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Do natural resources define convergence clubs? Empirical evidence from the Kazakh regions

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ABSTRACT

This paper deals with the hypothesis that natural resources are important in forming convergence clubs. We check this hypothesis by applying a dependence and an endowment measure of natural resource abundance and a regression tree analysis. The results indicate that for the Kazakh regions natural resources do indeed play an important role in forming convergence clubs. It is further shown that natural resource endowment rather than resource dependence determines initial conditions and thereby convergence clubs.

1. Introduction

Club convergence is an important issue in the economic growth literature as it is shown in a wide range of empirical studies on convergence that there is a considerable amount of countries and regions which do not converge according to the concepts of σ- and β-convergence.[1,2] This is also the case for

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[1] See for example Canova and Marcet (1999), Lee et al. (1997), and Grier and Tullock (1989).
[2] For an introduction to the concepts of σ- and β-convergence, see for instance Barro and Sala-i-Martin (2004).

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the Kazakh regions. As Frey and Wieslhuber (2011) point out, there is no σ- and absolute β-convergence across the Kazakh regions.[3,4] Therefore, the focus of this paper is on the analysis of club convergence in Kazakhstan.[5]

The term 'convergence club' was first introduced by Baumol (1986). Roughly spoken, the idea behind the concept of club convergence is that there are multiple steady states[6] a country or region[7] may approach. The 'basin of attraction' (Galor, 1996) a region belongs to is determined by the initial conditions at the beginning of the growth path.[8] To understand which initial conditions are potentially important in the case of the Kazakh regions, a closer look at their characteristics is needed.

The Kazakh regions are very heterogenous in terms of geography, population and economic activity. The regions in southern Kazakhstan (Almaty, Zhambyl and South Kazakhstan) are industrially underdeveloped and dominated by agricultural activities, as Ursulenko (2010) explains. At the same time these regions are the most populated ones in Kazakhstan. Kostanai, North Kazakhstan and Akmola produce the highest gross agricultural output. The regions with a strong industrial sector (East Kazakhstan, Karaganda and Pavlodar) are located in the north and center of Kazakhstan, whereas the oil- and gas-extracting regions (Aktobe, Atyrau, Kyzylorda, Mangistau and West Kazakhstan) are based in the western part of the country (Roudoi et al., 2011). Natural resources (namely oil, gas and coal) play an important role in Kazakhstan[9,10] and might also influence a region's growth path. Accordingly, many empirical studies[11] conclude that resource-rich and resource-poor countries or regions have different patterns of growth.[12] In addition, natural resources are also said to influence other variables like human development indicators (Bulte et al., 2005) and education (Gylfason, 2001), which in turn reflect the initial conditions at the beginning of the growth path.

Because of this and due to the fact that natural resources are unequally distributed across the Kazakh regions, we hypothesize that they play an important role in forming convergence clubs. But how should resource abundance be measured? This question has become a key issue in the empirical literature on natural resource abundance and economic development.[13] Bond and Malik (2009) point out that 'empirical findings [are] highly sensitive to the choice of resource measures.' In general, two types of natural resource indicators can be distinguished. One possibility is to use reserve or production data to capture a region's resource endowment or wealth, whereas the dependence of a region on natural resources is determined by taking relative measures as the share of primary commodity exports in total exports or in GDP. Therefore, we apply two different measures of resource abundance to identify resource-rich regions. One is based on production data in physical units and is hence considered as an endowment measure. The second measure refers to the value of natural resource production and its relative importance. Accordingly, this indicator is regarded as a dependence measure.

Looking for club convergence poses the question of how to cluster regions. Different approaches are proposed in the literature to identify potential convergence clubs (Harris, 2011). Among these is the Classification and Regression Tree (CART) analysis (Breiman et al., 1984), which endogenously identifies clubs in order to avoid a selection bias problem. Applying regression tree analysis, our hypothesis is tested by endogenously grouping the Kazakh regions according to the variables

[3] Conditional β-convergence is not a topic here as we assume that the Kazakh regions share the same structural characteristics and should therefore have a common steady state. This assumption seems to be reasonable when looking at regions within a country (Barro and Sala-i-Martin, 2004) and is also made by Johnson and Takeyama (2001), among others.

[4] However, Aldashev (2011) finds convergence in wages.

[5] Note that for the following empirical analysis the regions Astana city and Almaty city are excluded from the sample as cities are generally not resource abundant.

[6] For theoretical models with multiple equilibria, see for instance Galor (1996) and Azariadis and Drazen (1990).

[7] Note that in the following we only concentrate on regions, even though in general the arguments would also apply to countries.

[8] Empirically, regional club convergence is established for example in the case of the European regions (De Siano and Marcella, 2006a; Fischer and Stirböck, 2006), the US States (Johnson and Takeyama, 2001) and the Italian regions (De Siano and Marcella, 2006b).

[9] See for example Agrawal (2008) and Kutan and Wyzan (2005).

[10] Frey and Wieslhuber (2011) illustrate that growth in oil and gas extraction contributed considerably to real GDP growth in Kazakhstan.

[11] See for example Chambers and Guo (2009), Papyrakis and Gerlagh (2007) and Papyrakis and Gerlagh (2004).

[12] For the countries in Central Asia this is established by Felipe and Kumar (2010).

[13] See for example Bond and Malik (2009) and Brunnschweiler (2008).