

‘Knowledge Accumulation and Diffusion: Analysing Heterogeneity in an Interconnected World’

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Innovation is undoubtedly an important driver of long-run economic growth. Relatively recent innovations such as the PC or the Toyota manufacturing system offer clear evidence for a close link between innovation effort in the form of research and development (R&D) investment and successful development. The inability of an innovating firm to appropriate all of the knowledge it created and the ‘spillover’ of such knowledge to other firms leads to the well-known market failure of under-investment in innovation and represents a prime justification for policy intervention. But should some industrial sectors be deemed more important than others not only because they innovate a lot (creating profits and jobs), but precisely because the knowledge they create is believed to spill over to other parts of the economy? How can we measure these unobservable spillovers, how substantial are they, and to what degree do they extend across national borders? Does this relative importance of specific sectors warrant subsidies, incentives and protection?

The notion of ‘industrial policy,’ the selective government support for specific sectors, is presently being widely debated again among OECD country think tanks and policymakers as well as within international institutions such as the World Bank and UNIDO. A renewed interest among policymakers in the patterns of ‘knowledge accumulation’ and spillovers, and the means to benefit from domestic and international knowledge investments for economies at different stages of development is the prime motivation for this research.

The investigation of returns to knowledge investment and spillovers has exercised researchers since Griliches’ seminal 1964 paper added R&D stock to a productivity analysis of US agriculture. Building on previous work by the PI the projects contained in this proposal represent a significant departure from the conventional empirical approach and emphasize

- (1) that the analysis of knowledge spillovers deals with unobserved phenomena. Analysis needs to demonstrate that estimated spillover effects do not capture global economic shocks, spillovers unrelated to knowledge diffusion or other heterogeneities perhaps resulting from the choice of empirical model. The existing literature typically imposes one of two ‘transmission channels’ for knowledge to spill from the innovating country or sector to the rest of world/economy: (i) a trade and FDI channel, or (ii) a channel related to geographical distance. This is highly restrictive, does not rule out contamination by the above effects and commonly provides no test for the relative importance of these channels. The projects adopt more flexible panel time series models and place the explicit testing of rival hypotheses at the centre of the empirical approach.
- (2) that economies at different stages of development may have different ‘needs and tastes’ for knowledge. The assumed potential for spillovers from high-tech innovators in rich countries to agrarian societies in poor countries runs counter to any notion of ‘appropriate technology,’ a disconnect which due to agro-climatic differences is particularly salient in agricultural innovation. The projects recognise this potential heterogeneity, both in terms of differing patterns across industrial sectors as well as within sectors across countries. Providing more differentiated results represents a significant step away from reporting average effects across the entire sample of countries or sectors.

Policymakers in developing and developed economies alike are keen to gain insights into the magnitudes and patterns of knowledge spillovers and to learn about effective strategies to appropriate relevant knowledge for sustainable development. The findings from this research provide important insights into the macroeconomic performance of developing and developed economies, and highlight the potential for policy intervention for poverty reduction and the safeguarding of competitive advantage.