

NORTH-HOLLAND

International Review of Economics and Finance 12 (2003) 417-435



Growth accounting in the open economy: international comparisons

Ulrich Kohli*

Swiss National Bank, Börsenstrasse 15, P.O. Box 2800, CH-8022 Zurich, Switzerland

Received 18 December 2001; received in revised form 22 July 2002; accepted 30 July 2002

Abstract

This paper identifies, measures, and compares the main factors explaining nominal GDP growth in two dozen open economies. The analysis goes beyond the standard Solow approach by disaggregating outputs, by accounting for terms-of-trade changes, and by being based on a flexible representation of the aggregate technology, with special allowance for foreign trade. The results demonstrate the overwhelming importance of capital accumulation and technological change in explaining real growth. Movements in the terms of trade play a significant role in many countries as well. The contribution of labor is found to be negligible, or even negative, in most European countries. © 2003 Elsevier Science Inc. All rights reserved.

JEL classification: O4; C43; F11; D2 Keywords: Growth accounting; GDP function; Index numbers; Terms-of-trade effects; Technological change

1. Introduction

From 1967 to 1996, GDP growth averaged 48.8% in Turkey, but it barely reached 5.7% in Switzerland. How can such large differences be explained? Many reasons can be invoked. Besides the obvious fact that inflation has widely varied across nations, there are real factors, too, such as uneven rates of technological change, differences in the rate of capital accumulation, differences in employment growth, and uneven terms-of-trade movements.

* Tel.: +41-1-631-3233/34; fax: +41-1-631-3188.

E-mail address: Ulrich.Kohli@snb.ch (U. Kohli).

The purpose of this paper is to identify, to measure, and to compare the main factors explaining nominal GDP growth in a number of open economies. We will use an indexnumber decomposition that has a strong theoretical foundation, being based on the GNP/GDP function approach to modeling the production sector of an open economy.¹ This technique builds on the pioneering work of Diewert and Morrison (1986) who examined the welfare effects of technological change and terms-of-trade shifts.²

Much of the recent work on growth accounting has focused on the effects of technological change and increases in domestic factor endowments, especially the supply of capital (see Mankiw, Romer, & Weil, 1992; Pack & Page, 1994; Young, 1994a, 1994b, for instance). A controversy has developed regarding the relative importance of these factors, with some authors stressing the role of technological change and productivity shocks, and others adopting a more conventional view by mostly crediting the process of investment and capital accumulation. It is likely, however, that in most cases both factors are simultaneously at work, and that any discussion as to the relative importance of these two forces can only progress on the basis of additional empirical evidence. In fact, it probably would be most useful to first refine the measurement of the various factors at work, and to ensure that all major growth determinants have indeed been taken into account. In this regard, it strikes us that previous work has generally neglected the impact of terms-of-trade changes. This is all the more surprising that foreign trade has often been cited as a major factor explaining economic growth.³ As noted by Diewert and Morrison (1986), an improvement in the terms of trade is similar to a technological progress since it makes it possible for a country to increase its net output for any given amount of domestic inputs. A deterioration, on the other hand, is equivalent to technological regress, and it reduces the net amount of goods that a country obtains for a given effort.

With a few exceptions, growth accounting is based on the method developed by Solow (1957).⁴ That is, the technology is described by an aggregate production function. All outputs are aggregated, and two inputs—labor and capital—are considered. The functional form is Cobb–Douglas.⁵ The model then decomposes growth into three parts: the contribution of labor, the contribution of capital, and an unexplained residual that is interpreted as the contribution of technological change. This calculation can easily be done, based on the knowledge of the data alone, and of the average share of labor and capital in total costs.

418

¹ See Kohli (1978, 1991), and Woodland (1982). This approach recognizes the fact that the bulk in world trade is in raw materials and in intermediate goods, and that even most so-called finished products must still flow through the domestic production sector before reaching final demand. Similarly, exports are used as an input by the foreign technology, and they are thus not ready to meet final demand. As such, they are conceptually different from goods intended for domestic use that can therefore be viewed as nontraded goods.

² See Kohli (1990, 1991) and Morrison and Diewert (1990) for additional details.

³ See Pack and Page (1994), for instance.

⁴ See Christensen, Cummings, and Jorgenson (1980) for a decomposition based on the Translog production function.

⁵ Thus, Mankiw et al. (1992) explicitly use the Cobb–Douglas functional form, whereas Young (1994a, 1994b) measures total factor productivity growth by the difference between the growth rate of output per worker and a constant proportion of the growth rate of capital per worker.

دريافت فورى 🛶 متن كامل مقاله

- امکان دانلود نسخه تمام متن مقالات انگلیسی
 امکان دانلود نسخه ترجمه شده مقالات
 پذیرش سفارش ترجمه تخصصی
 امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
 امکان دانلود رایگان ۲ صفحه اول هر مقاله
 امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
 دانلود فوری مقاله پس از پرداخت آنلاین
 پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات
- ISIArticles مرجع مقالات تخصصی ایران