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Labor productivity in the middle income trap and the graduated countries☆

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ABSTRACT

In this paper, we investigate the role of labor productivity growth and whether the determinants of labor productivity growth differed among the middle income trap (MIT) and the graduated (non-middle income trap, NMIT) countries in the 1950–2005 period. We decompose labor productivity growth into "within sector" productivity improvements, "static structural change" productivity progress and "dynamic structural change" gains. Moreover, we study sectoral contributions to within sector productivity gains in these countries. We find that there was a significant labor productivity growth rate difference between the MIT and the NMIT countries, and this difference mainly originated from the within sector productivity improvements. Our sectoral analysis reveals that the most important sector that enlarged the within sector productivity growth gap between the MIT and the NMIT countries was manufacturing.

1. Introduction

In this paper, we investigate the role of labor productivity growth and whether the determinants of labor productivity growth differed among the middle income trap and the graduated (non-middle income trap) countries in the 1950–2005 period. Middle income trap usually refers to inability of a middle income country to join the group of high income countries. The Middle Income Trap (MIT) countries are the ones who have passed the low income levels and made significant progress in social and economic areas but cannot reach the socioeconomic levels attained by the rich countries. They usually stagnate in middle per capita income levels for a long period of time. The Non-Middle Income Trap (NMIT) countries are the ones who could pass from middle income levels to high income levels successfully (Yılmaz, 2015).

In the literature, there are mainly two different approaches to evaluate the existence of the middle income trap. According to the first approach, the MIT can be considered as the existence of weak or stagnating growth performance in absolute per capita income levels (Abdon et al., 2012; Aiyar et al., 2013; and Eichengreen et al., 2013). The second approach considers the MIT as unsatisfactory relative convergence of per capita income levels on those of the rich economies (Robertson and Ye, 2013; and Woo, 2012).[1]

In this paper, we categorize the MIT countries by a criteria suggested by Robertson and Ye (2013). Robertson and Ye (2013) claim that countries having 8–36% of the U.S. per capita GDP with unsatisfactory relative convergence of per capita income levels on those of the rich economies might be in the MIT. We think that their approach has some advantages. For instance, they utilize an econometric approach instead of ad hoc definitions to determine the MIT countries; and their approach enables to discriminate between the MITs and other short run developments. Moreover their findings on the trapped countries are consistent with other papers in the literature (Abdon et al., 2012; Aiyar et al., 2013; Eichengreen et al., 2013 and Woo, 2012). Hence we fix that a country is stuck in the MIT if it had 8–36% of the U.S. per capita GDP in 1960 and 2010.

By using the Penn World Table 7.1 (Heston et al., 2012), we determine that the NMIT countries are Cyprus, Greece, Portugal,

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[1] Along with these MIT advocating studies, Pritchett and Summers (2014) argue that the MIT is a questionable qualification for the growth theory. In this paper, we don't argue whether the MIT exists or not. We analyze the issue by focusing on the literature that supports the argument of the presence of the MITs.

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Hong Kong, Japan, Republic of Korea (Korea), Singapore and, Taiwan; and the MIT countries are Algeria, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Fiji, Gabon, Guatemala, Honduras, Iran, Jordan, Malaysia, Mauritius, Mexico, Namibia, Panama, Paraguay, Peru, the Philippines, Romania, South Africa, Syria, Turkey, and Uruguay.

We investigate the role of labor productivity growth and whether the determinants of labor productivity growth rates differ between the MIT and the NMIT countries utilizing a 9-sector framework. We decompose labor productivity growth into "within sector" productivity improvements and "structural change" productivity progress. Moreover, we study the sectoral contributions to within sector productivity gains in these countries. Our main research questions are: (i) What is the role of labor productivity growth in the MIT and the NMIT countries? (ii) Which component of labor productivity is more decisive in productivity developments? (iii) What are the contributions of sectors to within sectors productivity gains?

To answer these research questions, we use the well-known shift-share analysis to decompose aggregate labor productivity growth. The traditional shift-share analysis separates the change in aggregate productivity into a "within sector" productivity and "static and dynamic structural changes" effects by using various decomposition equations. We employ three decomposition equations that are widely used in the literature.

Our findings for the representative MIT and NMIT countries demonstrate that average labor productivity growth rates differentiated significantly. We also find that a typical MIT country lagged behind a typical NMIT country in terms of the "within sector" productivity gains. Moreover, manufacturing was the largest contributing sector to this within sector productivity gap. Our findings for the individual MIT countries show that the best three productivity growth performers were Malaysia, Turkey and Brazil. The decomposition analysis shows that within sector productivity gains were the main determinant of labor productivity gains with the exception of Bolivia and Mexico. In Bolivia and Mexico, structural change contributed to productivity growth more than within sector productivity. We find that manufacturing had the highest contributing share to the within sector productivity gains in more than two-thirds of the MIT countries.

The rest of the paper is organized as follows. Section 2 introduces shift-share analysis and Section 3 presents a brief literature review. Section 4 introduces the data and the methodology. Section 5 discusses the findings and Section 6 concludes.

2. Shift-share analysis

One of the well-known arguments of development economics is that modernization of economic activities and development require structural change (Kuznets, 1966; Lewis, 1954). Structural change means reallocation of labor across sectors. During the modernization process of economic activities, utilization of labor and other production factors in modern economic activities increases compared to their utilization in less modern and traditional ones. Increasing relative importance of modern economic activities with high productivity levels such as manufacturing and high quality services triggers wage and salary improvements. In other words, reallocation of labor across sectors supports economic growth.

To measure the importance of reallocation of labor among sectors for growth, a conventional shift-share analysis coming from Fabricant (1942) was usually used. Although it has some drawbacks (Timmer and Szirmai, 2000), some variants of shift-share analysis were applied to understand structural change patterns along with their repercussions on growth in many countries. As discussed in the literature (McMillan and Rodrik, 2011; Timmer and de Vries, 2007; van Ark, 1996), aggregate labor productivity growth may occur within sectors or stem from reallocation of labor across sectors (structural change productivity growth). The basic shift-share equation decomposes the change in aggregate productivity into a within and a between (structural change) effect.

There are four basic decomposition equations that play a prominent role in the literature (de Vries et al., 2013).

One of those basic decomposition equations is used by McMillan and Rodrik (2011). They argue that within sectors productivity growth may come from capital deepening, technological progress and reduction of misallocation across plants; and structural change productivity growth originates from movement of labor from low-productivity sectors to high-productivity sectors. According to McMillan and Rodrik (2011), the aggregate labor productivity growth can be explained by employing the following decomposition:

$$\Delta AP_t = \sum_i \varphi_{i,t-k}\Delta SP_{i,t} + \sum_i SP_{i,t}\Delta\varphi_{i,t} \quad (1)$$

In the decomposition, AP_t represents aggregate (economy-wide) productivity level and $SP_{i,t}$ demonstrates labor productivity level of sector-i at time t. Labor productivity is calculated by dividing aggregate/sectoral real output by the corresponding employment figure. Employment share of a sector is the ratio of sectoral employment to overall employment and $\varphi_{i,t}$ shows employment share of sector-i at time t. The change in level of a variable is shown by Δ operator. In the decomposition equation, the first term on the right side represents the "within sector" productivity growth component and the second term demonstrates the "structural change" component of the aggregate productivity growth. The within component consists of the weighted sum of the productivity growth within each sector (the weights are the employment share of each sector at the beginning of the time period). The structural change component includes productivity effect of labor reallocations among different sectors. It is essentially the multiplication of productivity levels (at the end of the time period) with the change in employment shares across sectors. When the changes in employment shares are positively correlated with the productivity levels, the structural change component is positive, and it affects economy-wide productivity growth favorably.

Choices about which period's employment and productivity levels are used as weights in the decomposition equation have significant effects on the magnitude and interpretation of structural change term. For instance, Haltiwanger (2000) demonstrates that using the base period employment levels, as in the decomposition Equation (1), increases the relative contribution from within sector productivity growth and decreases the contribution from reallocation (structural change). Hence, a second variant of the shift-share decomposition can be formulated by using final period employment shares in within part and base period productivity levels in structural change part.

$$\Delta AP_t = \sum_i \varphi_{i,t}\Delta SP_{i,t} + \sum_i SP_{i,t-k}\Delta\varphi_{i,t} \quad (2)$$

As expected, the decomposition in Equation (2) typically results in a relatively larger contribution from structural change determinant (de Vries et al., 2013). Endeavors to have more balanced weighting coefficients yield a third variant of the decomposition equation, in which period averages are used as in Timmer and de Vries (2009).

$$\Delta AP_t = \sum_i \overline{\varphi}_i\Delta SP_{i,t} + \sum_i \overline{SP}_i\Delta\varphi_{i,t} \quad (3)$$