



Resource abundance and economic growth in China [☆]

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ABSTRACT

This paper revisits the resource curse phenomenon in China and differs from the previous studies in four respects: (i) City-level data is used; (ii) A spatial variable is constructed to estimate the diffusion effect of natural resources among cities in the same province; (iii) The impact of resource abundance on economic development is investigated not only at the city level but also at the prefectural level in China; (iv) We use a functional coefficient regression model to deal with city-specific heterogeneity and, at the same time, analyze the transmission mechanism of the resource curse phenomenon. Our empirical results show that there is no significant evidence to support the existence of a resource curse phenomenon in China. On the other hand, we find that the degree of natural resource abundance in a city has a positive diffusion effect on the economic growth of neighboring cities within the same province at the city level, but not at prefectural levels. We attribute this to the urban bias policy.

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1. Introduction

Many studies attempt to determine whether or not natural resources serve as an important engine for economic growth. Their common finding is that the economic growth rates of natural resource-abundant countries are slower than those of natural resource-scarce economies (Leite & Weidmann, 1999; Papyrakis & Gerlagh, 2004; Rodriguez & Sachs, 1999; Sachs & Warner, 1995, 1997, 1999, among many others). This widely accepted phenomenon is referred to as the “resource curse” in the literature. Moreover, some recent studies analyze which socio-economic variables yield a negative association between economic growth and natural resource abundance. For example, Gelb (1988) and Auty (1990) argue that resource rich countries are likely to pay more attention to rent-seeking behavior rather than other productive activities. Angrist and Kugler (2008) emphasize that abundant resources can be a source of civil conflict. Matsuyama (1992) and Sachs and Warner (2001) find that resource-abundant economies value their natural resource oriented goods higher than their manufactured goods, which could keep their economies at a low level of economic growth. Gylfason (2001) finds that the level of education is an important factor for determining the resource curse phenomenon. Kronenberg (2004) demonstrates that corruption is a major determinant for the

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appearance of the curse of natural resources. Papyrakis and Gerlagh (2007) extend this line of research from cross-country studies to one examining different regions within the same country. They investigate forty-nine U.S. states and find positive evidences of the existence of the resource curse. In particular, they find that resource abundance decreases investment, schooling, openness and R&D expenditure and while increasing corruption.

However, a consensus among economists is far from reached about understanding the role natural resources play in economic growth. Habakkuk (1962) believes that resource abundance is one of the main reasons the U.S. economy surpassed the U.K. economy in the 19th century. Wright (1990) finds that the most significant feature of U.S. manufacturing exports during the early 20th century was an intensity in natural resources, and that abundant resources reflect advanced technology. Davis (1995) analyzes twenty-two mineral-based economies using different criteria and finds that the existence of resource curse is the exception rather than the rule. On the other hand, many economists find that the negative association between resource abundance and economic growth is not robust or insignificant when different measures of resource abundance and different frequencies of data are used. Sala-i Martin (1997) finds a negative association when the ratio of primary products to exports is used, a measurement of resource abundance advanced by Sachs and Warner (1995), while a positive association is obtained when the ratio of GDP to mining products is employed. Stijns (2005) shows that resource curse disappears when the resource abundance is measured in terms of energy and mineral reserves. Alexeev and Conrad (2009) argue that the current finding of the existence of resource curse, obtained by using an average growth rate starting from 1965, is possibly due to a dynamic pattern of refinement.

In recent years, more and more economists have become interested in examining whether the resource curse exists in China. To the best of our knowledge, Zhang, Xing, Fan, and Luo (2008) is the first paper in the English literature to explore this important issue. Using provincial-level data from 1985 to 2005, they find that Chinese provinces with abundant resources perform worse than provinces with poor natural resources in terms of per capita consumption growth. However, when they use the subperiod sample of 1995 to 2005, this finding disappears. They attribute this change to the resource price liberalization launched in the mid-1990s. Xu and Wang (2006) employ provincial-level panel data from 1995 to 2003 and find evidence to support the existence of resource curse. Using panel data of eleven western provinces between 1991 to 2006, Shao and Qi (2009) verify the existence of resource curse in the western regions of China. Using the panel data of twenty-eight provinces, Ji, Magnus, and Wang (2010) find that although resource abundance has a positive impact on economic growth in China, resource dependence has a negative impact. Furthermore, using a varying-coefficient model, they find the effect of natural resource on economic growth varies with institutional qualities. Fang, Ji, and Zhao (2011) investigate the resource curse in China using city-level data. They argue that the controversial results of the existence of the resource curse partially result from using different resource abundance measures.

In this paper, we revisit the curse of resources in China and analyze possible transmission mechanisms between resource abundance and economic development. Our paper contributes to the literature in four respects:

- (i). Instead of using province-level data, our analysis is based on all city-level data in China.¹ Benefitting from the large number of prefectural-level observations, we adopt a cross-sectional econometric model rather than a panel data model.²
- (ii). A diffusion variable based on the relative degree of resource abundance and the geographic distances between cities is constructed to capture the spill-over effect of resource abundance among cities within the same province. Hence, our study can distinguish two different effects. The effect of resource abundance represents whether the resource abundance of a city affects this city's long-run economic development, and the effect of the diffusion variable implies whether a city can gain a benefit from resource-rich cities within the same province. To our knowledge, this is a new contribution to the literature.
- (iii). We investigate the impact of resource abundance on economic development not only at the city level but also in the rural regions. We obtain different empirical outcomes for these cases. This difference may result from the urban bias policy.
- (iv). We analyze transmission mechanisms between resource abundance and economic development by employing a functional coefficient regression model. To analyze the transmission mechanisms, many studies adopt two least squares regressions separately (see Fang et al., 2011; Papyrakis & Gerlagh, 2004, 2007; Shao & Qi, 2009; among others). Due to these two separated regressions, it is different to infer whether a particular transmission mechanism is important to the relationship between resource abundance and economic growth. Taking advantage of the functional coefficient regression, we can combine the two regressions into one and make a precise inference about the transmission mechanism. Moreover, this functional coefficient regression allows us to capture a nonlinear relationship between resource richness and economic development, providing some interesting economic stories that may be neglected in a simple linear model.

Our results show that there is no support for the existence of resource curse phenomenon at the city level in China over the period 1997–2005. By applying the functional coefficient regression model, we find that the estimated effects of natural abundance on the economic growth of regional economies are significantly positive when the relative scale of the manufacturing industry, innovation (R&D) and openness are considered as transmission channels. In particular, we find a nonlinear relationship

¹ Fang et al. (2011) employ a sample consisting of only 95 cities in China.

² Due the limited number of provincial-level observations in China, most studies employ a panel data model to examine the existence of the resource curse. However, most cross-country studies prefer a cross-sectional regression model rather than a panel data model. A panel data model usually assumes a fixed effect and a first-order difference method is adopted to estimate the within-group effect. After the first difference, one actually estimates the short-run effect: using the change in resource abundance over periods to explain the economic growth rates of different provinces, while resource curse theory concentrates on the long-run effect of resource abundance on economic development.

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