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ECONOMIC GROWTH DETERMINANTS AND PUBLIC ADMINISTRATION INSTITUTIONS

A Cross-National Analysis of TFP, AP and Weberianess

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ACRONYMS

AP	Average Productivity
CV	Control Variable
DV	Dependent Variable
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
GNP	Gross National Product
HCI	Human Capital Accumulation
IV	Independent Variable
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OVB	Omitted Variable Bias
PPP	Purchasing Power Parity
PWT	Penn World Tables
QoG	Quality of Government
SEs	Standard Errors
SMEs	Small And Medium-Sized Enterprises
SPSS	Statistical Package for the Social Sciences
TFP	Total Factor Productivity
UN	United Nations
WB	World Bank
VIF	Variance Inflation Factor

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ABSTRACT

The Weberian bureaucracy argument emphasizes a public administration with a set of principles on how it is organised, to make the bureaucracy more productive. This in turn means a more productive public sector. Due to the interconnected nature of the public and private sectors, improved public sector productivity also improves private sector productivity. Both the public and private sector productivities make up an economy's overall macroeconomic productivity. The result is enhanced economic growth. Based on this theoretical claim and using prior studies on the relevance of Weberianess as benchmarks, this paper tried to explore the relationship between Weberianess and productivity, at macroeconomic cross-country level. Studies that have so far explored the relevance of the Weberian model for productivity, have focused on specific country cases. The two bureaucratic organisational structures examined were bureaucratic professionalism and bureaucratic closedness, while the two macroeconomic productivity measures explored were Total Factor Productivity (TFP) and Average Productivity – AP (measured as GDP per person employed), for the year 2014. Two Quality of Government (QoG) datasets and one World Bank (WB) dataset were used. The sample sizes included both the more developed and the lesser developed nations. Empirically, bureaucratic professionalism showed a positive correlation with both TFP and AP. Bureaucratic closedness, however, was statistically insignificant for both TFP and AP, when measured as both a full index and using its different components. These results indicate that some Weberian principles are still relevant today. One policy recommendation is that states should ensure high professionalism in bureaucratic structures, so that macroeconomic productivity is heightened, as this affects long-run sustainable economic growth.

Keywords: *Economic Growth, Productivity, Total Factor Productivity (TFP), Average Productivity (AP), Public Administration Institutions, Weberianess, Professionalism, Closedness.*

Contents

CHAPTER 1

1.1 INTRODUCTION

Economic growth, being a concept that is easy to both quantify and measure (Feldman et al, 2016), has facilitated many empirical researches that have led to the sprouting of exogenous and endogenous growth models (Dutt & Ros, 2008; Peet & Hartwick, 2009; Szirmai, 2015). The former focus on international systematic factors, like international treaties, while the latter focus on in-country features as being the main drivers of economic growth (de Le Fuente, 2000; Parker, 2012). It is, however, apparent that many of the very renowned endogenous growth models focusing on in-country features such as 'institutions' centre on either institutions of property rights (Neo-Institutionalist theory) or technological institutions (Neo-Schumpeterian theory), than on institutions of public administration.[1] Early scholars like Max Weber emphasized a public administration with a set of principles such as meritocratic hiring and predictable long term careers (Dahlström, Lapuente & Teorell, 2010). These principles, if strictly adhered to, were to make bureaucracies well organised and more productive, for the effective provision of public goods and services (Ezrow et al, 2015). Based on Max's 'Weberian' concept, early attempts to address the gap in endogenous growth models were evident in the work of Evans & Rauch (1999) who found a positive correlation between Weberianess and economic growth.

Over the decades, others have sort to verify the relevance of the Weberian model, using diverse empirical approaches. One thing is clear: *there are contradictory views on the relevance of the Weberian model* (Lovett, 2011: 24). Some recent studies, like that of Lee & Ki (2017), have concluded that Weberianess no longer matters for economic activity. Others, like Kurtz & Schrank (2007), have claimed the existence of reverse causality and have argued that Evans & Rauch's noticed positive correlation could have been due to other economic growth determinants. However, others like Nistotskaya & Cingolani (2016) have examined Weberianess against *'private sector performance linked'* economic growth determinants instead, and a positive correlation was noticed. Yet, among these studies, few have focused on determinants that encompass both the public and private sectors, not only private sector performance. Few have focused on determinants that also *'directly'* capture public sector productivity. Weberianess was to enhance *'both'* public and private sector productivity, due to what Jordaan (2013) observed as the inevitable interconnected roles of the public and private sectors. A research gap thus lies in examining Weberianess against several *'productivity indicative'* economic growth determinants, capturing both private and public sector productivities, at cross-country level.

[1] Examples of the vast array of Neo-Institutionalist theory writings include Acemoglu & Robinson (2008), Iyer (2010), Dell (2010), and Michalopoulos & Papaioannou (2013). Examples of the vast array of Neo-Shumpeterian theory writings include Romer (1990), Verspagen (1993) & (2009), and Aghion, Akcigit & Howitt (2013).

This study, therefore, tried to explore the importance of Weberianess today using *'productivity indicative'* macroeconomic concepts of Total Factor Productivity (TFP) and Average Productivity (AP), which capture both public and private sector productivities on one end, and are linked to economic growth, on the other end. Accordingly, this research contributes to macroeconomics and public administration literatures by attempting to verify the 'relevance' of Weberianess today for macroeconomic productivity. This study also offered a shift of focus to the under-explored link of productivity measures like TFP with bureaucratic organisational structures at cross country level. Previous studies have focused on specific country cases. The research question posed was: *'To what extent is macroeconomic productivity empirically linked to Weberian public administration structures today?'* The aim of this paper was, therefore, to explore the idea that how bureaucracies are structured has a bearing on productivity - at macroeconomic level.

To answer the research question, this study used country level cross-sectional data from the Quality of Government (QoG) and World Bank datasets. The datasets included both the more developed and the lesser developed nations. The dependent variables used were macroeconomic TFP and GDP per person employed (to represent AP), while the main independent variables were the bureaucratic professionalism and bureaucratic closedness indices. As per the Weberian bureaucracy argument, it was hypothesized that both bureaucratic professionalism and bureaucratic closedness would correlate positively with TFP and AP. Empirically, bureaucratic closedness showed no statistical significance with either AP (GDP per person employed) or TFP, using sample sizes of 41 and 40 countries, respectively. Even when the N was increased to 101, 114 and 116, while focusing on the three different components that made up the Closedness Index, each of the components showed statistical insignificance. Bureaucratic professionalism, however, showed a positive correlation with both AP and TFP, using sample sizes of 100 and 86 countries, respectively. Even when heterogeneity was controlled for, and the Ns slightly dropped, the results remained the same for both professionalism and closedness. This suggests that there are some Weberian principles that still matter for a country's economic activity.

In terms of paper structure, this paper is arranged into four chapters. Chapter 1 provides the introduction. Chapter 2 firstly gives the theoretical framework and then highlights key empirical research on the relevance of Weberianess, and the research gap noticed. Chapter 3 has the research aim and hypotheses, followed by a comprehensive discussion of the operationalisation of concepts and measurement. Chapter 4 has the data diagnostics, results analysis, results discussion and conclusion.

CHAPTER 2

This chapter is the literature review. It starts off by firstly defining the key concept of productivity before providing the theory on which the principles guiding this research rest. This is then followed by a review of relevant empirical studies, which highlight the research gap. A succinct summary is given at the end of the chapter.

2.1 DEFINITION OF PRODUCTIVITY

Before discussing a theory that boarders on improving productivity, it is important that the term productivity is defined, so that how it is used in this research is made clear. Productivity refers to the ratio of inputs to outputs (Inklaar & Timmer, 2013; Da Cruz & Marques, 2011). In economic theory, the two types of productivity include partial productivity and Total Factor Productivity (TFP) (Mojtahedzadeh & Keshideh, 2015). Partial productivity looks at individual inputs used in the production process, and is therefore the output *"per unit of a specific factor of production"* (Khan, 2006: 1954). An example of partial productivity is labour productivity (also known as Average Productivity - AP), which reflects the capacity of each worker or the degree of intensity of each worker's efforts (OECD, 2018a). TFP, in contrast, looks at both the inherent productivity and aggregate efficiency of all factors of production (Jones & Tarp, 2017). TFP thus also captures partial productivity. Productivity is the portion of outputs produced that is not explained by the increase in inputs consumed (Da Cruz & Marques, 2011; Comin, 2006), but the degree of intensity and efficiency of the use of the already existing inputs (Comin, 2006). Increases in economic output is the two-way interaction of increases in inputs used in the production process and/or the productivity increases in the use of these inputs (Mojtahedzadeh & Keshideh, 2015). Therefore, productivity is key in understanding economic growth differences (Hall and Jones, 1999; Altuğ & Fİlİztekİn, 2006; Danquah, Moral-Benito & Ouattara, 2011; Brasch, 2015; Wu, 2016; OECD, 2015 and 2017).

2.2 THE ORGANISATIONAL THEORY OF BUREAUCRACY

The organisational theory of bureaucracy originates from Max Weber, who saw bureaucracies as a form of organisational structure that assured public sector rationality (Udy, 1959; Altay, 1999; Turner, 2006). This was because public administration institutions ensured the coherent execution of state law through state ministries and bureaucratic agencies (Woodrow, 1887; Uwizeyimana, 2013; Ezrow et al, 2015). Public administration institutions are the channels for the bureaucratic (or administrative) organisation of government (Marume, 2016: 16), so Max Weber saw them as relevant for economic

activity (Evans & Rauch, 1999; Szirmai, 2011: 76). Before Weber, bureaucracy was in the broad sense seen only as a collection of state officials (Turner, 2006). Yet, bureaucracy in the Weberian sense referred to well organised institutions of public administration (Ezrow et al, 2015).[2] Weber came up with the *'Weberian bureaucracy'* argument, which according to Dahlström, Lapuente & Teorell (2010) and Ezrow et al (2015) emphasized that a well organised bureaucratic structure had a set of principles such as hiring based on technical expertise, formal examinations, predictable long-term careers, rule-based authority, the internal recruitment of senior officials and hierarchical organisation. These principles all fell into the four categories of standardisation, formalisation, differentiation, and decentralisation (Walton, 2005). Others like Dahlström et al (2015) have categorised principles like long term careers and formal examinations, among others, as bureaucratic closedness (i.e. being more public-like) and principles like hiring based on technical expertise, among others, as bureaucratic professionalism (i.e. being more professional than politicised).

According to Weber (1946), Blau and Scott (1962) and Hage (1965), standardised procedures and rules provided the necessary guidelines for employees' performance and coordination of both interdependent and differentiated activities (Walton, 2005: 573). Strict bureaucratic administration would lead to bureaucracies achieving optimal levels of speed, precision and reduction of costs while ensuring the non-ambiguity of work tasks (Matte, 2016: 5). Also, unique employee experience was readily available because it was documented and filed (Walton, 2005). To ensure transparent, objective and predictable behaviour, the bureaucrats were to be professionals that were hired on grounds of technical merit, not loyalty, clan, political affiliation or special entitlements (Ezrow et al, 2015; Matevosya 2015). Meritocracy during hiring meant the emphasis on education and IQ testing through job entrance examinations (Evans & Rauch, 1999). This meant that an economy was now managed by technocrats who were 'fitted' to properly navigate organisational change (Matevosya 2015: 1). Meritocracy thus facilitated the effective negation of the role of a bureaucrat (Greisman & Ritzer, 1981: 34).

In addition, states were to offer apposite compensation such as long term careers and competitive salaries (Ezrow et al, 2015). This established consistent organisational norms, reduced the temptation for one to engage in corruption, and ensured the retention of highly competent employees (Ibid). It also increased corporate coherence because bureaucrats could now pursue long-term goals effectively (Evans & Rauch, 1999: 152). This made the professionals happier and more productive (Turner, 2017) –

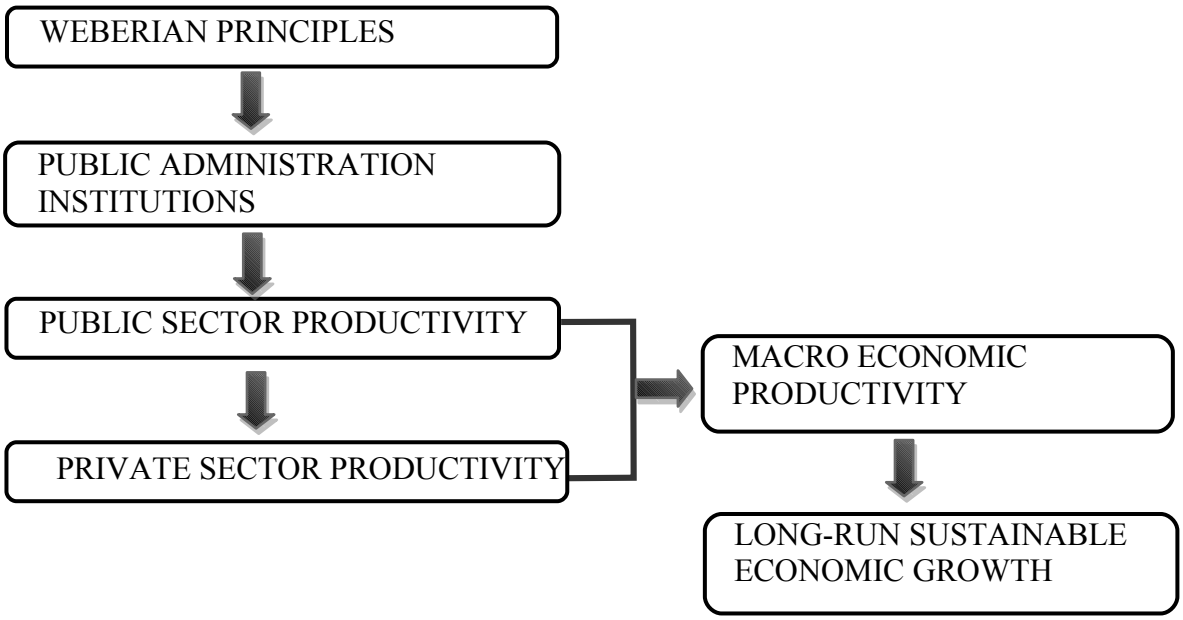
[2] The *description* of bureaucracy (i.e. it being a composition of bureaucrats), however, should not be mixed with its *evaluation* (i.e. whether it is well organised or not, which others refer to as 'high' or 'low' quality) (Altay, 1999: 35).

thereby offering both long-term tangible and intangible benefits (Evans & Rauch, 1999: 751). In converse, since a government regulates economic activity, highly politicised bureaucracies, for instance, meant that economic activity was run by politicians who could channel national resources towards selfish interests (Nistotskaya & Cingolani, 2016). An unstable working environment is created because concerns of loyalty dominate and political appointees make decisions that are favourable for them in the short-term, before the next elections (Gandhi & Ruiz-Rufino: 228). This rent seeking behaviour lowers the economic efficiency of public goods provision and leads to an ignoring of the growth of an economy (Altay, 1999:42; Knott & Miller, 2008).

Bureaucratic organisation is important for an economy (Evans & Rauch, 1999), since how a state contributes to economic activity largely depends on how productive that state is -i.e. it depends on that state's *'own ability'* to deliver public goods (Lovett, 2011). Bureaucracies facilitate public resource allocation through the budgetary provision of services and goods to citizens (Altay, 1999: 36). Public administration institutions thus have the task of ensuring that the resources allotted to public service provision/ production are put to the best available use, to facilitate both greater and high quality output in both the public and private sectors (Altay, 1999: 47; Matte, 2016: 1-2). Bureaucracies are channels for producing a range of outputs -such as policies, regulations and infrastructure- that can boost an economy's business environment (Asian Development Bank, 2007). For instance, when a government provides good roads, the costs incurred in transporting goods is lowered (Martin & Anderson, 2005: 5-6). Bureaucratic performance thus affects the level of market transaction costs which economic actors use to calculate the risks in market profit-making opportunities (Nee & Opper, 2009: 9). Further, regulations set entry and exit barriers in markets (Lovett, 2011), which either inhibit or stimulate private sector investment (Ibid; Nistotskaya, Charron, & Lapuente, 2014). State activities are, therefore, designed to increase productivity in the entire market/ production sector (Martin & Anderson, 2005).

From the preceding discussion, as postulated by the organisational theory of bureaucracy, a graphical summary of the relevance of Weberian principles for productivity is as shown in Figure 1 on the next page. In Figure 1, in a nutshell, Weber hypothesized an economy were the adherence to certain principles (weberian principles) in public administration institutions would improve public sector productivity. This then improves private sector productivity. Both the private and public sectors' 'improved' productivities equate to overall macroeconomic productivity for an economy, and this affects long-run sustainable economic growth. For details on how macroeconomic productivity measures of TFP and AP exactly link with long-run sustainable economic growth, see Appendix 1.

Figure 1: Weberianess And Productivity



2.3 PREVIOUS RESEARCH

2.3.1 The Relevance of Weberianess

Early researchers like Northcote & Trevelyan (1853) hinted that an independent and meritocratic bureaucracy acted as a channel for limiting corruption (Charron, Dahlström & Lapuente, 2016: 500). However, in the 1970s and 80s, successive researches proved the existence of state corruption and rent-seeking (Evans & Rauch, 1999). This triggered a rush to try and avoid these state 'evils', and the need to look into exactly which state organisational structures were relevant for an economy was lost (Ibid). Fortunately, in the late 1980s and the 1990s, researchers such as Stern (1989), Brautigam (1992), Knack & Keefer (1995) and Mauro (1995) refocused on examining cross-national data demonstrating the importance of state organisation, and underscored its relevance for an economy (Evans & Rauch, 1999; Kurtz & Schrank, 2007). By 1999, a key study was carried out by Evans & Rauch, and their results suggested that countries whose public administration closely approximated Weber's bureaucratic principles of organisation experienced higher economic growth (Evans & Rauch 1999: 749). Specifically, public administration institutions that had the two principles of meritocratic recruitment and predictable long term rewarding careers correlated positively with economic growth, especially for the lesser developed nations (Evans & Rauch, 1999).

After Evans & Rauch's study, other researchers sort to verify the relevance of Weberianess, using diverse analytical methods. Henderson et al (2007), for instance, found a positive correlation between a

state's ability to reduce poverty and Weberianess. Others like Tonon (2007) found that bureaucratic professionalism and good governance, were positively linked.[3] Later studies, however, have suggested that certain Weberian principles might matter more for an economy than others. An example is Dahlström, Lapuente & Teorell (2011: 656 & 664), who found that while meritocratic recruitment reduced corruption (a growth inhibiting factor), other bureaucratic principles such as long term rewarding careers and internal promotion did not significantly correlate with corruption.

In contrast, Kurtz and Schrank (2007) suggested reverse causality for Weberianess and growth. Since measures of public sector performance were opinion based, how efficient public institutions were was 'perceived' in the light of that country's economic performance (Ibid). Others like Han et al (2016) reached similar conclusions. Further, economic growth determinants range from including both physical and human capital to including regional, geographic and technological factors, demographics, foreign direct investment (FDI), foreign aid, trade, and investment (Chirwa & Odhiambo, 2016). Hence, Evans & Rauch's noticed positive correlation could have been due to other third factors, not necessarily Weberianess (Kurtz & Schrank, 2007). Thus, others like Lovett (2011) sort to re-examine these claims and found that Weberianess and growth proved to be inconclusive, but a strong correlation was found between a country's level of development and Weberianess (Ibid). Lovett (2011), however, also ran other tests and found that Weberianess still mattered but it seemed to matter less over time.

Recently, others have examined the relevance of Weberianess using economic growth determinants instead, but with a focus on determinants that are closely tied to the private sector. Notable examples included Nistotskaya, Charron & Lapuente (2015) who focused on SMEs, and Nistotskaya & Cingolani (2016) who focused on regulatory quality and entrepreneurship. Both studies found that different Weberian principles were positively correlated with the various *'private sector performance'* measures. This points to the authenticity of the idea that Weberianess is relevant for private sector productivity. Further, others like Suzuki & Demircioglu (2017) focused on innovation and found similar results. However, more recently, Lee & Ki (2017) sort to replicate Evans & Rauch's study. Lee & Ki (2017: 12) found both negative correlations and cases of no statistical significance for the two Weberian principles of bureaucratic professionalism and bureaucratic closedness with economic growth and concluded that Weberianess is no longer relevant. These findings, in contrast, put the relevance of the Weberian model into question. There seems to be no consensus on the model's relevance today.

[3] This justifies that the concept of good governance should not be confused with Weberianess, so that the two terms are interchangeably used. Weberian principles may make up part of the way governance is tailored in a country. Governance is a much broader concept. See, for instance, SIDA (2012).

Furthermore, others have examined the Weberian model at microeconomic level. Haenisch (2012), carried out an organisational level study on bureaucracies in the state of Wyoming in the USA and proposed the discarding of bureaucracy if the performance of each worker was to improve. In the light of Haenisch's thinking, according to Jacobsson et al (2015:8) and Walton (2005), today Weberian ideals usually existing side-by-side with ideals about the state administration being responsive and competitive, leading to flatter hierarchies and/or flexible work systems. However, others like Da Cruz & Marques (2011) sort to examine the extent to which these hybrid/ 'innovation type' of bureaucracies were more efficient than the traditional ones proposed by Weber. Da Cruz & Marques (2011) looked at the institutional organisation of urban Portuguese municipal companies and their TFP. The 'hybrid' bureaucracies were found to offer no improvements in urban public service provision mainly because of the presence of political patronage and the lack of necessary technical competences (Ibid). The 'innovation type' municipal companies even exhibited lower TFP levels as compared to that exhibited by the traditional ones (Ibid: 108). In contrast, Da Cruz & Marques' study underpinned the need to explore Weberianess against different productivity indicative measures. Literature was scarcely found on Weberianess and productivity indicative measures like TFP or AP at macroeconomic level.[4]

2.3.2 Why The Contradictory Empirical Results?

Walton (2005: 588) examined four decades of research and found that 50% of differences in empirical research on the relevance of Weberianess was due to statistical artifacts. Studies that concluded that the Weberian model had little or no relevance rested on illusionary variations which were instead due to shortcomings in methodology, than theoretical or substantive issues (Ibid). Kurtz and Schrank's 2007 study, for instance, despite posing a seemingly strong critic, used a measurement that captured 'governance' and not 'public administration structures', making their reverse causality argument misguided for the Weberian model.[5] In addition, both Kurtz and Schrank (2007) and Lee & Ki (2017) might have had their results affected by the tendency of economic growth to grow at a slower pace for advanced economies – something actually noted by Kurtz & Schrank (2007). Furthermore, critics like Haenisch (2012) did not clearly define bureaucracy and did not study other principles of the Weberian bureaucracy model, such as bureaucratic professionalism.[6] Examining Weberian bureaucracy in a unidimensional way and generally applying the findings, seems problematic if the concept is not accurately captured. Also, Haenisch (2012) did not capture actual changes in worker productivity.[7]

[4] Many studies exist on TFP but with Weber's ideas on religion or migration, not bureaucratic structures. See for instance Cavalcanti et al (2007), Khan & Bashar (2008), and Nathan (2014). Studies on AP were scarcely found.

[5] See Kurtz & Shrank (2007), page 541.

[6] See Haenisch (2012), pages 2, 4 and 5.

[7] See Haenisch (2012), pages 1 and 3. Bureaucrats were asked what *'they felt'* would improve productivity.

2.4 RESEARCH GAP AND CONTRIBUTION

It is evident that for those that have used economic growth determinants in order to empirically test the relevance of Weberianess for an economy, few have focused on determinants that encompass both the public and private sectors, not only private sector performance. Empirical studies on Weberianess and economic growth determinants encapsulating *'both'* the public and private sector productivities remains scarce. Weber's scholarly thoughts were directed at enhancing public sector productivity, which would then impact private sector productivity. Put simply, Weberianess was to enhance *'both'* public and private sector productivities, due to what Jordaan (2013) and Kousky & Kunreuther (2017) observed as the inevitable interconnected roles of the public and private sectors. This is how Weber saw bureaucracies as assuring public sector rationality (objectivity and efficiency) and being relevant for economic activity. Therefore, a research gap lies in examining Weberianess against several *'productivity indicative'* economic growth determinants, capturing both private and public sector productivities, at cross country level. To test if the assumptions under the Weberian bureaucracy argument hold today, the Weberian model should be explored against various productivity measures that also *'directly capture'* public sector productivity. Two questions can be further explored: Is Weberianess relevant for several macroeconomic productivity measures that *directly capture* 'both' public and private sector productivities? If yes, which Weberian principles are the most relevant?

This research contributes to macroeconomics and public administration literatures by attempting to verify the 'relevance' of Weberianess today, for macroeconomic productivity. This study tried to explore the importance of Weberian principles today using *'productivity indicative'* macroeconomic concepts of Total Factor Productivity (TFP) and Average Productivity (AP), which capture both public and private sector productivity. On one end, TFP and AP directly capture labour productivity, which is what Weberianess was to enhance in bureaucracies. On the other end, TFP and AP are both economic growth determinants (Burda & Wyplosz, 2013) and thus offer a more direct causal relationship study than looking at Weberianess against economic growth figures, for instance. Macroeconomic productivity contributes to sustainable economic growth (Ibid). Given this, studying what links with macroeconomic productivity is vital for national policy making. Literature on the empirical link between measures like TFP and AP with Weberianess in bureaucracies remains scarce. Those who have examined the link of such measures with Weberianess have focused on specific countries, than on cross country data. Therefore, this study also offered a shift of focus to the under-explored link of productivity measures like TFP with bureaucratic organisational structures, at cross country level.

2.5 A SUMMARY OF THE LITERATURE REVIEW

Emanating from Weber's writings, the organisational theory of bureaucracy advocates that institutions of public administration were to be well standardised and formalised in their work procedures in order for them to have improved productivity. This enhances overall public-sector productivity and also creates a conducive environment for the private sector to thrive. This further enhances macroeconomic productivity, which makes economic growth sustainable in the long-run. This fits the Weberian model into the general endogenous economic growth models. Despite Weber's model receiving a lot of positivity, it has not gone without criticism, mainly due to diverging empirical findings at both macroeconomic and microeconomic levels. However, scholars like Walton (2005) observed that 50% of the differences noticed in empirical findings have been due to statistical shortcomings. This is evidently seen in studies like that of Kurtz & Schrank (2007) where statistical measurements that did not accurately capture Weberianess were used to suggest reverse causality of Weberianess and growth. Literature on AP and TFP against Weberianess at macro economic level remains scarce. Yet, following microeconomic (organisational) level studies like that of Haenisch (2012) who suggested that bureaucracy be discarded if AP was to improve, there has been a mushrooming of hybrid state institutions having Weberian ideals side-by-side with ideals of being more responsive. However, other organisational level studies that measured 'actual' public sector productivity, like Da Cruz & Marques (2011), found that municipal institutions closely resembling the Weberian model had higher TFP than hybrid municipal institutions. Whether such correlations hold at cross country level for TFP and/or AP has remained unexplored. This is the research gap that this study explored.

CHAPTER 3

In this chapter is the research question, hypotheses and the operationalisation of concepts and measurement. The operationalisation of concepts and measurement section highlights the empirical setting, the different variables used and their data sources, the rationale behind the selection of analytical methods and the regression model used for this study.

3.1 RESEARCH QUESTION

'To what extent is macroeconomic productivity empirically linked to Weberian public administration structures today?'

3.2 HYPOTHESES

This study focused on bureaucratic closedness and bureaucratic professionalism, and macroeconomic TFP and AP. For the hypotheses, considering the literature review, it was assumed that:

1. As per the Weberian model, bureaucracies with Weberian principles are more productive.
2. Improved public sector productivity in turn improves private sector productivity, and this equates to improvements in overall macroeconomic productivity.

It therefore follows that:

Null Hypothesis (H_0): $\widehat{\beta}_1 = 0$ …..... *Eqn (1)*

That is, no relationship exists *(between how bureaucracies are structured with TFP and/or AP).*

Alternative Hypothesis (H_A): $\widehat{\beta}_1 \neq 0$ …..... *Eqn (2)*

That is, a relationship exists (*between how bureaucracies are structured with TFP and/or AP)*.

Following that two different dependent variables (DVs) will be explored against two independent variables (IVs), there are four specific hypotheses to be tested if H_A holds:

H_1: The greater the bureaucratic closedness, the greater a country's TFP, ceteris paribus.

H_2: The greater the bureaucratic professionalism, the greater a country's TFP, ceteris paribus.

H_3: The greater the bureaucratic closedness, the greater the AP, ceteris paribus.

H_4: The greater the bureaucratic professionalism, the greater the AP, ceteris paribus.

The four hypotheses can be graphically summarised as:

Table 1: Expected Correlation Sign of the Relationship Between DVs and IVs

Variables	Expected Correlation Sign
TFP **&** bureaucratic closedness	+
TFP **&** bureaucratic professionalism	+
AP **&** bureaucratic closedness	+
AP **&** bureaucratic professionalism	+

3.3 OPERATIONALISATION OF CONCEPTS & MEASUREMENT

3.3.1 Empirical Setting

This deductive research used the Large-N statistical analysis method. The scope of this study was not limited to any specific type of country. The samples used included all countries with available data, regardless of their level of income/ economic development. As Dahlström, Lapuente & Teorell (2010) put it, Evans & Rauch only had 35 'developing' countries in their sample but it would be interesting to examine if their findings also held for bureaucracies of advanced economies. The unit of analysis for this paper was, therefore, 'countries'. Cross-sectional data analysis was used because time series data analysis was not feasible, as the two main independent variable indices were available only as cross-sectional data.[8] Thus, the Ordinary Least Squares (OLS) regression analysis method was employed. OLS regression analysis appeared as the best available option since it is one of the widely used methods of analysing linear regression models, according to Stock & Watson (2012: 149 & 156).

3.3.2 Data

Several datasets were used, namely: the 2018 QoG Standard dataset, the QoG Expert Survey II dataset, and the World Bank (WB) dataset on GDP per person employed 1990-2017. The QoG Standard dataset was used because it is a compilation of reliable data sources. The dataset is also an award-winning dataset comprising many variables with large Ns (Quality of Government Institute, 2018). In addition, the widely used QoG dataset had measurements for most of the variables needed for this paper, for the period under observation -the year 2014. WB datasets are renowned datasets that have been used across a range of studies and have some of their measurements incorporated in the QoG Standard dataset. To capture data on AP, the QoG Standard dataset had to be used side-by-side with the WB dataset. The QoG Expert Survey II dataset was used in a bid to increase the N for bureaucratic closedness.

[8] The latest data on bureaucratic structure was the cross-sectional QoG Expert Survey II dataset for the year 2014 and it was wave 5 of the QoG Expert Survey. Individual level data was also available, but it was not used in this research.

3.3.3 Dependent Variables

Since this study focused on macroeconomic level productivity, the two dependent variables (DVs) used were TFP at current purchasing power parity -PPP (USA=1) and GDP per person employed (representing AP), for the year 2014. Two DVs were used in order to repeat the macroeconomic productivity measurement using a different variable and check the stability of the results. The first DV, *TFP at current PPP (USA=1)*, was originally from the Penn World Trade (PWT) dataset by Feenstra et al (2015) and was sourced from the 2018 QoG Standard dataset (Teorell et al , 2018: 494 & 489). According to PWT (2018), this variable indicated a country's level of TFP at constant PPP that was relative to USA prices in that period. Higher values of this variable indicated higher TFP.[9] TFP is a hard concept to measure (Danquah, Moral-Benito & Ouattara, 2011) because it reflects joint effects of both micro and macro level factors -including economies of scale, better technology, research and development, production organisational changes and managerial skills (Khan, 2006).[10] However, looking at current data sources, this variable provided reliable estimates of TPF at cross-country level.

The second DV, *GDP per person employed*, was from the World Bank (WB) ILOSTAT database (The World Bank Group, 2018). It captured GDP divided by the total employment for an economy, and thus represented labour productivity (Ibid). It indicated the level of output for every worker (OECD, 2018b; The World Bank Group, 2018) . Higher values of this variable indicated higher GDP per person employed. Currently, a measurement that best estimates AP at cross country level, having a large N, remains as GDP per person employed.[11] [12] However, the methodology for capturing the GDP per person employed sometimes differs among countries, due to things such as differences in the definitions of what makes up the informal sector (Ibid).

3.3.4 Main Independent Variables

The main independent variables were the Closedness Index and the Professionalism Index, for the year 2014.[13] Their original source was the Dahlström et al (2015) QoG data. The first index, *the Closedness*

[9] Information on this variable's exact scale was not available.

[10] Weberian principles fit into the components of 'production organisational changes' and 'managerial skills'.

[11] Other measures such as GDP per hour exist, but the N was very low. However, the variable was still tested as a DV.

[12] GDP per capita can also be referred to as AP. However, GDP per capita does not exactly capture how productive each worker is. GDP per capita only shows how productive one economy is, overall, as compared to another economy, while factoring in the population size. It captures the income of *'each person'* in an economy. Increases in annual GDP per capita can be influenced by an increase in the annual population death rate (Brenner, 2005), even if the overall GDP and available labour force have remained relatively the same, causing no change in labour productivity (AP) levels.

[13] A third measure, 'bureaucratic impartiality', which measured how impartial bureaucratic institutions were, was left out because it may be highly correlated with bureaucratic professionalism, according to Suzuki & Demircioglu (2017: 11). I also found that the two variables almost reached the threshold for highly correlated variables (see Appendix 7).

Index, measured the extent to which public administrations were closed or public-like, as compared to being open or private-like (Holmberg & Rothstein, 2012:62; Dahlberg et al, 2017). The specific components of this index were three, namely: 1) Formal examination system; 2) Lifelong careers; and 3) 'Special employment laws' for public administration operations that were not applicable in the private sector (Dahlström, Lapuente & Teorell, 2010). The index ran on a scale of 1 to 7, were 1 represented a perfectly open system and 7 represented a perfectly closed system (Ibid). Higher values of the index meant that a public administration was more closed (Dahlberg et al, 2017). Unfortunately, out of the original sample of 47 countries, no African country was part of the index, making it tricky to make generalisations to certain regions like Sub-Saharan Africa. The index also had only one South American nation (Guyana) and only three Asian countries (Kazakhstan, Kyrgyzstan and Tajikistan). To increase the N, the different components of this Index were explored using the QoG Expert Survey II dataset. For this research, the questions that represented these components were shortened as q2_d (Formal examination), q2_j (Long term careers), and q4_f (Special law for terms of employment).[14]

The second index, *the Professionalism Index,* measured the extent to which public administrations were professional, as compared to being politicised (Holmberg & Rothstein, 2012:62). The specific components of this index were four: 1) Meritocratic recruitment; 2) Existence of political recruitments; 3) Whether political elites recruited senior officials; and 4) Whether senior officials were internally recruited (Dahlström, Lapuente & Teorell, 2010).[15] The index ran on a scale of 1 to 7, were 1 represented a completely unprofessionalised system and 7 represented a perfectly professionalised system (Ibid). Higher values of the index meant that a public administration was more professionalised (Dahlberg et al, 2017). This index had a larger sample size as compared to the Closedness Index, with its original N being 112 countries, spread across all continents.

According to Dahlström, Lapuente & Teorell (2010), these measures of the dimensions of bureaucracy are the largest cross-national measurements on public administration structures.[16] The indices were maintained as separate variables. As shown in Figure 2, countries like Ireland had high closedness at 5.55 and high professionalism at 6.16, when a country like Greece, while having a similarly high level

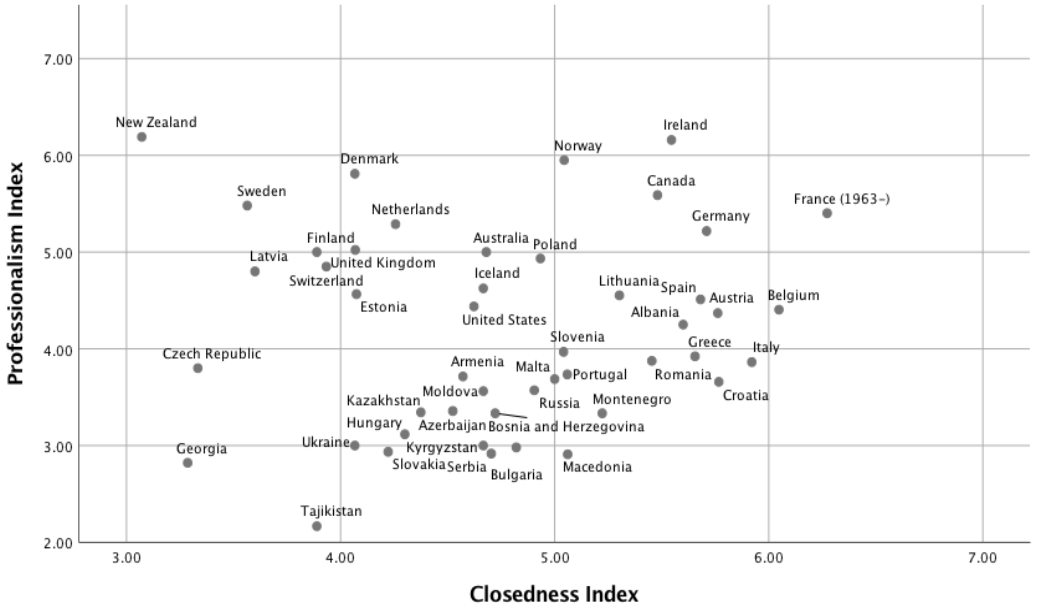
[14] See Dahlström et al (2015) pages 9-10, for more details on how each question was phrased.

[15] According to Dahlström, Lapuente & Teorell (2010), the Closedness and Professionalism Indices together measure the original Evans & Rauch (1999) Weberianess Scale well. However, the two indices do not address the part of *'rewards',* which appears as a significant component in the original Evans & Rauch 1999 Weberianess Scale.

[16] Other measurements of the quality/ efficiency of bureaucratic structures exist, such as the CPIA quality of public administration ratings. These measurements, however, could not concretely answer the research question posed in this paper. A country rating does not *specify* which bureaucratic dimension *matters the most/ least* for economic outcomes.

of closedness at 5.66, had a much lower level of professionalism at 3.92 (i.e. Greece was more politicised). Also, New Zealand had high professionalism at 6.19 but low closedness at 3.07 (i.e. was more open) as compared to Ireland which was more closed, despite having a similarly high level of professionalism. This was consistent with the observations made by Dahlström, Lapuente & Teorell (2010), suggesting that the two dimensions are distinctively independent Weberian characteristics (Ibid). The multidimensional nature of Weberian bureaucracy could even be superior to looking at Weberian principles from a unidimensional perspective (Reimann, 1973).

Figure 2: The Professionalism Index by the Closedness Index – 2014



Data Source: *2018 QoG Standard Dataset.*
N= 46 countries (Guyana, the 47th country in the Closedness Index is excluded).

3.3.5 Control Variables

The control variables (CVs) that were used for AP were two, namely: 1) The Human Capital Index (HCI); and 2) The Heterogeneity Index. For TFP, in studies like that of Danquah, Moral-Benito & Ouattara (2011:21-22), after looking at datasets for 67 countries from 1960 to 2000, the factors that empirically proved to be the most robust in determining TFP were initial GDP levels, the share of consumption, trade openness and unobserved heterogeneity. Therefore, for TFP, four CVs were used, namely: 1) Real GDP; 2) General Government Final Consumption Expenditure; 3) Trade freedom; and 4) The Heterogeneity Index. AP and TFP are different concepts that could not have the exact same CVs.

For the first CV for TFP, the variable that was used was the PWT 2014 ***Real GDP at constant 2011 national prices*** (in millions of 2011 US dollar) from the 2018 QoG Standard dataset (Teorell et al, 2018: 492-493).[17] Higher values were associated with higher Real GDP levels. According to Danquah, Moral-Benito & Ouattara (2011), lower initial GDP is associated with higher productivity levels. Therefore, for this research, hypothetically, the lower the Real GDP, the higher the TFP.

The second CV for TFP, ***General Government Final Consumption Expenditure***, was also from the QoG Standard dataset (Teorell et al, 2018: 605). The original data source was the UN 2017 Statistics (Opcit: 602). Higher values of this variable were associated with higher levels of General Government Final Consumption Expenditure. Government Consumption is a significant policy variable that negatively affects TFP due to reliance on government spending (Boldrin et al, 2004:113). An economy experiences increased consumption expenditure instead of increased investments. For this research, hypothetically, the higher the General Government Final Consumption Expenditure, the lower the TFP.

For the third CV for TFP, no variable directly measured trade openness in the QoG dataset, so the ***Trade Freedom*** variable was used instead, as the two are closely related concepts.[18] Trade openness/ freedom accelerates productivity (Keho & Wang, 2017) as it promotes competition for domestic producers and encourages innovation, while integrating an economy into the global market (Zidouemba & Elitcha, 2018: 467). Therefore, hypothetically, the higher the trade freedom, the higher the TFP. The trade freedom variable used in this paper was also from the 2018 QoG Standard dataset (Teorell et al, 2018: 349). Its original dataset was the Heritage Foundation 2017 dataset (Ibid: 345). It ranged from 0 to 100 – where 0 denoted the minimum degree of trade freedom and 100 denoted the maximum. The trade freedom variable was based on the two inputs of Non-tariff barriers and a country's trade-weighted average tariff rate (Op cit: 349).

For the fourth CV for TFP, a ***Heterogeneity Index*** was created. Including variables that capture things like language variations in a statistical model makes the model sufficient in accounting for unobserved heterogeneity – i.e. unobserved institutional and cultural effects (Fisher, 2010: 1). To capture all the areas of a country's heterogeneity, the index was created using the three measures of heterogeneity in the 2018 QoG Standard dataset, with the original dataset being Alesina et al (2003) (Teorell et al, 2018:

[17] To better represent 'initial' GDP, 2013 Real GDP could not be sourced as cross sectional data. Real GDP was picked over GDP per capita measures as the latter showed high correlation with the DVs and this distorts regression results.

[18] Other sources like the World Bank were checked but data on trade openness could not be found during the time of this research. Data from the Federal Reserve Bank Penn World Table 7.1 had openness to trade in time series format.

68). The three measures were: ethnic fractionalisation, religious fractionalisation and language fractionalisation (Ibid). All variables ran on a scale of 0 to 1, where 1 indicated the maximum degree of fractionalisation (Opcit). While language fractionalisation and religious fractionalisation captured only language and race, respectively, ethnic fractionalisation was a combination of both race and language, in order to capture people who spoke different languages but were of the same race (Teorell et al, 2018: 68). Further details on this index can be found under Appendix 5. It ran on a scale of 0 to 1 and higher values were associated with higher heterogeneity. For this research, hypothetically, the higher the Heterogeneity Index, the lower the TFP. High heterogeneity is usually associated with inducing inter-group conflict, especially in the case of public goods control (Spolaore & Wacziarg, 2017), and this can negatively impact productivity. ***The Heterogeneity Index was also used for AP.*** For this research, hypothetically, the higher the Heterogeneity Index, the lower the AP.

The second CV for AP, the ***Human Capital Index (HCI)***, was from the Penn World Trade (PWT) dataset by Feenstra et al (2015) and was sourced from the 2018 QoG Standard dataset (Teorell et al, 2018: 490). Higher values of the HCI meant that a country had higher levels of human capital.[19] Hypothetically, higher HCI figures were to be associated with higher AP values. Human capital is a set of skills that have the tendency of increasing a worker's productivity (Acemoglu, 2009), which increases overall productivity (Goldin, 2014), making workers valuable assets (Dae-Bong, 2009).[20] The HCI was used because it captured both years spent schooling and returns to that education (PWT, nd: 1). The HCI better captures the concept of human capital accumulation.

A summary of descriptive statistics for all the variables used in the main models and test models for the three components of bureaucratic closedness is presented under Appendix 4.

3.3.6 Test Variable

For TFP, a different measure of Consumption Expenditure - ***GDP Final Consumption Expenditure***- was tested as a CV. GDP Final Consumption Expenditure was also from the 2018 QoG Standard dataset and its original data source was the UN 2017 Statistics (Opcit: Teorell et al, 2018: 603). Higher values of this variable were associated with higher levels of GDP Final Consumption Expenditure. For this research, hypothetically, the higher the GDP Final Consumption Expenditure, the lower the TFP.[21]

[19] Information on the exact scale range was missing from both the 2018 QoG Standard dataset and original dataset website.
[20] See also Doepke (1999) or Solow (1956).
[21] *General Government Final Consumption Expenditure* was picked over this variable as it seemed to represent the share of consumption that would have the most impact on my models, given that the main IVs were related to state structures.

3.3.7 OLS Regression Model

Following the preceding discussion on the variables used for this research, assuming the expected value of the error term is 0, the bivariate and multivariate regression for the sample explored was therefore:

$$\hat{y} = \widehat{\beta}_0 + \widehat{\beta}_1 x_1 \quad \text{..... Eqn 3 (a)}$$

$$\hat{y} = \widehat{\beta}_0 + \widehat{\beta}_1 x_1 + \widehat{\beta}_2 z_1 + \widehat{\beta}_3 z_2 + \widehat{\beta}_4 z_3 \quad \text{..... Eqn 3 (b)}$$

Where:

I. *Eqn 1 (a)* is the bivariate regression model and *Eqn 1 (b)* is the multivariate regression model.

II. $\hat{y}$ represents the *'DV'*; the x variable represents the *'main IV'*; and the z variables are *'CVs'*, differentiated by the subscript value as different variables which can be increased or decreased depending on a specific model.

CHAPTER 4

This chapter presents the empirical results, discussion of the results and conclusion. The discussion also highlights how endogeneity was limited, the research limitations and potential areas for further research. The conclusion also includes a key policy recommendation, based on the research results.

4.1 RESULTS

4.1.1 Data Diagnostics

All data diagnostics are presented in Appendix 6. The assumptions of linearity between the two DVs and the two main IVs were fulfilled as shown in Figures 3 to 6.

Figure 3: TFP and The Professionalism Index

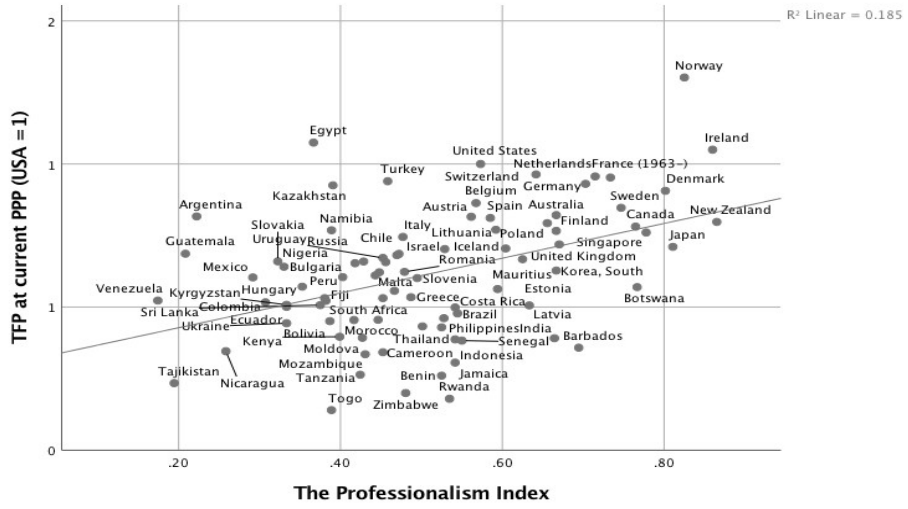


Figure 4: TFP and The Closedness Index

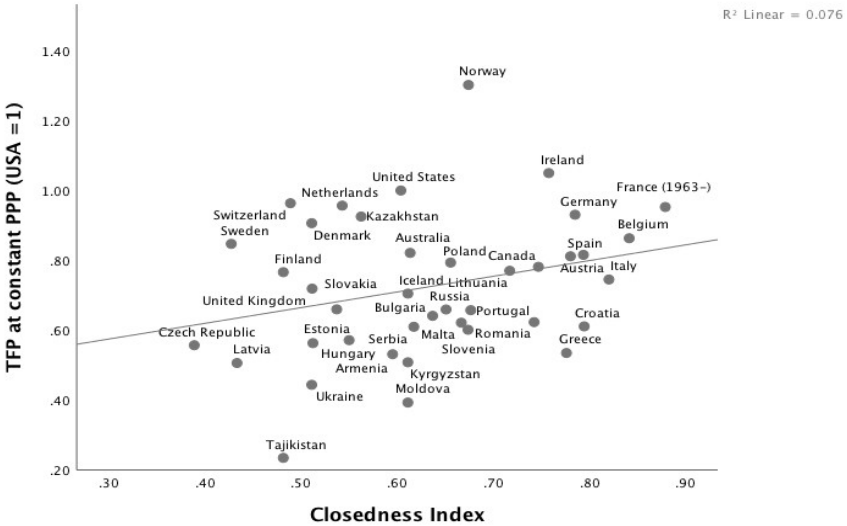
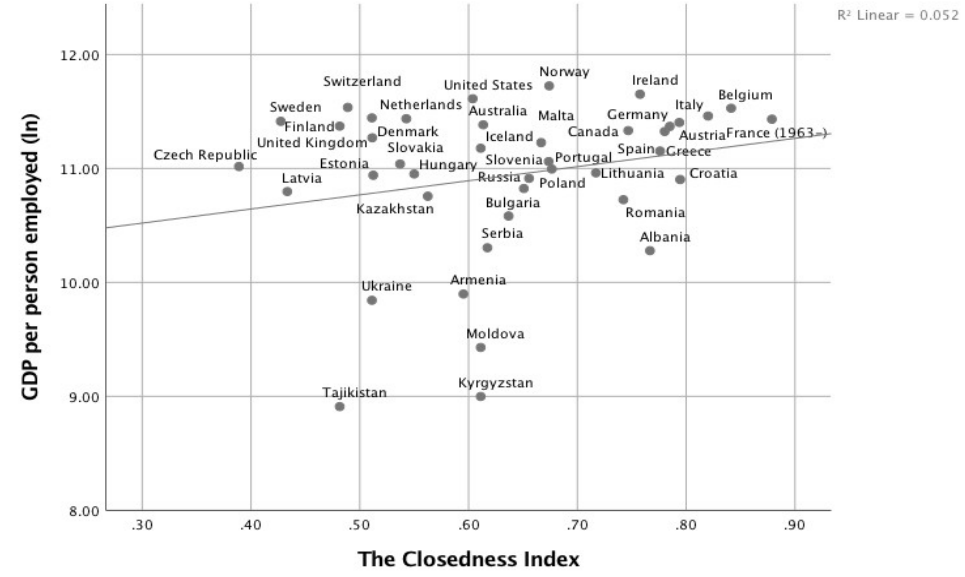


Figure 5: AP and The Professionalism Index

Figure 6: AP and The Closedness Index



The three components of the Closedness Index also showed linearity that suggested a positive relationship with both AP and TFP, except q2_j (Long term careers) which suggested linearity that had a negative relationship with AP and a less steep slope with TFP than other components. In addition, all variables used seemed to have a somewhat normal distribution curve, except GDP per person employed (AP) and Real GDP. GDP per person employed (AP) and Real GDP were therefore transformed into logarithms (logs) in order to give them a somewhat normal distribution curve. Both variables were

positive when being transformed, as required (Stock & Watson, 2012: 314), and what was used were their natural logarithms, which represented $x = \ln(e^x)$ with its base as e (Ibid: 308).

There also seemed to be no presence of extreme outliers which can increase Standard Errors (SEs) or exaggerate the coefficients. For all models, the Cook's Distances were between 0 and 1. The highest Cook's Distance being less than 1 indicated that those spots that were maximum Cook's distances were cases that were not so influential against the regression line (Nieuwenhuis et al, 2012). Further, homoskedasticity was checked because the presence of heteroskedasticity (an unequal scattering of a variable) compromises efficiency. Consequently, the values of the expected residuals were plotted against the actual residual values for the full models. The graphs suggested heteroskedasticity in all cases and so Robust SEs were done and the models re-ran. However, no changes were noticed in the full models. This suggested that the heteroskedasticty that was noticed was not influential.

For all other models, there seemed to be no/ little multicollinearity. All Variance Inflation Factor (VIF) values scored between 1 and 3, and as noted by O'Brien (2007), the rule of thumb that is used in many researches for the maximum acceptable value for the VIF is 10. The VIF statistics were between 1 and 3 even when all variables were made as the DV, as required in SPSS. What was reported, however, were the VIF statistics for the full models. Further, a look at the variable correlations did not indicate high multicollinearity because all the correlation scores were within acceptable ranges of less than 0.8. Furthermore, all variables showed normal errors, even when all variables were made as the DV. Normal errors for the DVs for the full models is presented in the data diagnostics Appendix 6.

For all models, a high cutting point for the p-values was employed. The minimum p-value was the statistically acceptable value of $p<.05$ for the null hypothesis to be rejected (Park & Allaby, 2017) and it was denoted with one asterisk, unlike in some other researches were such a p-value can be denoted by two asterisks.

4.1.2 Regression Analysis

The following results were according to the original bureaucratic closedness and professionalism indices in the 2018 QoG Standard dataset. Results according to the different components of bureaucratic closedness on both TFP and AP (measured as GDP Per Person Employed) are found in Appendix 2. Results according to the test CV on the TFP model are also found in Appendix 2.

Table 3: OLS Multivariate Regression of Bureaucratic Closedness and Professionalism on TFP[22]

DV: **TFP**	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Closedness Index	.450 (.254)	.231 (.225)	.217 (.209)	.210 (.210)	.164 (.225)	–	–	–	–	–
Professionalism Index	–	–	–	–	–	.598*** (.138)	.493*** (.131)	.282** (.116)	.248* (.119)	.277* (.116)
Real GDP (ln)	–	.063*** (.017)	.058*** (.015)	.057** (.016)	.060** (.016)	–	.044*** (.011)	.041*** (.009)	.042*** (.010)	.036*** (.009)
Trade Freedom	–	–	.016* (.006)	.015* (.006)	.015* (.007)	–	–	.012*** (.002)	.011*** (.002)	.010*** (.002)
General Government Final Consumption Expenditure	–	–	–	.005 (.007)	.004 (.008)	–	–	–	.005 (.004)	.002 (.004)
Heterogeneity Index	–	–	–	–	–.113 (.117)	–	–	–	–	–.201* (.093)
Constant	.440* (.164)	–.214 (.221)	–1.499* (.523)	–1.482** (.526)	–1.437* (.619)	.312*** (.074)	–.17 9 (.141)	–.983*** (.182)	–1.026*** (.186)	–.726*** (.217)
R^2	.07 6	.33 9	.44 8	.45 8	.46 5	.18 3	.31 4	.51 5	.52 3	.55 3
N	40	40	40	40	39	86	86	86	86	84

*p<.05 ** p<.01 ***p<.001. Standard errors within parentheses.

Data: Standard QoG dataset (2018), & The World Bank dataset on GDP per person employed 1990-2017

[22] Countries were split according to income level, using World Bank GNI per capita levels from the 2018 QoG Standard dataset, PPP at constant 2011 international dollars (Teorell et al, 2018: 644). High income and upper middle income countries were categorised as *'high income'* while lower middle income and low income were categorised as *'low income'*. See World Economic Situation and Prospects (2014: 144). For Closedness and TFP, the N for the low-income group was only 2 countries. For Professionalism on TFP, the N for the low-income group was only 12 countries. For the high income group, professionalism showed significance at p<.001 in its bivariate model (N=74) and p<.05 in the full model (N=73). For the high income group, closedness showed insignificance in its bivariate model (with N=38) and in the full model (with N=37). This is not reported because the Ns are close to the original models.

Table 4: OLS Multivariate Regression of Bureaucratic Closedness and Professionalism on AP[23]

DV: **GDP Per Person Employed (ln)**	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Closedness Index	1.240 (.844)	1.929* (.850)	1.443 (.800)	–	–	–
Professionalism Index	–	–	–	2.970*** (.617)	.987* (.454)	1.049* (.429)
HCI	–	3.719* (1.568)	4.578** (1.479)	–	4.724*** (.433)	3.922*** (.447)
Heterogeneity Index	–	–	–1.624** (.581)	–	–	–1.338*** (.327)
Constant	10.149*** (.546)	6.642*** (1.566)	6.789*** (1.444)	8.782*** (.350)	6.509*** (.300)	7.585*** (.026)
R^2	0.05 2	.17 5	.32 2	0.19 1	.63 7	.69 7
N	41	41	40	100	100	97

*p<.05 ** p<.01 ***p<.001. Standard errors within parentheses.

Data: Standard QoG dataset (2018), & The World Bank dataset on GDP per person employed 1990-2017

[23] **Notes:**

1. For Closedness and AP, the low-income group had only 2 countries. For Professionalism and AP, the low-income group had only 20 countries. However, when the sample size was made to have only the high income group, professionalism showed significance at p<.001 in its bivariate model (with N=80) and p<.01 in the full model (with N=78). Closedness remained insignificant in its bivariate model (N=39) and in the full model (N=38)
2. A different measure of AP - *GDP Per Hour Worked*- was tested as DV. Bureaucratic closedness remained insignificant while professionalism was significant at p<.001 in both its bivariate and full model. The models, however, had N= 29 and thus showed high SEs. GDP Per Hour Worked was in USD (at constant 2010 prices and PPPs) and was an index (OECD, 2018a). The variable had an original N of 39 and was from the 2018 QoG Standard dataset. Its original source was the OECD 2017 dataset (Teorell et al, 2018: 468 & 453).
3. Initial AP was tested on both bureaucratic closedness and bureaucratic professionalism, using 2013 GDP per person employed from the WB dataset. However, there was high multi-collinearity between this variable and the main DV, with variable correlation statistics being at 1. The initial AP variable was seen to have reversed the signs for both the HCI and Heterogeneity Index and made both variables insignificant. According to Park & Allaby (2017), this happens when there is high multicollinearity. However, the Closedness Index remained insignificant while the Professionalism Index remained significant at p<.05.

4.2 DISCUSSION

4.2.1 Interpretation of Results

4.2.1.1 TFP with Bureaucratic Closedness And Bureaucratic Professionalism

Under Table 3, for TFP and bureaucratic closedness, with a sample size of N= 40, bureaucratic closedness was insignificant in models 1 to 4. With N= 39, after controlling for heterogeneity, the Closedness Index still remained insignificant in the full model 5. There was a reduction in the value of the constant from the bivariate regression at .440 to -1.437 in the full model when CVs were added. In all models, the R^2 was greater than zero ($R^2 > 0$) and increased when more variables were added to the analysis. This is noticed with the move from 0.076 in model 1 to 0.465 in model 5, even if model 5 had an N that was less by one country. Model 5 variables explained 46.5% (i.e. 0.465 *100) of the expected variance in the change in TFP. For TFP and closedness, the N for the low-income group was only 2 countries, making between group analytical comparisons impossible. H_1 *(The greater the bureaucratic closedness, the greater a country's TFP, ceteris paribus*) had no empirical support.

For TFP and bureaucratic professionalism, with N= 86, bureaucratic professionalism was significant in models 6 to 9. The Professionalism Index was significant at a 99.9% level of confidence $p<.0001$ in its bivariate model 6. In the bivariate model 6, the 0.598 value of the estimated coefficient of the Professionalism variable suggested that a one unit increase (or decrease) in bureaucratic professionalism would result in a 0.598 increase (or decrease) in the TFP at constant PPP (USA=1) holding all other variables in the model constant. Higher values in bureaucratic professionalism corresponded to higher values in TFP, and lower values in bureaucratic professionalism corresponded to lower values in TFP. In all five models (models 6 to 10), the R^2 was greater than zero ($R^2 > 0$) and increased when more variables were added to the analysis. In model 6, bureaucratic professionalism explained 18.3% (i.e. 0.183 *100) of the expected variance in the unit change of TFP. In the full model 10, factoring in all the CVs, the R^2 increased to 0.553, suggesting that the variables now accounted for 55.3% of the variation in the unit change of TFP at constant PPP (USA=1). There was a reduction in the value of the constant from the bivariate model at 0.312 to -0.726 in the full model 10 as more variables were added to the analysis.

Replacing the OLS regression model with the actual values in the full model 10, *Eqn 3 (b)* will then be:

$$TFP = -0.726 + 0.277\,Prof + 0.036\,RealGDP(\ln) + 0.010\,TF + 0.002\,CE - 0.201\,HI \quad \text{....Eqn 4}$$

Where; *Prof* represents The Professionalism Index, *TF* represents the Trade Freedom variable, *CE* represents the Consumption Expenditure variable, and *HI* represents the Heterogeneity Index.

In the full model 10, with N= 84, 0.726 is the value of TFP at constant PPP (USA=1), when all other model variables are equal to 0. The 0.277 value of the estimated coefficient of the professionalism variable suggested that a one unit increase in bureaucratic professionalism would result in a 0.277 unit increase in TFP, at constant PPP (USA=1), holding all other variables in the model constant. Higher values of the professionalism variable were associated with higher values of TFP. This result was in line with H_2 *(The greater the bureaucratic professionalism, the greater a country's TFP, ceteris paribus*). The null hypothesis that no relationship exists between bureaucratic professionalism and TFP (H_0) was rejected, looking at the 95% level of confidence ($p<.05$) recorded for the Professionalism Index in the full model. The alternative hypothesis (H_A) was therefore accepted.

For the CVs, a one percent change in Real GDP would result in a 0.00036 change in TFP at constant PPP (USA=1), holding all other variables in the model constant. That is, using the formula $\widehat{\beta}_1 * \ln(1.01/100)$, which Stock & Watson (2012: 314) simply put as representing a $0.01\widehat{\beta}_1$ change. Higher values of the % change in the Real GDP variable were associated with higher values of a unit change in TFP at constant PPP (USA=1), in contrast to what was expected. For the same model, a one unit increase in Trade Freedom would result in a 0.010 unit increase in TFP, holding all other variables in the model constant. Higher values of the Trade Freedom variable were associated with higher values of TFP. Further, a one unit increase in the Heterogeneity Index would result in a 0.201 decrease in TFP, holding all other variables in the model constant. Higher values of the the Heterogeneity Index variable were associated with lower values of TFP, as expected. In the same manner, lower values of the the Heterogeneity Index variable were associated with higher values of TFP.

For both the Closedness Index and Professionalism Index, the N for the low-income countries proved to be too small in all cases to facilitate the capturing of between-group differences. For TFP and closedness, the N for the low-income group was only 2 countries, making between group analytical comparisons impossible. For TFP and professionalism, the N for the low-income group was only 12 countries, hindering between-group analytical comparisons. The N was too low to facilitate the minimum widely acceptable sample size of N=30. However, professionalism maintained its significance with TFP in the high income group for both its bivariate (N=74) and full model (N=73).

4.2.1.2 AP with Bureaucratic Closedness And Bureaucratic Professionalism

Under Table 4, for AP and bureaucratic closedness, with a sample size of N= 41, bureaucratic closedness was insignificant in its bivariate model 11 but seemed to be significant with the probability of the null hypothesis being true at 5% ($p<.05$) for model 12. In model 12, the 1.929 value of the estimated coefficient of the Closedness Index suggested that a one unit change in bureaucratic closedness would result in approximately 192.9% change in the GDP per person employed (AP), holding other variables constant. That is, using the formula $(e^{\widehat{\beta}_1}-1)*100$, which Stock & Watson (2012: 314) simply put as representing a $100\widehat{\beta}_1$ % change. However, when the Heterogeneity Index was added and the N dropped to 40, the Closedness Index again showed insignificance. The HCI had a positive correlation at a 95% level of confidence ($p<.05$) and the Heterogeneity Index had a negative correlation at a 99% level of confidence ($p<.01$). In all three models, the R^2 was greater than zero ($R^2 > 0$) and increased when more variables were added to the analysis. In model 13, the variables explained 32.2% of the variance in the percentage change in AP. There was a reduction in the value of the constant from model 11 at 10.149 to 6.789 in model 13 as more variables were added to the analysis. However, H_3 *(The greater the bureaucratic closedness, the greater a country's AP, ceteris paribus*) found no empirical support.

For AP and bureaucratic professionalism, with N= 100, the Professionalism Index remained positively correlated in all models (i.e. model 14 to 16). In the bivariate model 14, a one unit increase in bureaucratic professionalism would result in approximately 297% change in the GDP per person employed, holding all other variables in the model constant. The Professionalism Index seemed to be significant at a 99.9% level of confidence ($p<.0001$). In model 15, when controlled for HCI, the Professionalism Index maintained its significance but at a lower confidence level of 95% ($p<.05$). For the full model 16, when all CVs were added and the N dropped to 97, the Professionalism Index maintained its significance at a 95% level of confidence ($p<.05$). There was a reduction in the value of the constant from model 14 at 8.782 to 7.585 in the full model 16 when all CVs were added. In all three models, the R^2 was greater than zero ($R^2 > 0$) and increased when more variables were added. In model 14, bureaucratic professionalism explained 19.1% of the expected variance in the % change in GDP per person employed (AP). In the full model 16, the model variables explained 69.7% of the expected variance in the % change in GDP per person employed (AP).

Replacing the OLS regression model with the actual values in model 16, *Eqn 3 (b)* will then be:

$$AP(\ln) = 7.585 + 1.049\,Professionalism + 3.922\,HCI - 1.338\,Heterogeneity\ Index \quad .....Eqn\ 5$$

In the full model 16, the value of 7.585 is the percentage value of GDP per person employed (AP), when all other model variables are equal to 0. The 1.049 value of the estimated coefficient of the professionalism variable suggested that a one unit increase in bureaucratic professionalism would result in approximately 104.9% increase in the GDP per person employed (AP), holding all other variables in the model constant. Higher values of the professionalism variable were associated with higher values of the % change in AP. This result was in line with H_4 *(the greater the bureaucratic professionalism, the greater the AP, ceteris paribus*). The null hypothesis that no relationship exists between bureaucratic professionalism and AP (H_0) was rejected, looking at the 95% level of confidence ($p<.05$) recorded for the Professionalism Index in the full model 16. The alternative hypothesis that a relationship exists between bureaucratic professionalism and AP (H_A) was therefore accepted.

For the CVs, in the full model, the HCI maintained a positive correlation at a 99.9% level of confidence ($p<.001$) and the Heterogeneity Index had a negative correlation which was also at a 99.9% level of confidence ($p<.001$). A unit increase in the HCI would result in a 1.049 percentage increase in the GDP per person employed (AP), holding all other variables in the model constant. Higher values of the HCI variable were associated with higher values of the percentage change in GDP per person employed (AP). For the same model, a unit increase in the Heterogeneity Index would result in a 3.922 percentage decrease in the GDP per person employed (AP), holding all other variables in the model constant. Higher values of the Heterogeneity Index variable were associated with lower values of the percentage change in GDP per person employed (AP), as expected. In the same manner, lower values of the the Heterogeneity Index variable were associated with higher values of the percentage change in GDP per person employed (AP).

The N for the low-income countries proved to be too small in all cases to facilitate the capturing of between-group differences. For AP and closedness, the N for the low-income group was only 2 countries. For AP and professionalism, the N for the low-income group was only 20 countries. However, professionalism maintained its significance with AP in the high income group for both its bivariate (with N=80) and full model (with N=78).

4.2.1.3 Model Robustness Checks

Firstly, as mentioned, Robust SEs were ran for all full models and none of the results changed. Secondly, to check if bureaucratic closedness would show different results when analysed in a way that increased its N, regression analysis for its three different components was done. More specifically, regressions were ran for q2_d (Formal examination), q2_j (Long term careers) and q4_f (Special law for terms of employment). These regression results are shown under Appendix 2 as models 17 to 22. However, even when the N reached as high as 101, 114 and 116, each of the closedness components remained insignificant in their bivariate models, and there was no need to add any CVs to the models. Thirdly, when another measure of consumption expenditure (GDP Final Consumption Expenditure) was tested on the TFP model, closedness remained insignificant while professionalism remained significant at $p<.05$. For bureaucratic professionalism, the test variable was insignificant, but for bureaucratic closedness, the test variable was significant at $p<.01$ and showed a negative correlation, as expected. The full models had Robust SEs done but no change was noticed. This test model is also presented under Appendix 2, models 23 to 26. Fourthly, when only high income countries were examined, professionalism remained significant and closedness remained insignificant.

4.2.1.4 A Summary of All Regression Results

The Professionalism Index was significant for both AP and TFP, and it maintained its significance even when CVs where added to the different models one CV at a time. The Professionalism Index was significant at a 95% level of confidence ($p<.05$) for both TFP and AP in their full models. A more professional bureaucracy was positively correlated with both AP and TFP. The Closedness Index, however, showed statistical insignificance for both AP and TFP, except in only one model. Bureaucratic closedness, however, also showed statistical insignificance even when it was looked at from its three different components of q2_d (Formal examination), q2_j (Long term careers), and q4_f (Special law for terms of employment). In addition, when a different measure of consumption expenditure was tested on the TFP models, bureaucratic closedness remained insignificant while professionalism remained significant. Overall, H_1 and H_3 did not receive empirical support, but H_2 and H_4 found empirical support. Unfortunately, the N for the low-income countries proved to be too small in all cases to properly facilitate the capturing of between-group differences.

The empirical results for the four main hypotheses earlier discussed, can be graphically summarised as shown in Table 5.

Table 5: Expected Vs Actual Correlation Sign of the Relationship Between DVs and IVs

Variables	Expected Correlation Sign	Actual Correlation Sign
TFP **&** bureaucratic closedness	+	0
TFP **&** bureaucratic professionalism	+	+
AP (GDP per person employed) **&** bureaucratic closedness	+	0
AP (GDP per person employed) **&** bureaucratic professionalism	+	+

4.2.1.5 Possible Implications of Regression Results

Results in this study suggest the relevance of Weberianess today, in contrast to studies like that of Lee & Ki (2017). In accordance with other earlier studies like that of Dahlström, Lapuente & Teorell (2011), these results indicate that some Weberian principles are more relevant for economic activity than others. Regression results in this paper suggest that bureaucratic closedness might not be relevant for macroeconomic productivity. However, bureaucratic professionalism seems to be relevant for macroeconomic productivity. As per the literature review, bureaucracies with organisational structures that practice high professionalism seem to have more productive economies. Bureaucratic professionalism makes a conducive environment for efficient and effective communication, work coordination, and policy planning and implementation.

This study's findings suggest that governments should cut out political recruitments in bureaucratic structures, especially in senior positions, so that macroeconomic productivity is enhanced. Senior officials should be internally recruited as opposed to being politically appointed. This probably acts as motivation for the junior professional bureaucrats to be more productive in order to get noticed and promoted. Furthermore, appointing a senior official from among the professionals means that the new senior official is already well vested with the right organisational knowledge and they focus on achieving long-term goals. This could imply less time for work orientation in the new role. Switching from having highly politicised bureaucratic structures to highly professional bureaucratic structures might be more beneficial for politicians than what they may assume. Bureaucratic professionalism seems to be key in improving labour productivity, which in turn improves the output and quality of goods and services in an economy. The latter is what citizens judge a politician's performance by before casting their vote.

4.2.1.6 Dealing With Endogeneity

What makes parameter estimates uninterpretable is endogeneity, i.e. omitted variables, multicollinearity, reverse causality, omitted selection or when the error term and explanatory variable correlate (Antonakis et al, 2014). For this study, diagnostics were done and necessary adjustments made. Specifically, an omitted variable bias (OVB) makes regression coefficients inconsistent (Stock & Watson, 2007), resulting in an over or underestimating of one or more of the other model variable effects. To try and address OVB, several CVs were employed, and the variables were added to the analysis model one at a time to track changes in the effect sizes (R^2). There will always be some OVB but I did my best to address it by adding several CVs to my models. However, another way that suggests that the case of OVB seemed unlikely is by looking at past research models. The models used in this research were not far from other studies done on related variables. Further, to check if the model included an irrelevant variable, standard errors (SEs) and significance levels were employed.

It would be inexact to conclude that the sample used was entirely unbiased as this study relied on all available data and data on bureaucratic structures was skewed towards high income countries, especially for the Closedness Index. Unbiasedness comes from a perfectly random sample (Stock & Waltson, 2012). Yet, in such a study, random sampling could not be employed. All endogeneity can not be solved, but I tried to minimise it. To try and make the sample more consistent, a larger N was scouted for bureaucratic closedness by looking at each of the Closedness Index components. The law of large numbers -where the sample $\hat{y}$ approaches the actual population y, making $\hat{y}$ more consistent (Stock & Waltson, 2012: 109)- guided this research. Furthermore, to check for the stability of the results, two DVs that differently measure macroeconomic productivity and had different data sources were explored.

Furthermore, the possibility of *reverse causality* seemed highly unlikely, despite Kurtz & Schrank (2007) claiming reverse causality of the Weberian-growth link, as they measured government effectiveness and growth. How effective one thinks a particular country's bureaucracy is might be largely influenced by levels of economic performance because effectiveness is usually tied to outcome. In contrast, how professional or closed one perceives a particular country's bureaucracy to be is disjointed from economic performance. Political elites not recruiting senior officials (i.e. a component of professionalism), for instance, can be observed whether a country has high or low income. Moreover, due to the insignificance of bureaucratic closedness, reverse causality seemed non-existent.

4.2.1.7 Study Limitations

This research encountered some limitations. Firstly, the indices for the two main IVs were gathered using expert opinions (Dahlberg et al, 2017). Thus, an unavoidable element of subjectiveness could not be separated from the data. However, no other data sources provided more accurate measurements of these indices (Dahlström, Lapuente & Teorell, 2010). Secondly, the full Closedness Index had a low N and the entire data on bureaucratic structures was skewed towards high income countries, posing a challenge for exploring between-group differences. For the former, the three different components for the index were explored to capture a more widely representative sample. Thirdly, increases in TFP can be due to technological progress, not only worker productivity. For this reason, two DVs were used, so that this is double checked with actual estimates of labour productivity (AP). Fourthly, cross-sectional data analysis only captures a point in time. Therefore, while this type of study helps to empirically test the assumptions under the organisational theory of bureaucracy, it does not say what happens over time. The other unfortunate part with using cross-sectional country level data was that sub-national variations could not be captured, a concern also hinted by Charron, Dahlström & Lapuente (2016).

4.2.1.8 Future Research

For future research, datasets that capture bureaucratic structures should also focus on capturing data for more low-income countries. Evans & Rauch's suggested positive correlation was found using data on 35 developing countries. Hence, researchers that want to explore the degree to which their study results are still applicable today should use a dataset that has enough low-income countries to facilitate between-group difference analysis. This means that, for instance, the latest waves of the QoG Expert Survey should be available in both larger Ns that capture more of the lesser developed nations and as time series data. The latter would facilitate the tracking of empirical changes over time. Also, despite the private and public sectors having interconnected roles, it would also be interesting to empirically test the data on public administration institutions' Weberianess with measures that capture only 'public sector productivity', if such data could be 'reliably' compiled and made available at cross-country level. As noted by Micheli et al (2005: 1), many public sector performance indicators that currently exist are methodologically flawed and do not capture outputs or service quality. In addition, in the future, perhaps investigating individual level data for Weberianess in the QoG datasets could suffice in capturing within-country differences on Weberianess. This would be possible if future individual level datasets have questions that focus on capturing organisational level data, the pool of respondents is large for each individual country and the variations in answers are not due to high personal subjectivity.

4.3 CONCLUSION

Following controversy over the relevance of Weberianess today, this study explored the idea that how bureaucracies are structured has a bearing on productivity – using two productivity measures at macroeconomic cross country level. Bureaucratic closedness showed statistical insignificance with the two macroeconomic productivity measures of Average Productivity – AP (measured as GDP per person employed) and Total Factor Productivity (TFP), for the year 2014. Bureaucratic closedness maintained its insignificance when looked at both as a full index and through its three different components, in order to increase its sample size. Bureaucratic professionalism, however, correlated positively with both AP and TFP throughout the models used in this research. The null hypothesis that no relationship exists was rejected for bureaucratic professionalism. This suggests that there are some Weberian principles that still matter for economic activity today. More professional bureaucratic structures are empirically linked with higher levels of macroeconomic AP and TFP.

One policy recommendation is that governments should focus on ensuring low politicisation in bureaucratic structures so that macroeconomic productivity is heightened, as this affects long-run sustainable economic growth. Governments should adopt bureaucratic structures that hire professional staff based on merit, while cutting out political recruitments - especially in positions of seniority in bureaucracies. Senior officials should be internally recruited as opposed to being politically appointed. The relevance of some Weberian principles, such as bureaucratic professionalism, should not be ignored. In a world of limited resources, knowing what factors seem to be empirically linked with macroeconomic productivity, which in turn influences long-run sustainable economic growth, is key for properly directing government policy formulation, planning/ budgeting and execution, for both the less developed and more developed countries.

In contrast to studies like that of Lee & Ki (2017), results in this study support the relevance of Weberianess today. However, in accordance with other earlier studies like that of Dahlström, Lapuente & Teorell (2011), these results indicate that some Weberian principles might be more relevant for economic activity than others. Furthermore, the literature reviewed in this research supports Walton's 2005 findings. Some of the studies that have suggested the non-applicability of the Weberian model have exhibited shortcomings in methodology. These shortcomings range from examining measurements that do not accurately capture Weberianess to looking at the Weberian model from a unidimensional nature but generally applying the findings. This makes the data on the relevance of

Weberianess seem like it is surrounded by controversy, when it is infact surrounded by mere statistical artifacts. An examination of bureaucratic organisational efficiency and/or effectiveness deviates from examining Weberianess. Weberianess is 'the means to an end', the end being bureaucratic organisational efficiency and/or effectiveness.

Despite the data used in this research being based on expert 'opinions', the possibility of reverse causality seemed highly unlikely, especially because bureaucratic closedness was statistically insignificant. To try and address endogeneity, diagnostics were done and necessary adjustments made. Several variable checks and larger Ns were explored so that the inferences could be more consistent with reality. Further, the two macroeconomic productivity measures and the three components of the Closedness Index offered a repetition of the 'Weberian-productivity' analysis with different sets of data, in order to check the stability of the results. To accurately inform policy, considering the type of data that was available for cross-country level analysis, seemingly fitting data analysis methods and models were sort.

Results of this research can be generalised to both the less developed and more developed nations, but with caution because this research did not go without limitations. The data on bureaucratic structures was skewed towards high income countries. This also posed a challenge for exploring between-group differences, according to country income level. Future research should look at ways of capturing data that facilitates between-group difference analysis, and time series analysis. This study offered a shift of focus to the under-explored link of Weberianess with macroeconomic productivity measures like TFP, at cross-country level. Yet, as more comprehensive data on bureaucratic structures and productivity measures at both macroeconomic and microeconomic level becomes available, more research should be done. This would enhance our understanding of Weberian principles like bureaucratic professionalism and the exact mechanism behind how they contribute to productivity.

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6.0 APPENDICES

6.1 APPENDIX 1: HOW TFP & AP EXACTLY LINK WITH ECONOMIC GROWTH

6.1.1 Economic Growth Stylised Facts Relating To TFP And AP

The economic growth stylised facts highlighted in this section accentuate how the macroeconomic concepts of AP and TFP link with economic growth. To get proper insight on the variations in the pace of sustainable economic growth among countries, one has to at least have information on inputs, outputs and productivity (Inklaar & Timmer 2013: 2). Firstly, it is well known that an economy's economic output is measured by the gross domestic product (GDP) at constant prices (Burda & Wyplosz, 2013).[24] As Gottfries (2013) and Burda & Wyplosz (2013) pointed out, this can be expressed in simple terms as:

$$Y = F(K, L) \quad \text{..... Eqn (6)}$$

Where; Y = Economic output, K = Physical capital stock, and L = Labour.
In equation 4, GDP/economic output (Y) is a function of K and L. Changes in either K or L affect Y.

Among the many economic growth stylised facts, the first stylised fact that proved to be important for this research was that pointed out by Comin (2006), Kouramoudou (2017), Yalçınkaya, Hüseyni & Çelik (2017) and Jones & Tarp (2017) as:

'The large disparities in economic output are attributable more to total factor productivity (TFP), than variations in the quantity of factors of production such as K or L.'

To clearly understand the above stylised fact, equation 3 has to be modified to include TFP, and so as demonstrated by Adak (2009), the production function is then expressed as:

$$Y = A.F(K, L) \quad \text{..... Eqn (7)}$$

Where; Y = Economic output, K = Capital, L = Labour, and A = TFP.

The function (F) is now a product function so that changes in Y are influenced by changes in A, K and L (Ibid; Adak, 2015). To support this stylised fact, many studies have also linked TFP with GDP and economic growth. Jones & Tarp (2017), for instance, using cross country level data, found that TFP

[24] The monetary value of economic output can, however, be measured in terms of GDP or Gross National Product (GNP). Refer to Constanza et al (2009), page 3.

levels accounted for up to approximately half of the level of increased GDP. In addition, Yalçınkaya, Hüseyni & Çelik (2017) found that the TFP growth impact on overall economic growth was larger for the more advanced economies than for emerging countries. TFP is thus a common determinant of an economy's performance as it shows the *"productivity based catching up capability"* (Jajri, 2007: 41).

According to Burda & Wyplosz (2013), and Isaac (2017), Nicholas Kaldor also highlighted six notable stylised facts about economic growth, after studying economic growth in 1961 across countries over long time periods. Among these notable economic growth stylised facts (Isaac, 2017), the one that merited note for this paper was that which Burda & Wyplosz (2013) highlighted as:

'Both capital intensity (K/L) and the average productivity (Y/L)
keep rising over time'.

GDP keeps growing without bound and K keeps growing, while L grows at a slower pace than K, indicating a steady continuing rise in a country's standards of living - materially (Ibid). What thus sets countries apart is the pace of this increase over time (Opcit). Consequently, one would ask: What exactly affects this disparity in the average productivity? Among other things, is it how institutions - such as public administration institutions - are organised, ceteris paribus?

Using the two highlighted stylised facts, it is apparent that TFP and Average Productivity (Economic Output/Labour) are macroeconomic concepts linked to productivity, on one end, and economic growth, on the other end. As Korkmaz & Korkmaz (2017) rightfully put it, productivity is a concept that has its focus on economics of the firm. Scholars like Max Weber focused their theories on how to make bureaucratic professionals more productive (i.e. firm level productivity), and thus had the organisational theory of bureaucracy having its principles imbedded in the economics of the firm. Economics of the firm refers to how an organisational entity (firm) arranges its resources, which includes both physical capital and human capital (Demsetz, 1988:144; Coase, 1937). This organising of human capital, in particular, is what the organisational theory of bureaucracy looks at.

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6.2 APPENDIX 2: TEST MODELS[25]

6.2.1 Results According To Each Component of the Closedness Index

Table 6: OLS Multivariate Regression of Components of the Closedness Index on AP[26]

DV: **GDP Per Person Employed (ln)**	Model 17 (bivariate)	Model 18 (bivariate)	Model 19 (bivariate)
q2_d (Formal examination)	.066 (.077)	_	_
q2_j (Long term careers)	_	–.061 (.089)	_
q4_f (Special law for terms of employment)	_	_	.034 (.106)
Constant	10.005*** (.346)	10.482*** (.435)	10.026*** (.589)
R^2	.00 7	.00 4	.00 1
N	101	116	114

*p<.05 ** p<.01 ***p<.001. Standard errors within parentheses.
Data: Standard QoG dataset (2018), the World Bank dataset on GDP per person employed 1990-2017 & the 2015 QoG Expert Survey II dataset

[25] Suffice to mention that I also tried to arrange the data in the QoG Expert Survey II dataset as according to the original broad components mentioned by Max Weber, i.e. meritocratic hiring, predictable long-term careers, competitive salaries and rule based authority but the Cronbach Alphas' were below the satisfactory levels for most of the categories and this methodological approach had to be discarded.

[26] **Notes for the regression:**

1. The N for q2_d is less by 13 countries, as the full dataset for this question had an N of 114 when regressed with AP, and it showed significance at a p<.05 level. However, when the first control variable, HCI, was added to this model, the N dropped to 101 and q2_d became insignificant, and remained insignificant when all other CVs were added to the model. Other variables showed significance. Due to this, the data was then filtered from the beginning in order to get a constant N at 101, thus the noticed 101 in the Table 6 bivariate model. Since the bivariate model with N=101 later on showed insignificance, there was no longer a need to add any CVs to the model.
2. For the high income group, q2_d (Formal examination), q2_j (Long term careers) and q4_f (Special law for terms of employment) were all insignificant in their bivariate models with N= 89, N=90 and N=89, respectively. The Ns for the low income group were again too low to capture any meaningful regression results for comprehensive between group comparisons, with the highest N being at 24.

Table 7: OLS Multivariate Regression of Components of the Closedness Index on TFP[27]

DV: **TFP**	Model 20 (bivariate)	Model 21 (bivariate)	Model 22 (bivariate)
q2_d (Formal examination)	.015 (.017)	_	_
q2_j (Long term careers)	_	–.007 (.021)	_
q4_f (Special law for terms of employment)	_	_	–.041 (.027)
Constant	.569*** (.079)	.662*** (.103)	.854*** (.155)
R^2	.00 9	.00 1	.02 4
N	88	91	91

*p<.05 ** p<.01 ***p<.001. Standard errors within parentheses.
Data: Standard QoG dataset (2018) & the 2015 QoG Expert Survey II dataset

[27] **Notes:**
1. There was no need to add other variables to the models because each component was already insignificant in the bivariate models.
2. For the high income group, q2_d (Formal examination), q2_j (Long term careers) and q4_f (Special law for terms of employment) were all insignificant in their bivariate models with N= 73, N=75 and N=75, respectively. The Ns for the low income group were too low to capture any meaningful regression results that facilitated between group comparisons.

6.2.2 TFP Results Using A Different Consumption Expenditure Measurement

Table 8: OLS Multivariate Regression of Bureaucratic Closedness and Professionalism on TFP[28]

DV: **TFP**	Model 23	Model 24	Model 25	Model 26
Closedness Index	.260 (.179)	.22 4 (.192)	_	_
Professionalism Index	_	_	.262* (.123)	.274* (.118)
Real GDP (ln)	.041** (.041)	.044** (.015)	.033** (.010)	.033** (.010)
Trade Freedom	.003 (.006)	.003 (.007)	.010*** (.002)	.010*** (.002)
GDP Final Consumption Expenditure	–.008** (.002)	–.008** (.002)	–.001 (.002)	–.001 (.002)
Heterogeneity Index	_	–.080 (.143)	_	–.212* (.092)
Constant	.469 (.690)	.440 (.739)	–.844* (.321)	–.546 (.330)
R^2	.60 6	.61 1	.51 7	.55 3
N	40	39	86	84

*p<.05 ** p<.01 ***p<.001. Standard errors within parentheses.
Data: Standard QoG dataset (2018), & The World Bank dataset on GDP per person employed 1990-2017

[28] For bureaucratic closedness and AP, the N for the low-income group was only 2 countries. For bureaucratic professionalism on AP, the N for the low-income group was only 12 countries. Yet, for the high income group, professionalism showed significance at p<.05 in the full model (N=73).

6.3 APPENDIX 3: LIST OF COUNTRIES USED

6.3.1 Countries Used in the Main Models (1 to 16) - According To Continent

No	Country	Continent	Country	Continent	Country	Continent
1.	Benin	Africa	Pakistan	Asia	Poland	Europe
2.	Botswana	Africa	Philippines	Asia	Portugal	Europe
3.	Cote d'Ivoire	Africa	Singapore	Asia	Romania	Europe
4.	Cameroon	Africa	Thailand	Asia	Russia	Europe
5.	Algeria	Africa	Tajikistan	Asia	Serbia	Europe
6.	Egypt	Africa	Vietnam	Asia	Slovakia	Europe
7.	Ethiopia	Africa	Australia	Australia	Slovenia	Europe
8.	Ghana	Africa	Albania	Europe	Sweden	Europe
9.	Kenya	Africa	Austria	Europe	Ukraine	Europe
10.	Morocco	Africa	Belgium	Europe	Armenia	Middle East
11.	Madagascar	Africa	Bulgaria	Europe	Iraq	Middle East
12.	Mozambique	Africa	Switzerland	Europe	Israel	Middle East
13.	Mauritius	Africa	Cyprus	Europe	Turkey	Middle East
14.	Malawi	Africa	Germany	Europe	Barbados	N. America
15.	Namibia	Africa	Czech Republic	Europe	Canada	N. America
16.	Nigeria	Africa	Denmark	Europe	Costa Rica	N. America
17.	Rwanda	Africa	Spain	Europe	Guatemala	N. America
18.	Senegal	Africa	Estonia	Europe	Jamaica	N. America
19.	Togo	Africa	Finland	Europe	Mexico	N. America
20.	Tanzania	Africa	France	Europe	Nicaragua	N. America
21.	Uganda	Africa	Greece	Europe	El Salvador	N. America
22.	South Africa	Africa	United Kingdom	Europe	United States	N. America
23.	Zimbabwe	Africa	Croatia	Europe	Fiji	Oceania
24.	Bangladesh	Asia	Hungary	Europe	New Zealand	Oceania
25.	China	Asia	Ireland	Europe	Argentina	S. America
26.	Indonesia	Asia	Iceland	Europe	Bolivia	S. America
27.	India	Asia	Italy	Europe	Brazil	S. America
28.	Japan	Asia	Lithuania	Europe	Chile	S. America
29.	Kazakhstan	Asia	Latvia	Europe	Colombia	S. America
30.	Kyrgyzstan	Asia	Moldova	Europe	Ecuador	S. America
31.	Cambodia	Asia	Malta	Europe	Peru	S. America
32.	Korea, South	Asia	Netherlands	Europe	Uruguay	S. America
33.	Sri Lanka	Asia	Norway	Europe	Venezuela	S. America
34.	Nepal	Asia				

Total N= 100

6.3.2 Additional Countries Included In The Sample For Checking The Bureaucratic Closedness Index Components (Models 17 to 22)

No	Country Name	Continent
1.	Eritrea	Africa
2.	Guinea	Africa
3.	Somalia	Africa
4.	South Sudan	Africa
5.	Afghanistan	Asia
6.	Hong Kong	Asia
7.	Malaysia	Asia
8.	Bosnia and Herzegovina	Europe
9.	Macedonia	Europe
10.	Montenegro	Europe
11.	Georgia	Europe
12.	Azerbaijan	Middle East
13.	Jordan	Middle East
14.	Lebanon	Middle East
15.	Dominican Republic	North America
16.	Guyana	South America

Total additional N = 16

6.4 APPENDIX 4: DATA MANIPULATIONS AND DESCRIPTIVE STATISTICS

6.4.1 Scale Manipulations

No	Variable	Original Scale	Scale Used For Analysis
1.	GDP Per Person Employed	Higher values indicated higher GDP per Person Employed	– ***Comment:*** *Variable was logged*
2.	TFP	Higher values indicated higher TFP	0 to 1
3.	Closedness Index	1 to 7	0 to 1
4.	Professionalism Index	1 to 7	0 to 1
5.	Real GDP	Higher values indicated higher Real GDP	– ***Comment:*** *Variable was logged*
6.	HCI	Probably 0 to 2, higher values indicated higher HCI	0 to 1
7.	Heterogeneity Index	-	0 to 1
8.	Trade Freedom	0 to 100	0 to 100
9.	General Government Final Consumption Expenditure	Higher values indicated higher General Government Final Consumption Expenditure	Original scale maintained

No scale manipulations were done for the three components of the Closedness Index in test models 17 to 22.

6.4.2 Descriptive Statistics For Main Model Variables (Models 1-16)

Variable	N	Scale	Min.	Max.	Mean	Std. Deviation
GDP Per Person Employed (ln)	100	–	7.91	11.88	10.25 3	1.05 9
TFP	86	0 to 1	0	1	0.62	.22 4
Closedness Index	41	0 to 1	0.39	0.88	.635 0	.125 4
Professionalism Index	100	0 to 1	0.17	0.87	.495 3	.155 9
Real GDP (ln)	86	–	8.11	16.66	12.27 0	1.86 6
HCI	100	0 to 1	.3 0	.9 0	.68 9	.16 3
Heterogeneity Index	97	0 to 1	0.7	.8 4	0.4	.20 5
Trade Freedom	86	0 to 100	54.2 0	90	80.06 7	8.92 2
General Government Final Consumption Expenditure	86	–	6.46	26.2 0	17.08 3	4.44 1

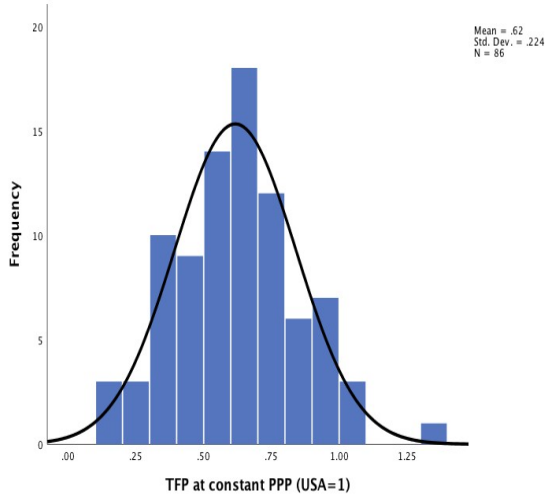
6.4.3 Descriptive Statistics For Test Model Variables (Models 17-22)

Variable	N	Scale	Min.	Max.	Mean	Median	Std. Deviation
GDP Per Person Employed (ln)	116	–	7.66	11.88	10.19 3	–	1.07 9
TFP	91	0 to 1	0	1	0.63	–	.23 1
q2_d (Formal examination)	101	1 to 7	1	7	4.3 0	–	1.35 1
q2_j (Long term careers)	116	1 to 7	2	7	4.7 6	–	1.13 5
q4_f (Special law for terms of employment)	114	1 to 7	1	7	5.4 9	6	.95 6

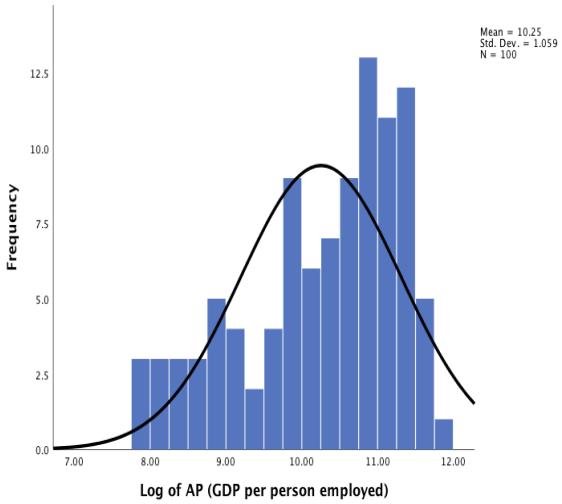
Note: q4_f (Special law for terms of employment) had data that seemed to be somewhat skewed to the left, and so its median has also been reported.

6.4.4 Graphical Descriptive Statistics For Key Variables

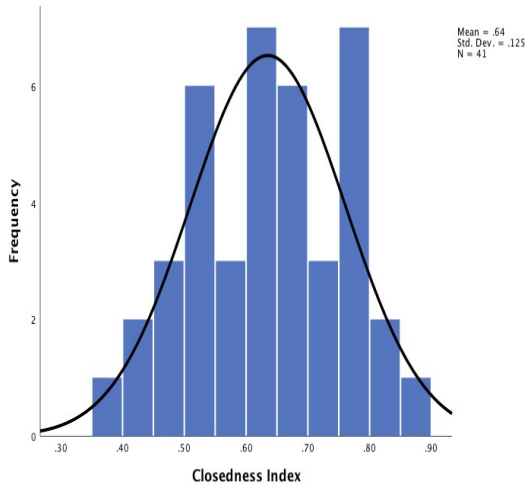
TFP
(when N= 86)



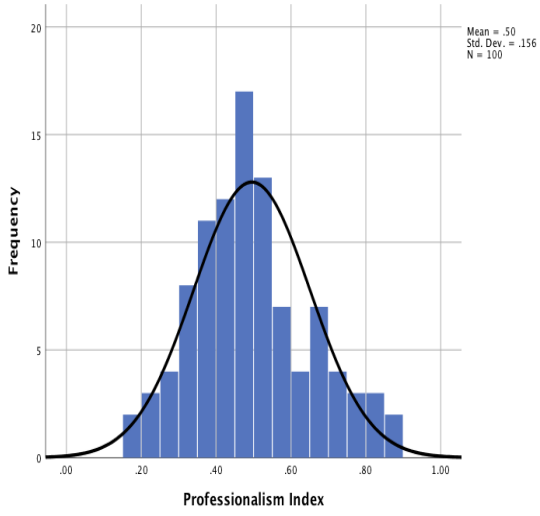
AP/ GDP Per Person Employed (ln)
(when N= 100 & after being logged)



Closedness Index
(when N= 41)



Professionalism Index
(when N= 100)



For the histograms above, the highest Ns were picked using models 1 to 16.

6.5 APPENDIX 5: THE HETEROGENEITY INDEX

The countries that made up the index were only those that were used for the analysis, after controlling for all CVs. Testing the degree of reliability of the mix of variables, the Cronbach's Alpha score was at 0.723 for the 97 countries used in preparing the index, as shown in the following data outputs:[29]

Case Processing Summary

		N	%
Cases	Valid	97	97.0
	Excluded[a]	3	3.0
	Total	100	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.723	.715	3

Item Statistics

	Mean	Std. Deviation	N
Ethnic Fractionalisation	.4069	.25181	97
Religious Fractionalisation	.4434	.22827	97
Language Fractionalisation	.3639	.28448	97

Inter-Item Correlation Matrix

	Ethnic Fractionalisation	Religious Fractionalisation	Language Fractionalisation
Ethnic Fractionalisation	1.000	.282	.723
Religious Fractionalisation	.282	1.000	.361
Language Fractionalisation	.723	.361	1.000

[29] According to Loewenthal, K. M. (2004), a Cronbach's Alpha of 0.6 would still be an acceptable score. However, the Cronbach's Alpha score that the data had was above what Nunnally (1978: 458) noted as the generally accepted minimum of 0.7.

6.6 APPENDIX 6: DATA DIAGNOSTICS

6.6.1 OLS Assumptions Check For Models 1 to 16[30]

6.6.1.1 TFP and The Closedness Index (Model 5)

Figure 7: Variable Correlations

		TFP level at current PPPs (USA=1)	Closedness Index	Real GDP (ln)	Trade Freedom	General Government Consumption Expenditure	Heterogeneity Index
TFP level at current PPPs (USA=1)	Pearson Correlation	1	.276	.566**	.416**	.233	-.208
	Sig. (2-tailed)		.085	.000	.008	.148	.203
	N	40	40	40	40	40	39
Closedness Index	Pearson Correlation	.276	1	.253	.061	.065	-.278
	Sig. (2-tailed)	.085		.115	.706	.690	.087
	N	40	40	40	40	40	39
Real GDP (ln)	Pearson Correlation	.566**	.253	1	.151	.078	.051
	Sig. (2-tailed)	.000	.115		.352	.633	.759
	N	40	40	40	40	40	39
Trade Freedom	Pearson Correlation	.416**	.061	.151	1	.283	-.285
	Sig. (2-tailed)	.008	.706	.352		.077	.078
	N	40	40	40	40	40	39
General Government Consumption Expenditure	Pearson Correlation	.233	.065	.078	.283	1	-.384*
	Sig. (2-tailed)	.148	.690	.633	.077		.016
	N	40	40	40	40	40	39
Heterogeneity Index	Pearson Correlation	-.208	-.278	.051	-.285	-.384*	1
	Sig. (2-tailed)	.203	.087	.759	.078	.016	
	N	39	39	39	39	39	39

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 8: Minimum and Maximum Cook's Distance

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.35	.94	.73	.140	39
Std. Predicted Value	-2.716	1.539	.000	1.000	39
Standard Error of Predicted Value	.036	.097	.061	.016	39
Adjusted Predicted Value	.35	.94	.72	.143	39
Residual	-.272	.460	.000	.151	39
Std. Residual	-1.685	2.846	.000	.932	39
Stud. Residual	-1.755	2.960	.008	1.008	39
Deleted Residual	-.295	.497	.003	.177	39
Stud. Deleted Residual	-1.815	3.401	.027	1.067	39
Mahal. Distance	.917	12.735	4.872	2.932	39
Cook's Distance	.000	.308	.029	.055	39
Centered Leverage Value	.024	.335	.128	.077	39

a. Dependent Variable: TFP level at current PPPs (USA=1)

Figure 9: VIF Statistics

Model		Collinearity Statistics: Tolerance	VIF
5	Closedness Index	.844	1.185
	Real GDP (ln)	.890	1.124
	Trade Freedom	.867	1.154
	General Government Consumption Expenditure	.813	1.231
	Heterogeneity Index	.730	1.369

a. Dependent Variable: TFP level at current PPPs (USA=1)

Figure 10: Homoskedasticity Check

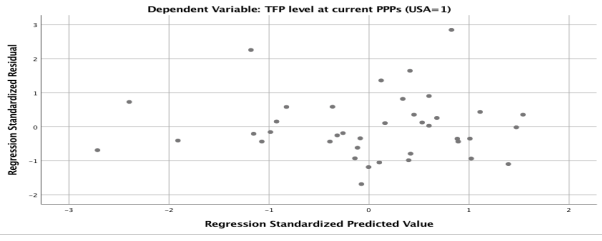
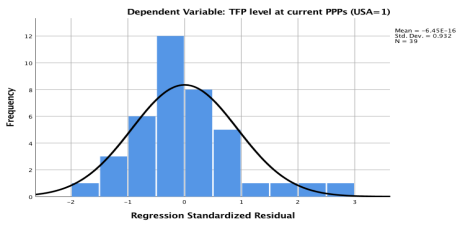


Figure 11: Normal Errors



[30] The study assumed the OLS multivariate regression assumptions of: 1) A linear relationship exists; 2) The mean of residuals is zero; 3) No auto-correlation of residuals; 4) Residual homoskedasticity; 5) No presence of extreme outliers; and 6) No or little multicollinearity (Bryman & Cramer, 2011; Stock & Watson, 2012: 164-168).

6.6.1.2 TFP and The Professionalism Index (Model 10)

Figure 12: Variable Correlations

		TFP at constant PPP (USA =1)	Professionalism Index	Real GDP (ln)	Trade Freedom	General Government Consumption Expenditure	Heterogeneity Index
TFP at constant PPP (USA =1)	Pearson Correlation	1	.427**	.442**	.586**	.255*	-.443**
	Sig. (2-tailed)		.000	.000	.000	.018	.000
	N	86	86	86	86	86	84
Professionalism Index	Pearson Correlation	.427**	1	.203	.329**	.304**	-.181
	Sig. (2-tailed)	.000		.061	.002	.004	.100
	N	86	86	86	86	86	84
Real GDP (ln)	Pearson Correlation	.442**	.203	1	.129	-.071	-.183
	Sig. (2-tailed)	.000	.061		.237	.517	.096
	N	86	86	86	86	86	84
Trade Freedom	Pearson Correlation	.586**	.329**	.129	1	.288**	-.386**
	Sig. (2-tailed)	.000	.002	.237		.007	.000
	N	86	86	86	86	86	84
General Government Consumption Expenditure	Pearson Correlation	.255*	.304**	-.071	.288**	1	-.252*
	Sig. (2-tailed)	.018	.004	.517	.007		.021
	N	86	86	86	86	86	84
Heterogeneity Index	Pearson Correlation	-.443**	-.181	-.183	-.386**	-.252*	1
	Sig. (2-tailed)	.000	.100	.096	.000	.021	
	N	84	84	84	84	84	84

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 13: Minimum and Maximum Cook's Distance

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.221	.891	.622	.1647	84
Std. Predicted Value	-2.432	1.636	.000	1.000	84
Standard Error of Predicted Value	.024	.073	.040	.010	84
Adjusted Predicted Value	.230	.902	.621	.1655	84
Residual	-.2675	.4873	.0000	.1480	84
Std. Residual	-1.752	3.192	.000	.969	84
Stud. Residual	-1.847	3.340	.004	1.010	84
Deleted Residual	-.2971	.5335	.0012	.1608	84
Stud. Deleted Residual	-1.876	3.584	.010	1.033	84
Mahal. Distance	1.140	17.967	4.940	3.019	84
Cook's Distance	.000	.177	.015	.029	84
Centered Leverage Value	.014	.216	.060	.036	84

a. Dependent Variable: TFP at constant PPP (USA=1)

Figure 14: VIF Statistics

Model		Collinearity Statistics Tolerance	VIF
10	Professsional Index	.805	1.242
	Real GDP (ln)	.902	1.109
	Trade Freedom	.764	1.308
	General Goverment Consumption Expenditure	.815	1.227
	Heterogeneity Index	.806	1.241

a. Dependent Variable: TFP at constant PPP (USA=1)

Figure 15: Homoskedasticity Check

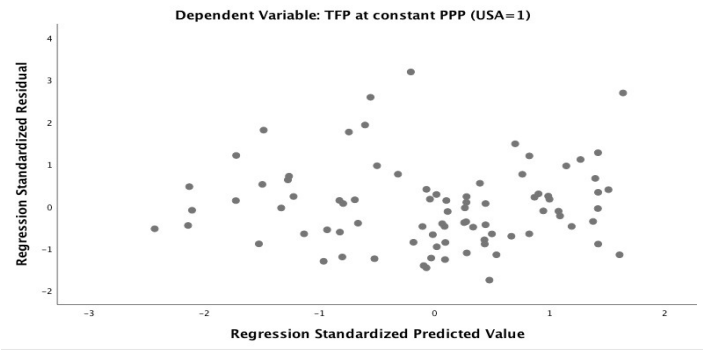
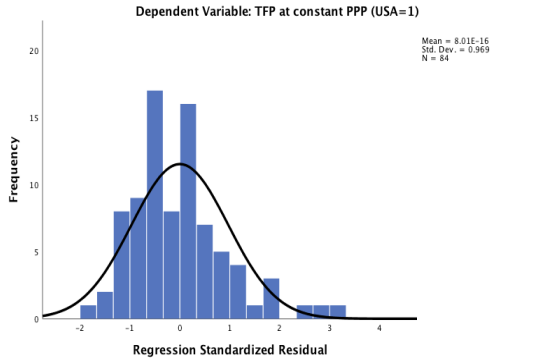


Figure 16: Normal Errors



6.6.1.3 AP and The Closedness Index (Model 13)

Figure 17: Variable Correlations

		AP	Closedness Index	HCI	Heterogeneity Index
AP	Pearson Correlation	1	.229	.250	-.352*
	Sig. (2-tailed)		.150	.115	.026
	N	41	41	41	40
Closedness Index	Pearson Correlation	.229	1	-.342*	-.286
	Sig. (2-tailed)	.150		.029	.073
	N	41	41	41	40
HCI	Pearson Correlation	.250	-.342*	1	.293
	Sig. (2-tailed)	.115	.029		.067
	N	41	41	41	40
Heterogeneity Index	Pearson Correlation	-.352*	-.286	.293	1
	Sig. (2-tailed)	.026	.073	.067	
	N	40	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 18: Minimum and Maximum Cook's Distance

Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	10.0116	11.7177	10.9519	.38598	40
Std. Predicted Value	-2.436	1.984	.000	1.000	40
Standard Error of Predicted Value	.097	.328	.179	.046	40
Adjusted Predicted Value	9.8284	11.7166	10.9377	.40715	40
Residual	-1.54007	.80486	.00000	.56038	40
Std. Residual	-2.640	1.380	.000	.961	40
Stud. Residual	-2.754	1.496	.011	1.016	40
Deleted Residual	-1.67595	.96886	.01413	.62824	40
Stud. Deleted Residual	-3.057	1.523	-.002	1.059	40
Mahal. Distance	.097	11.343	2.925	2.119	40
Cook's Distance	.000	.208	.031	.051	40
Centered Leverage Value	.002	.291	.075	.054	40

Figure 19: VIF Statistics

Model		Collinearity Statistics Tolerance	VIF
13	Closedness Index	.845	1.184
	HCI	.842	1.188
	Heterogeneity Index	.875	1.143

a. Dependent Variable: GDP per person employed (ln)

Figure 20: Homoskedasticity Check

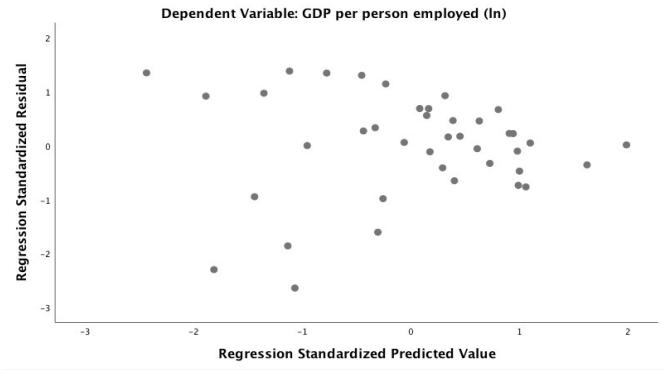
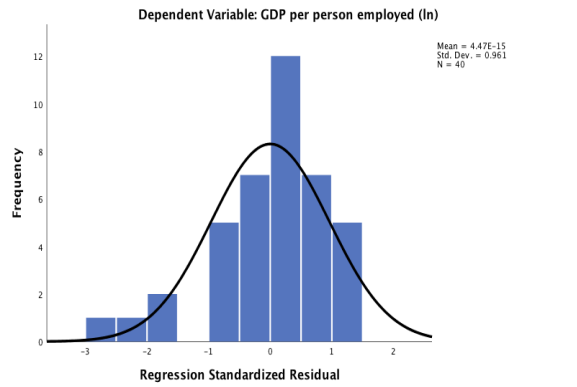


Figure 21: Normal Errors



6.6.1.4 AP and The Professionalism Index (Model 16)

Figure 22: Variable Correlations

		GDP per person employed (ln)	Professionalism Index	HCI	Heterogeneity Index
GDP per person employed (ln)	Pearson Correlation	1	.437**	.787**	-.549**
	Sig. (2-tailed)		.000	.000	.000
	N	100	100	100	97
Professionalism Index	Pearson Correlation	.437**	1	.400**	-.180
	Sig. (2-tailed)	.000		.000	.078
	N	100	100	100	97
HCI	Pearson Correlation	.787**	.400**	1	-.429**
	Sig. (2-tailed)	.000	.000		.000
	N	100	100	100	97
Heterogeneity Index	Pearson Correlation	-.549**	-.180	-.429**	1
	Sig. (2-tailed)	.000	.078	.000	
	N	97	97	97	97

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 23: Minimum and Maximum Cook's Distance

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	8.2416	11.8453	10.2797	.87264	97
Std. Predicted Value	-2.336	1.794	.000	1.000	97
Standard Error of Predicted Value	.064	.179	.117	.029	97
Adjusted Predicted Value	8.2524	11.8541	10.2797	.87297	97
Residual	-1.55966	1.46158	.00000	.58582	97
Std. Residual	-2.620	2.456	.000	.984	97
Stud. Residual	-2.639	2.500	.000	1.006	97
Deleted Residual	-1.58165	1.51433	-.00004	.61261	97
Stud. Deleted Residual	-2.729	2.574	-.001	1.020	97
Mahal. Distance	.117	7.741	2.969	1.841	97
Cook's Distance	.000	.099	.012	.020	97
Centered Leverage Value	.001	.081	.031	.019	97

a. Dependent Variable: GDP per person employed (ln)

Figure 24: VIF Statistics

Model		Collinearity Statistics Tolerance	VIF
16	Professionalism Index	.828	1.208
	Heterogeneity Index	.816	1.225
	HCI	.698	1.433

a. Dependent Variable: GDP per person employed (ln)

Figure 25: Homoskedasticity Check

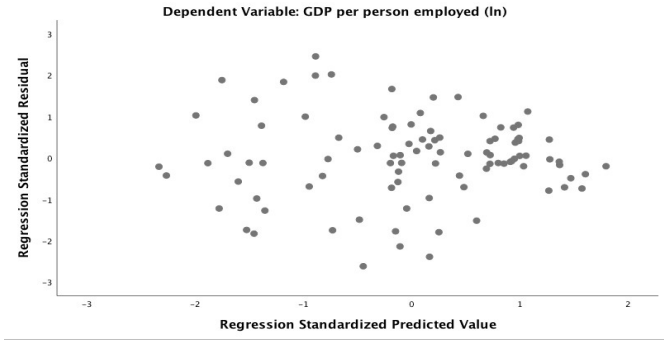
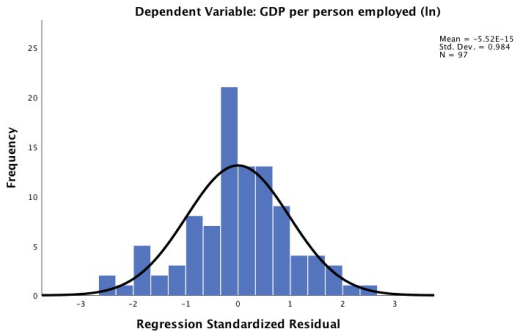


Figure 26: Normal Errors



6.6.2 OLS Assumptions Check For 'Test' Models 17 to 22

A Linear Relationship Exists

The assumption was fulfilled for all three components.

VIF Statistic(s)

All three components of the Closedness Index were checked for VIF statistics and they all equalled 1.00.

No Presence Of Extreme Outliers

The minimum and maximum Cook's distances all fell between 0 and 1 for all three components.

Variable Correlations

The variable correlations were low for both AP and TFP with the three different components of the Closedness Index. All variable correlations were below 0.8. The highest variable correlation was at 0.064.

Homoskedasticity Check

All the three components were checked for homoskedasticity and heteroskedastcity seemed present. Robust SEs were done for all three variables but no changes were noticed in the full model. This suggested that the heteroskedasticty that was noticed was not influential.

Normal Errors

All the three components showed normal errors for both AP and TFP.

6.6.3 Additional References Used For Data Diagnostics

(1) Bryman, A. & Cramer, D. (2011). "Quantitative Data Analysis with IBM SPSS 17, 18 & 19; A Guide for Social Scientists". Routledge. USA and Canada.

(2) Loewenthal, K. M. (2004). "An Introduction To Psychological Tests And Scales." 2nd Edition. Hove, UK. Psychology Press.

(3) Nunnally, J. C. (1978). "Psychometric Theory." 2nd Edition. New York. McGraw-Hill.

6.7 APPENDIX 7: THE PROFESSIONALISM INDEX AND THE IMPARTIALITY INDEX

The variable correlation results for bureaucratic professionalism and bureaucratic impartiality were as shown below.

		Professional Public Administration	Impartial Public Administration
Professional Public Administration	Pearson Correlation	1	.786**
	Sig. (2-tailed)		.000
	N	115	110
Impartial Public Administration	Pearson Correlation	.786**	1
	Sig. (2-tailed)	.000	
	N	110	112

**. Correlation is significant at the 0.01 level (2-tailed).

Bureaucratic professionalism and bureaucratic impartiality seem to be variables that fluctuate together. A correlation of .78 6 is very close to the 0.8 mark which is considered as high correlation. However, it is still less than the 0.8 threshold.