Fiscal Policy as an Instrument of Investment and Growth

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Abstract

This paper investigates the role of fiscal guarantees in promoting infrastructure investment. Infrastructure is a critical driver of economic growth, but infrastructure entails significant up-front costs that yield benefits after a time lag. Investors hesitate to put their money down on private infrastructure ventures because of the long lag and governments do not give guarantees for reasons of fiscal prudence. The paper argues that governments and large investment guarantee agencies can in many situations give suitably-calibrated guarantees to private projects by exploiting the fact that a guarantee on one project can reduce the risk of another one failing. The paper works out the architecture of such guarantees, which can be fiscally prudent and yet boost investment, especially in infrastructure, and thereby promote growth.

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Fiscal Policy as an Instrument of Investment and Growth\textsuperscript{1}

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1. **Preamble**

In December 2009, from a life in the ivory tower of research and academe, I was plunged into the chaotic and turbulent world of policy making and politics. In 2012, I moved from Delhi to Washington, where I continue to inhabit the world of policy. My plan is to develop this lecture from the dual perspective of research and policy. After entering the world of policy, I became convinced of the accuracy of John Maynard Keynes’s celebrated observation that, in the long run, the world is shaped more by the ideas and beliefs that people carry in their heads than by their vested interests (Keynes 1936). This was not just a self-serving comment of a researcher, but a profound statement about the world. As such, I believe that the long-run fate of the Indian economy is determined much more by the deliberations, discussions, and writings of scientists, philosophers, and thought-leaders and by bodies like the Indian Econometric Society than those in charge of day-to-day policy making. The policy makers are of course important, but what they do is largely determined by the thought-leaders of the past. So let me congratulate the Indian Econometric Society and its office-bearers and functionaries on the Golden Jubilee of the Society for its immense contributions to the nation and, more generally, to the world of ideas.

During the past five years, I have been increasingly drawn to the interface between microeconomics and macroeconomics. I believe that we have not drawn enough on the analytical strengths of microeconomics and the larger, real-world concerns of macroeconomics. Microeconomics tends to be too inward-looking and macroeconomics too unfussy about logical foundations. I hope to make some amendments for this in this lecture.

The aim is to bring analytical economics to bear on some of the central economic policy challenges faced by virtually all emerging economies and certainly by contemporary India. Usually the policy maker’s perspective is one of empirical economics, based on a lot of data and evidence. In this lecture, however, I want demonstrate the role of economic theory in making policy. I have argued elsewhere that in our zeal to found our decision making better on
evidence, we have tended to ignore theory and analytics excessively. Just as policy ought to be evidence-based, it also should be reason-based. Economics would not be the discipline it is today if it were not for the major theoretical breakthroughs of the past three centuries.

The main feature of the Indian economy that stands out over the past decade and a half is the surge in the GDP growth rate, alongside the rapid globalization of the economy. In order for this growth to be sustained, India may now need to focus more attention on domestic supply constraints to growth—as is the case for many emerging markets. The period of globalization may be reaching its limits and with much openness ensure, one key for success is to ensure the efficient and secure delivery of goods and services to market. This requires quality infrastructure and quality logistics services to support the transport of goods and services. Both the private sector and the public sector will need to collaborate in order to attend to the vast infrastructure gaps that India now faces.

We pay lip service to PPPs or public-private partnerships, without attention to detail. This partnership between the private and public is however fraught with risks, because it is like bringing two very different animals inside the arena. If the design of incentives and boundaries of action are not well-specified, PPPs can be a disaster, with one side draining the other or totally stalling its functioning. Remember, crony capitalism is also a form of public-private partnership.

2. The Drivers of Growth

This lecture addresses a specific topic concerning the interaction between the government and the private sector, in particular, the role of fiscal guarantees in promoting infrastructure investment. Infrastructure is a core ingredient of economic development. But infrastructure entails incurring significant up-front costs that yield benefits after a long time lag. Private investors worry about putting their money down on private infrastructure ventures. In this paper, I shall draw on actual policy conundrums, a large general literature, and two of my
recent papers (Basu 2012; Basu and Stiglitz 2013) to analyze the role of the state and its fiscal instruments in facilitating infrastructure investment and, hence, economic growth.

For emerging economies to take off and have robust growth, there are many prerequisites—good fiscal and monetary policy, good governance, a culture of trust and respect for contracts in society, an educated and healthy labor force, and much else. All this has been written about and researched. The triggers of growth have been debated and discussed at length.

All these topics arise in the context of India. The question has been posed time and again: Can India sustain the rapid growth that the nation witnessed from 1994 and especially from 2005 till a year or two ago? Much has been written in general on this subject and many factors will come into play. But I shall here focus on one critical input for high growth—fiscal policies for higher infrastructure investment, which is a vital ingredient and has roots in the theory of growth, going back to Harrod, Domar, Solow, and Swan (see Solow 1970). The link between investment and growth in the case of India is quite visible to the naked eye, without need for fancy econometrics, but with a little help from moving averages. Figure 1 plots India’s investment rate, or more precisely, gross capital formation, and the five-year moving average of annual GDP growth. It is evident that the two graphs track each other very well, quite in keeping with the Solow model. We do know that once a country industrializes and labor becomes a binding constraint, this relationship no longer holds. Further, once the investment rate becomes very high, for instance, well over 40 percent, the returns to investment fall sharply. But clearly, India can still work on raising its investment

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2 The World Bank’s next World Development Report is on the social and behavioral foundations of economic development and will stress the role of culture, mind-sets, and beliefs in promoting growth.
3 See, for instance, Bhagwati and Panagariya (2011); Dreze and Sen (2013). Even the theoretical literature recognizes the link between monetary and fiscal policy and investment and growth (see, for instance, Aghion, Farhi, and Kharroubi 2012).
4 See Basu 2008; Ahluwalia 2011; Government of India 2012.
5 A detailed empirical study (Iarossi 2009) of 16 states in India shows that infrastructure is the most important constraint for enterprise and growth.
rate by another 4 or 5 percentage points and expect to get a major boost to growth.

**Figure 1: Growth and Investment in India, 1966–2012**

![Graph showing growth and investment in India, 1966–2012.](image)

Source: Author’s elaboration, based on data from the World Development Indicators.

The story of what happened behind the two graphs plotted in the figure has been told many times (see, for instance, Basu 2008). The question must now turn to how India can boost investment and, in particular, infrastructure investment by another, say, 5 percentage points. Clearly, this will involve both the private sector and the government. Fiscal support for the private sector in building up investment and infrastructure is a path fraught with risks. If one incurs excessive deficits, a crisis can cause the debt-GDP ratio to spiral upward, as observed in several Eurozone countries in recent years, and this could threaten a crash. If one is excessively cautious, then the country can remain trapped in a state of stagnation. The next section spells out the challenges for all emerging economies about to get on the turnpike.
Recent news from Turkey about the Turkish Treasury being prepared to extend state guarantees to promote mega infrastructure projects makes the analysis that follows of some topical interest. Contrary to the standard knee-jerk reaction that such guarantees evoke—they are all bad or all good, the paper argues that the goodness depends critically on the architecture of the guarantees. The paper may be viewed as an exercise in spelling out how to do this right.

There are lessons in this analysis that go beyond individual national governments to multilateral financial authorities (Villanger 2004a) that are in the business of giving guarantees and providing insurance, such as the Multilateral Investment Guarantee Agency (MIGA) of the World Bank Group. MIGA provides insurance to try to encourage foreign direct investment to flow into emerging economies. MIGA often enters into areas with a lot of risk, but its entry acts as a signal and can have multiplier effects. What the analysis that follows, especially in section 4, shows is that the riskiness of a project can be dependent on what other projects are initiated. But choosing appropriate clusters to start together, risk can be mitigated, making it easier for MIGA to provide insurance and lowering the premium for insurance and thereby making it more attractive to the country trying to attract Investment.

3. Triadic Interactions, Government Guarantees, and Infrastructure

The crux of growth is investment and, in particular, infrastructure investment. A critical question that faces India at a crossroads is how to step up infrastructure investment and boost infrastructure growth (Singhi and Malhotra 2012). Recognizing that this is more a matter of financing than bricks and mortar, the Indian Planning Commission has set a target of one trillion dollars of infrastructure investment during the 12th Five-Year Plan, 2012–17, with about half of this to be raised from the private sector. It is clear, however, that the success of raising this substantial sum will depend a lot on the government’s

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policy. Should the government get involved in raising private sector money for this or should it follow a hands-off policy? Should the government give guarantees or comfort letters\(^7\) to investors considering an investment in infrastructure? We do know that such guarantees facilitate investment greatly, but of course they also place a responsibility on the government. Minimally, they tend to raise a country’s debt ratios in the short and medium term, even though they can, by raising growth and revenue, eventually lower these ratios. This is a subject that has been heavily debated in India and abroad; the present paper tries to shed new light on this.

When trying to undertake large investment projects, reckless governments often used to give guarantees to investors, which would, in effect, assert that in the event of the project going bankrupt, the government would pay off the investor. Experience shows that when a government (with the ability to print money) gives a guarantee, investors come in *en masse* to put their money into projects. However, we have come to learn that this may not be such a good strategy for governments. Giving such a guarantee may do nothing to the government’s fiscal arithmetic immediately, but it amounts to undertaking future fiscal expenditure. Since there is always the probability that such a guaranteed project will go bankrupt in the future, each such guarantee amounts to a certain additional expected expenditure by the government in the future. Hence, such guarantees, given recklessly, can lead to unsustainable fiscal deficits in the future with all their attendant problems, such as inflation, collapse in investment, and, ultimately, economic recession. India’s fiscal history, originally noted for conservatism, became profligate in the late 1980s. Since then, it has been on a path of consolidation with occasional lapses (for a brief account, see De 2012). One way in which these lapses occur is by giving future assurances, which do not show up on paper immediately.

\(^7\) We know, in retrospect, that it is foolish to draw too sharp a distinction between a guarantee and a comfort letter. Under certain legal interpretations, a comfort letter becomes like a guarantee. It is not surprising that in raising investment a comfort letter from the government is so effective (Reddy 2002). For my argument here, the distinction is however not important. All I want to show here is how there are situations where giving multiple guarantees is less onerous on government than giving a single guarantee.
For this reason, governments were repeatedly warned by international standard-bearers not to give guarantees to investors, especially for private sector initiatives. While this warning is a valid one and governments ought to heed it, there are circumstances where some strategic and well-designed guarantees or comfort letters from the government can be desirable in the overall interest of the nation. This can happen in a buoyant nation on the verge of a takeoff considering an expansion in a number of infrastructure projects. In brief, what I am arguing here is that we may have been excessively cautious in terms of granting government guarantees. Designed in an intelligent way, government guarantees can boost investment in infrastructure and encourage growth without causing government finance to spin out of control. Arguments for specially-designed systems of joint liability to boost overall economic welfare have been used in the context of the current Eurozone crisis (Schafer 2011; Basu and Stiglitz 2013). In this paper, I produce an argument in the context of domestic policies to boost infrastructure investment.

The simple overarching argument is the following. When designing most policies, we think in dyadic terms—that is, in terms of two agents interacting, whereas a lot of mileage can be had from utilizing the inherent triadic nature of some economic transactions (Basu 1986, 2000; Hatlebakk 2002, 2011; Villanger 2004). This may be pictorially represented as follows:

![FIGURE 2: Triadic Interactions](image)

**L**

**E**

**G**

**Lender**

**Entrepreneur**

**Government**
Suppose a lender and an entrepreneur have a bilateral or dyadic relation, whereby the lender lends money to the entrepreneur’s new firm and the entrepreneur promises to pay back, subject to a limited liability clause. The limited liability means that, if the project is demonstrably successful, the entrepreneur has to pay back; otherwise, she can plead bankruptcy. This relation will often be inefficient and suboptimal. However, by utilizing the power of a third party, such as the government or a powerful multilateral financial authority, all can do better. What follows is a simple model to illustrate this.

Suppose there is an entrepreneur, $E$, who needs $B (> 0)$ for an investment. If the project succeeds, it yields a return of $f(B)$. The probability of the project succeeding, however, is $\frac{2}{3}$. Further, if the project succeeds, there is a $\frac{1}{2}$ probability that the success will be visibly demonstrable and $\frac{1}{2}$ probability that it will not, in which case the entrepreneur can abscond with the money. In other words, the probability of having a state of the world where the project fails is $\frac{1}{3}$; the probability of having a state of the world where the project succeeds and this is demonstrable is $\frac{1}{3}$; and the probability of having a state of the world where the project succeeds but this is not demonstrable and the entrepreneur can abscond is $\frac{1}{3}$.

Assume the lender, $L$, is a competitive agent who simply wants to ensure that she can recover the money she lends.

Assume that the following condition holds:

$$\frac{2}{3} f(B) > B > \frac{1}{3} f(B).$$

Then the project as a whole is viable since $\frac{2}{3} f(B) - B > 0$.

It is now easy to see that between $E$ and $L$ no bilateral deal will take place. This is because if $L$ lends $B$ to $E$ at a zero interest rate, her expected return is $\frac{1}{3} f(B)$. Since

$$\frac{1}{2} f(B) - B < 0,$$
the lender will not lend.

Now suppose there is a government, $G$, that can verify if the project has actually succeeded and has the power to prevent people from absconding. $G$ offers a guarantee to the investor or lender, $L$, that if $E$ does not repay the money, $G$ will repay it. Now, if the borrowing takes place:

$$E’s \text{ expected earnings: } \frac{1}{3} f(B) - \frac{1}{3} B$$

$$L’s \text{ expected earnings: } B - B = 0$$

$$G’s \text{ expected earnings: } -\frac{1}{3} B$$

Hence, their total income is $\frac{1}{3} f(B) - B > 0$.

They are, collectively, better off. If the government wants this to be a fiscally neutral deal, it can charge the entrepreneur $\frac{1}{3} B$ for the standing guarantee. In that case, $G$ earns 0, $L$ earns 0, and $E$ earns $\frac{2}{3} f(B) - B$.

There are some implicit assumptions about the government’s power structure and reach that underlie this exercise. If the government were one monolithic organization, the same outcome could be reached more simply by the government playing the role of both verifier (to check if the entrepreneur is hiding the project’s success) and enforcer of the contract. But the judiciary and the executive are often separate and there may be other good reasons for that.$^8$

This simple model can be made more sophisticated by bringing the entrepreneur’s effort into the model and allowing for the fact that the probability of success depends positively on the entrepreneur’s effort (see Basu 1989). We can then do without the category of states of the world where the project is successful, but this is not demonstrable.

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$^8$ It is also implicitly assumed that the entrepreneur does not have enough up-front money to self-finance part of the project but can get into a state-contingent agreement with the government to pay the government if the project succeeds and otherwise not pay anything.
4. Fiscal Guarantees and Coordination

Among infrastructure projects, there are typically a lot of positive externalities (see Murphy, Shleifer, and Vishny 1989; Paternostro 1997; Oh 2011; Government of India 2012). The new road that will be operated by a toll system is more likely to be successful if the residential township at the end of the road is constructed; and the residential township being contemplated by the developer is more likely to be successful if the road gets built. The government, by giving some carefully orchestrated guarantees to investors, can ensure that all these projects will come to fruition, thereby raising the probability of success of all these projects. The fact that government investment often leads to greater private investment, especially in low-income countries (see, for instance, Eden and Kraay 2014), is indirect evidence of this being true. What follows is a simple model that draws on Basu (2012) to illustrate this idea.

Let us suppose that there is a set \( X \equiv \{1, \ldots, n\} \) of \( n \) potential infrastructure projects. Each project is run by an independent private entrepreneur. To undertake the project entails an up-front cost of \( C (>0) \). The project will yield results after a longish time. If it succeeds, it gives a return of \( S \) and if it fails, it gives 0.

Let \( p \) denote the probability of this project succeeding. I shall assume that the probability of success depends on how many projects in \( X \) are undertaken. If \( m \leq n \) projects are undertaken, then the probability of success is given by \( p(m) \). It is possible to argue that, quite apart from its dependence on \( m \), \( p \) could vary merely by the fact of government giving a guarantee. Suppose an international investor puts money in a private Indian firm building an airport. The investor, who has little legal jurisdiction—certainly not one without considerable cost—in India, could face a high risk of default. I am assuming that the investments that are made take the form of nonrecourse loans (Basu 2010). If, instead, the government of India gives a guarantee, then by virtue of the government’s power, the probability of default could decline. This is broadly the idea that was pursued.
in the model in the last section and will be left out of the analysis in the present section.

The complementarity between these infrastructure projects is captured by the assumption:

\[ p'(m) > 0 \quad (1) \]

Hence \( p(1) \) is a low-valued number in the interval \([0,1]\), denoting the probability of an infrastructure project succeeding when it is a solitary project. But if all projects are undertaken, the probability of each project succeeding, \( p(n) \), is a higher-valued fraction.

As explained earlier, these are large projects and \( C \) is a very large sum of money. Entrepreneurs do not have this kind of money to invest. So they turn to private investors for “angel” or “start-up” money. It is also supposed that \( C \) is sufficiently large that no single investor can invest in all \( n \) projects. Purely for mathematical ease, let me assume that each private investor can invest in at most one project. The investor’s opportunity cost of investing money is captured by a nominal interest rate of \( i(\geq 0) \). Hence, for an investor, it is worth investing money if the project yields more than \((1+i)C\).

The condition that the project, if successful, is viable is given by:

\[ S - (1 + i)C > 0 \quad (2) \]

If only one (infrastructure) project is undertaken, this will yield aggregate expected earnings of:

\[ p(1)S - (1 + i)C \equiv \Delta(1) \]

Assuming that this is a nonrecourse loan, the entrepreneur’s expected earnings are \( p(1)[S - (1 + i)C] \) and the investor’s expected earnings are given by \(-(1 - p(1)) (1 + i)C\). These add up to \( \Delta(1) \).

9 In deriving this expression, recall the investor borrows the money he invests at an interest rate of \( i \). So if his investment yields nothing he loses \((1+i)C\). And if the investment is successful he gets 0.
If \( m \) projects are undertaken, however, each project will yield a return of \( \Delta(m) \), where:

\[
\Delta(m) \equiv Sp(m) - (1 + i)C
\]

Since \( p'(m) > 0 \), \( \Delta(m) \) rises as \( m \) rises. The interesting case arises if the following assumptions hold:

\[ \Delta(1) < 0 \]

And there exists \( m^* \leq n \) such that:

\[ \Delta(m^*) > 0 \]

It follows that if \( m^* \) or more projects are started up, they will all be viable and the aggregate return will be greater than or equal to \( m^* \Delta(m^*) > 0 \).

This is where government can play a role. If it gives a guarantee to \( m^* \) (or more) investors that government will insure their investment, then all \( m^* \) projects will be undertaken.

Each entrepreneur will earn \( p(m^*)[S - (1 + i)C] \), each investor will earn \( 0 = (1 + i)C - (1 + i)C \), and, on each project, government has an expected income of \( -\left(1 - p(m^*)\right)(1 + i)C \).

It is easy to verify that all of these summed together for all \( m^* \) projects earns (in expected value terms):

\[
m^* p(m^*)[S - (1 + i)C] - m^* (1 - p(m^*))(1 + i)C
\]

It is easy to verify that this equals \( m^* \Delta(m^*) \). So they make a collective positive return.

It is true that government makes a loss, but since the total is positive, the government can charge each entrepreneur \( (1 - p(m^*))C \) to provide this insurance service. Then the government bears no net cost and all enterprises make a profit. An interesting future exercise that remains to be done is to work out the optimal number of projects that should be supported with this kind of guarantee.
International organizations can play an important role when foreign capital or foreign expertise is needed to develop an infrastructure project. Foreign banks and construction companies sometimes are hesitant to participate in potentially profitable and socially productive projects because of the perceived risks of operating in India and other emerging market economies. These risks can be related to political events, judicial decisions, credit default by the government, or changes in the regulatory regime governing the project.

Some agencies of the World Bank Group, such as MIGA, offer insurance and guarantee instruments to address different types of risks, as do the regional development banks. By strategically choosing complementary projects to support, these organizations can be more effective than they are. It is worth mentioning in this context that if a country has sufficiently well-developed institutions of contract enforcement and governance, there is no reason why private investors cannot play the role attributed to government in the above model. Indeed, this paper may be viewed as an argument for striving toward such a governance system. But setting up institutions can take time and so, in the interim, government may have to step in and do what governance will perform in the long run.

This is the kind of gamble that the Indian government has to consider taking as it ponders whether to make the next Five-Year Plan the big leap to industrialization. This is the kind of Big Push that China undertook with success under Deng Xiaoping’s leadership in the late 1970s. But it is sobering to recall that there was also the Great Leap Forward that Mao Tse-Tung initiated in 1958, which ended in disaster. History makes suggestions but rarely gives a road map (Palit 2012).

The overall argument is simple. From a period of reckless fiscal guarantees, most governments have gone to the other extreme of few guarantees or guarantees for the wrong reasons, such as crony capitalism. What this paper has tried to show is that there is scope for a carefully designed use of government guarantees that can promote long-term investment without burdening the government’s fiscal sustainability.
References


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