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How do governments determine policy priorities? Studying development strategies through spillover networks

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ABSTRACT

Determining policy priorities is a challenging task for any government because there may be, for example, a multiple objectives to be simultaneously attained, a multidimensional policy space to be explored, inefficiencies in the implementation of public policies, interdependencies between policy issues, etc. Altogether, these factors generate a complex landscape that governments need to navigate in order to reach their goals. To address this problem, we develop a framework to model the evolution of development indicators as a political economy game on a network. Our approach accounts for the –recently documented– network of interactions between policy issues, as well as the well-known political economy problem arising from budget assignment. This allows us to infer not only policy priorities, but also the effective use of resources in each policy issue. Using development indicators data from more than 100 countries over 11 years, we show that the country-specific context is a central determinant of the effectiveness of policy priorities. In addition, our model explains well-known aggregate facts about the relationship between corruption and development. Finally, this framework provides a new analytic tool to generate bespoke advice on development strategies.

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1. Introduction

Throughout the process of economic development, governments prioritize public policies with the aim of reaching specific targets. Such targets may be motivated by internal political agreements, by imitating successful countries or by a broad international consensus (best practices), among other reasons. Whichever the case, the task of effectively prioritizing policies can be daunting, on one hand, due to inefficiencies (such as corruption) in the implementation process and, on the other, because dealing with a large set of policy goals is not trivial. For example, the recent transition to the Sustainable Development Goals (SDGs) implies that governments should increase their policy spectrum to cover 169 targets as opposed to 18 from the Millennium Project. Moreover, governments have to consider 232 indicators about the relevant policy issues, instead of the 48 previously used ([General Assembly, 2017](#)).

Leaving aside well-known measurement and data-generation problems, one of the biggest challenges in reaching development goals is accounting for the interdependency between policy issues ([Nilsson et al., 2016](#)) (see [Pradhan et al., 2017](#) for

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a survey). For example, schooling is likely to exert positive effects on labor markets, so depending on how governments prioritize and coordinate policies, the allocated resources may become complementary or redundant. Furthermore, the policy-issue relationship structure may vary considerably from one country to another. For instance, health policies can have a widespread impact on the socioeconomic indicators of a poor country like Haiti, given the fact that human capital is not a generalized asset in its population. As Nilsson et al. (2016) put it: “Implicit in the SDG logic is that the goals depend on each other – but no one has specified exactly how”. Some attempts have been made to characterize SDGs as networks of pairwise correlations (Le Blanc, 2015). However, it is not obvious how to move from correlations to causal relationships. Even more important, it is not clear how to use such networks for prescriptive purposes without running into well-known limitation of conventional statistical models (see Section 2).

We propose to think about such interdependencies in terms of positive spillover effects between development indicators.¹ In this network, each node represents a policy issue, and an edge flowing from one node to another symbolizes a spillover from the former to the latter. This network structure can be unique to a particular economy, resulting in a distinctive allocation of resources across the same policy issues that other countries face. Thus, a set of policies that work for a country may be ineffective in another. In addition, there are political-economy considerations that central authorities need to address when allocating resources to different government offices. For instance, in face of imperfect supervision, positive network effects can mask the incompetence of government officials. Even more preoccupying, these situations may elicit incentives to divert public funds for private gains. Together, these mechanisms shape the development strategies observed throughout the world; therefore, building a framework to understand them is paramount. Ideally such a framework could be used to shed some light on the complex process by which countries prioritize public policies and to provide some advice to governments who wish to reach specific targets.

In this paper, we appeal to ideas and tools from behavioral economics and network science in order to develop a new approach to the problem of formulating policy priorities, and to provide a policy-guiding tool. The method builds on a model where a central government assigns resources to different officials who, in the end, decide how much of these resources they will actually use for their original purpose. Three distinctive features define this model: (1) a country-specific network of spillovers (interdependencies) between policy issues; (2) political economy considerations that differentiate policy design from implementation; and (3) a central authority that –through a behavioral game– achieves development targets by allocating resources while, in parallel, its functionaries learn how much corruption can pass undetected.²

The proposed model allows inferring policy priorities from observed indicators, and to evaluate their suitability for reaching specific targets. With that aim in mind, we consider that, as countries evolve, they leave behind a ‘development footprint’ reflected in their policy indicators. That is, developing countries may use as guides those policies that advanced nations implemented to achieve their current stage of development. In fact, in the study of structural transformations in developing countries, a step-wise development process in which nations follow successful cases is indeed observed (Akamatsu, 1962).

The rest of the paper has the following structure. In Section 2, we review the literature related to the problem under consideration, and make some comments with regard to the limitations of alternative methodologies. Section 3 introduces the theoretical model and provides a brief computational analysis. In Section 4 we describe the data, its normalization and how the spillover network is estimated. Section 5 presents different tests for the external validation of the model using information from 117 countries. Then, in Section 6, we perform internal validation tests, analyzing the outcomes’ sensitivity to the model’s components (or social mechanisms). Next, Section 7 presents retrospective and prospective analyses for the countries included in the sample. The former allows us to infer the policy priorities that these nations employed throughout the last decade. The latter allows identifying the policy priorities that emerge when following the development footprints of more advanced nations. Finally, we conclude in Section 8 with a summary of the empirical results of the model, and provide suggestions for future extensions.

2. Related literature and alternative methodologies

The literature studying how a set of policies impacts the economic development of a region (e.g., country, state or municipality) offers different methodological approaches. In this review, we compare three that are frequently considered and one that is closer to ours: econometric analyses, benchmark studies, growth diagnostics and interdependency networks. In particular, we focus our discussion on their main limitations and how our framework can help overcoming them.

2.1. Regression analyses

Most econometric-based studies concentrate on linear-regression analysis. A direct implication of considering linear relationships is the implicit assumption of substitutability between public policies. This, in turn, prevents any policy issue from

¹ The literature on pairwise correlations between SDGs (Nilsson et al., 2016; Pradhan et al., 2017) also considers negative relationships. Here, we focus on positive ones because they have a natural economic interpretation in terms of public policy and in simulating the growth of development indicators. Future extensions might consider negative spillovers as well.

² Generally speaking, one can think of inefficiencies in the implementation process. However, in the context of developing countries, the concept of corruption, understood as the diversion of public funds, is highly salient. Therefore, in this paper, we adopt this concept.

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