are many causes for the difference between q_i and q_i^* . A less risky portfolio (q_i^*) may be the result of a reputation mechanism whereby, for instance, borrowers are identified for future purposes. A similar result might also be reached by tacit community surveillance whereby a small community defends a local bank’s the ability to make loans as if this were a common good. Micro-credit initiatives often use the same tools. Jayaraman and Kothari (2013, 9) found evidence to link firm-specific information made available to banks and bank’s risk-taking.

All these cases, however, are abatements in the lack of information hypothesis. A bank demanding significant collateral also reduces the riskiness of loans, but in this case credit rationing takes place *ex ante*. However, besides these considerations on the different probability distribution of payments owing to greater or lesser information asymmetry, and to *ex ante rationing*, we should also consider when and how those default probabilities enter the algorithm determining banks’ loan supply. It does so when the bank is *risk averse*, namely if the bank prefers the amount of money π in hand rather than the promise of amount $\pi = xq_i^*$, where x is an amount of money and q_i^* , the already defined probability. If the bank is *risk-neutral*, then π and xq_i^* are indifferent. We can thus assume that q_i^* could represent both the case where there is less lack of information and the case of risk neutrality.

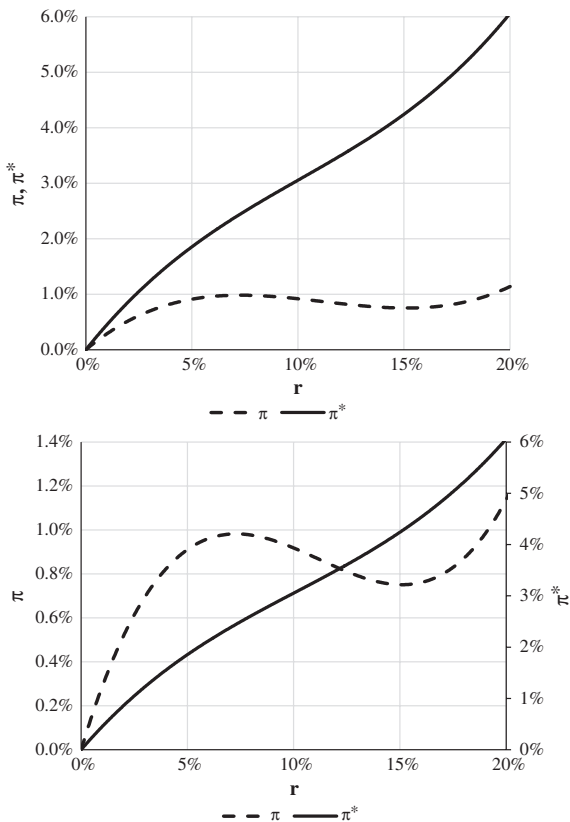
In this way q_i represents the case of higher lack of information and risk aversion. By summing the products of probabilities and interest rates of the projects at an increasing rate of interest, and dividing by this whole, we obtain the relationship between interest rate (r) and average unit bank’s yield (π or π^* , depending on q_i or q_i^*), as shown in Fig. 5.4 where by assumption interest rates go from 0 to 20 %.

$$\pi(r) = \frac{\sum_{i=1}^n r q_i}{n(\pi)}; \quad n = 1 \dots 650 \tag{5.4}$$

$$\pi^*(r) = \frac{\sum_{i=1}^n r q_i^*}{n(\pi)}; \quad n = 1 \dots 650 \tag{5.5}$$

There are two major characteristics of the curve π (more risky portfolio or bank’s risk aversion) compared to π^* . The π curve is much lower, indicating lesser yields for the bank at the same nominal interest rates. Secondly, it shows a strange shape, first increasing, then decreasing, and then increasing again. As pointed out by Keiding (2013, 6), this shape is the consequence of the assumed pooled adverse selection and moral hazard as well as the little recovery at the end of the probability

Fig. 5.4 Bank's yield at increasing interest rates (in the second graph, for greater evidence, the two curves are superimposed representing them on two different scales. This will also be done in the following graphs)



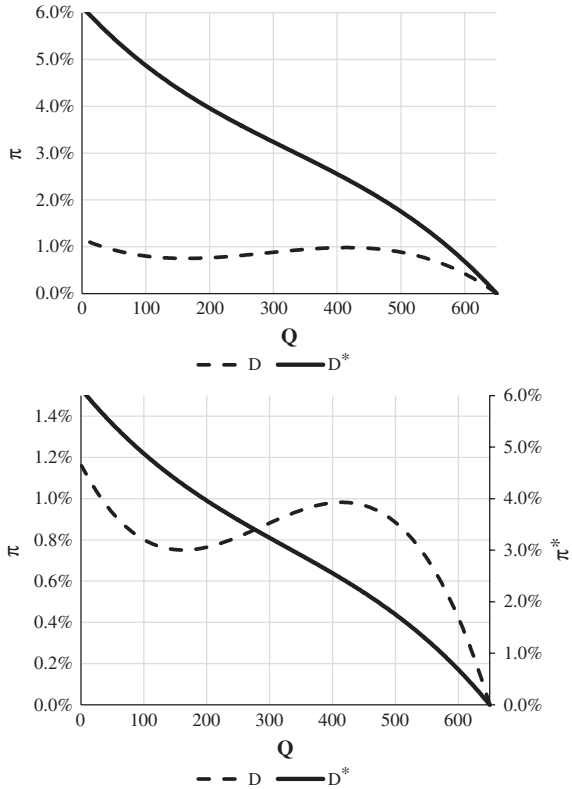
distribution of debt collection service. A very low rate of interest will give a low π given the minimum cost of credit that all risky and unrisky project-investors have to pay. If r increases, some investors with relatively low risk drop out, leaving the bank with a more risky portfolio. Until the effect of the rising interest rate exceeds that of the increased probability that loans will not be repaid, the yield for the bank will increase. However, at some point, it will start to decrease, when the quantity of loans granted and not repaid will result in a loss greater than the increase in revenue from higher interest rates on repaid loans. Once they reach a minimum, the expected gains will start to grow again because further increases in the interest rate no longer increase the already very high probability of losses.

Figure 5.5 shows the demand curves for loans, where Q is quantity from 0 to 650, and D represents demand loans in the case q_i , while D^* denotes demand for loans in case q_i^* .

The last step, now, is to add the loans supply, and examine cases where there is or there is not credit rationing.

The equilibrium of the credit market without any rationing, even in case of imperfect information, is 300 loans offered and demanded at 3.2 % unitary yield

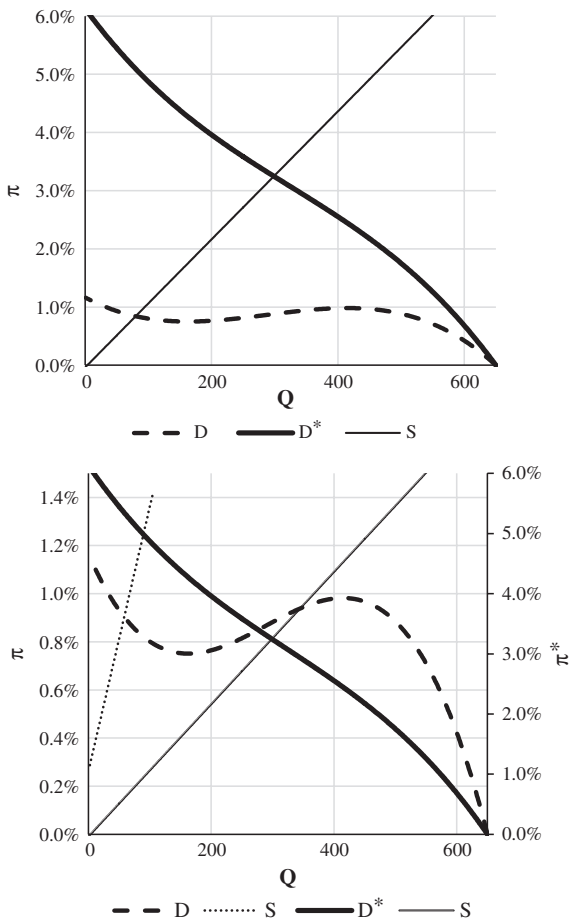
Fig. 5.5 Demand of loans function of the bank's yield



(corresponding to 8 % interest rate). This is the crossing point between D^* and S in Fig. 5.6. This equilibrium avoids any rationing because at 3.2 % yield (8 % interest rate) there is not another level of demand for loans.

The condition depicted by D and S is completely different. With a more risky portfolio or with risk aversion, the equilibrium of some 70 loans demanded and offered is situated at a unitary yield of 0.9 % (interest rate 18.5 %). Credit rationing occurs because at the same yield 0.9 % and interest rate 18.5 % there are other possible demand levels. In this exercise two: 300 (the same as in the case without rationing), and 500. These higher quantities of loans are not spontaneously reached. The only possibility to avoid credit rationing requires an even lower—or conversely much higher—supply function. The first is the case of almost completely lacking credit supply because banks do not have funds and nobody is rationed; loans are simply very scarce and at a very high cost. The second case occurs when the bank has funds at low cost, such as, for example, in the period of exceptionally strong liquidity in the U.S. before the financial crisis showed its first signs in the summer of 2007. In this second case, the interest rate is so low that even borrowers at low risk apply for loans, and thus balance the presence of high risk or opportunistic loans. Banks, on the other hand, have so much liquidity in this scenario that they have every interest in granting whatever loans are requested.

Fig. 5.6 Credit market



Between these two extreme cases lie all those situations where credit rationing takes place. Interest rate levels are *not able to exclude nor to balance* the presence of opportunist loan applicants. In this case, if the loan supply is lower than demand and the interest rate increases, the return to the bank can easily decrease and not increase. By increasing the interest rate, in fact, less risky borrowers and less opportunists come to the fore, and the number of those who are less likely to pay back their loans increases. By increasing the interest rate, therefore, the bank does not raise the supply. Rather, it decreases it.

In this intermediate case, when credit rationing occurs, there is nevertheless the chance to avoid it. Credit rationing disappears when the bank is *risk-neutral*. In this case, the crossing point between S and D*, as seen, will be at 300 loans, 3.2 % yield, interest rate 8 %.

There are then two crucial questions that arise. What does the attitude towards risk depend on? Is it possible to identify the environmental and subjective conditions that allow an actor (the bank) to take risks *as if it were* risk-neutral?

5.2 Risk Taking

The conditions that shape the ability and willingness to implement risky activities have been studied extensively in different domains: individuals and families, small firms and large firms (domestic and multinational), in financial and insurance operators, and others. Research results are different in the different fields and some issues are still controversial. One example is the question whether competition drives operators to take more risks or to avoid risk.¹ However, some conclusions tend to recur, indicating that they probably capture some firm points.

5.2.1 Stylized Facts

Attitudes towards risk are context specific, based on economic and regulative aspects, and they also depend on historical, cultural, and anthropological conditions. All things being equal, a *pluralistic environment* with many agents engaged in different activities promotes more risk-oriented behavior compared to a more *homogeneous environment*. There are two effects of diversification on risk-taking. The first is a portfolio effect. The availability of diversified investment opportunities or activities can reduce the level of risk across all agents and thereby increase the possibility of pursuing very risky activities (Goetz 2012). The second effect stems from the fact that the inclination to take risks depends on familiarity with the issue at stake. This is probably the reason why a wealthy person may feel comfortable in taking financial risks, having had many opportunities to become familiar with different kinds of market risks and learn how to cope with them.² An environment in which diversified activities are ongoing, provides an opportunity to examine and learn from varied experiences. In an environment like this, a specialized agent (a bank) may discover better opportunities and avoid certain difficulties and may thus be more willing to take risks than an agent in a more homogeneous context.

¹ In the financial field, «until recently, the general consensus among policy makers and researchers has been that market power gives banks proper incentives to behave prudently. [...] In recent years, however, several theoretical and empirical studies have challenged the view that monopoly power mitigates bank risk taking, instead arguing that higher competition among banks leads to lower levels of bank risk. [...] The competition-bank risk taking nexus has been extensively analyzed in the theoretical banking literature. The predictions emerging from the theoretical models are ambiguous, however» (Kick and Prieto 2013, 1).

² This explanation seems much better than the traditional hypothesis of diminishing marginal utility of wealth (Rabin 2000).

This account contributes to the debate on the merits of diversification. In the Jacobs frame, in fact, more diverse industrial activities in close proximity foster opportunities to imitate, share and recombine ideas and practices across industries. The merits of specialization also form part of the debate. In the Marshall, Arrow, and Romer model, knowledge spillovers only occur among firms of the same or similar industrial sector. Beaudry and Schifffauerova (2009, 318–319) find reasons to believe that while diversification and specialization lead to both positive and negative effects, the negative effects related to diversification are generally less serious than those associated with specialization. Another review finds methods of reconciling specialization and diversification by considering specialization a way to diversify (Boschma and Frenken 2011, 297).

5.2.2 From Tautology to the (Likely) Right Approach

Applying these observations to our problem of getting out of the trap through credit and risk-sharing, however, we fall into a *tautology*. If the way out of the trap requires diversification and the trap itself arises from a lack of diversification, this way out would actually presume that there was no trap. We defined under-valorized areas in opposition to valorized ones, precisely indicating that in valorized areas there are no traps preventing resources from being exploited. We outlined that this was because their transfer from less productive to more productive uses takes place continuously because the manufacturing base has a wealth of diversified activities and it is easy to disinvest and reinvest.

However, the idea that one activity helps another through risk sharing, and learning about the true extent of the risk, is still useful as it can be declined in a dynamic sense, i.e. through an innovative process that develops *in steps*.

It is thus necessary to adapt the model presented in Chap. 4 in order to make it less simplistic.

5.3 A More Complex Trap Model

5.3.1 By Way of Experiment

The simple model previously described configured only actions taking into account *all* the costs of organization adaptation. For greater realism let us dismiss this hypothesis and assume that innovation (a way out of the trap) can occur through a process that is *unsure* and made up of *small steps*, by way of

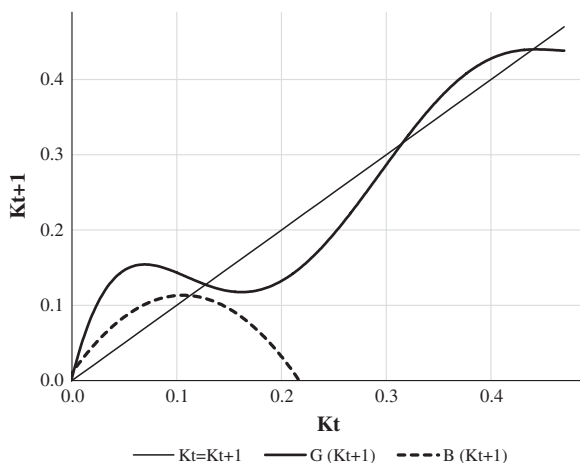
experiment³ in a *separate venture* supporting only limited costs in adapting its organization. This “strategic niche management (SNM)” was frequent in innovation processes as it is able to facilitate «innovation journeys [...] by creating [...] protected spaces that allow the experimentation with the co-evolution of technology, user practices, and regulatory structures» (Schot and Geels 2008, 537; Seravalli 2011). These experimental steps may or may not be successful. If they are successful, the result will consist in risk reduction in the subsequent steps. If they are unsuccessful, there will be a loss. This will reduce the savings available to make risky investments, and will be a defeat in the ongoing conflict against those who do not want change.

Let us go back to our example of graduates in mathematics taking badly-paid jobs in teaching, who could be better employed to support innovative activities in firms. Owing to the high costs of adaptation and conservative drags, as we saw, the mathematics graduates cannot move from the traditional to the modern sector if not in large numbers in order to make *sure* that positive externalities are able to balance the costs and the resistance to change. It seems realistic to assume, contrary to what we established in the simple model presented in Chap. 4, that it would be fairly easy for a single firm to hire a single graduate in mathematics as an experiment by implementing a *separate* organizational space. If it succeeds, additional earnings are created that can be saved and used in part to fund some other experiments in recruiting mathematics graduates. Moreover, this would be a small but significant victory for those who, in the Academic Senate, opposed the reduction of resources for the faculty of mathematics. Lastly each step teaches something to both worlds, business and university. What has been learned in one step allows another step to be taken. We could even assume that the first experiments give rise to an *ex post* advantage for firms, even if they go wrong, because graduates in mathematics are in any case smart people able to repay the wages that they earn even if they are not optimally employed, and because adaptation cost are very low. However, when several experiments do not succeed, a step backwards follows as there is an economic loss to be absorbed. The step backwards is a victory for conservatives. The effect of good or bad luck would be neutralized when experiments have allowed the learning process to be completed and a certain number of graduates has been successfully employed in the firms.

This new set up of the trap frame essentially corresponds to Acemoglu and Zilibotti’s model (1997) that we have already used in the Appendix of Chap. 2, in relation to size and growth in European cities. This model leads to a way out of

³ This term we use taking it from the Republic of Venice history. The “Serenissima” adopted this strategy continuously for centuries (from the fourteenth century to the end of the eighteenth) in regimentation of waters, constant threat to the lagoon always not completely understood despite continuous studies, and coined this expression. By way of experiment assumes the significance of tentative suspension of interpretations established to allow something new, even if apparently senseless, being made very clear by “La Magistratura delle Acque” (waters’ Authority) that these rules and interpretation were by no means abolished nor superseded (Bevilacqua 1998, 42–44).

Fig. 5.7 The Acemoglu-Zilibotti model's trap



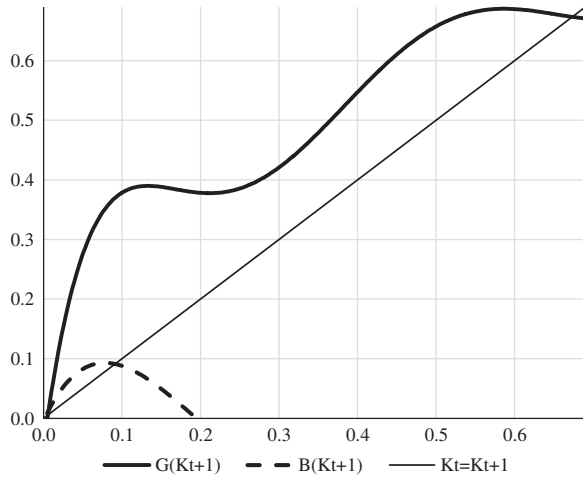
the trap of resource under-valorization that avoids the shortcomings of the other ways out. The results of the model are fundamentally linked to three assumptions, already pointed out in the Appendix to Chap. 2. These are: (1) savings can be used to make risky investments that have higher expected returns or to buy a safe asset with a lower return; (2) different projects, made possible by risky investments, are imperfectly correlated; (3) the allocation problem is not trivial (all agents invest an equal amount in all projects and diversify all the risks) because there is a minimum size requirement for each of the projects that entails a trade-off between insurance and high returns. Taking the Acemoglu and Zilibotti suggested values of the parameters (Acemoglu and Zilibotti 1997, 729) and the risk aversion assumption (Gancia and Zilibotti 2005, 156), Fig. 5.7 can be obtained showing the stock of the economy's capital dynamics.

In the figure, $G(K_t + 1)$ and $B(K_t + 1)$ denote the stock of capital at time $t + 1$ in case of “good news” and in the case of “bad news”. At the very beginning, the ease of the first experiments allows capital growth in any case and—obviously—higher capital growth in case of good news. Soon enough, however, in case of bad news, the growth stops and a stable steady state is settled (at around $K_t = K_t + 1 = 0.12$). This is the trap caused in this model, as in the previous credit rationing model, by the combination of risky investments and risk aversion. But now a way out of the trap emerges clearly.

5.3.2 Increasing Risky Investments' Return

The way out of the trap is provided by *increasing the difference between a risky investment's return and a safe investment's return*. With this move, we obtain Fig. 5.8 (where that difference has increased from 0.1 to 0.2).

Fig. 5.8 The way out of the trap



Below $K_t = 0.09$ the economy will surely grow, between that point and $K_t = 0.2$ it is still exposed to fluctuations and set-backs depending on good news or bad news. But the trap is eliminated. Despite the fluctuations, the economy can reach the point $K_t = 0.2$, where the take-off beyond which the bad news no longer has effects is situated.

5.4 The Policy Design

In conclusion, there are three results concerning the policy design required to get out of the trap of under-valorized local resources.

1. Intervention should not entail direct public involvement in starting and managing productive activities nor should it entail providing boundless grants and incentives to private agents. Often this policy (big push) produces perverse behavior that makes rents permanent due to public intervention.
2. Wage reduction is not a good approach. If forced, it may lead to negative consequences on productivity and on the over-exploitation of renewable resources.
3. Intervention should be designed with the goal of increasing the difference between the net return of new risky activities and the safe return of traditional ones.

5.4.1 Emerging Directions

Increasing the net return of new activities in relation to that of safe traditional ones requires new activities to be selected carefully. They must be the most promising of the pool. This sounds like a strong argument in favor of the main peculiarity of

place-based policy. Effective selection requires deep understanding of the local situation and its opportunities. People are needed with different experiences, external to the local reality, who are able to identify which option has greater trade value.

The ability to choose the most promising project, however, is not very realistic. The outcome of any new project is uncertain. If it were not so there would be no traps to deal with. The inevitable consequence of uncertainty concerning the revenue of innovative projects (while there is no uncertainty about the revenue of traditional activities) weakens this approach.

It leads one to use *cost* as the lever rather than selection. The cost lever is probably more effective, since selection is always subject to uncertainty. Public policies should aim primarily to reduce the *value* and *uncertainty* of the cost of new activities in order to support the difference between their expected uncertain revenues and their expected costs. Policy makers should provide public goods and services selected from those *best able with certainty to reduce costs* to whom is engaging in new activities.

This formula contains two directions and suggests a reflection.

- On one hand, the very common indication concerning local *specific* public goods is confirmed. In our example of mathematics graduates, they will consist in infrastructures and services for dialogue and collaboration between universities and business, which, for instance, the “triple helix model” insists on.⁴ Services for start-ups will also be useful, imagining that especially new businesses, rather than old, will be capable of making innovative choices even in staff recruitment.
- On the other hand, a strong indication emerges in favor of local public goods and services of *general utility*: health, security, justice, housing, school, transport and communication.⁵ There are two reasons why these services, if

⁴ There exist even an international triple helix association. «The Triple Helix Association intends to promote analyses and studies on the interaction between universities, firms and government aimed at translating academic models into practical achievements also by supporting international exchange of scholars, organizing international symposia of relevant scientific interest and assisting the education of students, scholars and practitioners in its areas of interest». (<http://tha2013.org/tha/index.php/tha/index/pages/view/triplehelix>).

⁵ Some contributions (Kemmerling and Stephan 2002, 2008; Psycharis et al. 2012), find, indeed, a positive relationship between general public investment and growth of local production activities. «Several key empirical findings emerge from our analysis using a panel of large German cities for the years 1980, 1986, and 1988: public capital is a significant input for local production [...], evidence of an endogeneity bias of [public] capital estimates in a production function framework as well as evidence of reverse causality running from output to [public] investments is weak» (Kemmerling and Stephan 2002, 422). «We study the determinants and productivity effects of regional transportation infrastructure investment in France, Germany, Italy, and Spain. [...]. The evidence shows that road infrastructure positively contributes to regional production» (Kemmerling and Stephan 2008, 1). «Using a new database of public expenditure per region for the period 1978–2007, it proposes a model which captures not just the impact of public investment in Greek prefectures, but also the spillover effects related to the existence of externalities from neighboring regions. The results point to a positive long-run impact of public investment per capita on regional economic growth—but not on convergence—which also generates considerable spillover effects» (Psycharis et al. 2012, 1).

they are efficient and of good quality, serve the purpose of supporting new activities that use local resources better. The first is that agents of innovation are particularly exposed to the risk of losses since their activities may or may not go well. Thus, public welfare services that effectively guarantee against general risks (disease, crime, difficulty in finding housing and the associated cost, difficulty in finding good schools for their children, transport and communication malfunction) have a higher value for these agents than it does for agents who engage in risk free activities. The second reason is that these agents often come from other places and do not have the same network of social relations as the locals do.

- As a reflection, it might seem that in the end we are back to policies for public services recommended by the spatially-blind approach. This would be curious after presenting and following the analytical path that supports and specifies the policies of the opposite place-based paradigm.

It might seem that this is the case, but it is not. The public utility services in the spatially-blind perspective are the *basic* ones needed to contain the mobility costs of people without a job or with a poorly paid job who move in order to seek a job or a better paid job. The implicit idea is that once these general basic services have been provided, government intervention has fulfilled its task. By contrast, in the place-based perspective—here intended as measures to increase the net return of innovative activities by lowering the cost of living for innovators—the condition is necessarily *dynamic*. Required public services will grow in quantity and quality as they are used to support a growing volume and an increasing value of innovative activities. The place-based perspective also accentuates specificities in public service provision. In this paradigm they should be tailored to the specific place’s peculiar conditions and needs, whereas spatially-blind services are general and the same everywhere.

In the geography of Italian small and medium-sized manufacturing firms, the industrial district of Prato was one among the approximately seventy districts identified. In the Emilia area, for example, there were and still are various districts that have had better and even longer life. In particular, in the area of Reggio Emilia a very significant mechanical sector has grown, which has always maintained a remarkable capacity for innovation. It is interesting to note that, in Reggio Emilia and its province, we find the best healthcare system in Italy and the nursery schools are the best in Europe. Policy makers in Reggio Emilia, a rural province until almost the eve of World War II, never thought that it was part of their job to interfere in business decisions, much less to guide them. They have always thought that their job was to continue to improve public services.

This indication in favor of dynamically conceived public services emerges again in the light of the debate about “creative cities”. In fact, critical observers of fashion recipes note that there are quite remarkable mistakes made believing that it was easy to have important development results putting in place policies for the “creative city” (Evans 2009). These errors have been made neglecting the crucial importance of a good supply of public utility services, essential to the quality of city life throughout the year, focusing instead on less demanding

initiatives useful only to “creatives”. This harsh judgment might be dismissed, considering that knowledge-workers’ residential choices, in balancing classical location factors (such as education, transport, housing services), and a lively, culturally rich cosmopolitan environment, may well prefer the latter, as stressed by recent literature aroused by Florida’s (2002) book. However, Frenkel et al. (2013) conducted research on a sample of 833 people working in high-technology and financial business services in the metropolitan area of Tel Aviv to ascertain exactly what factors are to be considered the most important among the classic ones and those indicated by Florida and subsequent literature. They conclude: «[...] contrary to the conceptual postulate by Florida (2002) while knowledge workers’ lifestyle and cultural amenities are important, the classical location factors continue to be the dominant factors» (Frenkel et al. 2013, 39). It seems that to attract knowledge workers, a city government should therefore be able to provide efficient services and resist housing speculation, which will be difficult if choices geared primarily to «urban vibrant environment, cultural amenities and lifestyle» are made. The reasons are probably the ones we have mentioned. People engaged in new modern activities are more prone to taking risks and often do not have the support of traditional social relations networks. They thus derive particular benefit from efficient public services that protect them from adverse events.

5.4.2 The Political Strait of Place-Based Policies

This is indeed the most recent and authoritative indication provided by the literature, which has identified three strategies for *local* development. The first is a non-policy such as the one following the World Bank’s spatially-blind approach. The second concerns the improvement of general living conditions. The third recommends direct interventions in support of specific production activities such as «direct government grants to support any number of activities; income tax credits [...]; establishment of state-sponsored venture capital funds for new businesses generally or those in certain sectors [...]; enhanced support of university research or teaching in specific fields where commercialization opportunities are perceived to be significant; the construction and maintenance of “incubator” facilities [...]; and the provision of coaching and mentoring services for entrepreneurs» (Acs et al. 2008, 3–4). These experts understand the reasons for the third strategy and do not detract from it, but they are clearly in favor of the second.

5.5 Concluding Remarks

At the beginning of the book, we quoted Rodrick’s essay: *Goodbye Washington Consensus, Hello Washington Confusion*. This title indicated the failure of a powerful widespread recipe to support economic growth, as well as the death of

shared proposals that ensued. One suggestion emerged: keep a humble attitude by giving up the idea of one single recipe, and adopt a case-by-case approach. At the end of the book, we quote another essay title mentioning consensus: *Entrepreneurship and Urban Success: Toward a Policy Consensus*. This essay is a “manifesto” propounded by ten academics from several American and Canadian universities (George Mason, Harvard, Ewing Marion Kauffman Foundation, Pennsylvania State, Carnegie Mellon, Syracuse, Rotman School of Management Toronto). We can probably say that there is something more than the disarming “confusion” reported by Dani Rodrick. A new consensus is perhaps emerging, no longer based in Washington. It does not propose a new recipe, recognizing that «there are no silver bullets or one-size-fits-all policies». It supports a place-based approach, recognizing that local and external forces should interact and design interventions tailored to their context. These interventions need to provide public goods and services of general utility with the aim of sustaining the *net* returns of innovation.

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