

Open Government Data Practices

A Global Comparison of Influencing Factors

Master thesis

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Master of Science

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Word count: 20.745

ABSTRACT

Governments hold large amounts of digital information about their territorial geography, infrastructure, budget, demography and public services such as education, transportation and healthcare, among other aspects of society. When released, this data is referred to as Open Government Data and can constitute an asset for social good, economic development and increased transparency and efficiency in public administration. Among academics the topic of Open Government Data has gained importance over the last few years, with research conducted pertaining to the influence of Open Government Data policies on individual countries. The emergence of countries' Open Government Data practices has not been quantitatively assessed yet. This research is conducting the first global and quantitative research on the factors influencing the emergence of Open Government Data practices. An international ranking of countries Open Government Data performance is used to analyze the association to the level of economic development, effectiveness of public administrations, the civil society's strength and the engagement of international organisations. Data is derived from reputable sources such as the World Bank's Worldwide Governance Indicators and the World Development Indicators. This research reveals that Open Government Data practices are globally spread through high public sector performance, international policy transfers of international organisations, the desire for more transparency and accountability by the civil society and the demand for free public sector information by the private sector. The value added to the existing body of research lies in this research's quantitative nature as most of research is qualitative.

ACKNOWLEDGMENTS

First of all I would like to thank my mother Henriette von Meien for enabling me to live and study in Rotterdam. I am incredibly thankful that I can always count on her support. Moreover, I would like to say thank you to my supervisor Professor Dijkstra for guiding me through this research. Even when issues arose while writing the research, she remained patient and positive and gave me the freedom I needed to write this thesis. At the same time I could always approach her and expect helpful counsel. I am very happy that I could write this research together with her and my second supervisor Dr Zhelyazkova who provided me with useful feedback and answers to my questions. Furthermore, I would also like to thank the following people without whom I could have not produced this research: Steffen Hasenohr stood by me through the research like no other. For that I would like to thank him. Elodie Théobald has accompanied me in the process of writing my dissertation from the start and has both inspired me and given crucial impulses for this research. Moritz Schwiede cheered me up every day we spent together at the library or off the campus. His positivity has given me strength to finish this work. I would also like to thank my flatmates Kaisha and Fraiya Myers, with whom I am looking forward to spend more time now that this research is complete. Furthermore, I would like to thank Edward Mc Donald and Ahmed Abdi on whose friendship and support I can always count on.

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1 INTRODUCTION

In a remarkable short period of time, Open Government Data (OGD) has evolved from a matter on the agenda of information activists and software developers to the global political stage. Governments around the globe as well as major international groups and organisations such as the G8, the G20, the OECD and the World Bank are acknowledging the potential of OGD and try to use it as an asset for economic development, more efficiency in the public sector and participation of the public (Van Schalkwyk et al., 2017; Gray, 2014).

The prominence of OGD increased together with related developments, such as the rise of Big Data and the creation of new analytical methods to derive insights into this data. By now, digital data constitutes an important asset for the data-driven economy and is essential for the creation of new innovative information technology. Advocates emphasise the involved opportunities for new jobs and growth through Open Government Data. Businesses use OGD to find new market niches and to create new products and services. Users of OGD range from companies of the start up community and larger companies from the information and communication sector. Companies, besides information technology companies, include banks and agriculture enterprises. The latter are using for example meteorological, geographical, or environmental information to enhance their products (Bates, 2012). Furthermore, access to Government Data can help to manage societal challenges such as enhancing the sustainability of healthcare systems or tackling environmental challenges (European Union, 2016). For governments, OGD can improve the delivery of public services and increase administrative efficiency. It is regarded as being able to improve the relation between civil society and the government by increasing state transparency and accountability. In a range of countries, OGD was therefore seen as a partial solution to the decreasing trust in governments (Harvey, 2007).

1.1 Aim

This research aims to add to the currently still limited knowledge of factors influencing countries' Open Government Data practices. Furthermore, this research seeks to contribute to the literature on Open Government Data, to clarify which factors contribute to good Open Government Data practices and which influences hinder them. Within the scope of a quantitative analysis, the research aims to make inferences about causality and to find results that can be used as a basis for inferences about all countries. It attempts to do so by answering the following research question.

1.2 Research Question

Which factors influence countries' Open Government Data (OGD) practices?

According to the – largely qualitative – literature, the implementation of OGD policies varies among countries. Initial OGD practices in the United States of America (USA) and the United Kingdom (UK) arose from an interaction between civil actors, a technically skilled private sector and public administrations (Hogge, 2010). Among the advocates of Open Government Data were politicians who saw Open Government Data as a way to make their respective public sector more efficient. In line with the New Public Management doctrine, they anticipated to expose public service decisions in order to highlight performance issues and increase competition within the public sector, as well as strengthen the hand of the citizen as customer (Longo, 2011). In the UK, the logic of making the public sector more effective by employing OGD evolved in the context of a neo-liberal political agenda, which was devoted to the marketisation and privatisation of public services (Bates, 2012; Bates, 2014). Civil society actors were demanding OGD as an instrument to enhance state transparency following the uncovering of several high-profile corruption cases (Bates, 2012). Politicians saw an increase in state transparency through OGD as a solution to growing sentiments of mistrust towards government (Grimmelikhuijsen et al., 2013). In addition, the expansion of OGD practices has occurred through international policy transfer, with states copying the concept of Open Government Data from each other (Davies, 2014). International organizations are likely to have an influence on this spread of OGD practices through policy transfers. Two international organizations in particular have contributed substantially to spreading the idea of implementing OGD initiatives, namely the Open Government Partnership and the World Bank. They are named as key influencers for OGD initiatives in the Open Data Barometer report, a report produced by the World Wide Web Foundation which monitors the progress of governments' efforts to apply OGD policies. It will be used in this research to operationalise the dependent variable, which consists of countries' employment and performance in OGD practices. The report investigates the readiness for Open Data initiatives and the implementation of Open Data programmes, as well as the impact that Open Data is having on business, politics and civil society in 116 countries (World Wide Web Foundation, 2017a). Further information on the report is provided in the third chapter when the operationalisation of the dependent variable is discussed.

1.3 Sub-Questions

1. What is already known about the factors influencing OGD practices?
2. In what way can all variables be operationalised and possible relationships analysed?
3. What are the results of the analysis?

How these questions are answered will be outlined in the next paragraph.

1.4 Research Approach

This research addresses the three sub-questions before responding to the central research question.

The first sub-question refers to the literature on OGD. It aims to deepen the existing knowledge of the influencing factors on OGD practices via a literature review. The influencing factors, which are derived from qualitative studies, will be used to determine the independent variables of this research. Based on the findings, hypotheses will be drafted and a conceptual model will be built.

The second sub-question is concerned with the research design, the empirical method and the operationalisation of the variables. The choice of the research design and the empirical method will be outlined. The independent variables will be determined after all influencing factors on OGD practices are discussed in the literature review. Data indices will be used to operationalise the independent variables. The dependent variable is composed of countries' OGD practices as ranked in the Open Data Barometer.

The third sub-question focuses on the statistical analysis and its assessment. As this research aims to discover the factors influencing countries' OGD practices, a regression analysis will be performed that enables an estimation of the relationship between variables. Before the analysis is conducted, the assumptions of a regression analysis are tested. Afterwards, the most adequate regression model will be chosen. Finally the results of the analysis will be presented and interpreted, in order to find an answer for the central research question.

1.5 Academic Relevance

The quantitative nature of this research is of academic relevance as previous studies analysing influencing factors on OGD practices are exclusively of a qualitative nature. Furthermore, reports on OGD have often been published by governments implementing OGD policies (Dapp et al., 2016, European Union, 2016). Academics have written articles on OGD for civil society organisations (Hogge 2010; Davies et al., 2013) and point out the civil potential of it. The majority of the first wave of literature on OGD provides a simplistic and optimistic view

of its benefits (Maali et al. 2010, DiFranzo et al. 2011, Hoxha & Brahaj 2011). However, it often lacks an assessment of barriers to Open Government Data which are provided by governments (Janssen, 2012). Oftentimes, Open Government Data is not fully open but for example constricted by licensing arrangements which makes the information not freely available to anyone (World Wide Web Foundation, 2017a).

This research seeks to find results that can form a basis for generalisations about the influencing factors of OGD practices around the world. OGD practices can be investigated in all countries as OGD has increased worldwide during recent years. The majority of the qualitative studies on OGD have focused on countries in the Western world, most of them on the UK and the U.S. (Davies, 2010, Robinson et al., 2013). In recent years, there has been an increase in OGD coverage in other parts of the world. Reports cover the use of OGD in Kenya (Rahemtulla et al. 2012), the Philippines (Canares 2014), India (Srivastava et al. 2014), Nigeria (Mejabi et al. 2014), South Africa (Van Schalkwyk 2013) and several Latin American countries (González-Zapata et al., 2015). Given the large case-study coverage of OGD practices, a quantitative study comparing the factors influencing the emergence of OGD initiatives is eminently appropriate. Furthermore, no study has yet tried to understand factors influencing the emergence of OGD initiatives on a global level.

1.6 Societal Relevance

The societal relevance of this research lies in the social potential of OGD. The OGD movement has become globally supported because of its promise of increasing governments' accountability and including the role of civil society in public policy making (Davies et al., 2013). Furthermore, the concept of Open Government is getting more prominent of states for re-building citizens' trust in their governments and for counteracting corruption. Open Government Data can also be used to improve public social services and improve people's quality of life. An example can be taken from Japan's approach to helping the elderly and pedestrians with disabilities. The initiative was introduced by the Japanese Ministry of Land, Infrastructure and Transport which published large data sets of facilities with disabled access in Japan. Apps were developed by so called civic hacking initiatives using this data, showing pedestrians with disabilities the easiest way around their city, pointing out wheelchair-accessible entrances and other features (World Wide Web Foundation, 2017a). By researching the influencing factors on the emergence of OGD practices, the civic potential of OGD can be further increased.

1.7 Thesis Outline

The first chapter of this research introduces the main principles of Open Government Data and the research question, the sub-questions, the research design, the academic and the societal relevance of the research.

The second chapter discusses the existing literature on OGD and what is already known about the most important factors influencing OGD practices. This chapter therefore answers the first sub-question of this research.

The third chapter answers the second sub-question. It describes the research design and the empirical method used in this research. The variables are operationalised, followed by an assessment of reliability and validity.

The fourth chapter covers the analysis and therefore answers the third sub-question. Descriptive statistics give an insight into the data, after which the regression analysis is performed, testing the associated assumptions. The chapter is concluded by an overview of the statistical results.

The fifth chapter presents the conclusions of the research. It summarises the main findings, providing an explanation of the findings and their implications. This chapter therefore answers the central research question. It also outlines the limitations and makes propositions for future research.

2 THEORETICAL FRAMEWORK & LITERATURE REVIEW

The second chapter discusses the existing literature on the factors influencing OGD practices in order to answer the first sub-question. The chapter begins by defining basic concepts present in Public Sector Information, Open Data, Open Government and Big Data. Afterwards, for each of the influencing factors, theory is provided, followed by empirical evidence supporting each factor's influence on OGD practices. Subsequently, the discussion of the empirical evidence, the conceptual model of the research is presented, after which the hypotheses are outlined at the end of the chapter. The literature usually covers four influencing factors when it comes to the emergence of OGD practices.

The first focuses on the public sector and the emergence of OGD within the broader framework of New Public Management reforms. Authors argue that Open Government Data practices stem from the New Public Management doctrine and aim to make civil services more effective by making their public service decisions public (Longo, 2011).

The second factor widely covered in the literature is the emergence of OGD as an answer to citizens' demands for more government accountability, driven by bottom-up pressure. Therefore, political leaders considered it necessary to adopt OGD practices in reaction to a rising civil society and a decreasing trust in government (Cook et al., 2010; Grimmelikhuijsen et al., 2013).

The third one discusses OGD as a policy transfer between political elites through international organisations. Member countries of certain international organizations adopt policies which are perceived by the organisation as 'best practice' models. Open Government Data practices spread through these policy transfer mechanisms and therefore had an effect on country's OGD practices (Schwegmann, 2012).

The last influencing of OGD practices is concerned with the economic interest in OGD, as information of the public sector constitutes an important asset for the data-driven economy. Businesses pressured governments to release Public Sector Information for free, for example by joining business interest groups (Grupe, 1995).

2.1 Definitions

In this part of the research the main components of Open Government Data are outlined. Open Government Data consists of government data or Public Sector Information and Open Data. The concepts of Open Government and Big Data are also outlined here, as their comprehension is important when it comes to the commercialisation of OGD by the private sector and civil societies' relation with OGD.

2.1.1 Public Sector Information

Public Sector Information can be described as any information held by public institutions (Vickery, 2011). A public institution is for example a government department or an establishment which is either majority-owned or regulated by a government (Bates, 2012). In this study, PSI is also referred to as government data. An overview of different types of government data can be found in Table 1.

Table 1: Types of Public Sector Information

Geographic Information	cartographic information
	land use info (cadastral data)
	spatial data/geographical coordinates
	administrative and political boundaries
	topographical information
Meteorological and Environmental Information	elevation data
	oceanographic data
	hydrographic data
	environmental (quality) data
	atmospheric data
Economic and Business Information	meteorological (weather) data
	financial information
	company information
	economic and statistics
Social Information	industry and trade information
	demographic information
	attitude surveys
	data on health/illness
Traffic and Transport Information	education and labour statistics
	transport network information
	traffic information
	transport statistics
Tourist and Leisure Information	car registration data
	hotel information
	tourism statistics
Agricultural, Farming, Forestry and Fisheries Information	entertainment (local and national)
	cropping/land use data
	farm incomes/use of resources
	fish farming/harvest information
Natural Resource Information	live stock data
	biologic and ecologic information
	energy resource/consumption information
Legal System Information	geological and geophysical information
	crime/conviction data
	laws
	information on rights and duties
	information on legislation
Scientific Information and Research data	information on judicial decisions
	university research
	publicly-funded research institutes
Educational Content	governmental research
	academic papers and studies
Political Content	lecture material
	governmental press releases
	local and national proceedings of governments
Cultural Content	green papers
	museum material
	gallery material
	archeological sites
	library resources
	public service broadcast archives
other public archives	

Source: Based on OECD (2006, p.12)

2.1.2 Open Government

Increasing mistrust of government has led citizens to demand more Open Government. The doctrine of Open Government describes the idea that governments are held to account by allowing citizens access to public documents and to providing them with insight into government proceedings (Robinson et al., 2012).

2.1.3 Open Data

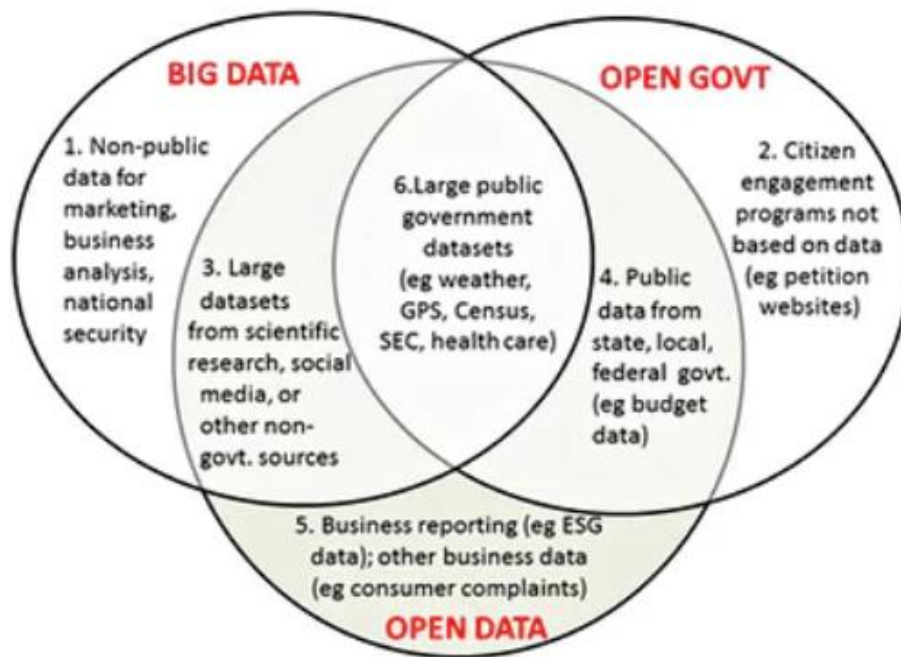
Open Data is the conception that digital data should be freely available to everyone for the purpose of comprehension, re-use or distribution. It comprises the promise that citizens, businesses or organisations are able to use this data to drive innovation, find certain patterns and trends or make information-based decisions (Ubaldi, 2013). Basic features of Open Data include the necessity for the data to be legally and technically open, which means it must be published in electronic formats, without password restrictions and for everybody free to re-use. In order to make Open Data easy to access and easy to find, most organizations create and manage Open Data catalogs (World Bank, n.d.e). Furthermore, there is a general consensus that Open Data should be retrievable for free or at a fractional cost. The difference between Open Data and Open Government Data is that Open Data comes from anywhere, such as from companies or organisations, while Open Government Data stems from governments only. However, sometimes these terms are mixed (Ubaldi, 2013).

2.1.4 Big Data

The term Big Data consists of two facets. Firstly, Big Data is used to describe the increasing importance of data in the economy, causing a shift towards a data-driven socio-economic model. Nowadays, data constitutes an important asset in driving innovation, economic growth and a competitive advantage. Secondly, Big Data also describes the wide range of data sets that are too big, too complex, too poorly structured and too rapidly changing to be evaluated manually (Ubaldi, 2013) Big Data enables the analysis of these datasets and the performance of functions such as the identification of business trends or the optimisation of business processes. The deployment of Big Data in certain areas can also improve cities and countries. For example, Big Data could interlink transport infrastructure and inform a bus to wait for a delayed train, or to minimize traffic jams by letting traffic signals predict traffic volumes. Big Data methods are already used to improve security and law enforcement with governments using Big Data to expose terrorist plots and other threats perceived to be major or existential. Big Data can detect and prevent cyber-attacks, while credit card companies use it to expose fraudulent transactions. Data sets which are mentioned under the broad term of Big Data

include digital information which is produced through business transactions, social media or through machine-to-machine procedures. Public datasets such as Open Government Data are, however, also analysed by Big Data (Ubaldi, 2013). Figure 1 shows the relationship between Big Data, Open Data and Open Government and how the different concepts overlap.

Figure 1: Relationship Between Open Government, Government Data and Big Data



Source: Gurin, 2015, p.4

2.2 Theories

This part of the chapter clarifies key theories about the emergence of OGD policies. First, the role of neo-liberalism and New Public Management within the public sector is discussed. Then, the concept of policy transfer within the sphere of international organisations is outlined, following a description of the informationalisation of capitalism during the 1970s. Lastly, the fourth sub-section outlines theory around the decreasing trust of citizens in their governments and transparency as an instrument to counteract this trend. By means of these theories the empirical section (2.3) of this chapter and the paper will be built.

2.2.1 Neo-liberalism and New Public Management

In the 1970s the economic crisis brought about New Public Management Reforms. These reforms are partly responsible for the emergence of OGD practices. The economic system prior to the 1970s economic crisis is often referred to as Fordist and Keynesian. This economic model emphasised mass production for mass consumption, organised through the tripartite corporatism between the state, industry and labour (Webster 2006). The Fordist and

Keynesian economic model lessened economic inequality by decreasing the relative wealth of economic elites. However, the model was questioned when a structural crisis arose in the late 1960s in many economies and developed into a deep economic crisis throughout the 1970s. This crisis has led to rising support for neo-liberalist methods in political, economic and governmental circles. Neo-liberalism was formed by economists such as Friedrich von Hayek and Milton Friedman and refers to economic liberalisation policies. In concrete terms, the doctrine refers to free trade, low taxes, deregulation, privatisation, and balanced government spending or, simply put, the preference of market forces over government-based interventions to achieve economic outcomes and market design. The neo-liberal preference of the market is meant to increase the general level of societies' well-being. Neo-liberalist advocates argue that economic growth brings along a 'trickle-down' effect which in the end benefits the entire society. Wealth distribution does not play an important role in neo-liberalism. Critics of neo-liberalism believe the doctrine has led to more global economic inequality (Harvey, 2007).

Within the neo-liberal agenda, New Public Management (NPM) emerged. NPM is a public sector reform which first arose in Western states through the political impetus of Margaret Thatcher and Ronald Reagan during the late 1970s and early 1980s. In accordance with the neo-liberal preference for market forces, NPM tries to introduce the competitive component of the private sector into public administration. Supporters of NPM argue that the reform is making the public sector more effective. They often perceive public administrations as unable to respond to citizens' needs and view some public services as unnecessary and at too high a cost to tax-payers (Crouch, 2011).

Starting as a public-sector reform by westernised, in particular Anglo-Saxon, countries NPM reforms quickly spread to many other parts of the world. The internationalisation of NPM practices was caused by four main factors. Firstly, the wave of NPM consultants, business schools and advisers which travelled the world to spread the NPM doctrine is seen as a factor for the internationalisation of NPM practices. Secondly, the neo-liberal practice of advocating market liberalisation led to the adoption of neo-liberal practices of which NPM was one. Thirdly, the privatisation of certain public tasks was perceived as necessary in many countries around the world. The NPM reform was therefore often seen as a good method to modernise the relationship between the public and the private sectors. Lastly, international organisations such as the European Union, the World Bank or the IMF spread the use of NPM methods (Common, 1998). Organisations such as the World Bank, IMF or OECD began to adopt the neoliberal ideas of Hayek and Friedman during the 1970s, when their ideas began to be perceived as an answer to the failings of the Keynesian model (Crouch 2011).

In regard to Open Government Data, some advocates' encouragement for OGD practices originated from their support for NPM methods. These Open Government Data advocates were often politicians who saw Open Government Data practices as a way to expose perceived performance issues, increase competition within the public sector, and to strengthen the hand of the citizen as the customer (Longo, 2011). This way of using Open Government Data clearly reflects the beliefs from the New Public Management doctrine. With raw data accessible online, OGD can enable citizens to become 'public policy analysts' and expand the policy analytical capacity of governments (Bertot et al., 2010). These non-governmental analysts could include for example researchers in think tanks and civil society organizations, academics, journalists, or other citizens (Longo, 2011). From a NPM point of view, OGD allows the government to become more efficient through the collaboration with citizens.

With regard to the internal functioning of public administrations, OGD also provides the possibility of enhancing the flow of information within the government. States need to process large amounts of information which are transferred between many different organisations and agencies. Doing this inside the state requires access-controlled ways of digital communication and involves lots of interoperable IT systems. OGD provides an alternative to this complex and costly flow of information. By publishing data online, administrative burdens, financial costs and inefficiencies are counteracted. The data published online, needed for the inner functioning of governments, is likely not to include all areas of public administration. Security related issues, for example, are less likely to be made available. The example discussed in the empirical part of this paper is the International Aid Transparency Initiative (Schwegmann, 2012).

In sum, OGD practices are said to enhance the efficiency of governments through an enhanced flow of information both internally and externally by facilitating performance checks of the public sector by non-governmental users. It increases the pressure on civil servants and is therefore intended to improve their performance and the entire functioning of the public sector. OGD practices seem therefore to be in line with the key ideas of NPM. Some authors go as far as naming OGD a 'NPM Trojan Horse' as it allows the state to outsource policy performance or analysis tasks to its citizens and the private sector in the neoliberal tradition (Longo, 2011).

2.2.2 Distrust in government and citizen empowerment

Around the same time as the emergence of neo-liberalism in the late 1960s and 1970s, mistrust of citizens towards their governments and the democratic process began to grow across a range of countries. This increasing mistrust is partly based on the increasing

inequality caused by neo-liberalism and the accompanying shift of wealth and influence from a larger part of civil society to a smaller group of economic elites (Harvey, 2007).

Trust of citizens in their government is important because of democratic politics' condition that the citizens voluntarily comply with the legislation of the regime. This voluntary compliance could however decrease with a rising mistrust against the government. The latter could then be hampered when citizens' acceptance of the state's regulations or the compliance with tax laws diminishes. In this regard, the type of regime can play a role because citizens' rights vary across democratic, authoritarian or other political relationships (Dalton, 2004). In recent years some political leaders have therefore put an emphasis on Open Government practices to rebuild citizens' trust in government. With citizens receiving more information about how governments spend tax money and how they are trying to solve social problems, trust in government and legitimacy is meant to be increased. Furthermore, numerous authors claim that an increase in citizen insight into government processes and performance enhances the citizens' trust in them (Bok 1997; Cook et al., 2010; Hood, 2006). Other authors argue that Open Government can promote democracy (Bauhr et al., 2010) because a completely informed public is a major element of democracies (Fung et al., 2007; Fung, 2013). Conversely, critics argue that more state transparency can cause confusion and uncertainty among the public (O'Neill, 2002).

Meanwhile, social media has opened up new ways for citizens to engage with their governments. Within their Open Government initiatives, governments often assign social media a central role, in order to enhance their communication with civil society. Social media is defined as a set of online tools which are designed for social interaction (Bertot et al., 2012).

2.2.3 Coercive and voluntary Policy transfer

As mentioned in section 2.2.1, the spread of the New Public Management reforms occurred partly through international organisations by the method of policy transfer (Common, 1998). The spread of Open Government Data practices is partially caused by the same process. Organisations like the World Bank or the IMF have an interest in exporting 'best-practice' models to their member states. These organisations often have an interest in assimilating the policies of their member states. Through the adoption of certain reforms, international organisations have benefited over the years from a certain 'entrenchment of authority' which has bestowed on them some decisive interventionary powers (Held and McGrew, 1993, p. 272). This means that the authority of international organisations in their member states has increased due to the national governments' adoption of certain 'best practice' models (Held and McGrew, 1993).

Policy transfer occurs either voluntarily or coercively. A voluntary policy transfer is likely to take place when a policy from outside the sovereign state offers a better solution to a policy problem than those already at hand. Coercive policy transfer happens when one actor forces a particular policy on a government. In the case of NPM and OGD, it seems to be a case of an indirect coercive transfer, as countries have to adapt their public sector or Open Government Data practices in order to benefit by gaining membership or from funds of the organisations. International organisations impose modernising measures on their member states public sectors. In recent decades, international organisations have provided the models and standards to political elites to countries whose public sectors were perceived as not modern (Common, 1998).

The degree to which countries are willing to accept NPM reforms or OGD practices from international actors depends on the countries' degree of political freedom and democracy. Authoritarian regimes are likely to have less interest in pursuing Open Government policies than democratic ones (Malesky et al. 2012; Dalton, 2004). Former colonial links and a general international orientation of states can also lead to more acceptance for reforms offered by international organisations (Common, 1998).

2.2.4 Information and Capitalism

Open Government Data started to become a significant economic resource from the 1970s onwards, when capitalism began to become increasingly informationalised. Within this thesis, capitalism can be understood within the Marxist tradition, characterised by “private ownership, the accumulation of productive resources and the profit orientated investment by private interests” (Bates, 2012, p.18). The increasing demand for Public Sector Information from the private sector is directly connected to the 1970s economic crisis. Prior to the crisis, tripartite corporatism between the state, the industry and labour had produced a period called the ‘postwar settlement’, marked by full employment, rising living standards, state welfare systems, and so forth (Webster 2006). The post-economic-crisis period marks a period in which capitalist businesses were stuck in recession and had to find new sources of profitability. As enterprises were restructuring, the growth of information and communication technologies occurred which created a new informational mode of development. The restructuring of capitalism occurred when enterprises included Information and Communication Technologies (ICTs) in their internal structures as a new source of successful commercial activity (Castells, 2000). Therefore, the commodification of information was chosen by the private sector as the new basis for economic growth after the economic crisis. This created a need for technologies of information and tools for data accumulation, storage,

transfer and analysis of massive data sets to guide decisions in the global marketplace (Schiller, 2010). Harvey (2007) sees the neo-liberal agenda showing through in the informationalisation of capitalism. The neo-liberal belief that the entire society profits from economic growth and an accompanying increase in the reach and frequency of market transactions justified the increasing need for technologies of information and data analysis.

2.3 Empirical Evidence

2.3.1 New Public Management and Open Government Data

In many Open Government Data practices, a clear New Public Management is recognisable. In the United Kingdom, crime-related data was published by the government along with mapping software. The initiative was meant to motivate citizens to report on the security in their neighbourhood and rate the performance of their local police forces (Police.uk, n.d.). By enabling citizens to build these 'crime maps' politicians use OGD initiatives to hold police forces accountable. Another example of the influence of NPM in Open Government Data practices includes the 'YouCut' programme in the United States. The online invocation was introduced in 2010 by the Republican Party majority elected to the U.S. House of Representatives, to publish information on government spending and to encourage feedback from the public. The initiative specifically asked people to identify grants which showed questionable use of public resources. The 'YouCut' initiative can be seen as an approach to increase the government's transparency and accountability. However, it is also a way to check on public administrations to spend tax payers' money appropriately (Longo, 2011).

In countries outside of the westernised world New Public Management methods were used to enhance the functioning of public institutions. In African countries, public institutions have been decreased in size and public tasks have been outsourced. Furthermore, performance contracting became a more common method in the public sector as a measure to improve the performance of civil servants. By this attempt governments followed New Public Management methods (Common, 1998).

Open Government Data initiatives have also been introduced in order to make the flow of information within and between public bodies more efficient. The International Aid Transparency Initiative, for example, aims to make government aid spending information easier to access, use, and understand for governments and citizens in countries receiving this aid. This notably avoids laborious requests and having to reconcile information from different sources (Davies, 2013).

2.3.2 Civil Society and Open Practices

The emergence of OGD practices in a variety of countries occurred in part through a range of crises in the neo-liberal states and through a civil movement which aimed to take control from “a political and economic elite that could not be trusted” (Bates, 2014, p.391). OGD was perceived as a partial solution to a problem of neo-liberal governance, namely the perceived decline of democratic participation. This development could certainly be seen in the United Kingdom and the United States. However, also in non-Western countries the argument of OGD as an enabler of more transparency, accountability and citizen participation is prominent.

In the United Kingdom the OGD initiative data.gov.uk was launched in 2010 as a reaction to the Member of Parliament (MP) Expenses Scandal in 2009. For the British government, making evidence of abuse of the expenses system public, was part of the solution to the growing mistrust of British citizens towards its government (Bates, 2012). Other political scandals and crises which decreased the British citizens’ trust in their government include the anger regarding the invasion of Iraq (2003), the war in Afghanistan (2001–) and the relations between political, police and media elites which came to the surface after the phone hacking scandal and Leveson inquiry (2011–2012). In the United Kingdom, these events were feared to hazard the consent for the neo-liberal framework constructed by the combined forces of political, economic and media power (Bates, 2012). Therefore, the increased access to Public Sector Information was partly an attempt by the British government to reverse the fragmenting trust of citizens in government. Open Government Data practices provided a practical way to increase accountability, state transparency and participation which was seen as necessary to regenerate acceptance in the neo-liberal agenda (Worthy, 2010).

In the United States, a similar development as in the United Kingdom could be witnessed. Already during the 1970s and 1980s, the Vietnam War, urban unrest and the Watergate affair led to the decrease of trust of citizens in their political leaders. After the Bush administration, which was characterised by attacks on state transparency, Barack Obama emphasised both Open Government and Open Data (White House, 2009). Obama and his administration also contributed to the conceptual merger of the two concepts (Kirtley, 2006). While campaigning for his presidency, the then-Senator pledged to make government more open in order to win the peoples’ trust back (Robinson et al., 2013). On his first day in office, President Obama issued a call for increased openness in government and brought the Open Government Directive on the way (The White House, 2009). Afterwards, the topic of Open Government

and Open Government Data increased in importance rapidly and became a global agenda (In Lee et al., 2012).

In non-Western countries, Open Government Data initiatives are often motivated by the wish to improve transparency, accountability and citizen participation. According to Schwegmann (2012) this is especially the case in developing countries. The Ministry of Finance of the Democratic Republic of Timor-Leste publishes information on how the national budget is devised (Timor-Leste Ministry of Finance, n.d.). The government seeks to enhance its credibility and to encourage a culture of transparency which is hoped to counteract corruption in the country. Chile's government gives similar reasons for their Open Government Data website and especially underlines the possibility of strengthening democracy by making the government more accountable. Therefore, anti-corruption and democracy enhancement are important reasons for adopting open methods in developing countries. The economic and innovative potential of Open Government Data practices is perceived as less important. The latter is an important incitement for Western OGD initiatives (Schwegmann, 2012).

Furthermore, Schwegmann (2012) sees civil society organisations in developing countries as important influences for the emergence of OGD practices. She points out that many advocates for Open Government Data in developing countries originally had their roots in the movement for freedom of information or in anti-corruption activism. They provided bottom-up pressure and created incentives for governments to share information on their activities. Examples include the *Allianza Regional por la libre Expresión e Información* in Latin America. It is a network of civil rights movements across Latin America which was involved in the emergence of Open Government data in various countries. Similar civil society organisations which contributed to the spread of the Open Government Data movement include the budget-monitoring project *BudgIT* in Nigeria, the municipal e-participation projects *CiudadNuestra* in Peru, *TransparentChennai* in India, *Datos Publicos* in Argentina (Schwegmann, 2012).

In addition, in high, middle, as well as low income countries, the creation of applications based on data through programmers has led to a growing demand for Public Sector Information. A group of these programmers are so-called civic hackers. Civic hackers are people who collaborate with others to create open source solutions using Public Sector Information. They and other software producers use OGD for the development of citizen-service mobile and web applications. Hogge (2010) sees civic hackers as crucial to the emergence of OGD in the United States and the United Kingdom. These groups brought

about websites such as TheyWorkForYou.com (UK) and GovTrack.us (US). These websites provide information on peoples representatives (Members of Parliament or Senators) and what their position is on certain topics. Users who subscribe to these websites receive an e-mail when a topic of interest comes up in Parliament or Congress and can see the position of their representative on the matter. Furthermore, representatives can be contacted via e-mail on the website. The creation of further innovative applications are encouraged by so-called ‘apps for’ contests (Nichols, 2010).

2.3.3 International Organisations and policy transfer

Policy transfer played a role in the spread of NPM as well as in the distribution of OGD practices. The spread of OGD practices can be described as a trend in global politics and was influenced by international initiatives, organisations and world leaders of the most significant industrialised countries of the world, assembled under the 2013 G8 summit. At the 2013 summit, the G8 leaders signed the Open Data Charter. The Charter provides six strategic principles that the G8 states are supposed to meet. These include principles that aim to increase the quality and the interlinked re-usability of data. The first principle instructs that OGD should be Open by default, the second demands timely and comprehensive data, the third accessible and useable data and the fourth comparable and interoperable data. The fifth principle of the Charter prescribes that OGD must improve governance and citizen engagement and the last principle emphasizes OGD for inclusive development and innovation (Open Data Charter, n.d.). So far, 15 national and 25 local governments have adopted the Open Data Charter (World Wide Web Foundation, 2017a). The G8 countries have also identified 14 high-value areas in regard to Government Data. These include topics such as education, transport, health or crime. It is especially from these topic areas that should be data released (Lafayette, 2016). The summit of the most advanced capitalist states serves as a kind of ‘global directorate’ for states (Held and McGrew, 1993). The decision of the G8 to adopt the Open Data Charter in 2013 could therefore have had an effect on states OGD practices in the elapsed years.

In particular two organisations promote the adoption of OGD practices. The Open Government Partnership and the World Bank are viewed as key influences for a number of OGD initiatives covered in the Open Data Barometer (World Wide Web Foundation, 2013). The Open Government Partnership is an international initiative which aims to convince governments to “promote transparency, empower citizens, fight corruption, and harness new technologies to strengthen governance” (Open Government Partnership, n. d., n. p.). The initiative therefore largely pursues the goals behind Open Government with its ideas around

re-building citizens trust in government through access to government information and increased accountability (Robinson et al., 2012). The Partnership is led by a Steering Committee which is made up of members of the participating governments and civil society organizations. Countries can become members of the Open Government Partnership if they acknowledge the initiative's Open Government Declaration, deliver a country action plan developed with public consultation and commit to independent reporting on their progress going forward. Implementation of these action plans is then reviewed by an Independent Review Mechanism, creating a light-touch monitoring. The founding declaration of the Open Government Partnership frames an explicitly technological vision of Open Government, highlighting a desire to create new technologies to deliver better government. Although the OGP Declaration does not explicitly mention Open Data, commitments to Open Data have been among the most popular made by governments (Davies, 2014). The initiative was established by Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the United Kingdom and the United States in 2011. Since then, 67 additional governments joined the partnership. (Open Government Partnership, n. d.)

Open Government Data initiatives are often funded by international donors. Often, these donors make their allocations dependent on certain standards in the receiving country, such as good governance, accountability and transparency. The World Bank, as well as other bilateral donors, encourage the creation of OGD websites in their partner countries (Davies, 2013). The Bank opened its own Open Data portal in 2010 and supported the first member state's initiative in 2011. Kenya was the first country to receive funds from the Bank in return for setting up an OGD initiative. Since then the World Bank has continued to facilitate financial and technical assistance for OGD initiatives, particularly in low income countries. Furthermore conferences, events and Webinars are organised by the Bank mediate the idea of OGD (Rahemtulla et al. 2012; Majeed 2012). The World Bank's financial support for Open Government and the publication of Government Data is motivated by the idea of exporting 'best practices' (Davies, 2014). Other international organisations donating to OGD initiatives in low income countries are the International Aid Transparency Initiative, the Food and Agriculture Organization of the United Nations and the African Development Bank. (Schwegmann, 2012).

In addition, international ratings of aid receiving countries pressure countries to adopt OGD practices. These include ratings by the Open Budgets Initiative, Global Integrity, Transparency International and the Open Data Census. In other cases, OGD initiatives are formed due to market or business pressures, as foreign investor's choice to invest in a country

is partially affected by a country's degree of state transparency (Davies, 2013). Lastly, some states that adopt OGD practices are aiming to improve their reputation in the world. By setting up a website for publishing Government Data, states try to increase their transparency and accountability while the political costs of such measures are rather low. Therefore, there is a risk that OGD practices are only adopted for reputation gains. A lack of wider public-sector reform and a low quality of published data can be indicators for an OGD initiative that has been primarily established due to reputational concerns (Schwegmann, 2012).

2.3.4 Commercialisation of Open Government Data

Since capitalism started to become increasingly informationalised in the 1970s, Public Sector Information has developed into a significant economic resource for the private sector. Seeing the economic potential of re-using Public Sector Information and thereby producing new products, the private sector influenced the increasing release of PSI. American businesses started re-using public information on demographics in the 1970s to conduct business research and to design effective strategies (Russell, 1984). In the following years, private businesses became increasingly dependent on PSI and pressured the government into releasing information for free, treating its PSI as a commercial good (Smith, 1985). The information industry in the U.S. was a pioneer in these practices and organised their interest in PSI in the Information Industry Association. The association already counted 650 businesses as members by 1995 and represented the demand for data collection and information production. For example, the Information Industry Association worked closely together with the U.S. government in the production of new and more complex land information databases in the 1990's (Grupe, 1995). It is likely that in the years since then, similar processes have been taking place, highlighting how potential private sector demand shaped data collection and information production of governments. Furthermore during President Obama's election campaign, the Silicon Valley provided major support for the former president, both through funding and logistical support which included a web-based fundraising machine. The technology and internet industry based in the Silicon Valley were in support of Obama's plans of an increased Open Government model in the United States (Robinson et al., 2013).

On a European level, interest groups such as the PSI Alliance, founded in 2008, represents the information industry. Members of the group include the navigation service provider TomTom and the legal information provider LexisNexis, with Google having held membership since 2009 in the PSI Alliance. The goal of the PSI Alliance is to encourage public administrations to release Public Sector Information for free and make it re - usable in

order to enable companies to create innovative products (Aubert, 2009). Historically speaking, the private sector has started to demand the release of Public Sector Information far earlier than when data advocacy discovered open methods as a means to achieve transparency, accountability, civic participation and more democracy.

2.4 Conceptual Model & Hypotheses

This section of the paper provides the Conceptual Model, showing the relationship between the independent variable and the dependent variable. Furthermore, hypotheses are formulated based on the findings of the literature review. The hypotheses provide hypothetical answers to the central research question and will be tested in Chapter 4.

2.4.1 Conceptual model

The conceptual model shows the four independent variables in the square frames and the dependent variable in an oval frame. The model is supposed to visualise how these four independent variables affect the emergence of Open Government Data practices in countries around the world.

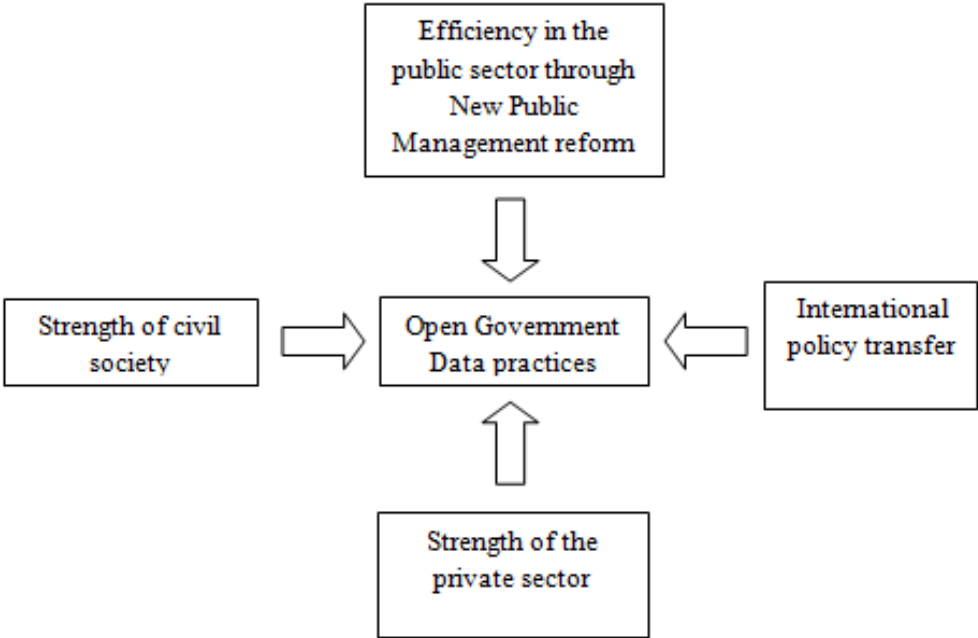
The New Public Management doctrine aims to bring the competitive component of the private sector into public administration in order to make civil servants and services more effective. Effective public administrations, that have most likely partially internalized the competitive component of the private sector within their organisation, are expected to follow the logic of the OGD agenda: Making public services more effective through the publishing of public sector decisions (Longo, 2011). A public sector coined from the NPM agenda can therefore be expected to put an emphasis on efficiency and is therefore more willing to include OGD practices.

OGD practices were partially introduced by political leaders in response to decreasing trust in government and demand for greater transparency (Cook et al., 2010). The ability of a civil society to make their wish for more transparency known, or the strength of the civil society, is therefore expected to have an effect on a country's Open Government Data practices.

Countries which are members of international organisations often adopt policies which are perceived by the organisation as 'best practice' models. This policy transfer either occurs voluntarily or coercively and has contributed to the spread of NPM and OGD practices around the world. (Held and McGrew, 1993; Common, 1998; Schwegmann, 2012). Therefore, membership in international organisations and the connected policy transfer is expected to have an effect on countries' OGD practices.

With businesses increasingly becoming dependent on public sector information and pressurising the government into releasing information for free, the private sector has played its role in the development of OGD practices around the world (Grupe, 1995). Private sectors which were highly developed and especially well organized, for example in business organizations, were able to receive the valuable commercial commodity of PSI. A strong private sector is therefore expected to have the demand for PSI in order to improve its products and services and build the capacities necessary to form interest groups or other instruments to engage with the public sector. Therefore, a strong private sector is expected to have an influence on a country's OGD practices.

Figure 2: Conceptual Model



2.4.2 Hypotheses

In order to answer the main research question, four hypotheses have been formulated. The first hypothesis refers to the performance of public sectors. Given the previous theoretical and practical remarks, this research argues that the economic crisis of the 1970s led to rising support for the neo-liberal agenda, which gave rise to the New Public Management doctrine and eventually mobilized support for OGD practices. Countries which have used the NPM doctrine to make their public sectors more effective can be expected to adopt OGD practices, as well. OGD would allow them to increase the checks of their civil servants and to expand their policy analytical capacity (Longo, 2011). The hypothesis for public sector performance variable therefore argues, the higher the public sector performance (X_1) in a country, the better the OGD practices (Y).

With the rise of neo-liberalism in the late 1960s and 1970s, shift of wealth and influence from a larger part of civil society to a smaller group of economic elites occurred which in turn increased mistrust of citizens towards their governments across a range of countries (Harvey, 2007). As trust of citizens in their government is necessary in order to make citizens voluntarily comply with legislation of the regime, political leaders have put an emphasis on Open Government practices to rebuild citizens' trust in government. The type of regime can play a role in whether citizens demand OGD practices, because citizens' rights vary across democratic, authoritarian or other political relationships (Dalton, 2004). As OGD practices were introduced by political leaders as a reaction to the demands of civil societies for more government transparency, the strength of the civil society is expected to have an effect on the Open Government Data practices of a country. The second hypothesis therefore states, the stronger the civil society's position in a country (X_2), the better the OGD practices (Y).

Similarly to the spread of the New Public Management reforms, the spread of Open Government Data practices is also partially caused by policy transfer of international organizations (Common, 1998; Schwegmann, 2012). Organisations like the World Bank or the IMF have an interest in assimilating the policies of their member states and try to transfer 'best practice' models either voluntarily or coercively (Held and McGrew, 1993). Therefore, the hypothesis for international policy transfer states that engagement with international actors which promote the use of Open Government Data (X_3) has a positive effect on a countries performance in OGD (Y).

The increasing importance of data in the economy has created a data-driven socio-economic model. Starting in the United States, large private businesses discovered Public Sector Information as a significant economic resource (Russell, 1984). These companies were in need of this data in order to conduct business research and to do economic planning and they pressured their governments to release more public data (Smith, 1985). Business interest groups were formed which represented their members demand for PSI in the Information Industry Association (Grupe, 1995). Later, technology and internet industry based in the Silicon Valley tried to enhance the access to PSI supporting election campaign of President Obama, who favoured an increased Open Government model (Robinson et al., 2013). This research therefore argues that in states with strong private sectors, demand arises for free Government Data. The stronger the private sector, the higher the demand for OGD. As the economic development of a country will be measured in this research using the level of GDP per capita, GDP per capita is used for operationalising the respective independent variable.

The hypothesis for the strength of the private sector variable therefore states, the stronger the private sector (X4), the better the OGD practices (Y).

Table 2: Dependent and independent variables

Dependent Variable	Authors	Effect on OGD practices
Open Government Data performance measured by Open Data Barometer	World Wide Web Foundation, 2017a	-
Independent Variables	Authors	Effect on OGD practices
Public sector performance	Longo, 2011	NPM reform aimed for more efficiency and brought about OGD practices.
Strength of civil society	Robinson et al., 2013	Pressure from civil society persuaded states to adopt OGD.
International policy transfer: Membership in the Open Government Partnership and receiving of World Bank funds	Davies, 2014	OGD practices expand through policy transfer of through international organisations. Funding from the World Bank motivates states to adopt OGD practices
Strength of private sector: GDP per capita	Grupe, 1995	The emergence of PSI as a valuable economic resource has advanced OGD practices.

3 RESEARCH DESIGN

The third chapter of this research aims to answer the second sub-question. The question asks in what way can all variables be operationalised and possible relationship analyzed? This chapter, therefore, outlines the choice of the research design, the empirical method, the sample used in this research as well as the operationalisation of all variables.

3.1 Cross sectional observation design

The research design of this paper is a cross-sectional observational design. The chosen design examines the connection between an independent (X) and dependent variable (Y) at a specific point of time. In this paper, the cross-sectional observational analysis investigates the connection between a country's Open Data performance (Y) and different factors having a potential impact on it (X). The chosen year for the cross-sectional observational analysis is 2016. This point of time was chosen because the Open Data Barometer report was published in this year. The data which is used to operationalise the independent variables stems from 2015. This year was chosen to ensure that the data has an effect on the Open Data Barometer scores from 2016. A cross-sectional design is able to discover patterns of association between the independent variables and the dependent variable. The chosen research design also allows the use of multiple independent variables. This research makes use of statistical instruments to check whether co-variation exists between the independent variables and OGD practices. Quantitative methods were chosen because a qualitatively approach would make it very difficult to assess the OGD practices in a large amount of countries (Kellstedt & Whitten, 2013).

As mentioned before, previous studies have exclusively described the emergence of OGD practices qualitatively. These studies used co-variation or congruence research designs to analyse the emergence of Open Government Data practices in single countries. For this research these qualitative research methods could have been chosen as well. A small-N qualitative co-variation case study for one or a group of countries could have given an idea about a countries' motivation for adopting OGD practices. However, as this research aims to provide a global comparison of countries' OGD practices, this approach would have been too restricted. Furthermore, for a qualitative study the conduction of interviews with relevant government representatives would have been necessary, which would have depicted an obstacle for this research.

3.1.1 Empirical Method

The multiple linear regression model was chosen as an empirical method for this research because it allows the use of multiple independent variables on a single continuous dependent variable. Hereby the independent variables are used to predict the changes of the dependent variables (Field, 2018).

3.1.1.1 Multiple linear regression analysis

The statistical test applied in this research, which is used to examine the possible relationship between the independent variables (Xs) and the dependent variable (Y), is a multiple linear regression model. A multiple linear regression analysis stems from the linear regression model which concentrates on the relationship between a dependent and independent variable. A multiple linear regression analysis adds at least more than one independent variable to the linear regression model (Field, 2018). The formula of a multiple regression analysis, with four independent variables, looks as follows:

$$\text{Outcome} = (b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4) + \text{error}$$

With this equation an outcome variable can be predicted. The four Xs in the equation are the predictor variables and the bs are the parameters. The parameter gives the researcher an idea about the relationship between the predictor and the outcome variable. The error variable is included in the formula as the model will most likely not predict the outcome perfectly. The acronyms for the dependent variable and the independent variables of this research are the following.

OGDP Open Government Data performance

PSP Public sector performance

SCS Strength of civil society

IPT International policy transfer

SPS Strength of private sector

When adding the dependent and independent variables, the multiple linear regression formula of this research looks as follows:

$$\text{Outcome} = (b_0 + b_1PSP_1 + b_2SCS_2 + b_3IPT_3 + b_4SPS_4) + \text{error}$$

3.1.1.2 Assumption of a multiple linear regression

When conducting a multiple linear regression analysis, it is necessary to test the data in order to make sure that the data can be analysed in the regression analysis. Multiple assumptions have to be tested before the multiple linear regression analysis can be conducted. The first assumption contains the necessity that the variables should be measured as ratio or interval figures. The second assumption states that the sample of cases must be large enough. The third one includes the assumption of no multicollinearity, which means that observations have to be independent and cannot correlate with each other. The fourth assumption relates to variance of the data and is referred to as homoscedasticity. The fifth assumption tests whether a linear relationship exists between the dependent variables and the independent variables. Such a relationship has to be at hand at a multiple linear regression analysis. The sixth assumption states that there should not be significant outliers, high leverage points or highly influential points. And the last assumption asks whether the variables are normally distributed (Field, 2018). Chapter 4.2 tests whether the assumptions are met.

3.2 Population & Sample

This research uses a country sample which includes the countries that are listed in the Open Data Barometer report from 2016. The 4th Open Data Barometer report examines the OGD practices of 116 countries. Due to the absence of data on other indicators, Palestine and Kosovo have to be excluded from the sample (World Wide Web Foundation, 2017a). Therefore, the country sample of this research counts 114 countries (N=114).

3.3 Operationalisation

In this section the variables of this research are operationalised, in order to perform a regression analysis. This section aims to explain which measures are used to operationalise each variable. The data which is used to operationalise the dependent variable stems from 2016. The independent variables were operationalised with data from 2015 and before.

3.3.1 Dependent Variable

The dependent variable of this research stands for a country's practice in the Open Government Data. How good or bad countries OGD practice is, reveals the Open Data Barometer. In this research, the 4th Open Data Barometer report from 2016 provides the data for operationalizing the dependent variable (World Wide Web Foundation, 2017a). In this section of the research the compilation of the Open Data Barometer is outlined followed by a summary of the main findings of the report.

The Open Data Barometer is annually produced by the World Wide Web foundation, the Open Data for Development network and the Omidyar Network. The Barometer examines the readiness for Open Data initiatives, the implementation of Open Data programmes, as well as the impact that Open Data is having on business, politics and civil society. Each participating country is receiving a score for their readiness, implementation and impact of Open Data. These three scores are brought together in a single score, ranging from 0 to 100. The three categories of the Open Data Barometer and with which data sources they are assessed can be seen in Table 3.

Table 3 The Open Data Barometer’s categories & data sources

Open Data category	Data source	Explanation
Readiness	Peer- reviewed expert survey responses	Interviews with trained country specialists
	Secondary data	International organisations’ expert surveys
Implementation	Government self-assessments	Interviews with trained country specialists
Impact	Dataset assessments	Investigation of 15 key data sets

The Open Data Barometer is built through data from government self-assessments, peer-reviewed expert survey responses, detailed dataset assessments and secondary data. All the data for the 4th Open Data Barometer report were brought together in 2016. The government self-assessments were conducted via a questionnaire. This self-assessment of the governments constitutes partly the implementation of Open Data programmes section of the Barometer. The peer-reviewed expert surveys were produced through interviews with trained country specialists about the Open Data situation in a specific country. Questions can score points on a scale from 0 to 10. The detailed dataset assessment consisted of an investigation of 15 data sets. The availability of which is viewed as a necessity for good Open Data practices. From the dataset assessment, conclusions on the impact that Open Data is having can be made. The dataset assessment constitutes the availability section of the Barometer. The secondary data analysed in the Barometer stems from independent expert surveys of the World Economic Forum, the Freedom house, the United Nations Department of Economic and Social Affairs and the World Bank’s data on internet use. Together with the analysis of the peer reviewed

expert surveys, the secondary data makes up the Readiness section of the Barometer (World Wide Web Foundation, 2017b). In the 4th Open Data report 116 countries received such a score. 114 of them are considered in this research.

The Open Data Barometer was chosen for operationalising the dependent variable of this research because it is the only source that assesses the quality of countries' Open Data performance. The disadvantages of the source are its limited sample of countries. An advantage of the index is its focus on governments and their measures to provide Open Data. This focus is in line with the core of this research of investigating the factors influencing governments in their OGD practices. Even though the Open Data Barometer does not use the word 'government' in its name, they are supervising the access to Government data in their report.

The authors of the Open Data Barometer find that governments should make a greater effort to release non-personal government data automatically, in machine-readable formats, and made available in a form that allows for re-use. The report also states that governments have to improve the quality of datasets which are often incomplete, out of date, of low quality, and fragmented. In public administration it is often unclear who is tasked with the overall open data management and publication of datasets. Therefore, governments should revise their OGD governance approach and include automated data publication processes in their IT systems. This would guarantee up-to-date datasets. Furthermore, the adoption of sustainable OGD practices beyond political mandates is seen as key for countries' successful OGD practices. Oftentimes, when countries experience political change, OGD programmes can get pushed into the background. In countries like Costa Rica, Ecuador, and Rwanda a positive progress was achieved on OGD but the lack of further government action dried the initiatives up. Therefore, it is important that countries translate their political will for OGD into strong legal and policy foundations. Countries like Canada, Mexico, Japan and Korea have done so and could continuously improve their Barometer rankings. In addition, the Barometer report advises countries to publish the data which is needed to restore the citizens' trust in their governments. Datasets which people most need, for example data on budget, spending, contracting, and company registers, are often the datasets which are least open. The Barometer recommends that governments consult citizens and intermediaries in order to find out which datasets have priority for citizens and to address their problems and improve public services. Intermediaries could include community organisations or the media. The last finding of the Barometer touches upon the inclusion of marginalised groups through OGD practices. The Barometer finds that groups with lower income or less political power are often not taken

into account in regard to OGD. For example, women are often less visible in datasets, they have worse access to the internet compare to men, they are less likely to be consulted on the design of data initiatives and they are under-represented among the ranks of data scientists. The Barometer therefore recommends consulting marginalised groups when designing new OGD initiatives and to differentiating within datasets by sex, income level, or age. This would improve the analysis of diversity in societies. The Open Data Barometer report therefore concludes that governments should invest in internet access for marginalised groups and in the processes that enable marginalised groups to participate in policymaking (World Wide Web Foundation, 2017a).

3.3.2 Independent variables

The independent variables are derived from the four main influencing factors on OGD practices discussed in the literature. These contain of public sector performance (X_1), strength of civil society (X_2) international policy transfer (X_3) and strength of the private sector (X_4).

3.3.2.1 Public sector performance

The first independent variable used in this research is public sector performance. The hypothesis which is tested with the independent variable of public sector performance is the following: The higher the performance of the public administration (X_1), the better the OGD practices (Y). To operationalise this variable, the data is used from the World Bank's Worldwide Governance Indicator Government Effectiveness. The Worldwide Governance Indicators include in total six dimensions of governance. In this research the indicators of government effectiveness and voice and accountability are used (World Governance indicators, n.d.). The public sector performance variable is operationalised with the government effectiveness data from 2015. The Government Effectiveness indicator expresses the "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies" (Worldwide Governance Indicators, n.d, n.p.). This indicator can be used to operationalise the independent variable of public sector performance as the indicator considers the overall performance of the public sector, by assessing the quality of public services and the civil servants. NPM reforms in turn aim to improve the delivery of public services and to make public servants more efficient. Within the NPM doctrine, a major emphasis is put on efficiency which describes the ability of doing things well while at the same time not wasting materials, energy, efforts, money, and time (Longo, 2011). In turn, the term effectiveness is

rather characterized by how well the public sector functions and how good the overall quality is in general. However, for the purposes of this research, the Government Effectiveness indicator seems adequate to operationalise the independent variable of public sector performance. Furthermore the other scope of the indicator, touching on civil servants' independence from political pressures, policy formulation and implementation and government commitment of implementation are also relevant for the independent variable. The estimate of Government Effectiveness is measured from -2.5 (weak) to 2.5 (strong) (Worldwide Governance Indicators, n.d.).

3.3.2.2 Strength of civil society

In addition a second hypothesis is tested for the independent variable of transparency and civil society. As mentioned before, the rise of OGD practices have often been described as an attempt to enable citizens to hold their governments accountable (Robinson et al., 2013). The hypothesis therefore states the stronger the civil society's position in a country (X_2), the better the OGD practices (Y). This variable is operationalised with the voice and accountability index of the World Bank. The voice and accountability index is part of the Worldwide Governance Indicators project of the World Bank. The data stems from the year 2015 in order to detect a possible effect on the Open Data Barometer scores. It displays the "perceptions of the extent to which the citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media" (Worldwide Governance Indicators, n.d., n.p.). Different indexes were used in order to build the voice and accountability indicator. These indexes include among others the Democracy Index, the Political Rights Index and the Freedom of Press index. The data is also provided by a number of non-representative sources. They include for example surveys on Trust in Parliament or the Satisfaction with democracy. A choice of the data sources which provide the indexes are the *Afrobarometer*, *Bertelsmann Transformation Index*, *Economist Intelligence Unit Riskwire & Democracy Index*, *Latinobarometro*, *Reporters Without Borders Press Freedom Index*, or the *World Justice Project Rule of Law Index*. The Voice and accountability Index ranges from -2.5 to 2.5 (Worldwide Governance Indicators, n.d.).

3.3.3 International policy transfer

The third independent variables of this research refer to international policy transfer. The hypothesis states that engagement with international actors that promote the use of Open Government data, (X_3) has a positive effect on countries' performance in OGD (Y). By international actors the Open Data Partnership and the World Bank are meant. As shown in

the literature review, both promote the use of OGD practices around the world. The variable of international policy transfer is composed of these two elements to measure the effect on international policy transfer on low, middle and high income countries. The World Bank funds measure the policy transfer for low and middle income countries, whereas the membership measures policy transfer for high income countries.

Since countries have to fulfil certain transparency standards and deliver an action plan for reporting on their progress with Open Government, the majority Open Government Partnership members are high income countries. In total 75 countries joined the Open Government Partnership. Since the foundation of the organisation in 2011, the participating countries have made 2,500 commitments in order to build more open and accountable governments (Open Government Partnership, n. d.). A membership at the Open Government Partnership is therefore considered to have an effect on OGD practices. This research attaches the countries which joined the Open Government Partnership before or in 2015. Consequently, the effect of membership on the countries OGD practices from 2016 is assessed. Therefore 67 countries are considered to meet the criterion of international policy transfer.

The report ‘World Bank support for Open Data 2012-2017’ (World Bank, n.d.d) publication names the International Bank for Reconstruction and Development (IBRD), International Development Association (IDA) as the Bank’s main sources of Open Government Data funding. Both financial institutions are member of the World Bank group. The IDA provides mainly loans and grants to the poorest countries. The IBRD gives mainly loans to middle income countries. This research therefore makes use of the development aid of the IBRD and the IDA for the years of 2013, 2014 and 2015, in order to determine whether the World Bank funds have an effect on OGD practices. The series used are derived from the World Bank’s World Development Indicator database and include IDA grants (Current US\$), PPG, IDA (DIS, current US\$) and PPG, IBRD (DIS, current US\$). PPG stands for public and publicly guaranteed debts and DIS for disbursements. The IDA grants are payments of grants for low income countries. The IDA disbursements are concessional loans. Concessional means that these loans are given on more generous terms than common on the market. As they are public and publicly guaranteed loans, the state, respectively its tax payers are guaranteeing for the payment of instalment and interest. IBRD disbursements are also public and publicly guaranteed debt, but they are non-concessional (World Bank Group, n. d.). Like the IDA grants, IDA disbursements and IBRD disbursements are only received by low and middle income countries, this variable is expected to have especially an effect on this group of countries. Even though recipients of the funds use the money in a variety of fields, it can be

expected that a part of the funds are used for the financing of OGD initiatives. At least IDA and IBRD are named as main financial sources of OGD projects (World Bank Group, n. d.). This research therefore expects that the funds stand in a relation with countries' OGD practices. Whether a country received World Bank funds is investigated for the years 2013, 2014 and 2015. The reason behind this is that the Bank supported the first member states OGD initiative (Kenya) in 2011. Two years after the initial start of OGD support, it can be expected that in 2013 the World Bank extended their funds for OGD practices to other countries.

In order to operationalise the membership at the international policy transfer variable, a dummy variable is used. Countries which became members at the Open Government Partnership and/or received World Bank funds receive a 1. Countries which are no members and did not receive funds get a 0.

3.3.3.1 Strength of private sector

As mentioned before, private sectors of many countries are in need of digital data in order to fuel their data driven economies. Therefore, the level of development of an economy plays a role in the demand of this data. A higher developed economy is expected to need more digital data and tries to take full advantage of Big Data and OGD developments. As the development of economies can be measured by the Gross Domestic Product (GDP) per capita level, this indicator is used as an independent variable in this research. The indicator is provided from the World Bank and consists of the GDP of a country, divided by the number of people in the respective country (World Bank, n.d.b). GDP per capita is used in this research to operationalise the strength of private sector because it shows the performance of a country and is therefore very much suited for comparison. The GDP per capita scores from 2015 are used in order to measure the effect on the Open Data Barometer results from 2016. An increase in a country's GDP per capita usually signals a growth in the economy. The hypothesis which was formed within the frame of this independent variables states the stronger the private sector (X_4), the better the OGD practices (Y). However, even though GDP per capita can be used as an indicator for economic development, it provides limited information on the level of industrialization or the amount of technological infrastructure of a country. These indicators could have an effect on the private sector's demand for OGD. This circumstance is considered as a limitation of this research and will be discussed in section 5.2. Furthermore, Venezuela did not offer a GDP per capita score for 2015 to the World Bank's data bank. The strength of the private sector variable therefore only counts 113 instead of 114 cases.

3.3.4 Operationalisation Table

An overview of the operationalisation of the variables can be found below.

Table 4: Operationalisation Table

Dependent variable	Measurement	Level of measurement	Time	Source
OGD Practices (OGDP)	Open Government Barometer ranking from 0 (weak) to 100 (strong)	Ratio	2016	Open Data Barometer
Independent variable 1	Measure	Level of measurement	Time	Source
Public sector performance (PSP)	Government effectiveness ranging from - 2.5 (weak) to 2.5 (strong)	Ratio	2015	World Governance Indicators World Bank
Strength of civil society (SCS)	Voice and Accountability ranging from - 2.5 (weak) to 2.5 (strong)	Ratio	2015	World Governance Indicators World Bank
International policy transfer	Membership in the Open Government Partnership organisation; Funds received from IDA/ IBRD Disbursements	Nominal 1 if either or both are present and 0 otherwise	2015; 2013, 2014 & 2015	Open Government Partnership; World Bank
Strength of private sector (SPS)	GDP per capita (current US\$)	Ratio	2015	World Bank

3.3.5 Reliability and validity of the research

The quality of a research is conditioned on the reliability as well as on the internal and external validity factors. Whereas internal validity addresses the degree to which results of a

research are caused by the independent variables, external validity describes the extent of which a study can be generalized.

The internal validity was tried to be enhanced in this research through the inclusion of multiple independent variables and checks on co-variation. When allocating the independent variables of this research, it was made sure that the variables are based on previous research in the literature. The research design allows the use of multiple independent variables, which is also hoped to increase the internal validity. When operationalising all variables, this research aimed to find the highest possible accordance between the index and the variable, which proved to be easier for some variables than for others. For example the dependent variable of Open Government practice could be sufficiently operationalised through the data Open Data Barometer. The independent variable of public sector performance was however more difficult to operationalise. The variable contains the idea that the New Public Management doctrine aimed for more efficiency in public sectors around the world and therefore contributed to the emergence of Open Government Data practices. The government effectiveness indicator, used to operationalise public sector performance, is an appropriate fit to the variable even though the idea of effectiveness concerns the overall functioning of the government and not in particular its efficiency. For other variables the match with their indicators is better, for example for the strength of civil society variable (from the voice and accountability indicator).

External validity would have been increased in this research if the country sample includes all countries. However, only 114 cases could be included due to the absence of data. 114 countries represent more than half of the world countries which allows a certain degree of generalization.

The concept of reliability is closely related to the validity of the research and comprises the quality, the consistency and the representativeness of a research. A research which uses reliable sources, and indicates detailed reporting on all steps, can increase its reliability. If these factors are given in a research, its repeatability increases. This research used reputable sources such as the World Bank's World Development Indicators or the Worldwide Governance Indicators, in order to increase its reliability. Furthermore, this research is the first quantitative study on the emergence of Open Government Data Practices around the world. The question to what extent it can serve as a ground stone for further quantitative research on OGD practices is mentioned in the limitations.

4 ANALYSIS

This section of the paper aims to answer the last sub-question which states: What are the results of the analysis? Before starting with the regression analysis, the descriptive statistics section provides information on the variables of this research. The chapter then turns to the discussion of the assumptions that have to be fulfilled for a multiple linear regression analysis. Afterwards the selection of the model will be discussed, followed by the results of this research and an interpretation of the results.

4.1 Descriptive Statistics

Descriptive statistics outline the character of the variable by describing the mean, the median, the range and the standard deviation. They aim to explain the nature of the dependent variable and independent variables. In this section the descriptive statistics are discussed and its data is provided in Table 5. The descriptive statistics for the transformed variables and the respective histograms can be found in Appendix III.

The comparison of mean and median gives an indication of whether the values of the variables are normally distributed. A mean indicates the average score of a variable's total observations and the median is the middle score of a variable, when the data is ordered according to its size. Variables are normally distributed when there are no significant outliers within the dataset and the mean and median of a variable are more or less equal to each other. If the mean is not equal to the median, the variable is said to be skewed (Field, 2018). The mean and median values lie relatively close to each other except for OGD practices and the strength of the private sector. The mean of OGD practices adds up to 32.374 and its median to 27.150. For the strength of the private sector variable the mean is 15085.827 and the median 6150.156. These two variables have to be transformed. Further information to the transformation of variables can be found in section 4.2.1.6 on Normal Distribution.

The standard deviation shows how closely or loosely values are clustered. Thereby a high standard deviation indicates that the values are spread. A low one suggests the values are not spread. The closer the standard deviation lies to 0 the lower is the spread of values. Looking at the data, it is noticeable that OGD practices (23.728) and strength of the private sector (18934.558) are strongly spread. The rest of the values are close to 0 and are therefore not very spread.

The remaining two columns in the table display the variables levels of skewness and kurtosis. These two measures provide information about normal distribution of the variables and are therefore discussed in section 4.2.1.1.

Table 5 Descriptive Statistics

In- /dependent Variable	N	Mean	Median	Minimum Statistic	Maximum Statistic	Standard Deviation	Skewness	Kurtosis
OGDP	114	32.374	27.150	.000	100.000	23.728	.813	-.150
PSP	114	.185	.112	-2.020	2.240	.967	.249	-.757
SCS	114	.106	.150	-1.840	1.690	.920	-.145	-.948
IPT	114	.820	1.000	.000	1.000	.382	-1.730	1.009
SPS	113	15085.827	6150.156	362.660	82016.02	18934.558	1.587	1.693

4.2 Testing the Assumptions

In this section of the paper the assumptions of the multiple linear regression model are tested. The assumptions have to be tested because they show whether the chosen regression method fits the data. Furthermore, only if the assumptions are met, the regression model allows researchers to appropriately test the hypothesis (Field, 2018).

4.2.1 Measurement and size of variables

The first and second assumptions are met for the research's country sample. The Operationalisation table (4) shows that the data of this research is measured on a ratio or nominal level. The second assumption asks for a sufficient size of the sample in order to conduct a multiple regression analysis. A threshold of cases needed for a multiple linear regression analysis lies around 100 cases (Field, 2018). This research is using a sample which includes 114 cases. The size of the sample is therefore sufficient.

4.2.1.1 Normal Distribution

The last assumption considers the normal distribution of the variables. In this research normal distribution is determined by testing whether the variables show indicators of skewness and kurtosis. Both are indicators of not-normal distribution and refer to the location of the data on the scale (skewness) and to the height (flat or peaked) of the distribution (kurtosis). In a normal distribution the skewness lies closely to 0. In regard to skewness, positive numbers indicate that the data is skewed to the left (high end) of the scale and negative ones indicate skewness to the right (low end). The further away a number away from 0, the more likely is a not-normal distribution of the variables. For kurtosis, numbers must also be close to 0. Lower numbers are indicators for flat distributions and higher ones are indicators for a peaked one. In order to indicate whether the data is normally distributed, the mean and median can also be considered, as they indicate possible outliers in the dataset. A mean score which is more or less equal to a median score can be another indication for

normally distributed data (Field, 2018). Should kurtosis and skewness be present and the mean and median not be roughly equal to each other, the data of the respective variable have to be transformed.

Two variables had to be transformed in this research, namely Open Government Data practice (Y) and strength of the private sector (X4). Both variables showed large positive skewness levels. According to Field (2018), three types of data transformations can be applied to correct a positive skew: a log transformation is taking the logarithm of the data. A square transformation is taking square root of the scores, while the reciprocal or inverse transformation is dividing each number by 1.

Without a transformation, the skewness level of the OGD practices variable amounted to .813 and the kurtosis level to -.150. When the log transformation was applied, the skewness changed to -1.368 and the kurtosis level to 3.265. After the square transformation the skewness level amounted to .020 and the kurtosis level to -.519. The reciprocal transformation made the skewness level increase to 9.390 and kurtosis to 94.267. The mean, median, skewness and kurtosis scores of the transformed OGD practice variable can be seen in table 6.

As the table shows, the square root transformation offers the highest improvements to the variable. The mean and median are nearly identical after the square transformation, with the mean adding up to 5.300 and the median to 5.210. Before the transformation the mean of the OGD practices variable was 32.374 and the median at 27.150. The skewness level decreased from .813 before the transformation to .020 after. The kurtosis score moved from -.150 to -.519 and therefore departs from the ideal kurtosis value of 0. However, the skewness and kurtosis level of the square transformed OGD practices variable lie closer to 0 than the untransformed variable and offer better values than the skewness and kurtosis scores of the log and reciprocal transformation. The fact that the kurtosis level of the square transformed ODD practices variable decreased after the transformation will however also be discussed in the limitations of this research.

Table 6 Transformation of the OGD practices variable

Transformation	Mean	Median	Skewness	Kurtosis
Log	3.156	3.316	-1.368	3.265
Square root	5.300	5.210	.020	-.519
Reciprocal	.0982	.0363	9.390	94.267

The strength of the private sector variable possessed a skewness level of 1.587 and a kurtosis level of 1.693, before the transformations. When the log transformation was applied,

the skewness improved to $-.066$ and the kurtosis level to -1.077 . Both scores could therefore move closer to 0 through the log transformation. The original mean of the strength of the private sector variable lay at 15085.827 and the median at 6150.156. After the log transformation the mean and median are nearly identical, with the mean adding up to 8.735 and the median to 8.724. The square and the reciprocal transformation proved to be less efficient in changing the strength of the private sector variable. The kurtosis level of square transformation is better than log transformation. However, the histograms in the Appendix II show that the log transformation worked best in transforming the data. Therefore, the log transformation was used to correct the positive skew of the strength of the private sector variable.

Table 7 Transformation of the strength of private sector variable

Transformation	Mean	Median	Skewness	Kurtosis
Log	8.735	8.724	$-.066$	-1.077
Square root	101.162	78.423	$.875$	$-.319$
Reciprocal	$.0004$	$.0002$	1.874	3.329

In addition to Fields (2018) three recommended transformations, this research also tried to correct the positive skews by a raise to the power of $^{\wedge}0.25$ and $^{\wedge}0.5$ transformations. This way of transforming variables stems from the Box-Cox transformation model (Boc et al., 1964). A raise to the power of $^{\wedge}0.25$ transformation could not sufficiently improve the variables. For the OGD practices variable, the power of $^{\wedge}0.5$ transformation gave the exact same results as the square transformation. This was seen as proof that the square transformation was appropriate to transform the OGD practices variable. The strength of the private sector variable could only be corrected by the log transformation. The Appendix III shows the histograms of the transformed variables.

4.2.1.2 Linearity

As mentioned before, in a multiple linear regression analysis, a linear relationship between the dependent and the independent variable needs to exist. The assumption of linearity can be tested by analysing scatterplots. A linear relationship is likely to exist between the dependent and independent variable if the scatterplot shows a horizontal band. Otherwise the relationship is likely to be non-linear. The scatterplots of this research can be found in Appendix IV. And the scatterplots show the relationships between the dependent and independent variables can be regarded as linear.

4.2.1.3 Homoscedasticity

Homoscedasticity refers to the variance of the error term. The assumption requires that the error term must be constant for each observation. This means that residuals are equal for all values of the predicted dependent variable. Homoscedasticity is assessed by visual inspection of the scatterplots. A scatterplot is homoscedastic if the size of error terms stays constant when moving up the scatterplot without increasing or decreasing. If the error terms vary increase or decrease, no homoscedasticity would be at hand (Field, 2018). As the scatterplots of the residual in Appendix V show all the error terms are constant for each observation. The assumption of homoscedasticity is therefore met.

4.2.1.4 No multicollinearity

The fifth assumption touches upon the multicollinearity. It describes the circumstance when variables highly correlate with each other. For a multiple linear regression analysis, no multicollinearity can exist. A correlation between two variables, bigger than 0.8 (Tolerance or VIF value), is not acceptable in a multiple linear regression design. It means that one of the respective variables has to be dropped.

In this research, the public sector performance variable highly correlates with strength of the private sector (.892). The N equals to 113 countries when all four independent variables are included. This is due to the circumstance that the strength of the private sector variable misses a countries GDP per capita score; Venezuela 2017 GDP per capita score is not listed in the in the World Banks databank (World Bank, n. d. b.).

Table 8 Correlations between all variables

	OGDP	PSP	SCS	IPT	SPS
OGDP					
PSP	.757				
SCS	.687	.701			
IPT	-.041	-.310	-.069		
SPS	.713	.892	.616	-.291	

As the strength of the private sector variable shows a high correlation with public sector performance (.892), one of the two variables has to be dropped. However, as both variables represent essential variables of this research, two models are formed, one containing the public sector performance and the other the strength of the private sector variable. Divided into two models, the values for VIF are within their range of tolerance and the assumption of no multicollinearity is met. The correlations values change slightly when the strength of the

private sector variable is excluded because the N increases to 114 cases. Table 9 shows new correlation values of the model including public sector performance and excluding strength of the private sector.

Table 9 Model 1 including correlations between OGD, PSP, SCS & IPT

	OGDP	PSP	SCS	IPT
OGDP				
PSP	.759			
SCS	.690	.706		
IPT	-.023	-.272	-.042	

The following table shows the correlation in the second model including OGD practices, strength of the private sector, strength civil society and international policy transfer.

Table 10 Model 2 including correlations between OGD, SPS, SCS & IPT

	OGDP	SPS	SCS	IPT
OGDP				
SPS	.713			
SCS	.687	.616		
IPT	-.041	-.291	-.069	

With the division of the two correlating variables into two models, the assumption of no multicollinearity is met.

4.2.1.5 No significant Outliers

As the box plot diagrams in the Appendix VI reveal, no outliers are present in the data sets of this research.

4.3 Model selection

The aim of this section is to assess which model depicts the best possible model for this research. Due to the high correlation between the public sector performance variable and the strength of the private sector variable (.892) two different models were laid out in this research. The first model includes the independent variables of public sector performance (PSP), strength of the civil society (SCS) and international policy transfer (IPT). The second model includes the variables of strength of the private sector (SPS), strength of the civil society and international policy transfer.

In this research the forward selection method is used to choose the best possible model. The forward selection strategy adds variables one-at-a time until the researcher cannot find any variables that present strong evidence of their independence in the model. In the model containing the public sector performance variable three models are produced, each composed of a different amount of variables. Model 1 consists of the public sector performance variable. Model 2 includes the public sector performance variable and the strength of civil society variable. Model 3 comprises public sector performance, the strength of civil society, as well as the international policy transfer variable. The model including the strength of the private sector is divided similarly into three models except the public sector performance variable is substitute with the strength of the private sector.

Which model is the best possible model for this research is determined by comparing the F and R^2 values. R^2 shows the proportion of variance in the dependent variable that can be explained by the model. It can have values between 0 and 1, whereby values close to 0 indicate the model cannot explain the proportion of variance in the dependent variable. The closer the R^2 values to 1, the better can the model predict the proportion of variance in the dependent variable. In this research the adjusted R^2 is used. R^2 values are influenced by the amount of independent variables in the model and usually increases with the amount of independent variables added, even if they cannot further explain the proportion of variance in the dependent variable. Therefore, R^2 is downwards adjusted and the adjusted R^2 value is formed.

Table 11 shows the data of the first model including PSP, SCS and IPT. The adjusted R^2 values reveal that 63.5% of the dependent variable's variance can be explained by model 3. This percentage is higher compared to the adjusted R^2 values of model 1 (57.2%) and model 2 (61.7%). The F value stems from a so called F-test which examines whether the prediction of the dependent variable can be improved by adding the independent variable. This means the F-test checks whether a model can explain the dependent variable. As table 11 reveals, the F-test is significant for every model.

Table 11 Coefficients, Significance, F & R^2 values of PSP, SCS & IPT

Model	1				2				3			
Independent Variable	B	B	T	Sig.	B	β	T	Sig.	B	β	T	Sig.
Public Sector Performance	1.701	.759	12.337	.000	1.215	.542	6.597	.000	1.385	.618	7.239	.000
Strength of Civil Society					.722	.307	3.733	.000	.612	.260	3.164	.002
International Policy Transfer									.886	.156	2.582	.011
R^2			.576				.623				.645	
Adjusted R^2			.572				.617				.635	
F			152.206*				91.860*				66.589*	

Note: B= unstandardised regression coefficient; β = standardized Coefficients Beta; t= T-test; Sig.= Significance; *:Sig.=.000

Table 12 shows the data of the second model including SPS, SCS and IPT. It is evident that the second model including the strength of the private sector variable and excluding the public sector performance variable is inferior to the other model. The model including the strength of the private sector only explains 50.4% in the first, 60% in the second, and 61.4% of the dependent variable's variance in the third model. Hence, the R^2 value of the model including the public sector performance variable (.635) is higher than the R^2 value of the strength of the private sector variable (.614) However, both models show high F and R^2 values and will therefore be further discussed in the following sections.

Table 12 Coefficients, Significance, F & R^2 values of SPS, SCS & IPT

Model	1				2				3			
Independent Variable	B	B	T	Sig.	B	β	T	Sig.	B	β	T	Sig.
Strength of the private sector	1.058	.713	10.712	.000	.693	.467	6.156	.000	.774	.522	6.640	.000
Strength of civil society					.944	.400	5.269	.000	.887	.375	4.980	.000
International policy transfer									.791	.137	2.208	.029
R^2			.508				.607				.624	
Adjusted R^2			.504				.600				.614	
F			114.739*				85.082*				60.345*	

Note: B= unstandardised regression coefficient; β = standardized Coefficients Beta; t= T-test; Sig.= Significance; *:Sig.=.000

For transparency reasons three more models are included in Appendix VII of this research. First, the model including all four independent variables is discussed. 64.3% of the dependent variable's variance can be explained when all variables are included in model 4. 63.8% of the dependent variable's variance can be explained by model 3, which is a higher value than the model including public sector performance (63.5%) and the model including the strength of the private sector (61.4%) could offer in their respective third models. Even though the model including all four variables shows the highest R^2 value, the strength of the private sector variable (.101) is not significant when all variables are put in the same model. The significance for the strength of the private sector variable disappears when public sector performance is also included due to multicollinearity. The two variables overlap and as a result, only one of them is significant.

The next model included in appendix VII is composed of the strength of the private sector and international policy transfer variable. This model was created in order to measure the significance of the private sector variable on OGD practices, without correlations distorting the results. The international policy transfer variable is the only independent variable is not highly correlating with is the strength of the private sector variable (-.291). The adjusted R^2 in model 1 is -.8 as the first model only includes the dummy variable of international policy transfer. The adjusted R^2 value in model 2 reveals that 53% of the dependent variable's variance can be explained by both variables.

In addition, a last model build including the independent variables of public sector performance, international policy transfer and the strength of the private sector was included. As section 4.2.1.4 on no multicollinearity showed, the correlation between the variable of public sector performance and the strength of the civil society is high (.701). Therefore, a model that excludes the strength of the civil society and the public sector performance from each other has to be tested in order to see whether that brings new results. The model explains 57.2% of the dependent variable's variance in the first model, 60.6% in the second, and 61.3% in the third model. Hence, the model separating the strength of the civil society and the public sector performance has a smaller R^2 value in its third model (.613) than the first model (.635) of this research (including PSP, SCS & IPT) and the second model (.614), including SPS, SCS and IPT.

4.4 Results

All four independent variables tested in this research show a significant effect on the dependent variable. This substantiates the hypotheses of these variables.

Tables 8 and 9 show the standardized and unstandardised coefficients and the respective significance of the independent variables. A standardized coefficient, also referred to as a beta coefficient, possesses a variance of 1 between its dependent and the independent variable, whereas unstandardised coefficients are in original units. Standardized coefficients give the researcher information about how much the dependent variable will change, per standard deviation increase in the independent variable. The significance values, also referred to as *p* value, show whether an independent variable is significant. Independent variables with *p* values smaller than .05 are expected to have an effect on the dependent variable.

For the model including the public sector performance variable, the multiple regression analysis shows that all three independent variables are highly significant. Public sector performance shows the highest significance (.000) and standardized coefficient value (.618). The strength of the civil society variable shows the second highest significance (.260) and standardized coefficient value (.002). The dummy variable of international policy transfer has the lowest significance (.011) and the lowest standardized coefficient value (.156).

For the model including the strength of the private sector variable, the multiple regression analysis shows that all three independent variables are also highly significant. The strength of the private sector variable is highly significant (.000) and has the highest standardized coefficient value (.522) of the three variables. The strength of the civil society variable is also highly significant (.000) and its standardized coefficient value is also high (.375). The dummy variable of international policy transfer has the lowest significance (.029) and the lowest standardized coefficient value (.137).

Within the model including all variables, all variables are significant except for the private sector variable (.101). The model including the international policy transfer and the strength of the private sector variables shows however that the strength of the private sector variable is significant (.000) when it is included with variables which do not correlate with it. The last model included in Appendix VII shows that the public sector performance variable is highly significant (.000) when tested without the correlating variable of strength of the civil society.

Regarding the interpretation of the size of effect, the independent variables have to be adapted to the dependent variable which was transformed by a square transformation. In order

to make the dependent variable increase by one unit equal to the independent variables, the unstandardised coefficients (B) of the independent variables have to be squared.

With respect to the model including the public sector performance variable, the Barometer score for the Open Government Data practices variable increases by 1.918 when public sector performance increases by one unit. When the strength of civil society variable increases by one unit, the Barometer score for a county's Open Government Data performance increases by .375. When the international policy transfer variable increases by one unit, the Barometer score for a county's Open Government Data performance increases by .785. Therefore, the public sector performance variable has therefore the greatest effect on the dependent variable.

A one unit increase of the strength of the private sector variable in the second model makes the Barometer score for the Open Government Data practices variable increase by .599. When the strength of civil society variable increases by one unit, a county's Open Government Data performance increases by .787. The unstandardised coefficient value of the dummy variable adds up to .791 and can therefore be expected to have a significant positive effect. When the international policy transfer variable increases by one unit, the Barometer score for a county's Open Government Data performance increases by .626.

In the model testing the effect of the private sector without the correlating variables, a one unit increase of the strength of the private sector variable makes the Barometer score for the Open Government Data practices variable increase by 1.107. A one unit increase of the international policy transfer variable makes the Barometer score for the Open Government Data practices variable increase by 1.293.

The following section aims to find explanations for the confirmation of the variables.

4.4.1 Discussion

The data suggests that a positive relation exists between the performance of public sectors and countries' Open Government Data practices. The public sector performance variable is highly significant (.000) and shows the biggest effect on the dependent variable (1.918). The hypothesis for public sector performance, which argues that the higher the public sector performance (X_1) in a country, the better the OGD practices (Y), is therefore supported. Countries which have an effective public sector seem also to be more open to OGD practices. Countries with an ineffective public sector perform worse in Open Government Data practices. This suggests that public sectors with efficient structures are more able to make use of OGD practices. These more efficient government structures can be a result of New Public Management reforms. It is also likely that these countries that have already made use of New

Public Management reforms in the past, use Open Government Data practices as a continuance or amendment. This can be expected as OGD is by some described as a ‘New Public Management Trojan Horse’ (Longo, 2011). In countries where the Performance of the Public Sector was perceived as good, OGD practices further developed. These OGD practices were influenced by an effort to oversee policy performance and to outsource public tasks to the citizens in the neoliberal tradition As mentioned in Chapter 2, such initiatives include the British ‘crime maps’ and the American ‘YouCut’ initiative (Police.uk, n.d.; Longo, 2011). Both countries score high in public sector performance and Open Government Practice which can be seen as proof that a good performance in public sectors leads to the emergence of OGD practices. However, some countries also show good OGD practices and rather bad public sector performance. These countries include Uruguay and the Philippines. With Uruguay coming 17th on the Open Data Barometer and the Philippines 22nd, these two countries are performing rather well in OGD practices whereas their public sector performance is weak. Country ranking and scores in the Open Data Barometer can be found in Appendix I. This suggests that other factors than public sector performance could have influenced countries Open Government Data practices.

One of these could be the respective strength of civil society. The variable shows the second biggest effect (.382) on the dependent variable in the model including public sector performance and the biggest effect (.787) in the model including strength of the private sector. Furthermore, the independent variable is highly significant in both models, namely .002 in the first and .000 in the second model. This suggests that the strength of civil society variable has an effect on countries OGD performance. Countries with strong civil societies tend also to have good Open Government Data practices. Low Open Government Data standards are rather found by countries with weak civil societies. Hence, the second hypothesis, stating the stronger the civil society’s position in a country (X_2), the better the OGD practices (Y), seems also supported. This research comes therefore to the same conclusion as Bauhr et al. (2010) and Fung et al. (2007) that democracy and the connected strength of the civil society are interlinked with the emergence of Open Government Data practices. People who live in authoritarian states and which have weak civil societies due to a state’s oppressive mechanisms, are likely not to be able to demand Open Government and can therefore not affect the emergence of it. Authoritarian regimes are expected to be less willing to pursue extensive OGD initiatives, as these would lead to the interference of the public in policy implementation. States which possess strong civil societies are performing better in Open

Government Data practices because an informed public is an important element of democracies (Fung et al., 2007).

The independent variable of international policy transfer has an effect on Open Government Data practices. The variable proves to be highly significant in the model including public sector performance (.011) and the other model including private sector strength (.029). The membership of countries in the Open Government Partnership seems therefore to move governments to improve their OGD practices and to fulfil their obligations connected with the membership. These include the acknowledgement of the initiatives official declaration and the fulfilment of the individual action plan (Davies, 2014). The Open Government Partnership covers the spread of OGD practices through international policy transfer in mostly high income countries. The World Bank's facilitation of financial and technical assistance for OGD initiatives seems to have an effect on the OGD practices in low and middle income countries. By exporting what the Bank perceives as 'best practice' receiving countries are developing their OGD practices. International policy transfer through funding and membership of international actors is therefore having an effect on the emergence of OGD practices. The hypothesis for international policy transfer which states that engagement with international actors which promote the use of Open Government Data (X_3) has a positive effect on a countries performance in OGD (Y) seems therefore affirmed.

The hypothesis for the strength of the private sector variable which argues the stronger the private sector (X_4), the better the OGD practices (Y) is supported by the quantitative test. The variable is highly significant (.000) and standardized coefficient value proves to be high (.522). This finding is confirmed by the model including the strength of the private sector and the international policy transfer variable, where the variable showed high significance (.000) and a standardized coefficient value of .182. The findings of this research therefore support the statements in the literature review (2.3.4) which see the informationalisation of capitalism starting in the 1970s and the increasing demand of the private sector for Public Sector Information as an influencing factor for the adoption of countries' OGD practices (Russell, 1984; Grupe, 1995; Robinson et al., 2013). The GDP per capita indicator neglects however other factors which can also give information about the private sector's demand for OGD practices. These include the industrialization of a country, the amount of technological infrastructure, the size of a country's information industry or the role of interest groups. Suggestions for operationalising the strength of the private sector differently can be found in section 5.3 on research implications.

5 CONCLUSION

5.1 Answers to the sub-questions and central question

This chapter aims to answer the central research question and the three sub-questions, in order to conclude this research. Firstly, the sub-questions are addressed, followed by a discussion of the results and how they stand to the research question. Afterwards the limitations and suggestions for future research, as well as for policy implications are included.

This research addresses the three sub-questions before the central research question is answered. The first sub-question asked what is already known about the factors influencing OGD practices. As extensively discussed in the literature review, Open Government Data practices spread across multiple countries due to global New Public Management reforms (Longo, 2011), international policy transfer through international organisations (Davies, 2014), lobby efforts and demand for Public Sector Information by the private sector (Grupe, 1995) as well as the demand of civil society for more transparency and accountability and the state's belief of being able to counteract the decreasing trust in government by the use of OGD (Robinson et al., 2013).

The second sub-question covered the operationalisation of the variables and how possible relationships are analysed. Four independent variables and one dependent variable were chosen and operationalised. The data to operationalise these variables was only provided by the World Bank and the Open Data Barometer. The country sample of this research includes 113 countries. Furthermore the third chapter outlined the chosen empirical method and the research design. These included a multiple linear regression analysis and a cross sectional observational design.

The last sub-question was concerned with the results of the analysis. Within the multiple linear regression analysis, the results proved to be in line with three out of the four hypotheses. Based on the findings, the main research question is answered. The research question asks:

Which factors influence countries' Open Government Data (OGD) practices?

The results reveal that public sector performance, strength of civil society, the strength of the private sector and the international policy transfer through international actors have an effect on country's adoption of OGD practices. The four variables had to be divided into two separate models. In both models the independent variables appeared to be highly significant and the adjusted R^2 proved to be roughly equal to each other. In the first model the adjusted R^2 explains 63.5% of the dependent variance and in the second model 61.4%.

5.2 Limitations

This research is the first quantitative study on the emergence of Open Government Data practices around the world. It aimed to serve as a ground foundation for further quantitative research on the emergence of countries' OGD practices. However, some of the influencing factors discussed in the literature could not be perfectly operationalised in this research. An example is the strength of the private sector variable.

The GDP per capita indicator was chosen for this research because it can indicate the development of economies. However, GDP per capita gives limited disclosure about a private sectors need for Private Sector Information, which in turn information industries would use for Big Data and OGD applications. Germany serves as a good example for the limitation of the GDP per capita indicator. It has a high GDP per capita (41,323.9 current US\$) but the country's OGD score is lower (rank 14) compared to the Spain's (rank 11) whose GDP per capita level (25,789.5 current US\$) is in turn not as high as Germanys. Therefore, a high GDP per capita seems not in all cases to be able to explain a country's performance in OGD practices. An indicator which would have given a more accurate insight of a private sector's demand for OGD and the size of countries' information industries sector is the digital competitiveness ranking (IMD World Competitiveness Centre, n.d.). However, this research could not make use of it due to an insufficient number of cases. Furthermore, the level to which national private sectors urge governments to release Public Sector Information through interest groups (Aubert, 2009) could not have been operationalised due to the absence of data.

In regard to the research design of this study, the fact that a cross-sectional study design analyses a potential relationship between the variables to a single point of time, depicts a limitation to this research. A proceeding relation between X and Y cannot be assessed under this research design. For example, changes in a country's regime or other developments which either increase or decrease civil societies' standing are difficult to assess in a single year.

Furthermore, the correlation of .892 between the strength of the private sector and public sector performance is a limitation of this research. Even though the two variables correlate with each other, all four variables were maintained in two separate models. The reason for it is that these two variables constitute central components of this research. With another operationalization of the strength of the private sector variable an inclusion of all four variables in a single model is likely to be possible.

The country sample used in this research shrank in size due to the absence of data. Palestine and Kosovo, both listed in the Open Government Data Barometer, had to be

excluded from this research because no data is available on these countries. Furthermore, information on the GDP per capita was not available for Vietnam which decreased the sample to from 116 to 113.

Other limitations of this research include the kurtosis level of the OGD practice variable, which deviated further from the ideal kurtosis level of 0 after the transformation. The kurtosis level of the OGD practices variable changed from -.150 before the transformation to -.519 after.

To conclude, data privacy protection and OGD are also discussed in the literature, for example in regard to the risk of anonymised personal data being de-anonymised in certain ways (O'Hara, 2011). Even though data privacy protection is an important and relevant topic for OGD, it has been excluded from this thesis as it is beyond the scope of this particular research. As the following section points out, these and other topics can be examined in other future research.

5.3 Research implications

Future research on the topic of Open Government Data could analyse the effect of indicators, which had to be excluded from this research due to high correlations. These indicators include for example the access to the internet in a country play in the emergence of OGD practices. The World Bank indicator of individuals using the internet had to be excluded from this research due to an overlap with the Open Data Barometer (World Bank, n.d.c). The Barometer is partly composed of the World Bank's data on peoples' internet penetration. However, as peoples' access to the internet matters for use and request for OGD, this indicator would have been a valid component for this research.

Furthermore, future research could also test whether OGD practices promote democracy as some authors have previously claimed (Bauhr et al., 2010). This research could not do so due to high correlations between the voice and accountability index, used to operationalised the strength of civil society variable, and the democracy index (The Economist Intelligence Unit, 2015). The democracy index was intended to Bauhr's assumption in a quantitative research. In future research, it could be statistically tested whether OGD practices are promoted by democratic states or more general the type of regime, using the democracy index.

One finding of the Open Data Barometer is that women are often not taken into account in regard to OGD, as they are less visible in datasets and generally have worse access to the internet compared to men. Future research could look which effect the access to the internet has on the development of OGD practices in countries and investigate the gender gap in internet usage. Thereby marginalised groups could be enabled to participate more in OGD

initiatives and in policymaking (World Wide Web Foundation, 2017a). The index which could be used for such a research is the World Bank's index on individuals using the internet (World Bank, n.d.c)

Finally, the effect of the private sector on OGD practices could be further investigated in future research. It is questionable whether GDP per capita is the best suited index to operationalise this variable as a private sector's demand for OGD is most likely connected to the size of countries' information industry sectors. This research tried to use the digital competitiveness ranking (IMD World Competitiveness Centre, n.d.) for operationalising the private sector variable, but due to an insufficient amount of cases could not make use of it. Furthermore, the level to which national private sectors urge governments to release Public Sector Information through interest groups (Aubert, 2009) could not have been operationalised due to the absence of data. Future researchers could however try to analyse the effect business interest groups have on the release of Public Sector Information.

5.4 Policy implications

This section of the research aims to derive policy implications for governments in relation to their Open Government Data practices. The implications will touch upon the four independent variables of this research.

Governments which possess efficient public sectors proved to be more accessible for OGD practices than countries with less efficient administrations. Countries which want to maximise the effect of their OGD initiatives, should therefore improve the functioning of their public sectors. The public administration reform of New Public Management is known to increase the efficiency of public administrations and seems therefore appropriate for achieving this goal. Some authors even claim that Open Government Data practices originated from the idea around New Public Management and encourage governments' collaboration with citizens (Bertot et al., 2010). By giving citizens the possibility to check their performance, OGD is likely to increase the competition within the public sector and could therefore increase the overall efficiency. Furthermore, internal functioning of public administrations could be improved by OGD, when the flow of information within the government can take place online without administrative burdens (Longo, 2011).

Furthermore, in order to guarantee the internal functioning of public administrations as well as the overall exhaustion of OGD benefits, governments should revise their OGD governance approach and include automated data publication processes in their IT systems. In public administrations it is often unclear who is tasked with the overall open data management and publication of datasets. This proceeding would guarantee the availability of

up-to-date datasets. Furthermore, this research advocates for the adoption of sustainable OGD practices beyond political mandates, as political change in countries often leads to the neglect of OGD initiatives. Laws on OGD could guarantee a more enduring development of OGD initiatives (World Wide Web Foundation, 2017a).

In this research, strong civil societies proved to be able to generate good Open Government Data practices of their respective national governments. It seems therefore that civil societies see Open Government models as a way to interact with their governments again. Countries should therefore publish the data which restores the citizens' trust in their governments. These data sets include information on budget, spending, contracting, and company registers (World Wide Web Foundation, 2017a). It would be a good idea for governments to decrease the mistrust of their citizens as this would increase citizens' voluntarily compliance with the legislation of the regime (Dalton, 2004).

This research showed that the countries which are part of the Open Government Partnership possess better OGD practices than non-members. Governments which want to improve their OGD practices should therefore consider a membership. Requirements for a membership include the acknowledgement of the partnership's Open Government Declaration and the compilation of an action plan can help countries to improve their OGD practices. The Open Government Partnership's focus on the promotion of transparency, anti-corruption and citizen empowerment can also help member governments to increase their citizens' trust (Open Government Partnership, n. d.). Governments should be aware when joining international organisation such as the Open Government Partnership that international actors can attain some influence on the government. In the case of the partnership, the implementation of the action plan is controlled by a light-touch monitoring mechanism, which leaves the participating countries relatively free to decide how to incorporate the Open Government standards.

In the case of the World Bank, coercive policy transfer is often used, when countries receive funds of the bank in return for adapting their public sector or Open Government Data practices. The World Bank emphasizes Open Government practices in its member states because the standards of good governance, accountability and transparency secure its investments. The World Bank in turn should be aware that some countries use OGD practices for improving their reputation. Setting up a website for publishing Government Data entails low political costs while the reputation gains are high. In order for OGD practices to be successful, governments' efforts should be accompanied by wider public-sector reform and the release of high quality data sets (Schwegmann, 2012).

A strong private sector has an effect on a country's OGD practices. Governments can help their national economies, including start up companies as well as established enterprises, to create new innovative products and services. Useful data for enhancing companies' products includes meteorological, geographical, or environmental information (Bates, 2012). Governments should therefore try to offer the data which businesses need without revealing personalized data of their citizens.

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APPENDICES

Appendix 1 Open Data Barometer rankings and scores

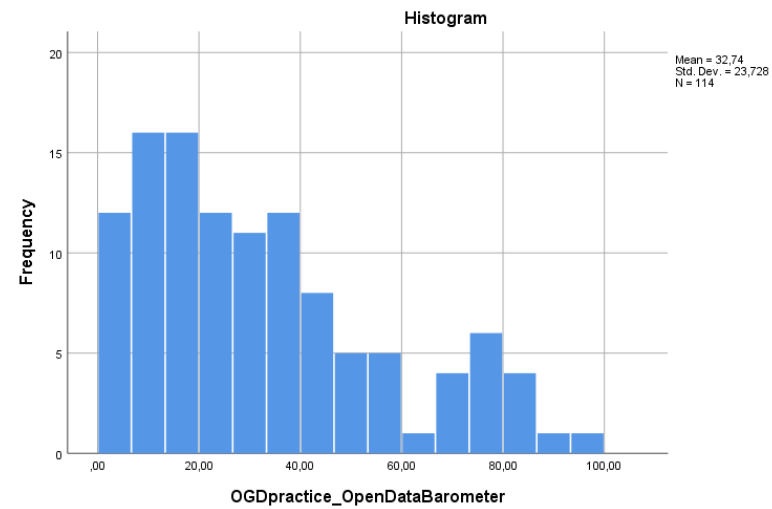
ODB Rank	Country	ODB Score	ODB Rank	Country	ODB Score	ODB Rank	Country	ODB Score
1	UK	100	40	Georgia	37.44	79	Morocco	16.86
2	Canada	89.54	40	Jamaica	36.95	79	Vietnam	16.79
3	France	85.13	40	Turkey	36.88	81	Ethiopia	16.14
4	USA	81.62	44	Estonia	36.31	81	Togo	15.65
5	Australia	81.15	44	Ukraine	35.96	83	Montenegro	14.54
5	Korea	81.16	46	Poland	33.95	83	Nepal	15.49
7	New Zealand	79.38	46	South Africa	34.43	85	Egypt	13.89
8	Japan	75.16	48	Macedonia	32.58	85	El Salvador	13.88
8	Netherlands	74.95	48	Peru	33.33	87	Jordan	12.58
10	Norway	73.81	50	Albania	32.43	87	Kyrgyzstan	13.24
11	Spain	73.36	50	Dominican Republic	32.21	87	Saint Lucia	12.53
11	Mexico	73.45	50	Tunisia	32.17	90	DR Congo	12.38
13	Denmark	70.52	53	Bolivia	27.87	90	Uganda	11.59
14	Austria	70.22	53	Latvia	27.89	90	Venezuela	11.62
14	Germany	69.52	53	Malaysia	28.06	93	Bangladesh	10.57
14	Sweden	69.84	53	Paraguay	28.07	93	Belarus	10.95
17	Uruguay	60.85	53	Thailand	27.55	93	Côte d'Ivoire	11.48
18	Brazil	58.86	58	Croatia	26.75	93	Malawi	10.51
19	Switzerland	57.46	59	United Arab Emirates	26.17	97	Tajikistan	9.7
20	Finland	55.89	59	Ghana	25.96	98	Namibia	9.08
20	Italy	55.93	59	Kazakhstan	26.1	98	Senegal	8.74
22	Philippines	54.7	59	Mauritius	26.3	100	Bosnia and Herzegovina	8.02
23	Singapore	52.69	63	Guatemala	23.72	100	Palestine	8.24
24	Colombia	51.65	63	Kosovo	23.67	100	Sierra Leone	8.47
25	Russia	48.53	65	Hungary	23.3	103	Benin	7.32
26	Chile	47.41	65	Serbia	22.77	104	Botswana	5.89
26	Ireland	47.44	67	Burkina Faso	21.63	104	Haiti	6.27
28	Israel	46.26	67	Ecuador	21.62	104	Lebanon	5.82
29	Belgium	45.28	67	Tanzania	21.73	107	Cameroon	5.15
29	Slovakia	44.9	70	Nigeria	20.97	108	Pakistan	3.59
31	Czech Republic	44.44	71	China	19.64	108	Zambia	3.82
31	Moldova	43.68	71	Costa Rica	19.87	110	Mozambique	3.46
33	India	42.8	71	Rwanda	19.62	111	Mali	2.46
34	Portugal	41.89	74	Bahrain	18.91	111	Zimbabwe	1.87
35	Kenya	40.42	74	Qatar	19.26	113	Myanmar	1.33
36	Greece	38.94	74	Saudi Arabia	18.66	114	Swaziland	0.28
36	Iceland	38.87	77	Panama	17.9	114	Yemen	0
38	Argentina	37.51	77	Trinidad and Tobago	17.99			
38	Indonesia	38.35						
40	Bulgaria	37.14						

Appendix II Distribution histograms and descriptive statistics

OGD Practices (Y)

Descriptives

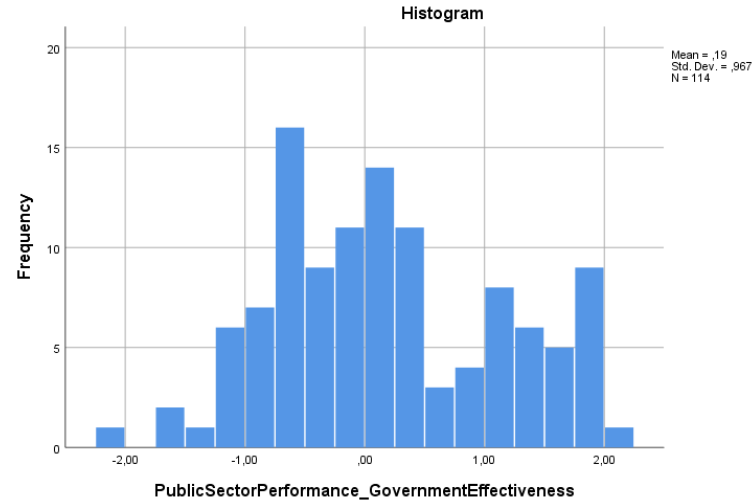
		Statistic	Std. Error	
OGDpractice_OpenDataBarometer	Mean	32,7361	2,22237	
	95% Confidence Interval for Mean	Lower Bound	28,3331	
		Upper Bound	37,1390	
	5% Trimmed Mean	31,4746		
	Median	27,1500		
	Variance	563,038		
	Std. Deviation	23,72843		
	Minimum	,00		
	Maximum	100,00		
	Range	100,00		
	Interquartile Range	31,81		
	Skewness	,813	,226	
	Kurtosis	-,150	,449	



Public Sector Performance (X₁)

Descriptives

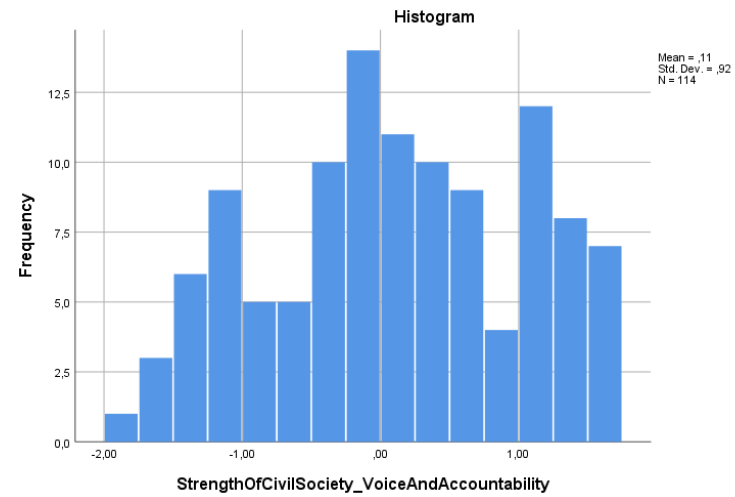
		Statistic	Std. Error	
PublicSectorPerformance_GovernmentEffectiveness	Mean	,1854	,09054	
	95% Confidence Interval for Mean	Lower Bound	,0061	
		Upper Bound	,3648	
	5% Trimmed Mean	,1820		
	Median	,1118		
	Variance	,934		
	Std. Deviation	,96666		
	Minimum	-2,02		
	Maximum	2,24		
	Range	4,25		
	Interquartile Range	1,61		
	Skewness	,249	,226	
	Kurtosis	-,757	,449	



Strength of the civil society (X₂)

Descriptives

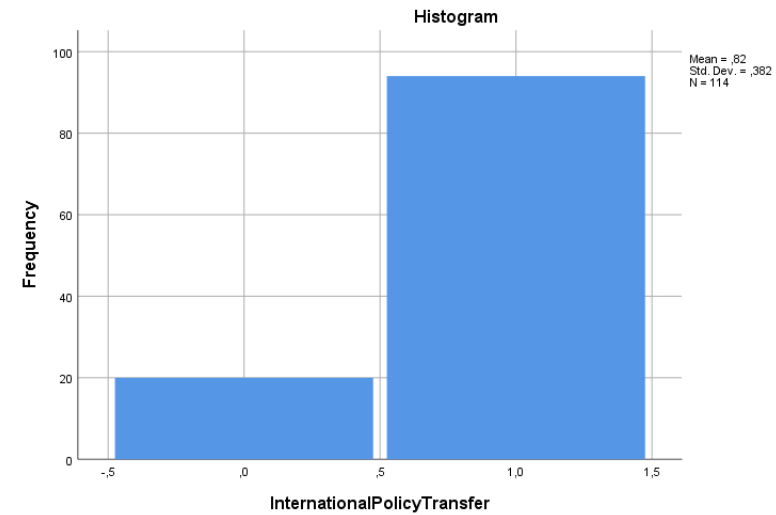
			Statistic	Std. Error
StrengthOfCivilSociety_VoiceAndAccountability	Mean		,1060	,08621
	95% Confidence Interval for Mean	Lower Bound	-,0648	
		Upper Bound	,2768	
	5% Trimmed Mean		,1180	
	Median		,1497	
	Variance		,847	
	Std. Deviation		,92049	
	Minimum		-1,84	
	Maximum		1,69	
	Range		3,53	
	Interquartile Range		1,50	
	Skewness		-,145	,226
	Kurtosis		-,948	,449



International Policy Transfer (X₃)

Descriptives

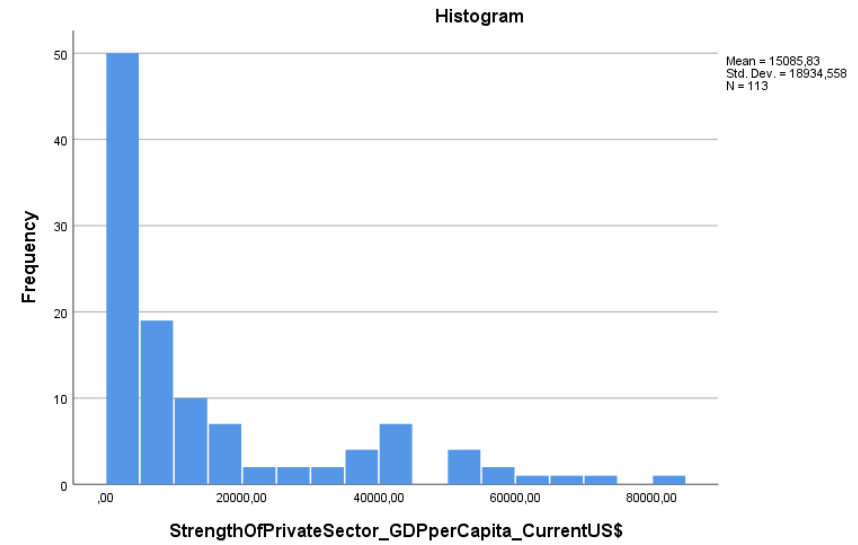
			Statistic	Std. Error
InternationalPolicyTransfer	Mean		,82	,036
	95% Confidence Interval for Mean	Lower Bound	,75	
		Upper Bound	,90	
	5% Trimmed Mean		,86	
	Median		1,00	
	Variance		,146	
	Std. Deviation		,382	
	Minimum		0	
	Maximum		1	
	Range		1	
	Interquartile Range		0	
	Skewness		-1,730	,226
	Kurtosis		1,009	,449



Strength of private sector (X4)

Descriptives

		Statistic	Std. Error	
StrengthOfPrivateSector_GDPperCapita_CurrentUS\$	Mean	15085,8270	1781,21340	
	95% Confidence Interval for Mean	Lower Bound	11556,5810	
		Upper Bound	18615,0730	
	5% Trimmed Mean	13011,4235		
	Median	6150,1560		
	Variance	358517494,2		
	Std. Deviation	18934,55820		
	Minimum	362,66		
	Maximum	82016,02		
	Range	81653,36		
	Interquartile Range	17146,31		
	Skewness	1,587	,227	
	Kurtosis	1,693	,451	



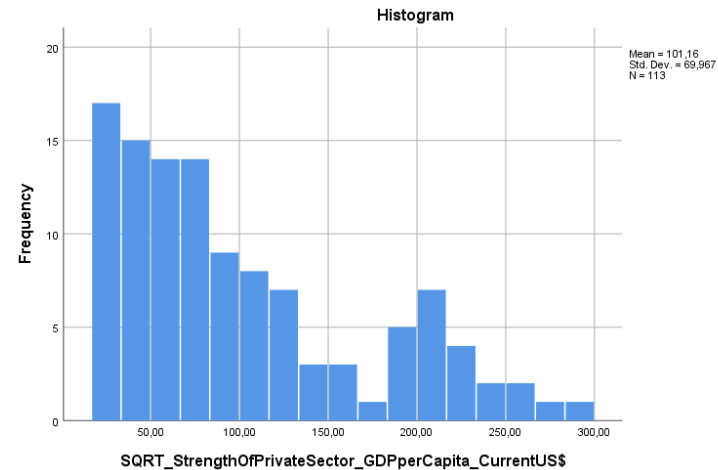
Appendix III Transformations

Strength of the private sector variable (X₂)

Square Transformation

Descriptives

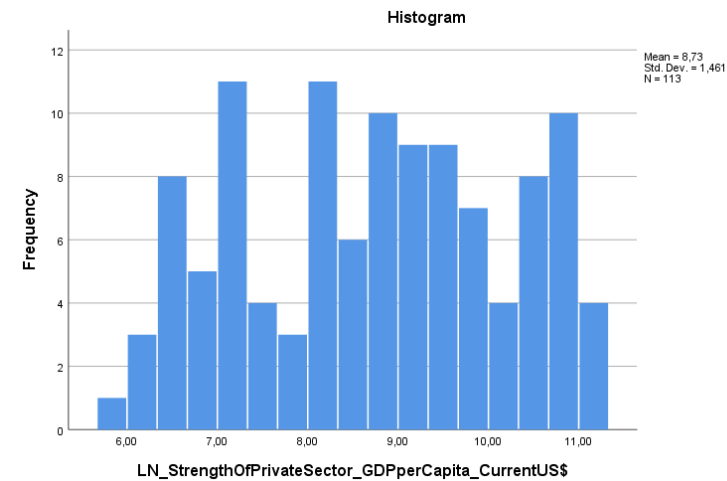
		Statistic	Std. Error	
SQRT_StrengthOfPrivateSector_GDPperCapita_CurrentUS\$	Mean	101,1619	6,58197	
	95% Confidence Interval for Mean	Lower Bound	88,1206	
		Upper Bound	114,2032	
	5% Trimmed Mean	96,8017		
	Median	78,4229		
	Variance	4895,421		
	Std. Deviation	69,96728		
	Minimum	19,04		
	Maximum	286,38		
	Range	267,34		
	Interquartile Range	97,68		
	Skewness	,875	,227	
	Kurtosis	-,319	,451	



Log Transformation

Descriptives

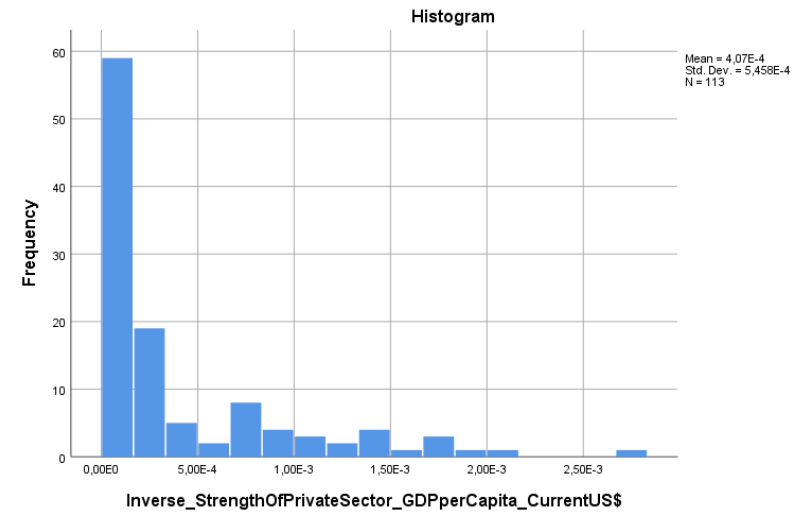
		Statistic	Std. Error	
LN_StrengthOfPrivateSector_GDPperCapita_CurrentUS\$	Mean	8,7349	,13744	
	95% Confidence Interval for Mean	Lower Bound	8,4626	
		Upper Bound	9,0072	
	5% Trimmed Mean	8,7427		
	Median	8,7242		
	Variance	2,135		
	Std. Deviation	1,46105		
	Minimum	5,89		
	Maximum	11,31		
	Range	5,42		
	Interquartile Range	2,51		
	Skewness	-,066	,227	
	Kurtosis	-,1077	,451	



Reciprocal Transformation

Descriptives

		Statistic	Std. Error	
Inverse_StrengthOfPrivateSector_GDPperCapita_CurrentUS\$	Mean	,0004	,00005	
	95% Confidence Interval for Mean	Lower Bound	,0003	
		Upper Bound	,0005	
	5% Trimmed Mean	,0003		
	Median	,0002		
	Variance	,000		
	Std. Deviation	,00055		
	Minimum	,00		
	Maximum	,00		
	Range	,00		
	Interquartile Range	,00		
	Skewness	1,874	,227	
	Kurtosis	3,329	,451	

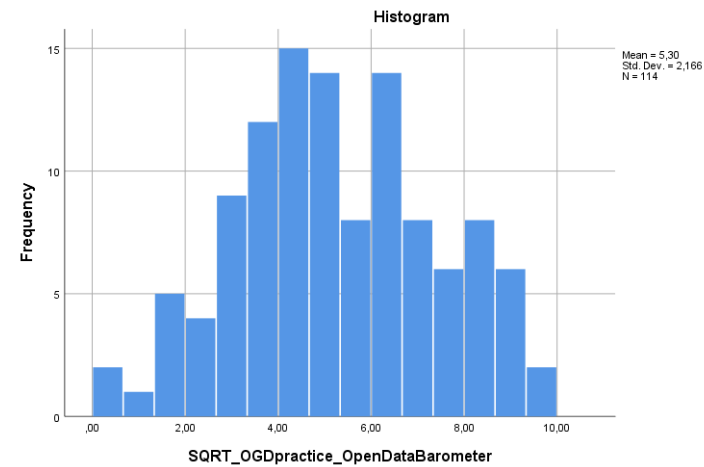


OGD practices variable (Y)

Square transformation

Descriptives

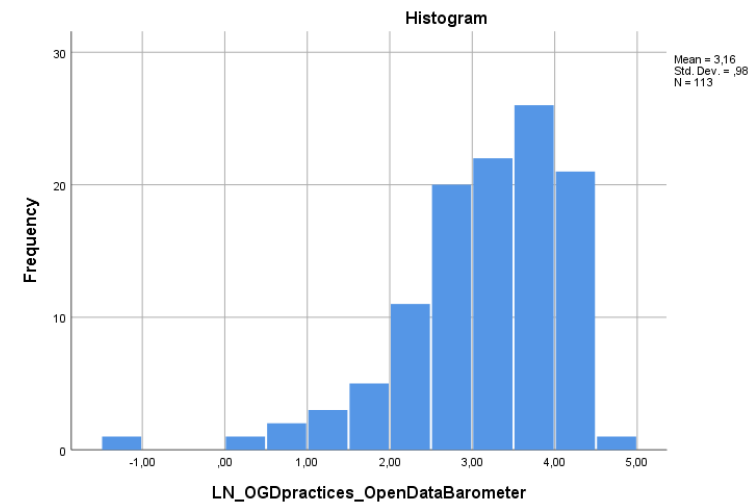
		Statistic	Std. Error	
SQRT_OGDpractice_OpenDataBarometer	Mean	5,2996	,20287	
	95% Confidence Interval for Mean	Lower Bound	4,8976	
		Upper Bound	5,7015	
	5% Trimmed Mean	5,3137		
	Median	5,2104		
	Variance	4,692		
	Std. Deviation	2,16608		
	Minimum	,00		
	Maximum	10,00		
	Range	10,00		
	Interquartile Range	3,04		
	Skewness	,020	,226	
	Kurtosis	-,519	,449	



Log transformation

Descriptives

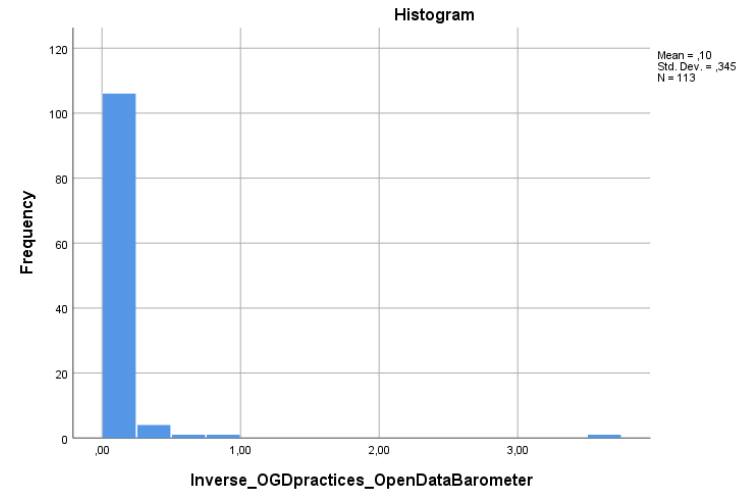
		Statistic	Std. Error	
LN_OGDpractices_OpenDataBarometer	Mean	3,1555	,09223	
	95% Confidence Interval for Mean	Lower Bound	2,9727	
		Upper Bound	3,3382	
	5% Trimmed Mean	3,2327		
	Median	3,3160		
	Variance	,961		
	Std. Deviation	,98047		
	Minimum	-1,27		
	Maximum	4,61		
	Range	5,88		
	Interquartile Range	1,19		
	Skewness	-1,368	,227	
	Kurtosis	3,265	,451	



Reciprocal transformation

Descriptives

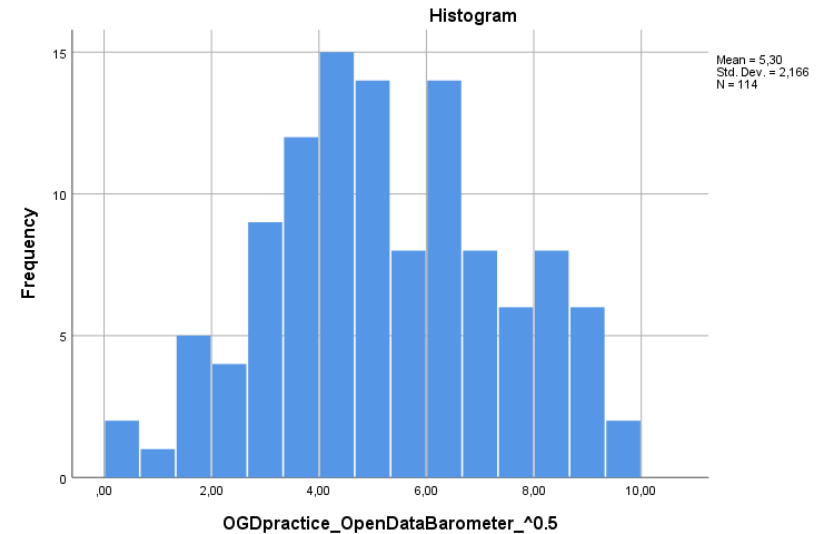
		Statistic	Std. Error	
Inverse_OGDpractices_OpenDataBarometer	Mean	,0982	,03242	
	95% Confidence Interval for Mean	Lower Bound	,0340	
		Upper Bound	,1624	
	5% Trimmed Mean	,0521		
	Median	,0363		
	Variance	,119		
	Std. Deviation	,34462		
	Minimum	,01		
	Maximum	3,57		
	Range	3,56		
	Interquartile Range	,05		
	Skewness	9,390	,227	
	Kurtosis	94,267	,451	



$\wedge 0.5$ transformation

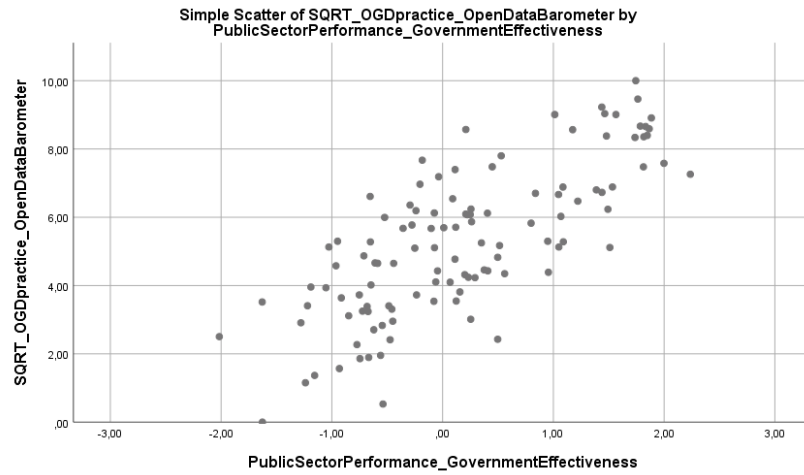
Descriptives

		Statistic	Std. Error	
OGDpractice_OpenDataBarometer_ $\wedge 0.5$	Mean	5,2996	,20287	
	95% Confidence Interval for Mean	Lower Bound	4,8976	
		Upper Bound	5,7015	
	5% Trimmed Mean	5,3137		
	Median	5,2104		
	Variance	4,692		
	Std. Deviation	2,16608		
	Minimum	,00		
	Maximum	10,00		
	Range	10,00		
	Interquartile Range	3,04		
	Skewness	,020	,226	
	Kurtosis	-,519	,449	

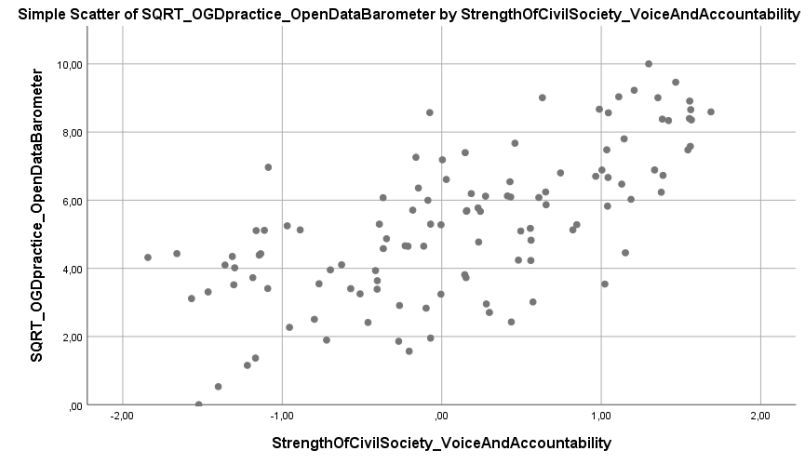


Appendix IV Scatterplots

Public Sector Performance



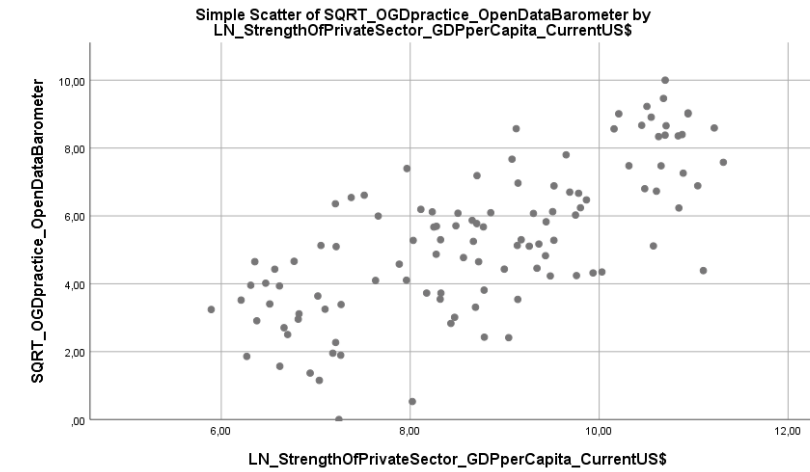
Strength of the Civil Society



International Policy Transfer

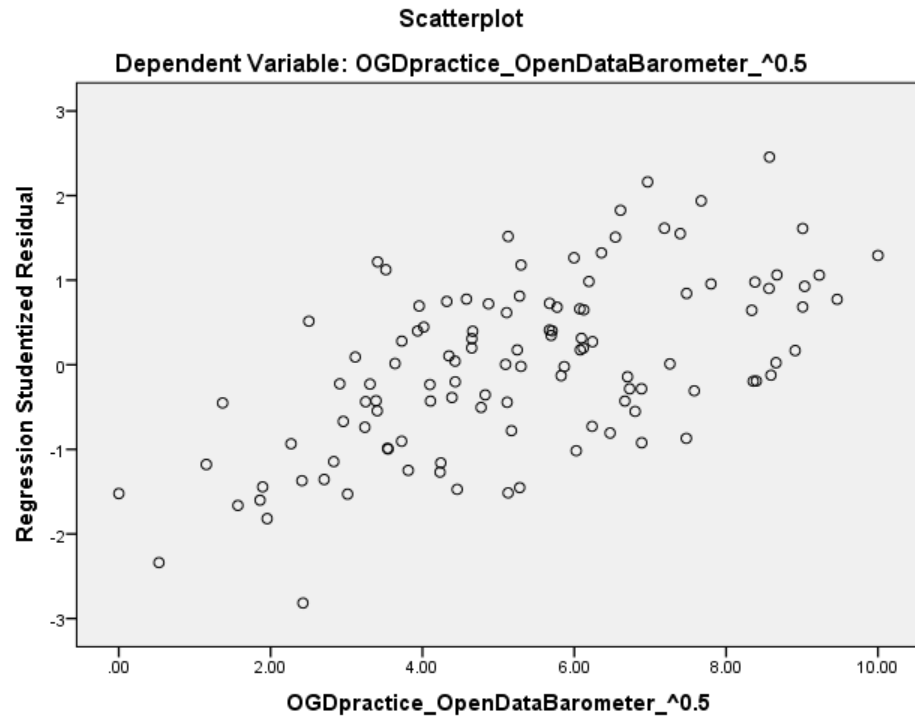


Strength of the Private Sector

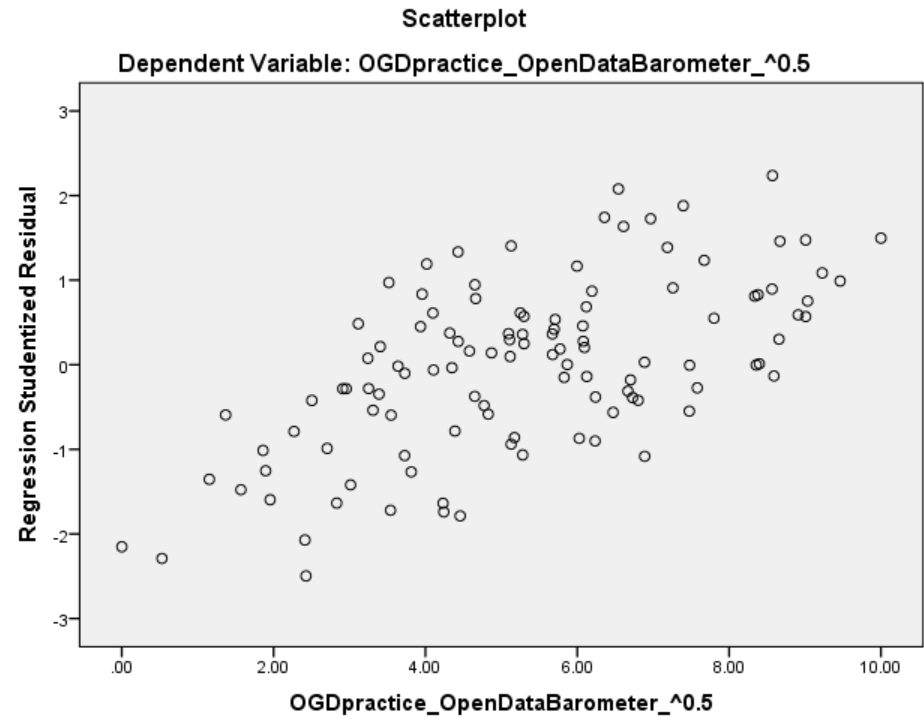


Appendix V Scatterplots of the Residual

Model 1 including public sector performance

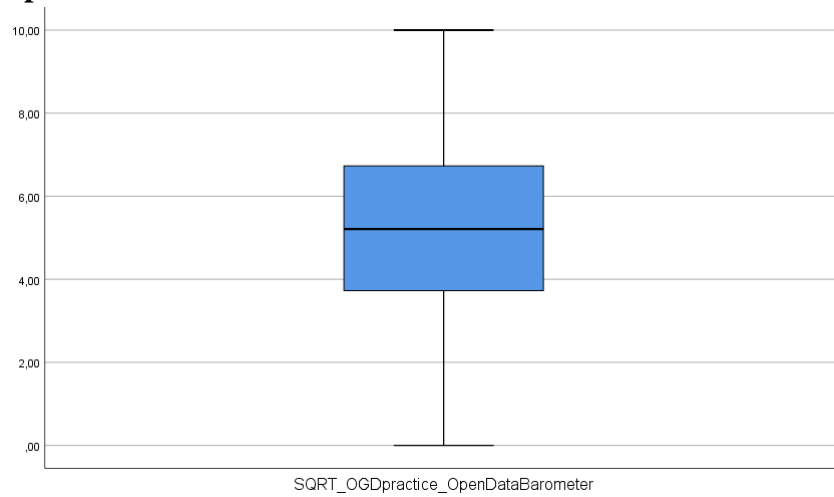


Model 2 including strength of private sector

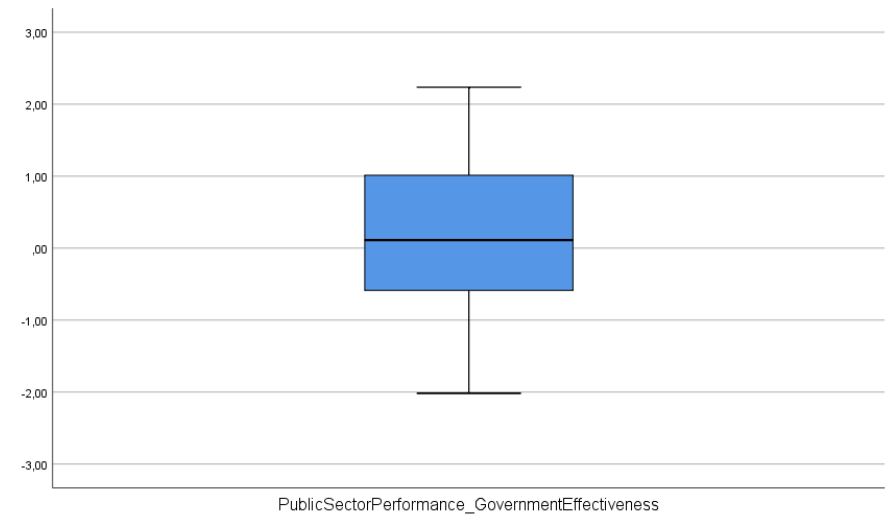


Appendix VI Box plot diagrams

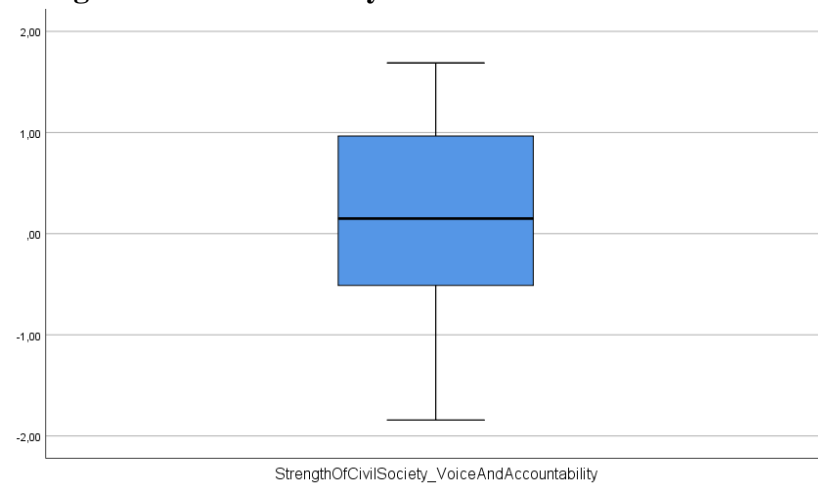
Open Government Data Practice



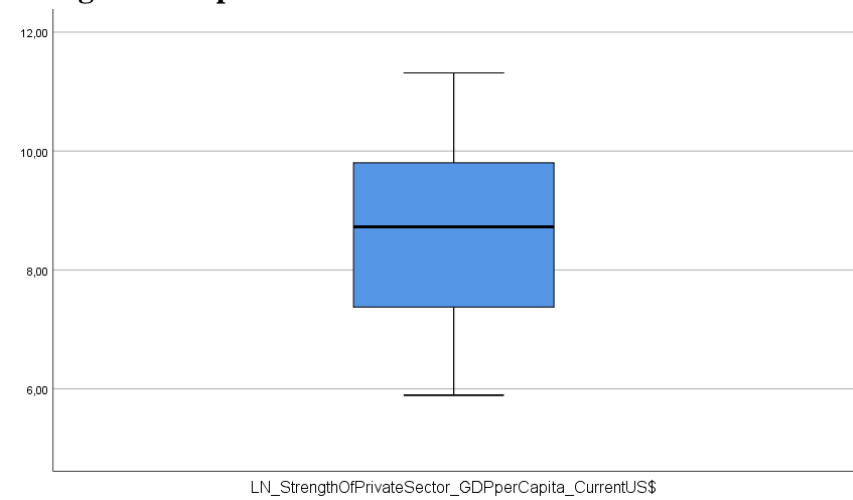
Public Sector Performance



Strength of the Civil Society



Strength of the private Sector



Appendix VII Coefficients, Significance, F & R2 of three additional models

Coefficients, Significance, *F* & *R*² values of all four independent variables

Model	1				2				3				4			
Independent Variable	B	B	T	Sig.	B	B	T	Sig.	B	β	T	Sig.	B	B	T	Sig.
Public Sector Performance	1.708	.757	12.221	.000	1.222	.542	6.595	.000	1.422	.631	7.356	.000	1.003	.445	3.169	.002
Strength of civil society					.726	.307	3.737	.000	.607	.257	3.146	.002	.614	.260	3.206	.002
International policy transfer									.995	.172	2.811	.006	1.012	.175	2.880	.005
Strength of the private sector													.307	.207	1.654	.101
<i>R</i> ²			.574				.622				.647				.656	
Adjusted <i>R</i> ²			.570				.615				.638				.643	
<i>F</i>			149.363*				90.388*				66.675*				51.486*	

Note: B= unstandardised regression coefficient; β= standardized Coefficients Beta; t= T-test; Sig.= Significance; *:Sig.=.000

Coefficients, Significance, *F* & *R*² values of model including IPT & SPS

Model	1				2			
Independent Variable	B	β	T	Sig.	B	β	T	Sig.
International policy transfer	-.130	-.023	-.243	0.808	1.052	.182	2.691	.008
Strength of Private Sector					1.137	.100	11.315	.000
<i>R</i> ²		.001				.539		
Adjusted <i>R</i> ²		-.008				.530		
F		.059*				64.217*		

Note: B= unstandardised regression coefficient; β= standardized Coefficients Beta; t= T-test; Sig.= Significance; *.Sig.=.000

Coefficients, Significance, *F* & *R*² values of model including PSP, IPT & SPS

Model	1				2				3			
Independent Variable	B	β	T	Sig.	B	β	T	Sig.	B	B	T	Sig.
Public Sector Performance	1.701	.759	13.337	.000	1.822	.813	13.242	.000	1.461	.648	4.947	.000
International policy transfer					1.126	.199	3.233	.002	1.256	.218	3.518	.001
Strength of Private Sector									.294	.198	1.521	.131
<i>R</i> ²		.576				.613				.623		
Adjusted <i>R</i> ²		.572				.606				.613		
F		152.206*				87.753*				60.104*		

Note: B= unstandardised regression coefficient; β= standardized Coefficients Beta; t= T-test; Sig.= Significance; *.Sig.=.000

