Technology policy that is effective has to be very cognizant of the political and organizational context in which it is located.

The nature of the contract failures that affect technology acquisition are quite different, and each problem potentially has multiple solutions.

The policy response that is most likely to work depends on at least two things:

i) What is or are the most important types of contracting failure that is/are blocking the development of competitiveness in particular sectors or in general

ii) What type of policy design responding to that particular problem is most likely to be effectively implemented (in terms of the conditions required for success) in the political and organizational context of that country.

Technology and industrial policy has failed in the past because of either or both reasons.

Growth strategies inevitably create rents, and they are subject to two distinct types of problems:

i) the strategies may be creating rents that are not relevant for solving the particular constraint that is important,

ii) the strategies could in theory be creating the right incentives but their implementation in that particular context is constrained by political interests.

The first is easier to discuss analytically but even here there are important issues that do not have consensus: there are different market failures and their relative significance can be debated, and moreover their relative significance can vary across countries.

The second is more difficult because it depends on the relative power of economic, political and bureaucratic organizations that may not be well understood in the country, and may also be changing over time.

There are a number of important contracting failures that affect technology adoption and the achievement of competitiveness.

While all of them ultimately involve rents for firms developing capabilities, the types of rents, the conditions under which they are allocated, the monitoring requirements and the withdrawal conditions are obviously different.

If the primarily problem is private failures to invest in formal skills, the answers are quite different from one where the problem is private failure to invest in discovery or other first mover disadvantages, or as I believe is often very critical, where the
problem is that entrepreneurs and managers do not have the organizational capabilities to manage modern competitive production and risky investments have to be financed in building organizational capabilities based on learning-by-doing.

More is known about the other market failures so let me focus on the organizational capability development problem: investment in acquiring tacit knowledge through learning-by-doing exposes outside investors to considerable risk and the investee often has poor compulsions and incentives to raise competitiveness through continuous effort in internal experimentation. Indeed, in many poorly designed programmes the incentive may be adverse: the achievement of competitiveness results in a loss of the rents and exposure to intense market competition. In a context of uncertainty and satisficing behaviour by firm stakeholders, the result could be the expenditure of effort in maintaining the rent rather than in raising competitiveness through investment in costly and risky internal-to-the-firm experimentation.

So the first problem is understanding the nature of the economic problem and the conditions required for its solution.

The second problem is that the economic problem may itself have multiple solutions, each with particular implementation conditions, and with a different allocation of rents across organizations and different rent evaluation and management conditions. So a policy based on tariffs is different from one based on preferential bank credit and so on.

Countries are different in terms of the relative organizational and bargaining power of the different types of economic, political and bureaucratic organizations that are likely to be affected by the policy in question. A successful policy targeting the textile sector is likely to look very different in a country where the textile sector is an important source of political rents and textile owners are politically powerful, relative to a country where the textile sector is marginal in the overall competition over rents, and is different from one where it is important but it is already quite competitive and so on.

We need to have a good map of this network or organizational power, which includes the capability and power of the agencies managing the policy, before the likely implementation success of a technology policy can be assessed. I describe this macro-distribution of power as the political settlement.

What this may mean is that either policy-makers should decide to avoid certain sectors in certain countries, or they will need to work particularly hard to ensure that the evaluation and exit conditions required for the success of particular strategies can be met.

This is where flexibility comes in. Flexibility is a particular requirement in polities where political constraints are complex and policy implementation may be blocked by diverse interests.

The most difficult cases are where flexibility has to be achieved in contexts where powerful interests are likely to be successful in capturing policy-induced rents and protecting them, as this makes the process ‘inflexible’.
Can organizational processes be designed that are flexible in these contexts?

Flexibility can mean:

i) Flexibility internal to the agency: The design of internal incentives and rules for agencies guiding industrial policy can be changed in response to observed results (what will work depends on the nature of the financing the agency delivers).

ii) Flexibility in the relationship of the agency to its investees: the agency itself acts flexibly in trying different strategies to achieve specified goals (it helps if these are clear). What works here depends on the contract failure the agency is aiming to address and the relative power of the different organizations affected by the rents created.

iii) Flexibility of policy-makers in trying out different agency structures and policies to address the capability and competitiveness constraints, including attempting to target different sectors and technologies.

In the typical developing country where the ruling coalition is weak and has a short time horizon, it is difficult for agency leaderships to get support for internal enforcement and external experimentation and easy for investees to make the short-term political alliances that can protect rents. Here, the quality of leadership of particular agencies can be quite critical.

Developing countries need to understand the structure of the problem, but also look very carefully at experiments that worked or partially worked in similar political contexts. I suggest a number of steps that can limit the risk of being locked in inflexible processes.

a) Analyse the political settlements as much as is possible: previous experiments of industrial and technological policy and why they failed give useful insights. This can limit the range of experiments that should be tried and focuses possible experiments in areas similar to those that worked elsewhere: Of course this may result in a Type I error of the Sah and Stiglitz terminology where we reject some experiments that may have worked so some bigger and richer developing countries should experiment in more ambitious ways, but smaller countries or poorer countries need to avoid Type 2 errors where they are stuck with experiments that do not work, particularly if there are also likely to be exit costs for closing down programmes.

This can inform the design of policies that aim to address particular contracting failures affecting technology acquisition: the policy needs to structure the incentives to solve particular market failures but also in a way that is least likely to be captured.

b) For a similar set of reasons, it is better to start with very small scale trials.

c) The political context gives the background information for deciding on the agency structure of the agency leading technology policy support that is likely to work: should it be working closely with the prime minister or president’s office, should it be...
relatively autonomous but operating with the informal support of the leadership? It also tells us the relative organizational power and political links of different types of firms and therefore the likelihood of enforcing the precise conditions that are necessary for making a particular policy work: so policy and target need to be iteratively determined as well.

Focus on building policy implementation capabilities of well-defined agencies tasked with following through on monitoring, adaptation and if necessary suspension of the programme under guidelines that are clear. However, simple rule-following behaviour by these agencies will not be sufficient: the personnel here have to interpret the data on outcomes and adapt and modify the policy, and this is why the focus on capacity in this narrow and agency-specific sense is likely to be important.