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Cognitive capital, good governance, and the wealth of nations

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ABSTRACT

Good governance or "government effectiveness" (per the World Bank) is seen as a critical factor for the wealth of nations insofar as it shapes political and economic institutions and affects overall economic performance. The quality of governance, in turn, depends on the attributes of the people involved. In an analysis based on international data, government effectiveness was related to the cognitive human capital of the society as a whole, of the intellectual class, and of leading politicians. The importance of cognitive capital was reflected in the rate of innovation, the degree of economic freedom, and country competitiveness, all of which were found to have an impact on the level of productivity (GDP per capita) and wealth (per adult). Correlation, regression, and path analyses involving $N = 98$ to 201 countries showed that government effectiveness had a very strong impact on productivity and wealth (total standardized effects of $\beta = .56$–$.68$). Intellectual classes' cognitive competence, as indicated by scores for the top 5 percent of the population on PISA, TIMSS and PIRLS, also had a strong impact ($\beta = .50$–$.54$). Cross-lagged panel designs were used to establish causal directions, including backward effects from economic freedom and wealth on governance. The use of further controls showed no independent impacts on per capita wealth coming from geographical variables or natural resource rents. Finally, we discuss background factors and ways in which governance might be improved.

Good governance, the benign and efficient management of society via decisions and institutions, can make a major contribution to the well-being of nations. Notorious examples of bad governance include China's "Great Leap Forward" under Mao Zedong (from 1958 to 1961) resulting in a famine with 18 to 45 million deaths, or the dictatorships of Adolf Hitler, Pol Pot, Idi Amin, and Saddam Hussein. By contrast good governance promotes not only economic prosperity, but also freedom, the rule of law, human rights, security, and peace.

How may good or bad governance affect society? Governance has an impact through the development and interpretation of law, the negotiation of agreements with other countries and international organizations, the shaping of political and economic institutions, the influence on human capital development and demographic policies, the development and control of executive organs and the workforce in administration, bureaucracy, police, judiciary, military, customs, tax bodies, and technical inspection organs. Corruption and low quality in administration and economy are controlled; competence, efficiency and meritoric principles are encouraged.

Since governance under modern conditions operates through many kinds of decisions and institutions, the development of cognitive capital is critical for its success. Educational policies are important for both the spread of basic skills and the emergence of specialists working in political, economic, and scientific institutions managing processes and developing new technologies. This view of governance is actively promoted by the World Bank and its researchers (Kaufmann, 2003).

We first bring together the different streams of research contributing to an understanding of the relationship between cognitive ability, good governance, and wealth of nations leading to a testable model integrating average cognitive ability, intellectual classes' ability, competences of politicians, government effectiveness, innovation, economic freedom, competitiveness, productivity, and wealth controlled for geographical variables and natural resources.

1. Human capital and cognitive ability theory

Aristotle (2009/-330)wrote in his *Nicomachean Ethics* VI, 8, 1141b that "Prudence is indeed the same quality of mind as statesmanship", and that this prudence (or wisdom and intelligence) is mirrored in legislation. Modern human capital theory relates individual human capabilities to life outcomes such as job performance, marriage, and health (Becker, 1993/1964). Studies of diverse forms of human capital — diligence, conscientiousness, discipline, and self-discipline, vitality, social competence, law-abidingness, agreeableness, and cognitive ability —

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have typically found the last of these to be the most important one. In statistical analyses of job performance, cognitive ability has the highest predictive validity of any form of human capital. Depending on the criteria used and corrections for low reliability and variance restriction, the correlations and regression coefficients for cognitive ability are typically between .25 and .80 (Salgado et al., 2003; Schmidt, 2012). Such results have been obtained in developed as well as in developing countries (Meisenberg, Lawless, Lambert, & Newton, 2006). In more complex jobs, the predictive validity of cognitive competence is even greater (e.g., $r = .40$–.58, Kuncel & Hezlett, 2010). The relationships hold regardless of whether the analysis is of a cross-sectional or longitudinal nature (Irwing & Lynn, 2006; Kramer, 2009).

One reason for these results is that cognitive ability tests are more reliable and valid than measures of other types of human capital. People probably also differ more in cognitive ability than in other fundamental traits such as visual ability. Differences are a prerequisite for correlational predictivity. Thus, a fundamental condition for successful job performance such as visual ability is not very predictive because blind people are rare and frequently excluded from consideration (e.g., from becoming a pilot).

More importantly, job requirements call for cognitive abilities because many tasks are better addressed through the use of knowledge and deliberation. Especially in modern and more complex jobs, learning is a prerequisite to becoming an effective worker (Schmidt & Hunter, 1998). Job requirements themselves are cognitively demanding, e.g. understanding instructions, orders, and security risks, prioritizing tasks, coming to a decision, processing, and integrating and evaluating information for solving problems. The performance of diverse professionals such as accountants, businesspeople, physicians, engineers, managers, and scientists depends on cognitive ability (Gottfredson, 2003). Cognitive ability is not only helpful in navigating the educational selection and competence building process in schools, but also in coping with conditions in jobs and in every day life, e.g. driving a car, managing income and property, selecting a mate, educating children, and engaging life in a healthy and sensible way. People with greater cognitive ability learn from their mistakes and can therefore mimic what works elsewhere (Kodila-Tedika, 2012). Intelligence is also positively related to patience, which enables players in institutions to develop a better understanding of the principles and rules that govern them (Kodila-Tedika & Kalonda-Kanyama, 2012; Shamosh & Gray, 2008).

An example of worst practice is revealing. According to Schmidt (2009, pp. 11ff.), until the mid-1980s the Washington, DC police force was one of the best in the USA. Applicants were selected for police academy training based on a general intelligence test and a background investigation. The mayor, Marion Barry, eliminated this procedure with several consequences: the drop-out rate among the police increased (80% of the new hires were incapable of completing the required training); the content of academy training was eased; the police officers being produced were frequently incompetent (murder indictments were dismissed because the reports written by the officers on the scene were unintelligible, solution rates for murder cases declined, firearms accidents soared because officers did not know how to use weapons properly, and crime on the police force became more common).

This example highlights not only the consequences of test abandonment for hiring decisions and its cognitive outcomes, but also the effects of bad government on the quality of institutions (Jones & Potrafke, 2014). Such a view is backed by systematic studies of the impact of human capital on institutions and growth (Glaeser, La Porta, Lopez-de-Silanes, & Shleifer, 2004, p. 297f.): "Much evidence points to the primacy of human capital for both growth and democratization. … The first order effect comes from human and social capital, which shape both institutional and productive capacities of a society."

The traditional human capital and cognitive ability approaches assume that their constructs show an impact on the achievement of individuals. However, in addition they have effects at higher order levels: First, there is a simple aggregation effect. Ability and achievement averaged across different individuals will lead to corresponding results at an aggregated level (e.g., intelligence and income: individual level across individuals: $r = .35$, Kramer, 2009; national level across nations, GNP/GNI per capita: $r = .57$ to .77, Hanushek & Woessmann, 2009; Lynn & Vanhanen, 2012a, p. 76f.; Weede & Kämpf, 2002). Second, there are interaction effects as the ability level of others in groups influences the behavior and cognitive development of individuals (Sacerdote, 2011). Additionally, intelligence furthers cooperation within institutions (Jones, 2008). Third, there are also interaction effects insofar as the ability level of individuals and groups influences the quality of institutions and the institutions again have an impact on individual and group development (e.g., through the instructional quality of teachers; Hanushek, Piopiunik, & Wiederhold, 2014). This could be extended from classes and schools to administrative bodies, companies, politics, countries, and cultures. For example, economies and societies at a higher ability level are likely to develop new and complex technology and will absorb innovations from other countries more quickly (Jones, 2012). Intelligence also reduces corruption (Potrafke, 2012), and more intelligent people tend to prefer pro-market policies (Caplan & Miller, 2010), both of which have a positive impact on economic growth. Thus we assume a causal impact of national cognitive ability on productivity, income, and wealth. By such an assumption the impacts of further determinants, mediating variables, and backward effects are not excluded.

Studies at the macro-social level usually show high correlations between average cognitive ability and productivity (GDP) or income (GNI), where average cognitive ability is assessed on the basis of intelligence tests or student achievement tests. The test results are also typically related to the average number of years in primary, secondary and tertiary schools or the percentage of the population with secondary school qualifications. Correlations (r) between cognitive ability and production or income are usually between $r = .50$ and .80 (Lynn & Vanhanen, 2012b), and the relationship holds for richer as well as for poorer countries (Kodila-Tedika & Bolito-Losembe, 2014).

However, in modernity the achievements of intellectual classes, high ability groups, called by Pritchett and Viarengo (2009) "global performers" or the "team in the tail", who can "compete internationally" and "perform at a globally competitive level", seem to be especially crucial for enhancing the production of wealth. Hanushek and Woessmann (2008) referred to them as "rocket scientists". Their impact works via technological innovation and management of complexity in companies and administration — the last as a part of government effectiveness. Contrary to other forms of "capital" there seems to be no diminishing returns from cognitive ability: the higher the ability and the more intelligent persons there are, even at highest ability levels, the better (Robertson, Smeets, Lubinski, & Benbow, 2010; Wai, 2013). The existence and extent of such intellectual classes can be estimated in two different ways: the size of higher ability groups (e.g., the share above SAS ≥ 600, equivalent to IQ ≥ 115; Hanushek & Woessmann, 2009) or the ability level of the top group (e.g., brightest 5%; Rindermann, Sailer, & Thompson, 2009).[1] Both operationalizations cover not only a small elite, but a broader spectrum of above average cognitive workers including teachers, engineers, entrepreneurs, physicians, lawyers, normal scientists, managers, accountants and politicians, managing and working in the areas of education, innovation, economy, administration, and politics.

2. A model of governance effects

Good governance is a highly complex cognitive task. Leaders and administrators need to acquire and interpret information, frequently from multiple and even contradictory sources, process it in the light of

[1] More precisely, the intellectual classes' level is the ability level at the 95th percentile rank, meaning the lower cognitive ability threshold of the top 5% group. SAS: scale used by student assessment studies, $M = 500$, $SD = 100$, varying reference groups.