



The Productivity Impact of Contract Work in India: An Establishment Level Structural Approach

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Although hiring temporary workers increases firm productivity in the current period, the short-tenure of such temporary workers preclude the accumulation of firm-specific human capital, resulting in lower future productivity.

Introduction

In low and middle income countries, a large proportion of firms hire contract or temporary workers through third-party licensed intermediaries or contractors. It is well established that contract worker usage is strongly driven by strict firing norms for regular workers; but comparatively little is known about how firm performance is affected, especially in developing and emerging economies. This project fills the gap by estimating the effects of contract man-days on contemporaneous and lagged firm productivity in India.

The project focusses on India, a middle-income country, where the share of contract man-days in the manufacturing sector more than doubled from 15% in 1998-99 to 33% in 2010-11. Firing norms for regular workers are strict and are governed by the Industrial Disputes Act 1947 (IDA) which requires large firms (typically above size 100) to provide severance pay (i.e. a remuneration given to a worker when he or she leaves employment) and issue advance notice for firing regular workers, and obtain government permission for mass layoffs. Not surprisingly, in the last decade large firms (as opposed to small firms not subject to the IDA) saw a tremendous increase in the share of mandays worked by contract workers, henceforth contract-mandays (Figure 1).

There are multiple pathways in the relationship between contract work and productivity. On the positive side, contract workers may contribute to increase firm productivity if they are highly motivated considering such work as stepping stones to permanent employment, or if they bring in specialized services that firms otherwise lack of. On the negative side, contract workers may lack of avenues to build firm-specific human capital, important for productivity growth. Further, work place inequality, which favours regular workers, may lower contract worker morale, thereby reducing their effort. The productivity effects we observe are a result of these opposing forces and represent therefore an empirical phenomenon. Productivity effects are separately examined for five broad industry groups in India, employing a 13-year firm level panel data set from the Annual Survey of Industries (ASI).

Methodology

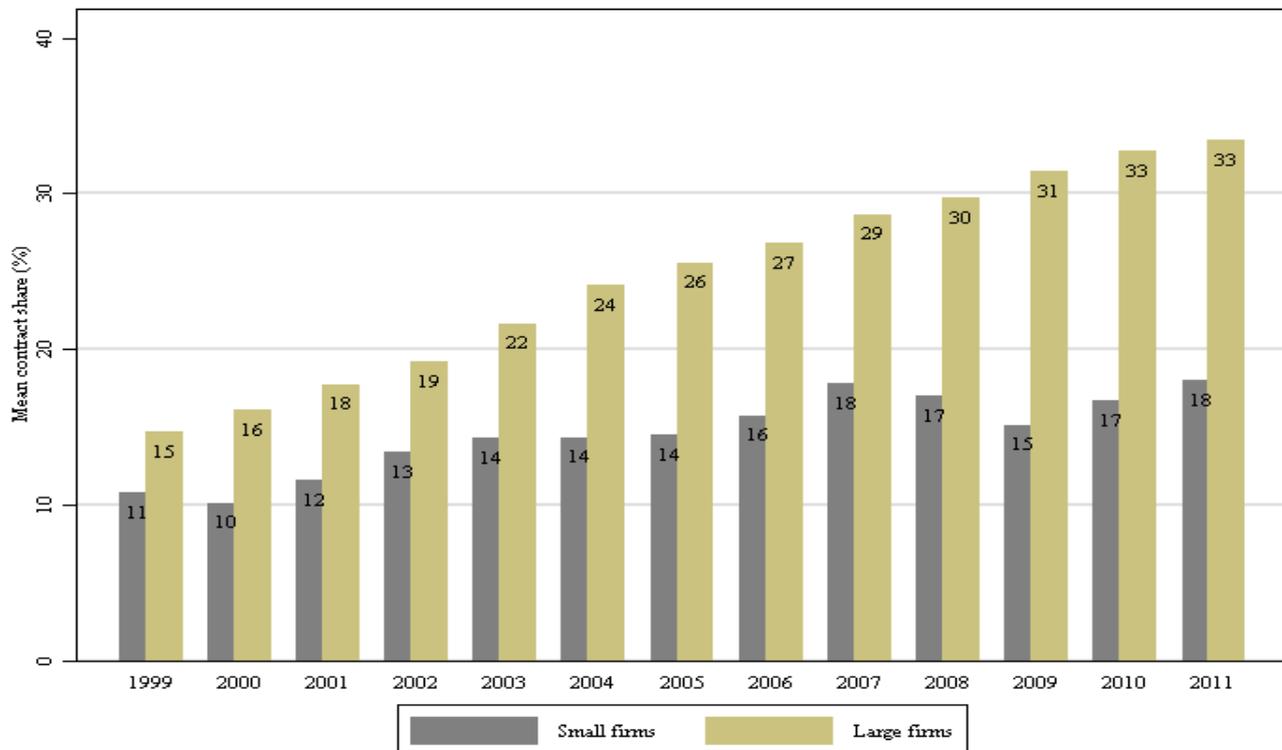
We are interested in estimating Total factor productivity (TFP), the portion of output not explained by input usage in production, which determines how efficiently and intensely inputs are utilized in production. The first step in measuring the level and modelling the dynamics of TFP is estimating a production function. Our production function models nominal revenue (i.e. revenues expressed without accounting for inflation) on the left hand side, expressed in terms of capital, total labour, and material usage on the right hand side. The Productivity term (technically, TFP) is unobserved by the researcher, but is an important component contributing to output. Our model allows for productivity to grow in such a way that current



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productivity depends on lagged productivity and contract-mandays share in the current and previous period.

Figure 1: Contract-mandays share in the Indian Manufacturing Sector



There are two sources of endogeneity¹ issues here. First, the productivity is unobserved. This biases the input coefficients of the production function. To address this issue, we utilize a proxy variable, typically an input whose usage is determined after the realization of a productivity shock. Should there exist a positive and monotonous relationship (i.e. a relationship that it is either always increasing or decreasing) between the productivity and demand for this proxy input, the former can be expressed in terms of the latter and controlled for in the production function, thus addressing the bias (we assume a functional form for input-demand to perform this inversion). Second, input choices could be endogenous. To address this, we use inputs lags as instruments for input choices. To obtain exogenous variation in contract worker man-days, we use the interaction of two set of instruments - (1) An index of stringency of employment protection for regular workers (2) Lagged rainfall shocks, which represent transitory income shocks for households translating to temporary product demand shocks and consequently contract workers.

Findings and policy implications

On average, contemporaneous productivity effects of employing contract workers are positive. This is seen from two distinct calculations. First, the mean difference between firms whose contract share is

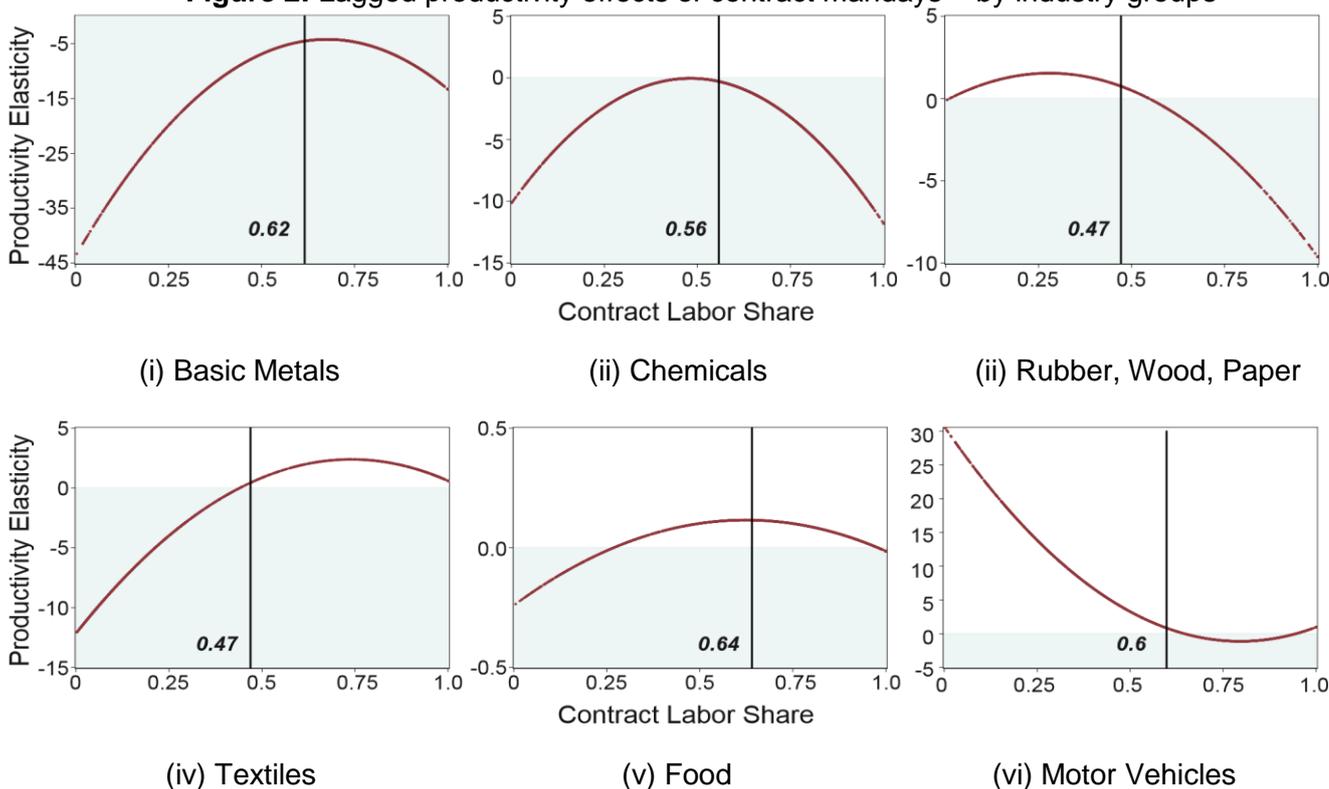
¹ Endogeneity in econometrics arises when the variable under study is correlated with the error term in the model. Let's imagine that a researcher wants to estimate the impact of schooling on future wages for workers and, to do so, he or she only has years of education and current wage of the workers. This model will probably show a large positive correlation between years of education and wages, but such relationship may be determined by other factors that are both correlated to years of education and wages, such as parents' income. The consequence, unless measures are adopted on account of endogeneity, results in estimation bias.

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above-median and below-median levels, is positive and significantly² different from zero in most industries. Second, the elasticity³ of productivity with respect to current contract share is positive in most industries. These positive effects could be consistent with two pathways – 1) high motivation and effort levels of these workers, 2) Contract worker specialized. However it is well known that in India, contract workers do not regularly perform specialized jobs, but mostly similar tasks as permanent workers, which rules out the second channel.

Lagged productivity effects are negative, indicated both by the significant negative mean difference between firms whose lagged contract share is above-median and below-median levels. Here again, the elasticity of productivity with respect to lagged contract share is negative in most industries. Further, in most industries, productivity increases with an increase in lagged contract-mandays share, but starts decreasing after a threshold indicating potential undesirable future effects in employing excessive contract workers (Figure 2). These effects are consistent with the poor accumulation of human capital in these settings as evinced by prior theoretical models (low morale driven productivity effects are likely to work through decreased effort and affect current productivity).

Figure 2: Lagged productivity effects of contract mandays – by industry groups



Findings explain why despite the flexibility gains from employing contract workers, firms choose to employ a core set of regular workers who contribute to the firm's pool of human capital. Due to the temporary

² In statistics, when taking differences between means, medians, etc drawn from a sample, there is the possibility (expressed as a probability) that the obtained difference is actually a zero, meaning that, if another sample were drawn, the two averages would be the same. When a difference is deemed statistically significant, it means that the possibility (again, expressed formally as probability) of a zero difference is extremely low.

³ In economics, we refer to elasticity as the percentage change in 'something' brought about by a percentage change in 'something else'. In our case, we can read it as "one percent increase in current contract share in an industry brings about a positive increase (expressed in percentage) in industry productivity."



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nature of such work, neither firms nor workers have the incentives to invest in firm-specific knowledge and skills. Employment protection laws, in protecting regular workers, create a separate pool of workers (contract workers) who are unable to invest in and contribute greatly to firms they work in, simply because they do not stay long enough.

Moving Forward...

Our project, along with other parallel bodies of work, shows that short tenure, weak industrial relations, and high workplace inequality are all correlated with a decline in productivity and product quality. These correlations suggest that core industrial and labour policies in emerging economies should not only be tuned to attract investment as they often are, but should also focus on augmenting productivity. Given the high incidence of contract work and its productivity ramifications, what options do policymakers have in improving productivity? Our next project will attempt to answer this question examining the efficacy of various policy options to improve productivity in these settings using natural experiments and randomized control trials (RCTs) in India.