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## Explaining long-run economic development in Africa

Bolt, J.

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**Explaining Long-Run Economic Development  
in Africa**  
*Do Initial Conditions Matter?*

Jutta Bolt

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RIJKSUNIVERSITEIT GRONINGEN

Explaining Long-Run Economic Development  
in Africa  
*Do Initial Conditions Matter?*

Proefschrift

ter verkrijging van het doctoraat in de  
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Prof. dr. O. Morrissey  
Prof. dr. J. L. van Zanden

*To my loved ones*



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Jutta  
Schouwerzijl, January 2010

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# Chapter 1

## Explaining Africa's Long-Run Economic Development: Do Initial Conditions Matter?

### 1.1. Introduction

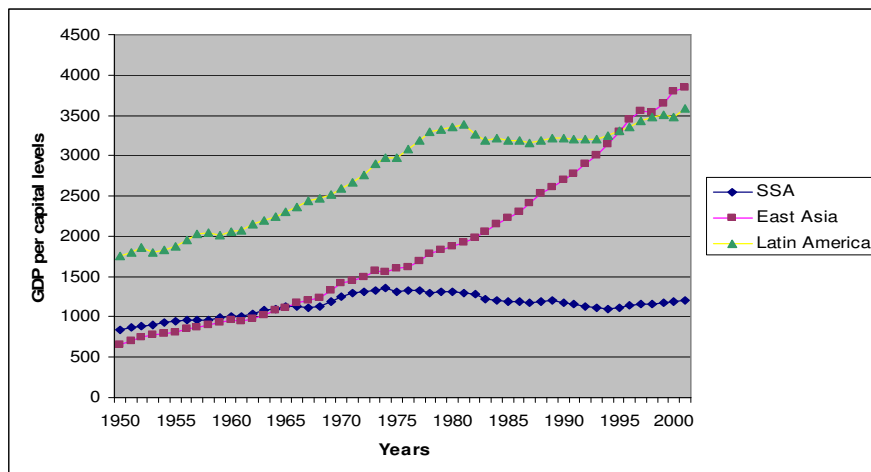
One of the most pressing issues in development economics is (the lack of) progress in *the* development region: Sub-Saharan Africa (Africa hereafter). Africa clearly occupies a distinct place in development studies, as Africa is the poorest region in terms of income levels per head of the population and also, on average, the slowest growing continent of the world (Easterly and Levine, 1997; Sachs and Warner, 1997; Acemoglu et al., 2001; Rodrik, 1998; Block, 2001).

However, these averages hide an enormous within-Africa diversity both in economic performance and in economic fundamentals. This thesis focuses on this African diversity as we analyse institutional and economic developments for the majority of the African countries from a long term perspective. Many studies have offered explanations for Africa's growth performance compared to other regions, ranging from bad institutions brought by colonisers, to ethnic diversity and bad geography (Acemoglu et al. 2001; Easterly and Levine 1997; Collier and Gunning 1999; Gallup et al. 1998; Sachs 2001). But these studies rarely take the situation before colonisation into account nor do they actually measure colonial presence beyond a colonial dummy. We focus only on Africa, and start by measuring pre-colonial institutional 'initial conditions' and link this to institutional and economic

development in later times to the present day. Subsequently we quantify colonial presence in education just before decolonisation, and link this to educational and economic development during independence. Finally, we study the influence of a colonial past on present day investment patterns.

When we compare the income per capita developments since 1950 of three geographical regions home to a majority of relatively poor countries in graph 1, Africa is the region obviously lagging behind as it is not much better off than it was 25 years ago (Vaughan, 2005). Africa's distinctiveness is also reflected by the Africa dummy which is often included in studies analysing economic growth in a world sample (Barro, 1998; Gallup et al., 1998).

**Figure 1.1: GDP per capita development for developing regions**



Source: Maddison (2003)

But averages have only limited value for the African continent, given the enormous diversity this region contains. There are 47 countries in Sub-Saharan Africa, together covering an area of 23,8 million square kilometres. This equals the size of Europe, the United States (including Alaska) and China put together. The continent has a wide variety of climate zones, ranging from deserts and semi-deserts to savannas, tropical rainforest and woodlands (Neff, 2007).

In 2000, there were over 665 million people living in Sub-Saharan African countries (U.S. Census Bureau, Population Division), which is on average 28 persons per square kilometre. The most populous countries are Mauritius (584 persons per sqd km. in 2000) Rwanda and Burundi (337 persons and 266 persons per sqd km. in 2000 respectively). The lowest population densities can be found in Namibia, Mauritania and Botswana (2,3 persons, 2,4 persons and 2,9 persons per sqd km in 2000 respectively). Furthermore, Africa is both linguistically and ethnically the most diverse continent in the world. In the words of Frederick Cooper (2002): ‘Africans are as different from each other as they are from anybody else (Cooper, 2002:12; see also Manning, 1990:25).

This vast variety in circumstances between African countries is reflected in various development paths (Rodrik, 1998; Collier and Gunning, 1999; Garner, 2005; Englebert, 2000a; 2000b). There are countries that experienced over 2.5% growth on average for 50 years, and there are countries that are actually worse off than they were 25 years ago. In half of the countries, income per capita is over 1,000 international dollars per annum at the end of the previous century.

The distinct place in terms of development Africa occupies in the world, and the variability of growth experiences on the continent merits an analysis of economic and institutional development in an African sample. This thesis will do so by taking a historical approach. We try to assess the impact of initial conditions on development paths in later times. Initial conditions, i.e. the situation present before or at the beginning of the period under analysis, can be thought of as a spectrum, from factors that are plausibly exogenous to factors that are the results of previous policies (Temple 1998). Many studies include initial conditions in growth analyses, such as the geographical situation, the availability of resource endowments, ethnic diversity, capital stocks, technological environment and social capability (Sachs and Warner 1997; Easterly and Levine 1997; Abramovitz 1986). In the convergence literature for example, initial conditions are argued to determine the potential of countries to catch up to the technology leader (Abramovitz 1986, 1989).

Given Africa’s colonial history, which has been influential if only for the creation of the countries we know today, two periods for initial conditions are



defined in this study, namely the pre-colonial period and the colonial period<sup>1</sup>. First, the institutional environment in pre-colonial times is measured using new data taken from anthropological datasets and this is utilized to analyse the influence of these early institutions on institutional development and economic development in present times. Second, using colonial archives the actual presence of colonial rulers in various African countries is captured and used to assess to what extent that influenced development paths after independence. Finally, we study the effect of a colonial past on investment patterns abroad.

Together with this introductory chapter, this thesis contains five chapters. Four chapters are based on articles published or submitted to various journals. This might cause some overlap in the discussion of both variable measurement and literature.

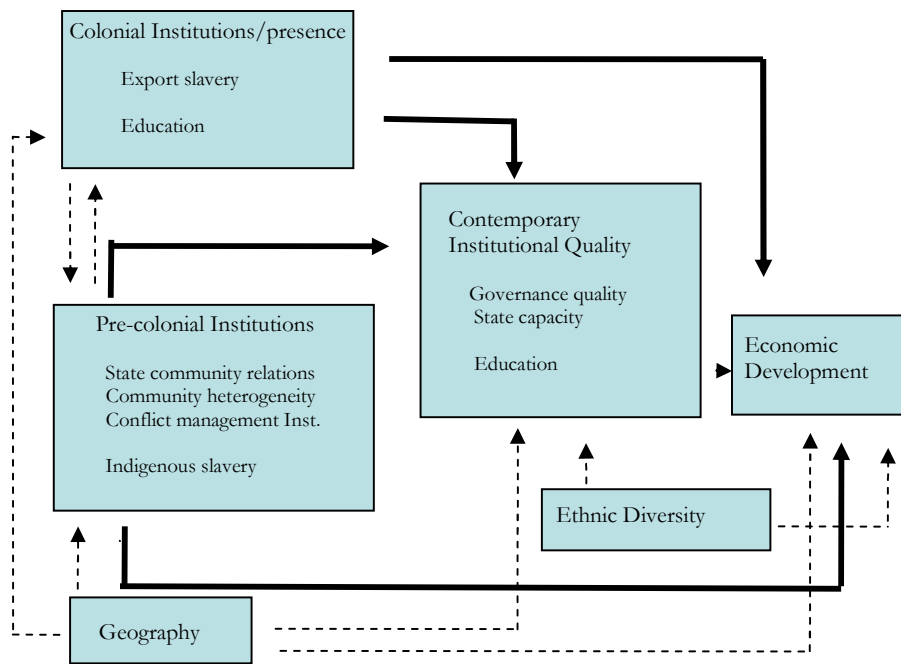
This first chapter serves both as a general introduction to the topic of African development and as a prelude to the other chapters. It will start with a brief overview of the current economic situation in African countries and the main developments since 1950. This will make clear that there is substantial between-country variation to be explained. Subsequently we review studies explaining broad economic development, with special relevance to Africa, while making the distinction between ultimate and proximate causes of growth. Literature discerns the following root causes of African development: *Institutions*, of which the roots are traced back to colonial times (Acemoglu et. al, 2001; Grier, 1999; Englebert, 2000b; Bertocchi and Canova, 2002; Lange, 2004; Fielding and Torres, 2008). *Slave trades*, which pre-dates and coexisted with colonial rule, in which millions of Africans were exported from the continent, arguably severely hampering African development (Nunn, 2008; Manning, 1983, 1990; Lovejoy, 1983). *Geography*, where the tropical location of the African continent leads to bad disease environments and limits to agricultural and labour productivity (Sachs and Warner, 1999; Sachs, 2001; Gallup et al., 1998). And finally, *ethnic diversity*, often in combination with little political development, is maintained to lead to the formation of less social capital, to the undersupply of productive public goods, and more generally to less growth enhancing policies, hence causing lower economic growth (Easterly and Levine, 1997; Collier and Gunning, 1999a, 1999b). Figure 1.2 below summarises variables

---

<sup>1</sup> In appendix 1.A we include a table with the start and the end of the colonial period for every African country.

discussed and the links to development and includes in bold the relationships studied in this thesis.

**Figure 1.2: Variables explaining Africa’s development**



Our main findings are that indeed initial institutional conditions matter. Africa was no tabula rasa with respect to institutions when Europeans conquered the continent, and these indigenous institutional histories matter when explaining institutional development in Africa. Furthermore, we find that variables useful in explaining the difference between rich and poor countries in a world sample are not always helpful in explaining growth differences within a sub-sample of only developing countries. More specifically, we find the extractive institutional hypothesis not able to explain within-Africa variation in development. In contrast, our results show that colonial education correlates well with Africa’s development after independence. And finally,

we find evidence that a shared colonial past fosters familiarity between countries and that this familiarity influences investment patterns between those countries.

After the discussion of the existing literature on economic development, we introduce each chapter included in this thesis. As the chapters can be divided into roughly two time periods, namely the pre-colonial period (chapter two and three) and the colonial period (chapter four and five), each set of chapters is preceded by a brief outline of economic and social circumstances prevalent in each period. Each of these outlines is followed by a discussion of the main conclusions of the chapters focussing on that period.

## **1.2. Africa's economies**

A feature of Africa which is often overlooked is that, even though its average development performance may be disappointing, some African countries have actually achieved significant and sustained growth between 1950 and 2000 (see figure 1.3). In contrast, there are also countries whose economy contracted in the second half of the 20<sup>th</sup> century. On the surface, it is not immediately obvious what distinguishes the good performers from the countries that experienced only low or even negative growth. Some of these good performing countries are landlocked, and others are not; some are islands, and some are not, some have natural resources, and some have not. But before we try to explain why some countries did better than others it is useful to first describe the current economic situation, and the broad trends since 1950.

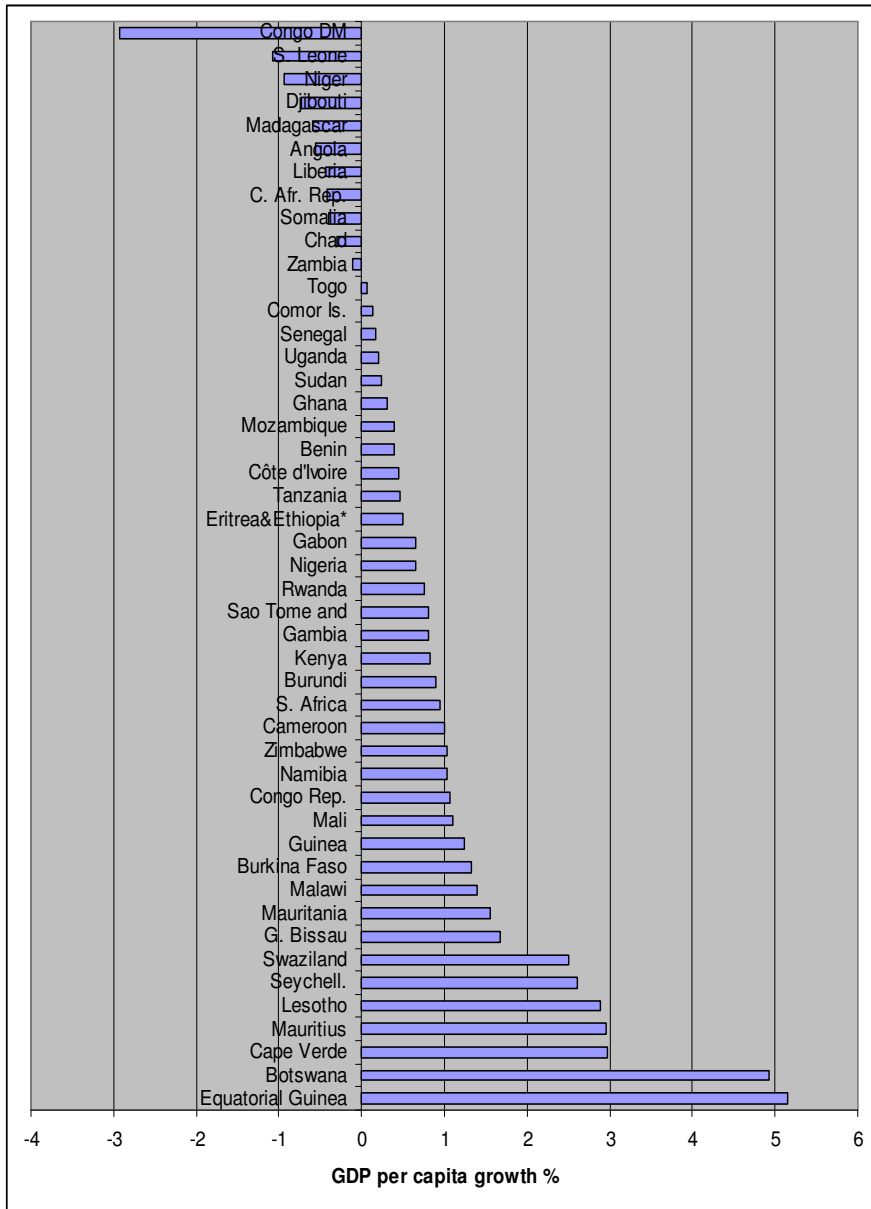
GDP levels more than doubled in all African countries since 1950, but GDP per capita figures show a very different picture (see figure 1.3). Ten countries<sup>2</sup> more than doubled their per capita income, eleven other countries<sup>3</sup> saw their average income decline since 1950, and the remaining 26 experienced some increase in income (see also figure 1.3).

---

<sup>2</sup> Botswana, Equatorial Guinea, Cape Verde, Mauritius, Lesotho, Seychelles, Swaziland, Guinea Bissau, Mauritania and Malawi.

<sup>3</sup> Zambia, Chad, Somalia, Central African Republic, Liberia, Angola, Madagascar, Djibouti, Niger, Sierra Leone and Democratic Republic of Congo.

Figure 1.3: GDP per capita growth 1950-2000



Sources: Total Economy database, GGDC Groningen

In terms of GDP per capita levels, Mauritius, Seychelles and Gabon were the richest countries on the continent<sup>4</sup> during the 1990s, the poorest were Tanzania, Ethiopia and Chad<sup>5</sup>. In around half the African countries, the average income per capita was above 1,000 international dollars at the turn of the century (GK PPP adjusted, see Maddison, 2003).

In many African countries during the 1990s, only ten percent of the working age population was engaged in wage-employment because of the lack of available wage-jobs (Fluitman 2001). The rest of the people were forced to be self-employed, or were engaged as unpaid family helpers in mini farms or in micro-enterprises in the informal sector. On average 69 percent of the people work in the agricultural sector in the 1990s, which makes this sector by far the largest employer of most African countries (ILO)<sup>6</sup>. Although the employment shares of agriculture have been declining in all countries, the growth of the labour force has led to an increase in the rural labour force in absolute numbers in most countries. The majority of agricultural workers were unpaid family helpers on household farms or were self-employed, and many produce for domestic consumption only. Although the majority of these workers were primary engaged in the agricultural sector, they are also increasingly active in other sectors on a part time basis. These part time exits from agriculture to other activities remain unnoticed in these statistics, as only primary occupations are included. At the national level though, these exits add up to a substantial shift in economic activity (Headey et al. 2009).

Even though the majority of the population was working in agriculture, only around 30 percent of the official GDP was produced in the agricultural sector in Africa. As only market activities are included in GDP estimates, the contribution of agriculture to GDP is highly underestimated.

The service sector and the industrial sector provide much less employment compared to the agricultural sector, although it should be noted again that only primary activities are reported. The service sector employs on average 20 percent of

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<sup>4</sup> Average GDP pc 1990-1999

<sup>5</sup> Actually the poorest country based on average income levels in the 1990s is Democratic Republic of Congo; see footnote 3.

<sup>6</sup> Data on employment per sector are very scarce. Data used here are taken from the ILO (*Economically Active Population 1950-2010*) for 1990 and from Fluitman (2001) for 1997, but the latter are only available for selected countries. For those countries, change between 1990 and 1997 is minimal.

the population and the majority of these people were typically engaged in small household-based ventures providing all kinds of services like mobile restaurants, barber shops, street traders and so forth (Fluitman, 2001). In only 14 countries, more than ten percent of the population was active in the industrial sector. Countries with the largest industrial sector in terms of GDP were almost all well known resource rich countries, such as Angola, Botswana, Nigeria, Gabon and more recently Equatorial Guinea. Especially the mining sector provides little employment.

#### *Social Indicators*<sup>7</sup>

Social indicators are, similar to GDP measures, important indicators for development. And just like GDP estimates, these indicators show a varied picture of African development, both between countries, but also in terms of progress achieved. On average the African population is very young, with between 42 and 45 percent of the population being 14 years or younger between 1960 and 2000 (WDI 2007) and only 3 percent of the population being over 65 years of age. This is due to high fertility and still relative low life expectancy although both indicators show improvements.

In other social areas, available data shows, sometimes considerable, progress. Access to clean water increased, as did the availability of sanitation facilities and primary school completion rates. Furthermore, especially in terms of school enrolment rates and child mortality, most African countries experienced substantial advancement in recent decades.

---

<sup>7</sup> Data taken from WDI 2007, except for numbers enrolled in primary school in 1960 which are obtained from the World Development Report 1978.

**Table 1.1: Social indicators for selected countries**

|                          | Numbers enrolled in primary school as percentage of age group |      |          | Mortality rate, under-5 (per 1,000) |      |          |
|--------------------------|---|------|----------|-------------------------------------|------|----------|
|                          | 1960  | 2000 | % change | 1960                                | 2000 | % change |
| Angola                   | 21  | 80   | 74%      | 345                                 | 260  | -25%     |
| Benin                    | 26  | 77   | 66%      | 296                                 | 160  | -46%     |
| Burkina Faso             | 8   | 44   | 82%      | 320                                 | 196  | -39%     |
| Burundi                  | 18  | 61   | 70%      | 250                                 | 190  | -24%     |
| Cameroon                 | 65  | 92   | 29%      | 255                                 | 151  | -41%     |
| Central African Republic | 32  | 64   | 50%      | 343                                 | 193  | -44%     |
| Chad                     | 16  | 67   | 76%      |                                     |      |          |
| Congo, Dem. Rep.         | 60  | 70   | 14%      | 302                                 | 205  | -32%     |
| Congo, Rep.              | 78  | 73   | -7%      | 220                                 | 108  | -51%     |
| Cote d'Ivoire            | 46  | 70   | 35%      | 290                                 | 188  | -35%     |
| Ethiopia                 | 5   | 63   | 92%      | 273                                 | 150  | -45%     |
| Ghana                    | 59  | 80   | 27%      | 215                                 | 112  | -48%     |
| Guinea                   | 30  | 60   | 50%      |                                     |      |          |
| Kenya                    | 47  | 98   | 52%      | 205                                 | 117  | -43%     |
| Lesotho                  | 83  | 120  | 31%      | 202                                 | 108  | -47%     |
| Liberia                  | 31  | 99   | 69%      | 288                                 | 235  | -18%     |
| Madagascar               | 52  | 100  | 48%      | 186                                 | 137  | -26%     |
| Malawi                   | 63  | 139  | 55%      | 362                                 | 155  | -57%     |
| Mali                     | 7   | 53   | 87%      | 500                                 | 224  | -55%     |
| Mauritania               | 8   | 87   | 91%      | 310                                 | 125  | -60%     |
| Mozambique               | 48  | 74   | 35%      | 313                                 | 178  | -43%     |
| Niger                    | 5   | 30   | 84%      | 354                                 | 270  | -24%     |
| Nigeria                  | 36  | 96   | 62%      | 290                                 | 207  | -29%     |
| Rwanda                   | 49  | 102  | 52%      | 206                                 | 203  | -1%      |
| Senegal                  | 27  | 64   | 58%      | 311                                 | 132  | -57%     |
| Sierra Leone             | 23  | 65   | 65%      | 390                                 | 286  | -27%     |
| South Africa             | 89  | 107  | 17%      |                                     |      |          |
| Sudan                    | 25  | 51   | 51%      | 208                                 | 97   | -53%     |
| Tanzania                 | 24  | 66   | 64%      | 241                                 | 141  | -41%     |
| Togo                     | 44  | 104  | 58%      | 267                                 | 142  | -47%     |
| Uganda                   | 49  | 127  | 62%      | 224                                 | 145  | -35%     |
| Zambia                   | 48  | 75   | 36%      | 213                                 | 182  | -15%     |
| Zimbabwe                 | 98  | 98   | 0%       | 159                                 | 117  | -26%     |

Sources: WDI 2007; World Development Report 1978

A much smaller proportion of African children has been dying in infancy in 2000 compared to 50 years earlier, as child mortality fell by on average nearly 40 percent to 152 per 1000 in 2000, although in 12 countries, mortality is still over 200 in 2000 see table 1.1. Also enrolment rates improved vastly, on average doubling between 1960 and 2000. Various countries actually reached the point where nearly all children go to school, at least for some period of time.

In other areas, the advancement has been less promising. For example health indicators like hospital beds per 1000 people, and economic indicators like road and railway densities per square kilometre are the lowest in the world, and hardly increased between 1990 and 2000. Moreover, for goods transported internally, no sufficient data is available, but numbers suggest actually a decline in transported volume since the beginning of the 1980s.

The fact that for various indicators not enough data is available brings us to an important issue in quantitative studies on African development: data availability and data quality. This will be discussed in section on data issues below.

#### *Period of analysis*

In this thesis, the period of analysis ends around the year 2000<sup>8</sup>. This is a somewhat arbitrary choice, based on the fact that the year 2000 nicely rounds off the preceding century, and because this project started in the year 2004 which made most data readily available up to the year 2000. But this choice ignores the period of rapid growth Africa embarked upon since the end of the 1990s. Average GDP growth between 1995 and 2005 has been over 5 percent, and GDP per capita growth over 3 percent on average (Arbache et al. 2008). But again, variances are large as Zimbabwe saw its economy contract by on average 5.5 percent per year, and Equatorial Guinea experienced over the same period a staggering 23.1 percent growth<sup>9</sup>. And not only resource rich countries experienced growth accelerations, but also oil importing, landlocked and to some extent fragile state countries have saw growth take off<sup>10</sup> (Arbache et al. 2008). The question is of course how sustainable this growth is, given Africa's history of frequent growth accelerations and - collapses. Despite the

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<sup>8</sup> In chapter 2 the dependent variable is measured between 1996 and 2002.

<sup>9</sup> Figures based on the WDI 2007.

<sup>10</sup> Countries such as Ghana, Mozambique, Senegal, Tanzania, Burkina Faso, Ethiopia, Mali, Rwanda and Uganda.



impressive growth records, it seems clear that the increase in commodity prices since the turn of the century is a great driver of this increased growth. Moreover, much also seems to depend on aid flows and debt relief, although also economic fundamentals of growth seem to improve, like macro economic policy and institutions (Arbache et al. 2008).

#### *Data issues*

Africa is in the eyes of many economists notorious for the lack of reliable data. Especially GDP (per capita) estimates have been subject to much critique (Chander 1990; World Bank 1989). There are two kinds of problems with GDP measures, both technical issues and a more fundamental problem. To start with the latter, GDP growth is often used to measure development, but development is actually much more than economic growth alone. Social aspects as literacy and healthcare and for example the environmental costs of growth are also important. Still, at least for the poorest countries, economic growth is seen as a pre-requisite for development and therefore GDP growth is a good indication of development (Szirmai 2005).

The most pressing technical problems related to GDP estimates are first of all that these measures exclude subsistence production and the informal sector. Both sectors are generally large in developing countries especially in Africa. Furthermore, GDP estimates do not adequately include environmental pollution and depletion of natural resources. Finally, these measures do not allow for difference in conditions in life that demand different types of food, housing and clothing (Szirmai 2005; Headey et al. 2009).

Another problem with GDP estimates is that various sources of GDP give different estimates for the same country, with the difference generally larger for developing countries, especially Africa (Jerven, 2007). Sutcliff (2003) for example compared GDP measures provided by Maddison (2000) and the Penn World Tables (PWT) 6.1 for 98 countries, and finds that the values of Maddison (2000) vary between 62 and 291 percent of those presented by PWT values. This implies that it matters for the analysis, which source of income estimates you use.

Despite these limitations, there are also indications that GDP measures for Africa are not of such low quality that they cannot be used for certain analytical purposes. Cinyabuguma and Putterman (2007) for example estimate growth in an all African data panel, and find the typical negative relationship between initial income and growth and the common positive relationship between investment and growth.

This suggests ‘that Africa is not all that different from other continents and that data for the continent’s countries is not all that poor’ (Cinyabuguma and Putterman, 2007:2). Furthermore, studies using alternative measures of welfare such as mean population heights and nutritional statuses, find that the correlation with GDP is generally high and positive (Moradi, 2006; Austin et al., 2007).

As GDP measures are the most readily available measure of the size of the economy, and are an important indicator for development, in various chapters we use these estimates as an indicator of welfare, although it is obvious that, especially in developing countries, GDP estimates should be interpreted with care. Acknowledging the variation in income levels between different sources, we always use two different sources of income estimates when assessing the income effect of certain variables.

### **1.3. The ultimate sources of economic growth**

Trying to answer the question why some countries are rich and others poor has produced an enormous number of studies (Hall and Jones, 1999; Landes, 1997; Acemoglu et al., 2001; Easterly and Levine, 2003 among many others). Especially since the independence of most former colonies, ‘the problem of economic growth came to the fore’ (Easterlin, 2001:1). Determinants of economic growth are often divided in ‘proximate’ and ‘ultimate’ causes of growth (Maddison, 1987; 1991). Proximate causes include inputs of labour and capital, technological change and population growth (Maddison, 1991; Acemoglu, 2008). Ultimate causes comprise ‘institutions, ideologies, pressure of social-economic interest groups, historical accidents and economic policy at the national level’ (Maddison, 1991:10). Rodrik et al. (2004) and Rodrik (2003) define the ‘deep’ determinants of growth to be ‘institutions, integration and geography’. Acemoglu et al. (2004) and Acemoglu (2008) divide the fundamental causes of growth into the ‘geography hypotheses’ and the ‘institutional hypotheses’.

The general root causes of development, namely institutions and geography, and factors deemed more specifically relevant for long run ‘African development’, namely slave trades and ethnic diversity will be discussed extensively below.

*Institutions*

The institutional approach to economic development has received much attention during the last few years as among others Acemoglu et al (2001), Djankov et al (2002), Rodrik et al. (2004) and Knack and Keefer (1997) drew attention to the relation between weak political-economic institutions and low growth in cross-country studies. Furthermore, the book 'In Search of Prosperity' edited by Rodrik (2003) shows the importance of good institutions in explaining the performance of individual countries such as China, Botswana, Mauritius and Australia. In contrast, the chapters about Indonesia and Bolivia describe the difficulties countries encounter when growth promoting institutions are absent.

Institutions or institutional quality is a very broad concept which means different things to different people. Many studies do not explicitly define institutions, but implicitly often the definition of North (1990) is used. According to North (1990), institutions are 'the rules of the game in a society' (North 1990:3). These rules govern interaction and exchange in society and so reduce the uncertainty of daily live. These rules include both formal rules and informal codes of behaviour.

The institutional approach is not new. Ever since the famous article on transaction costs by Coase (1937), scientists have analyzed the importance of institutions for economic growth. North and Thomas state in their book 'The Rise of the Western World' (1973) that the key reason the West soared was because it developed efficient institutional arrangements.

*Colonial Institutions*

Directly linking the institutional framework to economic development is difficult, since the causal relationship could very well run from economic development to institutions (richer countries might need and can afford better institutions). To solve this, Acemoglu et al (2001) argue that the exogenous variation in different institutional frameworks is rooted in history. The authors take a sub sample of former European colonies, and propose that where the (disease) environment of possible colonies was favourable to the European settlement, the colonisers went to stay, which led to the creation of institutions similar to those in Europe. In contrast, where the (disease) environment was not favourable, i.e. (potential) settler mortality was high, the Europeans created 'extractive institutions' to get valuable resources out of those regions. These implemented institutional frameworks are presumed to be persistent, i.e. they still influence the institutional environment today in former

colonies. Fielding and Torres (2008) argue in line with the previous study, that the style of colonisation still influences institutional quality in former colonies although they suggest that colonisation depended not on the disease environment but on the natural comparative advantages of prospective colonies. Climate, physical geography and to some extent settler mortality determined factor endowments and the production structure of the colony which in turn determined whether colonisation was extractive or not. In countries with a comparative advantage in (slave) labour or physical capital intensive goods, i.e. countries suitable for cash crops and mineral rich countries, there was no need for large settlement to reap the benefits of colonisation. Consequently, colonisers implemented a institutional framework in these countries, designed only to control the population and extract resources. In contrast, in countries with a comparative advantage in pastoral agriculture, European settlement densities were much higher. These colonies developed much stronger political and economic institutions. According to both studies, this explains why settler economies like the US, Australia and New Zealand are well developed, and many countries in Africa and Asia are much worse off.

Distinctive from the studies discussed above, which use circumstances in the distant past to explain settlement patterns and subsequent (colonial) institutional development, there is also an expanding literature that recognises the influence of colonial era circumstances on long term development in ex-colonies, by taking the colonial time as the starting point (Grier, 1999; Bertocchi and Canova, 2002; Lange, 2004; Djankov et al , 2002; Glaeser and Shleifer, 2002).

The 'legal origin' view argues that the fundamentals of the institutional framework that evolve in different countries crucially depend on legal origin (Djankov et al, 2002, Glaeser and Shleifer, 2002, La Porta et al., 1998). Djankov et al. (2002) and La Porta et al. (1998), identify five legal traditions or origins: British common law, French civil law, German civil law, Scandinavian civil law, and Socialist civil law. Most developing countries have inherited a legal structure from their colonisers, which according to this view has remained fundamentally the same ever since. So the legal identity of the colonizer determined the quality of institutions in terms of regulation and property rights, the quality of governments and, to a certain extent, political freedom (Glaeser and Shleifer, 2002). The British common law and the French civil law are the most common in the world, and for Africa also the most relevant ones. Both systems are different since the French system depends on 'professional judges, legal codes, and written records' (Glaeser and Shleifer,

2002:1193) whereas in contrast, the British system works with 'lay judges, broader legal principle, and oral argument', (Glaeser and Shleifer, 2002:1193). It is interesting to note that civil law countries always perform different on all institutional areas analysed, (institutions such as regulation and property rights, the 'quality' of governments and political freedom) and also on financial development, compared to common law countries (Djankov et al., 2002; Glaeser and Shleifer, 2002; La Porta et al., 1998)<sup>11</sup>.

Grier (1997) finds that British colonies perform significantly better economically between 1960 and 1990 than their French and Spanish counterparts in a 63 country sample. Given the British indirect rule, it is argued that ex-colonies were allowed to adopt institutions that best suited their situation. Additionally, Grier (1999) argues that also the length of colonial period positively influences economic performance after independence. Both the length of the colonial period and a British legacy are also positively related to growth in a sub-sample of 31 African countries.

Bertocchi and Canova (1996) focus on Africa when establishing a link between colonisation and development. They find that former British and French colonies perform better than former Portuguese and Belgian colonies. Possible channels mentioned are the high degree of political instability and low human capital accumulation caused by colonial rule. Apparently (but not mentioned by the authors) political instability has been higher and human capital accumulation lower in former Portuguese and Belgian colonies compared to former British and French colonies. Additionally, exploitation of natural resources and repatriating profits during colonial times<sup>12</sup> are negatively associated with growth post-independence.

The general conclusion of the institutional view is that African countries are performing so poorly compared to other regions, because they lack a sound institutional framework due to colonisation (Acemoglu et al., 2001; Djankov et al., 2002; Fielding and Torres, 2008), although some colonial legacies are apparently

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<sup>11</sup> Scoring higher on these measures appears to indicate more like the Anglo-Saxon system. Often higher scores are immediately associated with better institutions, but the question is whether that is the case. At the least it is important to specify for what purpose exactly certain institutions are better.

<sup>12</sup> measured as the difference between GDP and GNP in 1960, so after most countries gained independence. This discrepancy between GDP and GNP reflects 'repatriated profits on foreign investment, royalties as well as direct exploitation activities' (Bertocchi and Canova, 2002: 12).

worse than others (Djankov et al., 2002; Glaeser and Shleifer, 2002; Grier, 1997; Bertocchi and Canova, 1996). In some sense, colonisation, and to some extent also coloniser identity can also be interpreted as a 'historical accident', one of the ultimate causes of development according to (Maddison, 1991).

### *Slavery*

A phenomenon closely related to colonisation, and also often associated with Africa's underdevelopment is the slave trade, which took place prior to and alongside colonisation. Many papers have studied slavery - introduced by Arab settlers and European colonizers, and greatly extended by the latter - and its impact on long-term development (Manning, 1983; 1990; Lovejoy, 1983; Nunn, 2007)<sup>13</sup>.

A major immediate effect of the export of slaves out of Africa was demographic: more than 18 million people, generally young adults, were exported from the continent since 1500, of whom up to twenty percent died during transport (Manning, 1990). The export of people reduced production of food which aggravated famines (DeLancey, 2007). A more long term effect of the slave trades was that it severely changed sex-ratios, as along the Western Coast mainly male slaves were exported which left a dominantly female population; in the Savana and the Horn, most slaves exported were female, leaving a dominantly male population behind. This greatly reduced fertility in sub-Saharan Africa during this time. But there is some debate about whether the slave trades actually led to a decline in population, since in some areas compensatory population growth occurred and in some areas population growth was too low to compensate the number of people taken away (Manning, 1990; Lovejoy, 1983; Evans and Richardson, 1995; Miller, 1981:66). What seems clear is that at the least slave trade and the resulting sex-ratio changes tempered population growth. It is estimated that without slavery, the population of Africa could have been double that of the roughly 50 million present at around 1850 (Manning, 1990; Lovejoy, 1983). It left Africa with a smaller proportion of world population in 1900 than it had in 1700. Labour became even scarcer and slaves were traded for products which undercut existing African industry, such as textiles (Manning, 1990:22). Slave trades in some areas increased political centralisation because kings and chiefs raided slaves (Fage, 1969), but in the long run

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<sup>13</sup> Some authors have also assessed the impact of New World slavery in econometric analysis (Engerman and Sokoloff, 2000, 2002; Mitchener et al., 2003).

the continuing raids and the loss of large parts of the population led to political instability in many societies (Manning, 1990). The reduced population size also had a long term influence on the agricultural system. The extremely sparse populations kept extensive long-fallow land use feasible, as there was no necessity to change under the pressure of increasing population densities (Boserup 1965, 1981). This reduced the shift of employment to other activities. Finally, the diminished population size, to some extent, limited the ability of the African people to fight the Europeans who came to take possession of the continent after 1880 (Manning 1990). Next to the population effect of the slave trades, various studies also claim that export slavery greatly influenced the indigenous institution of slavery. Although this indigenous slavery can be traced back as far as historical records go (Lovejoy, 1983; Manning, 1990), in many areas during the 19<sup>th</sup> century (and sometimes even the late 18<sup>th</sup> century) the scope and the intensity of indigenous African slavery expanded significantly.

The legacy of slavery manifests itself today in Africa in the distribution and size of the population and in continuing class distinctions. Although there are quite precise data on exported slaves, especially since the start of the Atlantic slave trade, most studies on the impact of slavery on long term development have been qualitative (Lovejoy, 1983; Vasina, 1989; Hilton, 1985; Inikori, 2003). Manning calculates the population loss and the demographic consequences for regions, but this was an exception until a recent path breaking study by Nunn (2008). Nunn (2008) is the first to quantify the number of slaves taken out of each country and combines this with population and area data to gauge the long-term effect of export slavery on economic development. He finds this relation to be robustly negative, also when controlling for geographical conditions, natural endowments and nationality of colonizers. Nunn (2008) explores two channels through which slavery had a negative effect on economic development: early political instability and increased ethnic fractionalisation. Since slaves were often obtained in raids and wars, these events both hampered the formation of pre-colonial states hence increasing political instability, and also increased fractionalisation. Both are in turn linked to lower economic development in later times.

Slavery also had an indirect effect on institutional development through its effects on colonial activity. The colonial strategy to rule Africa differed from region to region, depending on circumstances such as the availability of cheap labour, the availability of natural resources, and the suitability of the area for large scale white

agricultural settlement. Three broad colonial strategies can be determined (Amin, 1972; Oliver and Atmore, 1967).

The first strategy was executed in those areas where the population was least depleted by slave exports and where there were natural resources and/or settler agriculture was possible. The availability of cheap labour enabled the colonial authorities to extract natural resources and run farms at minimal costs. These areas were characterised by the most intense settlements and the relatively high investments in colonial institutions to oversee the colonial economy.

In contrast, in areas where there was not enough cheap labour available (mainly because of the slave trades), where no natural resources were discovered and where large scale white settlement and farming was not viable, colonial activity focused on extracting surpluses from peasant production through the introduction of merchantalist houses controlling marketing and export. Surplus was extracted by paying producers extremely low commodity prices. In these areas, the 'colonial trade economies', only limited colonial institutions were implemented to oversee activities of the merchantalist houses and therefore no large scale colonial investments were deemed necessary.

Finally in those areas where even less labour was available (again due to slave trades) and where the ecological system made it difficult for the colonial authorities to penetrate the area, the colonial authorities gave the area to charter companies who were on their own to get as much resources out as possible. This resulted in hardly any settlement, close to zero colonial investment and very little colonial institutions.

### *Geography*

Another group of scholars relate patterns of economic development to geographical circumstances (Gallup et al., 1998; Bloom and Sachs, 1998; Sachs, 2001; Diamond, 1999). They find that almost all countries in the tropics are poor, and nearly all landlocked countries have on average a lower level of income than coastal countries. As the position on the globe determines the distance to large markets, natural endowments, average rainfall, and various other climatic factors, geography directly affects income levels via agricultural productivity, human health, natural endowments and transport costs (Sachs, 2001; Gallup et al. 1998). Agricultural productivity appears to be considerably lower in the tropics compared to countries with a more temperate climate (Gallup et al., 1998; Sachs, 2001). Tropical soils are generally very



fragile and usable water is often scarce. Rainfall is limited and infrequent, and irrigation is generally underdeveloped as only 4 percent of the crop land was irrigated in the 1990s (Bloom and Sachs, 1998). Furthermore, pests and parasites are more common in tropical ecosystems affecting both plants, animals, and humans. This has long hindered animal husbandry and mixed crop-cattle agricultural systems (Sachs, 2001:14) and lowered agricultural productivity. Moreover, (agricultural) technologies developed in temperate zones proved largely inapplicable in tropical areas so that 'key technologies could not cross the ecological divide' (Sachs, 2001:22; see also Diamond, 1999). This severely limited the diffusion of technology which is crucial for the catching up of technologically backward areas.

Health outcomes are generally worse in tropical regions compared to temperate zones, lowering labour productivity. Infectious diseases like malaria, and the incidence of bacterial contamination are much more prevalent in the tropics, and have a year round transmission period. This continuous exposure to life threatening diseases makes people in the tropics more vulnerable to illness and less productive.

Thirdly, natural endowments of point (mainly oil, gas, diamonds, gold, silver and minerals) are a potential source of substantial and sustainable income growth when exploited effectively. At the same time, these endowments often give rise to tensions over 'resource rents', creating political and economic instability hampering development (Sala-i-Martin and Subramanian, 2003; Sachs and Warner, 1999, 1997; Torvik, 2002) Natural resources are also related to Dutch disease effects (Sachs and Warner, 1999; Torvik, 2001), making resource rich economies more fragile.

Finally, when countries are situated far away from world markets, transport costs will be higher, and exporting will be more costly. Also, when countries are landlocked, transport has to go over land, increasingly hindering transportation (Bloom and Sachs, 1998; Sachs, 2001).

Over time, these geographical constraints to economic development may be reinforced as low agricultural productivity hinders an agricultural revolution, a necessary precondition for a country to start the development process (Timmer, 2002; Diamond, 1999). Also, lower income might reduce technological innovation, amplifying the initial adverse effect through the dynamics of endogenous growth (McArthur and Sachs, 2001).

All these geographical factors seem relevant to Africa. All African countries are located in the (sub) tropics, and infectious diseases like malaria and to a lesser extent the human sleeping sickness (caused by the tsetse fly) are prevalent. Various studies

indeed find a robust and negative relationship between malaria prevalence and per capita income (Sachs and Malaney, 2002; Gallup and Sachs, 2001). Moreover, the continent has the highest percentage of land-locked countries and the highest percentage of people living in landlocked countries of any continent in the world. Additionally, many rivers are not easily navigable because of the many steep waterfalls. This is often found to be negatively related to economic development (Bloom and Sachs, 1998; Gallup et al., 1998; Sachs and Warner, 1997).

### *Ethnic Diversity*

A prominent argument in the African context is, of course, that its long-term development is seriously hampered by the high ethnic fractionalisation of many countries. But empirical evidence is mixed, making clear that the relationship between ethnicity and development is a complex one.

One strand of literature links ethnic diversity to more civil conflict (Horowitz, 1985; Gurr, 1993; Sambanis, 2001) and worse economic performance (Easterly and Levine, 1997; Collier and Gunning, 1999). ‘Conflict of preferences, racism and prejudice often lead to policies that are at the same time odious and counter productive for society as a whole’ (Alesina and Ferrara, 2005:762). In contrast, diversity can also contribute to variety in ability, culture and experience, which might enhance innovation, productivity and creativity (Alesina and Ferrara, 2005). Moreover, fractionalisation may even make societies safer compared to more homogenous societies, since fragmentation makes large scale organised violence more difficult to execute (Collier and Hoeffler, 2000; Collier, 2001; Bates, 1999)<sup>14</sup>.

Literature linking ethnic diversity to worse economic performance often finds the effect to run via worse institutions and policies (Easterly and Levine, 1997; La Porta et al., 1998). Based on game theoretical principles, the main argument in this literature is that it is more difficult to reach an optimal solution with many different players. This theory is supported by ample empirical evidence. For example, Alesina and Drazen (1991), Alesina and Rodrik (1994) and Alesina et al. (1999) find that more heterogeneous societies find it more difficult to create a socially optimal solution, both in the supply of public goods (in terms of composition and amount of

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<sup>14</sup> There are also studies which find no effect of ethnic heterogeneity on instability and conflict (Elabwadi and Sambanis 2000 and 2002).

supply) and in the distribution of costs. Moreover, as it is easier for small groups to organise themselves as they suffer less from the collective action problem, often small groups are very successful in influencing policies for their own benefits, at the cost of society at large (Olson 1965). Finally, when governments are busy satisfying their political supporters, they are likely to provide goods that are valued by their own followers, but are not necessarily good for development (Alesina et al., 1999).

There are also studies that argue that heterogeneity comes in different forms and can have various effects on institutional development and economic growth (Collier, 2001; Bates, 1999; Bates and Yakovlev, 2002). These authors make a clear distinction between dominance and fractionalisation<sup>15</sup>. Dominance is found to be detrimental to growth (irrespectively whether in a democracy or dictatorship - when the same group is in power), simply because there is an incentive to redistribute to the own group at the expense of growth. Fragmentation comes in many different forms (many small groups vs. three or four groups none of which has a majority). Collier (2001) finds that different compositions of groups have different influences on stability and government predation, but that fragmentation in the context of democracy does not lower growth. Aghion et al. (2004) argue that political institutions are endogenous to the nature of inter-group conflict. Societies characterised by domination may be more inclined to restrictive institutions, whereas fractionalised societies may put more weight on defending the rights of minorities within the constitution.

Finally, according to Rodrik (1999), heterogeneity on its own is not sufficient to explain low institutional quality. More specifically, it is the combination of heterogeneous population and conflict management capabilities that explain the outcome of the political market and ultimately development. This implies that when for some reason tension arises between different groups within society, agreement on how to distribute the costs or profits is much more difficult in a deeply divided society which lacks proper conflict management institutions (Rodrik, 1999; Alesina and Drazen, 1991).

Summarising, the root causes of African development can be divided into the broad areas of institutions, of which the origins are generally placed in the colonial times; slave trades, geographical features and ethnic diversity. The

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<sup>15</sup> They speak of 'dominance' when one group comprises 45-60 % of the total population (Collier 2001; Bates and Yakovlev (2002) mention 50%).

transmission channel via which the slave trades and ethnic diversity affect income development is largely institutional (Nunn, 2008; Easterly and Levine, 1997; Rodrik, 1999). Also certain geographical features have been linked to the development of specific institutions (Easterly and Levine, 2003; Sachs and McArthur, 1995). This suggests that the development and quality of institutions is one of the central issues in African development. Generally, the institutional approach is applied in a world sample of countries to explain why Africa is growing less compared to other regions. The first interesting question is of course whether such an approach also helps us to understand within-Africa growth patterns? Secondly, a crucial aspect missing in the explanations offered so far is the situation present on the African continent at the time colonisation. The only thing that seems to matter for institutional development is colonial presence. There are a few exceptions, for example Genaiolli and Rainer (2007) who in their study link pre-colonial centralisation of societies to public good provision post colonial, and find a significant positive relationship. Also, Nunn (2008) touches briefly upon pre-colonial state development in his export slavery account, but only to show the influence of exported slaves on this pre-colonial state development (Nunn, 2008). Englebert (2000a) takes into account pre-colonial institutions by determining whether postcolonial states are legitimate. He does so by (amongst others) analysing whether postcolonial states embed their authority into the historical legitimacy of pre-colonial kingdoms or states (Englebert, 2000a:129). However, no account is given of the actual institutions present during pre-colonial times.

This leaves open the opportunity to study the influence of pre-colonial institutional settings on postcolonial institutional development. The importance of early institutions is brought forward by, among others, Greif (2006) who emphasises the importance of initial institutional conditions in the development of modern institutions. North (1990) argues that ‘the present and the future are connected to the past by the continuity of a society’s institutions’ (North 1990: vii). Furthermore, it has been thoroughly analysed that that colonial rulers based their institutions on what was already there (Boone, 2003; O’Toole, 2007:23; Spear, 2003; Greenstein, 1995; Herbst, 2000). And finally, the abundant evidence on the presence of hugely diverse societies spread all over the continent (Curtin et al., 1988:129, 286; Ayittey, 2006; Schapera, 1970), makes the inclusion of pre-colonial characteristics feasible.

In this thesis we attend to both the applicability of the institutional approach to within-Africa development, and to the influence of the pre-colonial institutional framework on post-colonial development.

Institutions or institutional quality is a very broad concept which means different things to different people. In this thesis, I follow North (1990) who defines institutions as ‘the rules of the game in a society’ (North 1990:3). These rules govern interaction and exchange in society and so reduce the uncertainty of daily life. Not only through formal rules, but also through informal codes of behaviour. This definition distinguishes between institutions (the rules) and organisations (the players). The rules define the way the game should be played and the players decide within these rules how to actually play. The institutional framework develops as the players are directed by the rules, and the players in turn influence the evolution of the rules. The distinction between rules and organisations is of course often difficult to make in practice. Is the state for example an institution as it sets the rules of the game, or organisation as it consists agencies that play according to the rules. And is the market an institution consisting of rules for how people can buy and sell, or is it an organisation as it consists of different firms and consumers. In this thesis, the focus is on rules like whether people are excluded from participating in society, whether there is room for people to organise themselves, and whether people are protected from expropriation by other parties. By avoiding measures that represent organisations and attempt is made to not further obscure the distinction between rules and organisations.

A second issue with the institutional framework is the measurement aspect. How to measure constraints or incentives prevalent in society? There are many proxy variables available all reflecting different parts of institutional quality. The question is, which one should be used, and does it measure what you want it to measure? Given that the available measures are proxies, representing the actual institutions, no measure is perfect. In this thesis straightforward measures are used, like democracy and rule of law to represent whether people are able to participate in society and whether they are protected from expropriation, but we are aware that these measures are not ideal. The discussion therefore needs to be modest and careful.

A final problem with institutional quality is what is a good institution and what is a bad institution? What is good in one situation, might not be optimal for another situation. The discussion in this thesis tries to avoid claims like a small government is better than a larger one, or a market economy is better than one

where the government plays a significant role. Instead, as stated before the focus is on the opportunity the population has to participate in society, and how well they are protected, and to what extent rules by the state are directed towards development.

We start with the argument that to understand within-Africa diversity in development, it is important to also take into account pre-colonial institutional characteristics when explaining long term institutional development. In other words, the analysis of institutional development in Africa needs to be based on the right initial conditions. To this end the institutional situation at the onset of colonisation is quantified, based on anthropological data and this is linked to the institutional and economic development in the independent period. Subsequently we focus more specifically on one particular pre-colonial feature so far underrepresented in quantitative studies, namely indigenous slavery, and analyse its effect on long term income development.

Thirdly, we analyse to what extent the institutional explanations offered in the literature apply to a within-Africa context. The extractive institutional thesis as proposed by Acemoglu et al. (2001) is tested, now only including African countries. Additionally, a newly compiled dataset based on colonial archives is used, to be able to estimate the actual influence of colonial presence on long term development in Africa. And finally, we study whether colonial ties still affect global direct investment patterns, and analyse whether this is due to increased familiarity between countries linked by a colonial tie, or due to increased similarity between these countries.

Below we will start with short overview of pre-colonial Africa, to understand the importance of pre-colonial institutions for subsequent development paths. Subsequently the first two chapters included in this thesis are introduced.

#### **1.4. Pre-colonial Africa**

The actual size of the populations of pre-colonial African societies is unknown. Broad population estimates for around 1700, using the most positive scenario, suggest that in west Africa, an estimated 25 million people lived (Manning, 1990:82). At the same time, the Savanna and the Horn were home to around 20 million people, and the Eastern coast to an estimated 4.5 million, both also using the positive scenario (Manning, 1990:196). Even from these most optimistic population estimates it is obvious that population densities were very low. From the 19<sup>th</sup> century

onwards some regions embarked upon rapid population growth for the first time in history, while others experienced demographic stagnation or decline. Regional diversity at the time was so large that a clear continental trend could not be discerned (Iliffe, 1995:159).

Contrary to what is often assumed, pre-colonial Africa was not only comprised of isolated economic units – ‘subsistence economies’ where the village group actually produced all it consumed (Curtin, 1975:197). In all regions, there were various local, and sometimes very long distance trading networks. This suggests that in many places more was produced than consumed, and certain specialisation patterns can be distinguished. In eastern and southern Africa, trade in commodities for consumptions, such as dried fish, grain, timber, salt and barkcloth took place in various local trading networks. Additionally, especially ivory was traded over long distances. In Western and Equatorial Africa, consumption commodities like millet, meat, fish, shea butter and salt, as well as iron products, copper, and in Equatorial Africa ivory, were traded in both local and long distance trading networks. In the latter region, trade connected regions now known as Zambia with eastern Shaba (region in what is now Democratic Republic of Congo), with the coast of the Indian Ocean, the capital of Zimbabwe and the region west of the River Kasai. In southern Africa, trade was mainly barter from village to village, without a merchant class. In contrast, in western Africa, many different merchant societies developed over time. In most regions, trade was controlled and taxed, as trade was seen as a convenient source of wealth and power, both in West and in East Africa. Especially long distance trade is in many instances linked to state formation in pre-colonial Africa (Curtin et al., 1988:131; Iliffe, 1995).

In pre-colonial West Africa a manufacturing sector evolved. Much of West Africa had a significant iron industry, and production withstood European competition relatively well until the coming of railroads and motor roads. Until then, high inland transportation costs kept interior markets relative isolated and the African iron industry remained competitive (Curtin, 1975: 207, 211, 312). Especially in Senegambia, a cloth manufacturing industry was present, which also produced for the export market.

During the 19<sup>th</sup> century, overseas trade increased rapidly, although for most of Sub-Saharan Africa, it was only a small fraction of total trade (Curtin et al., 1988: 325). Especially for West and Equatorial Africa, evidence suggests that total long distance trade within Africa increased more rapidly than overseas trade (Curtin et al.,

1988: 331). Between 1500 and roughly 1850, a major export product for many African regions were slaves, although already during the 17<sup>th</sup> century, gold from the Gold Coast and hides from Senegambia were more important as export products than slaves. Also, there was a substantial export of timber, gum, palm oil, beeswax, gold, hides and manufacturing goods like beads or cotton textiles from western Africa, (Curtin et al., 1988: 332; O'Toole, 2007: 44) and ivory from eastern Africa (Curtin et al., 1988). After the slave trades, the export of 'legitimate' products such as palm oil, gum, peanuts, gold and ivory increased.

Internal trade in Africa took place between societies characterised by vastly different political institutions. Yet despite this diversity, the boundaries of political systems did not at all restrict the exchange of goods. (Curtin et al., 1988: 129). In some areas, large kingdoms developed, such as the Ashanti in present day Ghana, Dahomey in present day Benin, Great Zimbabwe, and Mali in western Africa, among others. In other areas, such as the Rift Valley of Kenya and in Southern Africa, age set systems<sup>16</sup> performed major political functions. Independent self governing kin groups (in large parts of Somalia, and in south and south eastern Nigeria among others), and minor chiefdoms (South Western Tanzania, Angola among others) also appeared frequently (Curtin et al., 1988).

The second chapter in this thesis focuses on these various political structures and we analyse the effects of political institutions on present day institutions. Our main hypothesis is that in those areas where both state and community hierarchy (political structure at both state and community level) was well developed, more participatory political institutions developed, governed by stronger rule of law.

The importance of early state structures in the development of stronger institutions is well documented in the literature (Bockstette et al., 2002; Chanda and Putterman, 2005; Evans, 2005; Lange, 2005). Bockstette et al. (2002) link early state development to greater political stability, to higher institutional quality and ultimately to higher growth. They propose that early state development fosters learning by doing in public administrative system, that the long term operation of a state structure may increase state effectiveness and that an effective state might foster

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<sup>16</sup> An age set is a social group or a social category, consisting of people of similar age



trust and ease social interaction between various agents (Bockstette et al., 2002: 4-5). Focussing on the effect of pre-colonial state formation in Africa, Gennaioli and Rainer (2007) find that more centralised societies in pre-colonial times are positively linked to higher supply of certain public goods post independence.

Additionally to these previous studies, we argue that state structures alone are not sufficient in explaining institutional and economic development in later times in Africa. We propose that complementary community structures are equally important. Community structures refer to the number of jurisdictional levels up to and including the local community, ranging from the nuclear family to clan barrios. Organising capabilities at the local, communal level, were important for various reasons. First of all the community was a vital feature of many pre-colonial societies organisational principles (Ayittey, 2006:42). Community structures were central to the survival of societies with scarce resources, because it provided insurance in times of illness or when harvest was bad. Within these communities, group solidarity was considered very important although limits on individual freedom set by the community varied between various societies. Nevertheless, the pre-eminence of social interest prevailed in all groups (Ayittey, 2006). Furthermore, since the local chief was in closer contact with the local community and was better informed about specific local issues, the king or chief generally preferred to decentralise many decisions.

Secondly, well developed community structures facilitated the checks and balances of the state, functioning as a civil society. Community structures were important to limit the power of the state, to organize collective action, and to enable people to participate in society (Ayittey, 2006, Schapera, 1970, Maundeni, 2004). At the same time, state structures enabled especially long distance trade and increased security, also from slave trades (Inikori, 2003). Furthermore, it fostered organisational capacities in times of external threat (Ayittey, 2006) and provide checks and balances against local tyranny.

It has been widely documented that many pre-colonial African culture traits endure, possibly in modified forms, to the present day. Curtin et al. (1988) argue for example that the sense of social hierarchy and accountability of (local) rulers originates from pre-colonial times (Curtin et al., 1988:250; see also Page, 1980; Ayittey, 2006). Even though more recent events, such as colonial rule and wars greatly influenced Africa's development paths, it would be incorrect to assume that the history of pre-colonial Africa has been rendered irrelevant (Manning, 1990).

Why would this set of institutions be related to the development of stronger institutions post-colonial? One reason may be that societies characterised by both well developed state and community hierarchy survived colonial times with their institutions more intact than for example stateless societies. Colonial rulers found it often easier to deal with clearly structured societies (Ayittey, 2006:116). For example Tosh (1978) notes, in his study of the stateless Lango in Uganda, that that the colonial powers had difficulty in dealing with the Lango because there was no central contact point. Therefore, they assigned chiefs (first from the Baganda, later from the Lango themselves) to certain territories, and invested them with “unprecedented public authority and personal privilege, and [it] gave them sway over communities to which they had no prior claim” (Tosh, 1978:245). In other words, to be able to control stateless societies, colonial officers often assigned a chief as a contact between the people and the colonial rulers, as is also documented for the Igbo of Nigeria, the Gikuyu of Kenya among others (Betts, 1985; Boone, 2003). This way, they altered the organising structure of the indigenous stateless societies.

Next to political institutions, we include three other pre-colonial institutional characteristics arguably also important for institutional development. The first is slavery, often analysed as a reaction to prevailing factor endowments in pre-colonial Africa (Hopkins, 1973; Austin, 2008; Fenske, 2009). Given the long history of slavery and its prevalence and centrality in pre-colonial African societies (Lovejoy, 1983; Manning, 1990), we first analyse the effects of slavery in connection to other pre-colonial institutions on institutional development in chapter two. In a separate analysis we focus on its influence on long term income development in chapter three.

Although the institution of slavery goes far back in history, various sources argue that the indigenous institution of slavery changed drastically under influence of the export slavery (Manning, 1990; Lovejoy, 1983). The fundamental function of slavery was to ‘deny outsiders the rights and privileges of a particular society so that they could be exploited for economic, political and or social purposes. Usually, outsiders were perceived as ethnically different, the absence of kinship was particularly common distinction of slaves’ (Lovejoy, 1983:2). Many societies in Africa relied extensively on slavery. Production depended in varying degrees on slave labour, political power relied on slave armies, and external trade involved the sale of

slaves. Class relationships developed, where slaves were at the bottom of the social order (Lovejoy, 1983). The institution of controlling and excluding people is likely to lead to the development of restrictive (political) institutions, where people are limited to take part in the political process (Engerman and Sokoloff, 2000, 2002).

The final two initial institutional characteristics deemed important for institutional development are cultural heterogeneity and conflict management institutions. Literature on post-colonial ethnic diversity argues that often, heterogeneity of people hinders efficient institutional development, especially when conflict management capabilities are not well developed (Rodrik, 1999). We follow this route, but focus on cultural heterogeneity instead of ethnic heterogeneity, in combination with a proxy for the development of rudimentary conflict management institutions. When local communities were the basic unit of social organisation, differently organised societies living next to each other posed no threat to institutional and economic development. However, Curtin et al. (1988) point out that already in the early colonial period, institutional problems manifested themselves in the rapidly growing urban areas. As people from different ethnic backgrounds started to live together, with different cultural origins and a huge variety of law systems, there was no simple, overriding African law system which could be used to rule the cities (Van Oppen, 2006). Inter-group conflict resolving institutions were generally absent, because in times of conflict, societies could easily move away given the abundance of land (Ayitttey, 2006; Kopytoff, 1987). Still, very basic forms of local conflict management institutions were present in certain societies, in the form clearly structured groups, explicitly trying to marry outside their society. According to the anthropological 'Alliance theory', the fact that communities marry outside their own group indicates that such communities look for allies by marrying with people in other groups. This way these groups co-operate on a regular basis which promotes social solidarity and lessen (internal) conflict (Levi-Strauss, 1969, Chagnon, 1977)<sup>17</sup>.

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<sup>17</sup> Two other anthropological theories consistently pair exogamy with reduced likelihood of (internal) conflict and either increased survival rate of the group (Survival Value theory, see for example White, 1949) or promoted social cohesiveness (Conflicting Loyalties theory, see for example Colson, 1953; and Scheffler, 1973).

*Main Results Pre-Colonial Initial Conditions*

In chapter two, we analyse the impact of pre-colonial institutions, based on anthropological data, on present day governance quality in Africa in an OLS-framework. Estimations show that differences in governance quality between African countries in the late twentieth century correlate well with pre-colonial institutional variables. More specifically, we find that a well developed (local) state hierarchy in pre-colonial societies has a positive influence on present day governance quality at country level, when complemented by a well developed community hierarchy in the pre colonial era. In addition, the extent to which pre-colonial communities were outward looking and clearly structured, also positively relates to present day governance quality. Furthermore, both a high prevalence of social exclusion in pre-colonial times (measured as the extent to which pre-colonial slavery was present) and a large variance of organisational characteristics of pre-colonial societies in one country negatively correlate with governance quality. These findings suggest that pre-colonial institutional arrangements are quite persistent and are important when analysing Africa's long-run institutional development.

The negative impact of indigenous slavery on institutional development, the large literature on the influence of export slavery on development in Africa, and the alleged close connection between indigenous slavery and export slavery, leads us to scrutinize the impact of slavery on economic development in chapter three. In line with findings in the qualitative literature, we find that indigenous slavery was geographically concentrated and more common in societies with more developed states, and in those where Islam was more widespread. Indigenous slavery is also found to be robustly and negatively associated with long-term income development. We find evidence that indigenous slavery, by socially excluding large parts of the populations, led to the development of restrictive political institutions hampering the development of states conducive to growth, i.e. states with broad based legitimacy and capable bureaucracies.

**1.5. Colonial Africa**

The second part of this thesis focuses on the colonial period, and its influence on both economic development and investment patterns around the globe. We start with a short overview of the colonial period followed by an introduction of the two final chapters.

Although Europe had some commercial interest in Africa prior to colonisation, formal control by European countries did not start until the end of the 19<sup>th</sup> century. Various European powers were present in certain coastal trading posts, but possessed very little knowledge of and were generally not interested in the interior of the continent (Herbst, 2000; Christopher, 1984). The limited interest in Africa until the end of the 19<sup>th</sup> century can be explained both by the limited commercial opportunities and the disease environment which was very unfavourable to European settlement in many parts of Africa. Especially West Africa was seen as ‘the white man’s grave’ (Herbst, 2000: 64).

What exactly motivated the scramble for Africa after 1880 is rather complex. Necessary developments were the discovery of first of all quinine prophylaxis, which greatly reduced deaths from malaria. And secondly and maybe more importantly, the development of the Maxim-gun, a semiautomatic weapon, which created great military superiority (Uzoigwe, 1985; Iliffe, 1995; Herbst, 2000). Given this context, a mixture of factors influenced the increased interests of European countries in Africa, the relative importance varying from region to region. First of all, European rivalries increased European activity on the continent, such as Britain’s worries that France controlled more area than they did; secondly, the desire by men ‘on the spot’ to extend control, independent of the desires of the metropole; and thirdly, a sudden hysteria across Europe to be left out of the division of Africa, even though the gain of colonisation was highly uncertain (Herbst, 2000; Uzoigwe, 1985; Wesseling, 1991). Pure commercial interests were in the beginning limited to certain areas on the west coast mainly. In other areas merchants were opposed to conquest for fear of disturbing existing trade relations (Iliffe, 1995).

What sets the colonisation of Africa apart from other regions, is that it happened relatively late, quick – in 25 years the whole continent was divided - and without fighting between the colonial rulers (Herbst, 2000: 66). Seven countries divided Africa on a conference in Berlin in 1884-85, but the countries gaining the largest areas were France and Great Britain. The conference allowed any European power to prohibit others from challenging a piece of territory once they had brought it under their ‘sphere of influence’ (Herbst, 2000:73). Control was established by signing treaties with African chiefs, and subsequently unilaterally declaring those areas to be under their control (Uzoigwe, 1985; Herbst, 2000). If these treaties were not contested by other European countries, these areas came under actual control of the country with the treaties. The boundaries of these territories were determined as

closely as possible by natural boundaries, but if that was not clear or not available, arbitrary longitude and latitude lines were used. In the end, around 44 percent of the borders of African countries consisted of straight lines (Uzoigwe, 1985; Herbst, 2000).

It was important for Europeans to avoid war over territory, mainly because of high costs and uncertain benefits. Generally colonial powers were reluctant to incur more than minimum financial commitment, in particular Great Britain. In this context, Lord Salisbury is noted to complain about the ‘inconvenience of protectorates’ (Herbst, 2000:69). One of the means of reducing the costs was to allow private charter companies to control large parts of the areas by letting them sign treaties with local African chiefs. Moreover, colonial powers were initially unwilling to develop extensive administration networks, again because of the high costs and the low expected reward (Wesseling, 1991). But especially in contested areas, the colonial administration increased its influence, a trend which can also be noticed clearly in colonial education figures (see chapter 4; White, 1996; Herbst, 2000).

The number of Europeans that went to Africa to settle was very low. On average, around 1 percent of the population was European in British colonies, compared to less than a half percent in French colonies right after WW2<sup>18</sup>. Hence, the majority of construction, agriculture, and industrial works of the colonial era relied heavily on employment of Africans, recruited by force or enticement (Christopher, 1984: 5). So in the end, Africans built up the colonial economy, and paid taxes to maintain it. A strong distinction was made in every day life between Africans and Europeans. Africans became the underprivileged part of the population, and were only allowed to fulfil low positions in the official administration, if employed at all. This is also reflected in the separate administration of African and European affairs in colonial yearbooks and colonial bluebooks. Especially social indicators, such as health indicators like hospitalisation, diseases, causes and numbers of deaths, enrolment rates, crime figures and so on are separately recorded.

We make use of these colonial yearbooks in chapter four, to be able to quantify actual circumstances during colonial times. The main forces of social change during the colonial period came through the introduction of political settlement,

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<sup>18</sup> Author’s calculations. See chapter 4.

western economic forces, Christianity, and western education (Afigbo, 1985: 489) and we focus on two of these areas: the settlement patterns and the influence of western education. Settlement patterns allow us to assess the extractive institutional hypothesis brought forward by Acemoglu et al. (2001) and education levels are an essential part of Abramovitz's (1986; 1989) social capability, important in explaining the potential of a country to catch up. We first calculate the number of Europeans present right after World War 2, both per area and per population. And second we determine how many children went to school as a percentage of the population

Western education was brought to Africa by Europeans, though not spread through official agencies alone or even primarily in some areas. Especially Christian missionaries played a prominent role in the spreading of formal education during colonial times (Bergman, 1975; Crowder, 1964). For both the Catholics in French Africa and the predominantly Protestant (Anglican, but also other) missionaries in British Africa, education was a key institution for spreading religion, and especially in British Africa for creating self-perpetuating congregations as the missionaries considered their presence temporarily (Berman, 1975). Between various churches, rivalry existed to reach as many people as possible. Helped by improved means of communication, this stimulated the rapid spread of missionary educational work in the first half of the twentieth century, with enduring results (Cameron, 1970). The colonial administrations were only to a limited extent involved in providing education, mainly out of cost considerations, although in French areas official involvement was generally more important than in British areas. Via the increased educational efforts, colonial governments hoped to train the low-grade personnel they needed for staffing the lower ranks of the colonial bureaucracy (Collins, 1970).

The initial African reaction to Western education was generally one of animosity. In Muslim areas, this was usually respected, since it was assumed to be based on religious grounds, but the refusal of 'pagans' to bring their children to missionary education could not count on such respect (Crowder, 1964). But gradually, the resistance of Africans towards Western education changed. Africans saw the power and the status educated Europeans had, and also the better jobs were in European hands. This made education attractive, since it provided opportunities (Berman, 1975).

Given this context, the number of children enrolled in primary and secondary schools are a good indication to what extent western education was actually present in the various countries. The general level of education at the onset

of independence is also an important indicator of social capacity, the capacity of a country to absorb new ideas and technology and thus the capacity to catch up to developed countries (Abramovitz, 1986, 1989). In chapter four we use these enrolment figures to determine the effect of colonial education on development patterns first in an OLS framework. But as education during colonial times might be endogenous, we also apply an 2sls framework where we instrument education with settler mortality taken from Acemoglu et al. (2001).

The colonial period as such can be seen as a ‘historical accident’, one of the ultimate causes of development according to (Maddison, 1991). Especially for the colonised countries, the colonial period forms an initial condition of its own, as especially in Africa, colonisers created countries, but more generally, the colonisers influenced many areas of society. The colonial period is often found to have an effect long after the independence of countries (Grier, 1997; Bertocchi and Canova, 1996; Djankov et al., 2002).

A very visible result of the colonial period is that it created a tie, a bond between the countries of the ruled and the rulers. It created a sense of familiarity between the populations of both countries, as some people from the colonial countries followed their education in the mother country during the colonial period, and trade was intense between the colony and the metropole. Furthermore, colonial ties are often reflected in the national education systems and literary histories of the colonisers (Said 1978). In chapter 5, we hypothesise that this ‘familiarity’ between countries that share a past together influences how foreign countries are perceived today. People feel closer to a foreign country with which their country shares a past, and hence when thinking about investing abroad, these countries are more likely to be entered than countries with which they share no past. We test in an OLS framework whether more direct investment goes to countries with which four major colonial powers<sup>19</sup> share a past with than to countries without such a shared past.

#### *Main Results Colonial Initial Conditions*

In chapter four, we firstly consider whether the ‘extractive institutions’ hypothesis brought forward by Acemoglu et al. (2001) is applicable to an African sample, by explicitly checking the intervening steps from high settler mortality to low settlements to extractive institutions. Secondly, we test the ‘colonial human capital’

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<sup>19</sup> The UK, France, the Netherlands and Germany.



explanation for sub-Saharan Africa, controlling for legal origin and geography. Our main hypothesis is that colonial education may have fostered long-term growth through two channels: both by affecting present education levels, and through its effect on political institutions, fostering stability, ‘voice’, and good governance. Utilising our data on colonial era education, we find that instrumented human capital explains long-term growth better, and shows greater stability over time, than instrumented measures for extractive institutions. We suggest that the impact of the disease environment on African long-term growth runs through a human capital channel rather than an extractive-institutions channel. The effect of education is robust to including variables capturing legal origin and geography, which have some additional explanatory power.

In chapter five, we analyse whether colonial ties, being part of broader historical ties, linger on after independence. Colonial legacies are often analysed from colonised country perspective (Acemoglu et., al 2001; Grier, 1999; Englebert, 2000a; Bertocchi and Canova, 2002; Lange, 2004; Fielding and Torres, 2008). In this chapter we analyse the influence of a shared history between countries from the coloniser perspective, and test whether more direct investment is going to former colonies compared to other countries. We hypothesise that when countries share a past together, this increases familiarity between these countries. Familiarity in turn is negatively related to ‘psychic distance’ – the perceived distance to a foreign market –, a factor strongly influencing internationalisation decisions (Dow, 2000; Ellis, 2007; Stöttinger and Schlegelmilch, 1998). This contrasts with existing literature, which assumes country similarities (also sometimes proxied for by colonial ties) to drive the perceived distance to a foreign market. But we feel that the case for historical ties as an originator of similarities is often rather far fetched. For example in the case of the UK, which both shares a past with the United States and Zambia the similarity school argues that this makes the UK similar to both the US and Zambia. Conversely, we argue that in this example, the UK is more familiar with the US and Zambia compared to countries with whom they do not share a past, but that they are not more alike these very different countries.

Empirical results show that indeed countries invest more in countries with which they share a common history. Furthermore, our results caution against the indiscriminate use of country differences as a surrogate for the perceived distance to a foreign market. Although the effect of historical ties, common language, and

industrial development is highly significant when explaining direct investment patterns, no support emerges for the idea that firms favour investments in culturally, institutionally, politically, religiously, or educationally similar countries.

### **1.6. Limitations and future research**

Much literature has over the years been devoted to explaining Africa's long-term economic development. Factors found relevant range from institutions brought by colonisers to geographical location, to ethnic diversity and slave trades (Acemoglu et al. 2001; Gallup et al. 1998; Easterly and Levine 1997; Nunn 2008).

But these explanations of Africa's long-term growth performance have generally paid very little attention to the actual institutional circumstances on the continent before colonisation. Coloniser activities are taken into account, the geographical situation is represented, but little account is given of the people living on the continent before colonisation, or their activities and organising principles.

Furthermore, most of these explanations contrast Africa to the rest of the world without analysing whether these explanations are also applicable to explaining within-Africa variation. Moreover, when the colonial influence is discussed, little is done to actually measure presence and influence of colonisers, beyond a colonial dummy. On both subjects, this thesis has tried to proceed.

When trying to explain institutional and economic development within Africa, initial conditions matter. We find that modern institutions reflect the influence of early institutions, and that institutional histories between countries differ partly because they have a different institutional heritage, as proposed by Greif (2006) and North (1990). In addition, we find that pre-colonial institutions robustly correlate with economic development.

Moreover, we found that growth explanations in a world sample are not always useful for explaining growth variances within a specific geographical region. Factors that correlate well with the difference between the developed and developing world are often less helpful when analysing growth differences within the developing world. We test the famous 'extractive institutions hypothesis', and found this proposition unsuccessful in explaining within-Africa differences in development. Instead, we found colonial education to be a more robust explanation of development in Africa.

Nevertheless, the studies included in this thesis do suffer from various limitations. The first is the relative unknown validity of the data used to construct the pre-colonial institutions. Both the basic data underlying our main source - the ethnographic atlas - , and the coding scheme used by the author of this source to rework the underlying data to comparable classifications are subject to uncertainty.

Our main source of pre-colonial data is the Ethnographic Atlas (1967) created by Peter Murdock. This study pinpoints each society to a particular time and community, usually when some reliable observer (traveller, missionary, trader, or anthropologist) first visited the society and wrote about it in sufficient detail to impart important ethnographic information. It is known as one of the most extensive sources of anthropological data available and it has been used in economic studies before (Pryor 2005; Gennaioli and Rainer 2007). Besides, studies focusing on coding biases in anthropological data find no evidence of coding biases in the Ethnographic Atlas (March 1970: 270).

A related problem is that it is possible that data from the most developed indigenous societies is over represented in the Atlas as it was more readily available to Europeans collecting the data, because these societies were (arguably) in closer contact to Europeans. It is very difficult to assess this issue, but as there are large state organised societies *and* very small dispersed hunting and gathering groups<sup>20</sup> included in the Ethnographic Atlas, there seems to be at least some variance in the level of development of included societies.

A second limitation of this thesis, and at the same time an opportunity for future research, is that all chapters include cross section analyses, linking an early (pre-colonial or colonial) snapshot to a snapshot of the situation at the turn of the century. This approach ignores in between fluctuations of the dependent variable. This might be especially relevant for Africa, which has a history of infrequent growth accelerations and - collapses, and most countries on the continent experienced a substantial plunge in development starting right after the first oil crisis in the mid 1970s and continuing until the end of the 1980s. It would be an interesting addition to this thesis to link pre-colonial initial conditions to institutional and economic development in a time perspective.

A third limitation of this research is that we treat colonial education as the start of educational developments in Africa. Hence we ignore all possible forms of

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<sup>20</sup> The Kung and the Naron in Southern Africa.

indigenous education present before colonisation such as education by village elders, by the extended family or in an indigenous religious setting (Adeyemi and Adeyinka, 2003). These efforts to create or pass on skills and knowledge possibly contributed to long-term growth of the African economies – either directly or by providing a basis for colonial education systems. One might conjecture, for instance, that people used to education of some sort were more willing to have their children attend colonial schools; or conversely, that indigenous and colonial education were rivals and so the presence of pre-colonial education hampered the spread of colonial education. Moreover, pre-colonial education schemes have most likely not been homogenous (see chapter 4). So an important avenue for further research would be to study the effects of pre-colonial educational forms on the development of colonial education.

This brings us to a more general limitation of this study, which again is a valuable opportunity for further research: the effects of pre-colonial institutional arrangements on the formation of colonial institutions are not examined. It has been widely documented that, among other things, due to the fact that only a limited number of Europeans actually settled in Africa, colonial rule had to be based on Africa's indigenous institutions (Spear 2003, Boone 2003, Tosh 1978; Herbst 2000). It was in the interest of colonial rulers to leave these local institutions intact as they enabled the agricultural sector to grow and thus increased tax income (Pim 1946). Moreover, “[...] colonial authorities depended on local authorities to effect and legitimate their rule [...]” (Spear 2003: 9). We also know that colonisers implemented different tax policies in their colonies (Frankema 2009). It would be valuable to examine to what extent these variations can be explained by the different indigenous institutions the colonisers faced.

A final limitation of this thesis applies to the final chapter. Part of the data we use for the analysis is only available for a limited number of developed countries. Although we can test our main hypothesis for developing countries including nearly all Sub-Saharan African countries, the second part of the analysis is only possible for a limited set of countries. Even though we believe and argue that the results are applicable to the extended set of countries, we can not substantiate this with empirical evidence.

Despite these limitations and opportunities for future research, the contribution of this research was to suggest and substantiate that initial conditions matter when explaining institutional and economic development in Africa. We will

start with the pre-colonial initial conditions in chapters 2 and 3, followed by colonial initial conditions in chapters 4 and 5.

## Chapter 2

### Can the Nature of Pre-Colonial Institutions Explain Governance Quality in Africa?<sup>21</sup>

#### 2.1. Introduction

Studies focusing on Africa tend to identify the lack of proper institutions as one of the main sources of its dismal growth performance over the last decades (World Bank 1992, 1994; Collier and Gunning 1999; Lewis 1996, Rodrik 1999, Rodrik et al. 2004). After independence, in a large number of countries predatory states emerged that benefited the ruling elites and which often resulted in slow growth and social conflict. However, within Africa quite striking variations in institutions can be discerned (Englebert 2000b). Some of Africa's 'growth miracles', such as Botswana and Mauritius, seem to be based on high-quality- and growth-promoting institutions, whereas in many other cases slow growth seems to be connected to a lack of institutional quality.

This chapter aims to explain the differences in present-day governance quality within Africa from a historical perspective. Contrary to among others Acemoglu et al. (2001), Grier (1999), and Bertocchi and Canova (2002) who argue that present-day differences in institutional quality and economic performance are

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<sup>21</sup> Chapter based on the paper "Can the nature of pre-colonial institutions explain governance quality in Africa?" written with J.P. Smits. His contribution is gratefully acknowledged. The paper is submitted at World Development.

rooted in the colonial period, we stress the *pre-colonial* origins of development. Over the years various Africa scholars have emphasized the importance of the pre-colonial institutions (Ayittey 2006, Hopkins 1973, Schapera 1970). Recently also the economic literature has started to pay attention to the pre-colonial period (Gennaioli and Rainer 2006, Gennaioli and Rainer 2007). But where these studies focus solely on the influence of pre-colonial centralization, we emphasize the crucial role of local communities in the development of good institutions, based on the extensive literature on state failure in Africa over the last decades (Bates 2008, Wunsch and Olowu 1995, Olowu and Wunsch 2004). Additionally we find that focusing only on pre-colonial political organization is too limited, as ample evidence shows the importance of other initial conditions on institutional development, such as factor endowments, and the heterogeneity of population (Engerman and Sokoloff 2002, Domar 1970, Easterly and Levine 1997).

We use anthropological data collected by Murdock (1967) to capture important pre-colonial institutional characteristics and link these data to present-day governance quality measured in terms of rule of law and the degree of democratization. We find that variations in governance quality in the late twentieth century can be (partly) explained by the nature of pre-colonial institutional arrangements. The results point at the importance of well-organized local communities and their ability to shape an institutional context characterized by high governance quality.

The remainder of the chapter will start with a literature review. In section three we discuss the data and methods we used to build the model which links present-day governance quality to pre-colonial institutional measures. In section four the main results of the model are examined, followed by some robustness checks to see the strength of our results. Section five summarizes our main findings.

## **2.2. Literature Review**

It is widely believed that institutions are an important determinant of economic development (Rodrik 1999, 2000, North 1990, Collier and Gunning 1999, Easterly and Levine 1997). However, there is still much debate on why growth promoting institutions did develop in some countries, and not in others.

Recently, attempts have been made to tackle this issue by trying to identify the historical roots of present-day institutions. An expanding literature has sought to

identify the impact of colonial-era conditions on long-term development in former colonies (Acemoglu et al. 2001, Grier 1999; Bertocchi and Canova 2002; Lange 2004; Fielding and Torres 2008; Bolt en Bezemer 2009). But these studies do not account for the indigenous institutional context at the time of colonization. Initial conditions are relevant in explaining institutional development, as Greif (2006) for example argues (Greif 2006: 394). In Africa, especially due to the fact that only a limited number of Europeans actually settled here, colonial rule had to be based on Africa's indigenous institutions (Spear 2003, Boone 2003, Tosh 1978). More specifically, "[...] colonial authorities depended on local authorities to effect and legitimate their rule [...]" (Spear 2003: 9). So it was in the interest of colonial rulers to leave these local institutions intact as they enabled the agricultural sector to grow and thus increased tax income (Pim 1946).

One of the few attempts to do quantitative research along these lines has been made by Gennaioli and Rainer (2007, 2006) who argue that pre-colonial centralization of local communities, increased the ability of post-colonial governments to supply important public goods and rule of law. One of the crucial elements in the Gennaioli and Rainer (2007) paper is that strong local state structures were needed to limit the rent-seeking behavior of local chiefs at community level.

Contrary to Gennaioli and Rainer (2007), most historians and social scientists describe the nature of Africa's indigenous local institutions in rather favorable terms. Hopkins (1973) argues that Africa's (economic) institutions might have been different from those in other parts of the world –partly due to differences in endowment structures which induced different paths of institutional development– but that these institutional arrangements were conducive to growth. Individuals enjoyed substantial freedom to engage in economic transactions (Wickins 1981: 349, Falola 1984, Ayittey 2006:360) and at least in West Africa capital markets were well-functioning (Sundstroem 1965). These findings are not that surprising as colonial officials already stressed how hard it was for white farmers to compete with the indigenous modes of production. In large parts of Eastern and Southern Africa levels of labor productivity in agriculture were higher in African than in European farming (Pim 1946). It is quite interesting that many scholars who have studied Africa's institutional problems in the post-independence period, point at the devolved system of social and political organizations in the colonial and even pre-colonial era [see: Colson 1957, Gluckman 1965, Nhlapo 1995 and Dore 1997]. Ndulo (2006) even states that "if colonial powers were shrewd enough to use traditional



institutions in administering the colonial state (Lugard 1905-p. 149-50), why should African political systems not make use of them in an effort to reach out to small communities and help to build national consensus and cohesion?" (see also Olowu and Wunsch 2004)

The pre-colonial institutional arrangements were often characterized by democratic structures in which the political power of chiefs was limited by councils of elderly people (Ayittey 2006, Schapera 1970). For example, in the Ashante and Zulu kingdoms and in Tswana chiefdoms the king or chief could not make any laws without consulting the chiefs and elderly. Custom and tradition in these societies set limits to the authority of the king, his cabinet and advisors (Boamah-Wiafe 1993, Curtin et al. 1988, Ayittey 2006).

Furthermore, the king or chief generally needed local chiefs or village headmen for support and had to rely on them in order to carry out its policy, as the local chief was in closer contact with the local community and was better informed about specific local issues. In case a village chief made a poor judgment, he could be held responsible by the council of elders and the council of commoners and he could be removed from power, as happened in among others the Ashante, the Tswana, the Oyo-Yoruba (Ayittey 2005, 2006, Schapera 1967, 1970, Falola 1984, Vaughan 1986). At the same time, local chiefs could be replaced by the king in cases of bad performance (Ayittey 2006). In other words, both bottom up and top down checks and balances were well developed in many societies. This sophisticated system was well suited to govern life at the local level and guaranteed an adequate allocation of labor and capital.

A good example of the importance of such checks and balances can be found in pre-colonial Zimbabwe, where the Shona (the largest) and the Ndebele were the most important groups. Both groups have a history of state formation, but only the Ndebele also had a well developed community structure. In literature on pre-colonial societies, the Shona chiefdoms are described as being fragmented and undisciplined (Maundeni 2004). Chiefs were often engaged in mutual feuds, and since succession was collateral, also within chiefdoms there were fights over power and wealth between different families at all levels of the state. The Shona state institutions were 'structured' in ways that worked to promote the temporary enrichment of a few warlords who easily lost to others "[...] the fragmentation of chiefly power that led to the failure to exercise leadership in economic matters [...]" (Maundeni 2004: 196-197). In contrast, the Ndebele state, which was much smaller

than the Shona area, had a well-developed community structure (Murdock 1967). The Ndebele state was coherent and disciplined and 'had coercive, destructive and transformative ability' (Maundeni 2004: 197). Present day Zimbabwe still sees the results of this history since the Zimbabwean state elite is based on the pre-colonial state culture of the dominant Shona. The Ndebele groups were and still are too small in terms of its population size to gain enough influence on national politics (Maundeni 2004).

Also for other pre-colonial societies, there is ample evidence that an important balance was created between state and community levels. For example Smith (1988) notes about the Oyo-Yoruba (in present day Nigeria) that 'in general a delicate balance of power was achieved and all parties in the state were usually at pains to maintain this' (Smith 1988: 92). Mair (1974) observes about the Edo (also in present day Nigeria) that 'every village was allotted a chief [...]. Rather they were intermediaries, in both directions between the Oba [king] and the general population'. Mair (1974: 155). In Eastern Africa, the Chewa of Malawi among others represent the strong pre-colonial structures based on state and community development. According to Page (1980), 'one of the reasons for [their] cultural survival can be found in the importance of local, village authority in Chewa life' (Page 1980: 172). So although in different forms, various societies were characterized by a comprehensive balance between different political levels in pre-colonial times. As colonial entities had to base their authority on pre-colonial settings given their relatively limited presence in Africa (Boone 2003, Spear 2003, Tosh 1978), and post-colonial governments often failed to implement effective rule (Bates 2008), much of the contemporary institutional framework had to be based on pre-colonial fundaments.

Next to early (political) organization, there are other initial conditions that may have influenced institutional development in the long run, such as factor endowments and heterogeneity of the population (Greif 2006, Engerman and Sokoloff 2002, Domar 1970, Easterly and Levine 1997, Alesina and Rodrik 1994, and Alesina et al. 1999).

During pre-colonial times, Africa was characterized by extremely low population density. According to economic theory this implies labor scarcity which in combination with simple agricultural technology, leads to the absence of a non cultivating labor class and provides incentives for dominant groups to search for cheap labor in the form of slavery (Binswanger and McIntire 1987: 97 note 8).

Domar (1970) argues that land abundance in Eastern Europe around the sixteenth century led to serfdom, because the only way for non working land owners to survive in a situation of land abundance, was by restricting the free movement of labor. In contrast, North and Thomas (1971) claim that the high land labor ratios in Europe after widespread famines and pestilence of the 14<sup>th</sup> century actually ultimately led to a free labor market since lords had to compete for what had then become very scarce labor, since there was no effective central coercive authority to prevent this competition. Conning (2004) formalized Domar's hypothesis using a general equilibrium model and finds that indeed slavery is more likely to emerge in when land is abundant in combination with intermediate land inequality. When land inequality is high, landowners can obtain cheap labor by withholding land from the market, which raises the price of land and lowers the land labor ratio. In contrast, when land inequality is at intermediate levels, slavery is much more prevalent since land owners in this case do not have other means of obtaining cheap labor. This situation seems relevant to pre – colonial Africa, where land inequality was not extreme compared to Latin America and slavery was widespread (Fenske 2009, Austin 2008). This might have triggered an institutional development path characterized by relatively restrictive institutions, needed to tie the scarce labor to estates which led to high inequality both in wealth and in political power, since elites preferred more restrictive institutions to limit economic political opportunities for the masses (Engerman and Sokoloff 2002, Sokoloff and Engerman 2000).

In many African countries, restricted political institutions are present as large segments of society are not able to take part in the political process (Barkan 2006). This enables ruling elites to formulate policies which benefit themselves, but which are often harmful for the society at large. Ndulo argues that only 'devolution', i.e. giving more power to rulers at regional or local levels, may increase the participation of larger segments of society (Ndulo 2006a).

A second strand of literature on Africa's institutional development focuses on the influence of the ethnic heterogeneity of its population. Many studies link heterogeneity of population to the development of inefficient institutions, as empirical evidence shows that it is often more difficult to find socially optimal solutions in heterogeneous societies, both in the supply of public goods (in terms of composition and amount of supply) and in the distribution of costs (Easterly and Levine 1997, Alesina and Rodrik 1994, and Alesina et al. 1999). Also, when governments attempt to satisfy their political support, they are likely to provide

goods that are valued by their followers, but which are not necessarily good for the development of society at large (Alesina et al. 1999). Moreover, when natural resources are present, this could increase tensions in a country over how this gains should be distributed (Hodler 2006, Sachs and Warner 2001). Agreement on how to distribute the costs or profits is much more difficult in a deeply divided society which lacks proper conflict management institutions (Rodrik 1999, Alesina and Drazen 1991).

There are also scholars who argue that heterogeneity comes in different forms and can have various effects on institutional development and economic growth (Collier 2001, Bates 1999, Bates and Yakovlev 2002). These authors make a clear distinction between dominance and fractionalization. Dominance is found to be detrimental for growth (irrespectively whether in a democracy or dictatorship - when the same group is in power), simply because there is an incentive to redistribute to the own group at the expense of growth although the empirical effect is weak. In contrast, fragmentation (many small groups, or three or four groups none of which has a majority) are found to have different effects on stability and on the predatory behavior of governments. In democracies it fractionalization is generally not problematic for development, but it can be detrimental in dictatorships (Collier 2001).

During pre-colonial times, communities in Africa were dispersed over the vast continent and they were characterized by a high degree of cultural and institutional diversity (Murdock 1967). As long as local communities were the basic unit of social organization, these differently organized societies living next to each other posed no threat to institutional and economic development as in time of conflict, people could move away easily given the abundance of land. Within this context, the local level institutions were sufficient to govern everyday life and there was no need, and often no capacity, to develop special institutions for conflict management between groups (Kopytoff 1987, Ayittey 2006).

However, there are indications that this cultural and institutional diversity became problematic at the time that population density increased and groups of people could no longer easily leave their communities due to the growing problem of land scarcity. Curtin et al. (1988) point out that already in the colonial period institutional problems manifested themselves in the rapidly growing urban areas. People from different ethnic backgrounds and with different cultural origins started to live side by side in the new cities, but there was no simple, overriding African law

system which could be used to rule the cities (Von Oppen 2006). While within group conflict management institutions were often well developed, inter-group conflict resolving institutions were generally absent (Ayittey 2006: 101). This lack of inter-group conflict management institutions had serious implications for the functioning of Africa's political markets after independence. The different ethnic groups faced tremendous difficulties in co-operating and organizing effective collective action. The post-colonial central state gained power to the extent that it could pursue policies which were mainly directed at benefiting the ruling elite. Due to the fragmented nature of Africa's civil society, the communities could not successfully influence the central state.

The above literature suggests a strong impact of pre-colonial factors on institutional development in Africa. First of all, strong and well developed local state and community structures of pre-colonial societies are associated with a positive effect on institutional development paths. More specifically, where state structures are linked to effective rule of law (Gennaioli and Rainer 2006), community structures are crucial to limit the power of the state, to organize collective action, and to enable people to participate in society (Ayittey 2006, Schapera 1970, Maundeni 2004). In other words, we argue that it is the interrelationship between the two that is essential for a balanced institutional development. Secondly, the early day resource endowments (i.e. labor scarcity) in Africa are linked to pre-colonial social exclusion (slavery) which in turn caused more restrictive institutions to develop to limit political and economic options for the masses. In countries with widespread social exclusion, we expect lower governance quality. Third, empirical evidence suggests that the combination of the (cultural) heterogeneity of Africa's pre-colonial societies (combined with the increasing population pressure already starting during colonial times), and the absence of good conflict management institutions, made it more difficult to develop efficient institutions. Therefore, in countries with many culturally different groups and with little conflict management institutions, we expect lower governance quality. In the next section we will quantify these pre-colonial characteristics and link them to present-day governance quality.

### 2.3. Data and Empirical analysis

In this section we will present the model in which contemporary governance quality is explained by a number of pre colonial institutional characteristics. Governance quality is measured at the country level. The data on pre colonial institutions are measured at the level of individual ethnic groups/ local communities and subsequently processed to get to a country level measure. It should be stressed that when we discuss state and community structures in the pre colonial period, these institutional characteristics *always* refer to community and state structures at a *local*, group/community level.

#### *Governance quality*

Institutional quality in African countries is measured in terms of *governance quality*. Governance quality is of course a broad concept and there are many different indicators to choose from (Goodloe Wescott 2003, Centre for Democracy and Governance, 1998). Most indicators can be placed into one of three broad aggregates - competitive and participatory political processes, rule of law, and government capacity (as defined by Kaufmann and Kraay 2004). We selected Rule of law - whether a country has a legal framework that protects property rights and human rights of citizens, and Democracy - which reflects to what extent a country has competitive and participatory political processes (Kaufmann et al. 2000, Goodloe Wescott 2003, and Court et al. 2002), as these variables that are both at the core of institutional quality and are relevant in the light of the literature discussion above. First of all, Rule of law is linked to state structures (Gennaioli and Rainer 2006), and community structures are important in enabling people to participate in society and to limit the power of the state (through competitive and participatory political processes (Ayittey 2006, Maundeni 2004), with many different groups in society, conflict management institutions are important. Through participatory political process, people can protect their interest, and an effective judiciary system is vital to peacefully settle conflicts. Finally, social exclusion and restricted political and economic opportunities for the masses will be reflected in less democratic processes and less or worse enforcement of the protection of property rights.

Factor analysis was used to combine the average over time of the index on rule of law between 1996 and 2002, taken from Kaufmann, Kraay and Mastruzzi (2007) and the average over time of the democratic score of a society between 1997

and 2002 taken from the Polity IV dataset (Marshall and Jagers 2002). This combined variable enabled us to include different aspects of governance or institutional quality in one variable<sup>22</sup>. Another option would of course be to link institutional or governance variables separately to pre-colonial institutions<sup>23</sup>. However, this would lead to analyzing only limited parts of governance and prevents the explicit analysis of our argument that it is the coherence between state and community structures that is important for the development of broad institutional quality.

#### *Pre-colonial institutions*

Data on pre-colonial community characteristics in sub Saharan Africa were taken from the Ethnographic Atlas, created by Murdock (1967). The Ethnographic Atlas (Murdock 1967) is based on data previously published in various issues of the Journal *Ethnology* and contains a global sample of 862 societies for which 48 different variables are collected. For sub Saharan Africa, 292 societies are included. The actual time periods for which societies are included is dependent on the earliest period for which the author could find satisfactory data, mostly the last quarter of the nineteenth century. Murdock focused on the earliest date possible between 1850 and 1950 to avoid cultural effects of contact with Europeans as much as possible.

We selected variables that represent the extent to which both local state and community structures are well developed, the extent to which communities were characterized by social exclusion, and cultural characteristics to capture both cultural heterogeneity and the extent to which communities were outward looking, i.e. were looking for ties to other groups, as a measure for inter-group conflict management arrangements.

As the data in the Ethnographic Atlas are presented at the level of groups, we combined these data with population data from the Atlas Narodov Mira (1964) to assign the different groups to present-day countries. This atlas represents the global

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<sup>22</sup> For factor scores see Appendix 3.A.

<sup>23</sup> We have estimated our model using democracy and rule of law separately as our dependent variable, and results do not change much (see Appendix 3.C). We have also separately linked state development and community development to respectively rule of law and democracy. Indeed, the results suggests that State structures correlate with rule of law, and that Community structures correlate with democracy (see Appendix 3.C).

distribution of ethnic groups and gives an explicit subdivision of groups over countries<sup>24</sup>. This enables us to calculate the proportion of each pre-colonial group that belongs to a specific country. Important to note in this context is that the subdivision of groups over countries was collected at the end of the colonial period. The sometimes large scale migration of groups, for example in the context of indigenous slavery discussed in chapter three of this thesis, took place before this period. During colonisation and after large scale migration was no longer an option, making these group division data extremely suitable to locate pre-colonial groups in present-day countries.

The following variables were taken from the Ethnographic Atlas:

- Jurisdictional hierarchy at the community level, i.e., “the number of jurisdictional levels up to and including the local community, ranging from the nuclear family to clan barrios.
- Jurisdictional hierarchy at the state level, i.e., the number of jurisdictional levels of those transcending the local community, ranging from autonomous villages to large states.
- The incidence of indigenous slavery, measuring “the forms and prevalence of slave status”.
- Community Organization, i.e., the prevalence of certain organizational features of communities such as the practice of endogamy or exogamy – the extent to which people marry within or outside their own ethnic group- combined with the presence or absence of clear segmented structures.

These variables have been scaled by Murdock (1967) from simple/flat structures to more complex and layered social structures, with the exception of slavery for which information was collected on whether indigenous slavery (ever) existed, and if so, which form was prevalent. In order to capture relevant information on pre-colonial institutional arrangements, we operationalize the four above mentioned community variables as follows:

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<sup>24</sup> P. Roeder (2001) and Easterly and Levine (1997) use the Atlas to construct their ethnic fractionalisation measure.



1. Jurisdictional hierarchy at local community and state level (the State-Community variable). To capture the extent to which both local state and community structures are well developed, we calculate the percentage of the population that belonged to a group that has at the same time both a well-developed state-level hierarchy and a local-level hierarchy. Data in the ethnographic atlas on (local) state hierarchy range from 0 to 4, where 0 stands for stateless societies and 3 and 4 for large states. Following Gennaioli and Rainer (2007), we define (local) state hierarchy to be developed for a score from 2 and higher, e.g. from larger paramount chiefdoms to large states. According to Murdock (1967), the state level digits can also be interpreted as a measure of political complexity. The data on community hierarchy ranges from 0 to 2, i.e. from independent nuclear or polygynous families to clan-barrios. Local level hierarchy is defined as the levels above the nuclear family, e.g. scores of 1 and 2. Local hierarchy can be seen as the extent to which higher authority is founded on local structures (Schapera 1967, Ayittey 2005). A good example of a society with such a political structure is the Mossi state. In the Mossi state (which covers parts of present day Burkina Faso), the smallest political unit is the family, the next level is the extended family, followed by the village council. Districts are the subsequent divisions, and the King the final political level (Williamson 1987). Burkina Faso scores intermediate on the state-community level (0.59), where the Mossi represent 91% of this score.

2. Pre colonial social exclusion (the Slavery variable). To capture the extent of social exclusion in the pre colonial period, we calculate the percentage of the population that belonged to a group where indigenous slavery existed. The existence of slavery represents pre-colonial social exclusion. According to Vaughan (1986: 1974) '[...] African [slavery] was a form of institutionalized marginality in which individuals were restricted in their participation in the society [...]'. The expected impact on institutional quality is negative. Social exclusion leads to inequality both in wealth and in political power which in turn results in more restrictive institutions since elites often prefer to restrict economic and political opportunities for the masses (Engerman and Sokoloff 2002).

3. Cultural heterogeneity between groups (the Heterogeneous Community variable). To measure cultural heterogeneity we calculated the standard deviation of

the population-weighted mean of the country level community organization score<sup>25</sup> (see Englebert 2000b), which can be seen as an indicator of the dispersion in organizational structure at the community level. The Ethnographic Atlas classifies communities from inward looking communities, without localized clans and where inhabitants marry within their community, to clearly segmented communities which are outward looking, i.e., where people marry outside their own group. There are six different categories, ranging from 0 to 5. According to Easterly and Levine (1997) and Alesina and La Ferrara (2002), the more diversely the communities are organized in a country the more difficult it will generally be to organize people. This will have a negative effect on institutional quality hence governance.

4. Characteristics of local communities (the Community Organization variable). We calculated the percentage of the population that belongs to a community that is clearly defined and practices exogamy to represent the development of (local) inter-group conflict management institutions. According to the anthropological “Alliance theory”, the fact that communities marry outside their own group indicates that such communities co-operate on a regular basis with other communities and are looking for allies and see the benefits of cooperation which promotes social solidarity and lessen (internal) conflict (Levi-Strauss 1969, Chagnon 1977)<sup>26</sup>. For this we use the same data as for the calculation of the heterogeneity of communities.

Summary statistics of the variables described are presented in table 2.1 and pairwise correlations are shown in table 2.2<sup>27</sup>.

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<sup>25</sup> Standard deviation of the population weighted mean:

$$StDev_{c.o.s.} = \left( \sum_{i=1}^n P_i * C.O.S_i \right) / \sum_{i=1}^n P_i, \text{ where } P = \text{population and } C.O.S. \text{ is the}$$

community organisation structure

<sup>26</sup> Two other anthropological theories consistently pair exogamy with reduced likelihood of (internal) conflict and either increased survival rate of the group (Survival Value theory, see for example White 1949) or promoted social cohesiveness (Conflicting Loyalties theory, see for example Colson, 1953 and Scheffler 1973).

<sup>27</sup> The actual data of the pre-colonial variables are available from the author on request.

**Table 2.1: Summary statistics of data**

| Variable                | Mean | Median | Max. | Min.  | Std. Dev. | N  |
|-------------------------|------|--------|------|-------|-----------|----|
| Governance              | 0.00 | -0.20  | 2.73 | -1.30 | 1.00      | 41 |
| State-Community         | 0.46 | 0.43   | 0.99 | 0.00  | 0.33      | 42 |
| Slavery                 | 0.63 | 0.76   | 0.99 | 0.00  | 0.35      | 42 |
| Community Heterogeneity | 0.61 | 0.50   | 2.29 | 0.08  | 0.51      | 42 |
| Community Organisation  | 0.24 | 0.10   | 0.98 | 0.00  | 0.28      | 42 |

The summary statistics reveal that only the State-Community variable is truly normally distributed. Slavery and Governance are normally distributed at the 5 % level, and our community level variables are not normally distributed. However the residuals from the regression models are in all cases normally distributed.

**Table 2.2: Pairwise correlations**

|                         | State-Community | Slavery | Community heterogeneity | Community Organisation |
|-------------------------|-----------------|---------|-------------------------|------------------------|
| Governance              | 0.36            | -0.21   | -0.22                   | 0.05                   |
| State-Community         |                 | 0.26    | 0.36                    | 0.12                   |
| Slavery                 |                 |         | 0.05                    | 0.35                   |
| Community heterogeneity |                 |         |                         | 0.26                   |

The correlations between the independent variables do not point at multicollinearity. Besides, we checked for multicollinearity by estimating auxiliary regressions relating each independent variable to the other independent variable. Also this robustness check confirms the suggestion of low multicollinearity.

*Empirical analysis*

We begin our empirical analysis by examining the relationship between governance quality and each of the pre-colonial measures introduced above. Figure 1 to 4 below show the individual relationships between governance quality and the several indicators of pre-colonial institutions, i.e. State-Community, Slavery, Community Heterogeneity and Community Organization, respectively.

**Figure 2.1: Scatter plot of Governance and State-Community Relations**

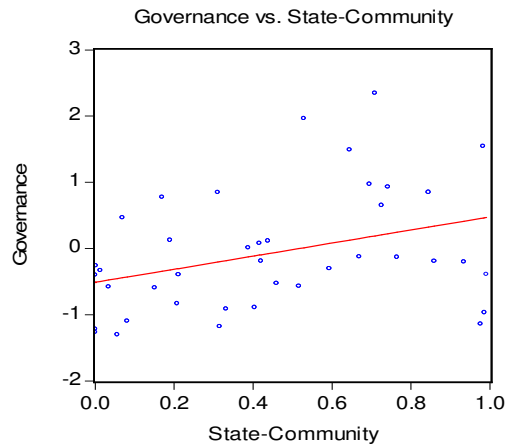


Figure 2.2: Scatter plot of Governance and Slavery

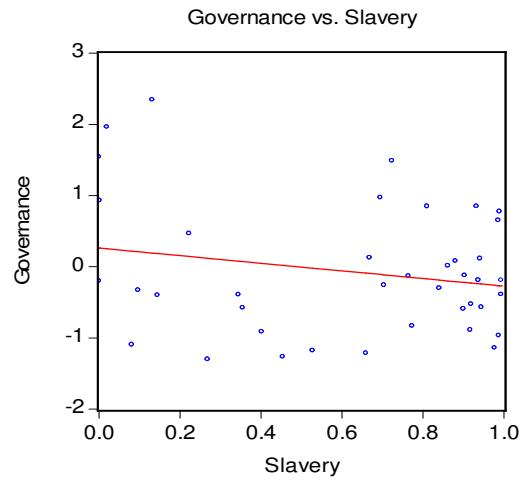
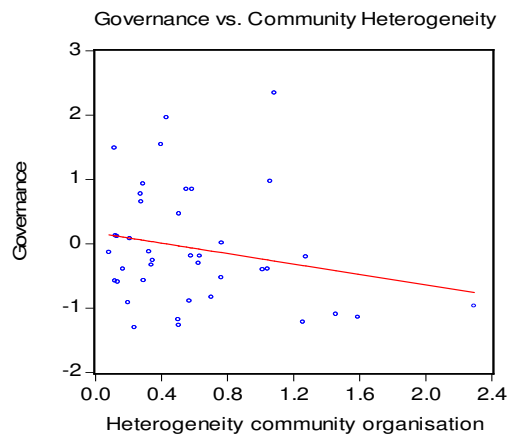
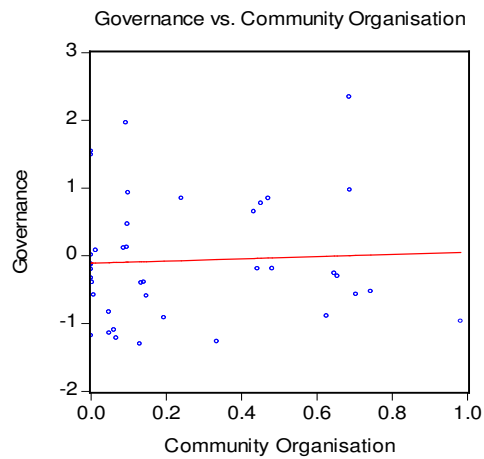


Figure 2.3<sup>28</sup>: Scatter plot of Governance and Community Heterogeneity



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<sup>28</sup> If the country-point on the right (Burundi) is left out, partial correlation between governance and heterogeneity of community organisation is -0.15. The outcome of the model is hardly influenced.

**Figure 2.4: Scatter plot of Governance and Community Organisation**

The first three figures show the expected relationship between governance and pre-colonial institutional measures. The more prevalent a well developed pre-colonial hierarchy structure both at the local and state level, the better contemporary governance quality is at the country level (figure 1). In contrast, in areas where slavery was common, present-day governance quality is on average lower (figure 2). The third figure shows that a larger variation of community organization structures before colonization are associated with lower contemporary governance quality. Finally, in the last figure we can see that the relationship between the part of the population that is organized with a clear community structure and outward looking characteristics and governance is not straightforward.

#### 2.4. Empirical Results and Discussion

Having examined the correlations between the different variables, we now look at the relationship between the pre-colonial data and contemporary governance by

estimating an OLS equation, where we include additional variables that potentially influence institutional quality<sup>29</sup>. The baseline equation is:

$$\text{Governance} = c + \beta_1 * \text{State-Community} + \beta_2 * \text{Slavery} + \beta_3 * \text{Heterogeneity} \\ + \beta_4 * \text{Community Organization} + \beta_5 * X$$

where  $\beta_1$  to  $\beta_4$  estimate the effects of our pre-colonial variables, and  $X$  is a vector of control variables, meant to capture other influences on institutional quality in our sample. See table 2.3 for the estimation results.

We first analyze the influence of each pre-colonial institutional variable on governance quality by adding the variables one at a time and start with the measure of the extent to which well developed local and state level hierarchy is prevalent in a country (State-Community, model (1)). This variable is strongly and positively correlated with governance quality. Following Ayittey (2006), this reflects the importance of pre-colonial structures where “the principle of central government [at the local level] was combined with greater degree of local autonomy (Ayittey, 2006: 267).

This effect remains robust in all the estimations when we control for other influences on governance quality (model (2)-(14)). Indigenous slavery (Slavery, model (2)), representing pre-colonial social exclusion, exerts a significant negative influence on governance quality. Societies in which substantial parts of the population were excluded from important political processes, might suffer from lock-in effects. These are societies that in the long-run are characterized by social polarization and low levels of governance quality. This relationship also remains robust (significant minimally at the 10%) level to including control variables. Various authors note the long lasting effect of pre-colonial exclusion, see for example Grace (1977) on the Mende in Sierra Leone, Macgaffey (1977) on the Kongo in the Democratic Republic of Congo, Klein (1977) on the Wolof and Serer in Senegambia, and MacCormack (1977) on the Sherbro in Sierra Leone. Moreover, Benin and Botswana, for example, are very comparable on every pre-colonial measure but Slavery. The most important society of Botswana (the Tswana) have no tradition in slavery, as did most other

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<sup>29</sup> See appendix 3.B for sources and explanations why specific controls were included and for pairwise correlations.

(smaller) groups (Schapera 1970). In contrast, in Benin, the major groups Ewe, Fon and the Oyo Yoruba customs that involved some form of slavery (Smith 1988; Argyle 1966). This is reflected in a lower score on governance quality for Benin compared to Botswana.

The variance of community organization in a country (Community Heterogeneity, model (3)) is strongly negatively correlated with governance quality and also robust after including control variables. Finally, the addition of the percentage of the population belonging to a clearly segmented community characterized by exogamy (Community Organization, model (4)) generates an additional positive effect on governance, although this represents the weakest link between pre-colonial institutions and contemporary institutional quality (generally significant at 10%).

In the models (5) to (14) we introduce control variables which are also often linked to institutional quality, such as income per capita in 1990, ethnic fractionalization, a colonial dummy, measures for internal conflict or tensions, resource endowments and early population density (for literature on these variables see appendix 3.B). As can already be seen in the pairwise correlation matrix (also in appendix 3.B), some of the control variables are highly correlated either with each other (see for example  $\ln$  GDP pc 1990 and population density in 1900 ( $r = 0.51$ ), or ethnic tension 1984-2000 and internal conflict 1984-2000 ( $r = 0.74$ ). Also, some of the control variables seem to be highly correlated with our pre-colonial institutional variables (see for example Community Heterogeneity and Ethno-linguistic Fractionalization 1985 ( $r = -0.75$ )<sup>30</sup>. This might influence the interpretation of the coefficients of the variables involved.

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<sup>30</sup> This is actually the only case in which one of our pre-colonial variables is highly correlated with one of the other independent variables.



**Table 2.3: Basic Estimation Results**

|  | Dependent variable: Governance 1996-2002 |        |          |          |          |          |          |
|--|--|--------|----------|----------|----------|----------|----------|
|  | (1)                                      | (2)    | (3)      | (4)      | (5)      | (6)      | (7)      |
| State-Community                          | 0.99**                                   | 1.18** | 1.53***  | 1.54***  | 1.47***  | 1.44***  | 1.37***  |
| Slavery                                  | -0.44                                    | -0.45  | -0.35    | -0.32    | -0.29    | -0.2     | -0.42    |
| Community Heterogeneity                  |  | -0.78* | -0.84**  | -1.12**  | -0.69**  | -0.64*   | -0.62*   |
| Community Organization                   |  | -0.44  | -0.4     | -0.43    | -0.33    | -0.33    | -0.34    |
| Ln GDPpc 1990                            |  |        | -0.73*** | -0.89*** | -1.04*** | -0.97*** | -1.05*** |
| British colonial dummy                   |  |        | -0.2     | -0.2     | -0.2     | -0.23    | -0.37    |
| ELF 85                                   |  |        |          | 0.89*    | 0.93*    | 0.90*    | 0.94*    |
| Total Military Intervention Score        |  |        |          | -0.53    | -0.49    | -0.48    | -0.54    |
| Ethnic Tensions 1984-2000 <sup>a</sup>   |  |        |          |          | 0.57***  | 0.55***  | 0.56***  |
| Internal Conflict 1984-2000 <sup>a</sup> |  |        |          |          | -0.2     | -0.2     | -0.2     |
| LHCpc                                    |  |        |          |          |          | 0.21     | 0.19     |
| Population density 1900                  |  |        |          |          |          | -0.25    | -0.26    |
| Adj. R <sup>2</sup>                      | 0.1                                      | 0.17   | 0.29     | 0.34     | 0.43     | 0.42     | 0.4      |
| N  | 40                                       | 40     | 40       | 40       | 40       | 40       | 40       |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. <sup>a</sup> Ethnic tension and Internal Conflict are scaled counter intuitively, in the sense that higher scores represent less tensions (even though differences in race, nationality or language may exist (ICRG risk guide). Sources: see appendix 3.B

Table 2.3: Basic Estimation Results (continued)

|  | Dependent variable: Governance 1996-2002 |          |         |          |          |         |         |
|--|--|----------|---------|----------|----------|---------|---------|
|  | (8)                                      | (9)      | (10)    | (11)     | (12)     | (13)    | (14)    |
| State-Community                          | 1.38***                                  | 1.50***  | 1.55*** | 1.55***  | 1.40***  | 1.43*** | 1.33*** |
| Slavery                                  | -0.29                                    | -0.32    | -0.37   | -0.26    | -0.31    | -0.36   | -0.37   |
|  | -0.56*                                   | -1.24*** | -0.69** | -0.52*   | -1.11*** | -0.57*  | -1.24** |
| Community Heterogeneity                  | -0.32                                    | -0.29    | -0.33   | -0.28    | -0.33    | -0.32   | -0.42   |
|  | -0.91***                                 | -1.06**  | -0.83   | -0.98*** | -1.21*** | -1.10** | -1.21   |
| Community Organization                   | -0.24                                    | -0.43    | -0.54   | -0.22    | -0.41    | -0.47   | -0.8    |
|  | 1.42***                                  | 1.35**   | 1.07    | 1.18**   | 1.31***  | 1.15*   | 1.38**  |
| Ln GDPpc 1990                            | -0.5                                     | -0.49    | -0.66   | -0.44    | -0.47    | 0.56*   | -0.63   |
|  | 0.38**                                   | 0.25     | 0.3     | 0.69***  | 0.45*    | 0.59**  | 0.47    |
| British colonial dummy                   | -0.17                                    | -0.21    | -0.26   | -0.17    | -0.22    | -0.23   | -0.33   |
|  | 0.34                                     | 0.39*    | 0.36    | 0.26     | 0.32     | 0.29    | 0.17    |
| ELF 85                                   | -0.21                                    | -0.19    | -0.22   | -0.21    | 0.19     | -0.21   | -0.29   |
| Total Military Intervention Score        | -0.04***                                 | -0.03**  | -0.03*  | -0.04*** | -0.04*** | -0.04** | -0.04** |
|  | -0.01                                    | -0.01    | -0.02   | -0.01    | -0.01    | -0.02   | -0.02   |
| Ethnic tensions 1984-2000 <sup>a</sup>   |  | 0.48***  |         |          | (0.41*** |         | 0.55**  |
|  |  | -0.14    |         |          | -0.13    |         | 0.19    |
| Internal conflict 1984-2000 <sup>a</sup> |  |          | 0.12    |          |          | 0.07    |         |
|  |  |          | -0.07   |          |          | -0.06   |         |
| LHCpc                                    |  |          |         | -0.07**  | -0.04    | -0.05*  | -0.05   |
|  |  |          |         | -0.03    | -0.03    | -0.03   | -0.03   |
| Population density 1900                  |  |          |         |          |          |         | 0.02    |
|  |  |          |         |          |          |         | -0.02   |
| Adj. R <sup>2</sup>                      | 0.53                                     | 0.72     | 0.61    | 0.66     | 0.73     | 0.65    | 0.65    |
| N  | 40                                       | 30       | 30      | 37       | 30       | 30      | 25      |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. <sup>a</sup> Ethnic tension and Internal Conflict are scaled counter intuitively, in the sense that higher scores represent less tensions (even though differences in races, nationality or language may exist (ICRG risk guide)). Sources: see appendix 3.B.

Income is generally significantly associated with better governance quality (models (5) through to (14)) and conflict variables on average significantly negatively influence governance quality (models (8) through to (14) show different combinations of conflict variables to see the robustness of these variables). Ethnic fractionalization exerts hardly any influence on governance (model (7))<sup>31</sup>. Likewise, the dummy for British legal origin does not exercise a strong influence on governance (models (6) to (14), where its only significant in model (9)) and neither does population density in 1900 (model (14)). Finally resource endowments is negatively correlated with governance quality but is only significant in half the cases it is included (models (11) through to (14)).

Generally speaking, the pre-colonial variables are not influenced much by the inclusion of the control variables. Only when we include “internal conflict” as a conflict measure, Community Heterogeneity and Community Organization just lose their significance (p-values of 14% and 12% respectively). Besides, when we include population density in 1900 our measure of Community Heterogeneity is no longer significant (p-value of 15%) (which might be due to multicollinearity - see the correlation table in appendix 3.B - or to fewer observations).

#### *Robustness checks*

There could of course be other explanations as to why well developed state and community structures would positively influence governance quality<sup>32</sup>. One such alternative hypothesis is that societies which had better developed state and community structures before colonization were at the time also economically and socially more developed and therefore needed or could afford institutions constructive to growth. Since early institutional arrangements are often assumed to be persistent (Acemoglu et.al 2001, La Porta et al. 1999), these growth and development promoting early institutions led to better institutions today. In this case we would have captured an early economic development effect with our State-Community variable.

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<sup>31</sup> The correlation between governance quality and ethnic fractionalisation is low, i.e. -0.11. Since it correlates highly with some of our other independent variables, it is excluded from our other equations.

<sup>32</sup> We thank an anonymous referee for this suggestion

A second alternative explanation could be that pre-colonial societies with less developed state and community structures possibly lived in geographical areas that hindered the development of growth promoting institutions. For example, one could imagine that in woodland or forest areas, it is harder to travel, communicate and trade. This would make it harder and maybe not as compelling to develop effective bureaucratic structures compared to for example savannas or other more open areas, where long distance trade routes were well established (Curtin et al. 1988). Hence, in this case we might have captured a geographical effect with our State-Community variable. To distinguish between these alternative explanations we calculated both variables that capture pre-colonial economic and social development of societies and a variable that captures unfavorable geographical circumstances for institutional development. These variables are then used to re-estimate our baseline model.

Pre-colonial economic and social development is calculated following Gennaioli and Rainer (2007)<sup>33</sup>: we first determined whether societies had an indigenous system of writing, since that can be seen as a measure of advancement (Gennaioli and Rainer 2007: 202, Murdock and Provost 1973: 379). Secondly, we calculated to what extent societies depended on agriculture (as opposed to hunting and gathering), and thirdly we determined whether societies lived in permanent settlements or not. Finally, to capture geographical circumstances, we calculated the percentage of a country covered by of forest and woodlands in 1961<sup>34</sup>. We included these four variables one at the time in our baseline model, to separate the effect of our State-Community variable from economic and social advancement and geographical circumstances, see table 2.4.

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<sup>33</sup> See Appendix 3.B for exact definitions and sources.

<sup>34</sup> Data are taken from the FAO, 1961 is the earliest date we could find consistent data for.

**Table 2.4: Alternative hypotheses**

|                           | Governance         |                    |                    |                    |
|---------------------------|--------------------|--------------------|--------------------|--------------------|
|                           | (1)                | (2)                | (3)                | (4)                |
| State-Community           | 1.68***<br>(0.35)  | 1.52***<br>(0.33)  | 1.49***<br>(0.32)  | 1.65***<br>(0.50)  |
| Slavery                   | -1.02**<br>(0.45)  | -1.13**<br>(0.43)  | -1.15**<br>(0.44)  | -1.06**<br>(0.51)  |
| Community Heterogeneity   | -0.96***<br>(0.21) | -0.90***<br>(0.20) | -0.93***<br>(0.21) | -0.92***<br>(0.22) |
| Community Organization    | 0.83<br>(0.55)     | 0.84<br>(0.58)     | 0.73<br>(0.56)     | 0.86*<br>(0.51)    |
| Written Records           | -0.57<br>(0.45)    |                    |                    |                    |
| Dependence on Agriculture |                    | 0.03<br>(0.07)     |                    |                    |
| Permanent Settlement      |                    |                    | 0.61<br>(0.36)     |                    |
| Forest-Woodland           |                    |                    |                    | 0.50<br>0.84       |
| Adj. R <sup>2</sup>       | 0.33               | 0.32               | 0.34               | 0.27               |
| N                         | 40                 | 40                 | 40                 | 39                 |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%  
Sources: see appendix 3.B

In the first three models we include variables capturing pre-colonial economic and social development. Only the variable for the settlement pattern, i.e. to what extent parts of the population lived in permanent settlements has a positive and rather high correlation with institutional quality which is only just insignificant ( $p=0.103$ ). Whether an indigenous system of writing existed is negatively (and insignificantly) associated with governance quality. The dependence on agriculture variable shows hardly any relation with governance quality at all. The final model includes the percentage of land covered by forest and woodlands. Again there is no significant relation with governance quality. All four models have an adjusted R-squared that is lower or the same as our baseline model (see table 2.3, model (4)). In other words, these variables do not add much to the explanation of contemporary governance

quality in our model. Moreover, these results do not suggest that with our State-Community variable we captured a development or geographical effect.

The notion that both local state *and* community hierarchy are important in explaining contemporary governance quality differs from the idea put forward by Gennaioli and Rainer (2007, 2006). Their studies focus on the relationship between pre-colonial centralisation and the supply of certain public goods and rule of law after independence. They argue that strong local state development is a necessary prerequisite of economic development because these state structures were needed to limit the rent-seeking behaviour of local elites and stress the low quality of Africa's local leadership in the pre-colonial era (Gennaioli and Rainer 2007).

We disagree with the rather negative view Gennaioli and Rainer (2007, 2006) present on the quality of Africa's pre-colonial communal institutions. Their claim seems to be based on a rather limited and sometimes even biased<sup>35</sup> reading of the

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<sup>35</sup> Gennaioli and Rainer (2007) argue that decentralisation as a means to improve local leaders accountability, i.e. by improving voters' information, increased ability to replace misbehaving politicians, and fostering peoples mobility' (see footnote 4, p. 191) is not relevant for Africa. Especially migration (leaving corrupt local leaders) was not a feasible option in pre-colonial times. In contrast, for example Ayittey (2006: 109), Schapera (1967, 1970) and Falola (1984) stress that actually the most powerful weapon to restrain rulers was indeed the threat of people leaving. Although leaving was often difficult and entailed high costs, it was used as a measure of last resort (Schapera 1967:154). Furthermore, in many cases replacing (or killing) the chief was also an option in case rulers abused their power (Ayittey 2006: 170, Schapera 1970, Vaughan 1986: 178). In essence, these authors argue that final power lay with the people. Many groups were characterised by a rather complex and balanced system of checks and balances to avoid abuse of power by chiefs. Furthermore in making their case for the abusive and corrupt local leaders Gennaioli and Rainer (2007) selectively quote Tosh (1978) on p. 190. Where they quote the sentence on abusive behaviour of local chiefs, they miss the preceding sentences in which Tosh (1978) states that "The way political offices were filled rapidly departed still further from pre-colonial practice" (Tosh 1978: 1982). Moreover, in his book, Tosh (1978) makes the claim that the colonial powers had difficulty in dealing with the stateless Lango. Therefore, they assigned chiefs (first from the Baganda, later from the Lango themselves) to certain territories, and invested them with powers "unprecedented public authority and personal privilege, and it gave them sway over communities to which they had no prior claim" (Tosh 1978: 245). In other words, only after the *colonial powers interfered* in the traditional power structure did the leaders of the Lango (in certain cases) become abusive and corrupt.

literature. No mention is made of the nature of Africa's indigenous community structures at all (for example the huge anthropological literature on the age-grade system and its beneficial impact on the outcome of political processes (see a.o. Boamah-Wiafe 1993; Curtin et al. 1988, Ayittey 2006). Besides, also the positive colonial view on the vitality of Africa's communal organisations (see for example Pim 1946 and several of the British Colonial Bluebooks) is not taken into account. Moreover, Gennaioli and Rainer (2007, 2006) do not attempt to quantify the quality of Africa's indigenous, local institutions and its impact on present-day institutional quality. The alleged poor quality of the local institutions is postulated and strangely enough they do not use the community data which are part of the Murdock dataset.

On the basis of a thorough survey of the literature as well as on our regression analysis, we come to the conclusion that high state development underpinned by well-developed communities structures which are successful in providing checks and balances on the power of the ruling elites, enhance the development of favourable institutions and high governance quality.

## **2.5. Conclusion**

This chapter aims to show how differences in present-day governance quality between African countries can be explained. On the basis of an extensive reading of the literature we argue that the nature of the indigenous pre-colonial institutions can be seen as an important determinant of present day levels of governance quality. A regression model was built on the basis of an anthropological dataset. Estimations show that differences in governance quality between African countries in the late twentieth century can to a considerable extent be explained from pre-colonial institutional variables. The incidence of slavery and a great variety in community structures in the pre-colonial era seem to have a negative impact on present-day governance quality, whereas a strong development of state as well as communal structures and the nature of community organizations have a positive impact. These

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findings are in line with qualitative studies by various Africa scholars on the pre-colonial period, as well as the literature on the post independence era. These strands of literature both emphasize that the quality of local communal institutions, with its favourable impact on the emergence of civil society structures, enhances the formulation of proper policies at central state level.

This chapter points at the pre colonial origins rather than the *colonial* origins of development, as put forward by Acemoglu et al (2001). In this respect we follow Gennaioli and Rainer (2007) who also stress the importance of pre colonial institutional arrangements. However, contrary to them we put more emphasis on the importance of local community structures and the positive effect they can have on the process of long-term institutional development.





## Chapter 3

### Indigenous Slavery in Africa's History: Conditions and Consequences<sup>36</sup>

#### 3.1. Introduction

This chapter contributes to an expanding literature that has recently sought to identify the impact of (pre-) colonial-era conditions on long-term development in ex-colonies (Grier, 1999; Englebert, 2000b; Acemoglu et al, 2001; Bertocchi and Canova 2002; Lange 2004; Fielding and Torres 2008). Specifically for Africa, Englebert (2002) attempted to link pre-colonial institutions to the quality of post-colonial states and to long-run economic development in tropical Africa. Gennaioli and Rainer (2007) investigated how the structure of pre-colonial African societies affected long-term public good provision. Bolt and Bezemer (2009) studied how colonial-era human capital formation affects long-term growth in Sub-Saharan Africa. A prominent argument in the African context is, of course, that its long-term development is seriously hampered by the slave trades, which took place alongside colonisation. Many papers have studied 'export slavery' - introduced by Arab settlers and European colonizers, and greatly extended by the latter - and its impact on long-term development (Manning, 1983, 1990; Bairoch, 1993; Nunn, 2007). Some authors have assessed the impact of New World slavery in econometric analysis (Engerman and Sokoloff, 2002, Sokoloff and Engerman 2000; Mitchener et al., 2003). But until Nunn's recent path breaking study, Africa's slavery had yet to be

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<sup>36</sup> Chapter based on the paper "Indigenous Slavery in Africa's History: Conditions and Consequences", written with D.J. Bezemer and B.W. Lensink. Their contribution is gratefully acknowledged.

examined in a systematic quantitative fashion. Nunn (2008) estimated the numbers of slaves exported from Africa's main ports during 1400-1800 and combines this with other data to gauge the long-term effect of export slavery on economic development. He finds this relation to be robustly negative, also when controlling for geographical conditions, natural endowments and nationality of colonizers. He also offers some evidence that export slavery may have induced ethnic fractionalization, which in turn impeded economic growth in later times, to this day.

The present chapter extends the investigation to sub-Saharan African (hereafter African) *indigenous* slavery, by which we denote customs of slavery that were innate in African societies before, during and after colonization. Indigenous slavery is contrasted to export slavery (which was introduced and developed in Africa by Arab and European invaders and colonizers) although indigenous and export slavery also existed in symbiosis (Nunn, 2008; Vansina, 1989; Hilton, 1985). We collected data from anthropological records to investigate under what conditions indigenous slavery arose and existed, what its relation to export slavery was, what its impact on long-run income development is, and what the plausible channels of influence were. In doing so, we build on a long-standing qualitative and descriptive literature on indigenous slavery, which is currently further being developed by, for instance, Ayittey (2006) and Perbi (2004)<sup>37</sup>.

In the next section we define and explore African indigenous slavery based on a review of the literature. In section 3 we formulate and test hypotheses on the historical and geographical conditions of indigenous slavery, and of its consequences on long-term income development. Previewing the results, we find that indigenous slavery was more common in countries closer to the Equator, and more prevalent in

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<sup>37</sup> The academic study of indigenous slavery in Africa is a niche research area that rapidly developed in the 1960s and 1970s, predominantly in universities in the UK, US and in France - francophone West Africa was the hub of Africa's slave trade, both continental and for export - as well as at some African institutes (such as the Institute for African Studies of the University of Ghana at Legon). Scholars could draw on colonial archives, eyewitness accounts (often of colonial officials), oral traditions, and interviews: there were then still living witnesses of indigenous slavery, which continued well into the 20<sup>th</sup> century. But the subject remains relatively under-researched; Ewald noted in 1992 of indigenous slavery (in Islamic Africa) that it '...has not engaged European and American scholars as intensely as slavery in the Atlantic world'. This remains true today of Africa's indigenous slavery systems generally.

societies with more developed states and in those where Islam was more widespread. We find a clearly negative impact of indigenous slavery on present-day income levels, also if we control for geographical conditions, nationality of colonizers, export slavery and for the possible endogeneity of indigenous slavery to income development. In section 4 we speculate on the possible channels through which indigenous slavery could have influenced long-term income development. We suggest that it may have created social structures that impeded the development of states conducive to economic growth – specifically, states that are accountable to their populations, and which are able to develop and maintain capable bureaucracies. This suggestion is supported by an empirical exploration, but also merits further research beyond the size and scope of this chapter. Section 5 concludes with a stock taking of the results, a critical discussion of our findings in the context of the literature, and some suggestions for future research.

### **3.2. Defining and Exploring Indigenous Slavery**

Slavery in Africa's history can be categorized into indigenous slavery and export slavery. The distinguishing feature adopted in this chapter here is whether or not slaves were traded beyond the continent<sup>38</sup>. Thus, African indigenous slavery includes both slavery and the slave trade in Africa, which often occurred across long distances within Africa. The distinction is important because (as we elaborate below) the conditions of indigenous slavery, its economic role, and slaves' status within African society were all very different from the conditions characteristic of varieties of export slavery – especially so in the case of the last form of export slavery that Africa experienced, the trans-Atlantic slave trade.

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<sup>38</sup> A note on definitions is in order. Nunn (2008:139,159) uses the term 'Africa's slave trades' or 'external slave trades' to denote exclusively export slavery, using shipping records to gauge the extent of 'slave trade'. Nunn juxtaposes the 'slave trades' (both Islamic and Atlantic) to 'domestic slavery' (2008:159). It should be noted, however, that slave trade was rife also within the African continent (i.e. 'domestically'), and many traded slaves were never shipped and never left the continent. Nunn's (2008) study is thus about 'export slavery' as defined here. Perbi (2001) writes of 'internal' and 'external' slavery, where 'external' slavery involves slave trade within and beyond Africa. Our 'indigenous slavery' is the trans-African part of Perbi's (2001) 'external' slavery. Finally, we distinguish our usage from some authors who have denoted by 'indigenous slavery' African involvement in the export slave trades.

Indigenous slavery has been studied by scholars in two broad frameworks: functionalism and (economic) rationalism. In the first school, Miers and Kopytoff (1977) argued that most forms of indigenous slavery in Africa cannot be understood simply as a commodification of people, or even as 'slavery as the legal institutionalisation of persons as property' as Tuden and Plotnicov (1970:12) defined it. This would be a more appropriate interpretation of ancient Roman or modern New World slavery. Instead, Miers and Kopytoff (1977) view indigenous slavery in Africa as part of a continuum of social relationships within a kinship system, of which slavery was the most marginal. Terms like (private) 'property' and (individual) 'freedom', they stressed, are unhelpful to understanding traditional African society. We elaborate on this below. With this framework comes a relative benign view on slaves' social status and living conditions.

In contrast Hopkins (1973), building on Nieboer (1900), suggested that indigenous slavery was a response to scarcity of labour especially in West Africa, where under conditions of simple agricultural technologies, 'the costs of acquiring and maintaining slaves were less than the cost of hiring labour' (Hopkins, 1973:25). This economic rationalism approach assumes the treatment of slaves as a commodity, since the slave was chattel. It also takes a dimmer view of slaves' circumstances. Klein (1978:601) suggests (based on fieldwork in Senegal) that this approach might be most appropriate in high-density slavery systems. Indigenous slavery was an ingrained feature of most African societies in recorded history<sup>39</sup>. Many have speculated that indigenous slavery may have been an important precursor for (and facilitator of) export slavery, and that the existence of indigenous slave trade 'opened up ... societies to the temptation of the Atlantic trade' (Klein, 1978:605)<sup>40</sup>. Perbi (2004), describing indigenous slavery in Ghana, takes the view that

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<sup>39</sup> There is early pre-colonial evidence of slavery among the Berbers of Morocco and Algeria, the Tuaregs of the Sahara, the Ethiopians, Egyptians and Somalis of northeast Africa, the Buhganda states and Nyamwezi and Chagga peoples of inland East Africa, the Mrima and Omani Arabs of coastal East Africa, the Wolof of Senegal and the Gambia, the Mende and Temne of Sierra Leone, the Via of Liberia, the Duala of Cameroon, the Bakongo and Luande of Congo, the Lozi of Zambia and, as Perbi (2001:2) notes, 'virtually all the states and societies in Guinea, Ghana, Ivory Coast, Dahomey, Mali, and Nigeria'

<sup>40</sup> This is not to suggest that export slavery started with the Atlantic slave trades. African slaves were acquired by the ancients Egyptians, the Greeks and the Romans and by mediaeval Europe, Arabia, the Ottoman Empire, and Asia. From the 1435 capture by the Ottomans of Constantinople which halted the flow of white slaves from the Black Sea regions and

it predated the Atlantic slave trade, coexisted with it from the sixteenth to the nineteenth centuries and survived it through the early twentieth century. She locates its origins in the neolithic and iron ages, and its institutionalisation with the formation and expansion of pre-colonial states (Miescher, 2007:157). Others argue that in fact indigenous slavery may not have predated New World export slavery. On the contrary, as the Guyanese historian Rodney (1966) suggested, the Atlantic slave trade may have stimulated slavery within Africa. Nunn (2008:159) notes that “[w]hether the parts of Africa that were untouched by the Islamic trades had chattel slavery has been the subject of an old debate (e.g., Fage, 1962; Rodney, 1966). Since this debate, evidence has been presented suggesting that domestic slavery may not have existed prior to the trans-Atlantic slave trade.” Nunn (2008) proceeds to examine linguistic evidence that there were no words for slaves prior to the New World export trades (also Vansina, 1989; Hilton, 1985).

However that may be, the indigenous slave trade from its earliest observations was part of pan-African trade in goods including salt, copper and dates from the Sahara and millet, sorghum, wheat, livestock, gum, shea butter, ivory and gold from West Africa. There were two major slave routes, one between North and West Africa, and one linking East, Central and Southern Africa. Important West African slave markets are recorded from as early as the year 1000. Ghana obtained slaves - mainly in returns for its abundant gold resources – from the 1<sup>st</sup> to the 16<sup>th</sup> century. Bono Manso and Begho in Ghana were important slave markets from AD 1000 to around 1750 (Perbi, 2001:4); others were Ouagadougou in Burkina Faso and Bonduku and Buna in Ivory Coast.

The geographic dimension of indigenous slavery is illustrated in Table 3.1. This is based on data taken from an ‘Ethnographic Atlas’ compiled by Murdock (1967), in turn based on data previously published in the journal *Ethnology*. For sub-Saharan Africa, Murdock included 292 societies, with a wealth of ethnographic data. One of these is whether a society historically had the institution of (indigenous) slavery. The actual time periods to which this data refer is dependent on the earliest period for which Murdock could find reliable data, which is from 1850 onward but not later

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Balkans, mediaeval Europe turned completely to Africa for its slave labour (Perbi, 2001:3; McKay et al, 1992). In modern times, export slavery was towards the Oriental, Islamic and, especially, Atlantic worlds during the 15<sup>th</sup> to 19<sup>th</sup> centuries (Perbi, 2001:4).

than 1950, and varying over societies. Following Bolt and Smits (2008), we combine this data with population data from the *Atlas Narodow Mira* (1964) to assign indigenous societies to present-day countries. We so calculate the share of the population within modern-day national borders that historically had the institution of indigenous slavery<sup>41</sup>. Thus, it is not a measure for actual slaves scaled by population (a quantity which is unknown), but for population fractions historically practicing the institution of indigenous slavery. An important distinction with measures of export slavery (such as Nunn's) is that our measure is about the country that *practised* indigenous slavery, while Nunn's measure relates to countries that *lost* their people to countries that practised export slavery.

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<sup>41</sup> For instance, let us assume that only the Mende and Temne peoples - who lived in lands now part of Sierra Leone - historically had the institution of indigenous slavery, and no other ethnicities in present-day Sierra Leone did. If the Mende make up 17 % of the population of present-day Sierra Leone and the Temne 8 %, then our measure for indigenous slavery in Sierra Leone is 25 %.

**Table 3.1: Population Fraction In Today's Borders That Historically Had Indigenous Slavery**

| Country       | % of population | Country              | % of population |
|---------------|-----------------|----------------------|-----------------|
| Lesotho       | 0               | Djibouti             | 0.76            |
| Madagascar    | 0               | Zimbabwe             | 0.77            |
| Swaziland     | 0               | Malawi               | 0.81            |
| South Africa  | 0.02            | Burkina Faso         | 0.84            |
| Eq. Guinea    | 0.08            | Central African Rep. | 0.86            |
| Kenya         | 0.1             | Gambia, The          | 0.88            |
| Botswana      | 0.13            | Congo, Dem. Rep.     | 0.89            |
| Gabon         | 0.15            | Ethiopia             | 0.9             |
| Mozambique    | 0.22            | Uganda               | 0.9             |
| Sudan         | 0.27            | Guinea               | 0.92            |
| Guinea-Bissau | 0.34            | Togo                 | 0.92            |
| Chad          | 0.36            | Senegal              | 0.93            |
| Cape Verde    | 0.38            | Nigeria              | 0.94            |
| Cameroon      | 0.4             | Sierra Leone         | 0.94            |
| Liberia       | 0.45            | Zambia               | 0.94            |
| Angola        | 0.53            | Rwanda               | 0.98            |
| Congo, Rep.   | 0.66            | Somalia              | 0.98            |
| Tanzania      | 0.67            | Burundi              | 0.99            |
| Benin         | 0.7             | Ghana                | 0.99            |
| Cote d'Ivoire | 0.7             | Mali                 | 0.99            |
| Namibia       | 0.72            | Mauritania           | 0.99            |
|               |                 | Niger                | 0.99            |

Source: Authors' compilation based on Atlas Narodov Mira (1964) and Murdock (1967)

Table 3.1 provides information on the fraction of the population in present day African countries that historically had indigenous slavery. It shows that indigenous slavery was prevalent among the peoples of most of today's African countries. On average, it was an indigenous institution in 63 % of the population; and in 20 of the 43 countries in our sample, it occurred among over 80 % of the population. It is also



noteworthy that nearly all these very high values (and none of the 18 lowest-ranking countries) are West or West-Central African countries north of the Equator. This is where both the institution of indigenous slavery and the slave markets for the Atlantic slave trade were concentrated.

Indigenous slaves in Africa were obtained by means of raiding and kidnapping, warfare, as punishment for criminals, as tribute paid by conquered nations, or by pawning (where debtors unable to repay their dues went into slavery, or sent dependents into slavery – Ayittey, 2006). For instance, almost all the states conquered by the famous Asante empire (in what is now Ghana) from 1700 to the end of the 19<sup>th</sup> century paid annual tributes in slaves and goods to the Asante capital of Kumasi— the state of Gonja 1000, Slaga 600, and Akwapim 1000 slaves (Perbi, 2001:5). Slavery lay at the core of Ghana’s pre-colonial states, whose economy was almost totally dependent on slave labour (Perbi, 2004:110). Slaves in pre-colonial Africa were used for a variety of purposes - to work in agriculture, trade and industry; in the administration and military; for domestic chores and in harems; for social prestige; for procreation; and occasionally for ritual sacrifice. This stands in stark contrast to the vast numbers of slaves shipped out of Africa in the trans-Atlantic trades, which were used almost exclusively for hard plantation labour.

Indeed, African modes of indigenous slavery were very different from slavery as known in North America, the West Indies, or Europe (including ancient Greece and Rome). Perbi (2001:12) records how 19<sup>th</sup> century European observers expressed surprise at the humane treatment of indigenous African slaves. The typical situation was that slaves were integrated, in various ways, into the extended family of their owners by adoption or marriage<sup>42</sup>. They usually had the right to be fed and clothed, to marry in legal ceremonies, to earn an independent income, to work a plot of land for own consumption, to hold and inherit property, and to have legal

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<sup>42</sup> For instance, slaves in Tuareg society were often regarded as fictive children and used kinship term to address members of the owner’s family (Miers and Kopytoff, 1977: 391-403). Perbi (2001:8-9) details the different practices to assimilate slaves into owner families among the Makara and Bambara in Niger, the Wolof and Serer in Senegal and the Gambia, the Bajongo, Baluba and Lunda in Central Africa and the Sena of Mozambique. Only a few peoples are known to have not integrated slaves habitually in existing kinship structures (Perbi mentions the Batawana of Botswana; the Ila in Zambia; the Yao in East Africa; the Duala of Cameroon; and the Shebro of Sierra Leone).

protection. Slave owners had no absolute power over their slaves and were not allowed to kill them at their discretion - only the king or chief could impose a death penalty on both free and enslaved persons. In cases of maltreatment, owners could be punished in accordance with local legal custom (e.g. fined, as in the Asante state). There are only five records of revolts of indigenous slaves in Africa (Perbi, 2004). Among most of the African states and societies there were also avenues for upward social and political mobility for slaves (Miers and Koptykoff, 1977:134-170). For instance, in the Hausa-Fulani Emirates, slaves could be appointed village heads. Slaves among the Mende of Sierra Leone could obtain the political positions of chiefs. Asante slaves were granted occupation of stools, the traditional symbols of authority (Perbi, 2001:11). And indigenous slaves, unlike export slaves, did not reproduce as slaves but often married free persons and had children who were free people: '... children born into slavery could expect to grow up as members of their master's lineage' (Lovejoy, 1983:127).

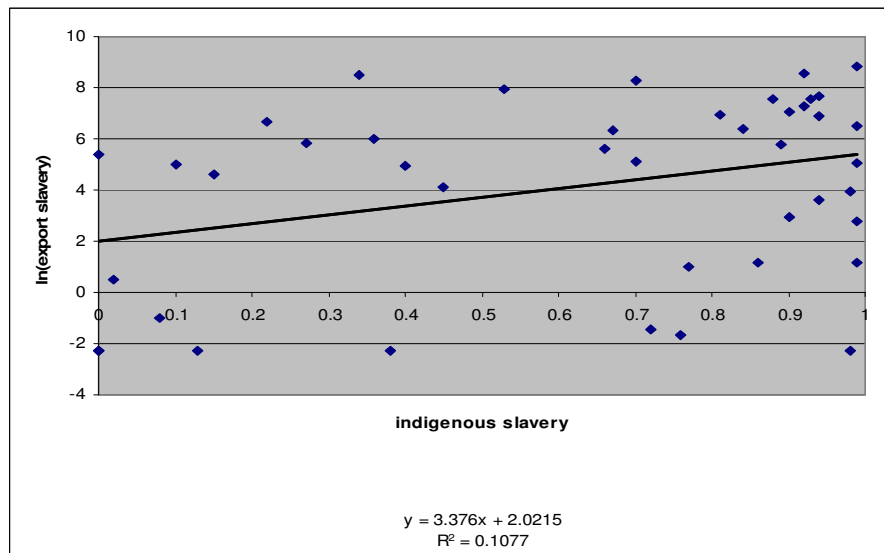
All this is not to say that slaves and free persons were equals in Africa's indigenous societies. People entered into slavery by an act of violence which stripped them of their social identity in their own kinship system, to be only marginally integrated into an alien kinship system. Precisely the danger that a slave might escape in the area where (s)he had social linkages was an important reason why slaves were transported and traded across societies (Klein, 1978:601; Manning, 1983:2). Slaves, while often not chattel, were exploited one way or another, more intensively so in the 'high-density' slave systems. The archives of Senegal contain the account of the Governor-General in Bamako (now capital of Mali) who during a 1904 survey of slavery in Africa was the only administrator who actually went out and talked to slaves. He encountered consistent complaints about malnourishment among the Soninke slaves (recounted in Klein, 1978:607). There was 'economic rationalization' resulting in harsh slave systems among the Soninke, Juula, Hausa and Swahili slaves comparable, Klein suggests, to New World slavery conditions. These slaves mostly did not live with their owner families but in separate compounds, in conditions where their membership in the owner's kinship system was a mere formality.

Furthermore, slaves had no familial rights, did not control their children and could not make bequest decisions (Klein, 1978:602). They could be used as sacrifice or to pay off debts; were expected to work harder and dress simply; could not freely mix with free men and women; needed the owner's permission to embark on any enterprise; and received only the simplest burials (Perbi, 2001: 1). Klein (1978: 602)

recounts that after slavery was abolished in French Africa, ‘hundreds of thousands of slaves left their masters and went home.’ Those who stayed often did so because they had no other place to go or because the costs of building up a new life were too large; or they formed separate communities locally. These ex-slaves often remained in relations of dependence and exploitation, as in the western Sudan were released slaves farming for themselves generally paid their master the amount of grain necessary to feed a person for one year. It is also noteworthy that most observations on indigenous slavery were made in the period of colonial rule, which, as Klein (1978:601) stresses, ‘deprived ruling [indigenous] elites of their capacity to coerce’. Thus historically, observed indigenous slavery may have been the milder form.

There was an intimate connection between slavery for export and for indigenous use. Ewald (1992:466) notes that ‘the same networks taking millions of slaves out of Africa also transported others within the continent’. We use our indigenous slavery variable introduced in Table 3.1 to explore the relation between indigenous and export slavery, which is measured by the total number of slaves taken from each country during various slave trades between 1400 and 1900, scaled by populations. This is a variable constructed by Nunn (2008), to which we refer for further detail on the underlying data. In Figure 3.1 we plot country-level observations of the prevalence of indigenous slavery against the logarithm of slave exports per population. The correlation between these two measures in our sample is substantial (as the positively sloped trend line demonstrates) but far from complete: the bivariate correlation coefficient is 30 % ( $n = 43$ ). While we must bear in mind that the two measures are not identical definitions of slavery prevalence and therefore will never perfectly correlate, we observe that a low prevalence of indigenous slavery occurred in both high-level and low-level export slavery environments. But a high prevalence of indigenous slavery seems more clearly associated with intense export slavery environments, as the concentration in the upper-right corner of Figure 3.2 shows. This is in line with scholarly work suggesting that high levels of slave exports was an important driving force for the development of indigenous slavery (Nunn, 2008; Vansina, 1989; Hilton, 1985; Lovejoy, 1983; Manning, 1990).

**Figure 3.1: Scatter Plot Of The Prevalence Of Indigenous Slavery and Slave Exports**



Sources: Atlas Narodov Mira (1964), Murdock (1967), Nunn (2008)

Indigenous slavery lasted longer than export slavery. In 1807 Britain passed a law abolishing the Atlantic slave trade, but the African colonies had laws against indigenous slavery passed by their colonizers much later and at different dates: in 1874 in the Gold Coast Colony (the southernmost part of Ghana), but not until 1908 in the Asante and Northern Territories of Ghana (Perbi, 2001:12). And only after 1914 was further enslavement prohibited in all colonies (Manning, 1990:12). And even then, indigenous slavery often continued in practice. The abolition brought about a labour shortage that induced an increase in pawning, to which former slaves and their descendants - often in the most vulnerable strata of society - were the natural victims (Perbi, 2004). 'Laws against slave trading were more strictly enforced than legislation on slavery, which was often a dead letter'... 'Servile labour remained important in many areas well into the interwar period; and in a few economic backwaters it persisted even longer, generally with the knowing complicity of colonial regimes' (Klein, 1978:599,608).

Against this background we use our new measure to conduct an econometric analysis of the conditions under which indigenous slavery arose and existed. The review of the literature above suggests that indigenous slavery was geographically concentrated (it was more likely to be encountered in Central-West Africa, home to the most important slave markets). We therefore include in our empirical analysis below the degrees of longitude and the distance to the Equator (latitude) into the regression equation. As colonizers adopted different attitudes towards indigenous slavery, the nationality of the colonizer is plausibly relevant: we also include five binary variables for colonizer nationality (capturing the British, French, Portuguese, Belgian, and Spanish colonising powers<sup>43,44</sup>). Cooper (1981) and others describe how religion generally and Islam specifically was a distinctive force in the development of indigenous slavery. Thus the prevalence of indigenous slavery may well have been higher in those areas where Islam was the dominant religion. We include the Islamic population share to capture this. The presence of export slavery may have stimulated the extent of indigenous slavery, as Rodney (1966), Ewald (1992) and Nunn (2008) suggest, and we include a control variable for the number of exported slaves per land area<sup>45</sup>. More hierarchical societies with stronger states may have induced indigenous slavery in their lands in various ways (*e.g.* by asking tribute in slaves as the Asante did) and we include a variable on state development, defined as the share of the non-European population that belongs to indigenous 'centralised' ethnic group<sup>46</sup>. These considerations lead to a model specification of the form<sup>47</sup>

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<sup>43</sup> For definitions see appendix 3.E.

<sup>44</sup> The reference group is comprised of countries that were never colonies (Ethiopia and Liberia) and Namibia (a former German colony).

<sup>45</sup> Using the numbers of exported slaves per population gives qualitatively similar results in all regressions below.

<sup>46</sup> We here follow the definition by Gennaioli and Rainer (2007), who provide more detail on data and sources for this variable.

<sup>47</sup> There are other variables that we considered but did not include in the analysis. Given the variation of forms of indigenous slavery over societal modes (Cooper, 1979; 1981), we experimented with variables on social heterogeneity, on community organization, on the presence of written records, on population density and on state-community relations (Gennaioli and Rainer, 2007; Bolt and Smits, 2008). Exploratory regressions indicated no robust correlations with indigenous slavery for all variables **except the presence of written records**. Nor did their inclusion improve the explained variation in indigenous slavery. This is actually an understandable finding taking into account that indigenous slavery was pervasive across very different societies. It is clear from the literature that the type of indigenous slavery

$$\text{Slavery}_i = C + \beta_{ij}X_{ij} + e_{ij} \quad \text{with } i = 1,2,\dots,43 \quad \text{and } j = 1,2,\dots,11$$

Where  $\text{Slavery}_i$  is the prevalence of indigenous slavery in country  $i$ ,  $C$  is a constant,  $\beta_{ij}$  is the coefficient reflecting the impact of condition  $X_j$  in country  $i$  on Slavery and  $e_{ij}$  is a white-noise error term. We refer to the Appendix for full details on data sources and definitions. In table 3.2 we present estimation results<sup>48</sup>. In models (1), (2), (3), and (4) we sequentially regress on slavery the intensity of export slavery, location (longitude and latitude), societal variables (prevalence of Islam and degree of state development) and colonial origin (with 5 colonial origin binary variables). Finally in model (5) we estimate a reduced model using Hendry's general-to-specific model selection method, starting with all variables included in models (1) through to (4) and stepwise excluding variables with coefficient p-values of 5 % and above<sup>49</sup>. We find that both the prevalence of Islam and the degree of state development are positively associated with the prevalence of indigenous slavery, as hypothesized, and that indigenous slavery is more likely to be encountered in countries closer to the Equator. Interestingly, there is no robust correlation with export slavery or with colonial origin.

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did vary over societies; but, according to our analysis, not the generic institution of indigenous slavery itself. This study is not about defining the nature of African indigenous slavery, which would probably be in vain: 'efforts to find an essence of slavery in Africa as a whole leads away from identifying more valid distinctions between slave systems' (Cooper, 1981:274; also Cooper, 1979). Another consideration we pursued is that colonizers tended to discourage indigenous slavery, and plausibly more so in the coastal areas where they had most influence. We experimented with including a variable capturing the share of the population living within a hundred kilometers from the coast but left it out for similar reasons: it reduced the number of observations and did not improve the explained variation in indigenous slavery.

<sup>48</sup> In order to account for the censored nature of our variable for indigenous slavery (which takes on values between 0 and 100) we also estimated a 'Tobit' specification instead of OLS. This yields qualitatively identical results.

<sup>49</sup> Since 'Hendry'-type general-to-specific model selection is based on standard errors, it is valid only in the absence of serious multicollinearity, which inflates standard errors. We checked this by studying Variance Inflation Factor values for all independents. We found values above 4 - i.e. explaining more than 75 % of the variation in the other independents - for the colony1 and colony2 variables. These were excluded from the most general model with which the model selection procedure started.

**Table 3.2: Correlates of Indigenous Slavery: OLS Regressions**

|                   | Dependent variable: Indigenous Slavery |                     |                     |                      |                      |
|-------------------|--|---------------------|---------------------|----------------------|----------------------|
|                   | (1)                                    | (2)                 | (3)                 | (4)                  | (5)                  |
| Export slavery    | 0.032**<br>(0.015)                     |                     |                     |                      |                      |
| Longitude         |  | -0.004<br>(0.003)   |                     |                      |                      |
| Latitude          |  | -0.013*<br>(0.007)  |                     |                      | -0.022***<br>(0.007) |
| Islam             |  |                     | 0.005***<br>(0.001) |                      | 0.005***<br>(0.001)  |
| Early state dev.  |  |                     | 0.176<br>(0.169)    |                      | 0.489**<br>(0.182)   |
| British colony    |  |                     |                     | -0.106<br>(0.157)    |                      |
| French colony     |  |                     |                     | 0.008<br>(0.141)     |                      |
| Portuguese colony |  |                     |                     | -0.323**<br>(0.130)  |                      |
| Belgian colony    |  |                     |                     | 0.263**<br>(0.118)   |                      |
| Spanish colony    |  |                     |                     | -0.610***<br>(0.115) |                      |
| (constant)        | 0.496***<br>(0.089)                    | 0.834***<br>(0.103) | 0.419***<br>(0.109) | 0.690***<br>(0.115)  | 0.481***<br>(0.110)  |
| R2                | 0.108                                  | 0.138               | 0.197               | 0.197                | 0.353                |
| N                 | 43                                     | 43                  | 41                  | 43                   | 41                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.  
See Appendix 3.E. for data definitions and sources.

In conclusion of this section, we identified indigenous slavery as conceptually separate from the export slave trade in that it is slavery and the slave trade *within* Africa. While indigenous slavery in Africa did not involve the vast numbers of people traded in the Atlantic slave trades, it was more pervasive across Africa's

traditional states and societies than export slavery. It is also more recent and plausibly more deeply engrained in the fabric of society. It was mostly - but by no means always - more benign towards slaves. But it dislocated and disenfranchised large numbers of Africans, was often initiated through violence, and intertwined commerce with warfare. While often less cruel than the Atlantic slave trades, it was arguably a strong and pervasive impediment to the development of political stability and human capital in traditional African states and societies before and during the colonial era, and well after export slavery had been ended. Its pervasiveness and longevity suggest that its impact on Africa's development may have been strong, possibly enduring to the present day. We now turn to investigate this issue.

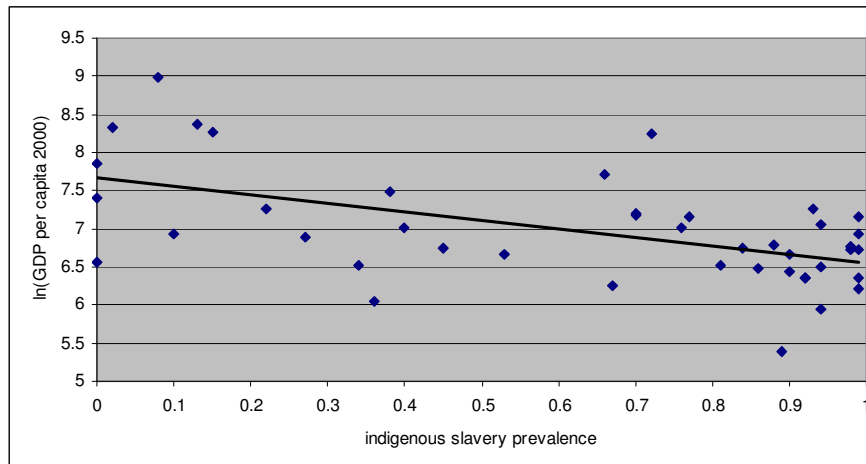
### **3.3. Indigenous Slavery and Long-Term Income Development**

Nunn (2008) showed statistically that export slavery had a negative impact on Africa's long-term development, as measured by the GDP per capita (income) levels in the year 2000. In this section we investigate whether this long-run effect is also observable for indigenous slavery.

To begin with, we plot the percentage of the population within today's borders of an African country that historically had the institution of indigenous slavery, against the logarithm of its per capita income in 2000, for 41 countries (Figure 3.2). The negative relation (with bivariate correlation coefficient of  $-55\%$ ) is already clear from visual inspection. This is confirmed by computation of an OLS trend line with a highly significant (t-value of  $-4.15$ ) and negative coefficient of  $-1.12$  (t-value  $-4.15$ ), and an R-squared of  $0.30$ . Thus, nearly a third of the variation in Sub-Saharan Africa's current income levels is statistically associated with the variation in the measure for past indigenous slavery.



**Figure 3.2: Indigenous Slavery Correlates Negatively to 2000 Income levels in 41 African Countries**



Sources: Atlas Narodov Mira (1964), Murdock (1967), Maddison (2003)

A baseline OLS equations to test this relation more rigorously, follows the specifications in Nunn (2008):

$$\ln(\text{income2000})_i = C + \beta_{ij}X_{ij} + e_{ij} \quad \text{with } i = 1,2,\dots,43 \quad \text{and } j = 1,2,\dots,11$$

Where  $\ln(\text{income2000})_i$  is the natural logarithm of average per capita GDP in the year 2000<sup>50</sup> in country  $i$ ,  $C$  is a constant,  $\beta_{ij}$  is the coefficient reflecting the impact of condition  $X_j$  in country  $i$  on year-2000 per capita income levels and  $e_{ij}$  is a white-noise error term. We refer to the appendix for full details on data sources and definitions. The set of  $X_j$  variables always includes the indigenous slavery variable, and in one model also Nunn's (2008) export slavery variable<sup>51</sup>. This specification

<sup>50</sup> We also conducted the same analysis with an average GDP pc between 1990 and 2000 and GDP pc in 2000 from the WDI as a robustness check. Results can be found in appendix 3.B.

<sup>51</sup> Compared to the Nunn (2008) specification, this model does not include a dummy for North Africa, as we have no North African countries in the sample.

allows us to examine if indigenous slavery has a long-term growth effect *apart from* the effect of export slavery already identified by Nunn (2008).

For our model exploration we follow the procedure also applied in table 3.2 above. To the simple univariate model just discussed we add sequentially groups of covariates in models (1) through to (5). These are variables commonly encountered in the literature on the long-term determinants of growth: location, access to sea, climate, legal origin, colonial origin, state development, religion, intensity of export slavery and presence of point resources (oil, gold, and diamonds). Finally in model (6) we start with the most general non-multicollinear model and stepwise exclude variables with coefficient p-values of 5 % and above<sup>52</sup>. This is our preferred model.

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<sup>52</sup> Variance Inflation Factors with values above 4 were found for four colony dummies and for the temperature and latitude variables. These were excluded from the most general model that the Hendry selection procedure started with, so as not to undermine the validity of the standard errors that are the basis for model selection.

**Table 3.3: Indigenous Slavery and 2000 Income levels: OLS Regressions**

|                 | Dependent variable: log GDP pc 2000 |                      |                     |                      |                     |                      |
|-----------------|-------------------------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
|                 | (1)                                 | (2)                  | (3)                 | (4)                  | (5)                 | (6)                  |
| Ind. Slavery    | -1.037***<br>(0.366)                | -1.056***<br>(0.375) | -0.811**<br>(0.318) | -0.969***<br>(0.318) | -0.900**<br>(0.331) | -0.712***<br>(0.247) |
| Latitude        | 0.014<br>(0.015)                    |                      |                     |                      |                     |                      |
| Longitude       | -0.004<br>(0.005)                   |                      |                     |                      |                     | -0.011**<br>(0.004)  |
| Coastline       | 0.030<br>(0.032)                    |                      |                     |                      |                     |                      |
| Rainfall        |                                     | 0.000<br>(0.007)     |                     |                      |                     |                      |
| Humidity        |                                     | 0.006<br>(0.013)     |                     |                      |                     |                      |
| Temperature     |                                     | -0.011<br>(0.015)    |                     |                      |                     |                      |
| Islam           |                                     |                      | 0.000<br>(0.003)    |                      |                     |                      |
| Early state dev |                                     |                      | -0.064<br>(0.302)   |                      |                     |                      |
| Export slavery  |                                     |                      | -0.071**<br>(0.029) |                      |                     | -0.109***<br>(0.026) |
| Gold            |                                     |                      |                     | -0.002<br>(0.016)    |                     |                      |
| Oil             |                                     |                      |                     | 0.049<br>(0.029)     |                     | 0.068***<br>(0.023)  |
| Diamonds        |                                     |                      |                     | 0.032<br>(0.061)     |                     |                      |
| British colony  |                                     |                      |                     |                      | -0.197<br>(0.520)   |                      |
| French colony   |                                     |                      |                     |                      | -0.254<br>(0.526)   |                      |
| Port. Colony    |                                     |                      |                     |                      | -0.444<br>(0.553)   |                      |
| Belgian colony  |                                     |                      |                     |                      | -0.749<br>(0.639)   |                      |
| Spa. Colony     |                                     |                      |                     |                      | 1.293**<br>(0.543)  |                      |
| (constant)      | 7.543***<br>(0.429)                 | 7.323***<br>(0.833)  | 7.788***<br>(0.359) | 8.079***<br>(0.357)  | 7.761***<br>(0.553) | 8.512***<br>(0.240)  |
| R2              | 0.34                                | 0.30                 | 0.36                | 0.37                 | 0.45                | 0.56                 |
| N               | 43                                  | 43                   | 41                  | 43                   | 43                  | 41                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.  
 We use Maddison's income data, as in Nunn (2008). Using other sources such as WDI (2007), or an average between 1990 and 2000 gives qualitatively identical results, see appendix 3.B. See Appendix 3.E for data definitions and sources.

Indigenous slavery is significantly and negatively correlated with current income in all models. As in Nunn's (2008) study, export slavery enters robustly and significantly. The indigenous slavery effect is appreciably smaller when export slavery is also included. But the preferred model suggest that indigenous slavery does has a long-term growth effect apart from the effect of export slavery already identified by Nunn (2008). Oil and location in degrees of longitude are also robustly part of the preferred model, with expected coefficient signs.

While this is *prima facie* evidence that indigenous slavery depressed economic development in the long run, it is important to note that there may be a selection problem, where countries destined by climate or location to remain relatively poor also selected into the practice of indigenous slavery. One plausible selection mechanism would run via technology. Hopkins (1973:25) attributed indigenous slavery institutions to scarcity of labour especially in West Africa, where under conditions of simple agricultural technologies (which restrain income growth), 'the costs of acquiring and maintaining slaves were less than the cost of hiring labour'. Similarly, Fielding and Torres (2008) explain that particular combinations of endowments and climates - prevalent especially in West and Central Africa - stimulated the development of plantation and mining economies with their attendant 'extractive institutions' (Acemoglu et al, 2001) inhibiting long-term development. This is another possible selection mechanism. In such and similar scenarios, we observe a negative correlation of indigenous slavery with today's income levels, but this is no conclusive evidence of causation. Conducting a simple OLS regression would then lead to biased estimates.

In order to assess how serious this selection problem is, we want to know if countries with endogenous slavery were already poor at the time of observation of indigenous slavery in our data set. Historically, as shown by (among others) Acemoglu et al. (2001), Africa's population density is a good indicator for prosperity. We explored this relation for the 27 countries for which we have data on both historical population density (in the 15<sup>th</sup> century) and indigenous slavery. With a correlation coefficient of +35%, it appears that if anything, there is a *positive* association between the two. This is also reported by Nunn (2008) on export slavery who finds it were the richer, not the poorer countries that selected into the slave trades.

But we cannot be certain, of course, that our OLS estimates do not suffer from endogeneity problems in some other way. In order to address this possible

problem, we apply an instrumental-variable approach to estimating the slavery-income relation. The instrumental-variable approach also controls for the fact that our indigenous slavery variable is a constructed variable, which may render OLS estimates biased. On the other hand, we note that 2SLS regressions have bad small sample properties. We therefore present them as just an additional robustness check of the OLS regression. Estimation results are relegated to Appendix 3.C. The reported model coefficients for instrumented indigenous slavery are positive across a range of model specifications and actually larger than OLS estimates. We conclude that the instrumental-variable approach - to the extent that it adds insight, given the data limitations - is in line with the above empirical findings.

Statistical issues of instrumentation aside, we may also ask what the *substantial* impact of indigenous slavery on long-term development of African income levels was. How much income development did it cost the continent? To put this into context, we express the decline in 2000 GDP per capita levels that the coefficients imply in terms of years of income growth, at the average 1960-2000 growth rate. A back-of-the-envelope calculation (detailed in appendix 3.D) suggests that a one standard deviation increase in the measure for indigenous slavery is equivalent to between 20 (preferred OLS estimate) and 24 (2SLS estimate) years of income growth, at the average 1960-2000 growth rate. Thus the estimated impact of indigenous slavery is truly substantial and not overly sensitive to choosing an OLS or 2 SLS estimation strategy.

It is interesting to note that we find substantially larger growth losses due to a one standard deviation increase in the measure for export slavery, of 58 and 38 years of contemporary growth, respectively. Note however that the magnitude of the coefficients for the two types of slavery cannot simply be compared, as one is a population fraction and the other is (the log of) enslaved and traded persons per land area. Also the number of people enslaved and exported during 1400-1800 per country population, given in Nunn (2008), would not be comparable in value terms to the fraction of the population living in societies that historically had the institution of indigenous slavery. All people included in the first measure were slaves, but not all people included in the last measure were. And the first is snapshot view in the mid-19<sup>th</sup> century, while the second is a cumulative measure over four centuries. With these caveats, our approximation suggests that export slavery was roughly a factor 2 or 3 times more harmful to long-term growth than indigenous slavery - a finding in

line with the literature on the uniquely pernicious effects of the slave trades to African development.

We should also note that all the above figures are merely approximations, as we use point estimates with a margin of uncertainty, and also as we extrapolate the coefficient originally estimated around the sample mean. While the numbers are indicative rather than precise, this exercise demonstrates that the estimated coefficients represent substantial development effects of indigenous slavery indeed.

### 3.4. Indigenous Slavery and Capable States

In view of these findings, the natural question to ask is *how* indigenous slavery influenced long-term development. For export slavery, Nunn (2008: 23-25) has suggested an ethnic fractionalisation channel and an early state development channel. Export slavery may have “impeded the formation of larger communities and broader ethnic identities” and therefore is “an important factor in explaining Africa’s high level of ethnic fractionalisation today” (Nunn, 2008:4), which in turn is negatively related to economic development. On the other hand, Kusimba (2004:67) suggests that “[i]n some cases, smaller ethnically related communities were compelled to aggregate into large groups strong enough to construct large fortified settlements”. The slave trades might have increased ethnic tensions, but it is less clear how it influenced fractionalisation itself. Likewise, indigenous slavery may - as we elaborate below - have perpetuated social exclusion along ethnic lines, but probably did not cause ethnic fractionalization itself. Indeed, we find no significant correlation between measures for ethnic fractionalisation and our measure for indigenous slavery<sup>53</sup>.

Alternatively, the political development argument is that export slavery was a major motivation in inter-African wars, intertwined commerce with warfare and decimated populations unevenly, so hindering the development of political stability and economic confederations in traditional African states and societies. In turn, early and continuing state development matters to economic development (Bockstette et al. 2002; Chanda and Putterman 2005). In comparison to this well-established

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<sup>53</sup> The correlation coefficient between our indigenous slavery measure and the Alesina et al. (2003) ethnic fractionalisation measure is insignificant 0.22 ( $p = 0.16$ ). This fractionalisation measure reflects “the probability that two randomly selected individuals from a population belonged to different groups” (Alesina et al. (2003: 5).

argument on export slavery, it is not obvious that indigenous slavery in the same way impeded early state development. In contrast to export slavery, it was not an external threat to the development of indigenous political systems, but an ingrained feature of many traditional societies and often (as in the Ashanti empire) one of the foundations of state structures through the tribute system and slaves' economic and administrative contributions to statehood (Perbi 2001; 2004, Fenske 2009). Indeed, correlations for measures of early state development and indigenous slavery are low and insignificant<sup>54</sup>.

Instead, we tentatively suggest that indigenous slavery may have impeded the development not so much of statehood itself, as of *capable* and *accountable* states. A large literature argues that such states are vital to processes of sustainable economic development (Kohli 2004; Evans 1995; Granovetter 1985). As noted, Africa's pervasive slavery practices implied discrimination and social exclusion of large population groups, which continued into the post-colonial era and to this day. Even in the most benign view, indigenous slaves were still marginalized members of society with few social linkages to free men and women (Perbi 2001). This was often perpetuated as after the abolition of slavery, ex-slaves often remained in relations of dependence and exploitation. They typically kept their inferior status, even over several generations (Miescher 2007; Manning 1990).

Where slavery was widespread, this might have triggered the development of restrictive political institutions, limiting the ability of people to take part in the political process or to access better educational and employment opportunities (Sokoloff and Engerman 2000). This continuing social exclusion (often along ethnic lines) is a problem especially with regard to the building of an effective state with broad-based legitimacy. As the 'capable states' literature emphasizes, economic development in poor countries requires that nation states are supported by large sections of society and have the administrative and bureaucratic capacity to uphold key market institutions<sup>55</sup> and to effectively implement policies (Sindzingre 2004;

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<sup>54</sup> The correlation coefficient between our measure for indigenous slavery and pre-colonial state development, taken from Gennaioli and Rainer (2007) is low and insignificant:  $r = 0.03$  ( $p = 0.84$ ).

<sup>55</sup> This is not to argue for a large state apparatus or for 'state intervention' in the market, e.g. via import-substitution policies, which have often turned out disastrously in the African context. The point here is more basic and uncontroversial: market economies function only

Kohli 2004)<sup>56</sup>. The indigenous slavery heritage of large-scale social exclusion may undermine both states' broad-based legitimacy and its capability. Below we sketch out this argument, making linkages to the relevant literatures, before turning to some empirical indication of its validity.

The importance of broad-based legitimacy is argued in the 'developmental state' literature. (Sindzingre 2004; Kohli 2004; Evans 1995; Granovetter 1985; Ndulu and van de Walle 1996). Democratic (or otherwise participatory) political processes signal that state are to some degree responsive and committed to their populations. They force rulers to improve the lives of large sections of the population to be able to stay in power, and thereby are an incentive for states to prioritize economic development for society at large, a necessary condition for sustainable economic development. The contrast to this 'developmental state' scenario is the capture of African states by elites identified by Bates (2008). Englebert (2000a) explicitly connects the weak capability of African states to their limited legitimacy.

As to the link of indigenous slavery with state capability, in societies where large population groups continue to be excluded from opportunities for higher education and state employment, bureaucracies cannot tap into much of the population's human capital. Also, social exclusion undermines broad-based state legitimacy, and thereby the state's capacity to formulate and implement effective development policies. A large body of literature places the weak state capacity at the core of Africa's dismal growth performance in the post-colonial era (Englebert 2000a; Ndulu and van de Walle 1996).

In sum, the suggestion developed here is that long-standing and pervasive indigenous slavery, and the social exclusion it implied, may have undermined the development of capable states with broad-based legitimacy and effective bureaucracies. Some empirical support for the validity of this explanation for the African context is presented in three scatter plots below, which plot our measure for the prevalence of indigenous slavery against measures for democratic accountability,

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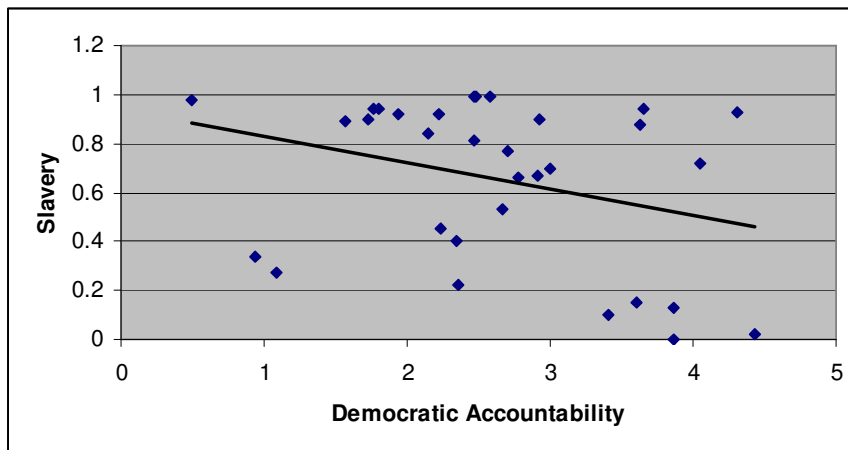
if market institutions are in place, many of which must be created and maintained by the state and its bureaucracy.

<sup>56</sup> This is not to argue for a large state apparatus or for 'state intervention' in the market, e.g. via import-substitution policies, which have often turned out disastrously in the African context. The point here is more basic and uncontroversial: market economies function only if market institutions are in place, many of which must be created and maintained by the state and its bureaucracy.



bureaucratic quality (taken from the ICRG database <sup>57</sup>) and state capacity<sup>58</sup> (taken from Englebert 2000a).

**Figure 3.3: Slavery and Democracy**

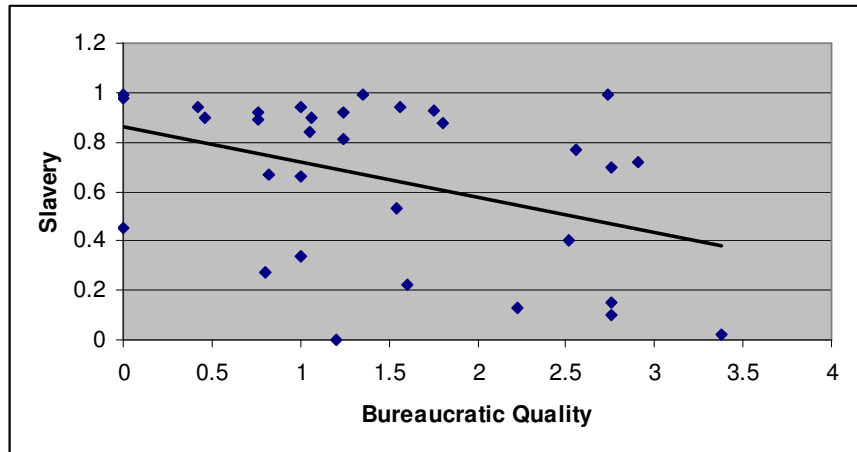


$r = -0.31, p = 0.08, n = 32.$

<sup>57</sup> ICRG data were available for 32 Sub-Saharan African countries. The 'Democratic Accountability' measure is an index scaled from one (low) to six (high). Index points are awarded on the basis of the type of governance enjoyed by a country, ranging from alternating democracy to dominated democracy to *de facto* one-party state to *de jure* one-party state to autarchy. 'Bureaucratic quality' is an index scaled from one (low) to four (high). High values reflect a low risk of drastic changes in policy or interruptions in government services after a change in government. Both variables are annually measured. We take the per-country averages of observations through the 1990s for each variable so as to avoid domination of the analytical results by single values.

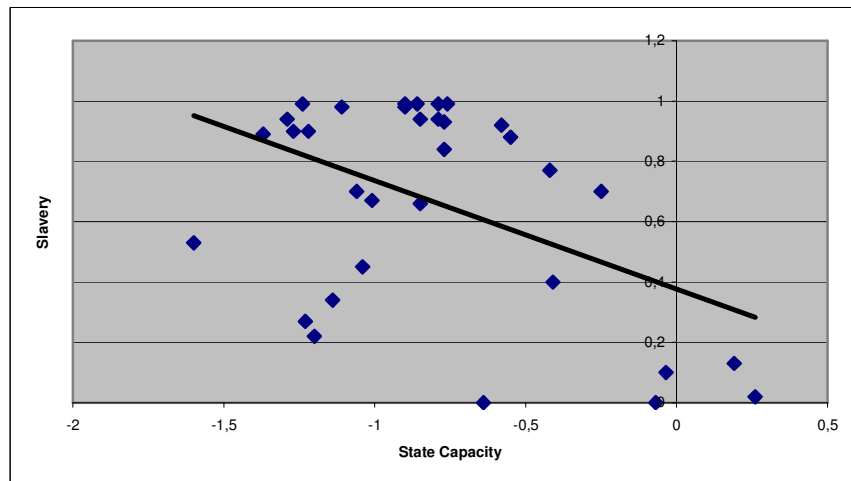
<sup>58</sup> State capacity measures the development capacity of states, by averaging six policy variables (public investments in education, public investments in agriculture, current government expenditure, distortions in the foreign exchange market, restrictions on free trade, and distortions in the foreign exchange market) and seven dimensions of governance (enforceability of contracts, risk of expropriation of investments, the prevalence of corruption, the quality of government institutions, the quality of bureaucracy, the extent of civil liberties, the degree of linguistic alienation of citizens from their government) in first principal components analysis. For exact sources we refer to Englebert (2000a).

Figure 3.4: Slavery and Bureaucratic Quality



$r = -0.4, p = 0.02, n = 32$

Figure 3.5: Slavery and State Capacity



$r = -0.47, p = 0.006, n = 33$

All three correlations are substantially negative and statistically significant. Also, in line with research findings that indicate that political development, or state capacity, is an important determinant of economic development (Englebert 2000a; Kohli 2004; Evans 1995), the correlation between our measures of political development and economic development are positive and significant (democracy:  $r = 0.55$ ,  $p < 0.01$ ; bureaucratic quality:  $r = 0.67$ ,  $p < 0.01$ ; state capacity:  $r = 0.70$ ,  $p < 0.01$ ). While this supports our tentative explanation of the channel from indigenous slavery to long-term economic development, clearly this issue warrants further research, beyond the space and scope of the present chapter.

### **3.5. Summary and Conclusion**

In this chapter we conducted the first systematic quantitative assessment of the long-term impact of Africa's indigenous slavery on its economic development. We document that indigenous slavery was a pervasive institution across traditional African societies, and construct a measure that indicates its prevalence especially in West-Central Africa and in societies with more developed states, and where Islam was more prevalent. Indigenous slavery lasted well into the 20<sup>th</sup> century, much longer than export slavery. Our review of the literature suggests that indigenous slaves mostly lived in better health and social conditions than did slaves exported to New World and other destinations. But it also highlights the violence and disenfranchisement that large parts of the populations in traditional African states experienced. All this suggests that it was arguably a strong and pervasive impediment on economic development - possibly via negative effects on political development - to the present day.

In order to research this hypothesis, we use historical data in a sample of 43 countries to estimate the conditions under which indigenous slavery existed, and its consequences for today's levels of economic development. We conclude that indigenous slavery was clearly harmful to long-term economic development. The effect is statistically significant and substantial in economic terms. We estimate that the continuing impact of Africa's indigenous slavery is about equal to 20-25 years of contemporary income growth, and is one half to a third of the negative long-term growth impact of export slavery. Our third analysis concerns the transmission

channel from indigenous slavery to current income levels. The literature suggest that slavery and the discrimination it entails may have inhibited the development of politically accountable states with capable bureacracies, in turn leading to lower income levels of economic development. We find confirmation of this also in our sample, where the measure for historical indigenous slavery is negatively correlated with democratic accountability, bureaucratic capacity and state capacity in the 1990s. These and other possible channels merit further research.



## Chapter 4

### Understanding Long-Run African Growth: Colonial Institutions or Colonial Education?<sup>59</sup>

#### 4.1. Introduction

This chapter is an empirical examination of the colonial origins of Africa's economic growth. Developments in growth theory suggest that explanations should be located in the broad areas of geography, institutions and human capital. Whereas the geography school examines factors where one-way causality with growth is beyond reasonable doubt – including location, precipitation, sunshine and natural endowments – empirical studies on institutions need to address an endogeneity problem. Recent studies have done so by employing variables that precede modern economic growth in the developing world, including the legal systems used by colonising powers (La Porta et al., 2004) and settler mortality (Acemoglu et al., 2001). This chapter extends this approach to the study of human capital's impact on long-run growth in sub-Saharan Africa (hereafter 'Africa'). We focus on Africa

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<sup>59</sup> Chapter based on the paper "Understanding Long-Run African Growth: Colonial Institutions or Colonial Education?", written with D.J. Bezemer. His contribution is gratefully acknowledged. The paper is published in the *Journal of Development Studies* 45 (1):24 – 54.

because of the availability of colonial data relating to our research topic. Also, Africa's experience occupies a sufficiently distinct place in the development literature to merit separate study of the continent (as testified by the notorious 'Africa dummy' appearing in much cross-country econometric work). We utilise freshly collected data on African colonial human capital and instrument it with settler mortality. Our main positive finding is that instrumented colonial era education is a causal factor for long-term growth. This finding is robust to inclusion of additional effects of legal origin and geography. Our education measure explains growth better and shows greater stability over time than do measures for extractive institutions used by Acemoglu et al. (2001). We also find some evidence that institutions are endogenous to education, as suggested by Glaeser et al. (2004) and Glaeser et al. (2006). The next section reviews the four main schools of thought in the current debate on the roots of long-term growth, followed by a historical background on colonial education in section 3. Section 4 introduces our data and presents the analysis and results. Section 5 concludes with a summary and discussion of our findings.

## **4.2. Explanations of Long-Term Growth**

### *Extractive Institutions*

Institutions are broadly defined as the written and informal rules, beliefs, norms and habits that 'constrain and liberate human action' (North, 1990). Any empirical study on institutions and growth must come to terms with the pervasive and often elusive nature of institutions – particularly, their manifold manifestations and the endogeneity of institutions to growth. A milestone study is by Acemoglu et al. (2001) who address both problems by studying a large number of former European colonies and defining their colonial era institutions generically as 'extractive' or 'constructive'. The authors suggest that where the disease environment was favourable to European settlers, they settled in larger numbers and built societies with economic institutions akin to those in Europe. These would typically include many checks and balances on state power, fostering private entrepreneurship, trade and innovation. In contrast, where the disease environment was not favourable – as indicated by high settler mortality – Europeans created 'extractive institutions': legal constructs endowing the state with large powers and few constraints, designed to effectively transfer natural resources to the colonisers while stifling private initiative

and commercial development (Acemoglu et al., 2001: 1375). The authors presume these institutional frameworks (if not concrete institutions) to be persistent, so that settler mortality would be a robust proxy for the quality of both early and current institutions.

One gap in the Acemoglu et al. (2001) analysis is that the two steps in the argument (high European population mortality led to low European population densities, which led to extractive institutions) are not separately tested. Also, they do not examine whether their result was driven mainly by the gap in economic performance between settler economies such as the US, Australia and New Zealand and colonies in Africa and Asia. This begs the question if extractive institutions explain performance also within a solely African context. The authors return to both these issues in section III.

#### *Legal Origins*

Djankov et al. (2002), Glaeser and Shleifer (2002) and La Porta et al. (1998) address the endogeneity problem besetting institutions by creating a measure of early, colonial era institutions, which preceded developing country current growth performance. Their measurement distinguishes between colonial institutions originating from different national legal systems. Again, the presumption is that once introduced, these systems do not change fundamentally and hence, legal origin determines the qualities of current institutions (Glaeser and Shleifer, 2002). In our context the differences between Africa's most active colonisers would be relevant. Under French civil law, 'professional judges, legal codes, and written records' are typical while British common law is characterised by 'lay judges, broader legal principle and oral argument' (Glaeser and Shleifer, 2002: 1193). Joireman (2006) questions this assumption and argues that there is significant heterogeneity within common law countries. This also applies to colonies: she shows how Kenya and India – which both had common law systems imposed by the British colonisers – have very different colonial and post-colonial legal experiences. Yet in Djankov et al. (2002), Glaeser and Shleifer (2002) and La Porta et al. (1998), legal-origin differences are successfully linked to measures for present-day institutions including market regulation, property rights, quality of government, political freedom and financial development. These concrete institutions, in turn, are shown to systematically relate to growth.



*Geography*

Yet another group of scholars links differences in economic development patterns to geographical factors. An important analytical advantage is the absence of serious endogeneity problems: geographical factors plausibly have some impact on economic growth, while growth has no or very little direct effect on geography. The four broad areas often cited relate to natural endowments, productivity, diseases, and transport costs (Sachs and Warner, 1997; Bloom and Sachs, 1998; Gallup et al., 1998; Diamond, 1999; Sachs, 2001).

Endowments of 'point resources' (principally oil, gas, diamonds, and precious metals) provide a growth potential which may be successfully exploited to raise income sustainably; but they are also notorious for leading to a 'resource curse' of political and economic instability related to rents (Isham et al., 2005). In contrast, endowments with non-point, widespread natural resources such as sunshine, rainfall and soil fertility have historically constituted the most common geographical basis for broadbased and sustainable growth. This may account partly for Africa's growth problems, as its location in the tropics implies that production conditions, particularly in agriculture, are less favourable and more variable than in temperate zones, due to fragile soils and little or infrequent rainfall. A third geographical factor is the incidence of plagues and pests which affect plants and animals (and thereby agricultural productivity), as well as the productivity of human labour. Such diseases (particularly malaria) are unusually widespread in Africa and their impact is therefore more harmful than in most other parts of the world. Fourth, lack of access to seaports or navigable rivers increases local transport costs. A third of all African countries are landlocked, comprising a quarter of its population (Sachs and Warner, 1997; Gallup et al., 1998). Also, large distances to world markets increase the transport costs of trade.

Over time, powerful feedback mechanisms may reinforce these barriers to economic development. Low agricultural productivity inhibits an 'agricultural transformation', which historically has been the basis for industrialisation, economic diversification and rising income levels in all currently developed countries (Timmer, 2002). Harsh living conditions lead to thinly settled countries and low incomes, which then constitute an endogenous drag on further growth, for example through demand limitations and larger costs (and lower returns) in infrastructure construction. Small domestic markets also inhibit scale-sensitive technological

innovation, widening the 'ecological divide' with developed countries that hinders the adoption of innovations through technology diffusion (Sachs, 2001: 22).

#### *Human Capital*

The human capital angle on growth in former colonies has recently been argued by Glaeser et al. (2004) and Djankov et al. (2003), based on early work by Dewey (1916), Lipset (1959, 1960), Schultz (1961), and others. As it is the focus of this chapter, we discuss it in some detail.

The term human capital was defined by its originator Theodore Schultz (1961: 1) as 'skills and knowledge' which are 'a form of capital' and are 'in substantial part a product of deliberate investment'. He also posited the link with economic growth, observing that 'increases in economic output have been large in comparison with increases in land, man-hours and physical reproducible capital. Investment in human capital is probably the major explanation for this difference' (Schultz, 1961: 1). Education can be viewed as one such investment in human capital, another one being, for example, healthcare (Schultz, 1999: 67). Our focus is on the education component of human capital.

The key observation in the human capital angle on the colonial roots of Africa's growth, then, is not that settlers took 'institutional fundamentals' with them. They took themselves, their human capital, and the means to proliferate the education component of that human capital through their educational systems. As in the Acemoglu et al. (2001) account, there is a link with the density of settlement by colonisers, but it does not run via extractive institutions. Instead, the relevant reasoning here is that where fewer settlers went to stay, less of their human capital was brought and developed via educational systems (Lloyd et al., 1999: 17). Amin (1972) and Oliver and Atmore (1967) note that in areas where there was large scale white settlement, colonial investment in social sectors was significantly larger than in areas where there was less settlement. Thus the idea is that the colonisers' initial human capital endowment and its proliferation affected long-term economic development. This links in with Krueger and Lindahl (2001: 1105) who, reviewing the literature on education and growth, conclude that 'the initial level of education [is] positively correlated with economic growth'. For Africa, the corollary would be that '[l]ow levels of health and education are two salient factors contributing to [Africa's] slow growth', as Schultz (1999: 67–68) notes.

Some observers question the relevance of education to growth, since the returns to education are typically low in agrarian societies (as most colonies were),

relative to its return in more diversified economies (Bennel 1996; Pritchett, 2000; Galor et al., 2005). For Africa, at least, this is contradicted by the Appleton and Balihuta (1996) overview of studies on the link between education and agricultural productivity in Africa. They conclude that the estimated effects are positive and often very large economically (though not always statistically significant) (Appleton and Balihuta, 1996: 420). However, apart from this, the human capital school has emphasised that the key benefits of human capital are ‘not technological but political’ (Glaeser et al., 2004: 282). Early writers argued that education ‘broadens man’s outlook, enables him to understand the need for norms of tolerance, restrains him from adhering to extremist doctrines, and increases his capacity to make rational electoral choices’ (Lipset, 1960: 39). Educated people are purportedly more aware of government actions, more actively participating in society, and better able to organise themselves politically and to resolve their conflicts ‘through negotiation and voting rather than through violent disputes’ (Glaeser et al., 2004: 272; also, Lipset, 1960; Tilly, 1998; Bourguignon and Verdier, 2000). Education, in this view, is also a precondition for a well-functioning judicial and administrative system (Coleman, 1965).

Yet, other critics question this benign role of education in fostering economic growth and development, it may also give rise to political instability, ethnic tensions and chronic violence. Huntington (1968: 41) already observed that ‘modernity breeds stability, but modernization breeds instability’: he found that at low levels of literacy (roughly below 50%), education breeds political instability while for countries with higher literacy rates it fosters stability. He went on to outline a mechanism where better educated people in developing countries with weak political systems are better able to organise protests, stage coups or foster other forms of political instability, which may impede economic growth. Bayly (2004: 222) likewise writes of Britain’s preference for indirect rule in Africa in an attempt to ‘stifle the growth of English educated elites like those who were causing such troubles in India and Egypt’.

In another type of criticism, Bush and Saltarelli (2000) document how education has been used by states for the purposes of cultural repression and segregation of ethnic minority groups. This includes colonial governments, who have used education for cultural assimilation aims and for divide-and-rule politics. For instance, in Belgian Africa, the schooling system from the late nineteenth century ‘openly favoured the Tutsi minority and actively discriminated against the Hutu’ and,

during the 1920s ‘set up special schools to educate Tutsis as the future leaders of the country and . . . as support staff for the colonial government’ (Bush and Saltarelli, 2000: 10). They link this to the enduring ethnic tensions in the successor states Rwanda and Burundi, which erupted into violence and genocide in the early 1990s. Bush and Saltarelli provide similar examples from Sudan, South Africa, Uganda, Zaire and for many other, non-African countries. Likewise, Davidson (1992) describes how the fact that African elites were typically Western-style educated alienated them from their compatriots – one reason for the legitimacy crisis of African governments, which in turn has hampered sustainable growth processes. Also other quantitative research confirms that the relation of education with growth is not simple and typically nonlinear, often mediated by other variables such as inequality, as in Rehme’s (2007) study.

This literature illustrates that education can indeed have long-term influence, for good as well as for harm. On balance, however, these adverse effects appear insufficiently strong to make education’s effect on economic growth negative on average. A large body of empirical research on that relation in the last half century finds that more and better education is robustly associated with higher levels of economic growth (Gemmel, 1996; Topel, 1999; Krueger and Lindahl, 2001), often conditional on other factors such as capital investment and the trade regime (Judson, 1998; Vinod and Kaushik, 2007)<sup>60</sup>. Schultz (1999) presents an overview of findings relevant to Africa. Beyond this specialist literature, the role of education in creating the ‘wealth of nations’ is also a mainstay in the general study of factors fostering economic growth, from Adam Smith to David Landes’ (1997) celebrated *Wealth and Poverty of Nations*.

We build on these results by looking back to colonial times. Taking our cues from the human capital literature, we hypothesise that colonial education may have fostered long-term growth through two channels: both by affecting present education levels, and through its effect on political institutions, fostering stability, ‘voice’, and good governance (especially, secure property rights and law and order). In support of this link, Lipset (1960) found that the least educated societies are never stable democracies, whereas highly educated societies generally are. This was updated

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<sup>60</sup> Obviously, this is not to say that education is therefore an unmixed blessing; the formation of human capital enabling economic growth may still co-exist with, for example, cultural repression perpetuated through educational systems.

and confirmed by Glaeser et al. (2004), who also find a strong effect of initial education on institutional changes (see also Glaeser et al., 2006).

It is important to note that we restrict our analysis to colonial education, and this is a limitation of the present research. Obviously, pre-colonial, indigenous education systems – such as education by village elders, the extended family or in an indigenous religious setting (Adeyemi and Adeyinka, 2003) – also invest people with social and cognitive skills and knowledge, and thus may build their human capital and so contribute to, among other things, economic growth. Or alternatively, they may have interacted with (hindered or fostered) the development of colonial education systems. Such indigenous education systems predated and often co-existed with colonial education efforts, and may have been important because the reach of colonial administration and education systems was often limited. As Bayly notes of colonial administration in general, ‘[w]hole areas of the European colonial world . . . remained in the grip of resistance to central authority, and the power of local chieftains until the very beginnings of decolonization itself in the 1940s’ (Bayly, 2004: 254). In this environment, state-colonial education systems must have been only one of many influences on human capital, and indigenous education systems may have been equally (or more?) determining to human capital formation as was colonial education.

However, as indigenous education systems varied greatly over communities and were often not formalised, it is difficult to systematically take them into account in a quantitative cross-country analysis – even if there were reliable cross-country data. In addition, even apart from data issues, conceptually the impact of pre-colonial education on colonial education is a vast topic in itself, mediated and shaped as that relation is by environmental factors such as population density, the spread of Islam with its rival schooling system, and the different policies of colonisers (see also Lange et al., 2006). For reasons of scope and delineation we therefore consider it beyond this chapter to treat it in any detail; but we return to this issue in our concluding section V as an avenue for future research.

We limit this study to a test of the effect of colonial human capital on subsequent growth in former African colonies. We do, however, include control variables (relating to legal origins, extractive institutions and geography). We will explicitly test in section 4.3, the two ‘human capital’ channels suggested in the literature. However, first we turn to a consideration of the context.

### **4.3. Colonial and Post-Colonial Education and Development in Africa: Historical Background**

We organise our discussion of colonial education systems around the main distinction in our sample, which is the difference between educational policies by the British and the French colonising powers. The spread of European-style education in the territories they colonised was part of the late nineteenth and early twentieth century process of empire building, in which the British and French vied for control over large parts of the African continent: formal education rates increased rapidly once the ‘scramble for Africa’ truly began in the 1880s, and indeed spread most quickly in contested areas (White, 1996). For instance Tanzania, handed to the British empire by the League of Nations after the First World War, and not threatened by the ambitions of rival colonisers, continued to have the lowest primary enrolment rates in all British Africa.

The two major European powers operated with distinct styles and educational outcomes. Benavot and Riddle (1988) calculate enrolment rates per school age population for different years before 1940, and find on average considerably higher figures in British Africa compared to French West Africa and Equatorial French Africa (see also Bowman and Anderson, 1963). This difference in outcomes can be plausibly linked to the complex interaction, in both the French and British colonies, of their two most powerful institutions: the state, represented by the colonial administration system; and the church, represented by missionary educators.

#### *Colonial Administration*

The British exercised ‘indirect rule’ in Africa (Lugard, 1929), where traditional structures and institutions were left intact and colonial rulers attempted to work with traditional chiefs. Within the colonial superstructure, chiefs maintained direct power over their peoples and lands (Lugard, 1919). Indirect rule was motivated by pragmatism and the aim of reducing the costs of colonial administration (Bayly, 2004: 222), and was characterised by a relative tolerance towards local customs compared to other colonial powers (Lugard, 1929; Wesseling, 1991; Lloyd et al., 1999). The British did not introduce one centralised educational policy in their colonies but instead largely left it to missionaries to provide the population with

education and to decide whether to educate also in the vernacular (Crowder, 1964). Missionaries had already laid the foundation of the schooling system before colonisation properly started, and the British government realised that they were the only party who had the organisation (and the motivation) to 'bear the brunt of the work in the early period' (Cowan et al., 1965: 3). This attitude only changed after the First World War, when the colonial administration faced increasing needs for an educated administrative workforce. In a policy memorandum published shortly after the First World War, the British government announced that it 'reserved to itself the general direction and supervision of educational policy' and that 'voluntary agencies should be used in education' to which grants in aid were to be made if they 'conformed to the established standards' (Cowan et al., 1965: 6). The colonial government increasingly involved itself in the content of educational programmes as it used inspection and supervision to monitor the spending of its funds. This larger involvement was partly also a response to growing concerns in the international community – expressed particularly in the League of Nations – about the quality and accessibility of colonial education (Cowan et al., 1965; Cameron, 1970).

The major aim of British colonial schooling, then, was to provide Africans with some minimal level of education and additionally build administrative capabilities of traditional chiefs (Sutton, 1965; Lloyd et al., 1999). Yet education was not a ticket to upward mobility. Non ruling-class Africans who achieved higher education could not participate in the ruling of the colony (Collins, 1970). Since the British wished to avoid an indigenous educated elite, colonial officials discouraged general education beyond the primary level. Cost considerations also played a role in the British administration preferring vocational training over general literacy and general education (Wesseling, 1991; Bayly, 2004: 222).

In contrast, the French implemented an assimilation policy with the ultimate goal of providing non-Western peoples with 'cultural characteristics that would make them acceptable as citizens on the same basis as their European fellow at home' (Sutton, 1965: 63), while 'degrading or ignoring [traditional] institutions in favour of French customs, culture and civilization' (Collins, 1970: 162). Assimilation policies implied the imposition of direct, centralised French control, including a centralised educational policy. By the beginning of the twentieth century all schools were obliged to teach in French and to adopt the French school curriculum (Cowan et al., 1965; Lloyd et al., 1999).

Also in contrast to the British, the French colonial government divested indigenous chiefs of their power by creating new administrative units (cantons) which typically cut through traditional boundaries. Chiefs kept their nominal positions but were assigned to cantons on the basis of their education or demonstration of loyalty to the French (Crowder, 1964). The reward to obtaining education was thus admittance to the lower echelons of the administration system (Collins, 1970). Since most positions in the colonial administration were to be filled by French nationals, trained in France, the colonial government selected those who received advanced schooling with care, fearful of unemployed higher educated Africans. A small elite excepted, pupils in the French colonial schools received training in basic skills only (Lloyd et al., 1999).

Like the British colonial government, and largely for the same reasons, the French colonial government gradually increased its investments in education after the First World War. However, until the end of the Second World War, the basic pattern already established in the French colonies by the turn of the century did not change (Cowan et al., 1965: 9).

#### *Missionary Education*

Beginning in the sixteenth century, missionaries had brought European-style education to Africa. During the first decades of colonisation, the British colonial government was mainly occupied with maintaining law and order, and missionaries remained the only party active in providing formal education to African people in the British colonies (Cameron, 1970). An additional factor for leaving education to the missionaries was the British desire, noted above, to contain the cost of colonial administration (Lugard, 1929; Bayly, 2004). In contrast, the French Third Republic (1870–1940) enshrined the separation of state and church in its constitution. While this was reflected in widespread antipathy towards missionary education in the colonies, in practice, this resentment was tempered by the government's recognition of the valuable role of missionary education in the government's assimilation agenda. So a dual church-state educational system was created, where missionary schools received state funding and functioned alongside state schools, adhering to the French state's centralised educational policy.

The presence of missionary (rather than only state) schools arguably helped the spread of Western-style education in the colonies (White, 1996). Both the Catholics in French Africa and the predominantly Protestant (Anglican, but also other)



missionaries in British Africa realised, in the words of Bishop Joseph Shanahan, 'that those who hold the school hold the country, hold its religion, hold its future' (as cited by Berman, 1975: 22). Between various churches, rivalry existed to reach as many people as possible. Helped by improved means of communication, this stimulated the rapid spread of missionary educational work in the first half of the twentieth century, with enduring results (Cameron, 1970). In those former French colonies where state activity was minimal due to historical and geographical reasons (Amin 1972), the missionary school system was more developed (Madagascar, Central African Republic, Cameroon, the Congo and Gabon) and the overall postcolonial enrolment rates were highest (Debeauvais, 1964; Benavot and Riddle, 1988). Missionary activity was even more determining of long-term educational achievements in British Africa, where education was largely the domain of the churches.

If the role of the churches within colonial education was markedly different between French and British Africa, so were the missionaries. Unlike Catholic educators, Protestant missionaries generally considered their presence temporary since they envisioned independent, self-reliant indigenous churches (Berman, 1975). This vision required a relatively high standard of fairly broadbased education, from which a future African church leadership could emerge. Also, due to the larger emphasis on individual bible study in Protestant theology, Protestant missionaries placed more value on spreading the key skill of reading among the whole population.

Both the colonial administration and the missionaries responded to most Africans' initially hostile reaction to Western education differently, depending on the nature of the local indigenous religion. In Muslim areas, animosity to Western education was usually respected and educational efforts restricted or abandoned. Large parts of Western Africa were Islamicised already before the French arrival, and the French did not replace Islamic education with their own system. In contrast, areas with traditionally animistic religions were nearly all Christianised eventually, and schooling was an important instrument in the process.

This policy had long-term consequences. As an illustration, the animistic southern part of Nigeria was Christianised, while Christian missionary activity in the Muslim areas of Northern Nigeria was forbidden (Sutton, 1965). In consequence, by 1958 over 90 per cent of the southern children were enrolled in primary schools, in contrast to only 9 per cent in the northern part (Ogunsheye, 1965; Morgan and Armer, 1988). As Benavot and Riddle (1988), Daun (2000), Hanson II (1989) and

Harrison (1988) show, colonial education in French Africa, more of which covers traditionally Muslim areas than was the case in British Africa, was clearly more restricted by this policy. Similarly, within the French areas, predominantly Muslim West Africa shows lower formal educational achievements compared to formerly animistic Equatorial Africa.

These differences in educational development have shown great stability over time (Brown, 2000). African educational standards in colonial times<sup>61</sup> correlate with Africa's educational achievements in 1995<sup>62</sup>, with an R2 of nearly 0.7. The postcolonial African distributions of educational achievements have been so persistent in part because many kept strong linkages to their colonial foundation (Lloyd et al., 2000). Newly post-colonial independent government typically had limited resources and many challenges and, therefore, did not take on extensive educational reforms: they 'hesitated to take over in toto a system it had not the resources to run' (Cameron, 1970: 25); and this reason for continuity has remained relevant since – see Brown (2000) and Ntiri (1993). This continuity lends partial support to our hypothesis that colonial education distributions had an enduring impact on growth patterns. In the next section we illustrate this claim by exploring the post-colonial development of educational systems in two countries: francophone Senegal and anglophone Uganda.

*Educational Continuity and Economic Development Illustrated: Senegal and Uganda*

Senegal's newly independent government inherited in 1960 the centralised educational system characteristic of French colonies, with a relatively large role for state-run schools. It developed a new education policy aiming at free, universal and compulsory education (Cain et al., 1994). Successive governments planned further reforms in 1969, 1979 and 1984 in order to develop a specifically African curriculum, to address issues of gender inequality and urban/rural inequalities, to promote instruction in a national language, and to provide more market-relevant skills. However, as Evans (1994), Bakary (1995), and Cain et al. (1994) all document, few of these plans were actually implemented and much of the schooling system remained

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<sup>61</sup> Total number of pupils divided by total population. See Appendix 4.B for sources.

<sup>62</sup> Average years of primary schooling in the total population over age 15, taken from the Barro and Lee data set (Barro and Lee, 2001).

unchanged from the colonial period: most teaching is still in French and the curriculum is still French-style. Financial restraints and the entrenchment of elites benefiting from the status quo are among the reasons.

The allocation of educational resources in Senegal is heavily biased against rural people: 93 per cent of urban children but only 10–34 per cent of rural children were enrolled in schools during the 1990s (Cain et al., 1994). Senegal also has lower primary enrolment rates and higher secondary and tertiary enrolment rates than most francophone African countries (Evans, 1994). Starting from very low literacy rates in 1960 when only 5 per cent of the population could read, in 1990 only 29 per cent of adult population was literate, increasing to 39 per cent in 2006 (World Bank, 2006). Thus education has retained its colonial features of exclusivism and strong elitism, mainly benefiting the better-off urban minority.

Yet despite these limitations and the relative inertia of the educational system since colonial times, there is evidence that Senegalese education is positively linked to economic development, for instance as measured by productivity in the manufacturing sector (accounting for around 18 per cent of GDP) as Mbay (2002: 17) finds. Furthermore, E' chevin and Murtin (2008: 7) find that education is a productive input in all formal sectors as well as in the services and trade segments of the informal sector (which provides most employment in Senegal). Another education effect they find is that in informal firms, the employer's level of education is positively associated with employee wage levels.

In sum, the ex-French colony which is now Senegal has both retained many of the colonial features in its educational system and has seen a positive contribution of education to output, productivity and wage levels. The reach of its educational system has remained limited, and so has the rate of its economic growth.

In contrast to Senegal, the British colony, which is now Uganda, had a colonial primary school system predominantly run by churches (Cameron, 1970). Although the colonial government increasingly funded these schools to support educational expansion, only 46 children per 1,000 population went to school around 1950. Soon after Uganda became independent, the new government attempted to implement a more centralised educational system compared to the decentralised system it inherited from the British (Cameron, 1970). It also laid heavier emphasis on primary education – a policy which pushed up primary enrolment rates even in the 1970s and 1980s when Uganda went through serious economic and political turmoil. This trend was reinforced and accelerated when Museveni came to power in 1985,

increasing the share of the government budget spent on education from the 10 per cent it had been under the Amin government to 23 per cent (Byrnes, 1990). Literacy rates consequently rose from 25 per cent in 1974 to 56 per cent in 1990, and up to 67 per cent in 2006 (World Bank, 2006).

However, many aspects of the Ugandan schooling system remain similar to the colonial system despite these reforms – as in Senegal, though not quite to the same extent. National exams determine the advancement from one level to the next, as is customary in the British system. The British curriculum remained in place until 1974, when it was replaced by a national curriculum. Instruction in local languages is common in the first few years of primary school in some regions (as it was during colonial times), but English is still the official language (Byrnes, 1990; Stateuniversity, 2008).

As in Senegal, there is clear evidence that Uganda's economic performance is linked to its educational achievements. Empirical studies find that the increase in educational coverage from the mid-1980s is reflected in rising agricultural productivity and in higher wages. Appleton and Balihuta (1996) argue that both general skills (for example numeracy and literacy) and specific knowledge enabled farmers to better implement productivity-enhancing policies such as fertiliser and pesticide applications. Using Uganda's first nationally representative household survey, they find that the sum of the total years of primary schooling of farm workers increases farm output significantly. If farm workers had four years of schooling, output was 7 per cent higher than if they had no schooling. Doubling the number of schooling years from 7 to 14 years (equivalent to an increase from one primary graduate to two graduates) led to an estimated increase in output of 13–19 per cent compared to the no schooling alternative (Appleton and Balihuta, 1996: 426). Schooling was also found to have spillover effects, where farmers with better educated neighbours tended to be more productive themselves. The results also show that secondary schooling does not lead to growth in farm productivity, and that there is very large variation in the education effects across Uganda's regions (Appleton and Balihuta, 1996: 424). Thus, this study finds that education can raise the productivity of farm workers in several ways.

Appleton (2001) in another study finds that more education is associated with higher levels of household welfare, the effect depending on the level of education and the household's portfolio of economic activities. Primary education is found to modestly raise the earnings in households engaged in agriculture, and more

substantially raise earnings of households engaged in wage employment. It also opens up opportunities to move into non-agricultural self-employment. In contrast to Appleton and Balihuta (1996), secondary schooling is found to raise agricultural productivity as well as wage incomes. University education only has an effect on the earnings from wage employment. Beyond primary education levels, further education induces a trade-off between losses in agricultural and non-agricultural self-employment income and increases in wages (Appleton, 2001: 20). Thus education is also instrumental in the structural transformation from an agrarian livelihood towards participation in an industrial or service oriented economy.

Summing up these two country narratives, in both Senegal and Uganda the legacy of colonial educational policies can still be discerned, especially in the value placed on universal (primary) education. While both countries officially adhere to the goal of providing universal education, only Uganda actually implemented policies to reach that goal while the Senegalese educational system remains more exclusivist and elitist. This parallels the more active British colonial policies towards a basic level of education for all (Lloyd et al., 2000) compared to the more passive French attitude to mass education. Uganda's educational expansion can be consistently linked to its impressive economic development over the last two decades, as Appleton (2001: 23) points out. In contrast in Senegal, Appleton and Teal (1999) argue, institutional restrictions and lack of investment in complementary factors of production (such as capital) have restricted the opportunities for many people to work in the formal sector. But given the positive educational returns to productivity observed in the informal sector by E' chevin and Murtin (2008), Senegal's limited post-colonial increase in education did have a modest positive influence on its economic development.

#### **4.4. Data and Analysis**

We use data collected from the colonial yearbooks<sup>63</sup> on the last years of African colonialism between 1945–1950 (Sudan was the first sub-Saharan country to gain independence in 1956) but before the European influence on the economic system started to decline (Hazlewood, 1953–1954; Hopkins, 1973; Giblin, 1980). Three variables from this data set are relevant to the present analysis:

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<sup>63</sup> See Appendix 4.B for sources

(i) and (ii) The percentage of Europeans in the total population and the number of Europeans per square kilometre. A salient feature of this newly compiled data is that in the 1940s, British colonies were on average about five times more densely populated than French colonies (27 compared to 5 persons per square kilometre), but with 1 per cent of the total population, the British presence was still about twice as large as the French who formed 0.5 per cent of the population.

(iii) The number of primary and secondary pupils per population, which proxies investment in educational institutions following for example Easterlin (1981). As already noted in section II, the ratio of total pupils to the population was clearly higher in British colonies<sup>64</sup>.

The number of pupils per population will be our measure for educational human capital in colonial times. This measure is obviously not a perfect one – for instance, with its emphasis on coverage rather than quality it leaves important dimensions of colonial education unaccounted for. Therefore we explored three alternatives in some detail. These are: the share of public investment from colonial budgets into the education system; literacy rates; and the pupils-to-teacher ratio as a proxy for educational quality.

In each case we ran into very serious data difficulties. One conceptual problem with the measure of budget shares for education is that it is an input measure which is only indirectly linked to the output of colonial educational achievements, which we are interested in. Additionally it varies with variations in total budgets, which need not reflect variations of actual resources allocated to education. For instance, where more expenditure went to increases in teacher salaries, this does not necessarily reflect an increase in the coverage or quality of education (Lloyd et al., 1999). Likewise, in the years after the Second World War, colonial governments changed their policies towards Africa and focused more on development. This shift in policy involved substantial changes in the level of public expenditure, also directed at the social sector (Hazlewood, 1953/1954; Hopkins, 1973). Measuring it consistently over countries is not really possible, as French and British (let alone other) definitions for budget components differed substantially. For

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<sup>64</sup> We present an overview of key statistics in the data Appendix 4.B

instance, the French colonial government ran a general budget and a budget for each separate country it occupied; but the British did not. In brief, we judged it not possible to construct reliable data for educational budget shares in colonial times.

It was found that the measure of pupil-to-teacher ratios, which would capture quality of education, was available for 15 countries only – ranging from 134 in Burkina Faso to 15 in Mauritania. While this limited number of observations disqualifies the variable from our statistical analysis below, it does seem that pupil-to-teacher ratios are clearly and negatively correlated to long-term growth, as would be expected in the ‘human-capital’ view on Africa’s long-term growth. The correlation coefficient of pupil-to-teacher ratios with 1995 GDP per capita levels is -0.33.

Similarly, the measure of literacy rates would arguably be a better variable than pupils per population, as it is a more direct measure of educational achievement. Unfortunately, to our knowledge, literacy rates during colonial times are not available. The earliest literacy rates for only 19 sub-Saharan countries are available for 1960. This is ‘too little, too late’: only 19 observations from a time well after decolonisation had started. Still, there is considerable correlation between our measure of pupils per population and literacy rates in 1960 (correlation coefficient 0.49). Moreover, correlation between literacy rates in 1960 and in 1990 and 2006 are 0.71 and 0.62 respectively; whereas correlation between pupils per population and literacy rates in 1990 and 2006 are 0.72 and 0.69 respectively. In summary, pupils per population is the only variable for educational achievement that we could credibly construct from the colonial data; but the above explorations suggest that it also captures literacy levels.

We apply these data to the question of Africa’s long-term growth in two ways. First, we explicitly check the two intervening steps in the Acemoglu et al. (2001) argument that higher settler mortality led to colonies being more thinly settled by Europeans and that a lower density of Europeans in the population led to different institutions, worse for long-term growth. Acemoglu et al. (2001) argue this was based on the literature but without primary empirical evidence. In table 4.1 we show that both these relations cannot be detected for sub-Saharan Africa. This then leads us to the second application, to explore an alternative explanation for Africa’s long-term growth in an instrumental-variable estimation, using our measure of pupils per population.

In Panel A of table 4.1, we report results from regressions of the density of Europeans in the population and density of Europeans per surface measure on

settler mortality. Neither regression gives statistically significant results, and the negative R2 indicate that models A1 and A2 perform worse than a constant-only model. In Panel B, we regress the two index measures for colonial institutions used by Acemoglu et al. (2001)<sup>65</sup> on the density of Europeans in the population, and again fail to find a relation.

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<sup>65</sup> As proxies for colonial-era institutions Acemoglu et al. (2001: 1384) used a democracy index at the first year of independence, varying between the 1950s and 1975, an index measure for constraint on the executive at first year of independence, where more constraints reflect better institutions. For both indices we used the Polity IV database, where Acemoglu et al. (2001) used the Polity III database.



**Table 4.1: The links from settler mortality to European densities to institutions in Africa**

| <i>Panel A</i>   |                          |                   |  |  |
|--|--------------------------|-------------------|--|--|
| <i>Dependent variable: Colonial density of Europeans</i> |                          |                   |  |  |
|  | Europeans/<br>population | Europeans/<br>km2 |  |  |
| Settler mortality  | -0.000<br>(0.001)        | 0.000<br>(0.007)  |  |  |
| (constant)   | 0.005<br>(0.007)         | 0.021<br>(0.040)  |  |  |
| R <sup>2</sup>   | -0.06                    | -0.06             |  |  |
| N  | 18                       | 18                |  |  |

| <i>Panel B</i>                                    |                     |                     |                               |                               |
|---|---------------------|---------------------|-------------------------------|-------------------------------|
| <i>Dependent variables: institutional quality</i> |                     |                     |                               |                               |
|   | ‘Democracy’         | ‘Democracy’         | ‘Constraints on<br>executive’ | ‘Constraints<br>on executive’ |
| Europeans/pop                                     | 88.665<br>(53.862)  |                     | 49.778<br>(36.587)            |                               |
| Europeans/km2                                     |                     | 15.641<br>(9.902)   |                               | 7.691<br>(6.778)              |
| (constant)  | 2.078***<br>(0.709) | 2.078***<br>(0.720) | 3.104***<br>(0.482)           | 3.149***<br>(0.493)           |
| R <sup>2</sup>                                    | 0.069               | 0.061               | 0.036                         | 0.012                         |
| N   | 24                  | 24                  | 24                            | 24                            |

Robust standard errors are in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Source: See appendix 4.A.

These results in an African sample differ from those reported by Acemoglu et al. (2001) in a global sample of former colonies. This leads us to question the link between settler mortality and early institutions. While Acemoglu et al. (2001, footnote 21) report that there is a ‘weaker relationship between settler mortality and institutions in a sole Africa sample’, we actually find no relationship in an African

sample. Naturally, our sample size is necessarily small, especially for panel A results, and this may (partly) cause the lack of statistical significance. Yet at the least we conclude that there is no evidence that African colonial-era institutions are well proxied by settler mortality<sup>66</sup>.

This is not to say that there cannot be a link between settler mortality and African growth, or that institutions are irrelevant in this relation; only that the account of this link presented by Acemoglu et al. (2001) finds no support in the African data. Alternatively, settler mortality may have influenced other aspects of colonial institutions than its extractiveness. We noted in section II above that one candidate for an alternative channel is colonial human capital. Lipset (1959, 1960), Djankov et al. (2003) and Glaeser et al. (2004) suggested that colonial human capital may have influenced both colonial institutions and current human capital, and – through either or both of these channels – it may affect present GDP per capita levels. It is this explanation of Africa’s long-term growth that we will now explore empirically.

We start with an Ordinary Least Squares (OLS) specification where we regress our human capital variable Pupils (per population) on PPP per capita GDP levels in 1995<sup>67</sup>. We test robustness to other explanations by adding a legal-origin variable (Coloniser, which takes value 1 for British and 0 for French colonies) and up to four geographical variables from the following set: Malaria (index of 1994 malaria prevalence), Coastal population (the share of the population living within 100 km from the coast), Landlocked<sup>68</sup> (absence of overland access to sea), Tropics (the share

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<sup>66</sup> An important reason underlying this result may also be that the stability over time of institutions assumed in Acemoglu et al. (2001) should be questioned in the African context. African colonial-era institutions do not correlate well with current institutions (which cause current GDP). Twenty-four of the 44 African countries included in the Polity IV data experienced shortly after independence a (often sharp) decline in the democracy index used here and in Acemoglu et al. (2001). Of the 14 countries with a low initial measure for ‘constraint on the executive’, six countries showed an appreciable improvement subsequently. This volatility links in with a cross-country analyses of institutional indices by Glaeser et al. (2004) who note that these index measures tend to reflect short-term changes (for example election results) rather than the stabler, underlying institutions.

<sup>67</sup> We chose 1995 to allow comparison to Acemoglu et al. (2001). If we use 1995 GDPpc from Maddison (2003) our results improve, see appendix 4.C. Pupils are always significant, regardless of the specification of the model.

<sup>68</sup> Note that including Coastal population and Landlocked does not amount to the same thing since they are quite different variables. There are countries with coastlines (Landlocked=0)

of territory located in the tropics)<sup>69</sup> and Hydrocarbons (proven reserves of natural gas and crude oil in 1993, BTUs per person). In selecting these variables, we follow Gallup et al. (1998) and La Porta et al. (2004). We take out one of these variables in turn and table 4.2 reports OLS estimation results. We find that in four of the seven specifications, Pupils significantly correlates with 1995 per capita GDP. Apparently, OLS results are not robust to adding control variables<sup>70</sup>; in addition, as noted they are plausibly biased because of endogeneity. Only Malaria is consistently correlated with lower 1995 income levels.

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such as Kenya, but with coastal populations of only 6 per cent. Compare also Mozambique (40%), Sudan (2%) and Tanzania (16%) (Gallup et al., 1998: 31)

<sup>69</sup> TROPICS has little variation within Africa, with many values equal or close to 100 per cent. Excluding it improves the significance of findings, without qualitatively changing them.

<sup>70</sup> OLS results are robust to control variables when Maddison's income data are used see appendix 4.C. See also footnote 9.

Table 4.2: OLS regressions of colonial education and controls on 1995 GDP per capita

|                    | Dependent variable: log GDP pc 1995 |                      |                     |                      |                      |                     |                      |
|--------------------|-------------------------------------|----------------------|---------------------|----------------------|----------------------|---------------------|----------------------|
|                    | (1)                                 | (2)                  | (3)                 | (4)                  | (5)                  | (6)                 | (7)                  |
| Pupils             | 7.679*<br>(4.010)                   | 7.011*<br>(3.456)    | 8.266*<br>(4.196)   | 4.673<br>(3.935)     | 8.446**<br>(4.032)   | 7.115<br>(4.446)    | 4.158*<br>(2.265)    |
| Coloniser          | -0.246<br>(0.275)                   | -0.244<br>(0.277)    | -0.302<br>(0.305)   | -0.203<br>(0.283)    | -0.282<br>(0.294)    | -0.256<br>(0.320)   |                      |
| Malaria            |                                     | -1.235***<br>(0.369) | -1.065**<br>(0.381) | -0.933***<br>(0.404) | -1.309***<br>(0.441) |                     | -1.357***<br>(0.360) |
| Coastal population |                                     | 0.776**<br>(0.349)   | 0.560<br>(0.429)    | 1.128**<br>(0.522)   |                      | 1.141<br>(0.715)    | 0.884*<br>(0.466)    |
| Tropics            |                                     | 1.004*<br>(0.564)    | 1.002<br>(0.596)    |                      | 1.257*<br>(0.573)    | -0.181<br>(0.859)   | 0.929*<br>(0.505)    |
| Hydrocarbons       |                                     | 0.047<br>(0.030)     |                     | 0.055<br>(0.043)     | 0.033<br>(0.038)     | 0.028<br>(0.039)    | 0.046<br>(0.039)     |
| Landlocked         |                                     |                      | -0.239<br>(0.297)   | 0.186<br>(0.402)     | -0.325<br>(0.284)    | 0.155<br>(0.426)    | 0.008<br>(0.329)     |
| (constant)         | 7.084***<br>(0.133)                 | 7.044***<br>(0.687)  | 6.933***<br>(0.684) | 7.686***<br>(0.385)  | 7.100***<br>(0.696)  | 6.978***<br>(0.902) | 7.136***<br>(0.616)  |
| adj. R2            | 0.074                               | 0.321                | 0.426               | 0.278                | 0.262                | 0.099               | 0.296                |
| N                  | 30                                  | 28                   | 28                  | 28                   | 28                   | 28                  | 33                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Sources: see appendix 4.A. For the results using Maddison's income data see appendix 4.C.

Since the above analysis faces the same endogeneity challenges as the Acemoglu et al. (2001) account, the question is whether the findings are robust to an alternative approach, addressing the endogeneity problem. We instrumented the colonial era education measure Pupils (the percentage of pupils in the population) with Settler mortality around 1800, as in Acemoglu et al. (2001)<sup>71</sup>. We then regress this instrumented human capital variable on PPP per capita GDP levels in 1995<sup>72</sup>. Panel A in table 4.3 presents the second stage of the 2sls regression<sup>73</sup>. Panel B reports the corresponding first stage results. We test robustness to other explanations by adding controls, as above. We include not more than five variables in total because of the limited number of observations (23) in this instrumented-variable regression<sup>74</sup>.

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<sup>71</sup> As we have one endogenous variable and one instrument, the model is exactly identified.

<sup>72</sup> We chose 1995 to allow comparison to Acemoglu et al. (2001).

<sup>73</sup> We combine an instrumental variable approach with generalised least squares (GLS), which accounts for the correlation structure in the disturbances across equations. This procedure, also known as ‘three stage least squares’ (3sls), results in consistent estimates that are more efficient than 2sls without using the information contained in cross-equation correlations of disturbances. We estimated our equations also without GLS (that is, ‘simple’ 2sls), which produces qualitatively identical, but less significant estimates, as expected. See Kmenta (1977) and Greene (2003) for more detail.

<sup>74</sup> An instrumented model without control variables, regressing Log GDP pc in 1995 only on Pupils (instrumented with Settler mortality) plus a constant, yields a similar coefficient estimate (24.941) and significance levels (s.e. is 7.404) for Pupils as model (1).

Table 4.3: Instrumented Colonial Education Correlates with 1995 GDP per capita

|                       | Panel A  |                      |                     |                     |                     |                     |
|-----------------------|--|----------------------|---------------------|---------------------|---------------------|---------------------|
|                       | 2 <sup>nd</sup> stage of 2SLS: Dependent variable: log GDP pc 1995 |                      |                     |                     |                     |                     |
|                       | (1)  | (2)                  | (3)                 | (4)                 | (5)                 | (6)                 |
| Pupils (instrumented) | 31.504***<br>(10.913)  | 26.624**<br>(12.629) | 25.905*<br>(14.525) | 22.266*<br>(12.751) | 24.990*<br>(12.533) | 30.860*<br>(16.004) |
| Coloniser             | -0.593*<br>(0.307)   | -0.521<br>(0.315)    | -0.530*<br>(0.283)  | -0.545*<br>(0.289)  | -0.533*<br>(0.297)  | -0.613*<br>(0.299)  |
| Malaria               |  | -0.476<br>(0.357)    | -0.457<br>(0.300)   | -0.802*<br>(0.424)  | -0.523*<br>(0.250)  |                     |
| Hydrocarbons          |  | 0.001<br>(0.001)     |                     |                     |                     | -0.020<br>(0.033)   |
| Coastal population    |  |                      | 0.218<br>(0.911)    |                     |                     | 0.057<br>(1.087)    |
| Tropics               |  |                      |                     | 3.740<br>(3.249)    |                     | 0.963<br>(5.148)    |
| Landlocked            |  |                      |                     |                     | -0.212<br>(0.275)   |                     |
| (constant)            | 6.536***<br>(0.294)  | 7.061***<br>(0.551)  | 7.004***<br>(0.304) | 3.790<br>(2.929)    | 7.198***<br>(0.491) | 6.593***<br>(0.374) |
| N                     | 24   | 23                   | 23                  | 23                  | 23                  | 23                  |

Table 4.3: Instrumented Colonial Education Correlates with 1995 GDP per capita (continued)

Panel B

|                    | 1 <sup>st</sup> stage of 2SLS: Dependent variable: Pupils |                     |                    |                     |                    |                    |
|--------------------|---|---------------------|--------------------|---------------------|--------------------|--------------------|
|                    | (1)   | (2)                 | (3)                | (4)                 | (5)                | (6)                |
| Settler mortality  | -0.011*<br>(-0.006)                                       | -0.010*<br>(0.005)  | -0.010*<br>(0.005) | -0.011**<br>(0.005) | -0.010*<br>(0.005) | -0.009*<br>(0.005) |
| Coloniser          | 0.013<br>(0.009)  | 0.013<br>(0.010)    | 0.0010<br>(0.010)  | 0.013<br>(0.010)    | 0.010<br>(0.011)   | 0.010<br>(0.010)   |
| Malaria            |   | -0.010<br>(0.023)   | 0.004<br>(0.016)   | 0.001<br>(0.031)    | -0.002<br>(0.025)  |                    |
| Hydrocarbons       |   | 0.002<br>(0.001)    |                    |                     |                    | 0.002<br>(0.001)   |
| Coastal population |   |                     | 0.037*<br>(0.019)  |                     |                    | 0.038*<br>(0.021)  |
| Tropics            |   |                     |                    | 0.003<br>(0.187)    |                    | -0.022<br>(0.096)  |
| Landlocked         |   |                     |                    |                     | -0.014<br>(0.010)  |                    |
| (constant)         | 0.087**<br>(0.0364)                                       | -0.094**<br>(0.042) | 0.067**<br>(0.033) | 0.085<br>(0.174)    | 0.087**<br>(0.041) | 0.094<br>(0.103)   |
|                    | 24  | 23                  | 23                 | 23                  | 23                 | 23                 |

Robust standard Errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. 2sls is estimated using small sample properties. Sources: see appendix 4.A. For the results using Maddison's income data see appendix 4.C.

In model (1) we include only a colonial origin variable. In model (2) we add Malaria and Hydrocarbons, in model (3) also we replace Hydrocarbons by Coastal population. In model (4) we replace Coastal population with Tropics (the share of territory located in the tropics) and in model (5) we then add Landlocked instead of Tropics. Finally in model (6) we run the model including Hydrocarbons, Coastal population and Tropics. We find that variation does not affect the key results. Panel B shows a significant negative effect of settler mortality on colonial education levels in all models<sup>75</sup>. And panel A shows that the instrumented Pupils variable is positive associated with 1995 GDP pc<sup>76</sup> levels in all specifications.

We conclude that the link between settler mortality and GDP pc in 1995, which Acemoglu et al. (2001) conjectured to run through ‘extractive institutions’ in Africa, is most likely to run through human capital investments made in the colonial era through education<sup>77</sup>. This conclusion is robust to including controls for geography and legal origin. It connects to the description given by Acemoglu et al. (2001: 1374–1375) of extractive institutions as *inter alia* involving low educational and healthcare investments; but in view of the lack of support for the intervening steps in the Acemoglu et al. (2001) argument, presented in table 4.1, this interpretation is tenuous for the African setting. A more plausible understanding of the findings is to see them as support for the hypothesis that human capital, as distinct from the broader framework of production-and-commerce oriented institutions, was the more important factor for long-term growth (Glaeser et al., 2004). This view finds additional support in the lack of significant findings for

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<sup>75</sup> Instrumenting colonial human capital with other (legal-origin or geographical) exogenous variables did not yield statistically significant explanations of 1995 GDP pc. Although colonial education does correlate with several of the exogenous variables considered here, only settler mortality is a suitable instrument for human capital variables in an equation explaining 1995 GDP. Results from these additional analyses are available on request from the author.

<sup>76</sup> Also for the 2sls estimates the results improve when we use Maddison’s income data, see appendix 4.C.

<sup>77</sup> Our newly compiled data set allowed us to also consider health, another dimension of human capital. In 2sls and OLS regressions of HOSPITALS, a measure for colonial healthcare (the number of hospitals per 1000 population health), again using settler mortality as the instrument, on 1995 GDP pc, HOSPITAL yields a valid instrumental-variable explanation of present GDP levels. But model performance is very weak, with a negative R2 indicating that a constant-only model would predict better. Also, the relation between colonial health and present pc GDP relation was not robust to introducing controls.



institutional measures, such as ‘democracy’ and ‘constraints on the executive’ variables, reported in table 4.1. In addition, our estimates offer support for the legal-origin explanation of growth: the coefficient is negative and significant in all models except model (2), implying that British colonisation is correlated with lower 1995 income levels than is French colonisation<sup>78</sup>. However, the significance of this exogenous variable is not robust to an OLS specification in table 4.2, perhaps because Coloniser captures some other systemic difference between British and French colonies other than legal origin; for instance, the qualitative differences in education systems noted in section 4.3. Another explanation is offered by Joireman (2006) who observes significant heterogeneity with respect to colonial and post-colonial legal experiences within the group of British (ex-) colonies. This reality may undermine a single ‘Coloniser’ effect. Of the geographical variables, Malaria is a robustly negative influence on growth, in the OLS specification, but not robustly significant in the 2sls specifications.

Having established a robust relation of colonial education with current per capita income levels, we now pursue the ‘educational’ line of reasoning further by examining the additional hypotheses that: (i) colonial education achievements persisted (that is that colonial education achievements statistically ‘cause’ present educational levels); and (ii) colonial human capital caused colonial institutions. On (i), table 4.4 shows that instrumented education levels in the 1940s correlate to present enrolment rates, both primary and secondary<sup>79</sup>. Thus, a first channel through which exogenous, colonial-era investments in human capital have affected present growth is through the ‘persistence effect’ mentioned above, by durable increases in levels of human capital till the present. It is important to note that human capital persisted over time, while institutional measures did not, as discussed above. This is in contradiction to the argument put forward by Acemoglu et al. (2001) on the durability of institutional quality, but it is in line with the Glaeser et al. (2004: 274) argument that human capital is ‘the more basic cause of growth’.

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<sup>78</sup> Interestingly, Lange et al. (2006: 1412) find that ‘British colonisation had comparatively positive effects’ on economic development, that is compared to Spanish colonisation.

<sup>79</sup> Average years of primary schooling in the total population over age 15, taken from the Barro and Lee data set (Barro and Lee, 2001). Using World Development Indicators as the source yields similar results.

**Table 4.4: Colonial human capital persisted**

| Panel A  |                       |                      |
|--|-----------------------|----------------------|
| Second stage of 2SLS: dependent variables: primary and secondary enrolment rates in 1990 |                       |                      |
|  | PRIM90                | SEC90                |
| Pupils   | 34.953***<br>(-3.730) | 10.6090**<br>(3.851) |
| (Constant)   | 0.290*<br>(0.144)     | -0.076<br>(0.148)    |
| Panel B  |                       |                      |
| First stage of 2SLS: dependent variable: Pupils  |                       |                      |
| Settler mortality  | -0.015**<br>(0.006)   | -0.015**<br>(0.006)  |
| (Constant)   | 0.122***<br>(0.038)   | 0.122***<br>(0.038)  |
| N  | 18                    | 18                   |

Robust standard errors are in parentheses.\* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Sources: see appendix 4.A.

Finally in table 4.5, we explore another channel by examining the influence of human capital investments on contemporaneous institutional indicators, as suggested by Glaeser et al. (2004) and Glaeser et al. (2006). We consider institutional indices both on democracy and on constraints on the executive as used by Acemoglu et al. (2001), and find positive and significant correlations of Pupils with both in an OLS framework. These findings are however not robust to using instrumented education, so that the results may be partly driven by endogeneity of education to institutions<sup>80</sup>.<sup>18</sup> We conclude that the major channel through which colonial

<sup>80</sup> Results from the 2SLS analysis are available on request from the author

education affects current growth is through the persistence effect of educational quality, more than through institutional quality.

**Table 4.5: Colonial education and current institutions**

| Dependent variable: Democracy and Constraints on the executive |                       |                     |
|--|-----------------------|---------------------|
|  | Democracy             | Constraints         |
| Pupils   | 37.990***<br>(12.488) | 19.086**<br>(9.163) |
| (Constant)   | 1.154<br>(0.714)      | 2.641***<br>(0.467) |
| adj. R <sup>2</sup>  | 0.16                  | 0.09                |
| N  | 37                    | 37                  |

Robust standard errors in parentheses \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Sources: see appendix 4.A.

#### 4.5. Summary, Future Research and Conclusions

Acemoglu et al. (2001) conjecture that high settler mortality led colonising powers to introduce ‘extractive’ institutions, which set the economy on a long-term path of low and volatile growth. Low settler mortality, in contrast, supposedly caused colonisers to build institutions more conducive to growth. When we implement this analysis for a sample of only African countries, both these correlations disappear. Higher settler mortality did not lead to African colonies being more thinly settled by Europeans, and a lower density of Europeans in the population did not lead to different institutions, worse for long-term growth. While it is noteworthy that these findings might well be due to small sample size, they leave sufficient room to pursue an alternative explanation of long-term growth differences between African countries, based on colonial education rather than colonial extractive institutions. We collect archival material from colonial yearbooks to construct a novel data set on European

and total population densities and investments that the colonial powers made in schooling.

In our analyses we find that African colonial education does possess both properties ascribed to institutions in the global Acemoglu et al. (2001) study: it correlates well both with settler mortality and with current measures for human capital. Instrumenting education with settler mortality, we obtain again a robust explanation of long-term development which does not suffer from endogeneity and which is specific to Africa. We establish the robustness of this explanation by introducing controls for the legal origin of institutional systems and for a number of geographical variables, both of which have additional explanatory power. Further investigation of the channels through which education fostered growth suggests its positive impact on both current education and on colonial institutions, though the causality between colonial institutions and colonial education seems two-way.

There are several loose ends to this study, which provide opportunities for future research. A big one relates to a relatively neglected issue in this strand of literature: what was there before colonialism?<sup>81</sup> Obviously pre-colonial Africa was not *tabula rasa* with respect to education. A next step in this literature would be therefore to enlarge the scope of analysis one step further compared to the Acemoglu et al. (2001) and similar frameworks (including this one) by noting that long-term growth may have depended not only on colonial education, but also on pre-colonial African education levels. In line with the human capital definition, this would include organised efforts by Africans to create or pass on skills and knowledge that contributed to long-term growth of their economies – either directly or by providing a basis for colonial education systems to be more rapid or slow. One might conjecture, for instance, that people used to education of some sort were more willing to have their children attend colonial schools; or conversely, that indigenous and colonial education were rivals and so the presence of pre-colonial education hampered the spread of colonial education. However, as in the present study, a simple causal approach would be amiss in that it ignores an endogeneity problem similar to the one addressed in this chapter. Namely, pre-colonial education cannot be assumed to simply determine (positively or negatively) colonial education; instead, both are plausibly jointly caused by underlying factors.

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<sup>81</sup> We are grateful to an anonymous referee for suggesting this.

In light of the literature reviewed in this chapter, one might speculate about two strong candidates for this underlying factor: Islam and population density. Societies where Islam – a ‘religion of the book’ – had spread before Western colonisation arrived, were more likely to have more extensive pre-colonial formal schooling systems and higher literacy levels. Bayly (2004: 261), writing on pre-colonial states, observes that ‘in Muslim West Africa, the state crept forward in alliance with elite literacy and the spread of purist Islam’. At the same time, as we noted in section 4.3, colonisers restricted colonial education in Islamic areas. So ‘Islam’ may well be a factor jointly fostering pre-colonial and hindering colonial education systems. A second candidate for the underlying factor is population density, which is one sign of a society’s potential for economic and social development, including the development of schooling systems. Population density may also be systematically related to the origin of the coloniser. We learn this, for instance, from Lange et al. (2006) who explain that ‘Britain tended to colonize most extensively pre-colonial regions that were sparsely populated and underdeveloped’ (Lange et al., 2006: 1412). This is in comparison to the Spanish; in our data we detect that British colonies (mostly in east Africa) were far more densely populated than other, predominantly French colonies, many in arid West Africa. The densities are 27 and 5 persons per square kilometre, respectively, and the correlation coefficient between population density and British origin is + 0.26. In section 4.3, it is described how Britain also achieved higher enrolment rates in its colonial schools than did the French, partly by making more use of missionary education. Combining these facts, it is found that population density is an influence both on colonial education and on pre-colonial education – in this case, both influences are positive.

In light of these supposed two underlying factors, ‘Islam’ and ‘population density’, with opposite effects on pre-colonial education, a further observation is that pre-colonial education itself is far from homogeneous. The most important distinction may well be between types of pre-colonial education linked to the spread of Islam and with more emphasis on formal schooling and literacy; and informal, indigenous pre-colonial education which had developed in Africa itself, plausibly in settled communities with high population densities. Valuable follow-up research would be to investigate how different kinds of pre-colonial education affected colonial education, and thus indirectly shaped the long-term economic fortunes of Africa.

This is an avenue for future research. The contribution of this study was to suggest and substantiate that African colonial education levels are among the long-term determinants of African economic growth. A more general implication is that the human-capital explanation of growth appears a fruitful issue to be explored in the development literature.



## Chapter 5

### The Familiarity Dimension of Psychic Distance; or, why Historical Ties Affect the Location of FDI <sup>82</sup>

#### 5.1. Introduction

International business studies often apply the concept of psychic distance to explain foreign market selection (Dow, 2000; Ellis, 2007; Stöttinger and Schlegelmilch, 1998) or international organizational performance (Evans and Mavondo, 2002; Evans, Treadgold, and Mavondo, 2000; O’Grady and Lane, 1996). Although actual measures of psychic distance have proved problematic (Dow, 2000; Dow and Karunaratna, 2006), a common assumption implies that the psychic distance experienced toward a foreign market depends on the extent to which that market differs from the home market. Country differences, such as in culture, religion, and political systems, should disturb the flow of information from the foreign market to the firm, which limits a firm’s ability to learn about such markets (Johanson and Vahlne, 1990; Johanson and Wiedersheim-Paul, 1975). All else being equal then, firms can be expected to favour foreign markets that are more similar to their home market.

Despite significant progress in operationalizing various psychic distance stimuli (Brewer, 2007; Dow and Karunaratna, 2006), the predominant focus on country differences and actual knowledge may overlook an important dimension of psychic distance. In particular, we argue that what determines the perception of psychic distance, and subsequently foreign market selection, is not merely the degree

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<sup>82</sup> Chapter based on the paper “The Familiarity dimension of Psychic Distance; or, why Historical Ties Affect the Location of FDI”, written with J.J. Hotho. His contribution is gratefully acknowledged. The paper is resubmitted at the International Business Review.



of similarity between the home and the foreign country but also the extent to which a foreign market environment is perceived as familiar. The familiarity argument developed herein builds on the idea that the perceived understanding of foreign markets depends not only on actual knowledge and market information (cf. Brewer, 2007; Johanson and Wiedersheim-Paul, 1975) but also on the unsubstantiated beliefs, assumptions, and generalizations that are held to be true regarding the nature of a foreign market environment. As a result, foreign markets may be perceived as psychologically close despite a lack of actual knowledge, or despite actual differences between countries.

We explore the validity of this argument by examining the extent to which both country differences and historical (colonial) ties—a variable we associate with the perception of familiarity—affect the location of foreign direct investment (FDI) originating from the United Kingdom, France, the Netherlands, and Germany between 1984 and 2003 in a world sample.

This chapter takes a different approach to investigate the effect of a colonial past on subsequent developments. First of all we analyse the influence of a shared history between countries from the coloniser perspective, and secondly we use a world sample of countries where all the other chapters explicitly focused on an all African sample. But given the extend of colonial activity on the African continent (only two countries remained independent during the whole period), and since the United Kingdom and France were Africa's major colonisers<sup>83</sup>, we believe that the current set up is nevertheless very relevant for the African continent.

We find that historical ties, common language, and the level of industrial development all significantly affect the location of foreign investment, but we find no consistent support for the idea that firms favour investments in countries that are more similar in terms of culture, institutional environment, religion, political system, or education level.

Our results thus caution against the indiscriminate use of country differences in conceptualizations and operationalizations of psychic distance. As others have argued and illustrated (e.g., Dow and Karunaratna, 2006; Evans and Mavondo, 2002), not all country similarities have equal weight as psychic distance stimuli. In addition, the results provide partial support for the argument that in addition to its relation to the similarities between the home and the host country,

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<sup>83</sup> Before WW I Germany also played a substantial role in the colonising of Africa.

psychic distance relates inversely to perceptions of familiarity with a foreign country or market.

Our results also require three caveats. First, data for country differences are only to a limited extent available for developing countries generally and for Africa more specifically. This is why we in addition to the basic results we provide additional estimates for an extended sample of countries that shed some light on the relationship between historic ties and internationalisation patterns in developing countries. Second, the use of aggregate data prevents us from examining the effects of historical ties on the actual internationalization sequence of firms or the commitment of resources over time. And third, the historical tie variable is but one of many potential indicators of foreign market familiarity, and it correlates with another explanatory variable, common language. We nonetheless focus on historical ties, which appear in previous literature as a potential psychic distance stimulus (e.g., Brewer, 2007; Dow and Karunaratna, 2006). Despite these concerns, the results open new lines of inquiry into the psychological dynamics of decision makers involved in internationalization decisions.

The remainder of this chapter proceeds as follows: We first critically review existing literature on psychic distance. Motivated by mixed empirical support and conceptual issues, we develop the notion of familiarity as an additional dimension of psychic distance. Then, following a discussion on the use of historical ties as a country-level indicator of perceived familiarity, we discuss the research methods and analysis results. We end with a discussion of the potential implications of the familiarity construct for the psychic distance concept, as well as for internationalization process theory at large.

## **5.2. Psychic distance and the location of foreign investment**

The term “psychic distance,” initially coined in a study on Western European trade patterns by Beckerman (1956), entered the field of international business studies in the 1970s with the development of internationalization process theory, which predicts two distinct patterns: the development of a firm’s engagement within foreign markets and the selection of foreign markets (Johanson and Vahlne, 1990).

Within foreign markets, internationalization process theory argues that a lack of local market knowledge initially defers resource commitments, but over time, greater market-specific knowledge should result in a gradual increase in foreign

market involvement through more committed modes of operation and larger resource commitments—a phenomenon termed the “establishment chain” (Johanson and Wiedersheim-Paul, 1975). According to O’Grady and Lane (1996), the establishment chain therefore reflects a gradual ‘learning through experience’ process within countries.

Regarding the selection of foreign markets, internationalization process theory predicts that “firms enter new markets with successively greater psychic distance,” which results from the degree of dissimilarity between markets, such as “differences in language, culture, political systems, etc.” (Johanson and Vahlne, 1990: 13). As O’Grady and Lane (1996: 310) explain, “There is an implicit assumption that psychically close countries are more similar, and that similarity is easier for firms to manage than dissimilarity, thereby making it more likely that they will succeed in similar markets.” As a result, international business literature largely assumes that country differences represent the source of psychic distance.

This emphasis on country differences, and cultural differences in particular, increased in response to the growing conception that cultural and psychic distance relate closely, as well as due to the availability of relatively straightforward measures of cultural distance. Kogut and Singh (1988: 430), in their study of the influence of cultural distance on entry mode selection, claim that “[c]ultural distance is, in most respects, similar to the ‘psychic distance’ used by the Uppsala school”. Their study popularized the use of a convenient measure of cultural distance based on Hofstede’s (1980) work, which in turn facilitated the interchangeable use of cultural and psychic distance. Furthermore, in their discussion of the Uppsala model, Johanson and Vahlne (1990: 17) explain that “[t]he internationalization model predicts, taking only psychic distance into account, that firms will start by invading ‘neighbouring’ (in the cultural sense) markets and later, as experience grows, more distant markets will be entered.” Here, Johanson and Vahlne explicitly link psychic distance to cultural closeness, unintentionally further obscuring the difference between the two concepts.

In response to the growing convergence between psychic and cultural distance, from the mid-1990s onward, several pleas demanded a more elaborate operationalization of psychic distance (e.g., Evans, Treadgold, and Mavondo, 2000; Harzing, 2003; O’Grady and Lane, 1996; Stöttinger and Schlegelmilch, 1998). On the one hand, some authors suggest expanding the measure of psychic distance by including additional measures of country differences, such as differences in language

(Harzing, 2003), industry structure (O'Grady and Lane, 1996), or legal and administrative approaches (Harzing, 2003). On the other hand, researchers also suggest psychic distance measures based on perceived rather than objective country differences (e.g. Dow, 2000; Evans, Treadgold, and Mavondo, 2000; Harzing, 2003; O'Grady and Lane, 1996), which tend to rely on measures developed by expert panels (Dow, 2000; Ellis, 2007; Nordström, 1991), psychographic instruments (O'Grady and Lane, 1996), and large-scale questionnaires (Stöttinger and Schlegelmilch, 1998).

More recently, the presumed effects of country differences have become subjects of debate. In a critical review, Shenkar (2001) extensively discusses several conceptual illusions and methodological assumptions regarding cultural distance, and Harzing (2003) questions the explanatory power of cultural distance in FDI decisions, particularly regarding entry mode selection and performance evaluation. The presumed influence of cultural distance on FDI decisions may have been overestimated, and country-specific characteristics may hold much more power in explaining foreign investment decisions. In a similar vein, Brewer (2007) proposes extending measures of psychic distance with indicators other than country differences, such as the availability of secondary information about foreign markets or the value of foreign aid programmes.

Empirical studies considering the effects of both cultural and psychic distance on market selection and expansion patterns have produced mixed results. Regarding cultural distance, Erramilli (1991) suggests that increases in firm experience abroad, measured as geographic scope, result in the selection of culturally more distant markets. Along similar lines, Grosse and Goldberg (1991) and Grosse and Trevino (1996) find that cultural distance negatively affects the direct involvement of firms in the United States, in terms of both assets and offices (Grosse and Goldberg, 1991) and FDI (Grosse and Trevino, 1996). Yet studies by Engwall and Wallenstål (1990), Benito and Gripsrud (1992), Mitra and Golder (2002), and Ellis (2007) find no support for the idea that firms gradually expand into culturally more distant countries; rather, Mitra and Golder (2002) and Ellis (2007) suggest that firms tend to enter markets that are similar to previously entered markets rather than to the home market.

Studies on the effect of psychic distance also produce mixed results. For example, Dow (2000) finds that psychic distance, measured using a panel of experts, significantly affects the pattern of export market selection by Australian exporters. In

contrast, Ellis (2007), using a similar method, finds no direct effect of psychic distance on foreign market entry. In their exploration of potential country-level psychic distance stimuli, Dow and Karunaratna (2006) find that differences in education levels and religion in particular affect the intensity of bilateral trade in their sample. Yet Stöttinger and Schlegelmilch (1998: 367) reveal no effect of psychic distance on export development and therefore suggest that “the concept of psychic distance has ‘past [sic] its due-date’.”

### *Familiarity*

The lack of consistent empirical support for the psychic distance construct may result from a misconception about what causes decision makers to perceive some countries as psychologically more distant than others. Recent studies focus on refining the concept by expanding the measurement of psychic distance in operational terms (Brewer, 2007; Dow and Karunaratna, 2006), but we contend that the psychic distance construct requires reconsideration at the conceptual level, especially with regard to the role of country differences as the sole driver of psychic distance.

Internationalization process theory employs the psychic distance construct as the cognitive link between the foreign market and the uncertainty that decision makers experience toward that market (Johanson and Vahlne, 1977). This uncertainty relates to characteristics of the foreign market environment, because country differences “disturb the flow of information between the firm and the market” (Johanson and Vahlne, 1990: 13), which hampers the development of local knowledge. Psychologically more distant countries thus should be less easy to understand, and following the logic of uncertainty reduction, firms prefer the commitment of resources to markets that are more similar to the home country.

What remains underemphasized, however, is that psychic distance is a cognitive phenomenon, based on both knowledge and beliefs. Internationalization process theory fails to acknowledge that implicit beliefs and assumptions about the nature of a foreign market may drastically reduce the uncertainty associated with resource commitments, even when the decision maker lacks knowledge and actual differences exists between countries. In other words, the more we know or *think* we know about a country, the less uncertainty we experience as a result of our (presumed) lack of local knowledge.

Accordingly, the psychological distance that decision makers experience toward a foreign country may stem not only from actual knowledge or information flows but also from the perception of familiarity with a foreign market, which results from beliefs and assumptions that a decision maker holds to be true. Subjective beliefs and assumptions differ from actual knowledge; whereas “[k]nowledge is generally defined as a subset of beliefs [...] beliefs do not have to be justified or true to affect decisions” (Markóczy, 1997: 1230). Thus, the perception of psychic distance should stem from the lack of both actual knowledge and subjective beliefs about a foreign market.

We find a somewhat similar argument in Beckerman (1956), who, in coining the term psychic distance, in our reading refers to the perception of familiarity with a country rather than an inhibitor of information flows. Beckerman (1956: 38) suggests that psychic distance stems from both “the extent to which foreign sources have been personally contacted and cultivated” and the nearness of a foreign market, resulting from a “psychic evaluation” by an individual. Although Beckerman briefly refers to linguistic similarities, country differences are not central in his notion of psychic distance. Rather, he alludes to the extent to which a foreign country is perceived as familiar, as a result of both personal experience and mental representations.

The familiarity argument in turn suggests that the degree of psychic distance depends not on country differences alone but on other factors that affect the knowledge decision makers have and the beliefs they hold. The question of which factors affect the representation of a particular information environment in the knowledge structure of decision makers typically appears in research on managerial and organizational cognition. For example, an extensive review of cognitive work in organizational decision making (Walsh, 1995) illustrates the complexity of understanding the origins of knowledge structures, in that factors at the individual, group, organizational, and national level all likely play a role. Direct personal experience and formal education, as well as socialization processes among the family (Gibson and Papa, 2000) and at the organizational level (Van Maanen and Schein, 1979), represent just some of the factors that shape decision makers’ knowledge structures. Furthermore, research into the determinants of national stereotypes suggests that beliefs about foreign nationals form in response to media coverage and cultural exports (Eagly and Kite, 1987). Overall, these studies indicate that perception links invariably to the cognitive structure of the observer, which in turn

depends on many potential information sources. Regardless of whether decision makers perceive countries as more or less similar, their knowledge and strong beliefs about the nature of those foreign countries and markets affect their perception of familiarity, which should lower the psychological distance they experience .

The term “familiarity” is not new to the international business literature. For instance, Child, Ng, and Wong (2002: 50) expect less psychic distance between the United Kingdom and Hong Kong due to “a degree of mutual familiarity arising from the fact that Hong Kong was a British colony until 1997.” Yet little consensus indicates what familiarity actually implies, and the term often gets applied without further elaboration. It has been equated with geographical proximity (Weinstein, 1977) and cultural distance (Erramilli, 1991) and associated with the liability of foreignness (Pedersen and Petersen, 2004; Zaheer, 1995), foreign market knowledge (Pedersen and Petersen, 2004), and information flows (Brewer, 2007). Both Pedersen and Petersen (2004) and Brewer (2007) associate familiarity with psychic distance, but equating familiarity—and psychic distance—with foreign market knowledge alone, as Pedersen and Petersen (2004) do, may ignore the crucial point that perceptions of familiarity stem from subjective beliefs as well. And although we agree with Brewer’s (2007) assertion that measuring perceived differences alone cannot suffice for operationalizing psychic distance, we propose widening the very notion of what constitutes psychic distance, not just the range of indicators used to measure it.

Furthermore, our argument demands differentiation between familiarity and experience. The perceived familiarity that we associate with psychic distance differs from firm experience, in that experience relates to post-entry learning about foreign markets (Johanson and Vahlne, 1977, 1990). Perceptions of familiarity instead relate to the psychic distance experienced both before and after entry. Therefore, though country-specific corporate experience may explain subsequent increases in resource commitments in a particular market (Davidson, 1980), it holds no explanatory power *ex ante*.

#### *Familiarity and Historical Ties*

Historical ties do not directly refer to country differences but nonetheless often appear associated with reduced psychic distance. Both Brewer (2007) and Dow and Karunaratna (2006) include colonial ties in their efforts to expand and improve the measures used to operationalize psychic distance, and Child, Ng, and Wong (2002)

suggest the short psychic distance between Hong Kong and the United Kingdom results from their historical ties, a claim supported by Ellis (2007), whose psychic distance scores for Hong Kong places the United Kingdom between Thailand and Korea. There are subtle differences in the way historical ties are argued to affect the perception of psychic distance. Whereas Child, Ng, and Wong (2002) and Dow and Karunaratna (2006) expect historical ties to affect perceptions of psychic distance indirectly, by engendering institutional or political and linguistic similarities, Brewer (2007) argues that they result in more detailed knowledge of these countries, which affects the perception of psychic distance directly.

Instead, we consider a historical tie a country-level psychic distance stimulus that positively affects perceptions of familiarity with a particular country by fostering more or less collectively shared beliefs about that country. The exact ways historical ties affect the knowledge structure of a population are complex. For example, postcolonial critics such as Edward Said (1978) note that colonial ties are often reflected in the national education systems and literary histories of the colonizers, which sustains particular representations of these countries in knowledge structures. Similarly, historical ties may foster stereotypical beliefs about foreign nationals (e.g., the Irish as excessive drinkers; Greenslade, Pearson, and Madden, 1995), which are not necessarily shared by the inhabitants of countries without such a historical tie. More direct effects of historical ties are conceivable, such as the presence of certain ethnic minorities or the incorporation of foreign dishes into the national cuisine of a country, which likely shape the mental representation of foreign nationals and foreign contexts further. In short, we argue that both directly and indirectly, historical ties evoke particular shared beliefs about the nature of a foreign country and its nationals, which increases the extent to which a country may be perceived as familiar. Following our familiarity argument, we expect historical ties to reduce the psychological distance experienced by key decision makers and positively affect location decisions.

Will all historical ties, both positive and negative, positively affect location decisions? It can be argued that historical ties with a negative connotation deter investments due to negative sentiments, but we separate the perception of familiarity that results from a historical tie from the emotional connotation of that historical tie. That is, we assume that irrespective of the connotation, historical ties positively affect the perception of familiarity, and psychological distance therefore decreases.



We explore the validity of our argument by examining the effect of historical ties on the location of FDI.<sup>84</sup> In line with our familiarity argument, we expect the following effect of historical ties on the location of foreign investment:

**Hypothesis:** A historical tie between the home and the host country has a positive effect on the amount of foreign direct investment from the home country dedicated to the host country.

Our familiarity argument and the country differences identified in existing literature offer alternative, and potentially complementary, explanations of what drives psychic distance. We therefore also include several measures of country differences in our empirical analysis as control variables, relying primarily on work by Johanson and Wiedersheim-Paul (1975), Johanson and Vahlne (1977, 1990), and Dow and Karunaratna (2006) to select among the many country differences available in the literature.

Specifically, we include differences in culture (Johanson and Vahlne, 1977; 1990; Johanson and Wiedersheim-Paul, 1975), institutionalized business practices (Johanson and Vahlne, 1977), and language (Johanson and Vahlne, 1977; 1990; Johanson and Wiedersheim-Paul, 1975). In addition, we include differences in education level and industrial development, as suggested by Johanson and Vahlne (1977) and Johanson and Wiedersheim-Paul (1975). Both Johanson and Vahlne (1990) and Johanson and Wiedersheim-Paul (1975) also note the potential relevance of religious and political system differences, distinguishing between ideological differences and differences in political freedom (Dow and Karunaratna, 2006). We therefore also control for differences in political ideology, democracy, and religion.<sup>85</sup>

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84 Although colonial ties may represent a determinant of foreign trade (Frankel and Rose, 2002; Linnemann, 1966; Rauch, 1999; Tinbergen, 1962), the potential effect of historical ties on the location of foreign investment remains largely overlooked. Studies of foreign investment that consider historical ties generally interpret them as indicators of either cultural or institutional distance, rather than as an explanatory variable. Rauch (1999) and Wei (2000), for example, combine colonial ties and common language in a composite variable to proxy for cultural distance, and Head and Ries (2005) combine historical ties and geographical distance.

85 Because Dow and Karunaratna (2006) find that the effect of time zones is neither strongly nor consistently significant, we exclude this factor.

### 5.3. Data and Methods

Our empirical analysis focuses on the influence of historical ties and country similarities on the location of FDI, for which we use an adjusted gravity model. We do not seek to explain the location of foreign investment in full, nor measure or operationalize psychic distance directly. Rather, we seek to challenge the assumption that psychic distance stems solely from country differences by contrasting the effects of country similarities with that of a country-level antecedent of perceived familiarity (historical ties) on the location of foreign investment. As Dow and Karunaratna (2006) explain, the use of data pertaining to aggregate firm behaviour is appropriate when the explanatory variables are country-level measures, which involves matching the level of analysis of the dependent and independent variables.

We address the location of FDI from four source countries: the United Kingdom, France, the Netherlands, and Germany. All four source countries are major international investors. Three of the four have been major colonial powers at some point in time, and Germany occupied substantial areas in Africa and maintains historical ties with a substantial number of countries within Europe. By focusing on four source countries from the EU, we control for the effects of preferential trade agreements between host countries and former colonizers. That is, the EU's common border policy applies preferential trade agreements to both the former colonizer and the EU as a whole, which nullifies any advantages of former colonizers over other EU members.

#### *The Gravity Model*

The empirically most successful framework for predicting foreign trade flows is the gravity model (Anderson and Van Wincoop, 2003; Bloningen and Wang, 2004; Rauch, 1999). Gravity equations are increasingly applied to explain cross-border investments, such as FDI flows (Anderson and Van Wincoop, 2003) and FDI stock (Head and Ries, 2008; Wei, 2000). The basic prediction of the gravity model is that “the volume of trade between two countries will be directly proportional to the product of their economic masses (as measured using GDP or GNP) and inversely proportional to the distance between them” (Rauch, 1999: 10). The basic gravity model can be expressed as:

$$Trade_{ij} = \beta_0 * GDP_i^{\beta_1} * GDP_j^{\beta_2} * D_{ij}^{\beta_3}$$

where  $Trade_{ij}$  is the bilateral trade between source country  $i$  and host country  $j$ ;  $GDP_i$  and  $GDP_j$  are the gross domestic products of country  $i$  and  $j$ , respectively; and  $D_{ij}$  is the weighted geographical distance between source country  $i$  and host country  $j$ .

Linearizing equation (1) and substituting FDI for trade, we derive the following gravity equation:

$$\ln(1 + FDI_{ij}) = \beta_0 + (\beta_1 + \beta_2) * \ln(GDP_i GDP_j) + \beta_3 * \ln D_{ij} + \beta_4 * X_{ij} + \varepsilon_{ij}$$

where  $FDI_{ij}$  is the bilateral stock of outward FDI of source country  $i$  in host country  $j$ ,  $\ln(GDP_i GDP_j)$  is the product of the size of the economies of the host and source country, and  $\ln D_{ij}$  is the log of the weighted distance between the source and the host country. In addition,  $X_{ij}$  is a vector that includes bilateral familiarity and similarity variables, and  $\varepsilon_{ij}$  is the error term. Because our four source countries report zero stock of outward FDI for various countries, using the double log form of the gravity equation would cause the loss of potentially valuable information. We therefore use  $\ln(1 + FDI_{ij})$  as the dependent variable, following Eichengreen and Irwin (1995) and others. The sample is (again) truncated at zero, so we estimate the equation using a Tobit rather than an ordinary least squares specification.

#### *FDI Data*

As our dependent variable, we use the bilateral stock of outward FDI of the four source countries by geographical destination between 1984 and 2003. Although using FDI flows may appear more appropriate when analyzing location decisions, FDI flow statistics do not account for multinational enterprise (MNE) activities financed through local capital markets (Devereux and Griffith, 2002), such as setting up a foreign subsidiary with local capital. In addition, outward FDI flow data often contain disinvestments from the host country, which explains their frequent negative values (OECD, 2008). Therefore, we use FDI stock as a closer approximation of the actual location of MNE activity.

We use Source OECD and UNCTAD data about outward FDI stock, complemented with data provided by the Office for National Statistics (U.K.) and

the central banks of Germany, France, and the Netherlands. To convert national currencies into U.S. dollars, we multiply data reported in national currencies by the currency ratios provided by the OECD.

Data pertaining to FDI stock in non-OECD countries is not always consistently reported annually, so we average the reported values for four five-year periods: from 1983–1988, 1989–1993, 1994–1998, and 1999–2003. This approach has two additional advantages. First, it enables us to include a more extensive set of independent variables, based on data from the 1990s, in our analysis of the last time period. Inversely, it prevents an explanation of the location of FDI in the first three time periods that uses variables based on future data. Second, testing our models for four separate time periods enables us to assess the robustness of our estimations against temporal trends in foreign investment, such as the rise of China as a major recipient of FDI.

#### *Independent Variables*

Along with the average bilateral stock of outward FDI in the four five-year periods as our dependent variable, we include the following independent variables.

**National incomes.** The most commonly identified determinant of foreign investment is the market size (measured as national income, or GDP) of both the host and the home country. Our equation includes the market sizes at the beginning of each five-year period in constant 2000 U.S. dollars, as reported by the World Bank World Development Indicators.

**Geographic distance.** The geographic distance between the source and the host countries, taken from the CEPII data set<sup>86</sup>, equals the weighted bilateral distance between the largest cities of the source and target country in kilometres, weighted by the share of the city in the overall population of the country. We expect an ambiguous effect, because greater distance is associated both with more FDI, to circumvent the transportation costs of exports (Egger and Pfaffermayer, 2004), and less FDI, because the costs of monitoring increase with distance (Head and Ries, 2005).

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<sup>86</sup> The CEPII data set was obtained from <http://www.cepii.fr/anglaisgraph/bdd/distances.htm>.

Several variables included in the vector  $X_{ij}$  represent various potential psychic distance stimuli. In addition to historical ties, our familiarity-based psychic distance stimulus, we include common language and seven measures of country differences.

**Historical ties.** We presume a historical tie exists between a host and a source country when substantial parts of both have existed under common rule for a substantial period of time. We define a substantial part of a host country as one-third of the geographical area or one-third of the population. With regard to a substantial period of time, we use one generation, which corresponds to 30 years of common rule. Key to our definition of a historical tie is that a certain degree of historical familiarization must be assumed to have taken place. We include historical ties starting with the coronation of Otto I in 962, which marks the formation of the Holy Roman Empire and the unification of several Central European fiefdoms. Data on colonial ties come from Henige (1970), and data on historical ties within Europe derive from Davies (1996) and Bideleux and Jeffries (2002).

**Common language.** A host and a source country share a common language when the official language of the source country is an official language in the host country. The CEPII data set provide data about common languages.

**Cultural distance.** Due to the pervasiveness of the concept in the international business literature and the common notion that cultural similarities between the host and the source country affect the location of foreign investment, we include a measure of bilateral cultural distance. Specifically, we adopt the most common measure of cultural distance, based on Hofstede's (1980) indices, as suggested by Kogut and Singh (1988):

$$CD_{st} = \sum_{i=1}^4 \{(I_{is} - I_{it})^2 / V_i\} / 4,$$

where  $CD_{st}$  is the cultural distance between source country  $s$  and target country  $t$ ,  $(I_{is} - I_{it})$  is the difference in scores of countries  $s$  and  $t$  on characteristic  $i$ , and  $V_i$  is the variance on characteristic  $i$ .<sup>87</sup> Because we estimate a double log form of the gravity model, we use the log of cultural distance in our equation.

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<sup>87</sup> The original measure of cultural distance, provided by Kogut and Singh (1988), distinguishes between Hofstede's scores for the United States (u) and the included foreign countries (j).

**Institutional distance.** Measures of institutional distance, as developed by Kostova and others (Busenitz, Gómez, and Spencer, 2000; Kostova, 1997, 1999; Kostova and Roth, 2002), rely on the decomposition of the institutional environment into regulative, normative, and cognitive components. Such institutional profiles can be compiled only with respect to very specific domains, such as the legitimacy of a particular organizational practice, which resides at a much lower level of analysis than that of our study. To capture relevant country-level institutional differences and similarities, we therefore apply a measure of institutional distance based on the key country-level institutional features identified by Whitley (1999).

We use data pertaining to 59 countries from the Global Competitiveness Report (2000) and match Whitley's (1999) institutional features with the indicators from the Global Competitiveness Report that best capture the intended institutional characteristics (see Appendix 5.A). To explore the validity of our indicators, we performed a cluster analysis of the OECD countries in our sample to determine the extent to which our indicators reproduce the business system typologies expected by Whitley (1999), as discussed in greater detail elsewhere (Hotho, 2008). Overall, we find sufficient support for the validity of our institutional indicators. We calculate institutional distance in a manner similar to the cultural distance index proposed by Kogut and Singh (1988) but without correcting for differences in variance,<sup>88</sup> which takes the form:

$$ID_{jk} = \sum_{i=1}^{11} (I_{ij} - I_{ik})^2 / 11$$

where  $ID_{st}$  is the institutional distance between source country  $s$  and target country  $t$ , and  $(I_{is} - I_{it})$  is the difference in the scores of countries  $s$  and  $t$  on institutional feature  $i$ .<sup>89</sup> To compare the estimated coefficients with those of the other variables, we use the log of institutional distance in our equation.

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88 As Kogut and Singh (1988) concur, correcting for variance imposes certain weights on the indicators included in a composite index. When the original scores are scaled similarly, as is the case in the Global Competitiveness Report, correcting for variance would inflate relatively small differences on some indicators and marginalize more considerable differences in country scores on other indicators. This procedure would unnecessarily distort the resulting institutional distances.

89 The calculated institutional distances are available upon request.

Furthermore, we adopt five composite variables pertaining to country differences from Dow and Karunaratna (2006).

**Education.** Dow and Karunaratna (2006) calculate the difference in education levels by first calculating the differences in adult literacy and enrolment rates in both secondary and tertiary education for the population over 15 years. Subsequently, they apply factor analysis to combine the three scores into a single difference variable, then take the absolute value.

**Democracy.** Country-level differences in the degree of democracy reflect the mean scores of four different democracy variables, taken from the POLCON V, the (modified) POLITY IV, the Freedom House Political Rights, and the Freedom House Civil Liberties database between 1993 and 1998. Dow and Karunaratna (2006) first calculate country differences for each score, then combine the scores using factor analysis to derive the absolute values.

**Industrial development.** Industrial development depends on income levels, energy consumption, the percentage of the labour force not working in agriculture, urbanisation, and the number of passenger cars, newspaper circulation, radios, telephones, and televisions per 1000 inhabitants. All data refer to 1994, except for the literacy rate, which has values for 1995. Dow and Karunaratna (2006) calculate the country differences for each variable, combine them into a single variable using factor analysis, and use the absolute differences.

**Political ideology.** Scores of different political ideologies come from Beck and colleagues (2001), measured between 1993 and 1998, and indicate absolute differences.

**Religion.** To measure differences in major religions between countries, we first assign scores to the distance between the two closest major religions between countries, ranging from those of the same denomination or sect to those that belong to different religious families. Subsequently, we assign scores to the prevalence of a country's major religion in the other country, and vice versa. Factor analysis enables us to combine the differences between these scores. Data come from Dow and Karunaratna (2006) and date from 2000.

#### **5.4. Results**

In table 5.1 we start by presenting the descriptive statistics and the correlation matrix for the most recent time period (1999–2003) for both the extended sample including

as many countries as we have data for (including on average 26 African countries per source country<sup>90</sup>) and for the limited sample for which all the data was available. Subsequently, we estimated the basic model for our extended sample, see table 5.2. In table 5.3 the estimations for the limited sample of countries for which all (similarity) variables were available are shown, to enable a comparison of familiarity and similarity measures. Finally, in Appendix 5.B contains the correlation tables and results for the earlier periods. Correlations remain stable across the four time periods. As Table 5.1 shows, the dummies for historical ties and common language are moderately correlated ( $r = 0.62$  for the extended sample,  $r = 0.60$  for the limited sample); therefore, we do not include historical ties and common language in the same equation in either sample.

In the limited sample, neither the historic tie dummy nor the language dummy correlates strongly with any of the other similarity-based variables. As expected (Dow and Karunaratna, 2006), the democracy, education, and industrial development variables show signs of multicollinearity, especially between education and industrial development ( $r = 0.77$ ). The rest of the correlation matrix does not suggest any clear incidences of multicollinearity, but we test for it by estimating auxiliary regressions involving only independent variables. Cultural and institutional distance and, to a lesser extent, cultural distance and the dummy for language correlate mildly. Including these variables together may result in biased estimates.

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<sup>90</sup> This sample includes 17 African countries the UK invests in, 37 African countries the Netherlands invests in, 13 African countries Germany invests in and 39 African countries in which France invests.



Table 5.1: Descriptive statistics and correlations 1999–2003

| Variables                  | N    | Mean  | s.d. | 1       | 2       | 3      | 4       | 5       | 7      | 8      | 9      | 10     | 11    | 12   |
|----------------------------|------|-------|------|---------|---------|--------|---------|---------|--------|--------|--------|--------|-------|------|
| 1. FDI 1999-2003           | 677  | 4.24  | 3.1  |         |         |        |         |         |        |        |        |        |       |      |
| 2. National incomes 1999   | 732  | 23.01 | 2.5  | 0.81**  |         |        |         |         |        |        |        |        |       |      |
| 3. Distance                | 800  | 8.47  | 0.9  | -0.57** | -0.35** |        |         |         |        |        |        |        |       |      |
| 4. Historical ties         | 852  | 0.17  |      | 0.18**  | 0.20    | -0.01  |         |         |        |        |        |        |       |      |
| 5. Common language         | 804  | 0.13  |      | 0.13**  | -0.08** | 0.62** |         |         |        |        |        |        |       |      |
| N                          | Mean | s.d.  | 1    | 2       | 3       | 4      | 5       | 7       | 8      | 9      | 10     | 11     | 12    |      |
| 1. FDI 1999-2003           | 171  | 7.68  | 2.11 |         |         |        |         |         |        |        |        |        |       |      |
| 2. National incomes 1999   | 171  | 26.06 | 1.52 | 0.69**  |         |        |         |         |        |        |        |        |       |      |
| 3. Distance                | 171  | 8.11  | 1.17 | -0.53** | -0.22** |        |         |         |        |        |        |        |       |      |
| 4. Historical ties         | 171  | 0.13  | 0.34 | 0.33**  | 0.19*   | -0.18* |         |         |        |        |        |        |       |      |
| 5. Common language         | 171  | 0.09  | 0.29 | 0.25**  | 0.04    | -0.1   | 0.60**  |         |        |        |        |        |       |      |
| 7. Cultural distance       | 171  | 0.37  | 0.91 | -0.36** | -0.26** | 0.27** | -0.25** | -0.33** |        |        |        |        |       |      |
| 8. Institutional distance  | 171  | 0.37  | 0.67 | -0.46** | -0.37** | 0.34** | -0.22** | -0.19*  | 0.42** |        |        |        |       |      |
| 9. Democracy               | 171  | 0.31  | 0.38 | -0.27** | -0.06   | 0.39** | -0.14   | -0.09   | 0.33** | 0.38** |        |        |       |      |
| 10. Education              | 171  | 0.57  | 0.47 | -0.44** | -0.26** | 0.55** | -0.05   | -0.07   | 0.21** | 0.40** | 0.48** |        |       |      |
| 11. Industrial development | 171  | 0.74  | 0.57 | -0.51** | -0.29** | 0.49** | -0.14   | -0.16*  | 0.33** | 0.45** | 0.51** | 0.77** |       |      |
| 12. Political ideology     | 171  | 0.38  | 0.26 | 0.02    | 0.09    | -0.08  | 0.11    | 0.07    | 0      | 0.05   | 0.1    | 0.07   | 0.06  |      |
| 13. Religion               | 171  | -0.62 | 0.82 | 0       | 0.22**  | 0.20** | 0.04    | 0.01    | 0.18*  | -0.06  | 0.35** | 0.21** | 0.18* | 0.04 |

\* p < 0.05, \*\* p < 0.0

**Table 5.2: Results of the gravity model for FDI location between 1999 and 2003 for the extended sample**

|                         | Dependent Variable: Ln FDI 1999-2003 |                    |                    |
|-------------------------|--------------------------------------|--------------------|--------------------|
|                         | (1)                                  | (2)                | (3)                |
| National incomes        | 1.07***<br>(0.03)                    | 1.07***<br>(0.03)  | 1.08***<br>(0.03)  |
| Distance                | -0.58***<br>(0.09)                   | -0.58***<br>(0.09) | -0.60***<br>(0.09) |
| Historical ties         |                                      | 1.14***<br>(0.20)  |                    |
| Common language         |                                      |                    | 1.62***<br>(0.23)  |
| Adjusted R <sup>2</sup> | 0.71                                 | 0.73               | 0.74               |
| N                       | 589                                  | 589                | 589                |

The model is estimated using a tobit specification, Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Our estimations for the extended sample provide evidence for our main hypothesis that a historical tie between the home and the host country has a positive effect on the amount of foreign direct investment from the home country dedicated to the host country. We start with the basic gravity model including market size and geographical distance in model (1) and add the historical tie dummy in model (2). The historical tie variable is significant and shows the expected positive sign, and the explanatory power of the model increases. The only other variable that has sufficient data for developing countries is official language. Although this variable is often used as an indicator of country similarity, table 5.1 shows that it does not correlate with any of the other similarity measures included in this study. Our interpretation of common language is that it is, like historical ties, an indicator of familiarity rather than similarity. First of all, because historical ties and common language are mutually correlated but are both not correlated with any of the similarity measures. If these similarity measures are to capture the same phenomenon, the least one would expect is that they correlate with each other. Furthermore, the argument that a common language makes a country more similar would mean that for example the UK would be more similar to at the same time the US and Zambia, where often the argument in literature is (see for example the discussion on colonial institutions in chapter one)

that the reason the US is rich and Zambia is poor is that they have such *different* institutions. See for an extended discussion of this point page 160. So in model (3) we consider the effect of common language. The effect of language is strongly significant and comparable to the effect of historical ties. Given the unavailability of similarity measures for developing countries, we now proceed with the estimations with a limited sample of countries.

Table 5.3: Results of the gravity model for FDI location between 1999 and 2003 for the limited sample

|                                      | (1)                | (2)                | (3)                | (4)                | (5)                | (6)                | (7)                | (8)                | (9)                | (10)               | (11)               | (12)               | (13)               |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Dependent Variable: Ln FDI 1999-2003 |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| National                             | 0.83***<br>(0.07)  | 0.80***<br>(0.07)  | 0.80***<br>(0.07)  | 0.78***<br>(0.07)  | 0.83***<br>(0.06)  | 0.84***<br>(0.07)  | 0.81***<br>(0.07)  | 0.78***<br>(0.07)  | 0.84***<br>(0.07)  | 0.86***<br>(0.07)  | 0.78***<br>(0.07)  | 0.76***<br>(0.07)  | 0.75***<br>(0.07)  |
| incomes                              |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Distance                             | -0.73***<br>(0.09) | -0.69***<br>(0.08) | -0.68***<br>(0.09) | -0.67***<br>(0.09) | -0.70***<br>(0.08) | -0.66***<br>(0.09) | -0.64***<br>(0.10) | -0.57***<br>(0.09) | -0.73***<br>(0.09) | -0.70***<br>(0.09) | -0.66***<br>(0.09) | -0.64***<br>(0.09) | -0.63***<br>(0.09) |
| Historical ties                      |                    | 0.98***<br>(0.29)  |                    |                    |                    |                    |                    |                    |                    |                    | 0.89***<br>(0.30)  | 0.91***<br>(0.30)  | 0.86***<br>(0.30)  |
| Cultural                             |                    |                    | -0.25**<br>(0.11)  |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| distance                             |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    | -0.13<br>(0.12)    |
| Institutional                        |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| distance                             |                    |                    |                    | -0.39**<br>(0.16)  |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Common                               |                    |                    |                    |                    | 1.34***<br>(0.33)  |                    |                    |                    |                    |                    |                    |                    |                    |
| language                             |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Democracy                            |                    |                    |                    |                    |                    | -0.51*<br>(0.28)   |                    |                    |                    |                    |                    |                    |                    |
| Education                            |                    |                    |                    |                    |                    |                    | -0.45*<br>(0.26)   |                    |                    |                    |                    |                    |                    |
| Industrial                           |                    |                    |                    |                    |                    |                    |                    | -0.73***<br>(0.20) |                    |                    |                    |                    |                    |
| development                          |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| Political                            |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| ideology                             |                    |                    |                    |                    |                    |                    |                    |                    | -0.48<br>(0.38)    |                    |                    |                    |                    |
| Religion                             |                    |                    |                    |                    |                    |                    |                    |                    |                    | -0.17<br>(0.13)    |                    |                    |                    |
| Adjusted R <sup>2</sup>              | 0.619              | 0.641              | 0.627              | 0.629              | 0.652              | 0.624              | 0.624              | 0.646              | 0.621              | 0.621              | 0.644              | 0.647              | 0.647              |
| N                                    | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                |

The model is estimated using tobit specification. Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Table 5.3 Results of the gravity model for FDI location between 1999 and 2003 for the limited sample (cont.)

|                                      | (14)               | (15)               | (16)               | (17)               | (18)               | (19)               | (20)               | (21)               | (22)               | (23)               | (24)               |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Dependent Variable: Ln FDI 1999-2003 |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |                    |
| National incomes                     | 0.81***<br>(0.07)  | 0.79***<br>(0.07)  | 0.78***<br>(0.07)  | 0.78***<br>(0.07)  | 0.77***<br>(0.07)  | 0.75***<br>(0.07)  | 0.82***<br>(0.07)  | 0.81***<br>(0.07)  | 0.79***<br>(0.07)  | 0.75***<br>(0.07)  | 0.79***<br>(0.07)  |
| Distance                             | -0.68***<br>(0.08) | -0.65***<br>(0.09) | -0.65***<br>(0.09) | -0.60***<br>(0.09) | -0.55***<br>(0.10) | -0.51***<br>(0.09) | -0.62***<br>(0.09) | -0.59***<br>(0.10) | -0.54***<br>(0.09) | -0.54***<br>(0.10) | -0.57***<br>(0.10) |
| Historical ties                      |                    |                    |                    | 0.93***<br>(0.30)  | 0.97***<br>(0.29)  | 0.94***<br>(0.29)  |                    |                    |                    | 0.92***<br>(0.29)  |                    |
| Cultural distance                    | -0.11<br>(0.12)    |                    | -0.06<br>(0.12)    | -0.08<br>(0.12)    | -0.10<br>(0.12)    | -0.06<br>(0.12)    | 0.00<br>(0.12)     | -0.02<br>(0.12)    | 0.01<br>(0.12)     | -0.05<br>(0.12)    | 0.02<br>(0.12)     |
| Institutional distance               |                    | -0.29*<br>(0.16)   | -0.27<br>(0.17)    | -0.26<br>(0.18)    | -0.21<br>(0.18)    | -0.14<br>(0.17)    | -0.25<br>(0.18)    | -0.23<br>(0.17)    | -0.15<br>(0.17)    | -0.18<br>(0.18)    | -0.19<br>(0.18)    |
| Common language                      | 1.23***<br>(0.34)  | 1.24***<br>(0.33)  | 1.19***<br>(0.34)  |                    |                    |                    | 1.28***<br>(0.34)  | 1.27***<br>(0.34)  | 1.21***<br>(0.33)  |                    | 1.19***<br>(0.33)  |
| Democracy                            |                    |                    |                    | -0.08<br>(0.31)    |                    |                    | -0.15<br>(0.30)    |                    |                    | 0.17<br>(0.31)     | 0.06<br>(0.31)     |
| Education                            |                    |                    |                    |                    | -0.32<br>(0.26)    |                    |                    | -0.23<br>(0.26)    |                    | 0.25<br>(0.34)     | 0.32<br>(0.33)     |
| Industrial development               |                    |                    |                    |                    |                    | -0.59***<br>(0.20) |                    |                    | -0.52***<br>(0.20) | -0.75***<br>(0.27) | -0.70***<br>(0.27) |
| Political ideology                   |                    |                    |                    | -0.48<br>(0.37)    | -0.43<br>(0.37)    | -0.38<br>(0.36)    | -0.45<br>(0.36)    | -0.43<br>(0.36)    | -0.37<br>(0.36)    | -0.42<br>(0.36)    | -0.40<br>(0.36)    |
| Religion                             |                    |                    | -0.17<br>(0.13)    | -0.17<br>(0.13)    | -0.14<br>(0.13)    | -0.11<br>(0.12)    | -0.17<br>(0.13)    | -0.17<br>(0.13)    | -0.13<br>(0.12)    | -0.15<br>(0.13)    | -0.15<br>(0.13)    |
| Adjusted R <sup>2</sup>              | 0.651              | 0.656              | 0.654              | 0.649              | 0.652              | 0.665              | 0.657              | 0.658              | 0.660              | 0.663              | 0.668              |
| N                                    | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                | 171                |

The model is estimated using tobit specification. Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Model (1) (table 5.3) provides the results from the basic gravity model for the limited sample. In model (2), we add the historical tie dummy. The coefficient of historical ties is significant ( $p < 0.001$ ), with the expected positive sign, and increases the explanatory power of the model. This result is consistent with our findings for the earlier time periods (Appendix 5.B). In the subsequent models (models (3)–(10)), we estimate the isolated effects of the control variables and find that the coefficients of both cultural distance (model (3)) and institutional distance (model (4)) are significant ( $p < 0.05$ ), with the expected negative signs. In model (5), we estimate the effect of common language in isolation. Similar to historical ties, the coefficient is strongly significant ( $p < 0.001$ ) and displays the expected positive sign. The results for cultural distance and common language also are consistent with our results for earlier time periods (Appendix 5.B). In models (6)–(10), we estimate the effects of the similarity variables adopted from Dow and Karunaratna (2006); differences in democracy ( $p < 0.10$ ), education level ( $p < 0.10$ ), and the level of industrial development ( $p < 0.001$ ) all appear to have a negative effect on the location of foreign investment in isolation. However, we find no significant effects of differences in political ideology (model (9)) or religion (model (10)).

In models (11)–(16), we estimate the combined effects of cultural and institutional distance with historical ties and common language, respectively. When we consider the effect of cultural distance in combination with historical ties (model (11)) and common language (model (14)), the coefficient of cultural distance shows the expected sign, but the effect is not significant. Both the effects of historical ties and common language remain strongly significant, and the coefficients show the expected sign. We find similar results for the earlier time periods (Appendix 5.B); the effect of cultural distance weakens or disappears when combined with either historical ties or common language, which both remain strongly significant. Furthermore, the coefficient of institutional distance remains significant when considered with both historical ties (model (12),  $p < 0.05$ ) and common language (model (15),  $p < 0.10$ ). When we contrast the effects of historical ties and common language with both cultural and institutional distance (models (13) and (16)), the coefficients for both cultural and institutional distance exhibit the expected sign but are not significant. The coefficient of both historical ties and common language remains strongly significant ( $p < 0.01$  and  $p < 0.001$ , respectively).

In the final estimations (models (17)–(24)), we work toward a full model. Because of the potential issues of multicollinearity among democracy, education, and

industrial development (Dow and Karunaratna, 2006), we first estimate their effects separately (models (17)–(22)). Somewhat surprisingly, the only coefficient that remains significant is that for differences in industrial development (models (19) and (22)). The coefficients of historical ties (models (17)–(19)) and common language (models (20)–(22)) both remain strong and significant ( $p < 0.01$  and  $p < 0.001$ , respectively). In the final set of models ((23) and (24)), we retain all variables, alternating only the collinear historical ties and common language variables. Consistent with our previous estimations, only the coefficients of historical ties, common language, and industrial development remain significant. The explanatory power of the models with historical ties (model (23)) and common language (model (24)) are comparable, with adjusted  $R^2$  of 0.663 and 0.668, respectively.

## **5.5. Discussion and Conclusion**

This study attempts to reflect critically on the commonly held assumption that underlies the psychic distance construct, namely, that firms favour foreign markets that are similar to the home market and eschew the commitment of resources to markets that are dissimilar. We argue that decision makers may perceive some countries and markets as psychologically more close than others because of not only the degree of similarity between the home and the foreign country but also the extent to which that decision maker perceives the foreign market as familiar.

We explore the validity of our argument by contrasting the effect of a set of similarity-based psychic distance stimuli with that of historical ties, a country-level psychic distance stimulus that we associate with foreign market familiarity. The results suggest that historical ties, common language, and differences in industrial development provide a stronger and more robust explanation of the location of foreign direct investment than do cultural or institutional similarities or similarities in terms of the political system, education level, or religion.

### *Effect of Historical Ties and Common Language*

Our estimates generally indicate that both historical ties and common language have significant effects on the location of FDI. The consistent effect of historical ties in both the extended and the limited sample supports our hypothesis, yet these results require further comment because of the correlation between historical ties and common language ( $r = 0.62$  in the extended sample and  $r = 0.60$  in the limited

sample). This finding is not surprising: In intensely colonized countries, native languages often got replaced with or complemented by the language of the colonizers. Two questions thus remain: Can the observed effect be attributed to either historical ties or common language, and does the significant effect of historical ties indicate a similarity effect or a familiarity effect?

To disentangle the effects of historical ties and common language, we removed countries with both a historical tie and a common language from our sample and re-estimate the effects of ties and language. Although the variation explained by historical ties remains consistently higher for all four periods, both ties and language become insignificant because of the reduced sample size. Strictly speaking, we therefore must conclude that the effects of historical ties and common language are inseparable on the basis of the current data set, and that both their effects are significant.

Thus, we turn to the question of whether the significant effect of historical ties should be interpreted as a similarity or a familiarity effect. A look at the correlation matrix indicates that though historical ties and common language are moderately correlated, neither correlates with any of the other similarity measures. This is not to claim that, for example, historical ties with the U.K. did not at least partially inform the parliamentary system of New Zealand or the legal system of South Africa. Rather, the correlation matrix illustrates that historically tied countries are not necessarily more similar in terms of the country characteristics most frequently associated with reduced psychic distance, see page 154. In addition, though the effects of both historical ties and language are significant and robust, the effects of many similarity-based variables remain insignificant. These observations provide at least partial support for the argument that the effect of historical ties captures a construct distinctive from that of country similarities.

#### *Cultural and Institutional Distance*

By and large, we cannot confirm that differences in culture, as measured with Kogut and Singh's (1988) measures, affect the location of FDI from the four source countries in our sample. Although our results suggest that cultural distance has merit as an explanatory variable when considered in isolation, this power mostly disappears when combined with other—better—explanatory variables, such as historical ties and common language. These results add to the work of those sceptical of the cultural distance concept or its supposed effects, such as Benito and Gripsrud



(1992), Shenkar (2001), Harzing (2003), and Tihanyi, Griffith, and Russell (2005). We also confirm the insignificant effect of cultural distance on internationalization decisions, even though Kogut and Singh's (1988) index remains one of the most indiscriminately applied psychic distance surrogates.<sup>91</sup>

A similar conclusion emerges regarding the effect of institutional distance: It has some explanatory power when considered in isolation or in combination with historical ties and common language, yet the effect disappears when we combine institutional distance with additional variables, such as cultural distance and industrial development, with which it is moderately correlated. This finding is not to say that institutions do not matter in location decisions; as evidenced in other empirical studies (e.g., Bevan, Estrin, and Meyer, 2004; Jakobsen and De Soysa, 2006), institutional *quality* serves to increase the attractiveness of countries as destinations for foreign investment, even if the combination of institutional conditions that determine location attractiveness differs by region (Pajunen, 2008). However, our results do not support the notion that substantive institutional country differences have a negative effect on locational attractiveness, which casts doubt on institutional differences as a significant psychic distance stimulus.

*Effects of Democracy, Education, Religion, Industrial Development, and Political Ideology*

We estimate the effects of several additional country similarities using measures developed by Dow and Karunaratna (2006). Although the effect of differences in industrial development is significant, we find no consistent effects of differences in democracy, education, political ideology, or religion on the location of foreign investment. However, multicollinearity among industrial development, education, and democracy means these results are not necessarily unbiased.

For three reasons, we nonetheless recommend differences in industrial development as a key predictor variable. First, when we alternate the industrial development, education, and democracy variables in the extended models (models (17)–(22)), only the coefficient for industrial development remains significant. Second, in our sample, differences in industrial development correlate most strongly with the location of foreign investment. In contrast with Dow and Karunaratna

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<sup>91</sup> Kogut and Singh proposed the measure in a study on entry-mode selection rather than on geographic location decisions. However, their measure thereafter has been applied in all sorts of studies related to foreign investment.

(2006), we therefore identify differences in industrial development, rather than differences in education, as the most significant psychic distance stimulus. Alternatively, the negative effect of differences in the degree of industrial development on the location of FDI may reflect the common notion that most MNE activity takes place within the “triad” of developed countries in the European Union, North America, and Asia (Rugman, 2000; Rugman and Verbeke, 2004). At the least, the results demonstrate that when it comes to the location of foreign investment, not all country differences equally affect location attractiveness. Third, the large differences in the effects of religion, education, and language support Dow and Karunaratna’s (2006) suggestion that the relative contribution of various psychic distance stimuli likely varies with the type of managerial decision or the type of entry mode.

#### *The Familiarity Dimension of Psychic Distance*

The dominant argument in the field of international business regarding psychic distance and the location of foreign investment asserts that the higher the degree of (perceived) similarity between the home and the foreign market, the lower the psychic distance experienced (Johanson and Wiedersheim-Paul, 1975), whereas the lower the psychic distance, the less uncertain firms are toward a foreign market (Kogut and Singh, 1988), and the higher the propensity or likelihood that the firm will invest or expand in that country (Johanson and Vahlne, 1990). In this study, we develop the notion of familiarity and suggest that what determines psychological distance is not merely the perception of country differences but also the degree to which a decision maker perceives a foreign market as familiar. Our empirical finding that historical ties, common language, and industrial development have a strong effect on the location of foreign investment, whereas the effect of other measures of country similarities is not significant, adds support to our argument that current conceptualizations of psychic distance overlook an important dimension.

The familiarity construct offers interesting implications for the psychic distance concept and internationalization process theory. Country differences may inhibit the flow of information between foreign markets and the firm (Brewer, 2007; Johanson and Vahlne, 1975), yet cognition research demonstrates that both knowledge and beliefs depend on a much wider range of information sources at the individual, organizational, and national levels (Walsh, 1995). As a result, a person may claim familiarity with countries that he or she perceives as very different from

the home country. Future research should examine the implications of such off-diagonal relations on the perception of psychic distance. In addition, holding or forming beliefs about foreign markets requires no actual experience, which implies that prior to entry, foreign markets may be perceived already as familiar (e.g. Pedersen and Petersen, 2004), with high confidence levels about the foreign context, even in the absence of actual local knowledge. Therefore, further research should also examine whether the perception of familiarity permits firms to demonstrate high levels of local engagement, even at entry.

Our study also comes with three important caveats. First, data on measures capturing similarity between countries are only available for a limited number of almost exclusively developed countries. This means that this study stands out from the other chapter in this thesis where we focus exclusively on *the developing* region in the world: Africa. It also means that we can not comment the relation between similarities and internationalisation patterns for developing countries, based on empirical results. But despite this serious shortcomings, we try to shed some light on the relationship between historic ties and investment patterns by providing additional estimates for an extended sample of countries that include many developing countries including the majority of Africa.

Second, though the use of country-level data enabled us to study the effect of several alleged country-level antecedents of psychic distance on aggregate firm behaviour, it does not allow for the measurement of psychic distance itself, which requires detailed firm- or individual-level data. Our level of analysis also implies that we cannot comment on the effect of historical ties on the actual internationalization sequence of firms or the commitment of resources to foreign markets over time. Despite these significant shortcomings, our results suggest that for the location of foreign investment, not all country similarities have equal weight as psychic distance stimuli. A comparison with Dow and Karunaratna (2006), who use trade intensity as their dependent variable, reveals that our results support their notion that the relative contribution of psychic distance stimuli may also differ, depending on the entry mode decision. For example, whereas a common language is not conducive for trade, language may positively affect location decisions when such decisions involve

local investments.<sup>92</sup> Our results therefore caution against the indiscriminate use of country differences as a surrogate for psychic distance.

Third, the historical ties variable we develop arguably provides a rather crude indicator of the perception of familiarity, and it may be compromised by its correlation with common language. In addition, as we have emphasized, many other factors likely influence the extent of perceptions of familiarity with a foreign market. We focus on historical ties mainly because they frequently have been recognized as potential psychic distance stimuli (e.g. Brewer, 2007; Dow and Karunaratna, 2006), though usually with the assumption that they engender country similarities—an assumption that, with the exception of common language, our data do not support.

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<sup>92</sup> In contrast with our findings, in Dow and Karunaratna (2006) the coefficient of the language variable—which correlates strongly with our common language dummy ( $r = 0.84$ )—is not consistently significant.



# Appendices

## Appendix 1.A

*Table 1.A.: Colonial period per country*

| Country              | Colonial name                   | Colonial power  | Date of colonisation           | Independence date |
|----------------------|---------------------------------|-----------------|--------------------------------|-------------------|
| Angola               | Angola (Portuguese West Africa) | Portugal        | Berlin Conference<br>1884-1885 | 1975              |
| Benin                | French West Africa              | France          | Berlin Conference<br>1884-1885 | 1960              |
| Botswana             | Bechuanaland                    | Britain         | Berlin Conference<br>1884-1885 | 1966              |
| Burkina Faso         | Upper Volta                     | France          | Berlin Conference<br>1884-1885 | 1960              |
| Burundi              | Ruanda-Urundi                   | Belgium         | Berlin Conference<br>1884-1885 | 1962              |
| Cameroon             | Cameroun                        | France, Britain | Berlin Conference<br>1884-1885 | 1960              |
| Cape Verde           |                                 | Portugal        | Berlin Conference<br>1884-1885 | 1975              |
| Central African Rep. | French Equatorial Africa        | France          | Berlin Conference<br>1884-1885 | 1960              |
| Chad                 | French Equatorial Africa        | France          | Berlin Conference<br>1884-1885 | 1960              |
| Comoros              |                                 | France          | Berlin Conference<br>1884-1885 | 1975              |
| Congo                | French Equatorial Africa        | France          | Berlin Conference<br>1884-1885 | 1960              |
| Côte d'Ivoire        | Côte d'Ivoire                   | France          | Berlin Conference<br>1884-1885 | 1960              |
| Djibouti             | French Somaliland               | France          | Berlin Conference<br>1884-1885 | 1977              |
| DR Congo             | Belgian Congo                   | Belgium         | Berlin Conference<br>1884-1885 | 1960              |
| Equatorial Guinea    | Spanish Guinea                  | Spain           | Berlin Conference<br>1884-1885 | 1968              |
| Eritrea              | Eritrea                         | Ethiopia        | Berlin Conference<br>1884-1885 | 1993              |
| Ethiopia             | Kingdom of Aksum                |                 | Berlin Conference<br>1884-1885 |                   |
| Gabon                | French Equatorial Africa        | France          | Berlin Conference<br>1884-1885 | 1960              |
| Ghana                | Gold Coast                      | Britain         | Berlin Conference<br>1884-1885 | 1957              |

*Table 1.A.1 continued: Colonial period per country*

| Country               | Colonial name                             | Colonial power                   | Date of colonisation           | Independence date |
|-----------------------|---|----------------------------------|--------------------------------|-------------------|
| Guinea                | French West Africa                        | France                           | Berlin Conference<br>1884-1885 | 1958              |
| Guinea-Bissau         | Portuguese Guinea                         | Portugal                         | Berlin Conference<br>1884-1885 | 1973              |
| Kenya                 | British East Africa                       | Britain                          | Berlin Conference<br>1884-1885 | 1963              |
| Lesotho               | Basutoland                                | Britain                          | Berlin Conference<br>1884-1885 | 1966              |
| Liberia               | Commonwealth of Liberia                   | American<br>Colonization Society | Berlin Conference<br>1884-1885 | 1847              |
| Madagascar            | Malagasy Protectorate                     | France                           | Berlin Conference<br>1884-1885 | 1960              |
| Malawi                | Nyasaland                                 | Britain                          | Berlin Conference<br>1884-1885 | 1964              |
| Mali                  | French West Africa                        | France                           | Berlin Conference<br>1884-1885 | 1960              |
| Mauritania            | French West Africa                        | France                           | Berlin Conference<br>1884-1885 | 1960              |
| Mauritius             |   | Britain                          | Berlin Conference<br>1884-1885 | 1968              |
| Mozambique            | Portuguese East Africa                    | Portugal                         | Berlin Conference<br>1884-1885 | 1975              |
| Namibia               | South West Africa                         | South Africa                     | Berlin Conference<br>1884-1885 | 1990              |
| Niger                 | French West Africa                        | France                           | Berlin Conference<br>1884-1885 | 1960              |
| Nigeria               | Nigeria                                   | Britain                          | Berlin Conference<br>1884-1885 | 1960              |
| Rwanda                | Ruanda-Urundi                             | Belgium                          | Berlin Conference<br>1884-1885 | 1962              |
| São Tomé and Príncipe |   | Portugal                         | Berlin Conference<br>1884-1885 | 1975              |
| Senegal               | French West Africa                        | France                           | Berlin Conference<br>1884-1885 | 1960              |
| Seychelles            |   | Britain                          | Berlin Conference<br>1884-1885 | 1976              |
| Sierra Leone          | Sierra Leone                              | Britain                          | Berlin Conference<br>1884-1885 | 1961              |
| Somalia               | Italian Somaliland, British<br>Somaliland | Italy, Britain                   | Berlin Conference<br>1884-1885 | 1960              |
| South Africa          | South Africa                              | Britain                          | Berlin Conference<br>1884-1885 | 1961              |
| Sudan                 | Sudan                                     | Britain                          | Berlin Conference<br>1884-1885 | 1956              |

*Table 1.A.1 continued: Colonial period per country*

| Country    | Colonial name       | Colonial power | Date of colonisation           | Independence date |
|------------|---------------------|----------------|--------------------------------|-------------------|
| Swaziland  | Swaziland           | Britain        | Berlin Conference<br>1884-1885 | 1968              |
| Tanzania   | Tanganyika          | Britain        | Berlin Conference<br>1884-1885 | 1964              |
| The Gambia | Gambia              | Britain        | Berlin Conference<br>1884-1885 | 1965              |
| Togo       | French Togoland     | France         | Berlin Conference<br>1884-1885 | 1960              |
| Uganda     | British East Africa | Britain        | Berlin Conference<br>1884-1885 | 1962              |
| Zambia     | Northern Rhodesia   | Britain        | Berlin Conference<br>1884-1885 | 1964              |
| Zimbabwe   | Southern Rhodesia   | Britain        | Berlin Conference<br>1884-1885 | 1980              |



**Appendix 2.A***Table 2.A.1: factor analysis scores + underlying variables*

|                          | Governance | Democracy 1997-<br>2002 | Rule of Law and Order<br>1996-2002 |
|--------------------------|------------|-------------------------|------------------------------------|
| Angola                   | -1.18      | 1.00                    | -1.54                              |
| Benin                    | 0.97       | 6.00                    | -0.27                              |
| Botswana                 | 2.35       | 9.00                    | 0.58                               |
| Burkina Faso             | -0.30      | 0.67                    | -0.54                              |
| Burundi                  | -0.96      | 0.83                    | -1.28                              |
| Cameroon                 | -0.91      | 1.00                    | -1.26                              |
| Cape Verde               |            |                         |                                    |
| Central African Republic | 0.01       | 5.00                    | -1.09                              |
| Chad                     | -0.58      | 1.00                    | -0.90                              |
| Congo, Dem. Rep.         |            |                         | -1.99                              |
| Congo, Rep.              | -1.21      | 0.00                    | -1.37                              |
| Cote d'Ivoire            | -0.26      | 3.00                    | -0.97                              |
| Djibouti                 | -0.13      | 2.00                    | -0.63                              |
| Equatorial Guinea        | -1.09      | 0.00                    | -1.25                              |
| Eritrea                  |            |                         |                                    |
| Ethiopia                 | -0.12      | 3.00                    | -0.82                              |
| Gabon                    | -0.40      | 0.00                    | -0.50                              |
| Gambia, The              | 0.08       | 0.00                    | 0.01                               |
| Ghana                    | 0.65       | 4.33                    | -0.27                              |
| Guinea                   | -0.89      | 1.00                    | -1.23                              |
| Guinea-Bissau            | -0.39      | 5.00                    | -1.52                              |
| Kenya                    | -0.33      | 3.00                    | -1.04                              |
| Lesotho                  | 1.54       | 8.00                    | -0.07                              |
| Liberia                  | -1.26      | 3.00                    | -2.04                              |
| Madagascar               | 0.93       | 7.17                    | -0.55                              |
| Malawi                   | 0.85       | 6.67                    | -0.54                              |
| Mali                     | 0.78       | 6.00                    | -0.48                              |
| Mauritania               | -0.39      | 0.00                    | -0.50                              |

*Table 2.A.1 continued: factor analysis scores + underlying variables*

|                       | Governance | Democracy 1997-2002 | Rule of Law and Order<br>1996-2002 |
|-----------------------|------------|---------------------|------------------------------------|
| Mauritius             | 2.73       | 10.00               | 0.79                               |
| Mozambique            | 0.47       | 6.00                | -0.80                              |
| Namibia               | 1.49       | 6.00                | 0.29                               |
| Niger                 | -0.19      | 2.67                | -0.83                              |
| Nigeria               | -0.57      | 3.20                | -1.34                              |
| Rwanda                | -1.14      | 0.00                | -1.30                              |
| Sao Tome and Principe |            |                     | -0.32                              |
| Senegal               | 0.85       | 5.00                | -0.19                              |
| Sierra Leone          | -0.19      | 5.00                | -1.30                              |
| Somalia               |            |                     | -2.15                              |
| South Africa          | 1.96       | 9.00                | 0.18                               |
| Sudan                 | -1.30      | 0.00                | -1.47                              |
| Swaziland             | -0.20      | 0.00                | -0.29                              |
| Tanzania              | 0.13       | 2.50                | -0.45                              |
| Togo                  | -0.53      | 1.00                | -0.85                              |
| Uganda                | -0.59      | 0.00                | -0.71                              |
| Zambia                | 0.12       | 3.00                | -0.57                              |
| Zimbabwe              | -0.83      | 0.00                | -0.96                              |

Sources: Democracy: Polity IV (Marshall and Jaggers 2002), Rule of Law and Order: Kaufmann et al. 2007)

## **Appendix 2.B: Included control variables**

**-GDP pc 1990.** Per capita income in 1990 is included to control for income differences across countries. Data are taken from Maddison (2003).

**-Colonial dummy.** To see whether different colonising powers had a distinct influence on governance quality we include a dummy for British colonies.

**-Ethnic Linguistic Fractionalisation.** Given that the heterogeneity of most African societies is often argued to negatively influence governance quality (Easterly and Levine 1997, Alesina et al. (1999), we include an ethnic fractionalisation measure of 1985 taken from P. G. Roeder (2001).

**-Ethnic Tensions.** Since ethnic diversity is often argued to create tensions and conflicts which negatively influence governance quality (Horowitz 1985, Gurr 1993, Sambanis 2001)<sup>93</sup>, we include the average measure for ethnic tension between 1984-2000 (taken from the ICRG).

**-Total Military Intervention Score.** Military intervention, or military coups have been a pervasive phenomenon in SSA (McGowan 2003). These interventions create political instability and military rule is almost by definition authoritarian. This leads to a worsening in governance quality. (Taken from McGowan 2003).

**-Internal Conflict.** The final measure of violence measures the extend to which countries experienced internal conflict. Countries that experience more internal conflict have on average lower governance quality (Elbawadi, I. and N. Sambanis 2002, 2000)

**-Mineral resource dependence.** Engerman and Sokoloff (2002) argue that capital intensive production systems in general, and mineral resource dependent systems in particular, are likely to lead to sub-optimal institutional development paths. Therefore include the following mineral resource dependency variable: the log of hydrocarbons deposits per captia (BTU's per person of proven crude oil and natural gas reserves in 1993, taken from Gallup et al. 1998).

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<sup>93</sup> There are also many studies either arguing the opposite (namely that fractionalisation makes countries saver) Collier and Hoeffler 2002, Collier (2001), or that there is no effect of ethnic heterogeneity on instability and conflict (Elbawadi and Sambanis 2000 and 2002).

**-Population density 1900.** Africa stands out for its low population density. Domar (1970) indicates that low population density in combination with land-abundance can result in sub-optimal paths of institutional development. Therefore population density in 1900 is included. Population data are derived from McEvedy and Jones (1978). Information on the area of the various African countries in squared km. is taken from the World Development Indicators.

**-Permanent Settlement.** We calculated the percentage of people that historically lived in permanent settlements. The settlement pattern variable in Murdock (1967) is divided in societies that live in “fully migratory or nomadic bands (a)”; in “separated hamlets where several such form a more or less permanent single community (b)”; in “neighborhoods of dispersed family homesteads (c); in “seminomadic communities whose members wander in bands for at least half of the year (d)”; in “semisedentary communities whose members shift from one to another fixed settlement at different seasons or who occupy more or less permanently a single settlement from which a substantial proportion of the population departs seasonally to occupy shifting camps (e)”; in “compact and relatively permanent settlements (f)”; in compact but impermanent settlements (g); and societies that live in “complex settlements consisting of a nucleated village or town with outlying homesteads or satellite hamlets (h)”. We follow Gennaioli and Rainer (2007) who define permanent settlement to include societies living in (b), (c), (f) or (h).

**-Written records.** We calculated the percentage of people that belongs to a society that had an indigenous system of writing based on the ‘writing and record’ variable of Murdock and Provost (1973). Societies are divided in societies that have “an indigenous system of true writing and possesses written records of at least modest significance (a)”; in societies that have “an indigenous system of writing but lack any significant accumulation of written records (b)”; in societies that “lack true writing but possesses a significant nonwritten records in the form of picture writing, quipus, pictorial inscription, or the like”(c); in societies where “writing and significant records are lacking but the people employ mnemonic devices, e.g. simple tallies” (d); and in societies where “writing, records and mnemonic devices in any form are lacking or unreported” (e). Murdock and Provost (1973) provide this data for only the 41 Sub-Saharan African societies which are included in the Standard Cross Cultural Sample (see Murdock and White 1969). As these societies represent clusters of culturally related societies, we assign the same value for all so societies in the corresponding cluster, following Gennaioli and Rainer (2007). Subsequently we follow Gennaioli and Rainer (2007), who define societies possessing an indigenous writing system to include those that are included in (a) and (b).

**-Dependence on Agriculture.** The Ethnographic Atlas (Murdock 1967) gives the estimated relative dependence of each society on five major types of subsistence activity (gathering, hunting, fishing, animal husbandry and agriculture). The scale is from 0-9 (Murdock 1967:47). We calculate for each country the weighted average for the dependence on agriculture for all its societies following Gennaioli and Rainer (2007).

**-Forest-Woodland.** The percentage of land covered by Forest and Woodland, taken from the Food and Agriculture Organization of the United Nations FAO (FAO 2001).

Table 2.B.1: Pairwise correlation all variables table 2.3, chapter 2

|                                 | (1)   | (2)   | (3)          | (4)         | (5)         | (6)   | (7)   | (8)         | (9)   | (10)  | (11)  |
|---------------------------------|-------|-------|--------------|-------------|-------------|-------|-------|-------------|-------|-------|-------|
| (1) Slavery                     | 0.26  |       |              |             |             |       |       |             |       |       |       |
| (2) Community Heterogeneity     | 0.36  | 0.05  |              |             |             |       |       |             |       |       |       |
| (3) Community Organisation      | 0.12  | 0.35  | 0.26         |             |             |       |       |             |       |       |       |
| (4) Log GDP pc 1990             | 0.02  | -0.47 | 0.23         | -0.11       |             |       |       |             |       |       |       |
| (5) British Colonial Dummy      | 0.03  | -0.10 | -0.13        | -0.07       | 0.18        |       |       |             |       |       |       |
| (6) Ethnolinguistic Fract. 1985 | -0.59 | 0.02  | <b>-0.75</b> | 0.01        | -0.22       | -0.14 |       |             |       |       |       |
| (7) Ethnic Tension 1984-2000    | 0.11  | 0.24  | 0.11         | 0.17        | 0.28        | 0.04  | -0.16 |             |       |       |       |
| (8) Internal Conflict 1984-2000 | 0.03  | -0.07 | -0.09        | 0.22        | 0.43        | 0.06  | 0.13  | <b>0.74</b> |       |       |       |
| (9) TMSI* 1980-2001             | 0.01  | 0.30  | 0.05         | <b>0.50</b> | -0.35       | 0.05  | 0.08  | -0.16       | -0.26 |       |       |
| (10) Log Hydrocarbons pc        | -0.13 | -0.18 | 0.01         | -0.22       | 0.31        | -0.15 | 0.14  | -0.17       | -0.11 | -0.29 |       |
| (11) Population Density 1900    | 0.34  | 0.26  | 0.45         | -0.05       | <b>0.51</b> | 0.19  | -0.35 | 0.04        | -0.10 | -0.14 | -0.04 |

\*Total Military Intervention Score

Table 2.B.2: Pairwise correlation all variables table 2.4, chapter 2

|                           | Governance | State-Community | Slavery | Community Heterogeneity | Community Organisation | Written Records | Dependence on Agriculture | Permanent Settlement |
|---------------------------|------------|-----------------|---------|-------------------------|------------------------|-----------------|---------------------------|----------------------|
| State-Community           | 0,36       |                 |         |                         |                        |                 |                           |                      |
| Slavery                   | -0,21      | 0,26            |         |                         |                        |                 |                           |                      |
| Community Heterogeneity   | -0,22      | 0,36            | 0,05    |                         |                        |                 |                           |                      |
| Community Organisation    | 0,05       | 0,12            | 0,35    | 0,26                    |                        |                 |                           |                      |
| Written Records           | 0,03       | 0,39            | 0,33    | 0,04                    | -0,12                  |                 |                           |                      |
| Dependence on Agriculture | 0,06       | 0,17            | 0,25    | 0,08                    | 0,45                   | -0,26           |                           |                      |
| Permanent Settlement      | 0,15       | 0,09            | 0,15    | 0,069                   | 0,41                   | -0,38           | 0,82                      |                      |
| Forest-Woodland           | -0,06      | -0,36           | -0,17   | -0,01                   | 0,002                  | -0,30           | 0,15                      | 0,21                 |

Appendix 2.C

Table 2.C.1: Robustness checks: dependent variable: Democracy

|  | Dependent variable: Democracy 1997-2002 |                 |                    |                    |                    |                    |                   |
|--|---|-----------------|--------------------|--------------------|--------------------|--------------------|-------------------|
|  | (1)                                     | (2)             | (3)                | (4)                | (5)                | (6)                | (7)               |
| State-Community                          | 1.63<br>(1.41)                          | 2.22<br>(1.53)  | 3.23**<br>(1.24)   | 3.29***<br>(1.09)  | 3.18***<br>(1.11)  | 3.18***<br>(1.11)  | 3.47**<br>(1.43)  |
| Slavery                                  |   | -2.39<br>(1.59) | -2.57*<br>(1.39)   | -3.72***<br>(1.32) | -3.09**<br>(1.23)  | -3.08**<br>(1.21)  | -3.17**<br>(1.18) |
| Community Heterogeneity                  |   |                 | -2.10***<br>(0.64) | -2.80***<br>(0.63) | -3.02***<br>(0.66) | -3.00***<br>(0.76) | -2.68*<br>(1.41)  |
| Community Organisation                   |   |                 |                    | 3.79**<br>(1.55)   | 3.85**<br>(1.53)   | 3.84**<br>(1.55)   | 3.69**<br>(1.80)  |
| Ln GDPpc 1990                            |   |                 |                    |                    | 0.83<br>(0.70)     | 0.85<br>(0.72)     | 0.79<br>(0.70)    |
| British colonial dummy                   |   |                 |                    |                    |                    | 0.04<br>(0.86)     | 0.12<br>(0.88)    |
| ELF 85                                   |   |                 |                    |                    |                    |                    | 1.12<br>(3.62)    |
| Total Military Intervention Score        |   |                 |                    |                    |                    |                    |                   |
| Ethnic tensions 1984-2000 <sup>a</sup>   |   |                 |                    |                    |                    |                    |                   |
| Internal conflict 1984-2000 <sup>a</sup> |   |                 |                    |                    |                    |                    |                   |
| LHGpc                                    |   |                 |                    |                    |                    |                    |                   |
| Population density 1900                  |   |                 |                    |                    |                    |                    |                   |
| Adj. R <sup>2</sup>                      | 0.01                                    | 0.087           | 0.18               | 0.28               | 0.28               | 0.26               | 0.24              |
| N  | 40                                      | 40              | 40                 | 40                 | 40                 | 40                 | 40                |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. <sup>a</sup> Ethnic tension and Internal Conflict are scaled countinutitive, in the sense that higher scores represent less tensions (even though differences in race, nationality or language may exist (ICRG risk guide).



Table 2.C.1 continued: Robustness checks: dependent variable: Democracy

|                                   | Dependent variable: Democracy 1997-2002 |                    |                    |                    |                   |                   |                   |  |
|-----------------------------------|---|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|--|
|                                   | (8)                                     | (9)                | (10)               | (11)               | (12)              | (13)              | (14)              |  |
| State-Community                   | 3.06***<br>(1.10)                       | 3.61**<br>(1.39)   | 3.79**<br>(1.36)   | 3.71***<br>(1.35)  | 3.29**<br>(1.32)  | 3.34**<br>(1.32)  | 2.70<br>(1.59)    |  |
| Slavery                           | -2.91**<br>(1.22)                       | -4.89***<br>(1.42) | -3.53***<br>(1.12) | -3.21***<br>(1.09) | -4.44**<br>(1.61) | -3.10**<br>(1.22) | -4.49**<br>(2.05) |  |
| Community Heterogeneity           | -2.87***<br>(0.76)                      | -3.27**<br>(1.57)  | -3.08<br>(1.82)    | -2.70***<br>(0.72) | -3.76**<br>(1.71) | -4.08**<br>(1.95) | -2.40<br>(3.44)   |  |
| Community Organisation            | 4.90**<br>(1.79)                        | 4.71**<br>(1.93)   | 4.70*<br>(2.52)    | 3.87**<br>(1.81)   | 4.57**<br>(1.98)  | 5.01*<br>(2.48)   | 4.45<br>(3.08)    |  |
| Ln GDPpc 1990                     | 0.48<br>(0.71)                          | 0.25<br>(0.88)     | 0.63<br>(0.86)     | 1.26*<br>(0.68)    | 0.89<br>(1.10)    | 1.67*<br>(0.83)   | 1.08<br>(1.20)    |  |
| British colonial dummy            | 0.30<br>(0.84)                          | 0.49<br>(0.85)     | 0.54<br>(0.91)     | 0.25<br>(0.81)     | 0.26<br>(0.82)    | 0.31<br>(0.85)    | 0.26<br>(1.16)    |  |
| ELF 85                            |   |                    |                    |                    |                   |                   |                   |  |
| Total Military Intervention Score | -0.09<br>(0.06)                         | -0.07<br>(0.08)    | -0.09<br>(0.09)    | -0.09<br>(0.05)    | -0.08<br>(0.08)   | -0.12<br>(0.08)   | -0.08<br>(0.10)   |  |
| Ethnic tensions 1984-2000*        |   | 0.93<br>(0.69)     |                    |                    | 0.69<br>(0.72)    |                   | 0.79<br>(1.05)    |  |
| Internal conflict 1984-2000*      |   |                    | 0.07<br>(0.30)     |                    |                   |                   |                   |  |
| LHCpc                             |   |                    |                    | -0.17*<br>(0.08)   | -0.13<br>(0.10)   | -0.20**<br>(0.09) | -0.08<br>(0.1)    |  |
| Population density 1900           |   |                    |                    |                    |                   |                   | 0.04<br>(0.13)    |  |
| Adj. R <sup>2</sup>               | 0.29                                    | 0.37               | 0.30               | 0.40               | 0.38              | 0.35              | 0.22              |  |
| N                                 | 40                                      | 30                 | 30                 | 37                 | 30                | 30                | 25                |  |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. \* Ethnic tension and Internal Conflict are scaled counterintuitive, in the sense that higher scores represent less tensions (even though differences in race, nationality or language may exist (ICRG risk guide)).

Table 2.C.2: Robustness check: dependent variable: Rule of Law

|  | Dependent variable: Rule of Law 1996-2002 |                   |                   |                   |                    |                    |                    |
|--|---|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|
|  | (1)                                       | (2)               | (3)               | (4)               | (5)                | (6)                | (7)                |
| State-Community                          | 0.49<br>(0.29)                            | 0.02**<br>(0.28)  | 0.84***<br>(0.24) | 0.86***<br>(0.24) | 0.81***<br>(0.19)  | 0.79***<br>(0.18)  | 0.69***<br>(0.23)  |
| Slavery                                  |   | -0.48**<br>(0.23) | -0.51**<br>(0.24) | -0.64**<br>(0.28) | -0.25<br>(0.22)    | -0.24<br>(0.23)    | -0.21<br>(0.24)    |
| Community Heterogeneity                  |   |                   | -0.39**<br>(0.18) | -0.46**<br>(0.18) | -0.59***<br>(0.16) | -0.57***<br>(0.19) | -0.68***<br>(0.19) |
| Community Organisation                   |   |                   |                   | 0.50<br>(0.36)    | 0.52<br>(0.34)     | 0.52<br>(0.36)     | 0.57<br>(0.35)     |
| Ln GDPpc 1990                            |   |                   |                   |                   | 0.49***<br>(0.13)  | 0.48***<br>(0.13)  | 0.49***<br>(0.13)  |
| British colonial dummy                   |   |                   |                   |                   |                    | 0.15<br>(0.19)     | 0.11<br>(0.19)     |
| ELF 85                                   |   |                   |                   |                   |                    |                    | -0.35<br>(0.55)    |
| Total Military Intervention Score        |   |                   |                   |                   |                    |                    |                    |
| Ethnic tensions 1984-2000 <sup>a</sup>   |   |                   |                   |                   |                    |                    |                    |
| Internal conflict 1984-2000 <sup>b</sup> |   |                   |                   |                   |                    |                    |                    |
| LIICpc                                   |   |                   |                   |                   |                    |                    |                    |
| Population density 1990                  |   |                   |                   |                   |                    |                    |                    |
| Adj. R <sup>2</sup>                      | 0.05<br>42                                | 0.09<br>42        | 0.17<br>42        | 0.19<br>42        | 0.34<br>42         | 0.33<br>42         | 0.32<br>42         |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. <sup>a</sup> Ethnic tension and Internal Conflict are scaled counterintuitive, in the sense that higher scores represent less tensions (even though differences in race, nationality or language may exist) (ICRG risk guide).

Table 2.C.2 continued: Robustness checks: dependent variable: Rule of Law

|  | Dependent variable: Rule of Law 1996-2002 |                    |                 |                    |                    |                    |                    |
|--|---|--------------------|-----------------|--------------------|--------------------|--------------------|--------------------|
|  | (8)                                       | (9)                | (10)            | (11)               | (12)               | (13)               | (14)               |
| States-Community                         | 0.75***<br>(0.178491)                     | 0.66***<br>(0.16)  | 0.62*<br>(0.25) | 0.75***<br>(0.22)  | 0.62***<br>(0.17)  | 0.58**<br>(0.26)   | 0.86***<br>(0.17)  |
| Slavery                                  | -0.21<br>(0.23)                           | -0.53**<br>(0.23)  | -0.19<br>(0.29) | -0.04<br>(0.20)    | -0.46*<br>(0.22)   | -0.12<br>(0.27)    | -0.41*<br>(0.23)   |
| Community Heterogeneity                  | -0.56**<br>(0.21)                         | -0.81***<br>(0.21) | -0.51<br>(0.30) | -0.67***<br>(0.23) | -0.85***<br>(0.19) | -0.60***<br>(0.26) | -0.80***<br>(0.34) |
| Community Organisation                   | 0.81**<br>(0.34)                          | 0.76*<br>(0.40)    | 0.41<br>(0.45)  | 0.74**<br>(0.32)   | 0.72*<br>(0.39)    | 0.42<br>(0.41)     | 0.56*<br>(0.32)    |
| Ln GDPpc 1990                            | 0.40***<br>(0.13)                         | 0.24*<br>(0.13)    | 0.20<br>(0.18)  | 0.60***<br>(0.16)  | 0.33***<br>(0.12)  | 0.33*<br>(0.17)    | 0.28<br>(0.21)     |
| British colonial dummy                   | 0.20<br>(0.18)                            | 0.26*<br>(0.13)    | 0.22<br>(0.16)  | 0.11<br>(0.20)     | 0.23<br>(0.15)     | 0.20<br>(0.17)     | 0.13<br>(0.17)     |
| ELF 85                                   |   |                    |                 |                    |                    |                    |                    |
| Total Military Intervention Score        | -0.02**<br>(0.01)                         | -0.02**<br>(0.01)  | -0.01<br>(0.01) | -0.02**<br>(0.01)  | -0.02*<br>(0.01)   | -0.02<br>(0.01)    | -0.03***<br>(0.01) |
| Ethnic tensions 1984-2000 <sup>a</sup>   | 0.42***<br>(0.11)                         | 0.42***<br>(0.11)  |                 |                    | 0.38***<br>(0.11)  |                    | 0.42***<br>(0.12)  |
| Internal conflict 1984-2000 <sup>a</sup> |   | 0.17***<br>(0.06)  |                 |                    |                    | 0.16**<br>(0.06)   |                    |
| LHCpc                                    |   |                    |                 | -0.05**<br>(0.02)  | -0.02<br>(0.02)    | -0.02<br>(0.03)    | -0.04*<br>(0.02)   |
| Population density 1900                  |   |                    |                 |                    |                    |                    | 0.01<br>(0.02)     |
| Adj. R <sup>2</sup>                      | 0.38                                      | 0.71               | 0.60            | 0.46               | 0.79               | 0.60               | 0.70               |
| N  | 42  | 32                 | 32              | 39                 | 32                 | 32                 | 25                 |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. <sup>a</sup> Ethnic tension and Internal Conflict are scaled counterintuitive, in the sense that higher scores represent less tensions (even though differences in race, nationality or language may exist) (ICRG risk guide)

Table 2.C.3: Robustness check: state development and community development separately linked to respectively rule of law and democracy

|                        | Rule of Law    |                  |                | Democracy      |                |                   |
|------------------------|----------------|------------------|----------------|----------------|----------------|-------------------|
|                        | (1)            | (2)              | (3)            | (4)            | (5)            | (6)               |
| State-Community        | 0,49<br>(0,29) |                  |                | 1,63<br>(1,41) |                |                   |
| State <sup>°</sup>     |                | 0,74**<br>(0,29) |                |                | 0,43<br>(1,46) |                   |
| Community <sup>a</sup> |                |                  | 0,50<br>(0,34) |                |                | 5,04***<br>(1,52) |
| Adj. R <sup>2</sup>    | 0,05           | 0,13             | 0,003          | 0,01           | -0,02          | 0,13              |
| N                      | 42             | 41               | 43             | 40             | 39             | 40                |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%

<sup>°</sup> Centralisation measure taken from Gennaioli and Rainer (2007).

<sup>a</sup> Percentage of the population that belongs to a society which had well developed community structures.

## Appendix 3.A

Table 3.A.1: Descriptive Statistics

| Variable                  | Obs | Mean    | Std. Dev. | Min      | Max     |
|---------------------------|-----|---------|-----------|----------|---------|
| Indigenous slavery        | 43  | 0.6277  | 0.3498    | 0        | 0.99    |
| Ln(income2000)            | 52  | 7.1335  | 0.8253    | 5.3845   | 9.2735  |
| Export slavery            | 52  | 3.2596  | 3.8948    | -2.3026  | 8.8183  |
| British colony            | 52  | 0.3462  | 0.4804    | 0        | 1       |
| French colony             | 52  | 0.4038  | 0.4955    | 0        | 1       |
| Portuguese colony         | 52  | 0.0962  | 0.2977    | 0        | 1       |
| Belgian colony            | 52  | 0.0577  | 0.2354    | 0        | 1       |
| Spanish colony            | 52  | 0.0192  | 0.1387    | 0        | 1       |
| Latitude                  | 52  | 13.5500 | 9.8586    | 0        | 36      |
| Longitude                 | 52  | 16.6988 | 20.2144   | -24.0443 | 57.7939 |
| Rainfall                  | 52  | 8.8654  | 16.0551   | 0        | 69      |
| Humidity                  | 52  | 71.6731 | 11.9471   | 35       | 95      |
| Temperature               | 52  | 8.7500  | 7.4882    | -9       | 19      |
| Coastline                 | 52  | -0.2378 | 3.2352    | -4.6052  | 6.9839  |
| Islam                     | 52  | 35.3192 | 39.0848   | 0        | 100     |
| Gold                      | 52  | -7.4840 | 5.6642    | -13.8155 | 3.0843  |
| Oil                       | 52  | -6.7148 | 4.0309    | -9.2103  | 3.2359  |
| Diamonds                  | 52  | -5.4901 | 2.3963    | -6.9078  | 2.1868  |
| Atlantic distance         | 52  | 7.3808  | 3.2803    | 3.6468   | 16.3927 |
| Indian distance           | 52  | 6.9342  | 4.2387    | 0.0319   | 16.7754 |
| Saharan distance          | 52  | 3.5112  | 1.5678    | 0.3097   | 6.6373  |
| Red Sea distance          | 52  | 3.4455  | 1.4666    | 0.0644   | 6.4654  |
| Early state development   | 47  | 0.5804  | 0.3291    | 0        | 1       |
| Written records           | 43  | 10.2884 | 24.3562   | 0        | 97.5    |
| Democratic accountability | 32  | 1.4699  | 0.9334    | 0        | 3.3750  |
| Bureaucratic quality      | 32  | 2.6393  | 0.9751    | 0.4917   | 4.4333  |
| State capacity            | 34  | -0.7784 | 0.4682    | -1.6000  | 0.2600  |

**Appendix 3.B: Robustness checks**

*Table 3.B.1: Indigenous Slavery and Average 1990-2000 Income levels: OLS Regressions*

|                 | Dependent variable: log GDP pc, average 1990-2000 |                      |                     |                      |                     |                      |
|-----------------|---|----------------------|---------------------|----------------------|---------------------|----------------------|
|                 | (1)   | (2)                  | (3)                 | (4)                  | (5)                 | (6)                  |
| Ind. slavery    | -0.861***<br>(0.317)                              | -0.902***<br>(0.318) | -0.603**<br>(0.278) | -0.770***<br>(0.257) | -0.855**<br>(0.325) | -0.613***<br>(0.223) |
| Latitude        | 0.013<br>(0.014)                                  |                      |                     |                      |                     |                      |
| Longitude       | -0.004<br>(0.004)                                 |                      |                     |                      |                     | -0.007**<br>(0.004)  |
| Coastline       | 0.028<br>(0.03)                                   |                      |                     |                      |                     |                      |
| Rainfall        |   | 0<br>(0.006)         |                     |                      |                     |                      |
| Humidity        |   | 0.004<br>(0.012)     |                     |                      |                     |                      |
| Temperature     |   | -0.007<br>(0.016)    |                     |                      |                     |                      |
| Islam           |   |                      | -0.001<br>(0.003)   |                      |                     |                      |
| Early state dev |   |                      | -0.238<br>(0.262)   |                      |                     |                      |
| Export slavery  |   |                      | -0.062**<br>(0.024) |                      |                     | -0.086***<br>(0.023) |
| Gold            |   |                      |                     | -0.001<br>(0.014)    |                     |                      |
| Oil             |   |                      |                     | 0.044*<br>(0.026)    |                     | 0.064***<br>(0.021)  |
| Diamonds        |   |                      |                     | 0.057<br>(0.049)     |                     |                      |
| British colony  |   |                      |                     |                      | -0.244<br>(0.479)   |                      |
| French colony   |   |                      |                     |                      | -0.292<br>(0.492)   |                      |
| Port. colony    |   |                      |                     |                      | -0.572<br>(0.487)   |                      |
| Belgian colony  |   |                      |                     |                      | -0.652<br>(0.541)   |                      |
| Spa. colony     |   |                      |                     |                      | 0.438<br>(0.497)    |                      |
| (constant)      | 7.411***<br>(0.369)                               | 7.274***<br>(0.795)  | 7.727***<br>(0.284) | 8.028***<br>(0.321)  | 7.763***<br>(0.507) | 8.246***<br>(0.219)  |
| R2              | 0,33  | 0,28                 | 0,35                | 0,4                  | 0,37                | 0,56                 |
| N               | 43  | 43                   | 41                  | 43                   | 43                  | 43                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

Table 3.B.2: Indigenous Slavery and 2000 Income levels WDI: OLS Regressions

|                 | (1)                 | (2)                  | (3)                 | (4)                  | (5)                 | (6)                  |
|-----------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
| Ind. slavery    | -1.66***<br>(0.52)  | -1.539***<br>(0.496) | -1.004**<br>(0.423) | -1.277***<br>(0.388) | -1.324**<br>(0.503) | -0.941**<br>(0.361)  |
| Latitude        | 0.008<br>(0.021)    |                      |                     |                      |                     |                      |
| Longitude       | -0.011<br>(0.008)   |                      |                     |                      |                     | -0.015**<br>(0.006)  |
| Coastline       | 0.003<br>(0.052)    |                      |                     |                      |                     |                      |
| Rainfall        |                     | -0,006<br>(0.010)    |                     |                      |                     |                      |
| Humidity        |                     | 0.005<br>(0.017)     |                     |                      |                     |                      |
| Temperature     |                     | -0.004<br>(0.027)    |                     |                      |                     |                      |
| Islam           |                     |                      | 0<br>(0.004)        |                      |                     |                      |
| Early state dev |                     |                      | -0.413<br>(0.490)   |                      |                     |                      |
| Export slavery  |                     |                      | -0.104**<br>(0.045) |                      |                     | -0.113***<br>(0.036) |
| Gold            |                     |                      |                     | 0.006<br>(0.023)     |                     |                      |
| Oil             |                     |                      |                     | 0.085***<br>(0.030)  |                     | 0.113***<br>(0.025)  |
| Diamonds        |                     |                      |                     | 0.093<br>(0.070)     |                     |                      |
| British colony  |                     |                      |                     |                      | 0.113<br>(0.783)    |                      |
| French colony   |                     |                      |                     |                      | 0.117<br>(0.792)    |                      |
| Port. colony    |                     |                      |                     |                      | -0.269<br>(0.928)   |                      |
| Belgian colony  |                     |                      |                     |                      | -0.632<br>(0.826)   |                      |
| Spa. colony     |                     |                      |                     |                      | 1.358<br>(0.824)    |                      |
| (constant)      | 7.062***<br>(0.597) | 6.640***<br>(1.114)  | 7.227***<br>(0.491) | 7.877<br>(0.414)     | 6.750***<br>(0.839) | 8.166***<br>(0.33)   |
| R2              | 0,3544              | 0,314                | 0,366               | 0,487                | 0,398               | 0,632                |
| N               | 41                  | 41                   | 39                  | 41                   | 41                  | 39                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

### Appendix 3.C: 2sls estimates

We need an instrument that is correlated with indigenous slavery, but not with the error term in the equation explaining present-day income. We base our instrumentation choice on model (3.6) above, where we now instrument indigenous slavery with latitude, state development and prevalence of Islam<sup>94</sup>. Also, since we are interested in unbiased estimates of the effects of both indigenous and export slavery, we take account of the fact that export slavery may be an endogenous variable. As in Nunn (2008), we instrument export slavery with a country's distance to African coasts where important export slave trade ports were located: the Red Sea coast, the Atlantic Ocean coast, the Mediterranean coast and the Indian Ocean coast.

Estimations results are reported in tables 3.B.1 and 3.B.2, where we report second and first stages, respectively, of 2SLS regressions of two models. In both models, the coefficient for instrumented indigenous slavery takes a negative value which is significant statistically. We conclude from this that indigenous slavery was a robust long-term influence on African development, even taking account of any endogeneity problems and controlling for the presence of export slavery.

To justify our use of the instrument variables (IV), we conduct several tests. A test of the exogeneity of the regressor (endogeneity test) indicates whether the IV method is required. It tests the null hypothesis that the variable is exogenous (hence, high p-values indicate exogeneity). Second, we use a weak identification test, with the Kleibergen-Paap F-statistic, to examine the relevance of our instruments. This confirms they correlate with our independent variables. A weak identification indicates the weak explanatory power that causes an increased bias in the estimated IV coefficients (Hahn and Hausman, 2002). We provide Stock-Yogo critical values. Test statistics below the critical value indicates weak instruments (which is the case for our second estimate). Third, we use a test of over-identifying restrictions using the Hansen J statistic to test the validity of our instruments (i.e., if the instruments are orthogonal to the error distribution of the dependent). For this test statistic, the null tests validity of instruments, which is indicated by high P-values.

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<sup>94</sup> Instrumenting only with latitude produces qualitatively identical results. This might be viewed as more valid since indigenous state development and prevalence of Islam are plausibly endogenous themselves and therefore, it could be argued, not suited as an instrument. Either choice does not affect the outcome.



Table 3.C.1: 2SLS estimations second stages

|  | (1)                   | (2)                   |
|--|-----------------------|-----------------------|
|  | pc income 2000        | pc income 2000        |
| Export slavery   |                       | -0.160***<br>(0.0559) |
| Slavery  | -1.297**<br>(0.574)   | -0.581*<br>(0.290)    |
| Longitude  | -0.00535<br>(0.00559) | -0.0137**<br>(0.0057) |
| Oil  | 0.0418<br>(0.0320)    | 0.0767***<br>(0.023)  |
| Constant   | 8.144***<br>(0.389)   | 8.760***<br>(0.427)   |
| adj. R <sup>2</sup>  | 0.249                 | 0.453                 |
| N  | 41                    | 41                    |
| Kleibergen-Paap rk Wald F statistic /<br>partial F statistic | 7.439                 | 2.278                 |
| Stock-Yogo critical values                                   | 6.46                  | 6.16                  |
| Hansen J statistic (p-value)                                 | 0.14                  | 0.61                  |
| Endogeneity test (p-value)                                   | 0.73                  | 0.5                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. 2sls is estimated using small sample properties. The Hansen J statistic tests for joint instrument validity, where null hypothesis is that the instruments are valid, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the second stage equation. The Kleibergen-Paap Wald rk F statistic for weak instruments is an adaption of Gragg Donald F statistic as errors are assumed to be the non i.i.d. and robust to HAC. The degrees-of-freedom for the rk statistic is  $((N-L)/L1)*((N-1)/N)*(N\_clust-1)/N\_clust$ , where N is the number of observations, L is the number of instruments and L1 is the number of excluded instruments. Kleibergen-Paap F closely approximates partial F statistic and is reported jointly. Stock -Yogo (2005) critical values are for 20% maximal LIML size.

Table 3.C.2: 2SLS estimations, first stages

|                     | 1                    | 2                   | 3                    |
|---------------------|----------------------|---------------------|----------------------|
|                     | Slavery              | Export Slavery      | Slavery              |
| Longitude           | -0.005**<br>(0.002)  | 0.153<br>(0.154)    | -0.059***<br>(0.019) |
| Oil                 | -0.027*<br>(0.014)   | 0.235<br>(0.165)    | -0.016<br>(0.016)    |
| Latitude            | -0.028***<br>(0.007) | -0.101<br>(0.156)   | -0.011<br>(0.01)     |
| Islam               | 0.004**<br>(0.001)   | 0.005<br>(0.02)     | 0.006***<br>(0.002)  |
| Early state dev.    | 0.538***<br>(0.152)  | 0.62<br>(2.495)     | 0.495***<br>(0.152)  |
| Atlantic dist.      |                      | -0.612<br>(0.713)   | -0.196***<br>(0.06)  |
| Indian dist.        |                      | -1.167<br>(0.878)   | -0.212**<br>(0.088)  |
| Saharan dist.       |                      | -4.299**<br>(1.624) | 0.231<br>(0.167)     |
| Red Sea dist.       |                      | 3.737*<br>(1.905)   | -0.670***<br>(0.217) |
| (constant)          | 0.443***<br>(0.105)  | 19.17<br>(15.458)   | 5.360***<br>(1.563)  |
| adj. R <sup>2</sup> | 0.38                 | 0.21                | 0.53                 |
| N                   | 41                   | 41                  | 41                   |
| F                   | 8.70***              | 3.59***             | 8.25***              |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

### Appendix 3.D: How much Income Development did Slavery Cost Africa?

What was the *substantial* impact of indigenous slavery on long-term development of African income levels was - how much income development did it cost the continent? To explore this issue we ask how a one standard deviation change in the slavery variable would affect per capita incomes in the year 2000. This then reflects the impact on long-term development of a sample-specific, typical change in indigenous or export slavery.

Since the dependent variable is in logarithmic terms but the independent is not, the coefficient is a semi-elasticity: it tells us the percentage change in 2000 per capita incomes resulting from a one unit change in the slavery variable<sup>95</sup>. The coefficient in the most conservative instrumented estimations in Appendix B is  $b = -0.058$ . A change in  $S$  from its sample average 0.63 by 0.01 unit to 0.64 would with lead to a growth decline of  $0.01 * -0.581 = 0.00581$ , or -0.581 percentage points. But the typical variation in our sample, the standard variation of 0.35, is much larger and results in a change in the 2000 income level equal to  $(0.35 * -0.581)$ , which is a -20 percentage points decline. In the same Appendix B model, the coefficient for export slavery is -0.160. A standard deviation increase in the measure for export slavery (of 3.60) then implies a GDP decline of 58 %, or nearly three times larger than the indigenous slavery effect.

As noted, it is not clear that instrumentation is necessary and valid, given the sample properties, so we also consider the coefficients in our preferred Table 3.2 OLS specification. These are -0.712 for indigenous slavery and -0.109 for export slavery, implying year 2000 per capita GDP declines of 25 % and 39 %, respectively.

To put this into context, total average growth in per capita income achieved during 1960-2000 in the same sample was 0.93 % annually. The growth loss due to a one standard variation change in the measure for indigenous slavery is thus equivalent to between 20 (2SLS) and 24 (OLS) years of contemporary growth; for export slavery this was between 58 and 38 years, respectively<sup>96</sup> - 3 or 2 times larger than the indigenous slavery effect.

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<sup>95</sup> In the equation  $\ln(y) = C + b*S + e$  (where  $y$ ,  $S$  and  $e$  are 2000 per capita incomes, slavery and the error term, respectively), coefficient  $b$  equals the first derivative of  $\ln(y)$  with respect to  $S$ , denoted  $d(\ln y)/dS$  (using  $d$  for infinitesimal changes). Because  $d(\ln y)/d(y) = 1/y$ , it follows that  $d(\ln y) = d(y)/y$ , which is the relative change in  $y$ , expressed as a fraction. Hence coefficient  $b$  is the ratio of  $d(y)/y$  over  $dS$ , or the relative change in  $y$  (expressed as a fraction) over a one unit change in  $S$ .

<sup>96</sup> Since  $\ln(1.25) / \ln(1.0093) = 24$ , rounded to whole years.

**Appendix 3.D***Table 3.D.1: Definitions and Sources*

| Variable                | Source                     | Definition  |
|-------------------------|----------------------------|---|
| log of GDP pc in 2000   | Maddison (2003)            | Real per capita GDP in 2000   |
| British colony          | Nunn (2008)                | British Colony  |
| French colony           | Nunn (2008)                | French Colony   |
| Portuguese colony       | Nunn (2008)                | Portuguese Colony   |
| Belgian colony          | Nunn (2008)                | Belgian Colony  |
| Spanish colony          | Nunn (2008)                | Spain (Equatorial Guinea)   |
| Longitude               | Nunn (2008)                | The longitude of each countries centroid, measured in degrees. The centroid of each country is calculated using the Centroid Utility in ArcGIS. For the countries where the centroid is located outside the land borders of the country (Cape Verde, Gambia, Mauritius, Seychelles and Somalia), a point within the country closest to the centroid is used. The location on the coast that is closest to each country's centroid is identified using the Proximity Utility in ArcGIS |
| Latitude                | Nunn (2008)                | The absolute value of latitude of each country's centroid measured in degrees   |
| Early state development | Gennaioli en Rainer (2007) | For each country the share of non-European population that belongs to indigenously 'centralised' ethnic groups  |
| Written records         | Bolt en Smits (2008)       | For each country the share of non-European population that belongs to an indigenous group that had written records  |
| Islam                   | Nunn (2008)                | The percent Islamic variable is the percent of a country's population that is Islamic.  |
| Slave export per area   | Nunn (2008)                | Log of total number of slaves taken from each country during various slave trades between 1400 and 1900, normalised by country size (measured by land area -millions of squared kilometres)   |

Table 3.E.1 continued: Definitions and Sources

| Variable                      | Source            | Definition   |
|-------------------------------|-------------------|--|
| Rainfall                      | Nunn (2008)       | The average total rainfall, in the driest month of the year, measured in millimetres.  |
| Humidity                      | Nunn (2008)       | The average of the maximum afternoon humidity, measured in percent, during the hottest month of the year   |
| Temperature                   | Nunn (2008)       | Lowest average monthly temperature, degrees Celsius  |
| Coastline                     | Nunn (2008)       | Countries' total coastline per land area measured in thousands of kilometres   |
| Gold                          | Nunn (2008)       | Natural log of the average annual gold production per thousand inhabitants from 1970 to 2000 measured in kilograms                                       |
| Oil                           | Nunn (2008)       | Natural log of the average annual crude petroleum production per thousand inhabitants from 1970 to 2000 measured in thousands of tonnes                  |
| Diamonds                      | Nunn (2008)       | Natural log of the average annual gemstones and industrial diamond production per thousand inhabitants from 1970 to 2000 measured in thousands of carats |
| Atlantic distance             | Nunn (2008)       | Shortest sailing distance for slave ships to the port of destination in the transatlantic slave trade  |
| Indian distance               | Nunn (2008)       | Shortest sailing distance for slave ships to the port of destination in the Indian Ocean slave trade   |
| Red Sea distance              | Nunn (2008)       | Shortest overland slave route to location of demand  |
| Saharan distance              | Nunn (2008)       | Shortest overland slave route to location of demand  |
| Population density 15 century | Nunn (2008)       | Log of thousands of population per million of squared kilometre  |
| Democratic accountability     | ICRG              | Type of governance enjoyed by a country, ranging from alternating democracy to autarchy  |
| Bureaucratic quality          | ICRG              | Reflects the risk of drastic changes in policy or interruptions in government services after a change in government                                      |
| State Capacity                | Englebert (2000a) | The development capacity of states combining policy and governance variables   |

### Appendix 4.A: Income, Geographical and Institutional Data

We thank Acemoglu for kindly providing the data on which the Acemoglu et al. (2001) results are based; and Gallup, Sachs and Mellinger for making their data on which the Gallup et al. (1998) results are based available on the Internet.

*Table 4.A.1. Data description*

| Variable  | Year          | Source               |
|---|---------------|----------------------|
| Settler Mortality   | 1800-1850     | Acemoglu et al, 2001 |
| Settler mortality is potential settler mortality measured in terms of deaths per annum per 1000 'mean strength' (raw mortality numbers are adjusted to what they would be if a force of 1000 living people were kept in place for a whole year).  |               |                      |
| Democracy at first year of independence before 1975   | Various years | Polity IV            |
| Democracy indicator based on the competitiveness of political participation, openness and competitiveness of executive recruitment and constraints on the executive. Scale between 0 and 10, where higher scores indicate more democracy. Year of observation is the first year of independence as long as that is before 1975, otherwise the country gets a score of 1 (in line with Acemoglu et al 2001). |               |                      |
| Constraint on the executive before 1975   | Various years | Polity IV            |
| Measure of the extent of institutionalised constraints on the decision making powers of chief executives, whether individuals or collectivises. Scale between 0 and 7, where higher scores indicate more constraints. Year of observation is the first year of independence as long as that is before 1975, otherwise the country gets a score of 1 (in line with Acemoglu et al 2001).                     |               |                      |
| PopCoast  | 1994          | Gallup et al 1998    |
| Proportion of the population living within 100 km of the coastline.   |               |                      |
| Landlocked dummy  |               | Gallup et al 1998    |
| A binary dummy, with a value one indicating landlockedness  |               |                      |
| Malaria index   | 1966, 1994    | Gallup et al 1998    |
| Index of Malaria prevalence based on a global map of extent of malaria in 1966 (WHO 1967), and the fraction of falciparum malaria. 'The index is the product of the fraction of land area subject to malaria times the fraction of falciparum malaria cases'. (Gallup et al 1998)   |               |                      |
| Life expectancy 1965  | 1965          | Gallup et al 1998    |
| Data Gallup et al took form the United Nations  |               |                      |

Table 4.A.1: Data description (continued)

| Variable  | Year | Source            |
|---|------|-------------------|
| Tropic  | 1996 | Gallup et al 1998 |
| The proportion of a country's land area within the geographical tropics   |      |                   |
| Legal origin  |      | Authors           |
| Binary dummy, where value one indicates a former British colony.  |      |                   |
| Hydrocarbons  | 1993 | Gallup et al 1998 |
| Hydrocarbon deposits are total BTU's per person of proven crude oil and natural gas reserves in 1993, which Gallup et al collected from World Resource Database (1996-1997) |      |                   |

### Appendix 4.B: Collected Colonial Data

Our newly constructed data set is comprised of data on former British and French colonies in Africa. Based on colonial yearbooks of the years 1945–1955 (detailed sources are below), we calculated variables that could serve as proxies for the general institutional environment between 1945–1950. The data set consists of four modules:

- a) Population density and European presence (calculated as density per squared kilometre and as the proportion of Europeans to total population) in countries is collected.
- b) Human capital: school pupils as a proportion to total population.

**Table 4.B.1: Summary statistics of the new variables**

|        | Pupils per 1000 population            | Pupils per 1000 population British colonies       | Pupils per 1000 population French colonies       |
|--------|---------------------------------------|---|--|
| Mean   | 42                                    | 61  | 23   |
| Median | 36                                    | 54  | 16   |
| Stdev  | 35                                    | 43  | 22   |
| Min    | 2                                     | 11  | 2  |
| Max    | 151                                   | 151   | 69   |
| Obs    | 39                                    | 15  | 15   |
|        | Europeans per population (percentage) | Europeans per population (%) - British colonies   | Europeans per population (%) - French colonies   |
| Mean   | 0,71                                  | 1,013   | 0,46   |
| Median | 0,31                                  | 0,277   | 0,33   |
| Stdev  | 1,13                                  | 1,599   | 0,41   |
| Min    | 0,08                                  | 0,075   | 0,08   |
| Max    | 5,50                                  | 5,499   | 1,30   |
| Obs    | 24                                    | 11  | 13   |
|        | Europeans per square kilometre        | Europeans per square kilometre - British colonies | Europeans per square kilometre - French colonies |
| Mean   | 0,040                                 | 0,062   | 0,022  |
| Median | 0,024                                 | 0,037   | 0,015  |
| Stdev  | 0,062                                 | 0,085   | 0,022  |
| Min    | 0,001                                 | 0,003   | 0,001  |
| Max    | 0,277                                 | 0,277   | 0,076  |
| Obs    | 24                                    | 11  | 13   |



Table 4.B.2. Sources

|   |  |
|---|--|
| French West Africa (Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Mauritania, Niger, Senegal) | Annuaire Statistique de L'Afrique Occidentale Francaise, 1949 Volume 4, and 1950 à 1955 Volume 5   |
| French Equatorial Africa (Central African Republic, Chad, Congo Republic, Gabon)                  | Annuaire Statistique de L'Afrique Equatoriale Française, 1936-1950 Volume 1, 1951 à 1955 Volume 2  |
| Madagascar  | Annuaire Statistique de Madagascar, 1938 - 1951, Vol. 1  |
| Botswana  | Official Year Book of the Union [of South Africa] and of Basutoland [Lesotho], Bechuanaland Protectorate [Botswana] and Swaziland, 1950 no 26.   |
| Ghana   | Economic and Statistical Bulletin of the Gold Coast, April 1952, Vol 1.<br>Digest of Statistics, November 1953, No. 4  |
| Kenya   | Statistical Abstract, 1955   |
| Lesotho   | Official Year Book of the Union [of South Africa] and of Basutoland [Lesotho], Bechuanaland Protectorate [Botswana] and Swaziland, 1950 no 26.   |
| Malawi  | Federation of Rhodesia and Nyasaland: Census of Population 1956<br>Monthly Digest of Statistics, April 1955, Vol 2, No. 1  |
| Mauritius   | Final report on the Census Enumeration made in the Colony of Mauritius and its Dependencies on 11th June, 1944<br>Blue Book of the Colony of Mauritius and its Dependencies, 1946/1947<br>Yearbook of Statistics, 1959 No. 14. |
| Nigeria   | Blue Book for the year ending 31st December, 1938.<br>Digest of Statistics, Vol. 2, October 1952, No. 1 and 4.<br>Digest of Statistics 1956  |
| Sudan   | Foreign Trade Report (with some internal statistics), 1949<br>First population census of Sudan 1955/56, Final Report, vol. 1   |
| Swaziland   | Official Year Book of the Union [of South Africa] and of Basutoland [Lesotho], Bechuanaland Protectorate [Botswana] and Swaziland, 1950 no 26.   |
| Tanzania  | Statistical Abstract, 1938-1952 (Tanganyika)   |

|                              |   |
|------------------------------|---|
| Uganda                       | Statistical Abstract, 1957  |
| Zambia                       | Federation of Rhodesia and Nyasaland:<br>Census of Population 1956                                |
|                              | Monthly Digest of Statistics, April 1955,<br>Vol. 2, No. 1  |
|                              | Economic and Statistical Bulletin<br>(Northern Rhodesia), February 1953, Vol.<br>5, No. 11        |
| Zimbabwe                     | Federation of Rhodesia and Nyasaland:<br>Census of Population 1956.                               |
|                              | Monthly Digest of Statistics, April 1955,<br>Vol 2, No. 1   |
|                              | Official Year Book of Southern Rhodesia,<br>1952, No. 4   |
| Additional data on Education | Mitchell, B.R. (2003) 4 <sup>th</sup> edition<br>The Statesman's Year-Book (1946, 1948,<br>1955). |

*Table 4.B.3: Variable description and availability*

| Variable           | Description                                     | Year       | Source  |
|--------------------|---|------------|---|
| Population Density | Total population per squared kilometre          | 1948-55    | French West Africa (Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Mauritania, Niger, Senegal) |
|                    |   | 1950-55    | French Equatorial Africa (Central African Republic, Chad, Congo Republic, Gabon)                  |
|                    |   | 1946-51    | Madagascar  |
|                    |   | 1948-53    | Ghana   |
|                    |   | 1947-51    | Kenya   |
|                    |   | 1946-51    | Malawi  |
|                    |   | 1946-47    | Mauritius   |
|                    |   | 1938-50    | Nigeria   |
|                    |   | 1936,46,50 | Botswana  |
|                    |   | 1936,46,50 | Lesotho   |
|                    |   | 1949-55    | Sudan   |
|                    |   | 1936,46,50 | Swaziland   |
|                    |   | 1947-52    | Tanzania  |
|                    |   | 1947-51    | Uganda  |
|                    |   | 1946-51    | Zambia  |
| 1946-51            | Zimbabwe  |            |   |
| European density   | Total European population per squared kilometre | 1948-55    | French West Africa (Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Mauritania, Niger, Senegal) |
|                    |   | 1950-55    | French Equatorial Africa (Central African Republic, Chad, Congo Republic, Gabon)                  |
|                    |   | 1946-51    | Madagascar  |
|                    |   | 1948-53    | Ghana   |
|                    |   | 1947-51    | Kenya   |
|                    |   | 1946-51    | Malawi  |
|                    |   | 1946-47    | Mauritius   |
|                    |   | 1938-50    | Nigeria   |
|                    |   | 1936,46,50 | Botswana  |
|                    |   | 1936,46,50 | Lesotho   |
|                    |   | 1949-55    | Sudan   |
|                    |   | 1936,46,50 | Swaziland   |
|                    |   | 1947-52    | Tanzania  |
|                    |   | 1947-51    | Uganda  |

| Variable     | Description   | Year         | Source  |
|--------------|---|--------------|---|
| European pop | Total European population as percentage of total population           | 1946-51      | Zambia  |
|              |   | 1946-51      | Zimbabwe  |
|              |   | 1948-55      | French West Africa (Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Mauritania, Niger, Senegal)       |
|              |   | 1950-55      | French Equatorial Africa (Central African Republic, Chad, Congo Republic, Gabon)                        |
|              |   | 1946-51      | Madagascar  |
|              |   | 1948-53      | Ghana   |
|              |   | 1947-51      | Kenya   |
|              |   | 1946-51      | Malawi  |
|              |   | 1946-47      | Mauritius   |
|              |   | 1938-50      | Nigeria   |
|              |   | 1936,46,50   | Botswana  |
|              |   | 1936,46,50   | Lesotho   |
|              |   | 1949-55      | Sudan   |
|              |   | 1936,46,50   | Swaziland   |
|              |   | 1947-52      | Tanzania  |
|              |   | 1947-51      | Uganda  |
|              |   | 1946-51      | Zambia  |
| 1946-51      | Zimbabwe  |              |   |
| Education    | Total students in primary and secondary education to total population | 1948-1950/51 | French West Africa (Benin, Burkina Faso, Cote d'Ivoire, Guinea, Mali, Mauritania, Niger, Senegal, Togo) |
|              |   | 1950-52      | French Equatorial Africa (Central African Republic, Chad, Congo Republic, Gabon)                        |
|              |   | 1947-49      | Madagascar  |
|              |   | 1945         | Gambia  |
|              |   | 1945-47      | Ghana   |
|              |   | 1947-49      | Kenya   |
|              |   | 1947-50      | Malawi  |
|              |   | 1947-49      | Mauritius   |
|              |   | 1949-50      | Nigeria   |
|              |   | 1947-49      | Botswana  |
|              |   | 1947-49      | Lesotho   |
|              |   | 1947-49      | Sudan   |
|              |   | 1948-50      | Swaziland   |

| Variable | Description | Year    | Source        |
|----------|-------------|---------|---------------|
|          |             | 1947-49 | Tanzania      |
|          |             | 1949-51 | Uganda        |
|          |             | 1948-51 | Zambia        |
|          |             | 1948-50 | Zimbabwe      |
|          |             | 1947-49 | Angola        |
|          |             | 1948-50 | Cameroon      |
|          |             | 1947-49 | Mozambique    |
|          |             | 1947-49 | Sierra Leone  |
|          |             | 1947-49 | Congo DM      |
|          |             | 1950-52 | Liberia       |
|          |             | 1945-51 | Burundi       |
|          |             | 1945-51 | Rwanda        |
|          |             | 1950    | Guinea-Bissau |

Appendix 4.C: Robustness checks

Table 4.C.1: OLS regressions of colonial education and controls on Maddison 1995 GDP per capita

|                    | Dependent variable: log GDP pc 1995 |                      |                     |                      |                     |                      |
|--------------------|-------------------------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
|                    | (1)                                 | (2)                  | (3)                 | (4)                  | (5)                 | (6)                  |
| Pupils             | 9.159**<br>(3.929)                  | 8.428***<br>(2.444)  | 9.839**<br>(3.754)  | 5.389*<br>(3.131)    | 10.113**<br>(3.733) | 5.988**<br>(2.461)   |
| Coloniser          | -0.175<br>(0.231)                   | -0.105<br>(0.201)    | -0.186<br>(0.252)   | -0.464<br>(0.196)    | -0.153<br>(0.237)   | -0.095<br>(0.237)    |
| Malaria            |                                     | -1.206***<br>(0.323) | -0.921**<br>(0.351) | -0.942***<br>(0.307) | -1.323**<br>(0.500) | -1.240***<br>(0.227) |
| Coastal population |                                     | 1.04***<br>(0.262)   | 0.912***<br>(0.323) | 1.689***<br>(0.549)  |                     | 1.637***<br>(0.532)  |
| Tropics            |                                     | 0.909**<br>(0.430)   | 0.871<br>(0.510)    |                      | 1.288**<br>(0.607)  | 0.732*<br>(0.413)    |
| Hydrocarbons       |                                     | 0.068***<br>(0.021)  |                     | 0.090**<br>(0.035)   | 0.054*<br>(0.031)   | 0.071**<br>(0.031)   |
| Landlocked         |                                     |                      | -0.218<br>(0.258)   | 0.439<br>(0.431)     | -0.355<br>(0.260)   | 0.388<br>(0.385)     |
| (constant)         | 6.683***<br>(0.143)                 | 6.633***<br>(0.534)  | 6.406***<br>(0.572) | 7.108***<br>(0.270)  | 6.680***<br>(0.625) | 6.537***<br>(0.447)  |
| R2                 | 0.21                                | 0.68                 | 0.57                | 0.67                 | 0.57                | 0.63                 |
| N                  | 30                                  | 28                   | 28                  | 28                   | 28                  | 36                   |

Robust standard errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Sources: see appendix 4.A.

Table 4.C.2: Instrumented Colonial Education Correlates with 1995 Maddison GDP per capita

| Panel A  |                      |                      |                      |                     |                               |                      |
|--|----------------------|----------------------|----------------------|---------------------|-------------------------------|----------------------|
| 2 <sup>nd</sup> stage of 2SLS: Dependent variable: log GDP pc 1995 |                      |                      |                      |                     |                               |                      |
|  | (1)                  | (2)                  | (3)                  | (4)                 | (5)                           | (6)                  |
| Pupils (instrumented)  | 30.520***<br>(7.890) | 23.211***<br>(8.065) | 22.500***<br>(7.962) | 19.976**<br>(7.161) | 24.990*<br>-12553<br>(10.161) | 27.922**<br>(10.161) |
| Coloniser  | -0.386<br>(0.235)    | -0.248<br>(0.249)    | -0.290<br>(0.192)    | -0.292<br>(0.223)   | -0.533*<br>(0.297)            | -0.374*<br>(0.201)   |
| Malaria  |                      | -0.676**<br>(0.297)  | -0.458**<br>(0.184)  | -0.851**<br>(0.327) | -0.523*<br>-0.25              |                      |
| Hydrocarbons   |                      | 0.032<br>(0.030)     |                      |                     |                               | -0.007<br>(0.027)    |
| Coastal population   |                      |                      | 0.622<br>(0.539)     |                     |                               | 0.451<br>(0.696)     |
| Tropics  |                      |                      |                      | 3.999<br>(2.457)    |                               | 0.612<br>(4.626)     |
| Landlocked   |                      |                      |                      |                     | -0.212<br>(0.275)             |                      |
| (constant)   | 6.192***<br>(0.245)  | 6.952***<br>(0.383)  | 6.580***<br>(0.176)  | 3.232<br>(2.117)    | 7.198***<br>(0.491)           | 5.519<br>(4.578)     |
| N  | 24                   | 23                   | 23                   | 23                  | 23                            | 23                   |

Table 4.C.2: Instrumented Colonial Education Correlates with 1995 Maddison GDP per capita (continued)

Panel B

|                    | 1st stage of 2SLS: Dependent variable: Pupils |                     |                    |                     |                    |                    |
|--------------------|---|---------------------|--------------------|---------------------|--------------------|--------------------|
|                    | (1)   | (2)                 | (3)                | (4)                 | (5)                | (6)                |
| Settler mortality  | -0.011*<br>(-0.006)                           | -0.010*<br>(0.005)  | -0.010*<br>(0.005) | -0.011**<br>(0.005) | -0.010*<br>(0.005) | -0.009*<br>(0.005) |
| Coloniser          | 0.013<br>(0.009)                              | 0.013<br>(0.010)    | 0.0010<br>(0.010)  | 0.013<br>(0.010)    | 0.010<br>(0.011)   | 0.010<br>(0.010)   |
| Malaria            |   | -0.010<br>(0.023)   | 0.004<br>(0.016)   | 0.001<br>(0.031)    | -0.002<br>(0.025)  |                    |
| Hydrocarbons       |   | 0.002<br>(0.001)    |                    |                     |                    | 0.002<br>(0.001)   |
| Coastal population |   |                     | 0.037*<br>(0.019)  |                     |                    | 0.038*<br>(0.021)  |
| Tropics            |   |                     |                    | 0.003<br>(0.187)    |                    | -0.022<br>(0.096)  |
| Landlocked         |   |                     |                    |                     | -0.014<br>(0.010)  |                    |
| (constant)         | 0.087**<br>(0.0364)                           | -0.094**<br>(0.042) | 0.067**<br>(0.033) | 0.085<br>(0.174)    | 0.087**<br>(0.041) | 0.094<br>(0.103)   |
| N                  | 24  | 23                  | 23                 | 23                  | 23                 | 23                 |

Robust standard Errors in parentheses. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. 2sls is estimated using small sample properties. Sources: see appendix 4.A



### Appendix 5.A. Institutional Indicators

The institutional distance scores are based on data from the Global Competitiveness Report (2000) and matched with the key institutional features of business systems identified by Whitley (1999). All scores range between 1 and 7, and we invert the scores on union power for interpretation. We also identify suitable indicators for all institutional features except the dominant organizing principle of unions, the extent to which bargaining is centralized, and the more specific extent to which communal norms govern authority relations.

| <i>Key institutional features</i>                        | <i>Indicators<sup>a</sup></i>   |
|--|---|
| <i>The state</i>   |   |
| Dominance of the state and its willingness to share risk | Independence of government policies from elites and special interest groups (3.05)<br>The extent to which government subsidies promote competition (3.03) |
| State antagonism to collective intermediaries            | The pervasiveness of industrial clusters and specialized institutions (10.16)   |
| Extent of formal regulation of markets                   | The burden of regulation (3.01)   |
| <i>Financial systems</i>                                 |   |
| Capital market or credit based                           | Access to external finance (8.04)<br>The use of the stock market (8.11)   |
| <i>Skill development and control system</i>              |   |
| Strength of public training system                       | The difference in quality of schools available to rich and poor children (6.02)   |
| Strength of independent trade unions                     | The extent of union power and influence (6.10)  |
| <i>Trust and authority relations</i>                     |   |
| Trust in formal institutions                             | Public trust of politicians (4.16)  |
| Predominance of paternalist authority relations          | The willingness to delegate authority to subordinates (11.13)<br>The extent to which management-worker relations are cooperative (6.09)                   |

<sup>a</sup> Corresponding items in the Global Competitiveness Report 2000 are in parentheses.

We also provide the correlation matrix of the selected indicators. A two-step clustering procedure with a sample of OECD countries from the Global Competitiveness Report validates the selection of our institutional indicators, as discussed more extensively in Hotho (2008). The clusters formed on the basis of the selected institutional indicators correspond

well with Whitley's business system typology, in terms of both cluster characteristics and cluster membership, which lends support to the selected indicators. We calculate subsequent distances using Kogut and Singh's (1988) approach, except that we do not correct for differences in variance, because the original scores are scaled similarly. Ultimately, our measure of institutional distance takes the form of

$$ID_{jk} = \sum_{i=1}^{11} (I_{ij} - I_{ik})^2 / 11,$$

where  $ID_{jk}$  is the institutional distance between countries  $j$  and  $k$ , and  $(I_{ij} - I_{ik})$  is the difference in the scores of countries  $j$  and  $k$  on institutional feature  $i$ . Calculated institutional distances are available upon request.

Table 5.A.1: Descriptive statistics and correlation matrix for institutional indicators

| Variables                              | Mean | s.d. | 1      | 2      | 3     | 4      | 5      | 6     | 7      | 8     | 9      | 10     |
|--|------|------|--------|--------|-------|--------|--------|-------|--------|-------|--------|--------|
| 1. Independence of government policies | 3.65 | 0.58 |        |        |       |        |        |       |        |       |        |        |
| 2. Subsidies promote competition       | 3.99 | 0.78 | 0.75** |        |       |        |        |       |        |       |        |        |
| 3. Pervasiveness of intermediaries     | 4.51 | 0.59 | 0.27   | -0.02  |       |        |        |       |        |       |        |        |
| 4. Burden of regulation                | 3.68 | 0.61 | 0.73** | 0.66** | -0.02 |        |        |       |        |       |        |        |
| 5. Access to external finance          | 4.04 | 0.31 | 0.61** | 0.40*  | 0.33  | 0.26   |        |       |        |       |        |        |
| 6. Use of stock market                 | 5.19 | 0.76 | 0.25   | 0.18   | -0.12 | 0.23   | 0.26   |       |        |       |        |        |
| 7. Equality schooling                  | 4.90 | 1.34 | 0.35   | 0.25   | 0.36  | 0.26   | 0.19   | -0.15 |        |       |        |        |
| 8. Union power                         | 4.32 | 0.91 | -0.05  | -0.02  | 0.11  | -0.19  | -0.00  | -0.29 | 0.34   |       |        |        |
| 9. Trust in politicians                | 3.95 | 1.27 | 0.72** | 0.59** | 0.21  | 0.60** | 0.50** | 0.18  | 0.55** | 0.03  |        |        |
| 10. Delegation of authority            | 4.68 | 0.95 | 0.56** | 0.53** | 0.46* | 0.43*  | 0.42*  | 0.07  | 0.54** | 0.11  | 0.80** |        |
| 11. Management worker relations        | 5.06 | 0.75 | 0.45*  | 0.37*  | 0.31  | 0.41*  | 0.20   | -0.26 | 0.43*  | -0.12 | 0.64** | 0.61** |

\* p &lt; 0.05, \*\*p &lt; 0.01.

**Appendix 5.B: Descriptive statistics and gravity estimations for 1984-1988 1989-1993 and 1994-1998**

*Table 5.B.1: Descriptive statistics and correlation matrix: 1984–1988*

| Variables                | N   | Mean  | s.d. | 1       | 2       | 3      | 4      | 5       |
|--------------------------|-----|-------|------|---------|---------|--------|--------|---------|
| 1. FDI 1984-1988         | 149 | 5.64  | 2.23 |         |         |        |        |         |
| 2. National Incomes 1984 | 149 | 25.30 | 1.52 | 0.65**  |         |        |        |         |
| 3. Distance              | 149 | 8.17  | 1.20 | -0.41** | -0.27** |        |        |         |
| 4. Historical Ties       | 149 | 0.15  | 0.36 | 0.28**  | 0.09    | -0.10  |        |         |
| 5. Common Language       | 149 | 0.09  | 0.29 | 0.26**  | 0.00    | -0.05  | 0.56** |         |
| 6. Cultural Distance     | 149 | 0.37  | 0.92 | -0.36** | -0.33** | 0.28** | -0.16  | -0.27** |

\*  $p < 0.05$ , \*\* $p < 0.01$ .

*Table 5.B.2: Descriptive statistics and correlation matrix: 1989–1993*

| Variables                | N   | Mean  | s.d. | 1       | 2       | 3      | 4      | 5       |
|--------------------------|-----|-------|------|---------|---------|--------|--------|---------|
| 1. FDI 1989-1993         | 192 | 5.91  | 2.43 |         |         |        |        |         |
| 2. National Incomes 1989 | 192 | 25.42 | 1.52 | 0.62**  |         |        |        |         |
| 3. Distance              | 192 | 8.25  | 1.14 | -0.44** | -0.31** |        |        |         |
| 4. Historical Ties       | 192 | 0.15  | 0.35 | 0.31**  | 0.10    | -0.10  |        |         |
| 5. Common Language       | 192 | 0.10  | 0.30 | 0.29**  | 0.02    | -0.09  | 0.60** |         |
| 6. Cultural Distance     | 192 | 0.43  | 0.89 | -0.36** | -0.30** | 0.30** | -0.17  | -0.30** |

\*  $p < 0.05$ , \*\* $p < 0.01$ .

*Table 5.B.3: Descriptive statistics and correlation matrix: 1994–1998*

| Variables                | N   | Mean  | s.d. | 1       | 2       | 3      | 4      | 5       |
|--------------------------|-----|-------|------|---------|---------|--------|--------|---------|
| 1. FDI 1989-1993         | 199 | 6.61  | 2.28 |         |         |        |        |         |
| 2. National Incomes 1989 | 199 | 25.62 | 1.49 | 0.64**  |         |        |        |         |
| 3. Distance              | 199 | 8.21  | 1.14 | -0.42** | -0.23** |        |        |         |
| 4. Historical Ties       | 199 | 0.15  | 0.35 | 0.26**  | 0.11    | -0.11  |        |         |
| 5. Common Language       | 199 | 0.10  | 0.29 | 0.25**  | 0.02    | -0.08  | 0.59** |         |
| 6. Cultural Distance     | 199 | 0.42  | 0.88 | -0.33** | -0.28** | 0.29** | -0.17* | -0.30** |

\*  $p < 0.05$ , \*\* $p < 0.01$ .

Table 5.B.4: Results of the gravity model for FDI location between 1984 and 1988

| Independent variables   | Dependent variable: Ln FDI 1984-1988 |                    |                    |                    |                    |                    |
|-------------------------|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                         | (1)                                  | (2)                | (3)                | (4)                | (5)                | (6)                |
| National Incomes        | 0.88***<br>(0.09)                    | 0.86***<br>(0.09)  | 0.83***<br>(0.09)  | 0.84***<br>(0.10)  | 0.87***<br>(0.09)  | 0.89***<br>(0.09)  |
| Distance                | -0.47***<br>(0.12)                   | -0.43***<br>(0.11) | -0.40***<br>(0.11) | -0.42***<br>(0.12) | -0.43***<br>(0.11) | -0.44***<br>(0.11) |
| Historical Ties         |                                      | 1.32***<br>(0.36)  | 1.25***<br>(0.36)  |                    |                    |                    |
| Cultural Distance       |                                      |                    | -0.21<br>(0.15)    | -0.28**<br>(0.16)  | -0.10<br>(0.16)    |                    |
| Common Language         |                                      |                    |                    |                    | 1.83***<br>(0.46)  | 1.91***<br>(0.44)  |
| Adjusted R <sup>2</sup> | 0.47                                 | 0.51               | 0.51               | 0.48               | 0.53               | 0.53               |
| N                       | 149                                  | 149                | 149                | 149                | 149                | 149                |

Notes: Standardized regression coefficients reported; standard errors are in parenthesis.

Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 5.B.5: Results of the gravity model for FDI location between 1988 and 1993

| Independent Variables   | Dependent Variable: Ln FDI 1989-1993 |                    |                    |                    |                    |                    |
|-------------------------|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                         | (1)                                  | (2)                | (3)                | (4)                | (5)                | (6)                |
| National Incomes        | 0.88***<br>(0.09)                    | 0.85***<br>(0.09)  | 0.81***<br>(0.09)  | 0.82***<br>(0.09)  | 0.85***<br>(0.09)  | 0.88***<br>(0.09)  |
| Distance                | -0.58***<br>(0.12)                   | -0.54***<br>(0.12) | -0.49***<br>(0.12) | -0.51***<br>(0.13) | -0.51***<br>(0.12) | -0.53***<br>(0.12) |
| Historical Ties         |                                      | 1.61***<br>(0.36)  | 1.52***<br>(0.36)  |                    |                    |                    |
| Cultural Distance       |                                      |                    | -0.30**<br>(0.16)  | -0.38***<br>(0.16) | -0.17<br>(0.16)    |                    |
| Common Language         |                                      |                    |                    |                    | 1.94***<br>(0.44)  | 2.08***<br>(0.42)  |
| Adjusted R <sup>2</sup> | 0.44                                 | 0.49               | 0.50               | 0.45               | 0.50               | 0.50               |
| N                       | 192                                  | 192                | 192                | 192                | 192                | 192                |

Notes: Standardized regression coefficients reported; standard errors are in parenthesis.

Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 5.B.6: Results of the gravity model for FDI location between 1993 and 1998

| Independent Variables   | Dependent Variable: Ln FDI 1994-1998 |                    |                    |                    |                    |                    |
|-------------------------|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                         | (1)                                  | (2)                | (3)                | (4)                | (5)                | (6)                |
| National Incomes        | 0.89***<br>(0.08)                    | 0.87***<br>(0.08)  | 0.84***<br>(0.08)  | 0.85***<br>(0.08)  | 0.87***<br>(0.08)  | 0.89***<br>(0.08)  |
| Distance                | -0.56***<br>(0.11)                   | -0.53***<br>(0.10) | -0.49***<br>(0.11) | -0.51***<br>(0.11) | -0.51***<br>(0.10) | -0.53***<br>(0.10) |
| Historical Ties         |                                      | 1.09***<br>(0.33)  | 1.03***<br>(0.33)  |                    |                    |                    |
| Cultural Distance       |                                      |                    | -0.21<br>(0.14)    | -0.27**<br>(0.14)  | -0.10<br>(0.14)    |                    |
| Common Language         |                                      |                    |                    |                    | 1.58***<br>(0.40)  | 1.66***<br>(0.38)  |
| Adjusted R <sup>2</sup> | 0.48                                 | 0.50               | 0.52               | 0.48               | 0.52               | 0.52               |
| N                       | 199                                  | 199                | 199                | 199                | 199                | 199                |

Notes: Standardized regression coefficients reported; standard errors are in parenthesis.  
Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



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## Nederlandse Samenvatting

Het is algemeen bekend dat Afrika het armste continent ter wereld is, gemeten naar niveau en groei van inkomen per hoofd van de bevolking. In veel studies naar economische groei in een globale context neemt Afrika dan ook een bijzondere plek in, vaak weerspiegeld door de beruchte Afrika-dummy.

Maar gemiddelden hebben een beperkte betekenis in de Afrikaanse context, gezien de enorme diversiteit die dit continent herbergt. Er zijn 47 landen in Sub-Sahara Afrika (hierna Afrika), die samen een gebied bestrijken van 23,8 miljoen vierkante kilometer. Dat is een gebied zo groot als Europa, de Verenigde Staten (inclusief Alaska) en China samen. Het continent kent een grote verscheidenheid aan klimaatzones die varieert van woestijnen en semi-woestijnen tot savannes, tropische regenwouden en bosgebieden.

In 2000 leefden er meer dan 665 miljoen mensen in Afrika, gemiddeld 28 mensen per vierkante kilometer. Het dichtstbevolkte land is Mauritius met 584 inwoners per vierkante kilometer, de minst dichtbevolkte landen zijn Namibië en Mauritanië die respectievelijk 2,3 en 2,4 inwoners per vierkante kilometer hebben. Daarnaast is Afrika ook etnisch en linguïstiek veruit het meest diverse continent ter wereld.

Deze grote verschillen in omstandigheden kunnen we terug zien in de ontwikkelingspaden die diverse Afrikaanse landen hebben bewandeld gedurende de tweede helft van de twintigste eeuw. Er zijn landen die gemiddeld meer dan 2,5 procent per jaar zijn gegroeid sinds 1950, maar er zijn ook landen die in 2000 armer waren dan 25 jaar eerder.

Afrika's bijzondere positie in ontwikkelingsstudies, en de grote diversiteit in ontwikkelingspaden van verschillende Afrikaanse landen verdient een analyse van haar institutionele en economische ontwikkeling in een volledig Afrikaanse context. Dit proefschrift zal dit doen vanuit een historisch perspectief, door te kijken naar de invloed van initiële condities op de lange termijn ontwikkelingspaden in Afrika.

Gegeven Afrika's koloniale geschiedenis, die een duidelijke invloed heeft gehad op de ontwikkeling van dat continent (al was het alleen al door de creatie van de landen die we vandaag de dag kennen) definiëren we twee perioden voor initiële condities: de prekoloniale periode en de koloniale periode.

Het **eerste hoofdstuk** van dit proefschrift is zowel een algemene inleiding op Afrikaanse lange-termijn ontwikkeling als een inleiding op de hoofdstukken die volgen. Het begint met een kort overzicht van de huidige economische omstandigheden in Afrikaanse landen en de belangrijkste ontwikkelingen sinds 1950. Daaruit wordt duidelijk dat er voldoende variatie in groei is tussen landen om te kunnen analyseren. Hierna volgt een overzicht van de literatuur over economische ontwikkeling, met een focus op Afrika.

De literatuur onderscheidt de volgende kernoorzaken van Afrikaanse ontwikkeling:

*Instituties*, die hun oorsprong hebben in de koloniale tijd. De algemene conclusie is dat Afrikaanse landen slechter presteren dan landen uit andere regio's omdat het institutionele raamwerk dat geïmplementeerd is gedurende de koloniale tijd om verschillende redenen niet voldoet.

*Slavenhandel*, die voor en tijdens de koloniale periode bestond, en waardoor miljoenen jonge Afrikanen zijn weggevoerd. Niet alleen zorgde de slavenhandel voor politieke instabiliteit, maar ook voor extreem lage bevolkingsdichtheid. De literatuur toont aan dat beide factoren een termijn effect hebben op de lange termijn ontwikkeling van Afrika.

*Geografie*: de tropische ligging van het grootste deel van het Afrikaanse continent wordt gezien als een reden voor de over het algemeen lage productiviteit in de landbouw vanwege slechte grondkwaliteit, schaarste van water, en de aanwezigheid van ongedierte en parasieten die ziekten veroorzaken bij mens en dier. Daarnaast zijn een groot aantal landen in Afrika afgesloten van directe toegang tot de zee, of een bevaarbare rivier. Dit maakt het transport van goederen kostbaar en moeilijk.

Een laatste belangrijke conclusie in de literatuur over de ontwikkeling in Afrika is dat de grote *etnische diversiteit* op het continent de economische ontwikkeling vaak heeft gehinderd, doordat het moeilijker is een oplossing voor conflicten te bereiken als er veel groepen betrokken zijn. Empirische resultaten echter wijzen verschillende kanten op, hetgeen bewijst dat de relatie tussen etnische diversiteit en economische groei een gecompliceerde is.

Eén van de onderwerpen waar in de kwantitatieve literatuur tot nu toe relatief weinig aandacht is besteed is de situatie zoals die was voordat de Europese landen het continent gingen besturen. Lange termijn institutionele verklaringen bijvoorbeeld houden meestal alleen rekening met de koloniale invloed op instituties en niet met de omstandigheden in de tijd daarvoor. Bovendien onderzoeken de meeste studies economische ontwikkeling op basis van analyses voor alle landen in de wereld. De vraag is hoe goed die methoden toepasbaar zijn op de groeiverschillen *tussen* Afrikaanse landen. Op beide terreinen beoogt dit proefschrift een bijdrage te leveren. Ten eerste door de institutionele omgeving van prekoloniale samenlevingen mee te nemen in een analyse van de lange termijn institutionele en economische ontwikkeling. Ten tweede door uitsluitend de verschillen in ontwikkeling tussen Afrikaanse landen te bestuderen.

Het **tweede hoofdstuk** van dit proefschrift is gewijd aan de invloed van prekoloniale instituties op institutionele ontwikkeling. Op basis van antropologische data construeren we verschillende institutionele maatstaven die lange-termijn institutionele en economische ontwikkeling zouden kunnen verklaren.

Een groot deel van de kwalitatieve en historische literatuur beargumenteert het belang van vroege politieke structuren op institutionele en ontwikkeling. Politieke stabiliteit (vaak gerelateerd aan staatsstructuren) bijvoorbeeld, leidt tot betere instituties en zo tot hogere economische groei.

In dit hoofdstuk beargumenteren we dat naast deze staatsstructuren, lokale gemeenschapsstructuren even belangrijk zijn voor het verklaren van institutionele ontwikkeling in Afrika. Ten eerste was de lokale een cruciaal kenmerk van (prekoloniale) Afrikaanse organisatiestructuren; een karakteristiek die tot op heden kenmerkend is gebleven voor veel landen in de regio. Lokale samenlevingen functioneerden als verzekering in tijden van ziekte of slechte oogst en speelden zo een centrale rol in het omgaan met schaarse hulpbronnen. Daarnaast functioneerden goed georganiseerde lokale samenlevingen als tegenwicht ten opzichte van de staat. Lokale gemeenschapsstructuren beperkten de macht van de staat en maakten collectieve actie gemakkelijker.

Naast vroege politieke structuren nemen we nog drie andere prekoloniale institutionele karakteristieken mee, waarvan op basis van de literatuur ook kan worden verwacht dat ze van invloed zijn op lange termijn institutionele ontwikkeling.

De eerste is autochtone slavernij. Hierbij bekijken we welke samenlevingen de institutie van slavernij hadden vóór de koloniale machten het continent innamen. Slavernij is een institutie die mensen controleert en uitsluit. Er bestaat literatuur die beargumenteert dat slavernij vaak leidt tot de ontwikkeling van politieke systemen waarbij mensen beperkt worden in hun deelname in politieke processen. De laatste twee prekoloniale instituties die we beschouwen zijn culturele heterogeniteit, en conflictmanagement instituties. Daartoe brengen we in kaart hoeveel verschillend georganiseerde groepen in één land leven, en of deze groepen naar binnen of naar buiten toe zijn georganiseerd, dat wil zeggen of ze wel of niet contact zoeken met andere groepen met als doel samenwerking (een heel rudimentaire vorm van conflictmanagement) te bevorderen. Als groepen heel verschillend zijn georganiseerd kan worden verwacht dat voorkeuren verschillen en dat samenwerking moeilijker is dan in samenlevingen waar groepen homogeen zijn gestructureerd. Dit zal met name het geval zijn in samenlevingen waar geen instituties ten behoeve van conflictmanagement waren ontwikkeld.

De resultaten bevestigen het belang van de combinatie van staat en community structuren voor institutionele ontwikkeling. In landen waar deze structuren goed ontwikkeld waren zien we nu meer wet- en regelgeving en sterkere democratische structuren. Daarnaast zien we dat in samenlevingen waar slavernij een algemene verbreide institutie was, de wet- en regelgeving en democratische structuren zich in veel minder sterke mate hebben ontwikkeld. Ook een grote diversiteit in culturele achtergrond blijkt de ontwikkeling van deze instituties te bemoeilijken, hoewel deze heterogeniteit een minder negatief effect heeft in die samenlevingen waar een zekere vorm instituties ten behoeve van conflictmanagement waren ontwikkeld.

De negatieve invloed die slavernij heeft op institutionele ontwikkeling, de omvangrijke literatuur over de invloed van Europese exportslavernij op ontwikkeling in Afrika, en het in de literatuur vaak genoemde nauwe verband tussen autochtone slavernij en exportslavernij, heeft ertoe geleid dat we de invloed van autochtone slavernij op economische ontwikkeling in een aparte analyse onderzoeken in **hoofdstuk 3**.

Autochtone slavernij kent een lange geschiedenis en bestond al ver voor de koloniale slavenhandel (zeker vanaf de eerste eeuw na Christus, bijvoorbeeld in wat nu Ghana is). Autochtone slavernij was vaak een volledig geïntegreerd kenmerk van

prekoloniale samenlevingen. Toch zijn er veel bronnen die beargumenteren dat de institutie van autochtone slavernij sterk beïnvloed en veranderd is door de Europese slavenhandel, en dat autochtone slavernij het continent heeft geopend voor de export slavernij.

Veel samenlevingen steunden qua economische groei en politieke machtsvorming voor een groot deel op slaven. Productie hing vaak af van slavenarbeid, en politieke macht was afhankelijk van slavenlegers. Verder maakte slavenhandel deel uit van de pan-Afrikaanse handel in goederen zoals zout, koper, en dadels vanuit de Sahara, en gierst, sorghum, graan, vee, gom, ivoor en goud vanuit West Afrika.

De belangrijkste conclusie van dit hoofdstuk is dat autochtone slavernij robuust en significant negatief gerelateerd is aan de lange termijn inkomensontwikkeling in Afrika. De resultaten van onze kwantitatieve analyse zijn grotendeels in lijn met bevindingen in de kwalitatieve literatuur, die stellen dat autochtone slavernij geografisch geconcentreerd was (voornamelijk in West en Equatoriaal Afrika), en meer voorkwam in samenlevingen waar de Islam domineerde. Tenslotte vinden we bewijs dat slavernij, door het sociaal uitsluiten van delen van de bevolking, heeft geleid tot de ontwikkeling van restrictieve instituties, die de ontwikkeling van ‘developmental states’ zeer bemoeilijkt heeft.

In **hoofdstuk vier** analyseren we het effect van de koloniale periode op de lange termijn ontwikkeling in Afrika. In dit hoofdstuk maken we gebruik van de koloniale archieven om de omstandigheden op een aantal gebieden te kunnen kwantificeren. Volgens de literatuur waren de grootste sociale en economische veranderingen tijdens de koloniale periode een gevolg van de politieke bezetting van gebieden en het creëren van landstaten, economische invloed van het Westen, de introductie van het Christendom en van de invoering van westerse scholing. Wij concentreren ons in dit hoofdstuk op twee invloeden, namelijk de invloed van de bezettingspatronen en de invloed van westerse scholing op de ontwikkeling in Afrika.

De bezettingspatronen stellen ons in staat om een van de meest invloedrijke verklaringen voor onderontwikkeling van Afrika, de ‘extractive institutions’ - hypothese, te testen. Deze hypothese stelt dat de instituties, geïmplementeerd door de koloniale machten hebben geleid tot een lage kwaliteit van hedendaagse instituties in Afrika, hetgeen één van de belangrijkste redenen is voor de achterblijvende ontwikkeling van Afrika ten opzichte van andere continenten.



We beginnen dit hoofdstuk met een kritische analyse van deze hypothese door te kijken of de analyse ook onderlinge groeiverschillen tussen Afrikaanse landen kan verklaren. Hoewel deze hypothese de groeiverschillen tussen Westerse landen en ontwikkelingslanden goed lijkt te verklaren, vinden we dat ze niet bruikbaar is voor de verklaring van groeiverschillen tussen Afrikaanse landen onderling.

Met de gegevens over westerse scholing analyseren we vervolgens de invloed van scholing op lange termijn Afrikaanse ontwikkeling. We constateren dat koloniale scholingscijfers een positief effect hebben op hedendaagse scholingscijfers, en dat koloniale scholing positief gecorreleerd is met inkomensontwikkeling sinds de onafhankelijkheid. Dit scholingseffect is robuust voor de opname van controle variabelen voor verschillende koloniale machten, en voor geografische variabelen, van welke sommigen een additionele verklarende kracht hebben. Ook vinden we bewijs voor de stelling dat politieke instituties door scholing worden beïnvloed.

In het **vijfde en laatste hoofdstuk** analyseren we of een koloniale band tussen landen, als onderdeel van bredere historische banden, ook op lange termijn interactie tussen moederland en kolonie beïnvloedt. Onze belangrijkste hypothese is dat, als landen een (koloniaal) verleden delen, dit de bekendheid tussen die landen vergroot en dat dat een positief effect heeft op investeringsbeslissingen.

Uit de literatuur weten we dat de psychologische afstand tussen landen is (de waargenomen afstand tot een ander land) een belangrijke factor voor investeringsbeslissingen is. Wij beargumenteren dat bekendheid tussen landen negatief gerelateerd is aan psychologische afstand tussen landen. Met andere woorden: als mensen bekend zijn met een ander land, voelen ze de afstand tot een ander land als minder ver, dan wanneer ze onbekend zijn met een land. Dit is een verschil met bestaande literatuur, waar de waargenomen afstand meestal afhangt van verschillen tussen landen, en niet van bekendheid met een ander land.

De resultaten bevestigen onze hypothese dat landen meer investeren in landen waarmee ze een historische (koloniale) band hebben dan in landen waarmee ze geen gedeelde geschiedenis hebben. Daarnaast tonen onze resultaten aan dat verschillen tussen landen niet zo belangrijk zijn voor de verklaring van investeringsstromen als vaak wordt gedacht. We vinden geen bewijs voor de stelling dat er meer geïnvesteerd wordt in landen die cultureel, institutioneel, politiek, religieus of op scholingsgebied sterke overeenkomsten vertonen.