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The chapter examines various modes of knowledge transfer from universities and public research institutes to industry, together with the policies that support knowledge transfer, in order to develop a conceptual framework for comparative country studies and identify relevant and useful metrics for assessing the economic impact of this activity.

While some common trends can be seen in policy and legislation around the world, a variety of policy instruments and methods are employed in developing and implementing relevant legislation and policy. It is recognized that knowledge transfer takes place through both formal and informal channels, and in different countries and organizations, the predominance and importance of each may differ. The prevailing mix in a particular context must be taken into account in making policy (at both national and institutional levels), to avoid inadvertent consequences of policies aimed at promoting one channel negatively impacting on others that may, in fact, be of greater importance in the relevant environment.

As a starting point, this calls for a comprehensive understanding of the ecosystem and its various actors and institutions. Disruptions to the status quo can yield both positive and negative effects and the possible impact of both must be considered to ensure that potential benefits outweigh potential costs. Assumptions must be validated so that existing strengths can be built on, gaps can be filled, and, ultimately, that fit-for-purpose policy can be developed.

Policy priorities should be clearly articulated. Different policies may be needed to promote different objectives, rather than trying to achieve too many outcomes by means of a single policy, especially when such outcomes might not support one another. Where different bodies are responsible for making policy for different knowledge transfer channels,

effective coordination between them becomes critical to ensure that conflict does not arise. If tradeoffs are required to achieve an optimal balance, these must be identified and agreed.

It is always useful to draw from experiences and best practice elsewhere when developing policy. Understanding what has not worked well, and why, is arguably as important as examining successful interventions. At the same time, borrowing uncritically without making relevant adaptations for a particular country's own circumstances is likely to lead to suboptimal results. This is perhaps especially true where policies and practices from developed countries are applied in low and middle income countries characterized by less developed innovation ecosystems and an industry sector with inherently less absorptive capacity for new innovations.

New policies must be sufficiently flexible to accommodate responses necessary to correct for unintended consequences that may be experienced. The choice of policy instrument should therefore be carefully considered. At national or regional level, legislation creates certainty and demands compliance, but making amendments becomes onerous. By the same token, if policy is implemented via nonlegislated policy documents, frameworks, codes of good practice, or guidelines, these can be adapted with greater agility.

Policy should, in the first instance, aim to create an enabling environment that allows knowledge transfer to thrive, by providing support and incentives. Overly prescriptive requirements or those introducing undue administrative burdens carry transaction costs that can detract from productive knowledge transfer activity and disincentivize compliance. One-size-fits-all policies may lead to certain channels of knowledge transfer being neglected.

Once policies are put in place, it becomes critical to evaluate their implementation objectively on a regular basis, to ensure that they are functioning effectively. Measuring performance allows comparisons to be made, trends to be identified and the achievement of targets and goals to be assessed. This yields information on what is working as intended and what needs to be improved or changed, and can be used to inform adjustments in policy and practices to achieve greater impact.

The chapter provides an instructive examination of a range of knowledge transfer metrics that are and, further, that *can* be collected, together with explanations of the reasons for and value of gathering different types of metric, both basic and supplementary. It also emphasizes the importance of using a variety of data sources to obtain a balanced view. While

surveys from knowledge transfer offices are perhaps the most common source of data in this regard, they should be supplemented with data from other stakeholders, such as industry and researchers, particularly for knowledge transfer channels other than IP licensing. Recommendations are made in respect of which metrics should be regularly collected, from where, and how frequently.

Designing, collecting, and reporting a suitable set of metrics is not, however, a trivial exercise. In doing so, it is worth recalling William Bruce Cameron's observation that "not everything that can be counted counts, and not everything that counts can be counted."¹ The chapter notes that many of the available data relate to the knowledge transfer channel of IP licensing (in high- and middle-income countries). This can be attributed at least in part to the fact that many of the activities associated with this channel provide several easily quantifiable indicators along the value chain, such as invention disclosures, patent applications, issued patents, licenses executed, and license fees earned. Most of these are, however, indicators of inputs into or progress toward commercialization rather than of economic impact or social benefits, which still remain difficult to measure directly and accurately (since the outcomes concerned are usually not solely attributable to knowledge transfer, but also to a range of other factors and influences).

Metrics can serve as significant drivers of behavior, particularly when linked to individual or institutional performance evaluation frameworks. Overemphasis on input metrics is likely to lead to increased activity in these areas, but will not always result in improved outputs or outcomes, unless appropriate ecosystem support and complementary incentives are in place.

"Vanity" metrics, which may superficially tell a positive story but fail to provide practical information on performance, should be avoided in favor of actionable metrics that can be used as a basis for implementing improvements to policy and practice.

The more comprehensive a set of metrics is the greater its value. But in selecting which metrics to capture, attention must be paid to the ease of acquiring and accessing the requested data by the survey respondents. If the data requirements are too ambitious, there is a risk of lower response rates, and/or supply of incomplete or inaccurate data.

¹ Cameron, William Bruce, "Informal Sociology: A Casual Introduction to Sociological Thinking" (1963).

Where metrics are used specifically for benchmarking purposes, data must be appropriately normalized (standardized) to ensure that one is comparing “like with like.”

Where a set of metrics focuses on a particular knowledge transfer channel, institutions or regions that pursue other channels more actively might be reluctant to participate, fearing that their performance will not reflect favorably when measured against that of other institutions/regions.

Each of these challenges must be acknowledged and tackled. Nonetheless, the benefits of a robust set of metrics generated on a regular basis cannot be denied. This is achievable with buy-in from all key stakeholders who recognize the value this can bring for improving performance and enhancing impact in their respective spheres, whether as policymakers or practitioners.