

CHAPTER 1

INTRODUCTION

The state of the whole commercial world can seldom be much affected by the improvement of any particular country; and the market for such commodities may remain the same or very nearly the same after such improvements as before. It should, however, in the natural course of things rather upon the whole be somewhat extended in consequence of them. If the manufactures, especially, of which those commodities are the materials should ever come to flourish in the country, the market, though it might not be much enlarged, would at least be brought much nearer to the place of growth than before; and the price of those materials might at least be increased by what had usually been the expense of transporting them to distant countries. Though it might not rise therefore in the same proportion as that of butcher's meat, it ought naturally to rise somewhat, and it ought certainly not to fall.

Adam Smith (1776)

Economists have sought to understand the processes and frameworks of economic growth across countries since Adam Smith developed the modern concept of economic growth in 1776. Two centuries later, Robert Solow observed some additional advantages of economic concepts and developed the standard neoclassical model of economic growth. The neoclassical perspective led some to argue that some countries achieve large increases in output over extended periods of time that in turn dramatically changes the general economic, political, and institutional landscape. The link between economic growth and a wider concept of “determinants” is, however, controversial.

In the 1980s, many economists argue against the assumption in the Solow model that the permanent changes in conventional government policies have no permanent effects on an economy's long-term growth. Paul Romer (1986) presents a profound finding that the long-term growth is clearly endogenous. The key determinants of long-term growth, rather than by some exogenously growing variables such as unexplained technological change, are the reason for the name endogenous growth.

Despite the vast literature on empirical growth studies following the papers of Sachs and Warner (1995), and Hall and Jones (1999), the empirical work attempted that has tried explain the dynamics of growth has identified a number of variables that only partially directly correlate with economic growth. The major problem is the lack of an explicit theory about the exact true causality of growth model.

Why are some so rich and some so poor? Gallup et al. (1999) focus on the significant impacts of geography on economic development. They found that geography directly impacts growth, controlling economic policies and institutions, and the effects of geography on policy choices and institutions. The geography variables used in the model are the geographical proportion of land in the tropics, the proportion of land in the ecological tropics, the prevalence of malaria, hydrocarbon deposits, and regional dummy variables. Following the natural resources research, Jeffrey Sachs has emphasized the impact of human health on economic development, particularly, malaria in Africa.

An empirical study, by Acemoglu et al. (2001), argues that the geography mechanism works entirely through institutions. Acemoglu et al. (2001) present the evidence on the significant role geography plays in explaining the establishment of early institutions. On the

contrary, Rodrik (2002) claims that geography plays both direct and indirect roles in the growth model.

A solution to the reasonable question of how to “go further” is proposed by Masters and McMillan (2001), who introduce a new climate variable labeled “annual hard frosts” that directly impacts economic growth. They note, however, as Masters and McMillan (2001) paraphrase above, that their aggregate measures choose a climate threshold that may perhaps be arbitrary. There are also various initially more substantial obstacles that can contribute to an incomplete picture and thus lead to possibly wrong conclusions since not all assumptions of the model uncertainty then hold.

This study contributes to the debate on growth empirics by empirically identifying robust determinants of per capita growth rates across the world. The study is organized as follows: Chapter 2 starts with a short retrospective regarding climate impact on economic growth rate along with a few remarks on robustness in econometrics. Subsequently, I present an introduction to several extensions and empirical applications of robust estimation techniques which are both addressed and discussed.

The following Chapter 3 applies the quantile regression procedure to the analysis of the economic growth model. The impact of climate factor on the conditional distribution of per capita income growth is considered. The obtained results vary significantly for different economic development. In next section, Chapter 4, the climate proxy “annual hard frosts” needs to be robustly linked to technical efficiency in agriculture. Finally, a brief summary is offered in Chapter 5.