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## Dynamic analysis of bureaucratic quality and occupational choice

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## ABSTRACT

This paper analyzes the interdependency between bureaucratic quality and economic development. Capital accumulation changes bureaucratic quality through occupational choice in two cases. In the first case, the bureaucratic quality improves through economic development, and, in the second case, bureaucratic quality worsens or remains low. In both cases, good quality of bureaucracy cannot be realized without economic development. Workers and bureaucrats earn a higher income under a low-quality bureaucracy. A change in quality from low to high expands income inequality between unskilled and skilled individuals and contracts inequality among skilled individuals.

## 1. Introduction

Few researchers doubt the fact that political institutions and economic development are significantly correlated. Thus, regarding this correlation, a large body of prior literature analyzes the effects of political institutions on economic development. Mauro (1995), Knack and Keefer (1995), Hall and Jones (1997; 1999), and Dollar and Kraay (2003) show a well-functioning institution and high-quality politicians and bureaucrats promote economic growth. These results form the core of the advice and conditions for receiving aid from international financial institutions.

Conversely, relatively little empirical research exists on the effects of economic development on political institutions. This lack of research exists because most empirical studies assume that political institutions affect economic development. Even if some studies<sup>1</sup> examine the effects of development on political institutions, their results do not reach a consensus. Chong and Calderon (2000) and Treisman (2000) show positive effects of development on political institutions, where political institutions become less corrupt or the quality of institutions improves as the economy grows. Contrarily, Kaufmann and Kraay (2002) find weak and negative effects of development on the governance of political institutions, where development worsens or does not change the quality of the institutions<sup>2</sup>. In addition, the study emphasizes the necessity of other interventions to realize the positive effects that development can have on political institutions in an economy. In other words, development cannot improve the quality of political institutions unless the economy fulfills certain conditions.

Therefore, political institutions and economic development can be interdependent and affect each other. Although almost all studies find evidence of positive effects of institutions on development, the effects of development on institutions are positive, negative, or nil<sup>3</sup>. The main purpose of this paper is to provide a theoretical model for analyzing such arguments.

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<sup>1</sup> All the studies in this paragraph analyze the causality between political institutions and economic development. Thus, they examine causal effects of institutions on development and effects of development on institutions.

<sup>2</sup> Kaufmann and Kraay (2002) find the negative effects of per capita income on governance and positive effects of governance on per capita income. The study shows a positive correlation between the quality of governance and per capita income because the positive effects dominate the negative one.

<sup>3</sup> The result that development has no impact on political institutions seems uninteresting. However, if there can exist an economy with positive effects and one with negative or no effects, then comparing these economies and finding conditions for positive effects would be important. An economy with negative or no effects can improve bureaucratic quality and promote capital accumulation as long as it adopts policies to satisfy these conditions.

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From a theoretical viewpoint, notable studies exist. [Acemoglu and Verdier \(1998; 2000\)](#), [Jaimovich and Rud \(2014\)](#), and [Murphy et al. \(1991\)](#) construct general equilibrium models and provide a static analysis of political institutions. [Blackburn et al. \(2006\)](#), [Ehrlich and Lui \(1999\)](#), [Sarte \(2001\)](#), and [Spinesi \(2009\)](#) conduct dynamic analyses using a growth model. Similar to the empirical literature, most theoretical studies focus only on the effects of political institutions on economic development. The exception is [Blackburn et al. \(2006\)](#), whose results are closely related to ours. They offer a positive and two-way causal relationship between the quality of bureaucracy and development<sup>4</sup>; that is, the quality of political institutions increases with economic growth because the number of corrupt bureaucrats decreases, and this high quality positively affects economic development. Thus, [Blackburn et al. \(2006\)](#) is the first study that theoretically shows the interdependency between political institutions and development and positive effects: development improves the quality of political institutions. In what follows, we also show the interdependency between bureaucratic quality and development and provide not only positive effects of development on quality but also the possibilities of negative or no effects.

This paper, based on [Jaimovich and Rud \(2014\)](#), constructs a dynamic general equilibrium model with an occupational choice. The model in [Jaimovich and Rud \(2014\)](#) has two features: occupational choice by skilled individuals and dishonest behavior by bureaucrats<sup>5</sup>. Skilled individuals choose their occupation between becoming an entrepreneur or a bureaucrat. Bureaucrats have the opportunity to display bad behavior. They lie to the central government to decrease their utility loss from exerting efforts for the production of public goods. We extend the model by [Jaimovich and Rud \(2014\)](#) in two aspects. First, capital accumulates endogenously. Second, the bureaucrats' utility loss depends on the scale of the economy. These extensions are used to examine the effects of economic development on bureaucratic quality. In this paper, a bureaucracy without dishonest behavior has high quality and a bureaucracy with the dishonest behavior has low quality. This paper calls the former a good bureaucracy and the latter a bad bureaucracy.

The results of this paper are as follows. Bureaucratic quality and capital accumulation are interdependent. The bureaucratic quality changes labor demand and taxes, and thus affects capital accumulation. Capital accumulation affects bureaucratic quality through changes in occupational choice. There are two cases. The first case has positive effects. Capital accumulation positively affects bureaucratic quality at any stage of development, wherein the quality changes from bad to good with economic growth. The second case has negative or no effects. The bureaucratic quality worsens with the accumulation of capital; the quality changes from bad to good and eventually to bad. In addition, there exists the case in which development does not affect quality; the quality remains bad. Thus, these results explain the positive effects by [Chong and Calderon \(2000\)](#) and [Treisman \(2000\)](#), and the negative or no effects by [Kaufmann and Kraay \(2002\)](#). Concerning the conditions for positive effects, the following three factors play an important role: the small share of dishonest bureaucrats, small utility loss of honest bureaucrats, and high probability of detecting dishonest behavior. In the present model, three factors lead to low income and high utility loss for dishonest bureaucrats. In such conditions, individuals who can act dishonestly in the bureaucracy choose to be entrepreneurs rather than bureaucrats. Using the interdependency between bureaucratic quality and development, this paper investigates transitions of capital accumulation and bureaucratic quality. The following three steady state types can exist: good bureaucracy with large output, bad bureaucracy with small output, and bad bureaucracy with large output.

The most important differences between this paper and [Blackburn et al. \(2006\)](#) are the mechanisms behind the effects of development on bureaucratic quality. In the model from [Blackburn et al. \(2006\)](#), if corrupt bureaucrats are caught, they lose everything, including their income. The number of corrupt bureaucrats or the amount of bribery decreases with the accumulation of capital because of an increase in bureaucrats' income<sup>6</sup>. According to this mechanism, [Blackburn et al. \(2006\)](#) show positive effects of development on bureaucratic quality. Contrarily, in our model, occupational choice plays an important role. As per [Blackburn et al. \(2006\)](#), capital accumulation increases bureaucrats' income. However, there is not only an increase in bureaucrats' income but also an increase in the utility loss of bureaucrats and entrepreneurs' profits. Dishonest bureaucrats change their occupation from bureaucrats to entrepreneurs when the utility of entrepreneurs becomes relatively greater than that of bureaucrats with the accumulation of capital. Thus, development improves the quality of bureaucracy. Contrarily, dishonest bureaucrats can easily maintain their motivation for working as bureaucrats in an economy wherein an increase in bureaucrats' income is larger and increase in utility loss of bureaucrats is smaller<sup>7</sup>. This keeps bureaucratic quality at a low-level.

These differences cause different policy implications. The effects of an increase in bureaucrats' income on bureaucratic quality positively work in the [Blackburn et al. \(2006\)](#) model, but negatively work in our model. In the [Blackburn et al. \(2006\)](#) model, high income indicates severe punishment for corruption. In that case, the policy that increases bureaucrats' income improves the quality of the bureaucracy. Contrarily, in our model, individuals who can behave dishonestly are more likely to become bureaucrats because they are attracted by the high income. Therefore, this policy worsens quality. Our result is derived from endogenous occupational choice. Thus, this paper relates to [Macchiavello \(2008\)](#), [Mattozzi and Merlo \(2008\)](#), and [Messner and Polborn \(2004\)](#) who show that an increase in bureaucrats' or politicians' salary decreases their quality, given a self-selection model for political jobs.

Moreover, this paper examines the following two types of income inequality: one is income inequality between unskilled and

<sup>4</sup> [Blackburn et al. \(2006\)](#) show a negative relationships between corruption and development. In this paper, a decrease in corruption translates into an increase in the quality of a bureaucracy.

<sup>5</sup> [Jaimovich and Rud \(2014\)](#) refer to dishonest behavior as rent seeking.

<sup>6</sup> In the [Blackburn et al. \(2006\)](#) model, bureaucrats get wages, similar to workers. The wage increases if capital accumulation proceeds; however, the supply of workers remains constant.

<sup>7</sup> In other words, the economy does not satisfy certain conditions by maintaining a large share of dishonest bureaucrats, large utility loss of honest bureaucrats, and low probability of detecting dishonest behavior.

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