

The Importance of Beliefs in Shaping Divergent Economic Outcomes

by

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Declaration

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Abstract

This thesis articulates the case for beliefs as a fundamental cause for divergent long-run development. This beliefs-centred approach is a synthesis of institutional and culture-based explanations of economic growth. New Institutional Economics provides the high-level incentive-based framework, while cultural primacy literature provides the necessary elucidations for hypothesising the channels of causality from beliefs to divergent decision-making across nations.

The stated purpose of this thesis is (1) to inquire whether the relationship between beliefs, culture and economic outcomes can be analysed systematically, and (2) to provide examples of how particular beliefs could influence economic decision-making. In response, this thesis (1) briefly discusses the three recognised general causes of growth in economic literature, (2) provides a review of prominent narratives on the effect of *culture* on divergent development outcomes, (3) qualitatively investigates real-world anecdotes where different beliefs have had an observable effect on outcomes, (4) provides a rationale for investigating beliefs in economics and discusses the conception of beliefs in the Neoclassical model, (5) provides a theoretical framework for analysing the effect of beliefs (namely New Institutional Economics) and describes an individual-level cognitive model of belief formation (namely Shared Mental Models), and (6) provides a demonstration of a model to empirically test beliefs-based explanations of divergent development.

This thesis critically reviews existing literature on the interaction between beliefs, culture and development, and finds that beliefs play a significant and interdependent role in causing divergent outcomes in development. Determining the *exact* magnitude and significance of the effect of beliefs is difficult due to the interdependence of prevailing economic incentive structures, i.e. there is an inextricable endogeneity between beliefs and prevailing institutions. Nevertheless, this thesis articulates methodologies to partially mitigate endogeneity concerns, which, in turn, provide a basis for future empirical research with richer datasets.

For future research and replication, this thesis provides a succinct description of the methodology of the proposed systematic method of analysing the economic effect of particular beliefs and values. To perform this systematic analysis, datasets are required that combine the responses to questions on (1) respondents' views, and (2) economic

outcomes. Surveys that ask more questions to determine beliefs and values, individual-level economic outcomes and policy views, relevant controls, and possible instrumental variables, would provide analysts with richer data for more insightful analyses.

Preliminary results show significant potential for employing this method in other contexts, such as political decision-making, the formulation of public information campaigns, public health, and the analysis of road-user behaviour. Additional contributions from cognitive science involving the formation and evolution of beliefs could further enhance the robustness of the preliminary arguments and findings on the effect of beliefs on divergent economic outcomes.

This thesis concludes that beliefs seem to ultimately affect economic and political decision-making. Moreover, this thesis shows that there is at least one method of analysing the effect of beliefs systematically.

Opsomming

Hierdie tesis verwoord die saak vir oortuigings as 'n fundamentele oorsaak vir uiteenlopende langtermynontwikkeling. Hierdie oortuigings-gesentreerde benadering is 'n sintese van institusionele en kultuurgebaseerde verduidelikings vir ekonomiese groei. Nuwe Institusionele Ekonomie (“New Institutional Economics”) bied 'n hoë-vlak aansporingsgebaseerde raamwerk, terwyl literatuur wat die verwantskap tussen kultuur en ontwikkeling ondersoek die nodige verduidelikings bied vir die kanale van oorsaaklikheid vanaf oortuigings tot uiteenlopende besluitneming van verskillende nasies.

Die doel van hierdie studie is die volgende: (1) Bepaal of die verband tussen oortuigings, kultuur en ekonomiese uitkomstestelselmatig ontleed kan word, en (2) gee voorbeelde te gee van hoe *spesifieke* oortuigings individuele ekonomiese besluitneming kan beïnvloed. Dit is waarom hierdie studie die volgende insluit: (1) 'n Kort beskrywing van die drie erkende algemene oorsake van groei in ekonomiese literatuur, (2) 'n oorsig van belangrike narratiewe oor die uitwerking van kultuur op uiteenlopende ontwikkelingsuitkomstestelsels, (3) 'n kwalitatiewe ondersoek van staaltjies uit die regte wêreld waar verskillende oortuigings 'n waarneembare uitwerking op uitkomstestelsel gehad het, (4) grondrede waarom oortuigings in die ekonomie ondersoek moet word en 'n bespreking van die opvatting van oortuigings in die Neoklassieke model, (5) 'n teoretiese raamwerk vir die ontleding van die impak van oortuigings en 'n beskrywing van 'n kognitiewe model van oortuigings-vorming op die vlak van die individu (naamlik “Shared Mental Models”), en (6) 'n demonstrasie van 'n model om oortuigings-gebaseerde verklarings van uiteenlopende ontwikkeling empiries te toets.

Hierdie studie bied 'n kritiese oorsig van bestaande literatuur oor die interaksie tussen oortuigings, kultuur en ontwikkeling, en bevind dat oortuigings 'n beduidende dog onderling afhanklike rol speel wat tot uiteenlopende ontwikkelingsuitkomstestelsels kan lei. Dit is moeilik om die *presiese* omvang en betekenis van die effek van oortuigings te bepaal as gevolg van die interafhanklikheid van heersende ekonomiese insentief-strukture, dit wil sê daar is 'n onlosmaaklike endogeniteit tussen oortuigings en heersende instellings. Hierdie studie omskryf nietemin metodologieë om die kommer oor endogeniteit gedeeltelik te verminder, wat weer 'n basis bied vir toekomstige empiriese navorsing met ryker datastelle.

Vir toekomstige navorsing en dupliseerbaarheid bied hierdie studie 'n bondige beskrywing van die metodologie van die voorgestelde sistematiese metode om die ekonomiese impak van spesifieke oortuigings en waardes te ontleed. Om hierdie sistematiese ontleding moontlik te maak is datastelle nodig wat die volgende kombineer: (1) respondente se sienings en (2) ekonomiese uitkomst. Meningspeilings wat meer vrae stel om oortuigings en waardes, ekonomiese uitkomst en beleidsbeskouings op individu-vlak, relevante kontroles en moontlike instrumentele veranderlikes te bepaal, sal ontleders ryker data bied vir meer insiggewende ontledings bied.

Voorlopige resultate toon dat hierdie metode beduidende potensiaal het om in ander kontekste (soos politieke besluitneming, die formulering van openbare inligtingsveldtogte, en openbare gesondheid) toepaslik te wees. Bykomende bydraes van kognitiewe wetenskap, wat die vorming en evolusie van oortuigings behels, kan die robuustheid van die voorlopige argumente en bevindings oor die uitwerking van oortuigings op uiteenlopende ekonomiese uitkomst verder verryk.

Hierdie studie kom tot die gevolgtrekking dat oortuigings uiteindelik 'n wesenlike invloed op ekonomiese en politieke besluitneming het. Boonop toon hierdie studie dat daar ten minste een metode is om die impak van oortuigings sistematies te ontleed.

Acknowledgements

My journey as a student thus far has been unorthodox. After school, I started studying civil engineering as a compromise between two passions, namely mathematics and architecture. However, as the undergraduate engineering course progressed, I became disenchanted with the content and working environment in the civil engineering field – so much so that I could not imagine enjoying life as a civil engineer. In the final year of my undergraduate engineering course, I started gravitating towards topics in the field of development economics and subsequently enrolled in undergraduate economics modules. In retrospect, the continuation of my studies has been extremely satisfying.

The decision to prolong my journey as a student would never have been possible without the support of my family and friends. For this, I am chiefly indebted to the unyielding patience and kindness of my parents. My parents, Patrys and Jamine, have supported me resolutely throughout my journey. Their moral and financial support has opened up opportunities for me for which I am eternally grateful. My brothers, Le Roux and Ruan, have backed me throughout the writing process.

I would like to thank my thesis supervisors, Dr Krige Siebrits and Prof Sophia Du Plessis, for their guidance and constructive commentary in the creation of this thesis. While I was still unsure about how I wanted to formulate my research inquiry, they assuaged my uncertainty with their words of encouragement. Throughout this process, they have granted me almost unrestrained levels of freedom to explore my topic however I felt was appropriate, while providing me with an arsenal of relevant academic material.

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Introduction

The purpose of this thesis is (1) to inquire *whether* the relationship between beliefs, culture and economic outcomes can be analysed systematically, and (2) to provide examples of how particular beliefs could influence economic decision-making. This introduction provides an outline of the structure of the thesis to articulate how these two research questions will be addressed.

First, this thesis investigates of the effect of beliefs and values in the context of development economics literature. The three recognised fundamental causes of development, namely (1) geography, (2) culture, and (3) institutions, are discussed in-depth. The case for beliefs as a fundamental determinant for divergent paths of development can be seen as a synthesis between two widely accepted explanations for long-term growth, namely culture and institutions.

Second, this thesis provides a review of prominent narratives on the effect of *culture* on divergent development outcomes. This includes a discussion of the renowned Weberian narrative on the importance of the Protestant Ethic, and a discussion of the importance of Catholic doctrine and marriage patterns. Subsequently, this thesis contends that it is preferable to investigate the effect of *particular beliefs and values*, as opposed to viewing culture per se as a fundamental cause of development. The reason for this approach is, in short, the indeterminate nature of the channel(s) by which a broad concept, such as culture, affects decision-making. *Particular* beliefs and values, in contrast, provide much more insightful channels of causality with respect to decision-making. Further justification for this approach is given later the thesis.

Third, this thesis discusses anecdotes from virology and road safety behaviour to provide case studies that show how beliefs can have real-life consequences. The use of anecdotes is meant to demonstrate how outcomes can differ distinctly based on differences in initial beliefs.

Fourth, this thesis challenges the undertaking of investigating beliefs. Before engaging in discussions on the effects of beliefs on economic outcomes, this research inquiry discusses whether there is, in fact, a *need* to investigate beliefs in the context of economics. To aid this discussion, Chapter 4 articulates the view of an influential opponent to the investigation of beliefs, Nassim Taleb. It is essential to consider whether the investigation of beliefs is a meaningful pursuit or whether it is redundant for

economics. Moreover, the Neoclassical view on preferences, as proposed by Stigler and Becker (1977), is discussed since the assumptions in the model have implications for our understanding of the effect of beliefs on economic outcomes. The conventional Neoclassical model makes specific assumptions about individual preferences, which have significant implications for how the model treats individual beliefs. After considering conceptual critique from social scientists in other disciplines and identifying shortcomings in the conventional Neoclassical model, Bowles (1998) presents an augmented Neoclassical model. The augmented Neoclassical model aims to alter assumptions made in the conventional model and regards preferences as contingent on institutional framing.

Fifth, this thesis discusses the theoretical principles employed to conduct research on the effect of beliefs on economic outcomes. The New Institutional Economics framework is proposed as the preferred theoretical framework for the purpose of investigating the effect of particular beliefs on economic outcomes. This section aims to provide further information on literature concerning the definitions and effects of institutions on development.

Sixth, this thesis demonstrates how the effect of beliefs on economic outcomes can be analysed systematically. To do this the thesis outlines the basic requirement of an empirics-driven method of evaluating the effect of particular beliefs on decision-making. The requirements include (1) the specifications of appropriate datasets, (2) the need for hypothetical claims about the effect of beliefs on outcomes to be *falsifiable* and *exact*, (3) the need for potential channels of causality to be explained, (4) the need for robustness tests, such as testing the same hypotheses with out-of-sample data or other data sources if available, and (5) replication studies of the conclusions made in previous studies with more robust methods and richer data. The need for reviewing hypotheses on the effect of *culture* on economic outcomes is due to the poor arguments on the exact channels by which culture, per se, affects behaviour. Instead, this research paper suggests that looking at *particular* beliefs provide clearer explanations for divergent outcomes. This section explains the distinction in greater depth.

In short, this study critically reviews existing literature on the interaction between beliefs, culture and development, and finds that beliefs do play a significant role in leading to divergent development outcomes. Determining the *exact* magnitude and significance

of the effect of beliefs is difficult due to an interdependence on prevailing economic incentive structures, i.e. there is an inextricable endogeneity between beliefs and prevailing institutions. Nevertheless, this thesis articulates methodologies to partially mitigate endogeneity concerns which, in turn, provide a basis for future empirical research with richer datasets.

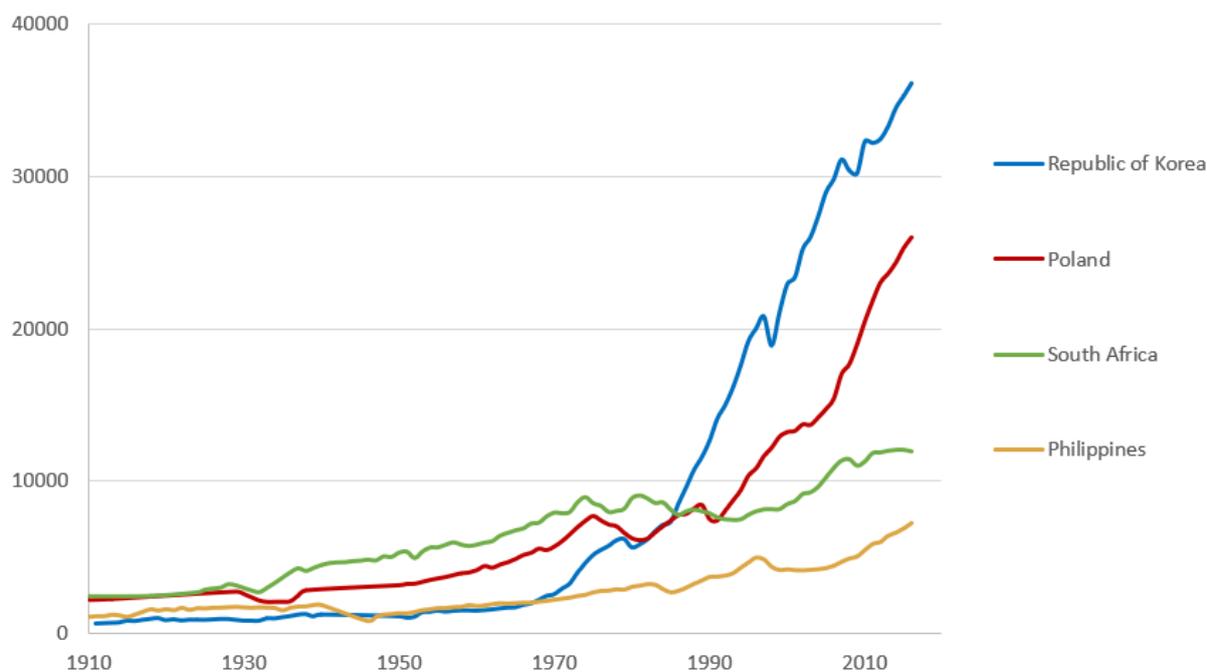
To address the two abovementioned research questions, this thesis (1) briefly discusses the three recognised general causes of growth in economic literature, (2) provides a review of prominent narratives on the effect of *culture* on divergent development outcomes, (3) qualitatively investigates real-world cases where different beliefs have had an observable effect on outcomes, (4) provides a rationale for investigating beliefs in economics and discusses two iterations of the Neoclassical model, (5) provides a theoretical framework, New Institutional Economics, for analysing the effect of beliefs and articulates a conception of the belief-formation process from cognitive science, namely Shared Mental Models, (6) provides more hypotheses on the effect of beliefs and tests them empirically, and describes the channels through which beliefs could translate into divergent behaviour and economic outcomes. Lastly, concluding remarks are made regarding the vision for further research into the topic.

Ultimately, this thesis aims to provide a rationale for investigating the effect of beliefs, and to articulate a methodological approach for investigating the effect of particular beliefs in shaping policy views and economic decisions. These include the choice of occupation, the inclination to spend, save or invest, the preference for redistribution, attitudes towards democracy, attitudes towards female participation in the workplace, and attitudes towards road safety.

Chapter 1: The three fundamental causes of development

When analysing development across nations, it is clear that countries have had vastly divergent growth trajectories. Figure 1 illustrates how per capita incomes between countries have diverged since 1910. In 1910, Poland and South Africa had per capita incomes of approximately \$2,200 and \$2,300, respectively. By 2015, however, the average Pole had an income of \$25,300 while the average South African had \$12,000. From 1910 to 2015, the per capita income in the Philippines grew from \$1,100 to \$6,900, while South Korea's per capita income grew from \$640 to \$35,300. Why have some countries been able to achieve high levels of growth? How can other countries achieve similar levels of growth? Since achieving high growth has profound implications for human welfare, these questions lie at the heart of development economics.

Figure 1: Price-adjusted per capita GDP for selected countries, 1910 to 2016



Source: Data from Bolt, Inklaar, De Jong and Van Zanden (2018)

Certainly, there are innumerable reasons for the divergent growth between the countries illustrated in Figure 1, as well as other countries. However, policymakers and economists are concerned with finding the *most important reasons* behind successful economic growth stories, i.e. they want to identify the *fundamental causes* of sustained economic development. What, then, are the reasons for divergent growth between countries, according to economists? Economic literature (Acemoglu, Johnson & Robinson, 2004:11) typically emphasises one of the three recognised general determinants for the difference

in long-run development between nations, namely (1) geography, (2) culture, and (3) institutions, all of which are discussed in depth in this chapter.

1.1. Geographical endowments

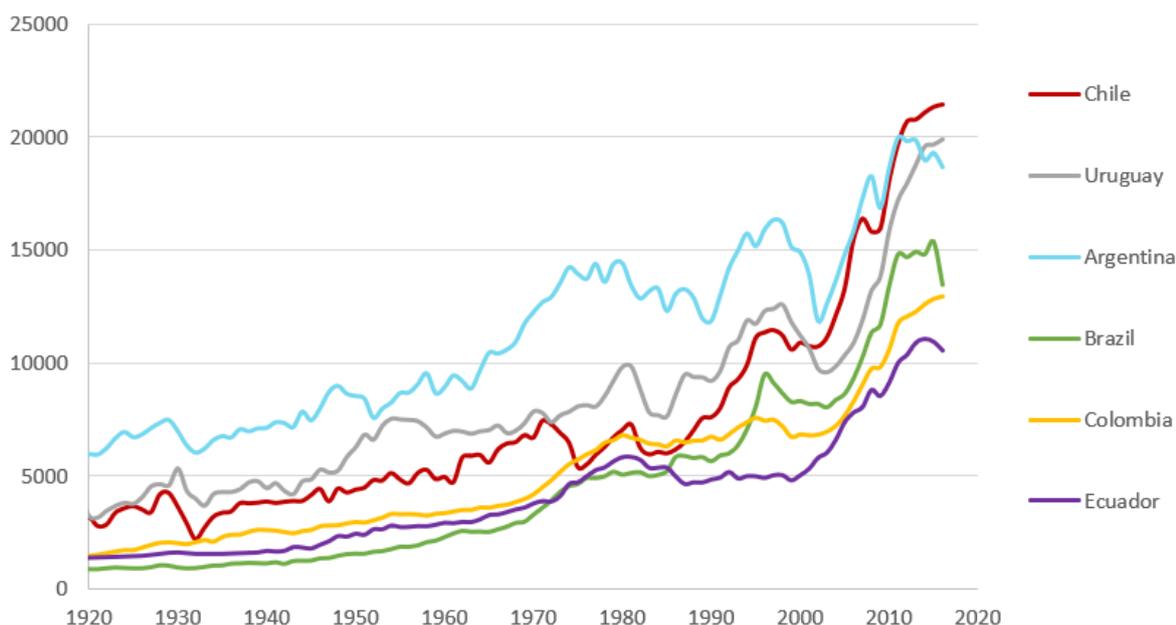
Hypotheses regarding the effect of geography on economic growth have long been expressed among historians and economists. Montesquieu (1748:167) laments that tropical regions are fated to remain destitute because “the heat of the climate may be so excessive as to deprive the body of all vigour and strength”. Moreover, Montesquieu theorises that “faintness is communicated to the mind” of individuals who live in tropical heat which, Montesquieu reasons, has a diminishing effect on the proclivity for scientific inquiry, enterprise and initiative. Since a population’s climate, as well as its resultant theoretical effect on culture, is largely immutable, the Montesquieuan hypothesis would predict that individuals (or communities) in colder regions would be more industrious than those in the tropics, and that the disparity in industriousness by region would be persistent over time.

Similarly, Sachs (2001:1) reasons that countries in the tropics face unique developmental obstacles, since two critical sectors of their respective economies – namely agriculture and healthcare – encounter exceptional challenges in these regions. The agriculture sector in the tropics is typically much less productive – in terms of output per hectare or per unit input – than agriculture sectors in more temperate regions. Sachs (2001:13-15) identifies four underlying ecological factors that contribute to the persistently lower yield levels in the tropics. First, soils in the tropics are weathered more harshly than in temperate zones through a combination of heavy rainfall, relentlessly high temperatures and the subsequent leaching of organic compounds. Second, crop pests and parasites are more pervasive in the tropics. The absence of cold seasons in the tropics means that pests and parasites are not subject to seasonal bouts of population reductions due to freezing. Third, plant respiration is more costly when ambient temperatures are higher. Consequently, the high night-time temperatures in the tropics lower crop yields. In response, many tropical farmers often relocate their crops to higher elevations to increase yields. Fourth, despite high levels of rainfall, high temperatures rapidly increase surface water evaporation, as well as water transpiration through plant surfaces. Moreover, in the tropics, rainfall levels tend to fluctuate significantly from year to year. Altogether, the absence of a reliable supply of water, as well as the difficulty of utilising

water that evaporates rapidly, fundamentally impedes agricultural productivity in the tropics.

In addition to the abovementioned obstacles to agricultural development, Sachs (2001:1) identifies the burden of diseases in the tropics as an invariable limitation to a nation's development prospects. Even when controlling for per capita income, life expectancy is lower and infant mortality is much higher in tropical regions (Sachs, 2001:15-16). The high prevalence of disease affects labour supply and labour productivity, and it also diverts resources away from economic activity other than medical expenditure for survival. Figure 2 shows the per capita GDP of selected South American countries. By simply comparing the performance of nations that are in the tropics, such as Brazil, Colombia, and Ecuador, to the performance of the "Southern cone", which consists of Argentina, Chile, and Uruguay, it appears that there is a potential link between growth and a country's proximity to the equator.

Figure 2: Price-adjusted per capita GDP for South American countries, 1910 to 2016

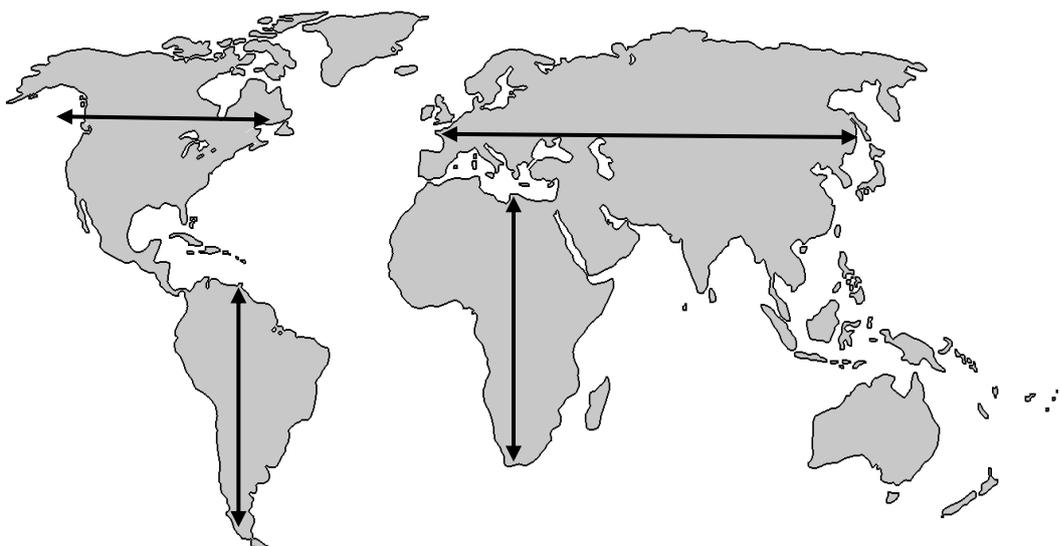


Source: Data from Bolt, Inklaar, De Jong and Van Zanden (2018)

Diamond (1997:180) suggests that the orientation of the major axes of continents has had a significant influence on the development prospects of countries. Figure 3 indicates four continental masses' respective major axes. How could the orientation of a continent's major axis affect its economic growth? In short, crop transfers are more successful along latitudes than transfers along longitudes because the climate is more similar along latitudes than longitudes. Civilizations that could transfer crops along latitudes,

therefore, had a geographical advantage over those that could not. North America, like Eurasia, has a latitudinal major axis, which is more beneficial for crop transfer. South America, like Africa, has a longitudinal major axis, which is unfavourable for crop transfer. Diamond (1997:180) claims that the orientation of major axes is a fundamental reason for the divergent growth between these regions.

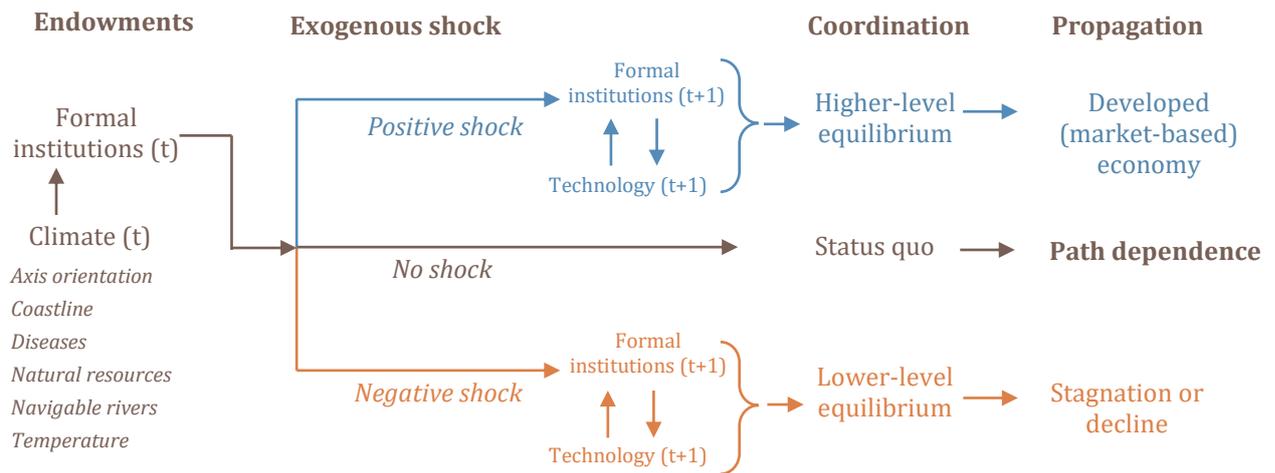
Figure 3: Major axes of four continental masses



Altogether, the climate-development hypotheses proposed by Montesquieu (1748), Sachs (2001:1) and Diamond (1997) are development narratives that emphasise the significance of strict path dependence, or “developmental fatalism”. Since countries in the tropics can do little to change their climate and geographic endowments, and since the obstacles to development are overwhelming, it would seem that there is little that tropical countries can do internally to overcome these obstacles. Sachs (2001:28-29) advocates for international aid and technological development directed at overcoming the climate-induced challenges in the tropics. Figure 4 presents a condensed version of the fatalistic climate-development model. The model indicates the need for a positive exogenous shock in the form of technological solutions to tropics-specific problems, as proposed by Sachs (2001:28-29), as a necessary “big push” to reach a higher level coordination equilibrium. A few countries have been able to seemingly escape “the curse of the tropics”, namely Hong Kong, Malaysia, Mauritius, Singapore, and Taiwan. Sachs (2001:26-27) remarks that these countries have accomplished their transition due to (1) the implementation of well-managed public health systems, and (2) the adoption of policies that were aimed at diversifying their respective economies and transitioning

away from primary sectors, such as agriculture, and towards export-orientated manufacturing. However, Sachs (2001:26-27) stresses that all of the “successful” tropical countries are *islands*, which makes disease control considerably easier than on mainlands. Therefore, the atypical ability of these countries to overcome their burden of disease may well have been aided by their particular geographies.

Figure 4: Fatalist climate-development model



In response to the climate-development hypothesis, Acemoglu, Johnson and Robinson (2002:1278-1279) reason that geography is an inadequate explanation for the divergence in economic performance between former European colonies. Moreover, Acemoglu, Johnson and Robinson (2002:1231) identify that there appears to be a “reversal of fortune” between regions that were colonised by Europeans, i.e. regions that were relatively affluent in 1500 CE are now poorer than regions that were relatively poor in 1500 CE. For example, North America, Australia, and New Zealand are much more affluent than Central America and South Asia, although the reverse was true in 1500 CE. Acemoglu *et al.* (2002:1278-1279) contend that the reversal of fortune contradicts two prominent hypotheses made by climate-development proponents. First, the reversal contradicts the “simple geography hypothesis”, i.e. that geographical endowment is the fundamental determinant of divergent growth between nations. The simple geography hypothesis would necessarily predict persistent growth paths, contrary to the reversal of fortune experience. Second, the reversal contradicts the “sophisticated geography hypothesis”, i.e. that geographical advantage manifests at particular times along a nation’s development path. Acemoglu *et al.* (2002:1261) reason that the sophisticated geography hypothesis is an inadequate explanation for divergent development due to the nature and timing of the reversal of fortune. The reversal in fortune occurs as

industrialisation is quickly embraced by some colonies, while others delay the transition to manufacturing.

In conclusion, the climate-development school reasons that factors such as axis orientation, access to coastlines and navigable rivers, consistent hot temperatures, and the burden of disease, result in path dependent development based on geographical endowments – i.e. “geographical fatalism”). Although the fatalist climate-development model provides an insightful hypothesis for why most countries in the tropics are poor, the model does not seem to account for why some countries, which cannot meaningfully change their geography, have been able to change their development paths.

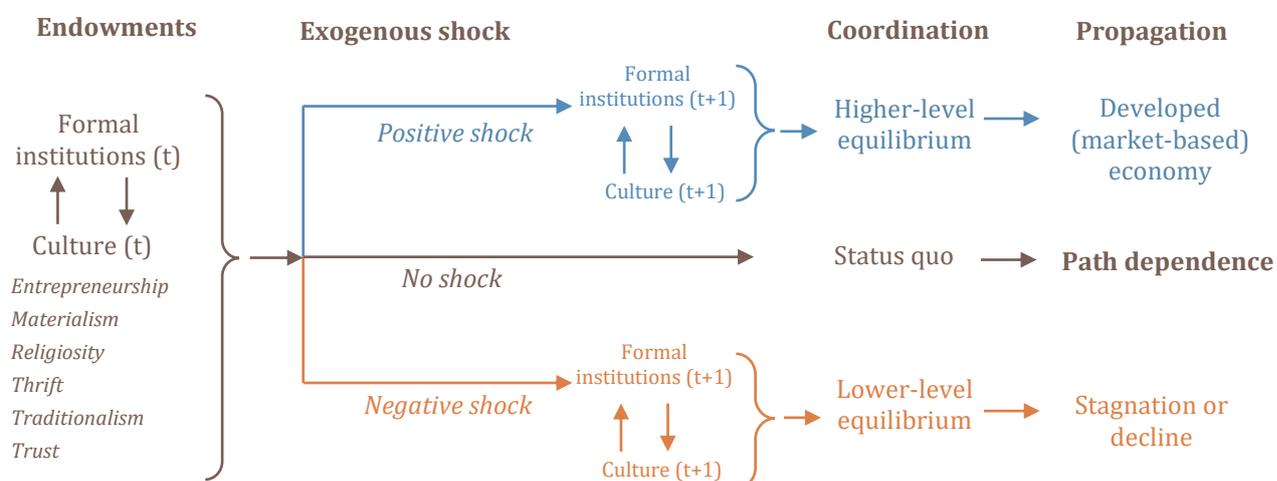
1.2. Culture

Guiso, Sapienza and Zingales (2006:1) define culture as “... those customary beliefs and values that ethnic, religious, and social groups *transmit fairly unchanged* from generation to generation”. Conceptually, the shared experience of a community that has lived in a geographical location for generations would generate particular mechanisms to facilitate cooperation and commerce. Over time the community would agree, either tacitly or explicitly, to a common set of customs and etiquette. It is not important whether the agreed upon custom is the most efficient or “superior”. What matters is that the custom is accepted by consensus or an overwhelming majority. The agreed-upon customs represent a stable social equilibrium. Furthermore, the set of customs is likely to differ between communities with different shared experiences. Differences between cultures can therefore be interpreted as multiple social equilibria, formed by respective shared experiences and prevailing institutions.

The case for regarding culture as a fundamental cause of growth is closely linked to the case for institutions since it is almost synonymous to the notion of *informal institutions* (see section 1.3). Since culture is, in effect, a catch-all term for a *set* of beliefs and customs, should economists not rather consider which *particular* beliefs or customs have an effect on economic decision-making and policy preferences? This section will discuss some of the obstacles of using culture, per se, as a determinant of growth. The distinction between using culture and beliefs for analyses will be illustrated in further detail in Chapters 2 and 6. Moreover, Chapter 6 provides a prototypical model for using *particular* beliefs or values as explanatory variables for divergent growth. Chapter 3 provides real-world anecdotes from pandemics and road-user behaviour to illustrate how beliefs may inform policymaking, as well as individual decision-making.

The climate-development school emphasises the constraints on development due to geographical endowments. Similarly, the culture-development school emphasises the constraints on development due to cultural endowments. Figure 5 presents a condensed version of the fatalist culture-development model. The model indicates the need for a positive exogenous shock as a necessary “big push” to reach a higher-level coordination equilibrium. Colonisation serves as a historical example of an exogenous shock that was strong enough to affect embedded cultural institutions, and, in turn, alter a country’s development trajectory. Acemoglu and Robinson (2010:4-5) distinguish between extractive and inclusive institutions that formed during colonisation. Extractive institutions typically formed when colonisers were chiefly concerned with rapid resource extraction in a colony. These institutions typically do not protect property rights of a broad cross-section of the affected population, and lack checks and balances on elites. Inclusive institutions typically formed when the colonisers settled in large numbers in regions with temperate climates and a lower burden of disease. These colonies formed institutions that favoured reinvestment, i.e. broad-based property rights and checks on elite power.

Figure 5: Fatalist culture-development model



The need for a momentous exogenous shock in this model implies that underdeveloped countries are, to a great extent, unable to reform themselves due to the pervasiveness and intransigence of an “anti-development” culture. Are there historical examples of underdeveloped countries that have transitioned towards being developed countries without the need for an exogenous change in culture? Chang (2011:491-492) describes how narratives on the conduciveness of Confucianism for development have changed

rapidly since East Asia has emerged as a hotspot for development since the late 20th century. Contemporary social scientists mostly argue that Confucianism is an innately “pro-development culture”. First, contemporary social scientists reason, Confucianism places a strong emphasis on education which is, of course, an essential complementarity to long-run development. Second, the Confucian concept of “the mandate of heaven” provides the precedent for grassroots movements to oust ineffective regimes. Third, Confucianism venerates frugality, which would hypothetically encourage saving for future investments.

Prior to the apparent growth in East Asia, however, social scientists mostly regarded Confucianism as an *impediment* to growth, i.e. an “anti-development culture”. First, earlier social scientists reasoned, Confucianism idealises scholarly bureaucracy as an occupation and alludes to a noble bureaucrat as its hero protagonist. Second, it antagonises a commercial occupation as a way of life by disparaging merchants and craftsmen. Third, it advocates for a relatively hierarchical form of social organisation and a top-down approach to politics. The Confucian Analects (see section 5.1) emphasises that an honourable leader is needed to guide the masses (Rainey, 2010:23-55). Moreover, Confucianism implores the masses to be obedient to their parents, and to conform to the prevailing customs and values in society. Despite the prevalence of asceticism and predestination in Confucian canon – the two doctrines that Weber (1905) emphasises as prerequisites for capitalist industrialisation (see section 2.1) – Weber (1916a) claims that the Confucian version of these two doctrines is not conducive to development. In particular, Weber (1916a:30-32) argues that the conception of frugality in Confucian asceticism undermines the “acquisitive drive” to refine one’s skills and master one’s craft. Weber (1916a:30-32) explains that the Confucian emphasis on achieving harmony within a prevailing social structure disincentivises the attainment of moral dynamism, as opposed to the quest for virtue in accordance to God’s will – *independent* of prevailing social milieu – in Protestantism.

More recently, Krugman (1994) contends that narratives that claim that East Asian economies would soon converge (toward the per capita income levels in advanced economies) are too optimistic. Krugman (1994:62-69) uses the development experience of the Soviet Union – where growth was initially exceptionally high but effectively stalled in the late 20th century – as an analogy for his interpretation of the apparent growth experienced in East Asia. Contrary to the optimistic forecasts of exceptional development

in East Asia made by other economists, Krugman (1994:69-72) regards growth in East Asia to lack concomitant levels of improvements in innovation and entrepreneurship. After Krugman's (1994) paper was published, however, East Asian economies have managed to converge or even surpass many advanced economies on several welfare metrics, such as performance in education, life expectancy and per capita income (World Bank, 2016).

As this section has shown above with Confucianism, social scientists draw similarly contradictory conclusions about Islamic culture's effect on development. In academic literature, Islamic doctrine either has an innate anti-developmental character or it has an innate pro-developmental character (Chang, 2007:130-139). Since most majority Muslim countries are relatively poorer today compared to other countries (World Bank, 2016), social scientists who argue that Islamic culture is an impediment to development tend to dominate contemporary discussions on the topic. Moreover, the detractors of Islamic culture provide reasonable channels of causality for its poor development outcomes. First, Islam's intolerance of apostasy, diversity, and heterodoxy impedes creativity and, in turn, entrepreneurship. Second, its disparagement of materialism and "worldly things", as well as a fixation with reaping the rewards for a devotional life on earth in the afterlife, is antithetical to commercial pursuits, such as profit-maximisation and wealth accumulation. Third, the strict regulations on the freedom of women mean that half of the labour force is effectively removed from meaningful civil engagement and commercial occupation. Fourth, a veneration of zealous militarism, or *jihad*, increases a fondness for making war, as opposed to investing in human capital or engaging in commerce.

However, those who argue in favour of Islamic culture's developmental potential recall particular periods in history, such as the Medieval period, when Muslim countries were world leaders in mathematics, medicine and science (Chang, 2007:135-136). Moreover, proponents of the development potential of Islamic culture provide their own hypothetical channels of causality. First, since the Prophet Mohammed was a merchant, Islam is regarded as "the merchant's religion". Second, Islamic teachings emphasise the importance of making and respecting contracts, which forms the basis of larger scale commerce and investment. Furthermore, adherence to contracts is a prerequisite for facilitating the rule of law in advanced economies. Third, pre-modern Muslim societies were evidently more tolerant than Christian societies. When Christians succeeded in the

Reconquista of Spain, Iberian Jews fled to the Ottoman Empire to live among Muslims instead of staying among intolerant Medieval Christians (Chang, 2007:136).

It appears that using *culture*, per se, as the explanation for growth is not very helpful for understanding the Protestant ethic and the effect of Catholic doctrine. Moreover, the supposed effect of Confucianism or Islamic culture on development seems to align with whatever the prevailing conditions are in those respective societies. When Confucian countries are poor, it is supposedly because Confucian culture (1) idolises bureaucrats, (2) disparages commercial occupations, and (3) favours innovation-stifling hierarchical rule. When Confucian countries are prosperous, it is supposedly because Confucian culture (1) esteems human capital investment, (2) stipulates means to oust ineffective leaders, and (3) promotes frugal living, which encourages saving. When Muslim countries are prosperous, it is because Islamic culture (1) idolises a merchant and is therefore commerce-friendly, (2) emphasises that contracts should be formulated and honoured when agreements are made, and (3) is tolerant towards adherents of other religions. When Muslim countries are poor, it is because Islamic culture (1) resists apostasy and heterodoxy, (2) is fixated on the afterlife and opposed to wealth accumulation in the earthly life, (3) imposes strict regulations on women, and (4) favours zealous militarism over productive economic activity. Altogether, narratives on the supposed effect of Confucianism or Islamic culture on development appear to be *ex post facto* explanations. The case for using *culture* as the fundamental explanation for divergences in development between nations is further marred due to difficulties in measurement. How can culture be measured quantitatively? Alesina and Giuliano (2015:900) review the different approaches for “measuring culture” in economics and psychology that have been attempted. Empirical measurements of culture tend to employ polling on declared beliefs and values, such as the methods employed by Guiso *et al.* (2006). Conversely, culture can be viewed as a dedication to certain values based on emotional attachment. The latter view illustrates the difficulty of generating comparable quantitative data on cultural differences. Putnam (1993:167-171) proposes a composite metric of “social capital” which measures cultural components that are important for development outcomes, such as trust, networks and norms. Conceptually, social capital is a composite measure of social coordination features. Putnam (1993:181-185) finds a positive correlation between social capital features and the effectiveness of local governments in Italy.

However, correlations between social capital and development are subject to significant endogeneity concerns (Acemoglu *et al.*, 2004:16).

Since using a complex concept like *culture* to explain divergent economic outcomes seems to be fraught with obstacles and murkiness, this thesis advocates for the use of *particular* beliefs or values as explanatory variables for divergent economic outcomes instead. Additionally, using particular beliefs or values as explanatory variables means that articulating causal channels towards economic outcomes are much more precise and falsifiable.

In short, the culture-development school reasons that cultural factors result in path-dependent development based on cultural endowments, i.e. “cultural fatalism”. Although the fatalist culture-development model provides reasonable hypotheses for why some cultures either impede or encourage development, the model does not seem to account for why some countries have been able to change their development paths, despite not changing their cultural endowments. Moreover, the seemingly *ex post facto* nature of culture-development narratives somewhat undermines the credibility of culture-based explanations for divergent growth.

1.3. Institutions

The climate-development and culture-development schools aim to explain the development prospects of a country (or community) based on prevailing conditions, namely the geographical situation or cultural endowments of the country. These endowments typically undergo negligible alterations as they are transferred across generations. Furthermore, climate-development and culture-development schools argue that countries are to a great extent anchored by their respective endowments, which results in path-dependent development. Unless a country is subjected to a significant exogenous shock, geographical and cultural endowments hardly change. Therefore, it follows that it should be relatively easy to predict a country’s growth trajectory, given the initial endowments. This section articulates the case for considering differences in institutions as a way to account for divergent growth between countries (or communities).

North (1990:1) and Acemoglu, Johnson and Robinson (2004:20) contend that the characteristics of a nation’s institutions is the essential determinant of growth. North (1990:1) defines *institutions* as the “humanly devised constraints that structure political,

economic and social interactions". In economic literature, institutions are categorised as either formal constraints – such as laws, regulations, and rights – or informal restraints – such as norms, taboos, and traditions.

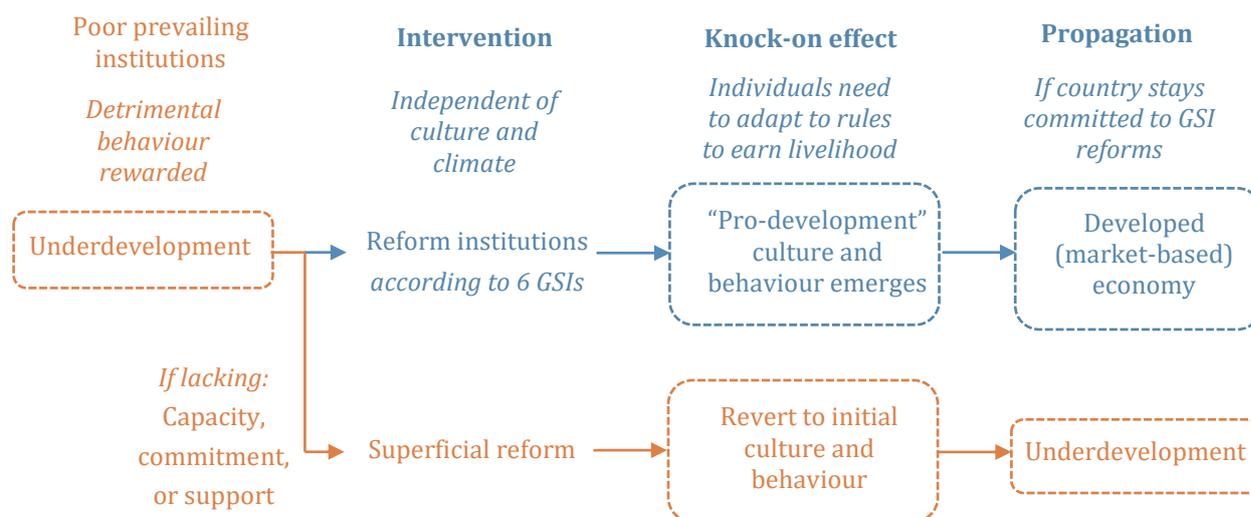
Additionally, Acemoglu, Johnson and Robinson (2004:24-28) distinguish between extractive and inclusive institutions. When analysing the difference in development between former European colonies, Acemoglu *et al.* (2004:24-25) note that countries where colonists were chiefly concerned with hastily extracting natural resources perform much worse in the long run than colonies that eventually became colonial settlements. Moreover, countries with high burdens of disease, such as malaria, were understandably not regarded as favourable settlement destinations for colonists. Because of these differing characteristics of colonisation, institutions formed according to the incentive structure of the colonisers. In regions with high burdens of disease, *extractive* institutions formed where the chief purpose was extracting natural resources without the need to reinvest the gains from extraction. In regions with favourable climates, akin to that of Europe, colonists had incentives to form *inclusive* institutions that emphasise reinvestment and, ultimately, sustainable development. It is, however, apparent that Acemoglu *et al.* (2004:24-25) require the *geographical endowments* of countries – such as the burden of disease, natural resources, and temperate climate – to justify their case for the primacy of institutions in accounting for divergent development.

In contrast to the fatalistic climate-development and culture-development schools, Chang (2011:490-494) identifies the voluntarist Global Standard Institutions (GSI) school in the development hypothesis debate. The voluntarist GSI school reasons that countries need to enact a distinct set of institutional reforms in order to achieve growth in a globalised world economy. In particular, GSI proponents argue in favour of six free market friendly institutional reforms (Chang, 2005:363-365).

First, GSI eschews domestic interventions in industrial policy, such as import substitution or export incentives (World Bank, 1987:58-59). Instead, GSI favours a *laissez faire* approach to industrial policy which emphasises the need to attract foreign direct investment through macroeconomic stability and incentives for foreign investors (World Bank, 1987:116-117). Second, GSI argues for an austere and limited state-owned enterprise sector, which needs to be subject to the oversight of politically independent regulators (World Bank, 1987:67). Third, policymakers should prioritise the

establishment of well-developed financial markets which can process high volumes of local and international stock trading (World Bank, 1987:22). Moreover, corporate regulations should be non-restrictive to allow for relatively easy mergers and acquisitions, i.e. the strength of antitrust regulations should be limited. Fourth, policymakers should prioritise conservative monetary and fiscal policy, favouring prudence and macroeconomic stability. Furthermore, central banks should be politically independent with a strict and singular mandate, namely inflation-targeting (World Bank, 1987:5). Fifth, corporate governance laws should be shareholder-orientated, thereby ensuring that corporations adhere to a legal imperative to maximise returns on stock owners' investment (Chang, 2005:370). Sixth, labour markets should be flexible and employer-friendly, to allow for quick reallocation of labour when prices change (Chang, 2005:370-373).

The six GSI reforms are aimed at providing the institutional foundation for developing countries to pivot towards free market economies. GSI proponents argue that these reforms are universally applicable, since a globalised world economy has made the pursuit of other development paths obsolete (World Bank, 1987:69-71). Implicit in the case for GSI is the acceptance that a predominantly free market economy *ought* to be the preferred outcome of institutional reforms and development. The voluntarist GSI model can be seen as a strong case for first reforming formal institutions, so that new *de jure* rules and market incentives compel changes in informal institutions. When compared to the culture-development model, the voluntarist GSI model implicitly inverts the direction of causality between culture and formal institutions on the way towards development. Figure 6 illustrates how the enactment of GSI reforms hypothetically causes culture and behaviour to change according to new incentives, which, in turn, leads to a superior development trajectory.

Figure 6: Voluntarist GSI development model

In 1987, the World Bank examined and contrasted the respective institutional reforms undertaken by several developing countries. The 1987 World Bank Development Report (1987:99-101) emphasises the need for economic liberalisation, i.e. for government intervention in markets to be limited so that prices in the economy are not distorted. Additionally, the report suggests that countries with an “outward orientation” to international trade had shown much higher levels of growth than those that had been “inwardly orientated”. Outward orientation is defined as having “... little or no use of direct controls and licensing arrangements” and with “trade controls [that] are either non-existent or very low” (World Bank, 1987:82). The report contrasts the performance of East Asian countries, which it describes as being more liberalised and outwardly orientated, to Latin American countries, which it describes as being more interventionist and inwardly orientated.

However, Wade (1990:19-20) challenges the World Bank’s analysis of East Asia’s growth during that period. South Korea, for example, contravened several of the principles proposed by the World Bank’s 1987 development report. First, the South Korean government extensively engaged in deliberate currency devaluations and exchange rate controls to stimulate exports. Second, the Korean government distorted prices by intervening in their domestic manufacturing and agriculture sectors to stimulate local development. Third, Korea had an assortment of measures in place to protect local industries and had controlled capital flows. Similarly, other East Asian countries that experienced remarkable growth, such as Singapore and Taiwan, had deviated notably

from the World Bank's approach of economic liberalisation and outward orientation, while also contradicting many of the recommended GSI reforms.

The revised account of the causes of rapid development in East Asia, as articulated by Wade (1990) and Rodrik (1995), demonstrates that countries can develop without strictly adhering to the six GSI prescriptions. Moreover, the experience in parts of the former Soviet bloc provides a bleak account of countries that adhered to the six GSIs and either stagnated or declined (Pejovich, 1999:175-177). Pejovich (1999:177) claims that the failure of GSI reforms in Eastern Europe was due to prevailing social norms, which were in conflict with the capitalist reforms that were enacted. Wade (1990:357) contends that the GSI reforms employed in Eastern Europe were inappropriate for the conditions at the time. Furthermore, Wade (1990:358) reasons that the "developmental state" model, as applied in East Asia, would likely have been a more adequate approach for initiating long-run development in Eastern Europe.

This section discussed the potential for using "universally preferable" institutional reforms. It is clear, however, that there is controversy around whether there are reforms that are universally preferable and whether such reforms can, in fact, be applied universally. The previous two sections investigated the case for emphasising the effect of geographical and cultural endowments on divergent development, and discussed the strength of path dependence. Chapter 2 will provide an articulation of two prominent narratives on how culture affects economic outcomes, namely the Protestant ethic and European Marriage Patterns.

Chapter 2: Narratives on the effect of culture on development

Numerous attempts have been made to use differences between cultures to explain why there are such differences in economic outcomes between nations. This chapter presents two prominent narratives on how culture affects economic outcomes, namely (1) the Protestant ethic and (2) European Marriage Patterns. Weber (1905:97-100) argues that the doctrines of Protestantism provided the necessary industrious culture in north-western Europe for this region to initiate capitalist industrialisation. The European Marriage Pattern hypothesis argues that the Gratian doctrine was the catalyst that changed household dynamics in north-western Europe, which led to the early adoption of industrialisation in these regions.

2.1. The spirit of capitalism

One of the most cited attempts at arguing for culture as a *cause* of growth is Max Weber's conception of the *Protestant ethic*. Weber (1905) claims that Protestantism, and especially Puritan Protestantism, is *the driving force* (or "spirit") behind capitalist industrialisation. Weber (1905:97-100) argues that the four Puritan sects – Calvinism, Baptism, Methodism, and Pietism – contain doctrines that are prerequisites for the manifestation of capitalist industrialisation. Puritans, Weber (1905:97-100) emphasises, share the doctrines of (1) predestination and (2) asceticism, which he identifies as the drivers behind industrialisation.

2.1.1. The case for Puritan virtues

The doctrine of predestination asserts that only a select few believers have already been chosen by the Christian God to be saved from eternal damnation. Believers will not know if they are fated to attain eternal life or damnation until they are physiologically dead. Weber (1905:103-104) reasons that the "extreme inhumanity" of predestination has "one consequence... [namely, a] feeling of unprecedented inner loneliness of the single individual", from which Weber concludes that this loneliness would necessarily cause a believer to live as if they were chosen, as opposed to being guilty of doubtfulness. Despite the apparent torment of a belief in predestination, Calvin himself was conveniently assured of his own salvation, due to him being "an instrument of Divine prophecy". Moreover, a Weberian argument typically reasons that Puritans necessarily respond to the uncertainty of their fate by performing "good works", as opposed to choosing either idleness or despair.

According to Weber, the virtue of asceticism would hypothetically inspire a believer to be consistently dutiful in the fulfilment of their “calling”. Weber (1905:123) regards Puritan asceticism as the cause for a “positively frugal” lifestyle. Conceptually, the combination of dutiful work and frugal living would result in high levels of savings among Puritans, which would subsequently be available for investment in capital stock. Weber’s *Protestant ethic* claims that the particular set of cultural beliefs that Puritans embraced is the fundamental reason for industrialisation originating in Protestant north-western Europe, as opposed to it originating in Catholic southern Europe.

2.1.2. Analysing the Protestant ethic hypothesis

This section will analyse the hypothesis and conclusion of the Protestant ethic. The analysis will (1) critically assess the coherence of the conceptual case of the Protestant ethic, and (2) evaluate whether the Protestant ethic is an empirically robust proposition. Should we accept Weber’s (1905:97-100) conceptual explanation about why providence and asceticism are doctrines that are required for capitalist industrialisation? Weber claims that Protestants will act as if they had already been “chosen” by God by engaging in good works, since they are uninformed about God’s plan for their life and about whether or not they have received God’s grace for eternal life. Moreover, some New Testament verses would seem to support the importance of engaging in material labour, such as:

“Let him who stole steal no longer, but rather let him labour, working with his hands what is good, that he may have something to give him who has need.” (Holy Bible, 1982: Ephesians 4:28)

“Thus also faith by itself, if it does not have works, is dead. But someone will say, “You have faith, and I have works.” Show me your faith without your works, and I will show you my faith by my works.” (Holy Bible, 1982: James 2:17-19)

However, the realisation of Protestant doctrine could conceptually *discourage* engagement in enterprise and labour. Some Protestant denominations emphasise the importance of attaining salvation through faith and *not* through works or deeds. These denominations laud the pursuit of a monastic life in order to actively strengthen their faith, and shirk “worldly” preoccupations, such as devoting too much time to commercial enterprise. Monastic denominations would also cite New Testament verses to justify their emphasis on faith above works, such as:

“... that in the ages to come He might show the exceeding riches of His grace in His kindness toward us in Christ Jesus. For by grace you have been saved through faith, and that not of yourselves; it is the gift of God, *not of works*, lest anyone should boast.” (Holy Bible, 1982: Ephesians 2:7-9)

It is, therefore, unclear whether Weber’s (1905:97-100) assertion that the doctrine of providence would *necessarily* lead to a Protestant engaging in “good works” is persuasive. The verses above show that there exists a degree of ambiguity regarding the importance of “works” and enterprise in the New Testament. Moreover, this ambiguity manifests in the divergent viewpoints on the primacy of works and enterprise between different Protestant denominations.

In fact, a belief in *Karma* from Hinduism provides a much clearer motivation for an individual to engage in good works in this physiological life. A belief in Karma is denoted by a conviction that an individual who engages in good deeds in the present will be compensated by reciprocal good deeds from others in the future. Moreover, many Hindu sects believe that good deeds will lead to a promotion in the notoriously rigid caste hierarchy upon reincarnation (Weber, 1916b:28).

It is unclear whether asceticism, which Weber regards as critical for capitalist industrialisation, is a uniquely Protestant doctrine. For example, Hindu doctrine asserts that adherents should not place high value on material comforts in their current physiological life, since material rewards will follow in their next life – so long as they do good deeds in the present. Certain sects in Catholicism, such as the Franciscan Order, emphasise living frugally to imitate the earthly life of Christ (Palomo, 2016:4-8). Sufi Muslims aim to imitate a simpler lifestyle, akin to that of the first Muslims in Medina, by eschewing material decadence and modern garbs (Armstrong, 1994:189-191). Similarly, Buddhist monks imitate the principally ascetic example of Siddhartha Gautama, who later became the Buddha, as a means to achieve enlightenment (Tiso, 2010:323-325).

Despite the apparent conceptual shortcomings of Weber’s hypothesis, it is nevertheless useful to evaluate whether the Protestant ethic is an empirically robust proposition. By analysing the growth of 272 Protestant and Catholic cities in the former Holy Roman Empire from 1300 to 1900 CE, Cantoni (2014:1) finds that Protestantism has no statistically significant effect on development, which Cantoni proxies by city size during the respective periods. Becker and Woessmann (2009:8) argue that Weber had

emphasised two doctrines in Protestantism that had *negligible* effects in causing industrial capitalism. Instead of providence and asceticism, Becker and Woessmann (2009:1) find that literacy is a much stronger predictor of subsequent divergence in prosperity between Protestant and Catholic Europe. A key reason for divergence in literacy was due to the Protestant emphasis on reading and understanding a translated Bible – as opposed to the Catholic doctrine of clerical control of Latin-only Biblical dissemination – which, according to the authors, served as a catalyst for broad-based human capital growth and consequent economic development. Despite its embeddedness in social science literature, the main arguments of the Protestant ethic – emphasising the significance of Protestantism, and its doctrines of providence and asceticism, in causing superior growth – lack empirical support.

It appears that using Protestant *culture*, per se, as the explanation for growth is not very helpful for understanding the origins of the Industrial Revolution, nor is it useful for policymaking. Weber's hypothesis on the virtue of Protestant culture in general does not articulate *precise* claims regarding the causal channels towards economic outcomes. Identifying *particular* beliefs, however, is clearly preferable for sensible economic analysis. In the Weberian hypothesis, the importance of the belief in predestination and asceticism is emphasised by Weber and can thus be tested empirically. Even though the beliefs Weber identifies seem to have negligible predictive power, the method is sound since it is unambiguous and falsifiable. The use of *particular beliefs* provides explanatory variables which are necessary for analysing divergent economic outcomes.

2.2. Catholic doctrine and the European Marriage Pattern

Could it be that the roots of the Industrial Revolution *precede* the doctrines of Protestantism? De Moor and Van Zanden (2010:1) contend that the typical composition of households in pre-Reformation Europe was instrumental in causing the Industrial Revolution. The observation of a widespread pre-Reformation “European Marriage Pattern” (EMP) was first recognised by Hajnal (1965:100, 1982:450), and is characterised by (1) later matrimones, (2) smaller households, and (3) higher celibacy ages. Initial investigations of EMPs made no hypotheses about the role of EMPs in causing growth. More recent hypotheses on the effect of EMPs, such as articles by De Moor and Van Zanden (2010) and Foreman-Peck and Zhou (2018), contend that EMPs played a *fundamental role* in causing industrial development in Europe.

Advocates of the EMP-growth hypothesis, such as De Moor and Van Zanden (2010:1), identify a unique combination of forces, namely (1) Catholic doctrines on marriage, (2) the effect of the Black Death, and (3) the expansion of labour markets, which contributed to the emergence of a particular household dynamic conducive to industrial development. This section will predominantly investigate the claim that *Catholic doctrine* contributed to EMPs, which, in turn, is claimed to have led to early industrial growth in north-western Europe.

2.2.1. Gratian doctrine

In the mid-13th century, Gratian doctrine was included in Catholic canon by Pope Gregory IX. Upon inadvertently utilitarian grounds, Gratian doctrine advocates for marriage by mutual consent, as opposed to marriage by physical union, since arranged or non-consensual marriages tended to result in lower contentment for the married partners and their families. De Moor and Van Zanden (2010:5) reason that Gratian doctrine enabled individuals of marriageable age to lawfully wed by performing sacraments in private, without the unambiguous need for the presence of witnesses or a priest. Private sacraments did, however, pose a risk of a rise in secret marriages. Murray (1998:128) finds widespread evidence from 13th century English pastoral manuals, which outline Gratian conventions at local pastoral level. Moreover, subsequent manuals include guidelines on dealing with the consequences of “witness-less” marriages, such as hidden prior marriages and polygamy.

How did the Gratian doctrine affect household dynamics? First, marriage by mutual consent necessarily undermined parental authority. Whereas the choice of spouse was previously a matter that the daughter’s parents would arrange for her, Gratian doctrine emphasised the importance of the consent of both prospective partners. Biller (2000:22) notes that 12th century marriage had mainly been a “lay and secular matter”. In contrast, Gratian doctrine provided a more explicitly spiritual, church-sanctioned definition of marriage. Moreover, the doctrine provided prospective partners with a church-sanctioned vindication of their private sacraments.

Second, households that had been established by mutual consent were more independent due to a combination of church doctrine and intergenerational wealth transfer regimes. In southern Europe, daughters tended to gain access to their parents’ inheritance at the time of her marriage, in the form of a dowry. In north-western Europe daughters mostly only had access to their inheritance at the time of their parents’ passing. Southern

European women were effectively materially incentivised to marry early, while north-western European women had no particular incentive to hasten marriage, especially when daughters had the assurance of a sizable inheritance from their parents. Since north-western marriages were not dependent on dowries from the wife's parents, marriage partners could make decisions independent of their parents' wishes.

Third, Gratian doctrine increased the power of women in deciding who and when they would marry. De Moor and Van Zanden (2010:9) argue that the increased autonomy of north-western women in choosing their partners, along with the assurance of inheritance regardless of the act of matrimony, diffused into household dynamics. The bargaining power of women in the household, pertaining to decisions on childbearing and household consumption, consequently increased. Due to women's delayed decision to marry and have children later, north-western European households tended to have fewer children. Moreover, due to the decreased burden of childbearing, north-western women were much more likely to participate in the labour market.

2.2.2. The Black Death and the industrious revolution

Apart from Catholic doctrine, De Moor and Van Zanden (2010:11) remark that the Black Death in the mid-14th century served to entrench the EMP household dynamic in north-western Europe. The rapid fall in population levels due to the pandemic led to a boom in labour markets across Europe. In north-western Europe, female labour force participation rose significantly due to the increased opportunity cost of non-wage labour, such as homemaking and childcare, in high wage environments. De Vries (1994:267) contends that increased female labour force participation increased the demand for market goods from "outsiders", i.e. individuals outside the household unit. De Vries (1994:247) calls this change in household operations "the industrious revolution".

Whereas households were previously able to produce many goods and services internally, both wives and husbands were now engaged in wage-earning activities. Although households had more income to spend, they had less time to produce a variety of goods on their own and were thus more dependent on buying goods from specialised producers in markets. The increase in the demand for market goods spurred rapid specialisation and accelerated the development of markets in Europe.

Neither De Moor and Van Zanden (2010), nor De Vries (1994) explain why the Black Death led to EMP-led growth in northwest Europe, but not in the rest of Europe or the parts of Asia which were similarly affected by the Black Death.

2.2.3. Testing EMP claims

Advocates of the EMP hypothesis, such as De Moor and Van Zanden (2010:1) and Foreman-Peck and Zhou (2018), claim that marriage patterns played “a *fundamental* role in western Europe’s economic development”. In the case of De Moor and Van Zanden (2010), the claim is mainly supported on the basis of (1) 13th century English pastoral manuals, (2) dissimilar inheritance customs, (3) the Black Death, which affected the whole of Europe and parts of Asia, and (4) the story of Janne Heyndericx, i.e. an anecdote. This section will investigate the soundness of EMP claims qualitatively and empirically.

2.2.3.1. Informal institutions vs Catholic Church power

Was Catholic doctrine truly instrumental in causing EMPs? In the high Middle Ages, the Catholic Church was regarded as “the one true church” throughout Europe. Why then did the Industrial Revolution not start in southern Europe instead of northern Europe? De Moor and Van Zanden (2010:5) argue that Gratian doctrine had more support in the north, and thus the EMP was more a northern trend. Since both the north and south were Catholic, why was the doctrine not accepted throughout Christendom? Could it be that “lay and secular” tendencies were more pervasive in the North? The north is, of course, the home of early dissenters, such as Tanchelm and Peter of Bruys (Pelikan & Frassetto, 2020). Moreover, the north subsequently became the home of the Reformation. It is arguably the case that the Catholic Church was *weaker* in the north and had to adapt to already prevailing egalitarian informal institutions in the north, such as the humanistic concern with gender equality.

In Moor and Van Zanden’s story of Janne Heyndericx, Janne and Adriaen slept together before marriage in clear *defiance* of the laws of the Catholic Church. The authors suggest that Janne’s expulsion from her mother’s home was due to Gratian doctrine (2010:2), as opposed to the myriad of more likely reasons, such as (1) the inconvenience of accommodating an additional adult, Adriaen, (2) the shame of having an unwedded daughter who was sleeping with a man in their home, a custom frowned upon at the time, and (3) Janne’s parents being ashamed that she was contravening their cherished Catholic doctrines. Despite the presence of Gratian doctrine, official marriage sacraments were “[commanded] by the law of the holy Church” (De Moor & Van Zanden, 2010:2) –

even in northern Europe. Thus, in the case of marriage customs, it would seem that differences between northern and southern Europe are more likely to be due to differences in informal institutions than Catholic doctrine.

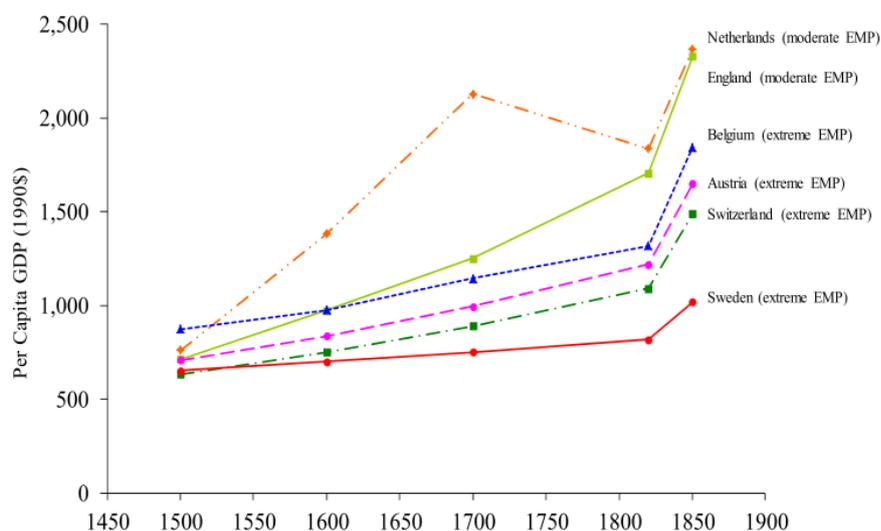
2.2.3.2. Concerns about endogeneity in the EMP hypotheses

There are two prominent hypotheses regarding causal channels in EMP literature, namely (1) female autonomy and (2) human capital investment channels. First, it is reasoned that countries with more acute EMPs produced greater levels of female autonomy, which in turn led to higher levels of economic development. Could the chain of causality justifiably be arranged in a different order and be more persuasive? For example, it can be argued that greater female autonomy produced EMPs, which in turn led to development. Alternatively, EMPs may be the *consequence* of development, as opposed to being the *cause* of development, i.e. it can be argued that higher levels of development produced greater female autonomy, which ultimately shaped EMPs.

Second, it is reasoned that households in countries with more acute EMPs were incentivised to invest more generously in their children's human capital development, which in turn led to higher levels of economic development. Yet again, the chain of causality could justifiably be arranged in a different order and be more convincing. For example, it can be argued that greater human capital investment increased the opportunity cost of having more children, which produced EMPs, which in turn led to development. On the other hand, it can be argued that higher levels of development produced the economic conditions that incentivise human capital investment, which ultimately resulted in EMP. Moreover, it can be argued that EMP hypothesis reasoning would predict *lower* levels of human capital investment in countries with more acute EMPs. If we consider parents' investment in their children's human capital development, and that this investment is made to earn greater future returns, parents would be less inclined to invest in their children's education when they (the parents) have less power over spousal choice, and the children would have greater independence from their parents after they (the children) have moved in with their spouses. In short, more independent offspring would leave their parents and remit *less* of their earnings to their investor parents. Neither De Moor and Van Zanden (2010) nor Foreman-Peck and Zhou (2018) provide arguments to mitigate serious concerns about endogeneity in their EMP hypotheses.

Does empirical evidence support the central claim that countries with a higher incidence of EMPs had higher subsequent levels of development? After composing a data set from 365 European historical demography studies, including comparable information on women’s mean age at first marriage, lifetime celibacy age, and household complexity, Dennison and Ogilvie (2014:659-672) conduct a multivariate analysis to determine whether countries with more *acute* cases of EMP were, in fact, more likely to develop earlier. Household complexity measures whether households accommodated many kin from outside the “nuclear family” of two parents and their children. The Dennison and Ogilvie (2014) analysis provides compelling descriptive evidence that contradicts the EMP-growth hypothesis. First, the early industrialisers, Britain and the Netherlands, were, in fact, “moderate” EMP cases when compared to the “extreme” cases of Belgium, Austria, Switzerland and Sweden. Slovenia and Bohemia had the highest mean age at first marriage. Austria had the highest celibacy age. Finland, the Baltic countries and northern Italy had very high levels of household complexity. Second, Figure 7 shows how the most extreme EMP cases had inferior to stagnant income levels when compared to moderate EMP countries, such as Britain and the Netherlands.

Figure 7: Pre-industrial per capita GDP for selected European countries



Source: Dennison and Ogilvie (2014).

Since England and the Netherlands are not archetypical cases of EMPs, De Moor and Van Zanden’s (2010:4) claim that “[it was] the long-term dynamism of [the EMP household] structure [in England and the Low Countries], which helps explain the long-term success of this region” is not a convincing causal argument when compared to the lower growth in more acute cases of EMPs. The combination of late marriage, higher celibacy age, and

nuclear families is, therefore, unlikely to be the *fundamental* explanation for the divergence in early industrial growth between countries in Europe.

Could there be factors, other than EMPs, that are more significant drivers of industrial development in Europe? In many cases where extreme EMPs prevailed there were severe institutional limitations on female autonomy, such as guild policies in Germany and Switzerland that explicitly discriminated against female labour force participation.

Economic development literature contains many hypotheses claiming to identify the *fundamental* causes of growth, such as geographic endowments, the quality of institutions, and factor prices and resource endowments. The EMP-growth hypothesis has not yet been able to mitigate serious endogeneity concerns and lacks empirical support.

The previous two sections presented two prominent narratives on how culture affects economic outcomes, namely the Protestant ethic and European Marriage Patterns. Weber (1905:97-100) argues that the embrace of Protestantism nurtured the necessary industrious culture in north-western Europe for this region to initiate capitalist industrialisation. The European Marriage Pattern hypothesis argues that Gratian doctrine was the catalyst for changing household dynamics in north-western Europe to form more industrious family units which, in turn, led to the early adoption of industrialisation in these regions. Both the Protestant ethic and Catholic doctrine on marriage were demonstrated to have serious conceptual shortcomings and to lack supporting empirical evidence.

Chapter 3: Anecdotes on the effect of beliefs

Chapter 1 provided an in-depth analysis of the three recognised fundamental causes of development in Development Economics literature, namely (1) geography, (2) culture, and (3) institutions. Chapter 2 scrutinised two prominent narratives on the effect of culture on development, namely the Protestant Ethic and European Marriage Patterns. This thesis reasons that *culture* is an unconvincing explanation for the divergence in development between nations. Both the Protestant Ethic and Catholic doctrine on marriage were demonstrated to have serious conceptual shortcomings, and to lack supporting empirical evidence. Moreover, the culture-development model does not seem to account for why some countries have been able to change their development paths, despite not changing their cultural endowments. The significant endogeneity concerns and *ex post facto* nature of culture-development narratives somewhat undermine the credibility of culture-based explanations for divergent growth between nations.

In contrast to the culture-development model, this thesis argues that a beliefs-based approach provides a superior approach for incorporating cultural factors into economic development analyses. This thesis gradually builds the case for a beliefs-based approach by (1) providing anecdotes to demonstrate how differences in initial beliefs can result in divergent economic outcomes, (2) discussing the rationale for investigating beliefs even though the Neoclassical framework avoids incorporating beliefs, (3) discussing an economic framework that is more amenable to a beliefs-based approach, namely the New Institutional Economics framework, and (4) using a model to demonstrate how the effect of beliefs can be analysed empirically.

This chapter provides anecdotes to illustrate how differences in initial beliefs can result in divergent economic outcomes. The use of anecdotes is aimed at providing tangible demonstrations of how different beliefs influence individual decision-making and how these decisions ultimately have divergent real-world outcomes. This chapter is intended to function as the prologue to a more robust approach of dealing with the relationship between beliefs, culture and divergent economic outcomes.

3.1. Anecdotes from virology

3.1.1. The Virodene treatment

South Africa has by far the highest number of people living with the human immunodeficiency virus (HIV) in the world, at approximately 7,7 million (Central Intelligence Agency, 2019). In fact, South Africa alone accounts for approximately 20% of

people living with HIV in the whole world (Simelela & Venter, 2014:1). Why does South Africa have such a high prevalence of HIV?

In 1992, South African leaders and members from the recently unbanned political party, the African National Congress (ANC), held a National Aids Convention of South Africa, which resulted in the drafting of a national “Aids plan” for the new South Africa. After the transition towards democratic rule in the country, the prospect of tackling a nascent acquired immunodeficiency syndrome (Aids) epidemic seemed promising. Post-transition South Africa’s first two Ministers of Health, Nkosazana Dlamini-Zuma and Manto Tshabalala-Msimang, were attendees of the 1992 National AIDS Convention (Nattrass, 2008:158). Moreover, the transitional Government of National Unity and the subsequent ANC government adopted the Aids plan as their official strategic document on HIV/Aids management. Dlamini-Zuma and Tshabalala-Msimang, however, proved to be major obstacles to effective HIV prevention and treatment.

During her tenure, Dlamini-Zuma undermined the credibility of Aids treatment initiatives by the Department of Health by becoming embroiled in a national scandal, namely the *Sarafina II* play. In 1995 Dlamini-Zuma awarded a R14.3 million Department of Health contract to director Mbongeni Ngema, a close acquaintance of hers, for an extravagant play to promote Aids awareness. The news of the suspect tender process, misuse of earmarked funding and perceived profligacy of the selected medium, a theatre play, ultimately resulted in a condemnatory report from the office of the public protector, Selby Baqwa, which refuted important statements made by the Minister of Health and found that “Mr Ngema’s company had not adhered fully to the spirit and terms of the contract, and it appeared they had tendered a defective service” (Van Onselen, 2016:19). Additionally, Dlamini-Zuma actively resisted the extension of antiretroviral drugs (ARVs) for prevention of mother-to-child transmission (PMTCT).

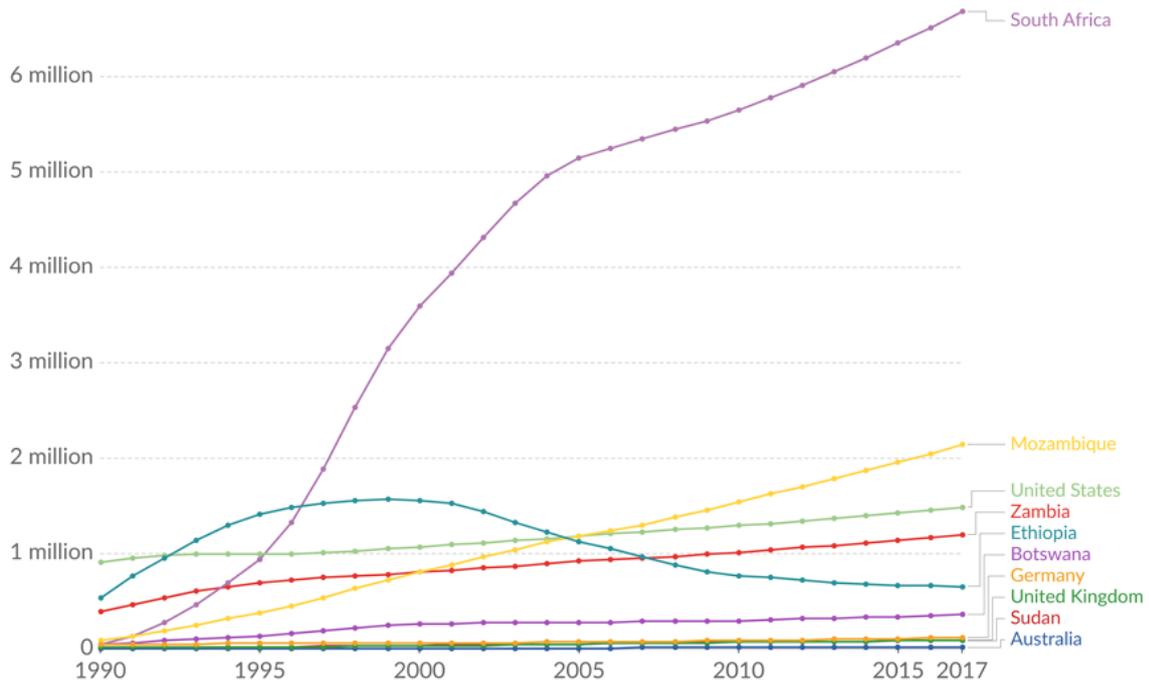
The Mbeki presidency was more vocal in its opposition to using ARVs for preventing or treating HIV/Aids. Mbeki publicly promoted the spurious work of a handful of Aids denialists – who claimed that HIV is harmless and does not cause Aids, and touted Virodene, a dimethyl-formamide industrial solvent, as their recommended treatment for Aids. Moreover, the Aids denialists claimed that Aids symptoms are caused by drug abuse, the use of ARVs and malnutrition (Nattrass, 2008:157-159). In October 2000, President Mbeki stopped giving public commentary on Aids, following strong criticism from local

and international Aids experts. However, his new Minister of Health, Tshabalala-Msimang, continued the fight against scientifically endorsed Aids treatments, such as PMTCT and highly active antiretroviral therapy (HAART). Despite a Constitutional Court finding and a cabinet revolt in 2003, which ultimately compelled her to enact PMTCT and HAART, Tshabalala-Msimang continued to advocate for dubious alternative Aids therapies and publicly described ARVs as “poison”¹.

Due to a lack of data, it may be difficult to quantify exactly how significantly Dlamini-Zuma and Tshabalala-Msimang’s respective tenures at the helm of the Department of Health affected the public’s attitudes towards HIV/Aids causes and treatments. In 2002, Kalichman and Simbayi (2004:1) conducted surveys in a township near Cape Town and found that a significant share of respondents (32%) believed that Aids was caused by spirits and supernatural forces. Moreover, stigma against those suffering from HIV/Aids was especially high among those who believed that spirits and supernatural forces caused Aids. The real-life consequences of the Dlamini-Zuma and Tshabalala-Msimang regimes are clear. Figure 8 shows how HIV cases have surged in South Africa. Figure 9 shows how deaths and new cases of HIV/Aids rose rapidly during the tenures of Dlamini-Zuma and Tshabalala-Msimang. This graph shows a clear decline of deaths from HIV/Aids from 2008 onwards, which coincides with the end of Tshabalala-Msimang’s tenure as the Minister of Health. Figure 10 compares the share of annual deaths attributed to HIV/Aids in selected sub-Saharan countries. Even when compared to sub-Saharan peers, the share of deaths from HIV/Aids in South Africa is among the highest in the region. Figure 11 shows a severe dip in life expectancy – from 63 to 54 years – in South Africa from the early 1990s to 2008, corresponding with the peak of the HIV/Aids pandemic.

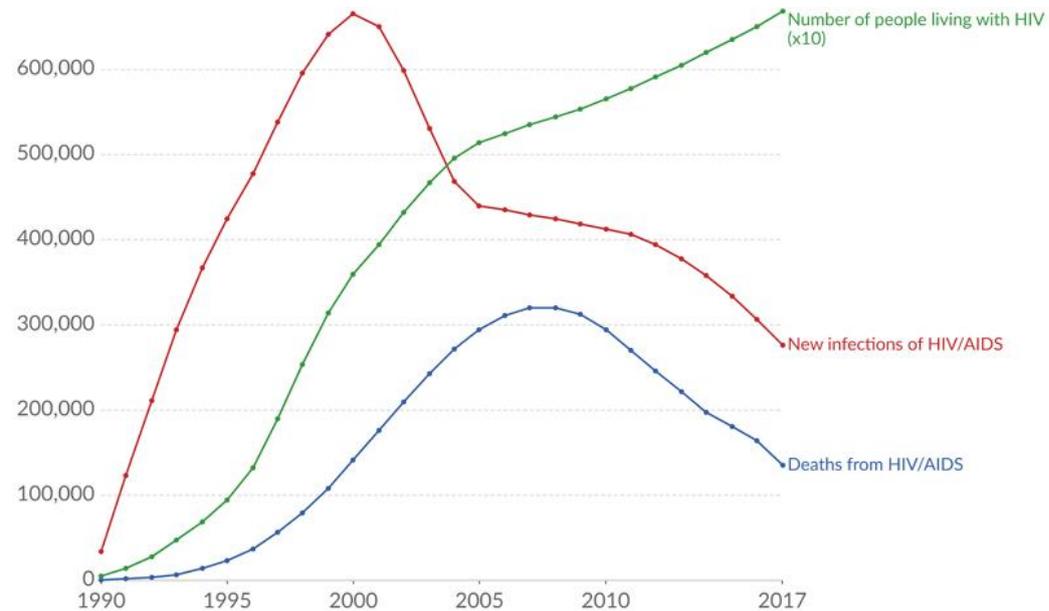
¹ Some may argue that President Mbeki’s anti-ARV policies were due to an ideological commitment, rather than it being a matter of his beliefs. It is indeed important to distinguish whether individuals make their decisions based on ideology, as opposed to their personal beliefs. In the case of Mbeki’s anti-ARV messaging, however, it is unclear which comprehensive worldview informed his disparagement of HIV/Aids treatments. Although it could be argued that his anti-ARV views were informed by a dogmatic form of scepticism towards Western interventions (even if such interventions were life-saving medicines), it is unclear whether Mbeki was in fact dogmatically anti-Western. In the case of other spheres of public policy – such as his conservative fiscal policy (see Pearson, Pillay and Chipkin (2016:8-10)) – Mbeki pursued policies that were suggested by Western nations. It is, therefore, more prudent to consider Mbeki’s anti-ARV policies to be a manifestation of his distrust in particular prescribed HIV/Aids treatment methods, and that his distrust was exacerbated by misinformation from Virodene treatment advocates.

Figure 8: Number of individuals living with HIV for selected countries



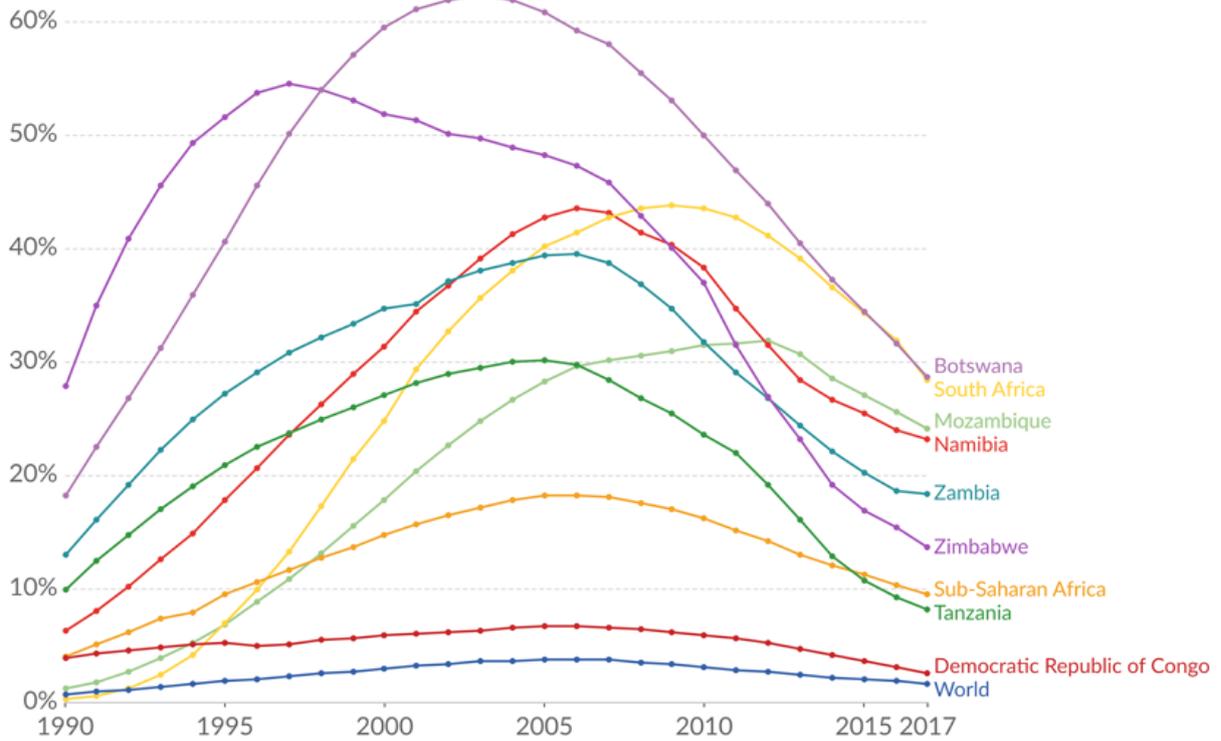
Source: Graph by author using Our World in Data interface. Data from the Institute of Health Metrics and Evaluation (2020).

Figure 9: Annual deaths, prevalence, and new cases of HIV/AIDS in South Africa



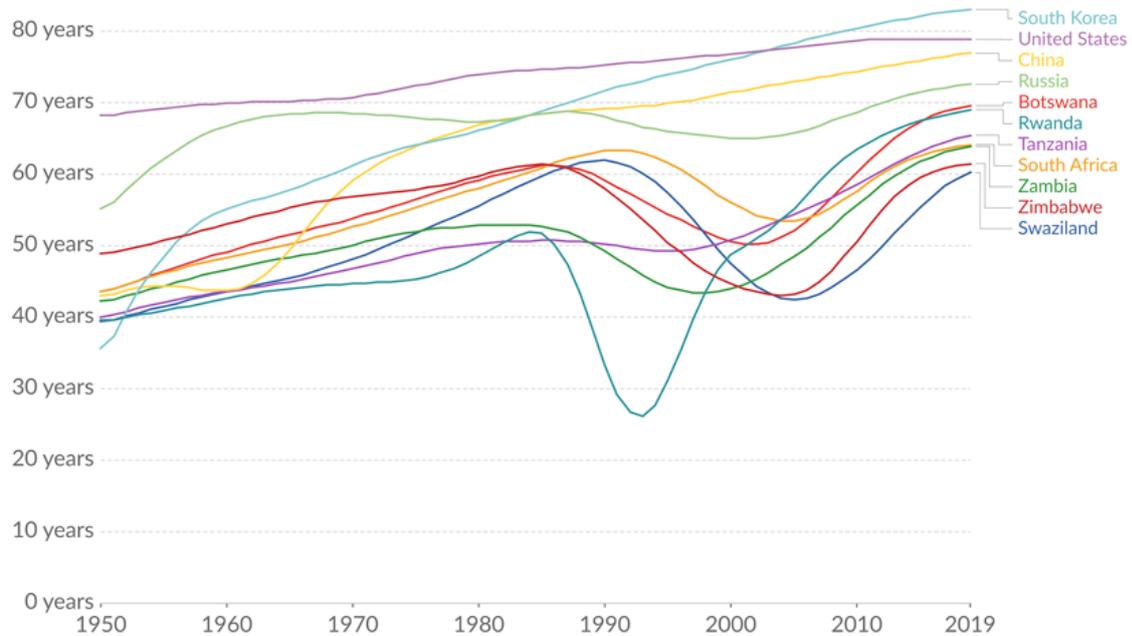
Source: Graph by author using Our World in Data interface. Data from the Institute of Health Metrics and Evaluation (2020).

Figure 10: Share of annual deaths attributed to HIV/AIDS in selected sub-Saharan countries



Source: Graph by author using Our World in Data interface. Data from the Institute of Health Metrics and Evaluation (2020).

Figure 11: Life expectancy for selected countries, 1950-2019



Source: Graph by author using Our World in Data interface. Data from the United Nations (2020:3).

3.1.2. Divergent first responses to COVID-19

On 20 January 2020, the United States (US) and South Korea both reported their first cases of Covid-19 (Terhune, Levine & Jin, 2020:14). The two countries took very different approaches in dealing with the virus. In the United States, White House officials were concerned that market activity might be harmed if financial markets and the public were unnerved by the new virus (Lahut, 2020:11). On a CNBC interview on 6 March 2020, Larry Kudlow, the U.S. Director of the Economic Council, advised Americans that “if you’re healthy, you should go to work. Go about your business. That’s our advice ... Americans should stay at work.” Moreover, Kudlow stated that mass transportation systems, such as domestic and international flights, “... [are] in good shape” and that citizens only need to stay away from “travel warning countries [with many cases of COVID-19]” (Faber, 2020:1). On the same day, when asked about a lack of available COVID-19 tests, Counsellor to the President, Kellyanne Conway, told reporters that the virus “is being contained” (Lahut, 2020:11).

The US president, Donald Trump, was more strident in his denial of the threat of the novel coronavirus (COVID-19). At a political rally in South Carolina on 29 February 2020, Trump claimed that the Democrats were “politicising the coronavirus” and that “[COVID-19] is their new hoax”. A week later in California, Trump suggested that he wanted to avoid reports of an increase in COVID-19 cases. In particular, he stated that he wanted to keep passengers from the Grand Princess cruise ship offshore because he “like[s] the numbers being where they are. I don’t need to have the numbers double (sic) ...” At the same press conference, Trump falsely claimed that “anybody right now, and yesterday... who wants a [COVID-19] test gets a test. They’re there. They have the tests and the tests are beautiful (sic)” (Associated Press, 2020). In fact, at that time the US had a severe lack of test kits (Leonhardt, 2020:17).

In an interview on the conservative news network, Fox News, prominent Baptist leader and president of the large evangelical Christian Liberty University, Jerry Falwell Jr, echoed Trump’s flippant tone regarding the severity of the global pandemic. Falwell claimed that people were “over-reacting”. Falwell strongly implied that there was “a political reason” for the COVID-19 warnings. He said that Liberty University would not suspend classes. Without any substantive evidence, Falwell suggested that coronavirus was a “Christmas present for America” from the North Korean dictator, Kim Jong-un, which was “developed when they got together with China”. The Fox News interviewers

made no attempts to question or scrutinise any of Falwell's claims about the virus (Fox News, 2020). If the Trump administration and conservative media outlets, such as Fox News, had intended to sow confusion regarding the severity and origins of COVID-19, they succeeded. In a survey conducted in mid-March 2020 of 8,914 American adults, the Pew Research Center found that 29% of Americans believe that COVID-19 was developed in a laboratory either by mistake or intentionally. Among Republican-leaning adults, 30% believe that COVID-19 was *intentionally* developed in a laboratory (Mitchell & Oliphant, 2020:1). Republican-leaning adults are also more likely to believe that the news media have *greatly* exaggerated the risk of COVID-19 (53%) than Democratic-leaning adults (22%) (Mitchell & Oliphant, 2020:2).

In September 2020, *Washington Post* reporter, Bob Woodward shared a voice recording of an interview he had conducted with Trump on 7 February 2020, where the president disclosed that he had intentionally been downplaying the severity of COVID-19, despite knowing that it is "... more deadly than your – you know, your – even your strenuous flus". In particular, Trump stated that he "wanted to always play [COVID-19] down. I still like playing it down ..." (Martin, 2020). Woodward's recording suggests that Trump did, in fact, believe that COVID-19 was a severe threat to public health and made statements to the contrary in public. It appears that Trump's public trivialisation of the severity of COVID-19 was likely due to political opportunism, rather than sincere personal conviction. Nevertheless, it seems that the Trump administration's COVID-19 misinformation campaign did succeed in shaping many Trump supporters' sceptical beliefs regarding COVID-19

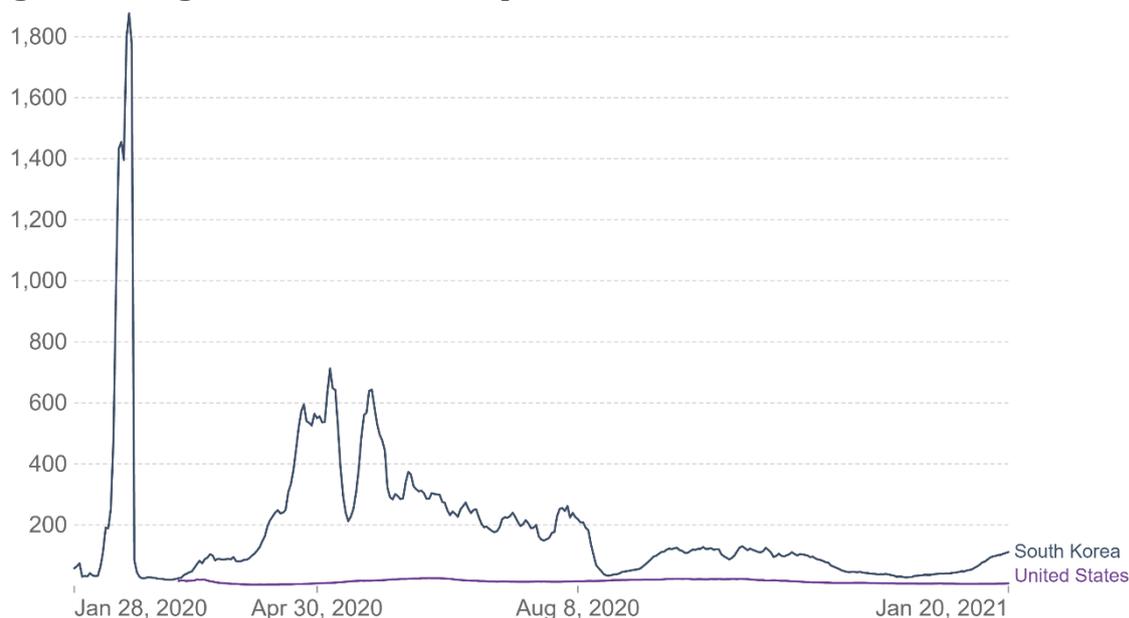
In South Korea, the government's response to COVID-19 was much more assertive than that of the US. In late January 2020, with only a handful of confirmed COVID-19 cases in South Korea, health officials organised an urgent meeting with representatives from major Korean medical companies. The message from health officials was clear: The Korean government wanted to help facilitate the development of an effective coronavirus test and would grant swift regulatory approval to companies with promising test kits (Terhune *et al.*, 2020:1). Within a week, the first diagnostic test kit for COVID-19 had been approved, and more kits would follow soon after. By late February 2020, Korea made headlines for its unparalleled COVID-19 testing capabilities – thousands per day – and drive-through screening centres.

Why was the South Korean response to COVID-19 so assertive? In the case of coronavirus, Korea is arguably *less* fortunate than the US. Korea is closer to the initial epicentre of the viral outbreak, i.e. it is practically adjacent to China. Korea is arguably more dependent on the Chinese economy, and there is a greater risk of contagion due to the close proximity of Chinese citizens. Moreover, the population density in Korea is much higher than in the US, which increases the risk of rapid contagion. Korea's top infectious disease specialists feared that coronavirus had the potential to become a pandemic, on par or worse than the 2015 Middle East Respiratory Syndrome (MERS) outbreak. In 2015, the spread of MERS in Korea resulted in 186 confirmed cases, as well as 38 deaths. The administration of President Park Geun-hye, as well as the Korea Centers for Disease Control and Prevention (CDCP), was subjected to fierce criticism by Koreans who felt that the administration was much too slow to respond to the crisis and lacked transparency. Lee Sang-won, an official at the Korean CDCP told Reuters reporters that, in the aftermath of MERS, "we [the CDCP staff members] were hurt so much, and we felt remorseful ... We can't ever forget the incident. It is engraved in our mind" (Terhune *et al.*, 2020:2). Once the first few cases of COVID-19 had been confirmed, the CDCP response was rapid and clear. It is clear that Korean officials and the Korean public *believed* that a new contagious virus was posing a significant threat and that they responded to COVID-19 accordingly.

The respective responses to the outbreak have led to very different outcomes. At the outset, it is important to note that reported COVID-19 data invariably underestimate the actual extent of the pandemic, mainly due to insufficient testing. When comparing the United States and South Korea, however, it is most likely that the extent of COVID-19 has been more severely underestimated in the US, due to lower testing rates per confirmed cases. Figure 12 shows how South Korea has conducted far more tests per confirmed cases of COVID-19 than the US since the start of the COVID-19 pandemic, and prior to the inauguration of the new president of the United States on 20 January 2021. Especially at the very early stages of the COVID-19 pandemic, South Korea conducted widespread testing while the US administration had a delayed testing program. Figure 13 shows how daily new confirmed COVID-19 cases in the US had surged to more than 97 per million people a day at the peak of its first wave (10 April 2020), 202 per million people a day at the peak of its second wave (22 July 2020), and 758 per million people a day at the peak of its third wave (8 January 2021), respectively. Meanwhile, South Korea's daily new confirmed COVID-19 cases has not surpassed 40 per million people a day over the whole

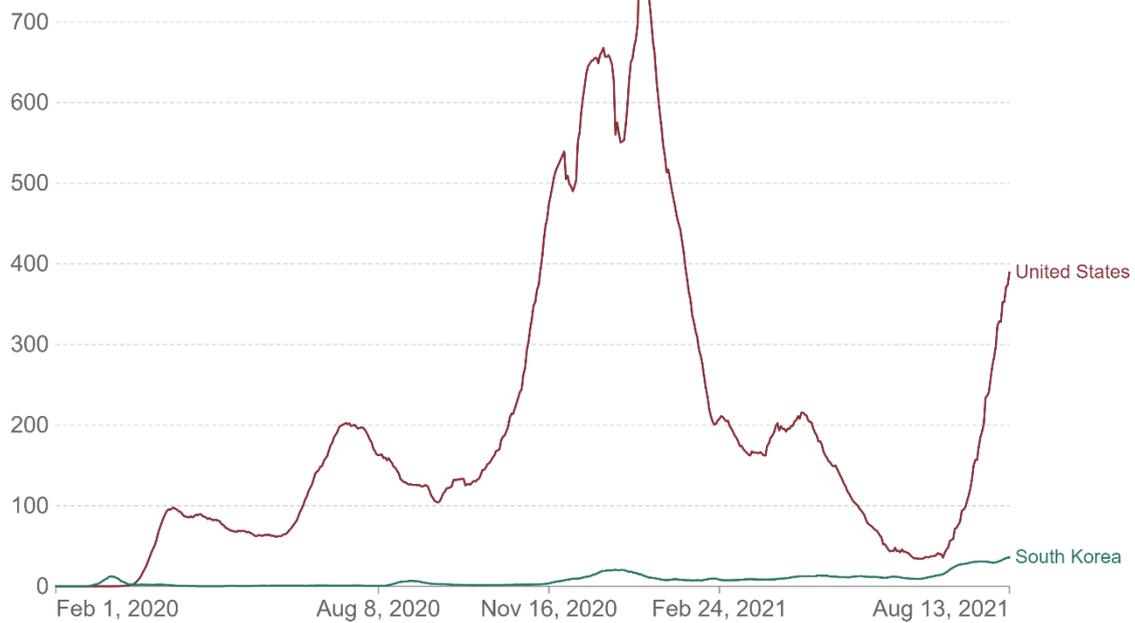
duration of the COVID-19 pandemic thus far. The disparity in deaths due to COVID-19 between the US and South Korea has been stark. Figure 14 shows daily new confirmed COVID-19 deaths per million people in the US and South Korea, respectively. In the US, daily new confirmed COVID-19 deaths had surged to more than 6.75 per million people a day at the peak of its first wave (23 April 2020), 3.4 per million people a day at the peak of its second wave (2 August 2020), and 10.3 per million people a day at the peak of its third wave (14 January 2021), respectively. Meanwhile, South Korea's daily new confirmed COVID-19 deaths have not surpassed 0.47 per million people a day over the whole duration of the COVID-19 pandemic thus far. By mid-August 2021, the total confirmed COVID-19 deaths in the US were 1,876 per million people (or more than 621,253 deaths in absolute terms). By contrast, the total confirmed COVID-19 deaths in South Korea were 42 per million people (or more than 2,156 deaths in absolute terms). Figure 16 shows excess mortality, i.e. the mortality rate in 2020/21 relative to the mean mortality rate from 2015 to 2019, in the US and South Korea, respectively. Prior to the inauguration of the new president of the United States on 20 January 2021, excess mortality in the US is significantly higher than that of South Korea.

Figure 12: Diagnostic tests conducted per confirmed cases of COVID-19



Source: Graph by author using Our World in Data interface. Data collated by Our World in Data (Ritchie, Ortiz-Ospina, Beltekian, *et al.*, 2020).

Figure 13: Daily new confirmed COVID-19 cases (per million people)



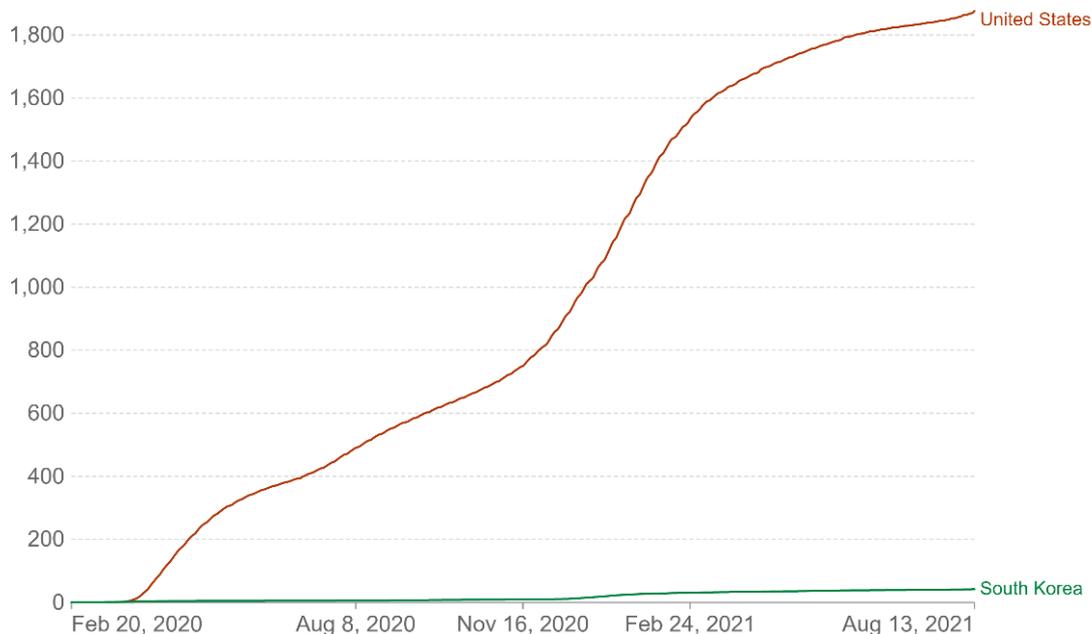
Source: Graph by author using Our World in Data interface. Data from the COVID-19 Data Repository by the Center for Systems Science and Engineering at Johns Hopkins University (JHU CSSE COVID-19 Data) (Dong, Du & Gardner, 2020:534).

Figure 14: Daily new confirmed COVID-19 deaths (per million people)



Source: Graph by author using Our World in Data interface. Data from JHU CSSE COVID-19 Data (Dong *et al.*, 2020:534).

Figure 15: Total confirmed COVID-19 deaths (per million people)



Source: Graph by author using Our World in Data interface. Data from JHU CSSE COVID-19 Data (Dong *et al.*, 2020:534).

Figure 16: Excess mortality relative to 2015-2019 mortality



Source: Graph by author using Our World in Data interface. Data from Human Mortality Database (University of California & Max Planck Institute for Demographic Research, 2021) and World Mortality Dataset (Karlinsky & Kobak, 2021).

There are various reasons why the US and South Korean responses to COVID-19 have been so different. The two countries have different regulatory environments for health products, different public health systems, different geographic endowments, and different cultures, to name a few. This thesis aims to articulate the importance of *beliefs* in shaping different economic outcomes. In the coronavirus anecdote, the Korean

administration was willing to *change* its regulatory environment to ensure swift action against the pending pandemic. The US did not. Korean leaders imposed emergency measures and implemented massive testing programmes. The US did not. Korean media outlets did not downplay the threat of the virus and citizens were clearly informed about the potential threat of COVID-19. Major US news media (such as Fox News) obscured the risks of the virus and spread spurious conspiracy theories instead. The Trump administration appears to have been more concerned with winning short-term political battles than with ensuring public health. US citizens were subsequently inundated with conflicting accounts of the origins and severity of the virus. Ultimately, Korean leaders understood the threat and made a clear and credible case for imposing emergency measures to prevent the spread of the virus. The 2015 MERS experience had left Koreans with a reference for a modern viral outbreak. Compliance among Korean citizens was high because they *believed* that the new virus could spread and lead to many fatalities.

The divergent responses by the US and Korea to the coronavirus pandemic, as well as South Africa's response to the HIV/AIDS epidemic, provide very useful, albeit anecdotal, illustrations for understanding how beliefs affect public health outcomes. Both anecdotes provide very stark examples of how decisions were made based on specific beliefs, which ultimately resulted in tangible consequences, in these cases contagion and death.

3.2. Anecdotes from road safety behaviour

In 2016, South Africa had approximately 14,500 road traffic fatalities or 25.9 deaths from road accidents per 100,000 people, according to the World Health Organization (WHO) (2018:253). Statistics South Africa (2020:48) identify transport accidents as the third most common non-natural cause of death in South Africa in 2016. The WHO (2018:13) finds that most countries regard strengthening road-use legislations as the most important path to mitigating road accidents. However, Du Plessis, Jansen and Siebrits (2020:3-7) argue that South Africa has had relatively poor road injury and fatality outcomes despite enacting legislation that aligns with international best practices. Enacting the correct legislation does not necessarily mean that road accidents will decrease. Road safety legislation needs to be enforced and adhered to in order to be effective. This section investigates one channel through which adherence to road safety is affected, namely beliefs.

Kayania, King and Fleiter (2012) investigate the effect of fatalistic beliefs on road traffic crashes in Pakistan. Fatalism refers to the conviction that all events that occur are

destined to happen due to fate. Moreover, individuals with fatalistic beliefs usually extend their belief in fate into resignation or powerlessness in the face of the perceived “inevitability” of future events (Rice, 2018). Kayania, King and Fleiter (2012:1043) find that fatalistic beliefs in Pakistan are pervasive and are strongly associated with religiosity. Moreover, the authors find that individuals who are intrinsically involved in road safety outcomes – namely drivers, law enforcement and policymakers – all report extensive acceptance of fatalist beliefs. Among road users, a belief in fatalism tends to affect how individuals interpret road accidents and to what extent they take precautions to mitigate future accidents. A belief in fatalism effectively functions similarly to a moral hazard. Hypothetically, fatalists are more likely to readily engage in risky behaviour and take fewer precautions to mitigate potential risks because they believe they are powerless to prevent accidents that were “bound to happen”. From qualitative investigations, Kayania, King and Fleiter (2012:1051) find that some respondents had extremely fatalistic attitudes. For example, when presented with a multiple fatality collision case, where several children were sitting on the roof of a travelling bus and subsequently died, one respondent interpreted the event as fate, saying that the children “would have died on that day anyway, one way or another”.

Speeding is considered to be one of the major behavioural risk factors causing road fatalities (World Health Organization, 2018:45). Hatfield and Soames Job (2006) surveyed a sample of licenced drivers in New South Wales, and find strong linkages between self-reported road-use behaviour and attitudes toward road safety laws. From the surveyed sample, 24% of the respondents self-reported that they tend to drive faster than the speed limit under typical conditions during daytime travel but significantly fewer report that they speed when conditions are poor. Predominantly, respondents report that they exceeded speed limits when doing so resulted in indirect benefits, such as getting to an appointment on time, overtaking another vehicle, or avoiding an accident (Hatfield & Soames Job, 2006:3). Although the majority of the surveyed population reported that they believe that speeding is the most important cause of serious road accidents, a significant share (approximately 15%) of the respondents believe that speeding does not increase the risk of road accidents *at all*, under any conditions. Those who reported that speeding increases the risk of collisions under normal conditions were less likely to speed in general. Conversely, drivers who generally viewed speeding as less of a risk were much more likely to (self-reportedly) speed.

As in the case of speeding, researchers find strong linkages between other major behavioural risk factors and beliefs. Gauld, Lewis and White (2014:15-16) and White, Walsh, Hyde and Watson (2010) find that different beliefs and attitudes predict different rates of self-reported mobile phone use during driving. Beck (1981) and Greenberg, Morral and Jain (2005) determine that an individual's personal views on the risks of drunken driving and their confidence in being able to control a vehicle while inebriated predict a greater proclivity to (self-reportedly) drive after consuming alcohol.

This chapter has employed anecdotes to ground the conversation on the effect of beliefs in real-world phenomena. First, two anecdotes from virology were presented to illustrate how differences in particular beliefs led to demonstrably divergent welfare outcomes. Second, the linkages between beliefs and road safety behaviour were discussed. Although anecdotes on the effect of beliefs on measurable outcomes are somewhat compelling, a more robust *systemic* approach would be preferable. The next chapter provides a rationale for investigating beliefs, while the subsequent chapters build a *systemic* approach for assessing the effect of beliefs.

Chapter 4: The rationale for investigating beliefs

4.1. Do beliefs matter?

Why is it important to analyse beliefs? Renowned essayist, Nassim Taleb (2018:201-210), prefers to regard a belief as “... an instrument to do things, not the end product”. He calls this definition an “epistemic definition” of belief. Taleb is opposed to the scientific analysis of beliefs, which assesses the rationality of beliefs based on their consistency with reality. Regarding the epistemic view, Taleb reasons that investigating people’s beliefs is profligate since epistemic beliefs will manifest in people’s “revealed preferences”. Ultimately, Taleb (2018:205) concludes that, regardless of their “scientific” accuracy, beliefs are important to the extent that they aid survival. Analysing beliefs is, therefore, irrelevant because “survival comes first, truth, understanding, and science later”. Paradoxically, Taleb (2018:210) criticises the evaluation – or “judging” in his phrasing – of people’s beliefs as being “not *scientific*”. Should economists and policymakers adhere to Taleb’s instruction and abstain from evaluating people’s beliefs? This research paper suggests that investigating beliefs may be *essential* to gain insight into the embedded reasons for a multitude of political and economic decisions.

To avoid being “non-scientific” when evaluating beliefs, and thereby validating Taleb’s critique, this thesis aims to pursue a systematic and falsifiable method of evaluating the effect of particular beliefs on decision-making. How can beliefs be analysed systematically? Here, datasets are required that incorporate observations of the stated values, views or beliefs, *along with* economic decisions or outcomes. Unfortunately, few such datasets exist, which will invariably limit the robustness of the conclusions from this inquiry. However, great care will be taken to provide a statistically defensible product despite limitations of the data. Due to its relative descriptive richness, the World Values Survey will be the chief data source for the analysis, although Afrobarometer, Eurobarometer, Pew Surveys and World Bank data may be employed for additional descriptive power. Despite prevailing data limitations, it is nonetheless useful to craft coherent and falsifiable hypotheses and methods for testing claims about the effect of beliefs, so that these hypotheses can be tested again in the future with richer datasets.

4.2. The Neoclassical conception of preferences

4.2.1. The enigma of preferences

Neoclassical theory posits that it is parsimonious to assume that the economy consists of rational individuals and firms that act according to their self-interest (Denzau & North,

1994:1). This proposition forms the basis of the rational choice framework. “Rational”, in the Neoclassical context, refers to the assumption that economic agents make decisions consistent with their preferences in order to maximise their utility from transactions when given information about the available range and possible outcomes of decisions (Friedman, 1953:21-22). Becker (1962:1) explains that the Neoclassical assumption of rationality “... simply implies consistent maximization of a well-ordered function, such as a utility or profit function”. Edwards (1954:381) denotes that the “rationality” of “economic man” consists of two essential features, namely that “[he] can weakly order the states into which he can get, and he makes his choices so as to maximize something”. For example, a “rational” firm makes choices that will maximise its profits. In short, the rational choice framework assumes that individuals *know* which choices will result in the satisfaction of their self-interest and make decisions accordingly.

Additionally, the Neoclassical model suggests that rational individuals make transaction and investment choices in accordance with their *preferences*, or “tastes”. Stigler and Becker (1977:1) lament that economists have been reluctant to incorporate individual tastes into their models, since understanding differences in tastes and how tastes can change over time are conventionally regarded as the purview of other social sciences. According to Stigler and Becker (1977:1), economists' conventional conception of tastes is that they are “inscrutable [and] often capricious”. The enigma surrounding the formation and adaptation of preferences somewhat undermines the robustness and predictive power of the Neoclassical model, since preferences are key inputs in the model. If preferences are wholly capricious, individuals' self-interest could change at random at any time without any reason. Such a model would be unable to make meaningful predictions since decision-making would be erratic throughout the economy.

In response to the enigma of preferences, Stigler and Becker (1977:2) propose that preferences should be assumed to (1) be stable over time and (2) differ negligibly between individuals. Since preference behaviour is no longer random, the Neoclassical model can simulate an economy by only using its preferred model inputs, namely prices and incomes, to explain divergent outcomes in behaviour. By abstracting the motive of all decisions made in an economy to the rational satisfaction of self-interest in accordance with individual preferences, the Neoclassical model aims to provide “a valuable unified framework for understanding all human behaviour” (Becker, 1976:5). Ultimately, the

rational choice framework aims to explain all human behaviour through “a generalised calculus of utility-maximizing behaviour” (Stigler & Becker, 1977:1).

How does the rational choice framework incorporate differences in *beliefs* between individuals or communities? To understand the Neoclassical conception of beliefs it is necessary to first reflect on the Neoclassical treatment of preferences. In the Neoclassical model, “preference” refers to an individual’s inclination to favour a certain outcome above others and is used interchangeably with the term “taste” (Stigler & Becker, 1977:76). Preferences are assumed to (1) be stable over time and (2) differ negligibly between individuals (Stigler & Becker, 1977:2). Stigler and Becker (1977:2) argue that their thesis, which makes specific assumptions about preferences and the omnipresence of utility-maximising behaviour, “does not permit of direct proof because it is an assertion about the world, not a proposition in logic”. How, then, can their thesis be proven to be useful or not? Stigler and Becker (1977:2) caution readers against considering examples that are in conflict with the assertions made by their proposed model, recognising that “it is possible almost at random to throw up examples of phenomena that presently defy explanation by [the Neoclassical] hypothesis”. Although it is often helpful to simplify reality in the process of building a model, a thesis that is at its core an “assertion about the world” that “does not permit direct proof” would seem to be intrinsically unfalsifiable and, therefore, methodologically inadequate for a reputable economic model.

4.2.2. Endogenous preferences

A serious flaw in Stigler and Becker’s (1977:2) conventional Neoclassical model is that it does not consider how preferences are formed. In fact, it simply *asserts* that preferences (1) are stable over time and (2) differ negligibly between individuals. In rejoinder, Bowles (1998) proposes a hypothesis where preferences are endogenous to the model economy. Bowles forms an augmented Neoclassical model from an institutional perspective by incorporating insights from psychology and sociology, as opposed to a singularly persistent “search for differences in prices or incomes to explain any differences or changes in behaviour” (Stigler & Becker, 1977:1).

Preferences can be regarded as antecedents to behaviour in both the conventional and augmented Neoclassical models. How are an individual’s preferences formed? While Stigler and Becker (1977) abstain from investigating the preference formation process, Bowles (1998:75-77) suggests that economic institutions have a highly influential role in how individual preferences are formed. Bowles (1998:76) reasons that prevailing

economic institutions dictate how resources are allocated in a given society, and that individuals must, therefore, adjust their preferences to adapt to allocation rules if they wish to acquire their livelihoods. Since resource allocation rules are distinct across nations, different sets of values and beliefs are incentivised and, ultimately, dominant in different nations. As if by adaptive necessity, these distinct values and beliefs form in conjunction with applicable preferences to satisfy the requirements of prevailing economic institutions.

Implicit in Bowles' (1998) hypothesis on preference formation is an argument about the direction of causality between economic institutions and preferences. Bowles (1998:77) makes the case that changes in economic institutions are likely to cause preferences to change because values and beliefs need to adapt in order to satisfy the allocation rules of the updated economic institutions. Ensminger and Rutten (1991) provide an insightful case study which supports Bowles' causal argument. In the late 20th century, the Galole Orma from Kenya have rapidly changed their social norms and preferences in response to exogenous changes in economic institutions. The Orma are pastoralists who reside along the Tana River in north-eastern Kenya. Prior to 1980, the Galole Orma were predominantly self-sufficient nomadic pastoralists, with relatively few (39%) of the Galole Orma settled in villages and integrated in the village markets. In the 15-year period after its independence from Britain, Kenya experienced relatively high levels of economic growth, averaging 6.4% per year. Similarly, the Orma experienced significant growth in their per capita income levels. By 1987, 63% of the Galole Orma had transitioned towards sedentary village life. Although it is not uncommon to see a transition from a nomadic to a sedentary lifestyle, the case of the Galole Orma is remarkable since their transition was not accompanied by a concomitant rise in crop farming activity. The floodplain along the Galole River is notoriously unreliable and thus not favourable for crop farming (Ensminger & Rutten, 1991:684). The Galole Orma continued to engage in pastoralism but transitioned from *nomadic* to *sedentary* pastoralism.

The post-colonial transformation in Kenyan institutions changed the material incentives and lifestyles of the Galole Orma pastoralists. In response to new incentives in their sedentary pastoral milieu, the norms and preferences of the Galole changed. Previously, the nomadic Galole were averse to applying property rights over grazing pastures along the Tana River because it would impede their freedom to travel in search of nutrition for their livestock. As incomes rose and the Galole transitioned to sedentary animal

husbandry, however, protecting grazing pastures in their immediate proximity from overgrazing became a central concern. Along with their sudden economic fortunes, sedentary pastoralists had obtained more political clout to lobby the Kenyan government to reform and enforce property rights along the Tana River (Ensminger & Rutten, 1991:695).

Altogether, the case of the Galole Orma's transition towards sedentary pastoralism and their increased preference in favour of property rights protected by the state is an informative confirmation of Bowles' (1998:77) hypothesis on the ability of institutional changes to alter individual preferences. Similarly, Bowles (1998:76) cites the impact of industrialisation on altering attitudes towards feminist ideas which, in turn, had tangible impacts on a wide array of preferences – affecting family size, sexual preferences and female labour force participation.

The augmented Neoclassical model aims to account for the formative role of institutions and institutional change in shaping preferences. As opposed to Stigler and Becker's (1977) conventional Neoclassical model, which rejects the body of knowledge from other social science disciplines in favour of a singular focus on prices and incomes, the institutional angle pursued by Bowles (1998) yields an augmented Neoclassical model that is compatible with other disciplines. The next chapter will describe the primary framework employed in this thesis, namely New Institutional Economics (NIE), and will suggest how NIE can be used to analyse the effect of beliefs in a systematic way.

Chapter 5: New Institutional Economics as theoretical framework

5.1. Defining institutions, beliefs and values

The New Institutional Economics (NIE) framework uses North's (1990:1) definition of *institutions* as the "humanly devised constraints that structure political, economic and social interactions". Subsequently, NIE opts to differentiate between formal and informal institutions. Formal institutions refer to the statutory constraints that regulate how individuals in societies interact. Laws, regulations, and rights are examples of formal institutions. These institutions are *de jure* in the sense that they are enshrined in law, i.e. they are *official*. Informal institutions include traditions, conventions, taboos, beliefs and values. Despite their "non-official" nature, informal institutions typically have a *de facto* influence over individuals because they are sanctioned by societal enforcement – as opposed to judicial enforcement.

This thesis is predominantly concerned with the latter two types of informal institutions – namely, beliefs and values – and will investigate if and how these institutions influence policy decisions and economic outcomes. Boudon (2001:4-5) defines belief as "something we hold to be true". In this thesis, *belief* is defined as the attitude or conviction that a particular proposition about reality is true, with a sufficient amount of confidence. For example, an individual who has a belief in astrology is *sufficiently convinced* that divine information can be deduced based on the position or trajectory of celestial objects. Durkheim (1912:62-64) distinguishes between two "stages" of belief. An individual believes something to be true in the first stage because the people around them believe it is true. First-stage beliefs tend to function as tacit societal assumptions. Second-stage beliefs, however, require individuals to *know* whether something is *actually* true. Groenewegen, Spithoven and Van den Berg (2010:26) claim that *values* "(1) are embedded in a society's culture, (2) are generally-held preferences about pursuable goals, and (3) embody what most citizens in a certain society consider to be 'good'". Although it is most likely true that individuals are influenced by embedded societal norms, this thesis will discern values at the individual-level. In this thesis, *values* refer to normative principles – such as compassion, determination, humility, obedience, and thrift – that an individual personally regards as important for a meaningful or moral life.

New Institutional economists aim to identify causal linkages between significant institutions and long-run economic performance (Alston, 2008:11). To achieve this aim,

the NIE framework includes the incentives of various stakeholders, as well as the existing “rules of the game”. Thereafter, NIE economists hypothesise the channels by which the interplay between rules and incentives result in divergent economic outcomes. Apart from formal and informal institutions, it is necessary to explain how the institutional environment and incentives would theoretically affect critical determinants of economic performance, such as enforcement costs, property rights, transaction costs, and transformation costs.

The notion that formal rules, as well as shared conventions and norms, play an essential role in how communities function is not necessarily novel. What makes NIE unique is the unified theoretical approach it provides to explain how institutions translate into divergent outcomes. NIE is primarily concerned with how incentives are structured. By understanding incentive structures, NIE social scientists are empowered to make informed hypotheses regarding prevailing institutions and how they influence the critical determinants of economic performance, such as property rights and enforcement costs, transaction costs, and transformation costs. Nevertheless, it is useful to consider different formulations of institutionalist thinking in order to identify concepts that NIE may have overlooked or to notice analogous concepts presented in different frameworks. This section briefly discusses an alternative framing of institutionalist thought which was formulated in approximately 500 BCE, namely the Confucian Analects, or *Lun Yu*.

The Confucian Analects is a collection of pithy comments – akin to the Book of Proverbs in the Christian Bible – related to ethics, traditions, culture and politics. Historians regard the Analects to be a product of the Chinese philosopher and politician, Confucius, and a few of his disciples (Slingerland, 2003:7). As a narrator, Confucius is unique due to his context and his style. Apart from his interest in social criticism, Confucius was a regional bureaucrat and politician. Much of his writing is thus concerned with articulating his image of a great leader, or “the great scholar-bureaucrat”, and his holistic view of a well-functioning society.

There are five interrelated central motifs in the Confucian Analects, namely *Ren*, *Xiao*, *Fa*, *Li*, and *Dao*. *Ren* refers to human goodness or benevolence, which Confucius considers to be the innate character or essence of a good leader. *Xiao* refers to filial piety. Confucius regards a child’s dutifulness and respect towards their parents to be the key to other virtues developed later in life. *Fa* refers to formal rules. The Legalistic school of thought

emphasised the importance of getting *Fa* right in order to achieve better harmony and development. Confucius was, to a great extent, a polemicist against the Legalistic school in Chinese political philosophy (Rainey, 2010:84-85). Instead of enacting or changing laws and regulations, Confucius advocates for conscious cultural guidance, and he calls on good leaders to direct the appropriate course of cultural trends. Confucius emphasises the importance of following conventions, whether such decorum is rooted in a sense of duty or not, so that societal harmony is preserved. *Li* refers to propriety or fulfilling one's obligations, while *Yi* refers to ritually correct behaviour or compliance to rules and conventions. In the Analects, Confucius favours *Li* over *Yi*, since he regards *Li* to be rooted in a sense of duty, while *Yi* is not. However, Confucius criticises the debasing influence of *Ning*, or glibness. The Analects describes *Ning* as a fundamentally insincere subversion of social norms and customs.

Ultimately, Confucius advocates for the pursuit of an ethic that aims to perpetuate social harmony, which is called *Dao*, or “the way”, in Confucian thought. To achieve *Dao*, Confucius calls on citizens (1) to tap into their essential benevolence, or *Ren*, (2) to cultivate their dutifulness, or *Xiao*, from a young age, and (3) to act in accordance with local customs from a sense of duty, or *Li* (Rainey, 2010:23-55).

Although there are clear differences in emphasis and formulation, the ideas expressed in the Confucian Analects contain elements of institutional thinking similar to New Institutional Economics. The Analects distinguishes between formal rules (*Fa*) and informal rules (cultural guidance). Similar to NIE, Confucius compares the cost of enforcing social change through formal or informal institutions. While the Confucian Analects is more concerned with providing moral commentary, NIE aims to provide a theoretical framework for economic analysis. In particular, NIE seeks to explain how different institutions link to divergent economic outcomes. The next section explores how formal and informal institutions interact, and the effect of their interaction on attempts at enacting institutional change.

5.2. The interaction between formal and informal institutions

Just because laws are enshrined in *official* documents does not mean that people will necessarily adhere to those laws. One method that could pressure compliance with laws is the threat of physical force by the state. Weber (1919:1) remarks that the modern state “... claims the monopoly of the legitimate use of physical force”, and that other institutions or interest groups are only granted the right to use force insofar as the state allows them

to do this. The state can lose its monopoly when it is confronted by organisations of comparable capacity to enact physical force, such as other states, or when it lacks capability for enforcement. The prevalence of widespread crime is usually a signal that a state has lost its credibility as enforcer of the law, and quasi-state entities, such as gangs, are typically formed in response to state incapacity. Despite the tendency for gangster law enforcement to be more arbitrary, gangs become the *de facto* enforcer of laws in the wake of the power void left by an incapable state.

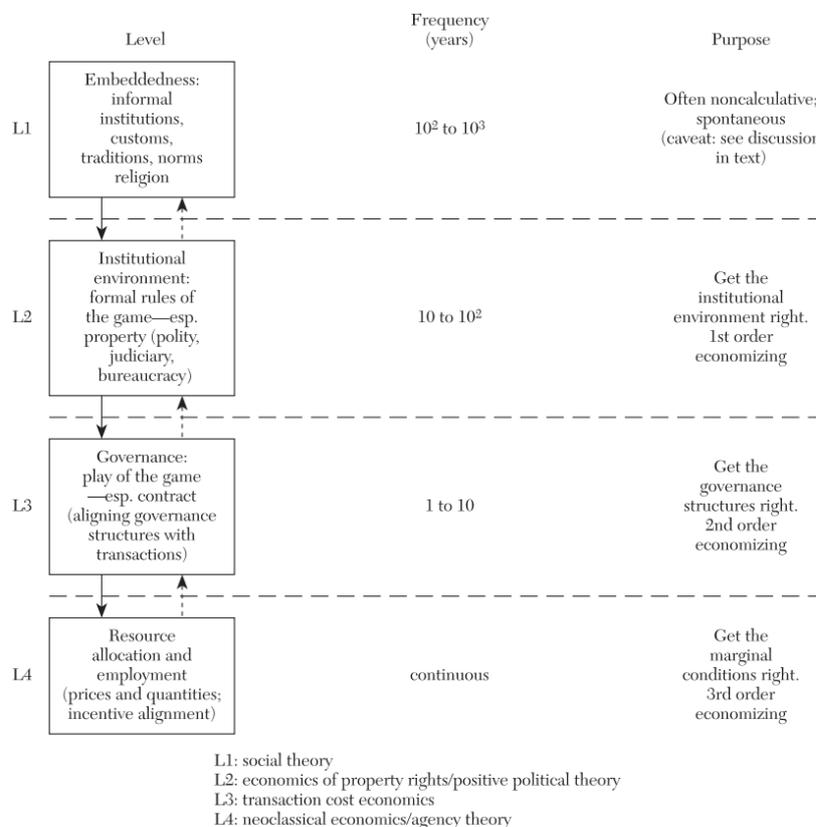
5.2.1. The cost of enforcement

The use of physical force by the state is a costly approach to enforcing rules. To exercise state violence upon the citizenry requires a significant amount of financing and manpower. Moreover, the unchecked use of state power can be susceptible to abuse by capricious political and economic elites, to the detriment of the rest of the citizenry. Fortunately, there are alternative approaches to ensure adherence to rules at a much lower cost to the state. Informal institutions are beliefs and customs that are shared by a particular community, and they are enforced without the application of official laws or the threat of state force (Helmke & Levitsky, 2004:9). From section 5.1, the analogous reasoning in Confucian thought can be found in Confucius' polemics against Legalism, or the school of thought that favours *Fa*. Confucius favours reforming society through guided cultural change, i.e. reforming informal institutions, rather than through legislative means.

Despite not employing the power of the state, informal institutions are, nevertheless, enforced by social sanctions. Individuals in cultural groups who resist prevailing informal institutions are more likely to face social punishments, such as social exclusion, public derision, a drop in their community standing, or shunning (Pejovich, 1999:178). Williamson (2000:597) regards informal institutions to be more embedded than formal institutions. Figure 17 (from Williamson (2000:597)) shows the level of embeddedness of different types of social relations, as well as the hypothetical period required before embedded social relations change. Figure 18 shows an adjusted version of Williamson's (2000:597) diagram, where different social relations are ranked according to their level of societal embeddedness and how these institutions theoretically interact. Deep-rooted social relations typically change slowly. However, there are arguably historical examples where cultural change occurred at a relatively rapid pace. Subsequent to industrialisation, the momentous change in social norms and conventions regarding

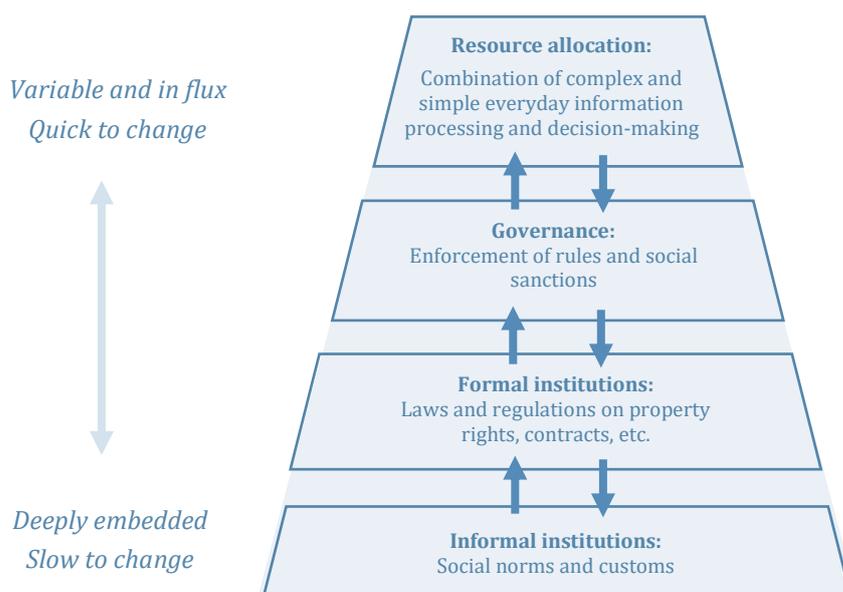
feminist ideas – such as family planning, female participation in the labour force, women’s suffrage – demonstrates that cultural paradigm shifts can occur within a generation (Bowles, 1998:76).

Figure 17: Level of embeddedness of social relations



Source: Williamson (2000:597).

Figure 18: Interaction between social relations and level of embeddedness

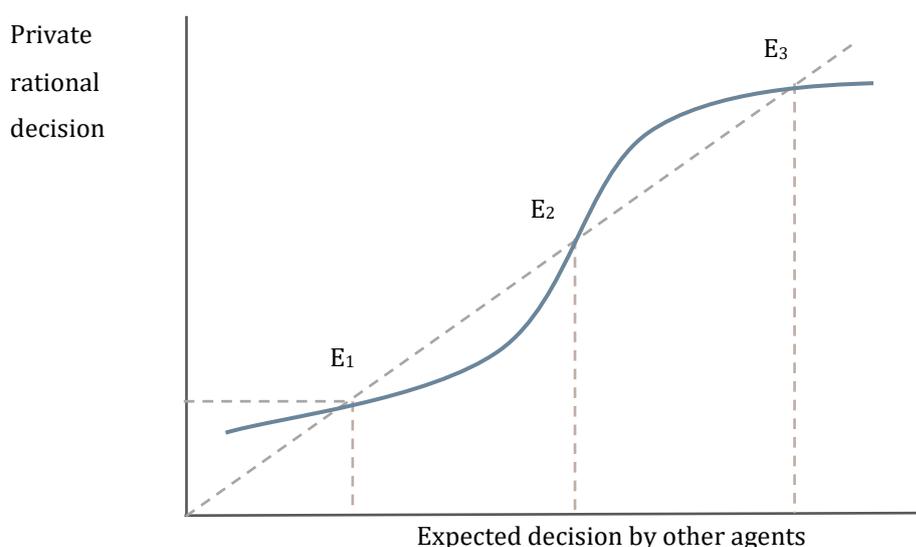


Source: Adapted from Williamson (2000:597) by author.

The nature of prevailing informal institutions is likely to affect the cost of enforcement of formal institutions. When informal institutions are more closely aligned to changes to formal institutions, the cost of persuading the citizenry to adhere to new rules is lower, and subsequent enforcement is also less costly. Conversely, when policymakers attempt to impose legislative reforms that conflict with established informal institutions, it is more costly to persuade and enforce these reforms.

To avoid incurring high costs to persuade the citizenry and enforce rules, should legislative reforms then always be aligned with prevailing informal institutions? Not necessarily. It could be that formal and informal institutions are in relative harmony at a lower-level equilibrium. Such an “institutional status quo” results in stable underdevelopment. Figure 19 illustrates a country with multiple potential performance equilibria. E_1 represents an underdevelopment coordination failure in the multiple equilibria model. For example, if dishonest trading is pervasive and not subject to social disapproval, and there is no formal regulation against such dishonest conduct, it is likely that the community’s trust levels will be lower and transaction costs will be higher. In this example, the harmony between perverse formal *and* informal institutions is likely to result in lower-level equilibria outcomes and high transaction costs. Conceptually, an intervention, such as a critical mass of acceptance of a new idea or an exogenous shock, could “puncture” the stability equilibrium towards a superior stable market equilibrium, as represented by E_3 in Figure 19.

Figure 19: Multiple equilibria coordination failure



Source: Adapted from Todaro and Smith (2015:197-199).

5.2.2. From institutions to culture

How do the “rules of the game”, i.e. institutions, relate to *culture*? Harrison and Huntington (2000:16) define culture as “... the values, attitudes, beliefs, orientations, and underlying assumptions prevalent among people in a society”. Harrison and Huntington’s definition does not, however, encapsulate how culture depends on generational collaboration. Guiso, Sapienza and Zingales (2006:1) define culture as “...those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation”. Alternatively, culture can be defined through the lens of NIE as *a distinct set of informal institutions* that is shared between a collection of individuals and is transmitted over generations without significant alterations.

Conceptually, *culture* differs from other concepts that denote “a set of informal institutions”, such as religion or ideology, because it is *necessarily* transferred across generations without significant alterations. In contrast, *religion* refers to a system of shared beliefs and practices that is concerned with the interaction between individuals and/or the transcendent. Denzau and North (1994:4) define *ideology* as “... the shared framework of mental models that groups of individuals possess that provide both an interpretation of the environment and a prescription as to how that environment should be structured”. To make the distinction between culture, religion and ideology clear, this thesis defines *ideology* as a set of principles that forms an individual’s worldview, especially with respect to their support for (or opposition to) certain economic and political theories.

The process by which the exact “set of informal institutions” that is shared by a collective of individuals is selected to define a hypothetical “culture” is an understandably imprecise science, and the degree to which each of the individuals in a designated culture group conforms to *each* of the selected institutions may be somewhat heterogeneous. The definition of a designated “culture” is, therefore, somewhat arbitrary. Although it is important to recognise the innate inexactness of the designation process, it is, nevertheless, helpful to define distinct cultures for sociological and economic analyses.

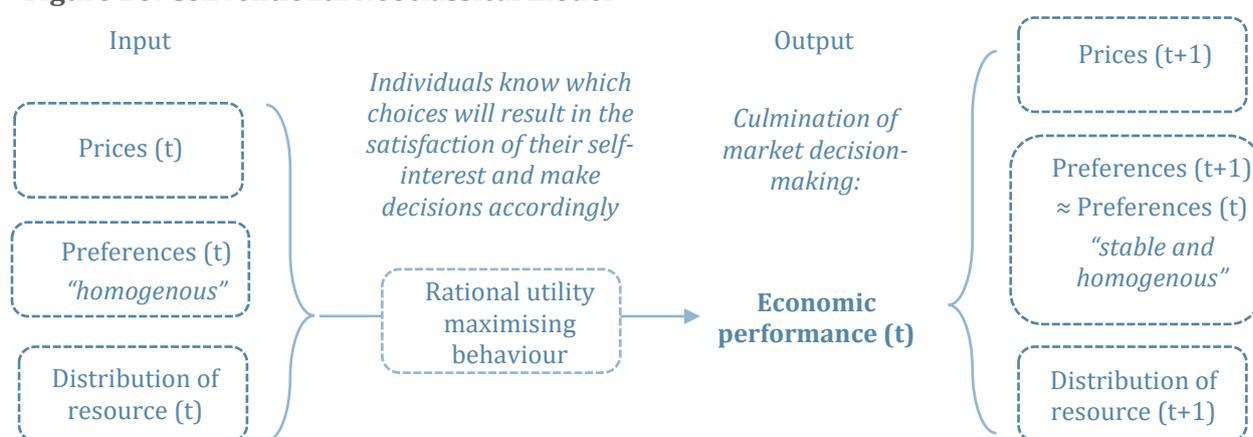
5.3. Departure from the conventional Neoclassical model

5.3.1. Scrutinising assumptions in the conventional Neoclassical model

How does New Institutional Economics differ from the conventional Neoclassical model? The conventional Neoclassical model is based on a set of simplifying assumptions. First, economic agents are assumed to have access to full information about all options

available to them, as well as understand the consequences of choosing each respective option (Edwards, 1954:381). Second, economic agents act rationally by choosing options, through the process of utility maximising calculus, which will result in the greatest level of satisfaction of their self-interest (Becker, 1976:153). Third, individual preferences are assumed to (1) be stable over time and (2) differ negligibly between individuals (Stigler & Becker, 1977:2). Figure 20 illustrates the workings of the conventional Neoclassical model. Firstly, the model makes simplifying assumptions to limit the number of inputs to prices and incomes. Additionally, it assumes that preferences are homogenous across the population. Secondly, individuals engage in economic activity, i.e. they transact goods and services, according to self-interested utility maximising calculus. The culmination of decision-making by all individuals across the economy results in economic outcomes, or “economic performance”, in period (t). Based on the economic outcomes from period (t), the distribution of income has changed, and economic agents adjust prices based on new information. Individual preferences may change slightly from in period (t) to (t+1) yet remain stable over time.

Figure 20: Conventional Neoclassical model



Neoclassical economists concede that it is difficult to prove with certainty that the conventional model makes fair modelling assumptions. However, proponents of the conventional Neoclassical model contend that it is desirable to make assumptions if the assumptions simplify the model without jeopardising the predictive power of the model. Friedman (2007:146) reasons that, although the general truth of the rationality of individuals is difficult to prove, it is nonetheless useful “to provide a system of generalizations that can be used to make correct predictions about the consequences of any change in circumstances. Its performance is to be judged by the precision, scope, and

conformity with experience of the predictions [that] it yields". Additionally, Friedman (1953:22) claims that "individual firms behave *as if* they were seeking rationally to maximize their expected returns... and had full knowledge of the data needed to succeed in this attempt; *as if*, that is, they knew their relevant cost and demand functions", and that such behaviour is evident "under a wide range of circumstances". Although, the conventional Neoclassical assumptions may not hold for *every* individual and firm, Friedman (1953:21-23) argues that it is a sound approximation of cumulative market activity. Is Friedman's (1953:22) claim true, i.e. do individuals act (1) *as if* they are seeking to maximise returns, (2) *as if* they have full knowledge of the data needed to successfully maximise returns, and (3) *as if* they know their relevant cost and demand functions? If we *assume* that individuals are rational and observe that they make certain economic decisions, do these decisions reflect the maximum utility outcome for the respective individuals? In other words, are "revealed preferences" (or observed choices) evidence of rational behaviour? Clearly, using revealed preferences to justify the assumption of rational behaviour is tautological reasoning. Just because an individual chooses option X, it does not mean that option X has maximised their subjective wellbeing by virtue of being chosen. Section 5.3.2 discusses the conceptual arguments against the Neoclassical assumptions, while section 5.3.3 provides a review of experimental studies that scrutinise Neoclassical assumptions empirically.

5.3.2. On substantive rationality

Even though Friedman (2007:146) asserts that the realism of Neoclassical assumptions is less important than the predictive power of the Neoclassical model, it is nevertheless important to consider the conceptual case made against its assumptions. Social scientists from disciplines other than economics have long contested the Neoclassical assertion that individuals act in accordance with their rational self-interest. Goldberg (1981:378) provides four reasons why anthropologists oppose the assumption of substantive rationality. First, individuals are mostly confronted with *incomplete information*, and information-gathering and processing is costly. Second, individuals often make decisions that satisfy short-term over long-term benefits. Although delaying gratification may likely provide greater utility, longer time horizons are subject to greater uncertainty, and individuals typically respond by ensuring that they acquire short term benefits instead. Third, contract enforcement by a third party is somewhat unreliable and not costless. For example, when an employer breaches the terms of a contract with an employee, the

employee needs to weigh up the cost of expending their time, the cost of hiring a lawyer, and the potential additional legal costs incurred if they were to lose the lawsuit. In the conventional Neoclassical model, the threat of perfect enforcement of contract would simply negate the risk of breaches of contract altogether. Fourth, the conventional Neoclassical model does not consider the effect of historical context and the power of prevailing social structures.

Simon (1997:92-117) presents the concept of *bounded rationality*, which contends that actual human behaviour deviates from rationality in three important ways. First, individuals mostly do not know for certain what the consequences of the decided course of action will be. Second, there are often too many unforeseen events that happen after choosing a course of action that alter the outcomes beyond what initial parameters could have predicted. Third, individuals are seldom, if ever, presented with the full set of all available alternative choices. Bounded rationality still regards the Neoclassical assumption of rational decision-making as being generally true, although it considers individual rationality to be somewhat constrained by informational and cognitive limitations.

Denzau and North (1994:1-2) reason that the Neoclassical assumption of substantive rationality is untenable in cases where individuals are faced with choices that have a higher degree of uncertainty. Therefore, the applicability of substantive rationality, and stable and homogenous preferences *depend* on the conditions of particular transactions. Denzau and North (1994:4-5) identify three factors that need to be gauged to determine whether substantive rationality is applicable, namely (1) complexity, (2) motivation, and (3) the quality of information. First, when comparing and evaluating choices require more cognitive complexity, choosers tend to deviate further from substantive rationality. This is especially the case when individuals have not previously been confronted with the particular choices under consideration.

Second, when individuals regard particular choices to be more important to them personally, they tend to expend more time to ensure that they obtain accurate information to ensure that they make appropriate decisions. Conversely, when individuals regard transactions to be of little consequence, their decisions are likely to result in deviations from substantively rational decision-making. However, an individual's *choice* to expend less time and cognitive effort on options that they perceive

as unimportant may in itself be aligned with their personal preferences. To minimise the cost of information-gathering and analysis, an individual may be “rationally inattentive”. The concept of rational inattention proposes that individuals consider the opportunity costs of information-gathering and analysis – due to the time and effort that certain investments require. Martin (2015:13-14) conducted a series of two-player games where some players faced additional cognitive costs to obtain information, and found that affected players were more prone to follow state-dependent choices.

Third, when a variety of choices are presented, individuals invariably need to rely on their experience and intuition to make decisions. From their finite real-life experience, individuals extrapolate their understanding of how the world works, and what their beliefs and preference are. Since individuals rely on a very small sample of data, i.e. finite real-life experiences, to construct their own “mental models” (see section 5.4), these models are destined to be biased and incomplete. In order to adjust their mental models, individuals require new information and feedback on the outcomes of their decisions. Higher quality information and more frequent feedback can accelerate an individual’s learning process, so that their mental model is more consistent with reality.

5.3.3. Evidence from behavioural economics

Do the assumptions in the conventional Neoclassical model – namely (1) rational self-interested behaviour (or substantive rationality) and (2) stable and homogenous preferences – yield “precise predictions” and are these predictions appropriate “under a wide range of circumstances”? Evidence from experimental and behavioural economics suggests that the abovementioned Neoclassical assumptions do *not* yield “precise predictions ... under a wide range of circumstances”. In fact, evidence suggests that human behaviour often deviates from Neoclassical assumptions on a *systematic* basis (Kahneman, 2003:162-165). This section provides a brief review of experimental studies that empirically test Neoclassical assumptions.

First, results from experimental game theory suggest that human behaviour is not characterised by pure rational self-interest, and that other factors play a crucial – and somewhat predictable – role in individual decision making. Camerer and Thaler (1995:210-216) found that individual behaviour in an ultimatum game deviates considerably from the behaviour that is predicted by Neoclassical theory. In a conventional ultimatum game, two players are given the opportunity to divide an allotted sum of money between themselves. The first player, or Proposer, is given the opportunity

to propose a distribution of the allotted money, which the second player, or Responder, can either approve or reject. If the Responder accepts the proposal, the money is distributed accordingly. However, if the Responder rejects the proposal, both players get nothing. For the sake of convenience, let us consider that the two players are given R1,000 to divide between themselves, with R1 being the smallest unit of currency in the experiment. If both players are income-maximisers, Neoclassical theory would suggest (1) that the first player would propose that they should take R999 and give the Responder R1, and (2) that the Responder would accept the proposal, since rejecting would leave them worse off ($R1 > R0$). In various experimental settings, researchers found that Proposers offer 30 to 40% (on average) of the money to Responders. Moreover, Responders regularly rejected offers lower than 20% of the initial sum of money (Camerer & Thaler, 1995:210). In the case of the ultimatum game, it is clear that individuals consider other factors, apart from rational self-interest (such as the perceived fairness of the proposal), and make their decisions accordingly. Similarly, the results from dictator game experiments suggest that the effect of perceived fairness persists, albeit somewhat weaker, when the second player has no opportunity to punish “unfair” offers (Camerer & Thaler, 1995:213). The dictator game is a variant of the ultimatum game, where the first player, or Allocator, can decide on the distribution of a windfall sum of money between themselves and a second player, or Recipient. In the dictator game, however, the Recipient cannot decide to reject the offer and must accept whatever the Allocator offers them. Contrary to what Neoclassical theory would predict, experiments show that Allocators choose the theoretically rational option (keeping everything for themselves) in only 20% of cases, although researchers found that the results may vary depending on the specifics of the dictator game’s experiment design (Camerer & Thaler, 1995:214).

Second, behavioural economics proposes that individual decision making should be modelled as a mixture of (1) reflective thinking and (2) automatic thinking. This hypothetical “mixed thinking” approach is called Dual Process Theory (Hansen & Jespersen, 2013:13). Rather than assuming away irrationality and hand-waving away cases where irrationality is predominant – i.e. the Neoclassical approach – Dual Process Theory (DPT) provides a theoretical framework that attempts to explain why individuals are observed as behaving both rationally and irrationally. Reflective thinking is deliberative, reasoned and cognitively effortful. Automatic thinking is reflexive, visceral

and based on “gut reactions”. Kahneman (2011:25) reasons that reflective and automatic processes “divide the labour” of thinking. When presented with a new stimulus, automatic processes activate, and individuals form rough preliminary hypotheses about the stimulus based on sensorial observations. If the individual has experienced the stimulus (or very similar stimuli) before, they need not exhaust their reflective cognitive faculties to react to the stimulus, since automatic reactions from prior experience (or habit) will suffice. Similarly, if immediate reaction is required, the deliberative nature of reflective thinking would likely be less effective than automatic reactions. However, if the stimulus is strange or complex, reflective thinking would likely formulate a more appropriate response.

How, then, does Dual Process Theory functionally differ from the Neoclassical model? In short, DPT challenges the central assumptions of the Neoclassical model, i.e. DPT challenges the assumption that individuals are rational self-interested utility-maximisers. Evidence from behavioural studies suggests that individuals deviate from rational behaviour on a systematic basis (Kahneman, 2003:162-165). Tversky and Kahneman (1986:270) find that, by making minor alterations to the presentation of choices, researchers can influence individual preferences significantly – i.e. changing the *framing* of available choices affects the preferences of subjects predictably. If individual preferences are subject to change by superficial changes in the presentation of choices, it is apparent that the Neoclassical principle of invariant preferences (see Stigler & Becker, 1977:76) is no longer credible. Similarly, behavioural economists find that individual preferences are subject to several other psychological peculiarities, such as defaults (see Thaler & Sunstein, 2008:130-139), product placement (see Keller, Markert & Bucher, 2015:1-3), and loss aversion (see Kahneman & Tversky, 1979:268). Contrary to the Neoclassical assumption of rationality, the results from behavioural studies suggest that individuals deviate from rationality on a systematic basis. Since the observed deviation from rationality is systematic (or predictable), there is a strong case against the Neoclassical model’s assumption of general rationality.

5.3.4. The effect of economic institutions on preference formation

Established economic institutions, i.e. allocation rules, have a significant effect on individual preference formation. Bowles (1998:78-80) describes a spectrum of preference formation behaviours, which differentiates an individual’s preference formation according to the degree of cognitive mediation required in the decision-making

phase. On the cognitively demanding end of the spectrum, an individual makes decisions by weighing the subjective costs and benefits of the choices under consideration. The costs and benefits are measured in terms of perceived utility for the individual, and are not necessarily quantifiable in monetary terms. The subjective value of the costs and benefits depends on a combination of (1) external factors – i.e. how much the product is valued in society, according to the market – and (2) internal factors – i.e. personal beliefs that affect the subjective valuation of the product. For example, when Scott contemplates purchasing a new car, he (1) considers the societally determined value of the car in the form of the market retail price, and (2) evaluates whether purchasing a new car at the retail value is in accordance with his beliefs and values, such as his attitude on thrift, and environmentalism. On the cognitively pedestrian end of the spectrum, an individual makes decisions reflexively based on visceral reactions. For example, although Scott is a staunch environmentalist, when a menacing spider suddenly appears on his hiking path, Scott reflexively crushes the spider without regard for the ecological impact of removing the spider from the nature reserve. Scott's instinctive decision to crush the spider may have contradicted his conviction to conserve the reserve's ecological integrity. Importantly, Scott's decision may well have been different if he had time to consider the full extent of the consequences of his action but instinctive aversion to fear compelled Scott to react impulsively to the situation.

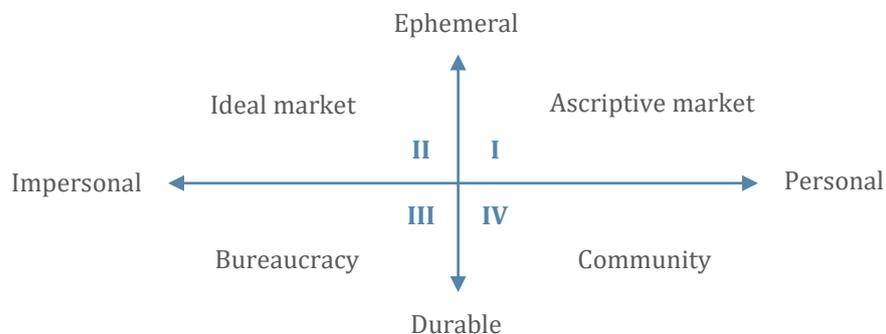
Furthermore, Bowles (1998:77-78) identifies five ways in which prevailing economic institutions affect individual preferences. First, rather than providing full information on all options in a transparent and accessible way, existing markets provide *limited* information on *fewer* than the full set of choices available to individuals. Moreover, the idiosyncrasies of the situational context that individuals experience when they are presented with the perceived set of options further bias the rationality of decision-making. Hence, markets frame choices, which affect the preference formation process.

Second, Bowles (1998:90-91) identifies the effect of changing whether allocation rules are structured to reward individuals *intrinsically* or *extrinsically* for engaging in economic activity. Lepper, Greene and Nisbett (1973:128-131) conducted a series of experiments where two groups of children were asked to complete the same tasks. In one experiment, the treatment group is told that the activity needs to be completed to receive a small cash reward, i.e. doing the task with the prospect of obtaining an extrinsic reward. The control group is asked to complete the task, without any explicit reference to an extrinsic reward.

Lepper *et al.* (1973:130-131) found that interest in the task itself was undermined in the treatment group when the task was presented as a means to gain extrinsic compensation. Moreover, when individuals are asked to complete activities without explicitly being incentivised, they consider that their engagement in the activity is intrinsically motivated (Lepper & Greene, 1978).

Third, reliance on market-like allocation rules may undermine formation of social capital in the long run. Figure 21 illustrates the conditions fostered under different allocation rules. Consider an ideal bureaucratic setting (quadrant III), which is characterised as an impersonal and durable social interaction. Bureaucracies are ideally impersonal because participants are required to act objectively, and to avoid favouritism or prejudice. Bureaucracies are durable in the sense that costs of admission and exit are high, such as the case of obtaining citizenship. Moreover, Bowles (1998:91) reasons that the political choice to structure allocation rules – as either ascriptive markets (I), ideal markets (II), bureaucracies (III), or communities (IV) – has an effect on the evolution of norms in a population. Thus, allocation rules “affect not only the demand for, but also the supply of cultural traits” (Bowles, 1998:90-96).

Figure 21: Characterising conditions promoted by allocation rules



Source: Adapted from Bowles (1998:85-86).

Fourth, the types of tasks that individuals are required to perform on a daily basis require that individuals – to a significant extent – need to internalise the norms and conventions in prevailing institutional settings under which those tasks were conceived and allocated. Since it is essential for an individual to perform their assigned (or self-assigned) task to earn their livelihood, the character of the task invariably affects the individual’s preferences. Furthermore, Breer and Locke (1965) present evidence that individuals tend to employ strategies that were instrumental to complete prior tasks in order to complete new tasks. Similarly, Goodman and Baloff (1968:1) conducted a series of

experiments where two groups of adults were asked to complete a series of consecutive tasks. In the first round, subjects in the treatment group were given a task that required rational problem solving, while subjects in the control group were given a task that did not require rational problem solving. In the subsequent round, the treatment group was more likely to employ rational problem-solving techniques, although both groups were given the same task. The findings by Breer and Locke (1965) and Goodman and Baloff (1968:1) provide support for the hypothesis that individuals tend to rely on instrumental approaches from prior tasks for future tasks.

Fifth, Bowles (1998:100) explains how allocation rules affect the process of cultural transmission. Cultural transmission refers to the process by which informal institutions are spread among peers and perpetuated from older to younger generations. After categorising 79 subsistence communities based on their food storage capacity and their predominant livelihood (such as agriculture, fishing, hunting, or pastoralism), Barry, Child and Bacon (1959:1) compare the types of economic institution to social norms and conventions (such as emphasis on teaching children to be independent, obedient, and responsible) in the respective communities. Barry *et al.* (1959:1) find that the type of economic institution accurately predicts social norms and conventions in the respective communities.

The causal argument made by Bowles (1998) is similar to Marx's (1867) proposition – i.e. that a change in allocation rules alters incentives which, in turn, transform social norms and conventions among peers and across generations. For instance, Marx (1867:463-475) reasons that the culture of former peasants in rural England changed significantly due to the enactment of several enclosure laws during the mid-16th century. When subsistence agriculturalists were expelled from rural fields, some peasants were absorbed into the labour force in more urbanised centres, while others were suddenly without livelihood. The urbanised peasants had to acquire new norms to adapt to urban lifestyles or risk being dismissed. The former agriculturalists who were not absorbed into the urban economies, either due to the saturation of vacancies in towns or the incapacity to change their way of life in accordance with urban norms instantaneously, were suddenly lowered to being beggars or outlaws.

In summary, this section provided responses to the conventional Neoclassical model from an institutional perspective. Core Neoclassical assertions, namely (1) substantive

rationality, and (2) stable and homogenous preferences, appear to be untenable abstractions since they do not approximate individual decision-making and that they lead to wholly inaccurate predictions. Neoclassical assumptions are not conceptually sound due to the effects of (1) incomplete information, (2) time discounting, (3) imperfect contract adherence and enforcement, and (4) historical context. Neoclassical assumptions are not empirically sound due to contradicting evidence from behavioural economics. Behavioural studies suggest that individuals deviate from rational behaviour on a systematic basis (see section 5.3.3). Moreover, Bowles (1998) provides a comprehensive case for incorporating the effect of economic institutions on preferences. The next section considers the effect of pre-existing beliefs on an individual's decision-making process at a cognitive level.

5.4. Shared Mental Models

This section describes a cognitive model of belief formation at the individual level. In addition, this model attempts to explain how belief formation translates into the formation of divergent worldviews, and how beliefs ultimately affect institutions. From the moment that humans are born, we are perpetually inundated by a seemingly chaotic mass of information. We are presented with a world of odd sights, sounds, smells, tastes, and textures. Moreover, we are compelled to make numerous critical decisions without prior reference to whether the chosen action is "correct" or not. Fortunately, humans are endowed with certain basic instincts (similar to many of our wilder relatives), as well as more advanced cognitive capacities. Our instincts and cognitive capacities are tools that help us to respond to new situations and that aid survival.

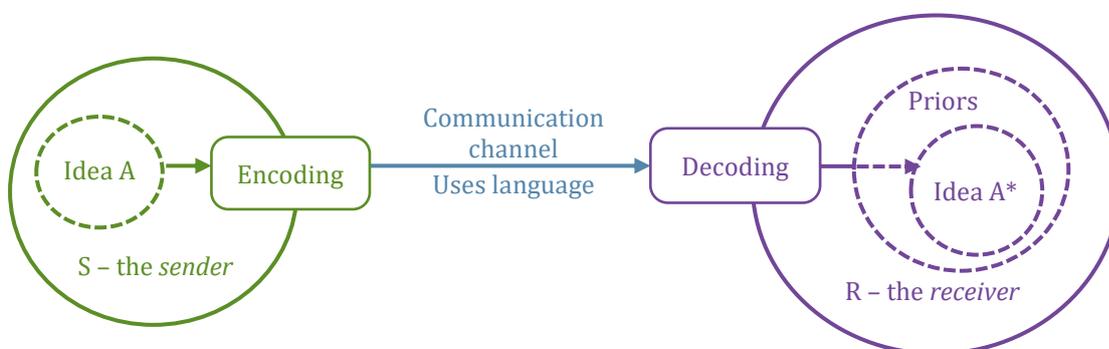
One essential "survival tool" at our disposal is the ability to learn and infer. From a very small sample of data we are able to construct vague causal hypotheses about the consequences of our decisions. In other words, we "build" a model inside our mind where we consider how, in a given situation, a set of possible choices (the model input) will result in corresponding outcomes in the real world (outputs).

How do humans respond when situations are wholly unfamiliar, i.e. when we do not have relevant *experience* about either the set of options presented or the *consequences* of choosing any of the options? Consider a more specific form of learning, namely language acquisition. Humans appear to have relatively advanced language learning capacities compared to other animals. From relatively finite real-life exposure to language from their parents and other adults – which at first must have been perceived as non-sensical

noise – infants are able to (1) quickly acquire elementary language competency, and (2) extrapolate language rules from the limited supply of language exposure (Chomsky, 1976:1-2). Furthermore, infants are quickly able to construct expressions that far surpass the limited sample of language they have been provided up to that point. Chomsky (1976:1-2) therefore reasons that humans possess innate language acquisition capabilities with the capacity to both memorise and creatively extrapolate from experiencing language.

Although humans may share similar experiences, especially if they live in the same region and share the same culture, every individual accumulates their own unique sample of experiences. Furthermore, despite the fundamental similarity between their cognitive learning tools, each individual possesses marginally unique cognitive processes. Consequently, the process of communication is invariably an imperfect one. Figure 22 abstracts how a message is relayed between two individuals. Suppose the sender (S) wants to convey their idea (A) to the receiver (R). First, the sender needs to translate their vaguely formulated idea into a communicable one, through an encoding process. The encoded message is transmitted into the real world by using language towards the receiver. Typically, the sender and receiver have an incompletely shared understanding of the medium used for communication, i.e. the language used for transferring the encoded message. When R receives the message, it is first experienced as an external sensation – usually audible or visual – which needs to be decoded by R's cognitive tools. The receiver compares the decoded message to their prior experience and accumulated understanding, and creates their own mental understanding of the message that imperfectly resembles the sender's idea.

Figure 22: A theory of communication between two agents



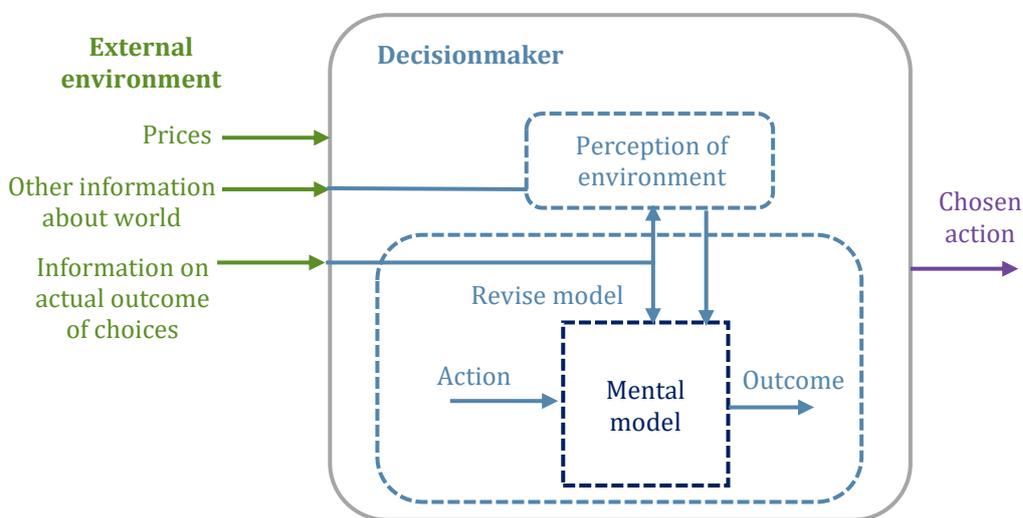
Source: Adapted from Denzau and North (1994:19).

Understanding the mechanism that individuals use to convert external sensory data into comprehensible and useful information is clearly essential for demystifying the preference formation and decision-making processes. Denzau and North (1994:4) propose that individuals possess *mental models*, which are “internal representations that individual cognitive systems create to interpret the environment”². *Ideology*, by contrast, is a “shared framework of mental models” that provides a set of principles and informs an individual’s worldview. Figure 23 shows how external information, such as prices and real-world feedback from prior decisions, is interpreted by a decisionmaker so that a course of action can be chosen. In the process, the decisionmaker decodes the (sensory) external input and uses a mental model based on the accumulation of prior experience and intuition. The mental model provides a hypothetical simulation of how choosing specific options will result in corresponding outcomes. Although the simulation is only cognitively constructed, or “imagined”, it plays a critical role in the individuals eventual choice and its ensuing real-life consequences. Once the action has been chosen, and its consequences manifest in the real world, the decisionmaker can identify discrepancies between outcomes predicted by their (internal) mental model and the outcomes in the (external) real world, and augment their mental model to reflect reality more accurately. When confronted with greater uncertainty about either the situation or the potential outcomes that will result from the set of available options, the chooser will require more cognitive power to extrapolate from their limited mental model. Figure 24 depicts the decision-making process of an individual with an ideology-based mental model. Denzau and North (1994:16-18) suggest that an independently formed mental model (Figure 23)

² Denzau and North’s (1994:4) “mental model” framework is one of many possible approaches that could be used to describe the belief-formation process. For instance, American pragmatist, Charles Sanders Peirce (1877), provides an alternative conception of belief formation which starts at the onset of doubt. According to Peirce, an individual first experiences a sufficient level of doubt to unsettle their prevailing convictions. Second, the individual generates new “warrantable assertions” after they have engaged in a search for a new truth in response to their doubts. Third, these assertions are tested and become “warranted assertions” if they satisfy the verification process. Fourth, if the warranted assertions are verified (or can be repeated) by scientifically minded peers, they become “valuable assertions”. Lastly, valuable assertions become “settled beliefs” if they are absorbed in the public’s consciousness over time. Settled beliefs, in turn, inform habits and individual decision-making. Peirce’s doubt-belief model, therefore, describes a scientific process of an individual’s belief formation. This thesis, however, does not confine the process of belief formation to the beliefs that are scientifically instituted. Section 5.1 defines belief as “the attitude or conviction that a particular proposition about reality is true, with a sufficient amount of confidence”. This definition does not require adherence to the scientific method. For the purposes of this thesis, an individual simply needs to be sufficiently confident that their assertion is true for it to be regarded as a belief. Denzau and North’s (1994:4) “mental model” framework is, therefore, arguably more useful than Peirce’s (1877) doubt-belief model.

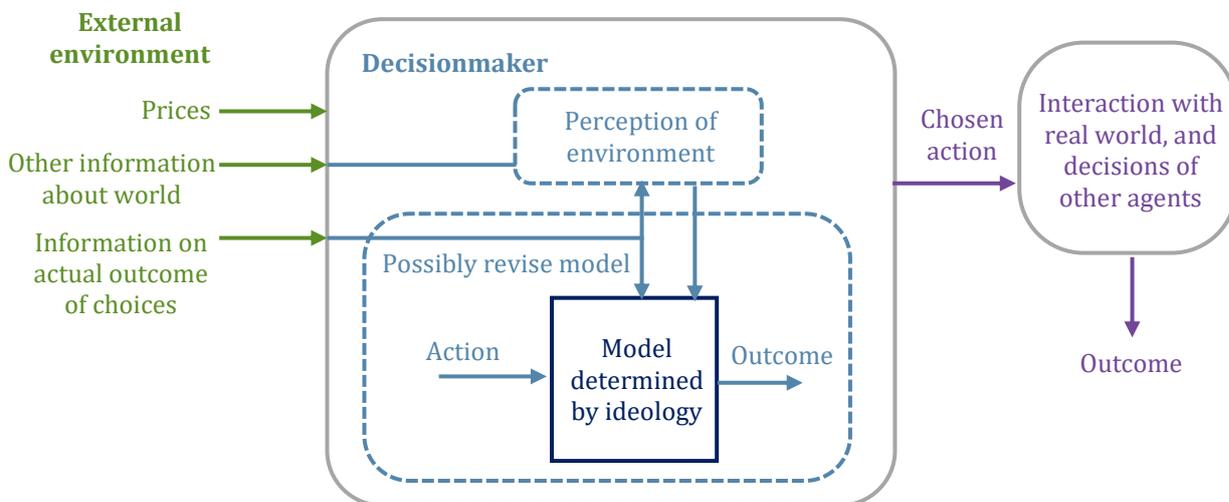
typically takes much longer to create than a ready-made ideology-based mental model (Figure 24). When mental models are shared, those who have common models tend to communicate more easily. Moreover, individuals that rely exclusively on their own observations to construct their mental models (i.e. direct learning), may limit the robustness of their models due to non-representative or testing erroneous observations. Conversely, a shared mental model may also be inaccurate if those who share it do not critically reflect on its premises and assumptions. Individuals who have invested a large amount of time and effort into internalising a shared mental model may plausibly be less inclined to alter their models when real-life outcomes conflict with their model's predictions.

Figure 23: Uncertain chooser using mental models to learn



Source: Adjusted from Denzau and North (1994:16).

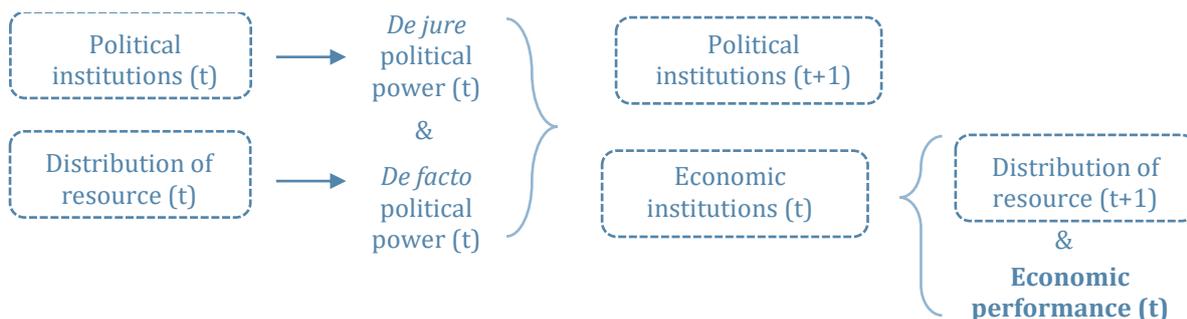
Figure 24: Uncertain chooser using ideology to form mental models



Source: Adjusted from Denzau and North (1994:18).

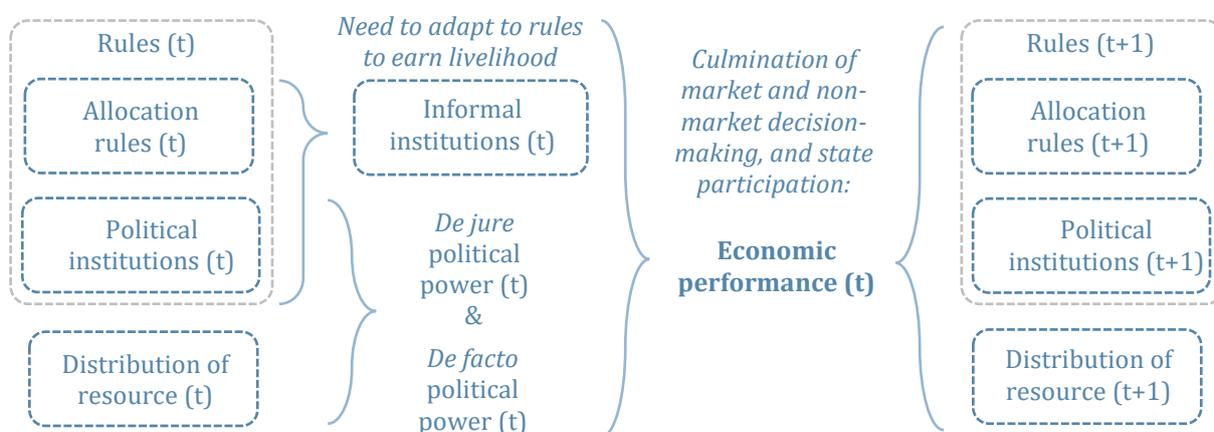
The preceding subsection discussed how the NIE framework departs from the assumptions of the conventional Neoclassical model. The NIE framework places greater emphasis on the effect of political and economic institutions on divergent economic performance. Figure 25 shows Acemoglu, Johnson and Robinson’s (2004:6) model of institutional change which models how prevailing institutions and resource allocations affect the nature of institutions in the future and economic performance. Figure 26 illustrates a beliefs-augmented institutional change model. In period (t) prevailing political institutions and the distribution of resources across the population are the sources of *de jure* and *de facto* political power. From section 5.3.4, the model considers political and economic institutions to influence informal institutions which, in turn, affect preferences. Based on the negotiation between interest groups with *de jure* and *de facto* political power, political institutions and allocation rules (economic institutions) are revised.

Figure 25: AJR model of institutional change



Source: Adjusted from Acemoglu and Robinson (2004:6).

Figure 26: Beliefs-augmented institutional change model



After considering the shortcomings of the conventional Neoclassical model and its reliance on the rational choice framework, this section discussed the features of New Institutional Economics and its merits as a theoretical framework for analysing the effect of beliefs. The next chapter provides a prototypical model for using particular beliefs or values as explanatory variables for divergent economic development outcomes.

Chapter 6: The relationship between culture, beliefs, and economic outcomes

This section provides a prototypical model for using *particular* beliefs or values as explanatory variables for divergent growth. Moreover, the relationship between culture, beliefs, and economic outcomes will be discussed and modelled empirically.

6.1. Data on culture and beliefs

Lamentably, there are few datasets that incorporate observations of an individual's stated values and beliefs, *along with* their economic decisions or economic outcomes. This thesis utilises the World Values Survey (WVS) due to its relative descriptive richness. However, the same methods could be employed to analyse similar datasets, such as Afrobarometer, Eurobarometer, Pew Surveys, General Social Surveys (GSS) and Demographic and Health Surveys (DHS).

The WVS is a survey that is conducted periodically and includes respondents from across the world. The questionnaire covers a wide range of topics in approximately 250 questions. Topics cover the respondents' demographic information, values, beliefs, views on economics, politics, religion, and self-perception, among others. This section utilises WVS Wave 6, which is compiled from surveys that were conducted from 2010 to 2014. Wave 6 includes answers from more than 89,500 respondents from 60 countries (Inglehart, Haerpfer, Moreno, *et al.*, 2014). Country-level and individual-level data from Wave 6 is publicly available on the WVS website. WVS extends questionnaires to a representative selection of residents in each participating country. Criteria for representation include gender, rural and urban population shares, race, and age groups. All respondents are 18 years old or older, with the WVS claiming to strive for a *full probability sample* of the population. Each participating country has approximately 1,200 observations. If a country's population is less than 2 million, 1,000 observations are deemed to be adequate. If a country's population is very large or widely distributed, at least 1,500 observations are required (Inglehart *et al.*, 2014:4).

6.2. From beliefs and culture to decision-making

How can beliefs be analysed systematically? Firstly, datasets are required that combine questions on respondents' beliefs *and* their economic outcomes. For example, it is essential that a questionnaire gauges how much a respondent values thrift in general *and* records a related economic outcome, such as the respondent's net savings status, i.e. if they are saving or dissaving. Furthermore, it is necessary to include relevant controls,

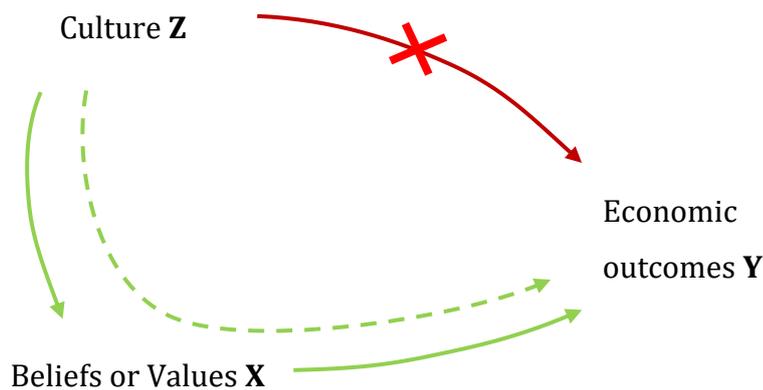
such as the demographics of the respondent. Ideally, more information on the respondents could feasibly be used for advanced statistical analyses, such as using instrumental variables. Ultimately, surveys that ask more questions to determine (1) values and beliefs, (2) economic outcomes and policy views, (3) relevant controls, and (4) possible instrumental variables, provide analysts with richer data for more insightful analyses.

Although the *exact* mechanisms by which individuals acquire and transfer beliefs may be unclear, this section will consider the following statement as the premise for understanding the relationship between beliefs, customs and culture:

Over time, different communities transmit different sets of beliefs and customs to their subsequent generations, which form distinct cultures.

Guiso *et al.* (2006) demonstrate how culture, beliefs, and economic outcomes correlate by using an assortment of ordinary least squares (OLS) regressions (with appropriate controls). By employing a similar methodology, section 6.3 demonstrates the relationship between religious denomination and trust. Section 6.4, however, provides a demonstration of a more robust empirical model. Section 6.4's model employs culture (or more specifically religious denomination) as an instrumental variable, while beliefs are used as explanatory variable to predict relative economic outcomes. Due to the cross-sectional nature of the WVS data, the use of instrumental variable (IV) regressions is preferable to alternative approaches – such as regression discontinuity design (RDD), which is more appropriate for ascertaining the causal effect of an intervention. Figure 27 illustrates how an instrumental variable approach is conceptualised in this thesis by indicating how culture (Z) functions as an instrument for particular beliefs (X) in the model, rather than being an independent variable. To decide whether culture is, in fact, a defensible instrument for beliefs, it must be reasoned that culture's effect on economic outcomes is only (or predominantly) due to the effect of beliefs and not through the other explanatory variables, as indicated by the dotted green line in Figure 27.

Figure 27: Culture as an instrument for beliefs



However, cultural identity is seldom probed in survey questionnaires. Moreover, such a survey question would need to use comparable “levels” of culture. For example, should surveys ask whether respondents identify as, say, English, French, German, or Italian, or should they ask whether respondents identify as, say, Prussian, Bavarian, Lombardian? Hence, there is a need for defensible proximations of *culture*. Guiso *et al.* (2006:2) propose using *religion* and *ethnicity* as proxies for culture due to their fairly consistent transmission over generations (see the working definition for culture in section 1.3). Additionally, data on religious denomination and ethnic identity are widely obtainable from publicly available datasets, such as WVS, Afrobarometer and Eurobarometer. Table 1 shows the breakdown of respondents by religious denomination in WVS Wave 6. To retain more degrees of freedom, and without losing descriptive power, the author has grouped certain responses into larger categories. For example, *Protestant mainline* includes responses such as Aglipayan, Anglican, Christian, Christian Reform, Free church/Non-denominational church, Lutheran, Christian community church, Protestant, Salvation Army, The Church of Sweden, Unitarian, AU: Uniting Church, and Dutch Reformed (see Table 10 in Appendix for the author’s complete classification of all religious denominations). For the sake of brevity, this thesis will only utilise religious denomination, and not ethnicity, as an instrument for beliefs and views. The same methods that are used for religion can be employed if ethnicity is used as an instrument.

Table 1: Wave 6 breakdown by religious denomination

Religious denomination	Frequency	Percent	Cum.
0 Non-religious	16,033	17.90	17.90
1 Esoteric	1,804	2.01	19.92
2 Folk	461	0.51	20.43
3 Dharmic	3,908	4.36	24.79
4 Far-Eastern	4,313	4.82	29.61
5 Judaism	174	0.19	29.80
6 Islam	21,757	24.29	54.09
7 Orthodox	9,702	10.83	64.93
8 Catholic	14,838	16.57	81.49
9 New Messiahs	214	0.24	81.73
10 Evangelical	2,810	3.14	84.87
11 Protestant mainline	8,386	9.36	94.23
12 NA	5,165	5.77	100.00
Total	89,565	100	

How significant are the differences in the practice of spirituality between individuals in different religious denominations? Equations 6.2.1 and 6.2.2 are two OLS regression models that estimate the effect of religious denomination on spirituality and religiosity, respectively:

$$Y_{Spirit} = \beta_0 + \delta_i X_{Religion} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.2.1)$$

$$Y_{Religiosity} = \beta_0 + \delta_i X_{Religion} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.2.2)$$

Table 2 shows the divergent levels of spirituality practices by religious denomination with non-religious (*Nones*) as base denomination, while controlling for demographic factors, education level and income level. Note that *all* coefficients for all of the religious denominations are statistically significant at a 99% confidence level. Table 4 is a condensed “heatmap” version of Table 2 which only displays the coefficients of religious denomination for each spirituality practice. The heatmap table is conditionally formatted, on a spectrum from dark green (highest coefficient) to dark red (lowest coefficient), by column. Table 2 suggests that New Messiah Christianity (NMC) and mainline Protestant denominations tend to reflect on the purpose of life most frequently, while Nones do this the least often. New Messiah Christians and Esoterics attend services and pray most often. Except for Nones, belief in a god is the lowest among Far Eastern denominations. Belief in hell is the strongest among Muslims. Table 3 shows the divergent levels of religiosity by religious denomination with Nones as base denomination, while controlling for demographic factors, education level and income level. Table 5 is a condensed “heatmap”

version of Table 3 which only displays the coefficients of religious denomination for each spirituality practice. Except for Nones, Far Eastern denominations designate the least importance to a god in their lives, while Muslims designate the greatest importance to a god in their lives. If religion and science conflict, Muslims and NMCs are the most likely to choose religion over science. Other than Nones, Jews and mainline Protestants are the least likely to regard their religion as the “only acceptable” religion.

Table 2: Spirituality by religion

	[1]	[2]	[3]	[4]	[5]	[6]
	Think about purpose of life	Frequency of service attendance	Frequency of prayer	Religiosity (subjective)	Believe in a god	Believe in hell
1 Esoteric	0.289*** -0.0219	3.145*** -0.0499	3.771*** -0.0587	0.852*** -0.0127	0.485*** -0.00745	0.381*** -0.0114
2 Folk	0.148*** -0.0417	1.955*** -0.0949	2.775*** -0.112	0.609*** -0.0242	0.478*** -0.0141	0.361*** -0.022
3 Dharmic	0.00906 -0.0165	2.751*** -0.0375	3.366*** -0.0439	0.881*** -0.00955	0.487*** -0.00555	0.328*** -0.00861
4 Far-Eastern	0.119*** -0.0153	1.900*** -0.0349	2.258*** -0.0411	0.438*** -0.00902	0.184*** -0.00533	0.437*** -0.00814
5 Judaism	0.00476 -0.0666	1.976*** -0.151	2.409*** -0.177	0.564*** -0.0386	0.325*** -0.0228	0.212*** -0.0344
6 Islam	0.295*** -0.00954	2.330*** -0.022	3.748*** -0.0258	0.794*** -0.00559	0.503*** -0.0034	0.641*** -0.00516
7 Orthodox	0.341*** -0.0114	2.021*** -0.026	2.731*** -0.0308	0.835*** -0.00667	0.490*** -0.00394	0.361*** -0.00611
8 Catholic	0.187*** -0.0101	2.705*** -0.023	3.258*** -0.0273	0.824*** -0.00589	0.482*** -0.00347	0.337*** -0.0053
9 New Messiahs	0.488*** -0.0609	3.930*** -0.139	4.421*** -0.163	0.912*** -0.0353	0.479*** -0.0205	0.128*** -0.0312
10 Evangelical	0.217*** -0.0181	3.098*** -0.0412	3.503*** -0.0486	0.809*** -0.0105	0.448*** -0.00616	0.225*** -0.00939
11 Protestant	0.372*** -0.0119	3.036*** -0.0271	3.720*** -0.0321	0.810*** -0.00694	0.451*** -0.0041	0.431*** -0.00622
12 NA	0.276*** -0.0145	1.744*** -0.044	2.025*** -0.0858	0.720*** -0.0102	0.371*** -0.011	0.229*** -0.0172
Health	0.0381*** -0.00382	0.136*** -0.00889	0.166*** -0.0105	0.0163*** -0.00226	0.00252* -0.00137	0.00174 -0.00209
Male	-0.0497*** -0.00597	0.156*** -0.0139	-0.316*** -0.0164	-0.0615*** -0.00351	-0.0267*** -0.00213	-0.0364*** -0.00325
Age	-0.000737*** -0.000196	0.000192 -0.000453	0.00232*** -0.000538	0.000196* -0.000115	-0.000982*** -6.93E-05	-0.00228*** -0.000106
Education	0.0184*** -0.00134	-0.0451*** -0.00314	-0.0709*** -0.00371	-0.0193*** -0.000794	-0.00590*** -0.000485	-0.00744*** -0.000741
Income scale	-0.00615*** -0.0015	0.0170*** -0.00349	-0.0061 -0.00413	0.000722 -0.000884	0.00152*** -0.000538	0.0011 -0.000824
Constant	2.828*** -0.0194	1.620*** -0.0452	2.649*** -0.0537	2.069*** -0.0115	0.555*** -0.00696	0.413*** -0.0106
Observations	80,954	77,691	76,669	77,942	73,080	71,243
R-squared	0.029	0.232	0.282	0.307	0.321	0.207

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Religiosity by religion

	[1]	[2]	[3]	[4]	[5]
	Importance of a god in life	Religion trumps science	Only my religion is acceptable	Religion at school	Other relig not as moral as my relig
1 Esoteric	4.215*** -0.0626	0.985*** -0.0245	0.480*** -0.0254	0.388*** -0.0267	-0.144*** -0.024
2 Folk	2.533*** -0.119	0.741*** -0.046	0.471*** -0.0475	0.544*** -0.0502	-0.215*** -0.0441
3 Dharmic	3.755*** -0.0467	0.892*** -0.0182	0.550*** -0.0191	0.786*** -0.0198	-0.240*** -0.018
4 Far-Eastern	1.160*** -0.0444	0.373*** -0.0173	0.326*** -0.0182	0.257*** -0.019	-0.124*** -0.0175
5 Judaism	2.268*** -0.189	0.572*** -0.0734	0.214*** -0.0756	0.0502 -0.0806	-0.228*** -0.0725
6 Islam	4.627*** -0.0275	1.435*** -0.0105	1.349*** -0.0114	0.0504*** -0.0117	0.0311*** -0.0108
7 Orthodox	3.600*** -0.033	0.686*** -0.0128	0.691*** -0.0136	0.0819*** -0.0141	-0.200*** -0.0129
8 Catholic	3.767*** -0.0291	0.665*** -0.0112	0.349*** -0.012	0.312*** -0.0123	-0.214*** -0.0113
9 New Messiahs	4.241*** -0.173	1.091*** -0.0664	0.959*** -0.0692	0.445*** -0.072	-0.110* -0.0639
10 Evangelical	3.555*** -0.0518	0.855*** -0.0198	0.439*** -0.0208	0.550*** -0.0217	-0.218*** -0.0194
11 Protestant	3.726*** -0.0343	0.861*** -0.0132	0.266*** -0.014	0.485*** -0.0145	-0.161*** -0.0132
12 NA	4.138*** -0.0606	1.678*** -0.0159	1.481*** -0.0201	0.207*** -0.0176	0.143*** -0.0161
Health	0.106*** -0.0112	0.0552*** -0.00422	0.00261 -0.00449	-0.00627 -0.00463	-0.0256*** -0.00419
Male	-0.252*** -0.0174	-0.0309*** -0.00659	0.0204*** -0.00697	-0.0280*** -0.00724	0.0541*** -0.00654
Age	-0.00690*** -0.000571	-0.00448*** -0.000218	-0.000940*** -0.00023	-0.00224*** -0.000239	-0.00250*** -0.000215
Education	-0.0894*** -0.00392	-0.0667*** -0.00148	-0.0493*** -0.00157	-0.0236*** -0.00162	-0.0311*** -0.00147
Income scale	-0.0115*** -0.00438	-0.00157 -0.00166	-0.0112*** -0.00175	0.0113*** -0.00182	-0.00932*** -0.00165
Constant	5.281*** -0.057	2.234*** -0.0214	2.246*** -0.0231	2.433*** -0.0236	2.613*** -0.0215
Observations	77704	75111	73902	75472	71957
R-squared	0.334	0.292	0.241	0.048	0.03

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Spirituality heatmap by religion

	[1] Think about purpose of life	[2] Frequency of service attendance	[3] Frequency of prayer	[4] Religiosity (subjective)	[5] Believe in a god	[6] Believe in hell
1 Esoteric	0.289	3.145	3.771	0.852	0.485	0.381
2 Folk	0.148	1.955	2.775	0.609	0.478	0.361
3 Dharmic	0.00906	2.751	3.366	0.881	0.487	0.328
4 Far-Eastern	0.119	1.9	2.258	0.438	0.184	0.437
5 Judaism	0.00476	1.976	2.409	0.564	0.325	0.212
6 Islam	0.295	2.33	3.748	0.794	0.503	0.641
7 Orthodox	0.341	2.021	2.731	0.835	0.49	0.361
8 Catholic	0.187	2.705	3.258	0.824	0.482	0.337
9 New Messiahs	0.488	3.93	4.421	0.912	0.479	0.128
10 Evangelical	0.217	3.098	3.503	0.809	0.448	0.225
11 Protestant	0.372	3.036	3.72	0.81	0.451	0.431
12 NA	0.276	1.744	2.025	0.72	0.371	0.229

* Based on the coefficients from Table 2, this heatmap table is conditionally formatted by column on a spectrum from dark green (highest coefficient) to dark red (lowest coefficient).

Table 5: Religiosity heatmap by religion

	[1] Importance of a god in life	[2] Religion trumps science	[3] Only my religion is acceptable	[4] Religion at school	[5] Other relig not as moral as my relig
1 Esoteric	4.215	0.985	0.48	0.388	-0.144
2 Folk	2.533	0.741	0.471	0.544	-0.215
3 Dharmic	3.755	0.892	0.55	0.786	-0.24
4 Far-Eastern	1.16	0.373	0.326	0.257	-0.124
5 Judaism	2.268	0.572	0.214	0.0502	-0.228
6 Islam	4.627	1.435	1.349	0.0504	0.0311
7 Orthodox	3.6	0.686	0.691	0.0819	-0.2
8 Catholic	3.767	0.665	0.349	0.312	-0.214
9 New Messiahs	4.241	1.091	0.959	0.445	-0.11
10 Evangelical	3.555	0.855	0.439	0.55	-0.218
11 Protestant	3.726	0.861	0.266	0.485	-0.161
12 NA	4.138	1.678	1.481	0.207	0.143

* Based on the coefficients from Table 3, this heatmap table is conditionally formatted by column on a spectrum from dark green (highest coefficient) to dark red (lowest coefficient).

6.3. Religious denomination and trust

This section illustrates how particular beliefs and values affect an important economic input, namely trust. Conceptually, the welfare implications of having higher levels of trust in an economy are significant. Higher levels of trust theoretically decrease transaction costs because buyers spend less effort and time on gauging the credibility of the information provided by sellers, and vice versa. Moreover, this section demonstrates how different beliefs can result in divergent economic outcomes by employing a systematic, empirically driven approach. Figure 27 provides an illustration of the general statistical methodology where particular beliefs (X) predict divergent economic outcomes (Y) and culture (Z) functions as an instrument variable.

Individuals who are part of the same religious denomination tend to trust each other more (Berggren & Bjørnskov, 2009:6). The spread of a religion provides a harmonised set of formal and informal institutions. However, transactions between members of heterogeneous religious denominations are, in general, more costly, due to lower levels of trust across denominations. How does trust differ across individuals by religious denomination? Equation 6.3 is an OLS regression model that estimates the effect of religious denomination on a variety of trust measures, respectively:

$$Y_{Trust} = \beta_0 + \delta_i X_{Relig} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.3)$$

Table 6 shows divergent levels of trust by religious denomination with non-religious (*Nones*) as base denomination. The regressions control for demographic factors, education level and income level. Table 7 is a condensed “heatmap” version of Table 6. When asked if people can be trusted, in general, *Nones* and Far Eastern denominations are the most likely to answer “yes”. Evangelical Christians are the least likely to trust their neighbours. Muslims are the least likely to trust people from other religions. Folk and Judaist denominations are the most likely to trust migrants. Do beliefs and views, such as trusting people in general, have an effect on economic outcomes and policy preferences? This chapter’s analysis utilises religious denomination as an instrumental variable, as conceptualised in Figure 27. Equations 6.3.1 and 6.3.2 represent a Two-Stage Least-Squares regression (2SLS) which estimates the effect of trust on a preference for redistributive policies, with religious denomination as instrumental variable:

$$X_{Trust} = \beta_0 + \delta_i Z_{Relig} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.3.1)$$

$$Y_{Redist} = \beta_0 + \widehat{X_{Trust}} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.3.2)$$

Columns 1.1 and 1.2 in Table 11 (see Appendix) are the first and second stages, respectively of equations 6.3.1 and 6.3.2. Column 1.3 is an endogeneity test conducted by using the first stage residual of *trust*. Column 2 shows the output of a 2SLS regression conducted by using Stata's built-in *ivregress* function. When using religious denomination as an instrument, it is apparent that individuals who have a stronger preference for redistribution place greater trust in other people in general. The effect of general trust is statistically significant at a 99% confidence level.

Table 6: Decomposed trust by religion

	[1] Trust in general	[2] Trust neighbour	[3] Trust personal	[4] Trust new people	[5] Trust other religions	[6] Trust foreigner
1 Esoteric	-0.147*** -0.0108	0.0608*** -0.0206	0.0265 -0.0203	0.00337 -0.0203	0.216*** -0.022	0.0437** -0.0222
2 Folk	-0.112*** -0.0205	0.113*** -0.0396	0.00157 -0.0391	0.257*** -0.0391	0.279*** -0.0421	0.118*** -0.0422
3 Dharmic	-0.172*** -0.00786	0.384*** -0.0149	0.130*** -0.0147	0.0428*** -0.0147	0.312*** -0.016	-0.0996*** -0.0163
4 Far-Eastern	-0.0486*** -0.00756	0.0770*** -0.0145	0.0328** -0.0143	-0.0305** -0.0144	-0.00236 -0.0159	-0.144*** -0.0159
5 Judaism	-0.0732** -0.0335	0.0431 -0.0638	-0.0763 -0.0626	0.0709 -0.0623	0.169** -0.067	0.0971 -0.0671
6 Islam	-0.161*** -0.00466	0.302*** -0.00893	0.0241*** -0.00878	-0.132*** -0.0088	-0.216*** -0.00976	-0.234*** -0.00973
7 Orthodox	-0.178*** -0.00567	0.0449*** -0.0108	-0.0747*** -0.0107	-0.0725*** -0.0107	-0.0309*** -0.0118	-0.0161 -0.0118
8 Catholic	-0.195*** -0.00499	-0.0325*** -0.00961	-0.126*** -0.00945	-0.0836*** -0.00948	0.0439*** -0.0105	-0.0995*** -0.0105
9 New Messiahs	-0.198*** -0.0298	0.0039 -0.0579	-0.174*** -0.0574	0.0496 -0.0573	0.103* -0.0615	0.087 -0.0613
10 Evangelical	-0.121*** -0.00893	-0.0639*** -0.0173	-0.212*** -0.017	0.0593*** -0.017	0.258*** -0.0184	0.0222 -0.0185
11 Protestant m	-0.110*** -0.0059	-0.0221* -0.0115	-0.0647*** -0.0113	0.0490*** -0.0113	0.255*** -0.0124	0.0594*** -0.0123
12 NA	-0.121*** -0.00714	0.383*** -0.0138	0.319*** -0.0135	0.125*** -0.0135	0.0672*** -0.0149	-0.0516*** -0.0148
Health	0.0262*** -0.00188	0.0665*** -0.00359	0.0514*** -0.00354	0.0381*** -0.00354	0.0392*** -0.00386	0.0357*** -0.00386
Male	-0.00348 -0.00293	0.0408*** -0.00561	-0.000831 -0.00552	0.0302*** -0.00553	0.00996* -0.00601	0.0116* -0.00603
Age	0.00253*** -9.64E-05	0.00764*** -0.000185	0.00518*** -0.000182	0.00400*** -0.000183	0.00386*** -0.000199	0.00530*** -0.000199
Education	0.0161*** -0.00066	-0.00761*** -0.00126	0.0233*** -0.00124	0.00942*** -0.00124	0.0344*** -0.00135	0.0549*** -0.00135
Income scale	0.00698*** -0.000736	0.0215*** -0.00142	0.0184*** -0.00139	0.0220*** -0.0014	0.0210*** -0.00152	0.0264*** -0.00152
Constant	0.0650*** -0.00954	2.161*** -0.0183	2.364*** -0.018	1.517*** -0.018	1.658*** -0.0197	1.469*** -0.0198
Observations	83,141	83,586	83,668	82,633	79,202	78,971
R-squared	0.047	0.059	0.034	0.022	0.056	0.057

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Decomposed trust heatmap by religion

	[1] Trust in general	[2] Trust neighbour	[3] Trust personal	[4] Trust new people	[5] Trust other religions	[6] Trust foreigner
1 Esoteric	-0.147	0.0608	0.0265	0.00337	0.216	0.0437
2 Folk	-0.112	0.113	0.00157	0.257	0.279	0.118
3 Dharmic	-0.172	0.384	0.13	0.0428	0.312	-0.0996
4 Far-Eastern	-0.0486	0.077	0.0328	-0.0305	-0.00236	-0.144
5 Judaism	-0.0732	0.0431	-0.0763	0.0709	0.169	0.0971
6 Islam	-0.161	0.302	0.0241	-0.132	-0.216	-0.234
7 Orthodox	-0.178	0.0449	-0.0747	-0.0725	-0.0309	-0.0161
8 Catholic	-0.195	-0.0325	-0.126	-0.0836	0.0439	-0.0995
9 New Messiahs	-0.198	0.0039	-0.174	0.0496	0.103	0.087
10 Evangelical	-0.121	-0.0639	-0.212	0.0593	0.258	0.0222
11 Protestant mainline	-0.11	-0.0221	-0.0647	0.049	0.255	0.0594
12 NA	-0.121	0.383	0.319	0.125	0.0672	-0.0516

* Based on the coefficients from Table 6, this heatmap table is conditionally formatted by column on a spectrum from dark green (highest coefficient) to dark red (lowest coefficient).

6.4. Predicting entrepreneurship and savings from stated values

This section illustrates how particular beliefs and values affect an important economic outcome, namely entrepreneurship. Conceptually, the welfare implications of having more entrepreneurs in an economy are significant. Moreover, this section demonstrates how different beliefs can result in divergent economic outcomes by employing a systematic, empirically driven approach. Figure 27 provides an illustration of the general statistical methodology where particular beliefs (X) predict divergent economic outcomes (Y) and culture (Z) functions as an instrument variable.

Can having certain values predict entrepreneurship? Table 12 (see Appendix) shows how strongly individuals from different religious denominations esteem different *values* in their children when prompted by the WVS surveys. The regressions control for demographic factors, education level and income level. Table 14 (see Appendix) is a condensed “heatmap” version of Table 12. Table 14 reveals that individuals from Dharmic denominations indicated the highest level of importance for every value prompt. It would seem that, since there are no limitations to assigning “high importance” to all the values, Dharmic individuals had opted to assign high importance to every value. Moreover, the terminology used in the child values questions is loaded. Which parent would respond disapprovingly of a child who has perseverance, and who is independent, hard-working, etc.? It is unclear exactly why the Dharmic responses are uniformly higher than other denominations, but it is decidedly irregular. Using data from these observations would

be dubious. How could these questions be improved so that they provide useful information? The first method would be to ask non-loaded questions. The second would be to use a limited number of “value points”, which have to be assigned more carefully across the different child values. Restricting value points would provide superior insight into how respondents *prioritise* certain values over others. The third method would be to introduce a scale, as employed in questions V131 to V139 in WVS Wave 6, where respondents can choose a point between two “competing” values. For example, respondents should be asked to choose a number on a scale from 1 to 10, where 1 represents *obedience* and 10 represents *independence*.

Fortunately, the Schwartz value questions provide more credible datapoints. Table 13 (see Appendix) shows how strongly individuals from different religious denominations associate different *values*-laden statements with themselves. The regressions control for demographic factors, education level and income level. Table 15 (see Appendix) is a condensed “heatmap” version of Table 13. Unlike Table 14, Table 15 does not appear to have uniformly biased responses from individuals from any particular religious denomination, and it is thus more credible as a basis for further analysis. It appears that NMCs place the highest importance on creativity and risk taking relative to other denominations. Far-Eastern denominations and Nones are the least inclined to value risk-taking. Nones and Far-Eastern denominations are also the least likely to emphasise the importance of tradition.

How do these values, albeit *self-reported* values, link to economic outcomes? Equations 6.4.1 and 6.4.2 represent a Two-Stage Least-Squares regression (2SLS) which estimates the effect of the respective Schwartz values (see Schwartz, 2012:3-7) on the probability of being an entrepreneur (self-employed), with religious denomination as the instrumental variable:

$$\mathbf{X}_{Schw} = \beta_0 + \delta_i Z_{Relig} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.4.1)$$

$$Y_{Entrep} = \beta_0 + \widehat{\mathbf{X}_{Schw}} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.4.2)$$

Table 8 is the output of a 2SLS regression conducted by using Stata’s built-in *ivregress* function which shows that self-reported claims of valuing creativity, being rich, and respecting traditions are not statistically significant predictors of self-employment. Individuals who value “having a good time and spoiling [themselves]”, and those who value being recognised for their success are *less* likely to be self-employed, at statistically

significant levels. Conversely, those who value “adventure” and risk-taking are *more* likely to be self-employed, at a statistically significant level.

Equations 6.4.3 and 6.4.4 represent a Two-Stage Least-Squares regression (2SLS) that estimates the effect of responses to Schwartz value questions on the respondents’ net savings status, with religious denomination as instrumental variable:

$$X_{Schw} = \beta_0 + \delta_i Z_{Relig} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.4.3)$$

$$Y_{Saving} = \beta_0 + \widehat{X}_{Schw} + \beta_j X_{Demog} + \beta_1 X_{Educ} + \beta_2 X_{Inc} + \epsilon_i \quad (6.4.4)$$

Table 8: Entrepreneurship by Schwartz values (IV: Religious denomination)

	[1]	[2]	[3]	[4]	[5]	[6]
	IV (Relig)	IV (Relig)	IV (Relig)	IV (Relig)	IV (Relig)	IV (Relig)
	Self-employed	Self-employed	Self-employed	Self-employed	Self-employed	Self-employed
schw_creat	0.00609 -0.00798					
schw_rich		0.00426 -0.00521				
schw_spoil			-0.0274*** -0.00457			
schw_recog				-0.0152*** -0.00468		
schw_risk					0.0501*** -0.013	
schw_trad						-0.000196 -0.00262
Health	0.0157*** -0.00203	0.0165*** -0.00153	0.0201*** -0.0016	0.0181*** -0.00158	0.0109*** -0.00214	0.0169*** -0.00149
Male	0.0759*** -0.00254	0.0759*** -0.00253	0.0787*** -0.00239	0.0792*** -0.00249	0.0592*** -0.00502	0.0770*** -0.00235
Age	-0.000335*** -0.000101	-0.000301** -0.00013	-0.000792*** -0.0001	-0.000659*** -0.00011	0.000676** -0.000285	-0.000416*** -7.68E-05
Education	-0.0179*** -0.000529	-0.0174*** -0.000597	-0.0181*** -0.000519	-0.0182*** -0.000529	-0.0172*** -0.000545	-0.0177*** -0.000528
Income scale	-0.000843 -0.000762	-0.000664 -0.000712	0.00140** -0.000652	0.000405 -0.000626	-0.00350*** -0.00104	-0.000419 -0.000587
Constant	0.141*** -0.0299	0.145*** -0.0209	0.265*** -0.0187	0.229*** -0.0216	-0.00991 -0.0449	0.163*** -0.0138
Observations	78,710	78,871	78,957	78,791	78,493	79,276
R-squared	0.031	0.03	0.024	0.021		0.03

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9 shows that self-reported claims that value being rich and being recognised for (their) success decrease the likelihood of respondents' having a favourable savings position at the end of the year. Similarly, respondents who place relatively more value on risk taking and tradition are less likely to be savers. Valuing creativity has a statistically insignificant effect on saving. Bizarrely, respondents who report that "having a good time and spoiling [themselves]" is important are more likely to save. This could be due to the financial circumstances of the respondent. Wealthier respondents may have the liberty to consider increasing leisure activity without dissaving.

Table 9: Inclination to save by Schwartz values (IV: Religious denomination)

	[1] IV (Relig) Saving	[2] IV (Relig) Saving	[3] IV (Relig) Saving	[4] IV (Relig) Saving	[5] IV (Relig) Saving	[6] IV (Relig) Saving
schw_creat	-0.0148 -0.0227					
schw_rich		-0.223*** -0.0151				
schw_spoil			0.119*** -0.0131			
schw_recog				-0.167*** -0.0133		
schw_risk					-0.258*** -0.0392	
schw_trad						-0.143*** -0.00729
Health	0.112*** -0.00547	0.125*** -0.0045	0.0953*** -0.00446	0.125*** -0.0044	0.139*** -0.00622	0.113*** -0.00417
Male	0.0338*** -0.00706	0.0675*** -0.00739	0.0177*** -0.00668	0.0577*** -0.00702	0.117*** -0.0151	0.0177*** -0.00659
Age	0.00263*** -0.000281	-0.00178*** -0.000378	0.00438*** -0.000278	-0.0000985 -0.000312	-0.00268*** -0.000858	0.00328*** -0.000214
Education	0.0168*** -0.00146	0.00236 -0.00178	0.0186*** -0.00145	0.0125*** -0.00149	0.0138*** -0.00159	0.00857*** -0.00148
Income scale	0.115*** -0.00212	0.131*** -0.00209	0.107*** -0.00182	0.121*** -0.00175	0.131*** -0.00306	0.115*** -0.00164
Constant	1.882*** -0.0859	2.672*** -0.0606	1.375*** -0.0532	2.566*** -0.0621	2.710*** -0.136	2.482*** -0.0385
Observations	74,878	75,032	75,114	74,950	74,677	75,427
R-squared	0.093		0.059	0.033		0.058

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Concluding remarks

By focusing on how values and beliefs link with economic outcomes, this thesis provides a new method for estimating the effect of beliefs on development. This beliefs-centred approach is a comfortable combination of institutional and culture-based explanations of economic growth. New Institutional Economics provides the high-level incentive-based framework, while culture-development literature provides the necessary explanations for divergent decision-making across societies.

The stated purpose of this thesis was (1) to inquire *whether* the relationship between beliefs, culture and economic outcomes can be analysed systematically, and (2) to provide examples of how particular beliefs could influence economic decision-making. In response, this thesis (1) briefly discussed the three recognised general causes of growth in economic literature, (2) provided a review of prominent narratives on the effect of *culture* on divergent development outcomes, (3) qualitatively investigated real-world anecdotes where different beliefs have had an observable effect on outcomes, (4) provides a rationale for investigating beliefs in economics and discusses the conception of beliefs in the Neoclassical model, (5) provided a theoretical framework for analysing the effect of beliefs (namely New Institutional Economics) and describes an individual-level cognitive model of belief-formation (namely Shared Mental Models), and (6) provided a demonstration of a model to test beliefs-based explanations of divergent development empirically.

This thesis critically reviewed existing literature on the interaction between beliefs, culture and development, and found that beliefs play a significant and interdependent role in leading to divergent development outcomes. Determining the *exact* magnitude and significance of the effect of beliefs is difficult due to the interdependence of prevailing economic incentive structures, i.e. there is an inextricable endogeneity between beliefs and prevailing institutions. Nevertheless, this thesis articulated methodologies to partially mitigate endogeneity concerns, which, in turn, provide a basis for future empirical research with richer datasets.

For future research and replication, this conclusion provides a succinct description of the methodology of the proposed systematic method of analysing the economic effect of particular beliefs and values. Datasets are required that combine questions on (1) respondents' views, and (2) economic outcomes. Ideally, surveys that ask more questions

to determine (1) beliefs and values, (2) economic outcomes and policy views, (3) relevant controls, and (4) possible instrumental variables, would provide analysts with richer data for more insightful analyses. To demonstrate a systematic method for analysing how beliefs affect economic outcomes, this thesis used religious denomination as an instrument for various beliefs. Ethnic identity could alternatively be used as an instrument, although ethnic classification tends to be more inconsistent across countries. Preliminary results showed great potential for employing this method in other contexts, such as political decision-making, the formulation of public information campaigns, public health, and the analysis of road-user behaviour. Additional contributions from cognitive science involving the formation and evolution of beliefs could further enhance the robustness of the preliminary arguments and findings on the effect of beliefs on divergent economic outcomes.

Beliefs seem to ultimately affect economic and political decision-making. Moreover, this thesis has shown that there is at least one method of analysing the effect of beliefs systematically. The policy implications of this thesis are potentially immense. This conclusion lists a few policy implications, but this list is not at all comprehensive. First, the opaque and fatalistic culture-development model can now be supplanted by a more useful beliefs-development model. Second, by focusing only on a few relevant beliefs, policymakers can target reforms much more precisely. Third, there is a clear rationale for pedagogical reforms that target the belief-formation process. In practice, these reforms could be small behavioural interventions, such as behavioural nudges. Alternatively, more profound reforms could be employed so that individuals are prepared to form their beliefs based on sound evidence. More specifically, these profound reforms would be meant to equip individuals with a reasonable command of critical thinking skills, epistemology, and media literacy.

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Appendix

Table 10: Wave 6 classification of religious denomination

	Code	Religious denomination
0 None	0	None
1 Esoteric	8	Bahai
	53	Other;Not specific
	54	Other: Brasil: Espirit, candombl, umband
	73	Spiritista
2 Folk	4	Ancestral worshipping / Tradition
	50	Native, Folk religion
	57	Other: Philippines (less 0.5%)
	59	Paganism
	86	Zoroastrian
	710002	ZA: African Traditional Religion
3 Dharmic	31	Hindu
	71	Sikh
4 Far East	12	Buddhist
	21	Confucianism
	58	Other: Taiwan (taoism, protestant fundam
	77	Taoist
	90	Yiguan Dao
	91	Daoism
5 Judaism	42	Jew
6 Islam	2	Al-Hadis
	22	Druse
	49	Muslim
	70	Shia
	75	Sunni
7 Orthodox	6	Armenian Apostolic Church
	30	Gregorian
	52	Orthodox
8 Catholic	29	Greek Catholic
	64	Roman Catholic
9 New Messiahs	20	Church of Christ / Church of Christ / Ch
	34	Iglesia ni Cristo (INC)
	39	Jehovah witnesses
	48	Mormon
10 Evangelical	3	Alliance
	7	Assembly of God
	9	Baptist
	10	Born again
	25	Evangelical
	35	Independent African Church (e.g. ZCC, Sh
	60	Pentecostal
	68	Seven Day Adventist
	85	Zionist
	89	New Apostolic Church
	528002	Reformed Churches in the Netherlands (Ge
710001	ZA: Evangelical/Apostolic Faith Mission	
11 Protestant mainline	1	Aglipayan
	5	Anglican
	17	Christian
	19	Christian Reform
	28	Free church/Non denominational church
	44	Lutheran
	55	Other: Christian com
	62	Protestant
	66	Salvation Army
	78	The Church of Sweden
	81	Unitarian
	360001	AU: Uniting Church
	528001	Dutch Reformed (Nederlands Hervormd)

Table 11: Preference for redistributive policies (IV: Religious denomination)

	[1.1] Stage 1: Trust	[1.2] Stage 2: Dem-redist	[1.3] Endog test: Dem-redist	[2] IVReg Dem-redist
Trust in general_Hat		1.029*** -0.16		
Trust in general			1.021*** -0.161	1.047*** -0.164
Residual_t			-0.820*** -0.163	
Health	0.0263*** -0.00192	-0.131*** -0.0142	-0.130*** -0.0144	-0.131*** -0.0145
Male	-0.00391 -0.00299	-0.0106 -0.0212	-0.00423 -0.0214	-0.00385 -0.0216
Age	0.00257*** -9.84E-05	0.000853 -0.000825	0.000897 -0.000835	0.000794 -0.000846
Education	0.0168*** -0.000672	-0.0656*** -0.00558	-0.0646*** -0.00565	-0.0651*** -0.00571
Income scale	0.00716*** -0.000752	-0.0622*** -0.0054	-0.0602*** -0.00546	-0.0604*** -0.0055
1 Esoteric	-0.147*** -0.011			
2 Folk	-0.105*** -0.0208			
3 Dharmic	-0.172*** -0.00822			
4 Far-Eastern	-0.0492*** -0.00767			
5 Judaism	-0.0720** -0.0336			
6 Islam	-0.153*** -0.0048			
7 Orthodox	-0.176*** -0.00574			
8 Catholic	-0.192*** -0.00505			
9 New Messiahs	-0.196*** -0.0302			
10 Evangelical	-0.117*** -0.00902			
11 Protestant mainline	-0.108*** -0.00595			
12 NA	-0.125*** -0.00726			
Constant	0.0561*** -0.00974	7.058*** -0.0653	7.038*** -0.0661	7.041*** -0.0666
Observations	79,832	79,199	77,490	77,490
R-squared	0.047	0.007	0.007	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12: Important values for children by religion

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Value	Value	Value	Value	Value	Value	Value	Value
	child_indep	child_work	child_resp	child_imag	child_thrif	child_persev	child_faith	child_obed
1 Esoteric	-0.121***	0.0745***	-0.0816***	-0.0147	-0.0728***	-0.0420***	0.455***	0.163***
	-0.0124	-0.0121	-0.0113	-0.0104	-0.0121	-0.0121	-0.0115	-0.012
2 Folk	0.032	0.0558**	-0.0993***	-0.0821***	-0.0423*	-0.102***	0.105***	0.00433
	-0.0237	-0.0231	-0.0217	-0.0198	-0.0231	-0.0232	-0.022	-0.023
3 Dharmic	0.270***	0.357***	0.136***	0.351***	0.368***	0.340***	0.642***	0.509***
	-0.00895	-0.00872	-0.00818	-0.00749	-0.00874	-0.00877	-0.00829	-0.00868
4 Far-Eastern	-0.00332	0.0844***	-0.0189**	-0.0583***	0.103***	0.0346***	0.0793***	-0.0267***
	-0.00871	-0.00849	-0.00796	-0.00729	-0.00851	-0.00854	-0.00807	-0.00845
5 Judaism	-0.0425	0.106***	-0.0885**	-0.0266	-0.0771**	-0.107***	0.215***	0.0562
	-0.038	-0.0371	-0.0348	-0.0318	-0.0371	-0.0373	-0.0352	-0.0369
6 Islam	-0.151***	0.0859***	-0.0581***	-0.0983***	-0.0609***	-0.0940***	0.440***	0.119***
	-0.00534	-0.0052	-0.00488	-0.00447	-0.00522	-0.00524	-0.00495	-0.00518
7 Orthodox	-0.219***	0.280***	-0.0342***	-0.111***	-0.0424***	-0.0726***	0.237***	0.0759***
	-0.0065	-0.00633	-0.00594	-0.00544	-0.00635	-0.00637	-0.00602	-0.0063
8 Catholic	-0.148***	-0.0509***	-0.0388***	-0.0601***	-0.0701***	-0.101***	0.289***	0.153***
	-0.00575	-0.0056	-0.00525	-0.00481	-0.00561	-0.00564	-0.00533	-0.00557
9 New Messiahs	-0.120***	0.0492	-0.0698**	-0.0268	-0.137***	-0.128***	0.434***	0.123***
	-0.0346	-0.0337	-0.0316	-0.029	-0.0338	-0.0339	-0.0321	-0.0336
10 Evangelical	-0.0881***	-0.0222**	-0.0620***	-0.0378***	-0.128***	-0.0712***	0.283***	0.128***
	-0.0103	-0.0101	-0.00945	-0.00866	-0.0101	-0.0101	-0.00958	-0.01
11 Protestant	-0.166***	0.0940***	-0.163***	-0.0835***	-0.113***	-0.0495***	0.367***	0.201***
	-0.00681	-0.00663	-0.00622	-0.0057	-0.00665	-0.00668	-0.00631	-0.0066
12 NA	-0.0766***	-0.0315***	-0.106***	-0.118***	-0.122***	-0.212***	0.563***	0.146***
	-0.00821	-0.008	-0.00751	-0.00688	-0.00802	-0.00805	-0.00761	-0.00797
Health	0.0180***	-0.0110***	-0.00765***	0.0144***	-0.0210***	0.00579***	0.0238***	0.00694***
	-0.00215	-0.0021	-0.00197	-0.0018	-0.0021	-0.00211	-0.002	-0.00209
Male	-0.00527	0.0259***	-0.0183***	0.0151***	-0.0160***	0.0151***	-0.00795**	0.0121***
	-0.00336	-0.00328	-0.00307	-0.00282	-0.00329	-0.0033	-0.00312	-0.00326
Age	0.000702***	-4.72E-05	0.00221***	-0.000910***	0.00234***	-0.000125	-8.16E-05	-0.00235***
	-0.000111	-0.000108	-0.000101	-9.28E-05	-0.000108	-0.000109	-0.000103	-0.000107
Education	0.0108***	-0.00438***	0.0169***	0.00552***	-0.00241***	0.0115***	-0.0207***	-0.0289***
	-0.000757	-0.000737	-0.000692	-0.000634	-0.000739	-0.000742	-0.000701	-0.000734
Income scale	0.00693***	0.000575	-0.00197**	0.00741***	0.00184**	0.00667***	-0.00351***	-0.00879***
	-0.000846	-0.000824	-0.000773	-0.000708	-0.000826	-0.000829	-0.000784	-0.00082
Constant	0.441***	0.578***	0.611***	0.201***	0.405***	0.331***	0.187***	0.579***
	-0.0109	-0.0107	-0.01	-0.00917	-0.0107	-0.0107	-0.0101	-0.0106
Observations	85,192	85,199	85,198	85,189	85,193	85,193	85,188	85,187
R-squared	0.05	0.056	0.03	0.057	0.054	0.046	0.162	0.084

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Schwartz values by religion

	[1]	[2]	[3]	[4]	[5]	[6]
	schw_creat	schw_rich	schw_spoil	schw_recog	schw_risk	schw_trad
1 Esoteric	0.192*** -0.0354	0.118*** -0.0384	-0.155*** -0.0385	0.115*** -0.0364	0.119*** -0.0398	0.594*** -0.0352
2 Folk	-0.106 -0.0674	0.464*** -0.073	0.154** -0.0731	-0.0786 -0.0692	0.105 -0.0755	0.783*** -0.0668
3 Dharmic	0.397*** -0.027	0.238*** -0.0292	-0.506*** -0.0294	0.331*** -0.0278	0.285*** -0.0305	0.729*** -0.0269
4 Far-Eastern	-0.222*** -0.0248	0.184*** -0.0269	0.0311 -0.0269	-0.0395 -0.0255	-0.0885*** -0.0279	0.455*** -0.0246
5 Judaism	0.214** -0.107	0.573*** -0.116	-0.213* -0.116	0.243** -0.11	0.275** -0.12	0.578*** -0.106
6 Islam	0.233*** -0.0155	0.577*** -0.0168	0.273*** -0.0168	0.632*** -0.0159	0.157*** -0.0174	1.256*** -0.0154
7 Orthodox	-0.00718 -0.0186	0.442*** -0.0202	-0.421*** -0.0202	0.395*** -0.0191	0.105*** -0.021	1.030*** -0.0184
8 Catholic	0.277*** -0.0163	0.0316* -0.0177	0.152*** -0.0177	0.428*** -0.0168	0.201*** -0.0184	0.854*** -0.0162
9 New Messiahs	0.485*** -0.0976	0.156 -0.107	0.207* -0.106	0.214** -0.101	0.494*** -0.11	0.651*** -0.0972
10 Evangelical	0.184*** -0.0292	0.299*** -0.0317	0.312*** -0.0317	0.420*** -0.03	0.126*** -0.0328	0.613*** -0.029
11 Protestant	0.191*** -0.0193	0.443*** -0.0209	-0.274*** -0.0209	0.404*** -0.0198	0.189*** -0.0217	0.507*** -0.0192
Health	0.166*** -0.00641	0.0751*** -0.00695	0.102*** -0.00695	0.105*** -0.00658	0.125*** -0.00721	0.0513*** -0.00635
Male	0.113*** -0.00996	0.183*** -0.0108	0.0696*** -0.0108	0.172*** -0.0102	0.340*** -0.0112	-0.0493*** -0.00987
Age	-0.00733*** -0.000327	-0.0182*** -0.000354	-0.0128*** -0.000354	-0.0148*** -0.000335	-0.0205*** -0.000367	0.00727*** -0.000323
Education	0.0242*** -0.00225	-0.0540*** -0.00244	-0.00949*** -0.00244	-0.0155*** -2.31E-03	-0.00483* -0.00253	-0.0320*** -0.00223
Income scale	0.0552*** -0.00251	0.0692*** -0.00272	0.0458*** -0.00273	0.0277*** -0.00258	0.0614*** -0.00283	-0.00926*** -0.00249
Constant	3.460*** -0.0325	3.372*** -0.0353	3.819*** -0.0353	3.909*** -0.0334	3.214*** -0.0366	3.495*** -0.0323
Observations	75414	75579	75672	75513	75209	75994
R-squared	0.058	0.092	0.071	0.079	0.088	0.104

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 14: Important values for children heatmap by religion

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Value	Value	Value	Value	Value	Value	Value	Value
	child_indep	child_work	child_resp	child_imag	child_thrift	child_persev	child_faith	child_obed
1 Esoteric	-0.121	0.0745	-0.0816	-0.0147	-0.0728	-0.042	0.455	0.163
2 Folk	0.032	0.0558	-0.0993	-0.0821	-0.0423	-0.102	0.105	0.00433
3 Dharmic	0.27	0.357	0.136	0.351	0.368	0.34	0.642	0.509
4 Far-Eastern	-0.00332	0.0844	-0.0189	-0.0583	0.103	0.0346	0.0793	-0.0267
5 Judaism	-0.0425	0.106	-0.0885	-0.0266	-0.0771	-0.107	0.215	0.0562
6 Islam	-0.151	0.0859	-0.0581	-0.0983	-0.0609	-0.094	0.44	0.119
7 Orthodox	-0.219	0.28	-0.0342	-0.111	-0.0424	-0.0726	0.237	0.0759
8 Catholic	-0.148	-0.0509	-0.0388	-0.0601	-0.0701	-0.101	0.289	0.153
9 New Messiahs	-0.12	0.0492	-0.0698	-0.0268	-0.137	-0.128	0.434	0.123
10 Evangelical	-0.0881	-0.0222	-0.062	-0.0378	-0.128	-0.0712	0.283	0.128
11 Protestant	-0.166	0.094	-0.163	-0.0835	-0.113	-0.0495	0.367	0.201
12 NA	-0.0766	-0.0315	-0.106	-0.118	-0.122	-0.212	0.563	0.146

* Based on the coefficients from Table 12, this heatmap table is conditionally formatted by column on a spectrum from dark green (highest coefficient) to dark red (lowest coefficient).

Table 15: Schwartz values heatmap by religion

	[1]	[2]	[3]	[4]	[5]	[6]
	schw_creat	schw_rich	schw_spoil	schw_recog	schw_risk	schw_trad
1 Esoteric	0.192	0.118	-0.155	0.115	0.119	0.594
2 Folk	-0.106	0.464	0.154	-0.0786	0.105	0.783
3 Dharmic	0.397	0.238	-0.506	0.331	0.285	0.729
4 Far-Eastern	-0.222	0.184	0.0311	-0.0395	-0.0885	0.455
5 Judaism	0.214	0.573	-0.213	0.243	0.275	0.578
6 Islam	0.233	0.577	0.273	0.632	0.157	1.256
7 Orthodox	-0.00718	0.442	-0.421	0.395	0.105	1.03
8 Catholic	0.277	0.0316	0.152	0.428	0.201	0.854
9 New Messiahs	0.485	0.156	0.207	0.214	0.494	0.651
10 Evangelical	0.184	0.299	0.312	0.42	0.126	0.613
11 Protestant	0.191	0.443	-0.274	0.404	0.189	0.507

* Based on the coefficients from Table 13, this heatmap table is conditionally formatted by column on a spectrum from dark green (highest coefficient) to dark red (lowest coefficient).