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Managers and productivity differences ☆

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ABSTRACT

We document that for a group of high-income countries the life-cycle earnings growth of managers relative to non-managers is positively correlated with output per worker. We interpret this evidence through the lens of an equilibrium life-cycle, span-of-control model where managers invest in their skills. We use the model to quantify the importance of exogenous productivity differences and the size-dependent distortions emphasized in the misallocation literature. Our findings indicate that such distortions are critical to generate the observed differences in the growth of relative managerial earnings across countries. Distortions that halve the growth of relative managerial earnings, a move from the U.S. to Italy in our data, lead to a reduction in managerial quality of 27% and to a reduction in output of about nearly 7% – more than half of the observed gap between the U.S. and Italy. Cross-country variation in distortions accounts for about 42% of the cross-country variation in output per worker gap with the U.S.

1. Introduction

Development accounting exercises conclude that productivity differences are central in understanding why some countries are richer than others (Klenow and Rodriguez-Clare, 1997; Prescott, 1998; Hall and Jones, 1999; Caselli, 2005). What does determine cross country productivity differences?

A growing literature emphasizes differences in management practices as a source of productivity differences; see Bloom and Van Reenen (2011) and Bloom et al. (2016), among others. Management practices differ greatly, both across countries and across firms within a given country, and better management practices are associated with better performance (total

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factor productivity, profitability, survival etc.). U.S. firms on average have the best management practices, and the quality of management declines rather sharply as one moves to poorer countries.

In this paper, we present novel evidence on the earnings of managers and their relation with output per worker. We first document that age-earnings profiles of managers differ non-trivially across countries. Using microdata for a set of high-income countries, we show that earnings of managers grow much faster than the earnings of individuals who have non-managerial occupations in most countries. In the United States, the earnings of managers grow by about 75% during prime working ages (between ages 25–29 to 50–54), while the earnings growth for non-managers is about 40%. This gap is weaker in other countries in our sample. In Belgium, for instance, earnings growth of managers in prime working years is about 65% whereas earnings growth of non-managers is similar to the U.S. On the other extreme, we find that in Spain the earnings of non-managers grow more than those of managers over the life-cycle.

We subsequently document that there is a strong positive relation between the relative steepness of age-earnings profiles and GDP per worker: managerial earnings grow faster than non-managerial earnings in countries with higher GDP per worker. The correlation coefficient between the log of relative earnings and log-GDP per worker is 0.49, and stable across several robustness checks on our data. Since better management practices and the GDP per worker are positively correlated in the data, there is also a very strong positive relation between the earnings growth of managers relative to the earnings growth of non-managers and the quality of management practices across countries. The relation between the relative steepness of age-earnings profiles and GDP per worker remains robust when we control for individuals' educational attainment, sector of employment and self-employment status. Furthermore, these cross-country relations hold only when we look at the relative earnings growth of managers vs. non-managers (workers). There is no systematic relation between GDP per worker and the relative earnings growths of professionals (lawyers, engineers, doctors etc.) vs. workers, self-employed vs. workers, or college-educated versus non-college educated.

It is, of course, an open question how to interpret the differences in managerial practices and quality across countries. In this paper, we offer a natural interpretation. Differences in managerial quality emerge from differences in *selection* into management work, along the lines of Lucas (1978), and differences in skill *investments*, as we allow for managerial abilities to change over time as managers invest in their skills. Hence, we place incentives of managers to invest in their skills and the resulting endogenous skill distribution of managers and their incomes at the center of income and productivity differences across countries.

We study a span-of-control model with a life-cycle structure along a balanced growth path. Every period, a large number of finitely-lived agents is born. These agents are heterogeneous in terms of their initial endowment of managerial skills. The objective of each agent is to maximize the lifetime utility from consumption. In the first period of their lives, agents make an irreversible decision to be either workers or managers. If an agent chooses to be a worker, her managerial skills are of no use and she earns the market wage in every period until retirement. If an agent chooses to be a manager, she can use her managerial skills to operate a plant by employing labor and capital to produce output and collect the net proceeds (after paying labor and capital) as managerial income. Moreover, managers invest resources in skill formation and, as a result, managerial skills grow over the life cycle. This implies that a manager can grow the size of her production unit and managerial income by investing a part of her current income in skill formation each period.

Skill investment decisions in the model reflect the costs (resources that have to be invested rather than consumed) and the benefits (the future rewards associated with being endowed with better managerial skills). Since consumption goods are an input for skill investments, a lower level of aggregate productivity results in lower incentives for managers to invest in their skills. We assume that economy-wide productivity grows at a constant rate. In this scenario, we show that the model economy exhibits a balanced growth path as long as the managerial ability of successive generations grows at a constant rate.

A central component of our model is the *complementarity* between available skills and investments in the production of new managerial skills. More skilled managers at a given age invest more in their skills, which propagates and amplifies initial differences in skills over the life cycle. This allows the model to endogenously generate a concentrated distribution of managerial skills. As in equilibrium more skilled managers operate larger production units, the model has the potential to account for the highly concentrated distribution of plant size in data.

We calibrate the model to match a host of facts from the U.S. economy: macroeconomic statistics, cross sectional features of establishment data as well as the age-earnings profiles of managers. We assume for these purposes that the U.S. economy is relatively free of distortions. We find that the model can indeed capture central features of the U.S. plant size distribution, including the upper and lower tails. It also does an excellent job in generating the age-earnings profiles of managers relative to non-managers that we document from the data.

We then proceed to introduce size-dependent distortions as in the literature on misallocation in economic development. We model size-dependent distortions as progressive taxes on the output of a plant and do so via a simple parametric function, which was proposed originally by Benabou (2002). Size-dependent distortions have two effects in our setup. First, a standard reallocation effect, as the enactment of distortions implies that capital and labor services flow from distorted (large) to undistorted (small) production units. Second, a skill accumulation effect, as distortions affect the incentives for skill accumulation and thus, the overall distribution of managerial skills – which manifests itself in the distribution of plant level productivity. Overall, the model provides us with a natural framework to study how differences among countries in aggregate exogenous productivity and distortions can account not only for differences in output per worker but also for