

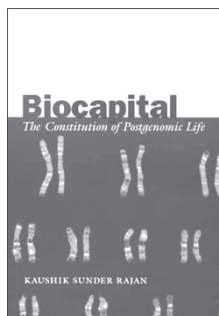
## Interpreting the global bio-economy

*Biocapital: the constitution of postgenomic life*  
Sunder Rajan K  
Durham, NC: Duke University Press, 2006  
ISBN: 978-0822337201

**THIS BOOK IS AN INSIGHTFUL** and theoretically ambitious anthropological study of the genomics and biotech industries in the United States and India. These and related science-based sectors form part of the bio-economy, a larger complex of manufacturing, service, and research and development (R&D) activities, grounded increasingly in advancements in the biological sciences. In his groundbreaking study, Kaushik Sunder Rajan seeks to explain the intersection between biological knowledge — the new knowledge of life itself — and the economic accumulation process in which large pharmaceutical firms are dominant actors.

The most striking manifestation of the bio-economy is the emergence of thousands of small biotechnology and other science-intensive start-up firms. These populate areas close to major universities in the developed parts of the world — in California, Massachusetts, the Cambridge region in the United Kingdom, and elsewhere — but have emerged also in some centres in developing countries. This is described in Sunder Rajan's empirical analysis which investigates the global evolution of the bio-economy, with a particular focus on India and California. He explains the interdependencies between giant pharmaceutical companies and small dedicated biotechnology firms, which operate in conjunction with a myriad of intermediaries, such as venture capitalist firms that provide funding for promising science and facilitate interaction between different bio-economic actors.

But this reading is only one of several possible takes on the bio-economy. It could also be framed as the emergence of a whole new scientific field (the "new biology") where laboratory work has strong economic implications and is therefore valued by both scientific and economic criteria. This would point to a novel dynamic of science, where scientists



mobilise market actors for the sake of their own economic interests and engage in trade of high-technology visions for financial resources. From such a perspective the bio-economy is something of a fictitious business sector; it appears instead as a prolonged and disguised

extension of scientific laboratories.

In a third interpretation, the bio-economy is viewed as a dimension of a broader and more generic transformation of contemporary capitalism, where businesses increasingly profit from low-cost labour and ineffectively regulated markets for high-risk production. Hence the bio-economy should not necessarily be understood as either particularly hi-tech or science-driven, but rather as the exploitation for economic accumulation of unequal global power relations and an institutional vacuum in the developing world. In India and other developing countries biopharmaceutical companies take advantage of lax environmental standards, with few constraints on emissions from manufacturing plants which pollute land and water, and clinical trials are operated at costs vastly lower than in developed countries.

Sunder Rajan's reflective study shows that the bio-economy is all of that, and more. The very concept of biology, and its manipulation through increasingly sophisticated technologies, is subjected to the market mechanism and market regulation, albeit with varying constraints through state intervention. The bio-economy is thus shaped by the traditional corporate form and the governance mechanisms that characterise contemporary capitalism, at least up until the present global economic crisis. On the other hand, this is a domain where traditional market mechanisms have had, so far, only a limited impact: value creation has been minimal, very few biotech companies are profitable, and the sector as a whole has generated a hefty deficit. Arguably, the biotechnology sector can be more aptly described as

an offspring of the phenomenon labeled “academic capitalism”. This is where academic research — always driven by the need for more resources, but also shaped by the growing penetration of venture capital — is embedded within commercial networks, even at very early stages of knowledge development.

It is also possible to read the rise of the bio-economy as an example of the intersection of private and public interests, where biology-based innovations serve to enhance the steering capacity of the modern state, for purposes such as surveillance and “national security”. Yet, the extent and implications of state interventions using biology-based new technologies into the sphere of daily living and the identities of citizens is so far marginal, despite widespread apprehensions.

Another intersection relates to health policy and the management of public resources. A feature of the bio-economy is the promise of reduced strains on public health care through new and advanced therapies and screening systems. Indeed, many innovations in this sector appeal to progressive and forward-looking political forces, which see the bio-economy as emblematic of the knowledge-based society. Here again the benefits realised so far do not meet expectations. There are many new biotechnology-based medicines, but their therapeutic and economic significance is as yet far less significant than was the wave of new chemistry-based drugs introduced in the first post-1945 decades.

The bio-economy has been neglected by social theorists, while becoming instead a favorite subject for innovation policy analysts with an instrumental and technocratic bent. In the latter perspective the sector appears as a shining example of an advanced knowledge-based economy, where innovations flourish through close and seemingly frictionless interchange between universities, hospitals, finance capital, biotech firms, and large pharmaceutical companies. The primary analytical focus in this context is on patterns of collaboration between academe and industry, notably issues relating to the generation of intellectual property and new spin-off firms. Indeed, there is a large volume of such innovation-oriented studies, as shown by Sunder Rajan, but he argues that there is a great need for a

political-economic reading of the bio-economy. His study is timely in that it moves beyond the literature on entrepreneurship and innovation, and enriches the tradition of science and technology studies (STS) in which the economic and business implications of R&D tends to be downplayed.

Sunder Rajan’s study also transcends much of the literature on the political economy of contemporary capitalism through its focus on the significance and specific characteristics of science-based economic activities, and it escapes the cruder notions of power and domination in that analytical tradition. It provides a fresh and welcome re-introduction of Marxist concepts to the STS literature by integrating them into debates on issues like biological manipulation, academic capitalism, and private–public intersections in the knowledge-based economy.

But the text also fails in several respects. The book is characterised by overlapping theoretical layers and employs an overly complex analytical scheme to explain too many issues in a too-condensed text. It is however an original and pioneering attempt to bridge the gap between several hitherto separate research fields. We learn a great deal about the conditions within firms in the biotech sectors, which are key carriers of the bio-economy. The investigation is undertaken with great care and ethnographic cunning. Sunder Rajan details how firms and laboratories in California and India sometimes operate in strikingly similar ways, despite differences in socio-economic conditions, and sometimes in very different ways. The ambition to combine the empirical analysis with sweeping arguments about US hegemony detracts however from the praiseworthy exposé of the dynamics of the bio-economy at the micro level. Clearly, the bio-economy is marked by conflicts and global domination, and perhaps hegemony. But as Sunder Rajan also demonstrates, such cleavages should not be taken to suggest that patterns of domination are fixed and stable. India may indeed emerge as a leading force in the global bio-economy but, if so, in a different form and framed by different regulative mechanisms than in the US.

**Mats Benner**

Research Policy Institute, Lund University, Sweden