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Journal of Monetary Economics 47 (2001) 163–187

Journal of  
MONETARY  
ECONOMICS

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# Government production of investment goods and aggregate labor productivity<sup>☆</sup>

James A. Schmitz Jr\*

*Research Department, Federal Reserve Bank of Minneapolis, 90 Hennepin Avenue, Minneapolis,  
MN 55480, USA*

Received 28 October 1998; received in revised form 14 January 2000; accepted 25 January 2000

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## Abstract

In this paper, I estimate the impact on aggregate labor productivity of having government, rather than private industry, produce investment goods. This policy was pursued to varying degrees by Egypt, India, and Turkey, among others. The policy has a large impact because there is both a *direct effect* (it lowers productivity in the investment sector) and a secondary effect (it lowers the economy-wide capital stock per worker). I estimate that this policy alone reduced Egypt's aggregate productivity by 30% and accounted for 20% of Egypt's aggregate labor productivity gap with the United States during the 1960s. © 2001 Elsevier Science B.V. All rights reserved.

*JEL classification:* E60; L32; O11; O40

*Keywords:* Government production; Public enterprises; Aggregate productivity

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## 1. Introduction

In this paper, I estimate the impact on aggregate labor productivity of having government, rather than private industry, produce investment goods. More

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<sup>☆</sup>For their help, I thank Tom Holmes, Pete Klenow, Edward C. Prescott, Richard Rogerson, and anonymous referees. The views expressed herein are those of the author and not necessarily those of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.

\* Tel.: + 1-612-204-5482; fax: + 1-612-204-5515.

*E-mail address:* jas@res.mpls.frb.fed.us (J.A. Schmitz Jr).

precisely, I examine the policy of government producing the vast majority of investment goods *purchased* in a country (that is, a policy where government severely restricts imports of investment goods and then produces domestic investment goods). A number of countries have pursued this policy. For long periods, the Egyptian government produced the vast majority of investment goods purchased in that country. India and Turkey also pursued this policy, though not as wholeheartedly as Egypt. I estimate that this single policy, of government producing the vast majority of investment goods purchased in a country, reduced Egypt's aggregate productivity by 30% and accounted for nearly 20% of Egypt's productivity gap with the United States during the 1960s.

The intuition for why government production of investment goods can have a large negative impact on aggregate productivity, even though the investment sector accounts for only about 20% of gross domestic product (GDP), is simple. If government production is less efficient than private production, government production in a sector directly reduces output and labor productivity. But for the investment sector, this *direct* effect is only the beginning of the story. If the economy produces investment goods less efficiently, then, all else equal, capital per worker will be smaller in all sectors of the economy. This *secondary* effect reduces labor productivity in all sectors.

To estimate the impact of this policy, of government producing the vast majority of investment goods purchased in a country, I use a standard two-sector neoclassical growth model. My only departure from the standard model is to assume that there are two technologies for producing investment goods: a government technology and a private technology. Both technologies exhibit constant returns to scale, but the government technology is less efficient than the private investment good technology (that is, the total factor productivity (TFP) parameter associated with the government technology is smaller than the private).

I first derive a benchmark estimate for the impact of this policy on aggregate productivity by supposing the government produces *all* investment goods. In particular, I derive the ratio of steady-state aggregate productivity under a policy where government produces all investment goods to steady-state aggregate productivity under a policy where private industry produces all investment goods. I show that this ratio of aggregate productivities, call it the overall-ratio, can be expressed as a product of two ratios, one corresponding to the direct effect mentioned above, call it the direct-effect ratio, and one corresponding to the indirect effect, call it the indirect-effect ratio.

To compute the above ratios for the benchmark case, I use values of government and private TFP in the investment good industries in Egypt and Turkey derived from Krueger and Tuncer (1982) and Handoussa (1991). If we normalize private TFP at one, then these studies indicate a reasonable value of government TFP is one-half. Using standard values for the model's other parameters (e.g.,

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