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Editorial

Misallocation and productivity ☆

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ABSTRACT

A large portion of differences in output per capita across countries is explained by differences in total factor productivity (TFP). In this article, we summarize a recent literature — and the articles in this special issue on misallocation and productivity — that focus on the reallocation of factors across heterogeneous production units as an important source of measured TFP differences across countries.

1. Introduction

Why are some countries so much richer than others? This is one of, if not *the* most important questions in all of economics. During the last twenty years the profession has made considerable progress in diagnosing the proximate sources of the variation in income per capita across countries. Work by Klenow and Rodriguez-Clare (1997), Prescott (1998), and Hall and Jones (1999) argued that the dominant source of differences in output per worker is differences in total factor productivity (TFP), as opposed to either the amount of physical or human capital per worker.[1]

But what is the underlying cause of low TFP in poor countries? Much of the literature effectively approaches this question from the perspective of asking why individual firms in one country would have lower TFP than their counterparts in another country, and emphasizes two possibilities. One is that firms in some countries are relatively slow to adopt more productive technologies.[2] The other is that firms in some countries do not operate technologies efficiently.[3] In recent years the literature has adopted a new perspective regarding cross-country differences in TFP: rather than asking why individual firms in one country might be less productive, this new literature starts from the perspective that in an economy with heterogeneous production units, aggregate TFP depends not only on the TFP's of the individual production units but also on

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[1] See also Caselli (2005) and Hsieh and Klenow (2010) for recent surveys.

[2] Applications of this idea in different contexts include for example Nelson and Phelps (1966), Aghion and Howitt (1992), and Parente and Prescott (1994). See also Comin and Hobijn (2010) for an examination of technology adoption patterns across countries.

[3] See, for example, Parente and Prescott (1999, 2000), Schmitz (2005), Bloom and Van Reenen (2007) and Bloom et al. (forthcoming).

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how inputs are allocated across these production units.[4] That is, aggregate TFP can be low because inputs are *misallocated* across heterogeneous production units.[5]

A simple model is useful to illustrate the concept of misallocation. Consider a static economy that has a collection of heterogeneous establishments, indexed by i, that produce a single good. Establishment i has a value added production function denoted by $z_i f(k_i, h_i)$ where k_i and h_i are capital and labor inputs of establishment i, z_i is an establishment-specific productivity term, and f is a strictly concave function. There is a fixed cost associated with operating an establishment, denoted by $\bar{y}$ and denominated in units of output. The economy is endowed with K units of capital and H units of labor, both of which are supplied inelastically. There is a representative agent that has preferences that are increasing in consumption of the single good.

In this framework, both slow adoption of technology and inefficient use of technology would be reflected in lower values for the establishment-level productivities z_i. In contrast, misallocation captures effects that occur holding the values of the z_i fixed. An efficient allocation in this economy will maximize final output (i.e., output net of fixed costs) and is characterized by two components: the first component determines which establishments will operate (i.e., which establishments pay the fixed cost), and the second component determines the allocation of labor and capital across those establishments that operate.[6] But if either of these decisions is distorted, the economy will have lower (net) output, which would manifest itself as lower aggregate TFP since aggregate factor inputs are constant.

But are differences in this type of misallocation quantitatively important in accounting for aggregate TFP differences both in the cross-section and the time series? Answering this question requires that we measure the amount of misallocation. And if the extent of misallocation is important, what underlying factors are generating the misallocation? And through what channels do these factors operate? These are the questions that the literature on misallocation seeks to answer and that the papers in this volume speak to.

In the next section we summarize some key contributions from the existing literature. Section 3 introduces the articles that appear in this issue. These articles represent important contributions to the literature on misallocation and productivity. They illustrate both the scope and depth of work that is being done to further our understanding of the role of misallocation. The papers develop extensive new data sets to examine misallocation in a variety of contexts across time and space: in historical data for the US, both in the late 1800s and during the Great Depression, in India and China during the last three decades, in Chile and Colombia during the 1980s, as well as the current US economy. The papers also study a variety of different sources of misallocation: financial frictions, trade restrictions, and a host of regulations associated with industrial policy. Some of the papers propose new mechanisms that amplify the TFP effects of policies that generate misallocation. To facilitate replication and further research progress, detailed information on the data (which is also available when possible), the programs used to manipulate the data, and the programs used to obtain results are available at:

http://www.economicdynamics.org/RED-misallocation.htm.

Section 4 concludes and describes what we see as some important open issues for future work.

2. Assessing misallocation

There are two main approaches that the literature has followed in its attempt to provide answers to the questions posed in the introduction, which we will refer to as the *direct* approach and the *indirect* approach. In this section we describe each of the two approaches, and summarize some of the contributions from the literature that have followed each of the approaches.

2.1. The direct approach

The essence of the direct approach is to pick one (or more) factors that are thought to be empirically important sources of misallocation, try to obtain direct measures of these factors, and then use a model of heterogeneous production units to quantitatively assess the extent to which these factors generate misallocation and impact aggregate TFP.

Many factors lend themselves to this type of analysis. Hopenhayn and Rogerson (1993) is an early example. Using the industry equilibrium model of Hopenhayn (1992), they showed that firing taxes distort the allocation of labor across establishments and that empirically reasonable values for this tax could generate TFP losses on the order of about 5%. In related work, Lagos (2006) uses a matching model to show analytically how policies such as unemployment insurance and employment protection affect TFP via selection effects regarding which matches are formed in equilibrium.

[4] One motivation for this emphasis comes from the importance of resource reallocation across productive units in aggregate productivity growth. For instance, in US manufacturing, 50 percent of productivity growth is explained by reallocation across plants (see Baily et al., 1992; and Foster et al., 2001). See also Foster et al. (2008).

[5] As Jones (2011b) notes, misallocation of inputs within establishments may also help to explain why some establishments have low TFP conditional on the technology that they are using.

[6] While the decision to not operate an establishment is equivalent to giving it zero inputs, it is nonetheless useful to separately distinguish the selection issue.