POLITICS THROUGH THE LENS OF THE INTERNET: DOES THE INTERNET AFFECT CITIZENS' TRUST IN GOVERNMENT?

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Submitted to

Central European University

Department of Political Science

In partial fulfilment of the requirements for the degree of Master of Arts in Political Science

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Budapest, Hungary

2018

Abstract

Political trust is regarded as an important element of legitimacy and democratic rule. Given a significant decline in the levels of trust across the developed world, identifying factors that drive the trend becomes a goal worth to pursue. This thesis investigates whether the rise of the Internet and different ways of using it can be associated with changes in trust in the government. Using a rich source of survey data covering a decade in the United Kingdom and diverse statistical methods, the analysis proceeds from comparing users and non-users to predicting trust in the government in multivariate regression models, coupled with a stepwise method for model selection. The analysis produces a mixed picture. At first, the results fail to uncover any significant impact of the Internet. Then, however, a deeper analysis finds that time spent on the web is repeatedly associated with lower levels of trust. Concurrently, the use of online news sources as well as social networks are estimated to be positively related to trust in the government. This lends some support to Norris' "vicious circle" theory and suggests that non-hierarchical online structures with a limited "gate-keeping" function are likely to foster trust in the government or at least neutralise a negative impact of traditional media sources. The analysis also reveals a strong convergence between trust in various institutions. Taken together, the findings signal a direction for further research, which should focus on comparing content of online and offline media sources as well as account for a puzzling alignment of different types of trust. On the metalevel, the results are revealing of shortcomings of traditional survey methods for Internet research and call for alternative ways of data collection, which would involve collecting observational data on Internet users. This would serve as a firm basis for a more in-depth analysis of the ways the Internet relates to political trust and social life in general.

Table of Contents

List of Figures and Tables

Introduction

One can easily notice that trust is omnipresent in human life yet its degree varies substantially depending on who trusts whom and under what circumstances. People usually trust their family and friends, while they are suspicious of strangers; what is written in an academic journal is likely to evoke a greater feeling of trust than what one reads in the yellow press; when we cross a street, buy food in a grocery store or vote in an election, we display some degree of trust in traffic rules, food safety regulations and electoral process correspondingly.

A few people would venture to argue that "political animals", as Aristotle famously referred to people, could build and prosper in large communities like modern cities and states while not trusting in one another. Indeed, a great stretch of imagination is needed to conjure up a picture of the world where people are barren of trust. Such a picture is unlikely to hold a lot of appeal since in the absence of trust, most everyday interactions and contracts would be enforced through coercion or pressure, traditional substitutes of trust.

It is not surprising therefore that modern economists, who are obsessed with the idea of efficiency, generally concur that a "trustless" world would not be a good way to go, for this is exactly mutual trust among members of the society that helps communities to overcome collective action problems and achieve greater efficiency (Granovetter 1985). Lower trust hinders collective action and increases the chances that one of the contract parties would eventually renege on its promise. As Putnam once put it: "Fabrics of trust enable the civic community more easily to surmount what economists call 'opportunism', in which shared interests are unrealized because each individual, acting in wary isolation, has an incentive to defect from collective action" (1993, 89) [1].

[1]For a discussion on what place trust occupies in economic theory, see Evans and Krueger (2009). Trust is also a major element within game theory, which is becoming popular in political science too.

Some go even further to ascribe to trust a central role in social life. Fukuyama famously argued that "one of the most important lessons we can learn from an examination of economic life is that a nation's well-being, as well as its ability to compete, is conditioned by a single, pervasive cultural characteristic: the level of trust inherent in the society" (1996, 7). Admittedly, he seems to think of trust as a cultural phenomenon only, which has little to do with institutional performance. The distinction between cultural and rational origins of trust lies at the heart of scholarly debates about the very concept of trust.

Because trust performs a vital social function, its declining levels across Western countries loom large. Existing accounts of trust – which might be divided into moralistic or cultural (Uslaner 2002) and rational or institutional camps (Mishler and Rose 2001) – fail to provide a holistic explanation as to what is behind this downward trend. While the former camp does better at explaining initial levels of trust[2], the latter has more to say when fluctuations in the trust levels are analysed in the short run.

Although bringing the two accounts together might result in a powerful explanatory theory for both micro- and macro-level changes in trust, an attempt to develop such a theory should be undertaken elsewhere as the complexity and importance of the issue require more time, research and experience as well as resources and space than a graduate student has at their disposal. Accordingly, the aim of this work is much more modest. The thesis sets out to investigate only one of the concomitants and an alleged culprit of the declining trust, namely the rise of the Internet[3].

[2] Uslaner writes "Democratic countries are more trusting, but this is largely because they depend upon cultural foundations (individualism, Protestantism, egalitarianism) that are conducive to faith in strangers." (2002, 8). And further: "Trust across countries, like trust in the United States, depends more on values (culture) and the distribution of resources (economic equality) than on political institutions" (Uslaner 2002, 221)

[3] It should be noted forthwith that the Internet is by no means regarded as *the* cause of declining trust. Rather, it is just one of multiple factors which might contribute to changes in political trust. Moreover, the direction of the effect should not be taken at face value. Although it does seem that the rise of the Internet goes hand in hand with the decline in trust, it is premature to conclude thereof that the use of the Internet affects trust in one way only. This issue will be discussed at length in Chapter 2.

Somewhat unrelated as it may seem at first glance, the Internet is a suspect for good reasons. Firstly, having been around for only several decades, the Internet has permeated through the whole social structure in developed countries. From a taxi driver to a bank clerk, from a police officer to a head of state, people on a massive scale use the Internet for work, entertainment, shopping and communication. Figure 1 below helps in realising the scope and speed of the Internet's spread. In just 15 years, the number of Internet users increased twofold in the OECD region, reaching as high as 80% on average in 2016. In the developing world, however, despite a huge increase of 10 or even 20 times in some countries, the share did not exceed even 40% as of 2016. In low income countries, only every fifth person has access to the Internet.

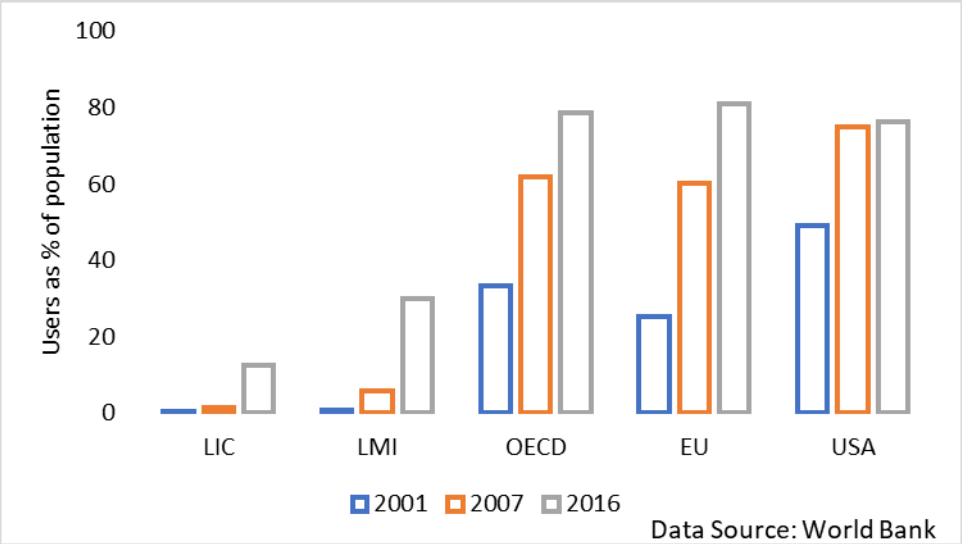


Figure 1. Internet Users Worldwide[4]

Secondly, while having spread far and wide, the Internet has also taken over some of the main societal functions. Not only has it started to play an important role as a source of information, supplanting newspapers and TV, but it has also become a prime method of communication, helping to maintain relations at distance as well as organising groups of people according to their interestы. Social network websites have proven to be especially suitable to this purpose .

[4] World Development Indicators by the World Bank. Internet users are defined as "individuals who have used the Internet (from any location) in the last 3 months". Abbreviations: LIC – Low Income Countries, LMI – Lower Middle-Income Countries.

Thirdly, in contrast to traditional media, the Internet, with its ever-growing amount of content, is able to cater for all tastes, allowing anyone find anything they want. Whether this has had any implications for levels of trust in the West is exactly the subject of the following chapters.

The thesis is structured in two parts. The first chapter continues the discussion on the role of political trust and reviews relevant determinants of it as identified in the previous research. Drawing on the media and communication literature, it explains how and why the Internet is thought to be related to changes in trust. This discussion leads to the research question, description of data and methods used to address the question as well as a brief concluding outline of expectations as to the effects of various Internet activities.

This is followed by an empirical analysis in Chapter 2. Starting with a comparison of three types of users, the analysis proceeds to multivariate regression models to predict political trust. Because the preliminary analysis provides mixed evidence, the data for specific years are scrutinised using additional methods coupled with cross-validation techniques. The obtained results are mostly in accord with the theoretical arguments developed in Chapter 1, which leads to a concluding discussion and acknowledgement of limitations. The thesis ends with a general conclusion and suggestions of directions for further research.

Chapter 1: Theoretical Underpinnings

This chapter lays out theoretical foundations for bringing trust research and the Internet together. It opens with a discussion on the place of (political) trust in society and its importance for government legitimacy and citizens' compliance. This is followed by a review of the literature on media effects on trust, which gives an idea of how the Internet might influence trust both as a medium *per se* and as a competing source of information. With this literature as a departure point, it is shown that the Internet – or rather specific online activities – might well have a different sort of relationship with trust in the government than traditional media has been shown to have.

1.1. Introduction to Trust and Politics

Although not everyone agrees with Fukuyama on trust being a cornerstone of a nation's well-being, relevance of this emotion to the political realm has been proven on numerous occasions. One of the earliest discussions of how trust relates to politics can be found in Easton's classic "A Re-Assessment of the Concept of Political Support" (1975), where he draws a distinction between specific and diffuse support. It is in the relation to these two types that he writes: "For example, diffuse support for the political authorities or regime will typically express itself in the form of trust or confidence in them" (Easton 1975, 447). The argument goes that contrary to "specific support", citizens direct "diffuse support" at institutions and a political regime itself in a more abstract way, without paying much attention to *how* these institutions have been performing (Dalton 2004, 23). This diffuse support is therefore what connects citizens' trust to government legitimacy[5].

Legitimacy, however, is not something peculiar to Western democracies. On the contrary, it constitutes an integral part in both democracies and autocracies alike. But to legitimise their

[5] Some would contest this interpretation of Easton. Iyengar (1980), for instance, thought that it is not as much political trust as *the sense of political efficacy* that contributes to government legitimacy. Regardless of which of the two is more influential, it is generally agreed that trust matters for political legitimacy at least to some extent.

policies, autocratic rulers need to resort to other tools and methods such as generous social spending or coercion which serve as substitutes for trust. In stark contrast, public trust is a central pillar for democracies, a necessary condition for a democratic country to persist as such (Turper and Aarts 2017, 417). It was also shown that higher trust contributes to higher citizens' tax compliance (Scholz and Pinney 1995) and makes law-breaking behaviour less likely (Marien and Hooghe 2011).

Besides legitimacy and compliance, trust has been found to play other essential roles. Thus, Brehm and Rahn (1997) established a close link between levels of interpersonal trust and civic engagement, with more trusting people being more engaged in civic activities; analysing the relationship between political trust and sentiment towards the government, Hetherington (1998) found that it is actually trust that has a stronger effect on satisfaction with the government than the other way around; Uslaner (2004) showed that trust is a strong determinant of tolerance and affirmative action in the US, while her collaboration with Brown demonstrated that trust affects both communal and political participation rates (Uslaner and Brown 2005).

Most of the literature, however, differs not only in operationalisation and measure of trust, but also in its basic definition. The diversity of accounts of trust sparked heated debates as to the validity and scientific value of some of them (Braithwaite and Levi 2003). The very fact of the controversy is not surprising since trust is a multifaceted phenomenon which is hard to pin down. Easton reasonably asks: "[A]re we able to distinguish conceptually between trust and cynicism on the one hand and those positive and negative orientations flowing from evaluations of performance on the other?" (1975, 448).

The question is still open, yet scholars usually endeavour to distinguish between several types of trust. A commonly drawn distinction is between two sorts: (1) trust in others which is subdivided into interpersonal trust, social trust and generalised trust; and (2) trust in

government, which is frequently used synonymously to confidence in government and political trust (Anderson 2010)[6].

It is worth noticing that interpersonal and social trust stay beyond the scope of this thesis and the focus is placed on political trust, operationalised as trust in the government, which is sometimes contrasted with trust in institutions. Although trust in institutions and trust in government sound similar, some have argued for a differentiation between the two on analytical grounds. For the former implies a more abstract and impersonal perception of political agents, while the letter is usually associated with the performance of incumbents. While discussing surveys of the Center for Political Studies, Erber and Lau aptly point to this issue:

> "It is unclear just how people interpret the trust in government items. Some respondents may interpret these items as meaning hostility toward 'the institutions of government' and 'the regime as a whole' and a 'negative orientation toward the political system,' […], while other respondents may interpret them as meaning 'mere disapproval of incumbent political leaders,' […]".
>
> (Erber and Lau 1990, 237)

This is a valid critique which raises several questions as to how results of a large body of existing research – including the analysis in Chapter 2 – should be interpreted and to what extent findings based on survey data may be generalised. However, as a recent empirical study by Hooghe (2011) shows, different political trust items measure more or less the same concept which means that, at least in practical terms, there is little difference in using one or another operationalisation of trust.

Conceptual issues aside, the fact remains: trust plays a vital role in our society. Generally, it is safe to say that higher levels of public trust provide a favourable political environment and allow a greater scope for political initiatives whereas declining levels hinder political process and pose new challenges for representative democracy (van der Meer 2017). Of course, trust

[6] Whether confidence and trust are indeed synonymous raises the problem of measurement validly. This issue is discussed in Chapter 2.

also bears enormous importance for elections, which have been badly suffering from declining turnout rates stemming partly from decreasing political trust (Solijonov 2016).

What becomes of cardinal importance to scientific enquiry is which factors influence levels of trust. This is especially pertinent in view of constantly declining levels of trust – or rather rising levels of distrust?[7] – in governments across developed countries (Dalton 2005) (Webster 2017). In a recent study, Armingeon and Guthmann (2014) found that the share of people who trust in their national parliaments declined in 20 out of 26 EU-member countries, with a mean change of -7.8 % across the whole European Union between 2008 and 2011.

Disturbing as they are, decreasing levels of political trust call for a closer and careful examination. Understanding what contributes to the downward trend is necessary so as not to allow corrosion or even decay of democratic regimes. In the current predicament, an adjustment of the political system is badly needed. Concerning this issue, Offe's (1999) almost 20-years-old interpretation of populism as a consequence of mistrust in political institutions sounds like an early warning as to what form this adjustment might take. He notes "Populist politics is an extra-institutional short-cut to political trust, and its spread and success testifies to the difficulty of mediating trust through institutions and the principles embodied in them" (Offe 1999, 78).

While looking for factors that are relevant to political trust, researchers have already pointed to diverse factors: civic engagement and citizens' participation in the community life (Brehm and Rahn 1997), personal knowledge (Rousseau, et al. 1998), societal cooperation (Putnam 2000), degree of exposure to media criticism (Iyengar 1980), information dissemination rate (Offe 1999), national economy performance (Armingeon and Guthmann 2014) and so forth. It is needless to say that the association between standard socio-economic variables - such as gender,

[7] It should be kept in mind that declining levels of trust in government do not necessarily entail rising levels of distrust. People might simply become apolitical or disengaged in politics which manifests in indifference towards government. This however does not mean that they are *ipso facto* discontent with how government functions. As noted above, declining levels of trust thwart political process; rising levels of distrust do so even stronger.

age, education and income – and political trust has long been established (Armingeon and Guthmann 2014). A special place in this miscellaneous assemblage of factors is given to information sources: newspapers, TV and, more recently, the Internet.

1.2. (Video-)malaise and Trust

Questions related to the way information is disseminated and possible effects of mass communication on the audience started to get traction in academic research shortly after scholars such as Lasswell (1948), Schramm (1948) and Shannon (1948) turned their attention to how information is transmitted via radio and television. Many new concepts such as agenda-setting and framing have entered social science vocabulary ever since.

It was the first time when large groups of people were exposed to identical content and the amount of time people spent on receiving such content was constantly increasing. Once TV news had grown to people's primary source of information[8], social scientists noticed a puzzling trend: increasing levels of TV consumption were concomitant with declining levels of trust in government (Robinson 1976).

Describing a crisis of young people's engagement into democratic politics in the US, which he denoted "malaise", Dahl observed: "If the malaise were only American, one could put it down to television, over-permissive child-rearing, the persistence of an unpopular and ugly war […]" (1967, 967). Dahl was the first to suggest a link between television and "malaise". He was followed by Robinson (1976) whose theory of videomalaise evolved from Dahl's observation.

Robinson listed six factors that make "viewers respond to the [TV] content by growing more cynical, more frustrated, more despairing" (Robinson 1976, 426): (1) the TV audience is large, (2) TV networks are perceived as credible, (3) news coverage is interpretive in its nature, (4) reports are negatively flavoured, (5) violence is prevalent in the content, (6) the topics of news

[8] Already in 1974, 65 percent of Americans indicated TV news as their main source of political information. (Burns 1975, 3).

are anti-institutional, i.e. highly critical of current policies and the state of affairs (Robinson 1976).

One of the first findings in media literature was that people are not simply passive consumers: their pre-existing views and values moderate the effects of media influence (Newman, Just and Crigler 1992) (Mutz and Reeves 2005) (Norris 2000). This was again confirmed in a recent research by Ceron (2015) who used Eurobarometer data on 27 countries. Moreover, some scholars found that the medium which people use for receiving political information also matters: Brians and Wattenberg (1996) revealed that reading newspapers has a positive impact on trust while watching TV influences trust negatively. Nonetheless, other researchers did not find support for this claim (Tworzecki and Semetko 2012).

One might suggest that differentiated effects of various media sources could simply be attributed to the fact that newspapers and television tend to present information in a different way. Indeed, deploying content analysis of newspaper and television news coverage, Moy, Pfau and Kahlor (1999) found that the former generally express much lower levels of criticism towards politicians and institutions than television news does. In a similar vein, Avery (2009) tested the claim that news impacts on political trust depending on both prior levels of trust as well as the medium. Using panel studies for 2000 presidential elections in the US, he found that those people who initially had lower levels of trust were less negatively influenced by TV news than those who were more trusting in the first place.

A different perspective was offered by Pippa Norris (2000) who developed the theory of "a virtuous circle". In her critical response to the media malaise theory, which she considered too simplistic, Norris suggested that users and viewers of media content are prone to selective perception. Previously, when people received most news from a small number of national television stations, this selective perception bore less relevance. In stark contrast, a growing

number of news sources and formats today, so the argument goes, makes it easy for people to find news that are to a large extent in line with the views they have already adopted (Norris 2000, 252). She writes "A more educated and literate public is capable of using the more complex range of news sources and party messages to find the information they need to make practical political choices" (Norris 2000, 17).

This allows Norris to argue against much of the previous research. She writes: "People who watch more TV news, read more newspapers, surf the Net, and pay attention to campaigns are consistently more knowledgeable, trusting of government, and participatory. Far from being a case of 'American exceptionalism', this pattern is found in Europe and the United States" (Norris 2000, 17). Her arguments imply that if there is any "virtuous circle", it would be most salient in case of people who receive their news online, as the Internet offers the widest range of sources for "a more educated and literate public".

It is notable that Norris mentions the Internet along with newspapers and TV news. The Internet is a new technology that plays an increasingly important role, taking over a share of traditional ways of mass communication (Kettl 2000). Accordingly, the academic focus has recently moved from the effects of traditional media sources such as newspapers and TV to those available online. While online news outlets with rich multimedia contents and social networks present a new way of receiving information, e-government websites alter the environment in which citizens and governments interact.

This brings up a lot of questions: is the overall effect of the Internet similar to the effects of traditional media? If people use selective perception when receiving information from TV news, how does this process of filtering play out on the Web? Can any other online activities, besides getting news, associate with changes in trust? These questions will be partly addressed in Chapter 2. But before doing that, the discussion of several other things is in order.

1.3. The Rise of the Internet

In comparison to printed media or TV, online world is different in some important respects. Not only is the Internet replete with conflicting information, but also users are left to themselves in navigating the Web and searching for information. The essential function of "gate-keeping" (H. D. Lasswell 1927) (Lewin 1947), which is integral to traditional media, is not fulfilled on the Internet, since no one filters the information for the user[9]. This lack of filtering contributes to citizens' sense of empowerment, which in turn makes citizens less deferential to government (Brainard 2003).

It is thus possible that the effect of the Internet on political trust might be dissimilar to that of newspapers and television. Moreover, recent developments such as open government and e-governance services increase the amount of political information on the web. Increased transparency coupled with better information about the government's decisions and policies available online might actually develop political trust.

The study of the Internet becomes even more relevant in the light of people's changing habits. Previously popular television news has yielded its place to the Internet. On average 52% of the people surveyed in 19 OECD countries said that they get daily news from the Web (Mitchell, et al. 2018). Interestingly, in 12 out of those 19 countries, numbers are disproportionately higher for people aged between 18 and 29; in all 19 countries, more educated people tend to rely on the Internet as their primary source of information more heavily than less educated, men more than women and people with higher income more than people with lower income.

[9] This should not be understood literally or in the sense that information on the Internet is completely random. Popular search engines have embedded filters which customise the content based on search history while online editions of newspapers are still edited. Governments of several countries do their best to limit their citizens' access to some sorts of information online. Cookies, browser history, likes on Facebook etc.: all these tools define what kind of information users would stumble across on the Web in the future. However, in contrast to "gate-keeping" and "agenda-setting" functions of traditional media, these tools do not furnish coherent pieces of information.

It might be inferred from the aforesaid that if the Internet does influence trust in government, its effect is unevenly distributed across socio-demographic strata, which is obviously problematic for political participation and democratic representation in general. The problem is even more worrying if the effect is negative, since it would make young, educated people with higher incomes sceptical about politics while discouraging them from taking part in political life.

1.4. Research Question, Data and Methodology

The aim of this thesis is exactly to examine the relationship between the Internet and trust in government. Formulated in a general way, the research question asks:

RQ: *What is the association between the use of the Internet and trust in the government?*

More precisely, in its endeavour to understand the complexity of the relationship, the research focuses on the following sub-questions: (1) Do Internet users in general differ from non-users in their trust in the government? (2) How does the amount of time people spend on the Web influence political trust? (3) Are people who prefer getting news online more or less likely to trust the government than those who prefer traditional media sources? (4) What do social networks tell us - if anything at all - about political trust their users have?

To answer these questions, I use data from Oxford Internet Surveys (thereafter: OxIS), which have been conducted by the Oxford Internet Institute in the United Kingdom biennially starting from 2003[10]. Advantages of using these data are numerous. Firstly, the time span covers a period of 10 years, which offers a suitable opportunity to control for time contingencies and exogenous fluctuations in levels of trust. Secondly, the surveys contain a set of specific questions as to the respondent's activity on the Internet, which makes it possible to investigate effects of particular online activities. Thirdly, sample sizes hover around 2000 respondents,

[10] OxIS 2003, 2005, 2007, 2009, 2011, 2013 databases provided by the Oxford Internet Institute on 19/02/2018.

while much of the previous research used tailor-made surveys on smaller groups of up to one thousand respondents. Finally, since the surveys have been conducted in the United Kingdom, results of the analysis might well be legitimately generalised to other developed countries[11].

Methodological toolkit used to assess the effects of the Internet includes analysis of variance to test differences in group means, simple OLS models and multivariate regressions with a stepwise method for model selection to identify predictors of trust. Given a continued controversy around some of the methods, several cross-validations procedures are adopted. On top of that, factor analysis is utilised to reduce the number of input variables, thereby adding to the relative parsimony of the models.

The thesis therefore contributes to the field of political communication by analysing the question of political trust using both a diverse set of methods and an extensive dataset. Since previous research has lacked in quality of data and sometimes methodological thoroughness, the combination of methods and data used in this thesis shows promises of yielding reliable and conclusive results.

1.5. More on the Relationship: Expectations

As describe above, literature in the filed offers sound reasons to suspect that the use of the Internet can *ipso facto* affect political trust. However, the range of activities that people might engage in online is so diverse that it threatens to produce a type II error unless the question is approached in a cautious way. It is true that even if some activities on the Internet are strongly associated with different levels of trust, one risks not to identify these activities when looking

[11] Whether the results may be generalised to a wider range of countries is a tricky question. On the one hand, it has been shown that institutional performance has a similar effect on political trust in East Central Europe as it does in Western European countries; on the other hand, it is also true that ECE countries have substantially lower levels of trust to start with (Boda and Medve-Bálint 2014). I would rather not trade the validity of results for a greater number of countries they could apply to.

at the aggregated data. The phenomenon of effects reversing their direction or even disappearing is widely known in statistics as Simpson's paradox[12].

The paradox is indicative of the importance of looking at the relationship from different perspectives and group specific effects. In this regard, having analysed 27 European countries using Eurobarometer data, Ceron (2015) concludes that news media and social media produce different outcomes: people who use the former tend to have higher levels of trust, while those who receive their news from social media on the contrary express lower levels of trust. If there was a single measure for news and social media usage, the net effect would probably be insignificant. There is of course the problem of causality lurking in Ceron's research – in that it is also possible that people with higher trust might simply tend to use news media – yet the very fact of the difference is of notice. Likewise, people who extensively use the Internet for entertainment might not express lower or higher political trust, whereas those who surf the Web in search of political information might be more trusting. For these reasons, it would not come amiss to look at disaggregated data when possible.

Another dimension of online world which received a substantial amount of scholarly attention is e-governance. It has been hopefully suggested that e-governance would stop if not reverse declining levels of political trust in developed countries. Empirical research on the citizens of Canada and the United States provides evidence of the effect (Welch, Hinnant and Moon 2005). Morgenson and his colleagues offer a fair causal explanation as to why that could happen: since the decline in trust is closely associated with the perception of government's performance and e-services are likely to alter this perception, e-government holds promise of increasing trust in government or at least not letting it decline (Morgeson, VanAmburg and Mithas 2011, 258-259). They go on to analyse the claim using structural equation modelling and find no evidence

[12] A concise explanation of the paradox can be found in Pearl (2014)

that the use of e-government is associated with greater levels of trust. Still they claim that it does lead to "improved citizen confidence in the future performance of the particular agencies with which they interact" (Morgeson, VanAmburg and Mithas 2011, 274). This harks back to Tolbert and Mossberger's (2006) earlier finding that users of e-services tend to have higher trust in local government but not in federal or state government.

With all this in mind, it is reasonably expected that in regard to political trust there might be no group differences between Internet-users and non-users. But there should be differences between people who use the Internet for different purposes. I would expect people who use online media to have different levels of trust than those who read printed news, due to both the content of these sources and the way people filter them.

Similarly, people who have used e-services are expected to increase their levels of trust through their experience. The relationship, however, might not be so simple. As suggested by Porumbescu: "the effects of information are heavily contingent upon levels of use – infrequent use may have positive effects, whereas intensive use may bring about negative effects" (2016, 300).

Another expectation concerns satisfaction with life and trust in media. Dissatisfied individuals are likely to be less trusting in the government despite the kind of news media they use. Similarly, trust in newspapers and television news matters of itself. For the same information will differently impact on individuals who trust in the source than on those who do not. This is not to mention that general levels of trust in society around that time should also be taken into consideration. Finally, social media with its plurality of opinions and non-hierarchical structure should be conducive to a less negative attitude towards the governments.

What needs to be kept in mind throughout next chapter is that the thesis does not purport to explain the whole incidence of the decline of trust in developed countries. Nor does it argue

that the Internet is the strongest determinant of confidence in government. Rather, the goal of the research is to identify just one of many possible factors relevant to political trust. In so doing, let us delve into the analytical part, which start with the description of trust levels in the United Kingdom.

Chapter 2: Analytical Part

This chapter is dedicated to the empirical analysis of the suggested effects of the Internet. Firstly, I start with placing the UK in the abovementioned theoretical framework of declining trust using descriptive statistics. Secondly, trust levels for users and non-users of the Web are compared. This is followed by a multiple regression analysis with the aim of predicting citizens trust based on six Oxford Internet Surveys. The analysis produces a mixed picture, which prompts to use a more sophisticated and tailor-made method, namely stepwise regression, for selected years. In view of a generally critical attitude towards this method, different cross-validation procedures are adopted. Finally, the results are interpreted in their relation to the theoretical framework at the end of the chapter.

2.1. The Decade of Erosion: Trust in the Government in the UK since 2003

Being a part of both economically developed countries and long-standing democracies, the United Kingdom is no exception to the downward trend identified earlier. Having used national surveys, Armingeon and Guthmann (2014, 432) found that the UK saw a share of its population dissatisfied with the parliament grow by 1.7 % while a share of citizens who do not trust their parliament increased by 9.3 % between 2007 and 2011.

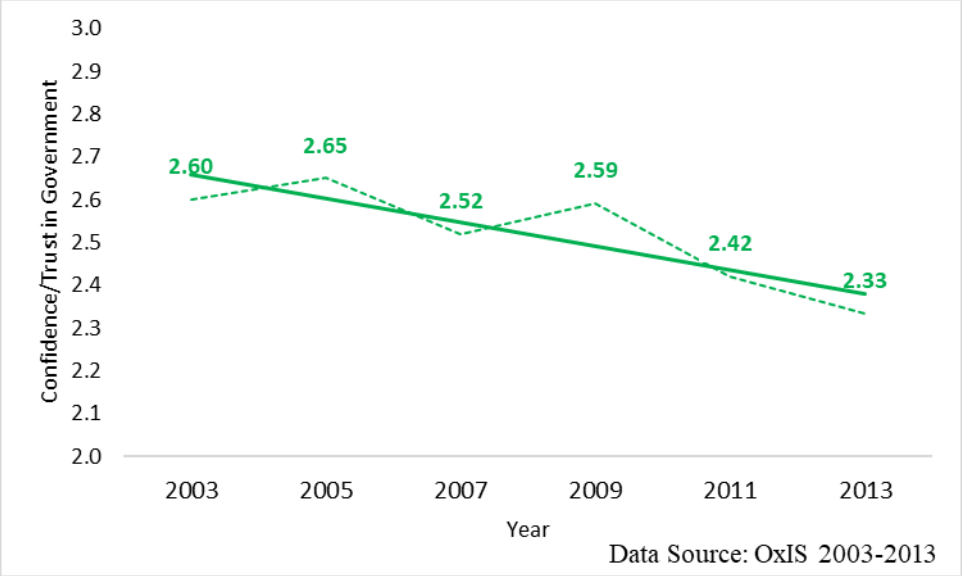
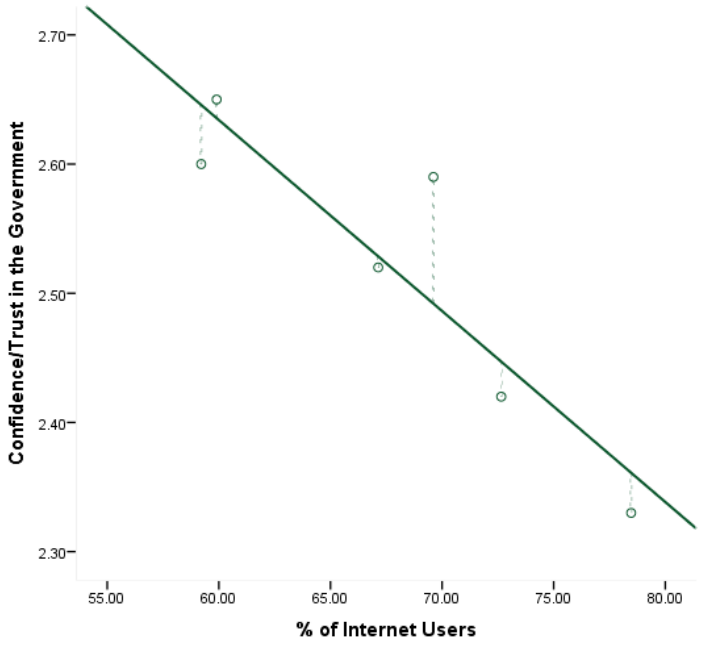


Figure 2.Dynamics of Confidence/Trust in the Government in the United Kingdom

A cursory look at the line chart above confirms that a negative change is also true for confidence/trust in government in general. Although one can see minor fluctuations, the country-level trend is apparently negative. In a decade, people in the UK became less trusting towards their government by roughly 0.3 points which is a fairly large change, given that the trust variable is measured on a 5-point scale.

Is there any sound reason for attributing this change to the rise of the Internet? At the aggregated level, the data are suggestive of a positive answer to this question. While trust has been gradually diminishing, the share of Internet users has been incessantly growing. According to OxIS data, only 59.2% of the British people surfed the web in 2003, whereas the number increased to 67.1% in 2007 and reached 78.5% six years later. Figure 2 below shows clearly that the two changes seem to have been going hand in hand: Pearson's correlation returns a value of -0.903, which is close to its negative maximum.



Data Source: OxIS 2003-2013

Figure 3. Scatterplot for Share of Internet users and Country-level Trust

Admittedly, people in the UK also started to watch less TV and spend more time online in late 2000s. The share of time spent on consuming television dropped by 25%, while that spent on

using the Internet increased twofold[13]. Thus, one of the possible effects of the Internet is not that it impacts on trust *per se*, but rather through the changes it causes in the way people spend their time on other relevant factors, which on top of television include face-to-face communication and engagement in social and political life.

Despite being insufficient for making any causal inferences or offering any convincing explanation, the abovementioned trends are indicative of some sort of association and need for further analysis. There might be multiple reasons which impacted on trust at the country level, e.g. fluctuations in economic growth, transitions of power from one party to another; and these could be better at explaining changes in trust than the Internet. However, the jury has been out on this issue, for the lack of a long time-series precludes scholars from using many statistical methods. Regrettably, not only are Oxford Internet Surveys – which are amongst the largest in terms of scope and the oldest surveys on the Internet available – conducted biennially, but they were also not initiated until 2003. As a consequence, there are as few as 6 years of observations available for the analysis, which is not enough even to run a simple regression[14].

Vexing as this may be, a rather short time span does not pose too serious a problem, since the disaggregated data offer a reasonable – if not better – alternative for a cross-sectional analysis.

2.2. Political Trust of Users and Non-Users

One way to investigate whether the association between trust and the Internet is spurious or not, is to look at differences in means between users, ex-user and non-users. In so doing, analysis of variance is used for individual-level data. Statistics for ANOVAs for each year are displayed in the table below. The results of the analysis are rather problematic and contentious.

[13] Estimates based on the OxIS data.

[14] At the time of writing, two newer surveys have already been conducted (2015, 2017). The Oxford Internet Institute however does not publicly release new data for at least two years.

For years 2003 and 2005, p-values are indicative of the fact that population means are unlikely to differ. Although for the following years it is much more likely that the means are indeed different (p-values < 0.05 or 0.1), none of the ANOVAs satisfies the homogeneity of variances assumption, either according to Levene's test or Brown-Forsythe's test[15]. This is not to say that the means in the population are *necessarily* equal, but rather that ANOVAs do not provide sufficient evidence to argue that they are indeed different.

Table 1. One-Way Analysis of Variance of Trust in Government by User Types

Year	*df (total)*	*F-statistic*	*p-value*	*Levene's test p-value*	*Brown-Forsythe tests p-value*
2003	1991	1.87	.13	.00***	.28
2005	1987	0.71	.49	.00***	.49
2007	1994	5.68	.03**	.3	.00***
2009	1972	5.66	.01***	.00***	.00***
2011	1990	2.66	.07*	.00***	.08**
2013	1996	5.76	.00***	.29	.00***
*Significant at * .1, **.05, *** .01*					

Moreover, even if one considers the results for 2007 and 2013 as reliable enough, Tukey's HSD test and Bonferroni procedure (not shown here) both indicate that the only statistically significant difference in means is between users and non-users of the Internet, while neither the difference in trust means between users and ex-users nor that between ex-users and non-users can be said to be different in the population. Figure 4 below visualises the differences for OxIS 2013[16].

This, of course, does not directly speak against the theoretical argument as the analysis does not take into account how long people have been Internet users or the amount of time they spend

[15] In contrast to Levene's test, which uses deviations from the mean, Brown-Forsythe's test uses deviations from the group medians. It has been suggested (Olejnik and Algina 1987) that Brown-Forsythe's test performs better than Levene's test if raw scores deviate from the normal distribution, which is the case for the data in years 2011 and 2013.

[16] Means plots look identical for the year 2007 and 2011. In stark contrast, other years' data show that either non-users have higher trust than ex-users or that ex-users are much closer to non-users that to users.

surfing the web. Neither does it consider effects of different ways of using the Internet (whether users look for news, read online newspapers etc.).

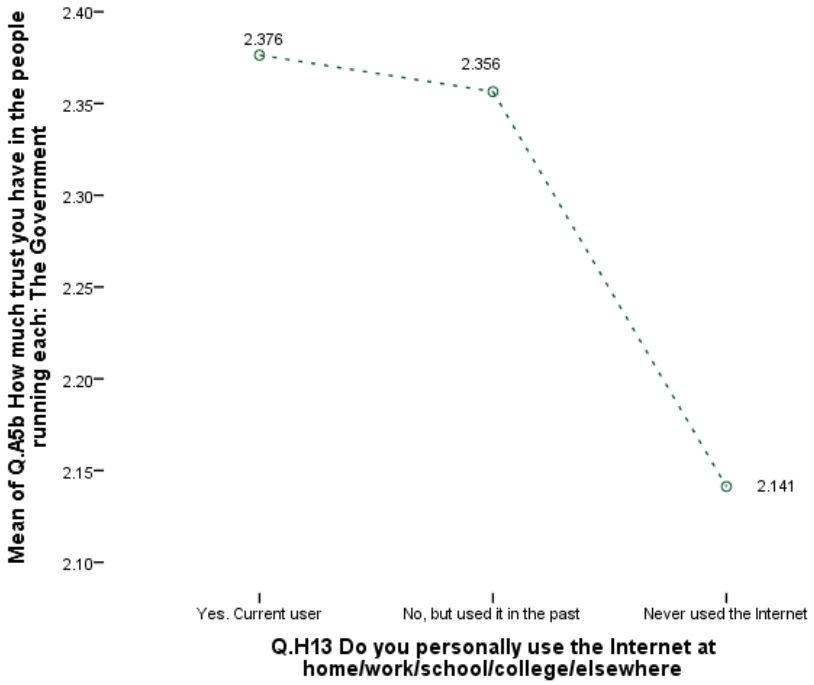


Figure 4. Means Plot of Trust in the Government by User Types for OxIS 2013

Thus, to conclude that the Internet has no effect based on the ANOVAs' results would be hasty, if not erroneous. Rather, it should be understood as suggestive of the fact that if the Internet does associate with trust, its relationship is subtler that the mere circumstance of being a user or non-user.

2.3. Assumptions and Data Description

In line with most previous research, this thesis will utilise regression models to estimate the association between trust and the Internet. As a desirable by-product, this will make results of the analysis directly comparable to previous findings. The price for such comparability, however, is a high risk of producing biased estimates, since most of the data are suitable for this sort of analysis only when several assumptions have been made. But before plunging into the explanation of models with their merits and flaws, some descriptive statistics as well as caveats about variables are in order.

Two fundamental assumptions of this thesis, which should be made explicit beforehand, concern measurement validity and levels of measurement. For it has become conventional in social sciences to take for granted the former (Adcock and Collier 2001) and mostly dodge the discussion of the latter, it is especially important to counteract this precipitous approach by making assumptions clear.

The issue with measurement validity stems from the change in Oxford Internet Survey's questionnaire. From 2003 to 2007, respondents were asked to tell how much *confidence* they have in the government[17]; starting from 2009, interviewers have asked about *trust* in the government. Unfortunately, it might be only speculated whether the change has any consequences for the analysis.

That said, the description of the confidence/trust variable in Table 2 below suggests that the validity is unlikely to have been grossly undermined as the scores are quite consistent.

Table 2. Descriptive Statistics of the Confidence/Trust in the Government Variable

Year	*M*	*SD*	*Skewness*
2003	2.60	1.08	.182
2005	2.65	1.16	.245
2007	2.52	1.13	.242
2009	2.59	1.10	.112
2011	2.42	1.18	.298
2013	2.23	1.18	.400
Minimum: 0; Maximum: 5			

As to the levels of measurement, it would not come amiss to repeat that the dependent variable is measured on a 5-point scale. Whether such a scale might be considered continuous or not has sparked off fierce debates which are not over yet. In this work, I draw on Carifio and Perla (2007) who showed that even variables measured on a notorious Likert scale – which the dependent variable is not – can be used as interval data without much loss in robustness.

[17] Exact question wordings for each year can be found in the Appendix 1.

With this in mind, independent variables used in regression models include but are not limited to those described in Table 3.

Table 3. Independent Variables and Measurements

Variable (or Proxy)	Measurement
Time Using the Internet[18]	Months
Time Online	Hours/Week
Education	Dichotomous (1 for university graduates)
Age	Years
Female	Dichotomous (1 for females)
TV (except for 2013)	Hours/Week
Factor for Media Reliability[19]	Regression scores from principal components
Factor for Institutional Trust	
Factor for General Trust	
Other Variables for the Internet and Media Usage	

Some of the above variables have already been analysed and have some analytical history to them. Thus, using a sample of South Korean citizens, Im and his colleagues (2012) have found that the more time people spend on the web, the less trusting they are. Being a female was also found to have a negative effect on trust, while education, income and rural origin were not significant.

Although Ceron and Memoli (2015) confirmed that females are less likely to trust in government, they also established that *age and education increase* the odds of higher trust. Their findings, however, originate from the analysis of Eurobarometer data from 2007. Valuable as it is, their contribution might be highly time-contingent. Exemplary in this respect is same year's article by one of these authors (Ceron 2015), who again uses Eurobarometer data but this time from 2012. In the article, Ceron shows that consuming news from social media has a negative impact on trust, while press news and radio news make people more trusting in

[18] So as to preclude any positive selection bias, ex-users and non-users had to be included in the analysis. While the issue with non-users was resolved by merely using zeros, the solution for ex-users was more complex, since simply using the number of months they were using the Internet without allowing for the discounted effect was deemed unsatisfactory. The following formula was used to account for the discounted effect: $t_i = total_{i\ \text{months used the Internet}} - total_{i\ \text{months since stopped using the Internet}}$. If t was < 0, a negative value was substituted for 0.

[19] Some descriptions of factors as well as their loadings and additional statistics will be provided below.

government. TV news as well as *education do not have a significant effect*, whereas age is positively related to trust.

As suggested in Chapter 1, the strongest predictor of trust in the government should be trust in other civil society institutions and people. Therefore, based on a set of available variables, two factors were constructed: factor for institutional trust[20] and factor for general trust[21]. The third factor was constructed to account for different levels of credibility people have in information they receive. An example of loadings can be found in Table 4 and 5 below[22].

Table 4.Component Matrix for Institutional Trust (OxIS 2003)

	Component
	1
Confidence in Major companies	.723
Confidence in TV news	.805
Confidence in Newspapers	.810

1 component extracted. The component explains 61% of total variance.

Table 5. Component Matrix for General Trust (OxIS 2009)

	Component	
	1	2
How much trust in: Most scientists	.654	.569
How much trust in: Most doctors	.625	.606
How much trust in: Most people in this country?	.723	-.507
Would you say that most people can be trusted?	.692	-.555

2 components extracted. The components explain 76.8% of total variance.

Factors offer a good alternative to including an excessive number of variables by reducing dimensions of the data. Although a concomitant of this is some loss in variance, this is not too severe a problem, since of interest here are not variables from which factors are constructed but rather Internet-related variables.

[20] For all years, it is created from three questionnaire items: confidence/trust (1) in major companies, (2) in television and (3) in newspapers. The name might be somewhat misleading as the factor is not meant to represent trust in state institutions but rather in civil society institutions.

[21] Based on the following items: confidence/trust (1) in scientists, (2) in doctors, (3) in most people I know, (4) in most people in this country. For years 2009, 2011 and 2013, the forth item is changed to "Would you say that most people can be trusted?"

[22] Scores for each OxIS were extracted using principal component method with a varimax rotation.

2.4. Preliminary Analysis: Multivariate Regressions

Due to the fact that Oxford Internet Surveys have changed their questionnaire several times, it is not possible to construct exactly same models for all years. However, the models employed in the analysis are quite comparable to one another and should not be too different to argue that the changes in regression coefficients or significance levels are only because of different model specifications (which of course cannot be completely ruled out).

Table 6 shows unstandardised coefficients with standard errors in parentheses for multivariate regressions to predict confidence/trust in the government. Needless to say that the results again do not present the Internet as an important factor in determining political trust. In all six waves, time people have used the Internet does not show any meaningful impact on the levels of trust[23]. Time spend online per week is significant only in one model and has a negative sign. At the same time, the amount of time people spend on getting on-line news has a positive sign and is significant in the first model (the only year for which such information is available).

This might indicate that post-2003 data suffer from Simpson's paradox mentioned earlier. Indeed, it is not unthinkable that the general amount of time people spend online conceals positive and negative individual effects of different Internet activities that simply cancel each other out when aggregated.

Unsurprisingly, the factor for institutional trust is significant in all models and is the strongest[24] predictor of confidence in the government. So is the factor for general trust, which is not significant only in one model. Rather puzzling in the table is the factor for media reliability[25], which is significant in three models yet has opposite effects. By the same token, watching

[23] Keep in mind that the way this variable was constructed might have drastically changed or distorted the actual effect.
[24] As seen from standardised coefficients which are not shown here.
[25] The factor is constructed from two variables: (1) reliability of information in newspaper and (2) television. From 2009 onwards, it also includes the third variable: (3) reliability in information on radio.

television increases trust in 2005, but decreases it in 2009 and 2011. Unfortunately, data on how much time people spend watching TV are unavailable for 2013.

Table 6. Multivariate Regressions to Predict Confidence/Trust in the Government[26]

Variable	Model 1 OxIS 2003	Model 2 OxIS 2005	Model 3 OxIS 2007	Model 4 OxIS 2009	Model 5 OxIS 2011	Model 6 OxIS 2013
	Untandardised Coefficients (Std. Error)					
Getting on-line news (Hours/Week)	.038** (.019)					
Time Online (Hours/Week)		-.006** (.003)	.002 (.002)	.001 (.002)	-.002 (.002)	-.002 (.002)
Time Using the Internet (Months)	-.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)	-.001 (.000)	.001 (.000)
TV (Hours/Week)	.003 (.002)	.002* (.001)	-.004 (.002)	-.008*** (.002)	-.006*** (.002)	
Radio (Hours/Week)			-.007*** (.002)			
Newspapers (Hours/Week)			.004 (.005)			
Satisfaction with life	.070*** (.026)					
Education	.211** (.071)	.193*** (.068)	.093 (.068)	.124* (.067)	.252*** (.066)	.150** (.060)
Age	-.004** (.001)	-.007*** (.001)	.006*** (.001)	-.005*** (.001)	-.006*** (.001)	-.008*** (.001)
Gender	-.071 (.044)	-.029 (.050)	.047 (.050)	-.051 (.051)	-.009 (.050)	.102** (.045)
Factor for Media Reliability	.014 (.025)	-.087*** (.029)	-.004 (.031)	-.169*** (.035)	.067** (.034)	.016 (.029)
Factor for Institutional Trust	.446*** (.028)	.542*** (.032)	.401*** (.033)	.568*** (.036)	.603*** (.036)	.708*** (.033)
Factor for General Trust 1	.092*** (.025)	.139*** (.027)	.178*** (.028)	.178*** (.027)***	.078*** (.025)	.014 (.028)
Factor for General Trust 2				.129*** (.030)	.099*** (.029)	
Constant	2.466 (.129)	2.949 (.88)	2.227 (.109)	2.908 (.094)	2.888 (.094)	2.700 (.087)
N	*1788*	*1683*	*1515*	*1315*	*1449*	*1706*
Adj. R^2	*.230*	*.254*	*.199*	*.304*	*.377*	*.403*
*Significance at: *.1, **.05, ***.01*						

[26] All models were checked for multicollinearity using variance inflation factors. None of the VIFs exceeded 3, with most of them being around 1-1.5, which shows that the models do not suffer from multicollinearity problem.

Of notice is also adjusted R^2, which ranges from a bit lower than 0.2 to 0.4. This means that the explanatory power of the models is markedly increasing. For 2007 data, it barely explains 20% of the variation in political trust, while it accounts for twice as much in 2013. Arguably, a proper way of understanding this phenomenon is that there is some convergence between different types of trust at play. Namely, trust in TV, newspapers and major companies seems to be more aligned with trust in the government as we move from 2007 to 2013.

This raises two tricky questions: (1) what can account for this sort of convergence and (2) how do multiway effects among trust in different institutions look like? In other words, is it higher trust in newspapers and TV that makes people view major companies as more trustworthy or is it actually trust in companies that increases trust towards the media? Path models or more sophisticated structural equation modelling would be useful to address these questions. Nevertheless, this goes beyond the scope of this thesis and calls for a separate piece of research to be produced elsewhere[27].

Unfortunately, the differences in questionnaires do not allow a deeper comparative analysis. Yet a closer look at separate waves might as well shed some light on the relationship between the Internet and trust in the government.

2.5. Exploratory Analysis with a Theoretical Discussion

The availability of some variables in a specific wave makes it possible to go further in the analysis while trading off the validity and comparability of models. This threatens to produce results which are highly context dependent or time contingent, i.e. biased. With this in mind, it

[27] There have already been several papers that looked at political trust using structural equation modelling. See for example Morgeson, VanAmburg and Mithas (2011) or Park, et al. (2015).

is still worth looking into what exploratory analysis of separate waves has to offer. To do this, I will employ stepwise regression for two waves: 2005, 2011[28].

Table 7 shows unstandardised and standardised coefficients as well as standard errors of the stepwise regression[29]. The results show good congruence between the two waves. But before discussing the results of the regression, excluded variables should be specified. Model 7 left out only one input variable, (1) gender. And so did Model 8, which also excluded binary variables for (2) Facebook and (3) Twitter users. (4) Use of the mobile phone for browsing/updating a social network website was also found insignificant and excluded from the second model. In sum, Model for OxIS 2005 and 2011 contain 8 out of 9 and 9 out of 13 input variables correspondingly. Arguably, this demonstrates that stepwise regressions in this case are unlikely to produce very different results from simple OLS models, which is a direct response to the general critique of this method[30].

As to the results themselves, both models reveal that – besides extracted factors which are still chief predictors – Internet related variables also do well at explaining changes in trust in the government. One additional hour online per week in 2005 decreased trust by 0.09 whilst in 2011 its effect would be slightly smaller: -0.05. In these models, the effect of being online is thus comparable to that of age, which is also found to decrease trust for every additional year. Interestingly enough, the results are in accord with the previous findings of Im and his

[28] The choice of the waves is not arbitrary: 2003 was ruled out for it did not include much specific information on the use of the Internet, 2007 is very limited in terms of variables as well. 2009 has a lot of missing information, so 2011 is preferred. OxIS 2013 will be used later for a separate analysis.
[29] By definition, all variables in the output of stepwise regression are significant.
[30] The models were also checked for collinearity issues using variance inflation factor. None of the variables was diagnosed an VIF higher than 1.5, which is well below even the most demanding threshold of 3. In addition, the distribution pf standardised residuals in both models was checked and turned out to be normally distributed, nicely falling on the line of the P-P plot (not displayed here).

colleagues (2012), who have studied South Korean citizens, yet show a substantially weaker effect of being online[31].

While the sign of the age coefficient runs counter to some of the previous findings in the Internet literature (Ceron and Memoli 2015), gender and education associate with trust as theorised earlier: the former is shown to be unrelated to the dependent variable and hence excluded from the model output, while the latter substantially increases the level of trust.

Newer data from 2011 flesh out some of the effects economic performance and social networks have on political trust. Confirming performance-based theories of trust, the table shows that people who have been personally affected by the financial crisis have a substantially lower level of trust than those who have not been (or at least think so). This also suggests that people tend to put the blame for economic slumps on government rather than on other agents, for instance, major companies.

Model 8 also includes binary variables for Facebook, Twitter and LinkedIn. Only the users of the last social network have been found to be different when accounted for other variables. LinkedIn users, who generally tend to be younger and more educated people with higher-than-average incomes, display more trust in the government than others. Still, the model accounts for two relevant demographic variables: age and education, which means that the effect of LinkedIn is valid on top of those caused by demographic variables.

Of more interest are year-specific variables which have been also found relevant. Thus, being a reader of a printed or online newspaper in 2005 would decrease trust by almost 0.2 points. At the same time, if the news service which you read online is different from what you read in paper, your expected level of trust is estimated to be higher by roughly 0.3.

[31] This prompts a question whether the stronger effect in case of South Korean citizens is attributable to a slightly different model specification that Im and his co-authors use or some other cultural or social characteristic.

Table 7. Stepwise Regression to Predict Trust in the Government (OxIS 2005 and 2011)

Variable	Model 7 OxIS 2005		Model 8 OxIS 2011	
	Unstandardised Coefficient	Standardised Coefficient	Unstandardised Coefficient	Standardised Coefficient
	B (Std. Error)	Std. Beta	B (Std. Error)	Std. Beta
Time Online (Hours/Week)	-.009 (.003)	-.078	-.005 (.002)	-.055
TV (Hours/Week)	.003 (.001)	.050	-.007 (.002)	-.081
Factor for Institutional Trust	.511 (.027)	.437	.617 (.030)	.528
Factor for General Trust	.134 (.027)	.117	.071 (.025)	.062
Factor for General Trust 2	N/A[32]		.094 (.029)	.082
Age	-.005 (.001)	-.078	-.006 (.001)	-.090
Education	.150 (.067)	.048	.195 (.069)	.065
Daily newspapers	-.194 (.053)	-.078	N/A	
Newspapers or news service online different than in print?	.299 (.079)	.086	N/A	
Affected by the economic crises	N/A		-.178 (.055)	-.071
LinkedIn User	N/A		.271 (.123)	.050
Constant	2.959 (.079)		2.888 (.085)	
N	1703		1347	
Adj. R^2	.266		.371	
All variables are significant at $p < .05$				

This might be construed as new evidence to support Norris' (2000) "virtuous circle" theory. Indeed, it seems safe to argue that people reading news online have a much wider range of sources to choose from. This allows Internet users who are interested in getting news to filter information in a way that they would like to thereby leaving the user at liberty to decide which media slant they prefer.

[32] N/A indicates that a variable is not available for a given year and thus is not included in the model in the first place.

Of course, Norris' argument is less convincing when it comes to the question why this impact should be positive. However, if one considers that previous research has found some mediums to be generally more critical of the government than others (Moy, Pfau and Kahlor 1999) (Avery 2009), it might well be the case that online news sources do not increase trust, but rather neutralise the negative impact of traditional media[33]. For instance, although watching TV has a positive impact in Model 7, it is negative in Model 8. So is it in Models 4 and 5 in Table 6 above. Model 3 also shows that radio news is negatively associated with the level of trust, which confirms the findings of Avery (2009) and Ceron (2015).

Therefore, it is not unreasonable to assume that traditional media on average decrease political trust. Given that, people who prefer to consume news online – and consequently watch less TV or listen to the radio – would be less exposed to the negative influence of traditional media and thus have higher levels of confidence in government.

Although time spent online *per se* is shown to decrease trust in both models, its effect shrinks almost twofold in Model 8 as compared to Model 7. We can only speculate as to what causes this change but it might be suggested that the rise of Web 2.0[34] - which got in a big way around 2005 - might be responsible for a weaker negative effect of time spent online. With the amount of user-generated information on the web constantly increasing, it could become harder to consume information which depicts the government only negatively as the web provides a great plurality of opinions.

To sum up the results of the two models above, a couple of numeric examples could be useful. Suppose, there are two persons of interest. Both are 25 years old, have a university degree, read

[33] Note that Model 1 for OxIS 2003 in Table 6 above has a positive and significant value for the amount of time people spend on the Internet getting news, which is in line with the argument outlined here.

[34] Besides some technical aspects as Ajax, Web 2.0 differs from Web 1.0., which dominated the Net until 2004-2006, in the way its content is created. Web 2.0 heavily relies on user-generated content (e.g. YouTube, Wikipedia) and encourages active users' participation (e.g. social networks). For a discussion of the term, see O'Reilly (2007).

daily newspapers and spend 7 hours per week watching TV. (1) One of the two, however, spends only 10 hours online weekly and reads online news sources that are different from those in print, while (2) another person surfs the web for 30 hours per week and does not receive news online. According to Model 7, the estimated trust of the first person is 3.02 whereas the number is much lower for the second one: it is only 2.54. Besides the fact that the difference is quite large by itself, it is also noticeable that the first person's trust is well above the average trust level for 2005 (2.65), while the second person's is a bit lower than the mean.

As to the Model 8, suppose now that we do not know whether the two persons read daily newspapers or any sources online, but we know that the second person is a LinkedIn user but the first is not. In this case, trust for the first and second persons is estimated to be 2.83 and 3.01 correspondingly, which is in both cases much higher than that year's average (2.42).

2.6. Validity Check for Stepwise Models 7 and 8

Since stepwise regression has been severely criticised by many statisticians for its inflated R^2 and incorrect use of degrees of freedom (Thompson 1995) (Henderson and Denison 1989) (Derksen and Keselman 1992) (Mundry and Nunn 2009), it is necessary to check how valid the results of Model 7 and 8 are. One way to do it is to see whether we will get same model specifications on a randomly selected subset of observations. For that purpose, a random sample of 75% cases is selected from each dataset first and then the regression with the same input variables is run.

For Model 7, the analysis identified exactly the same variables thereby signalling a fair degree of validity. However, stepwise regression estimated on the test set for 2011 data produced a substantially different picture than the original model. Six out of nine original predictors were

excluded from the model[35], but one new predictor – the use of mobile phone for browsing/updating a social network site – was included.

This is suggestive of the fact that Model 8 was somewhat overfitted for the data. Nevertheless, it does little harm to the argument outlined above. On the contrary, it seems congruent with the hypothesis that non-hierarchical online structures – which social networks are – diminish negative impact of other media sources. In this case, it would be useful to use some newer data in that social networks, although not a new phenomenon, have become popular only recently. Since 2015 and 2017 data have not been released by the Oxford Internet Institute yet, there is no way but to content with the most recent – and almost 5-years old – OxIS from 2013.

2.7. Recent Evidence on Trust and the Internet

It is interesting to see whether or not the pattern identified above would hold for newer data from 2013. Again, given a fair number of available variables, stepwise regression was applied to identify those which best predict the level of trust. Fourteen input covariates were used in the model. The analysis found that only six of those substantially contribute to the explanatory power of the model. Excluded variables include: (1) Total Time Online (Hours/Week), (2) Factor for General Trust, (3) Facebook, (4) Twitter, (5) LinkedIn (6) Affected by the economic crises (7) Use of the mobile phone for browsing/updating a social network website.

Keeping in mind some of the warnings as to the validity of the stepwise method noted before, I utilise a different cross-validation procedure than for Models 8 and 9. To check whether the results are valid, statistical learning procedure is used (Hastie, Tibshirani and Friedman 2009). The procedure goes as follows: firstly, the original dataset is randomly split into training and test subsets, then the model is fitted to the training subset. Using regression coefficients from the fitted model, predicted values of the dependent variable are estimated for both subsets.

[35] These include (1) Total Time Online (Hours/Week), (2) Factor for General Trust 1 and (3) General Trust 2, (4) Education, (5) Age and (6) LinkedIn User.

Finally, the congruence (in this case: correlation) between predicted and actual values is estimated and compared across training and test subsets. High congruence therefore suggests a good degree of validity, while low congruence is indicative of overfitting issues. Table 8 shows regression coefficients for the model fitted to the training set[36].

Table 8. Stepwise Regression to Predict Trust in the Government (OxIS 2013)

Variables to Predict Trust in the Government	Model 9 OxIS 2013	
	Unstandardised Coefficient	Standardised Coefficient
	B (Std. Error)	Std. Beta
Factor for Institutional Trust	.705 (.026)	.609
Pays for online news	.314 (.135)	.052
Political issue discussed via social network	.267 (.106)	.057
Age	-.006 (.001)	-.100
Education	.192 (.069)	.063
Gender	.114 (.053)	.048
Constant	2.543	
N	1210	
Adj. R^2	.397	

Before interpreting the results of the model, a short discussion of Table 9 below is needed. The table shows the fitted model predicted approximately the same amount of the dependent variable in the training test as it did in the test set (0.627^2 vs 0.621^2), which means that the model does well at predicting unobserved data. This serves as positive evidence of the model not being driven by some bias or noise in the data[37].

[36] As in the case of Models 7 and 8, this model was checked for collinearity issues and normal distribution of the residuals. While none of the VIF exceeded 1.5, residuals fell on the line of the P-P plot with a minor deviation in the upper right corner.

[37] Of course, this should not be seen as a decisive proof of the model being valid either. It would be much more helpful to use the same model specification for data from different waves. Unfortunately, this is not possible for those Oxford Internet Surveys which are available now in that questions as well as levels of measurement for some variables are too different. Thus, statistical learning, which nowadays is referred to as supervised machine learning, is the minimal procedure required to give the results of the model at least some credibility.

Table 9. Correlation Matrix for Model Validation with a Training/Test Split[38]

			Trust in the Government	Predicted Trust in the Government
Training Set	Trust in the Government	Pearson Correlation	1	.627**
		Sig. (2-tailed)		.000
		N	551	530
	Predicted Trust in the Government	Pearson Correlation	.627**	1
		Sig. (2-tailed)	.000	
		N	530	534
Test Set	Trust in the Government	Pearson Correlation	1	.621**
		Sig. (2-tailed)		.000
		N	1447	1376
	Predicted Trust in the Government	Pearson Correlation	.621**	1
		Sig. (2-tailed)	.000	
		N	1376	1390

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

As to the results obtained in Model 9, it should be noted that this is the first and only model which excludes the factor for general trust from the list of predictors. Conversely, it includes gender which was found statistically insignificant in all other models[39]. As in the earlier models, older people are estimated to have lower trust in the government that the youth.

Of notice are two new variables, which are both dichotomous. The first one asks whether a respondent pays for news they read online, while the second one asks if a respondent has discussed political issues via social networks (e.g. twitter). Each is associated with an increased trust in the government if answered positively.

[38] For OxIS 2013, the training set constrains 75% of the observations, the rest is allocated to the test set. Note that this is a tougher cross-validation procedure than the one with a traditional 80/20 split, since the model has to predict values for 25 instead of 20% of the observations.

[39] Bear in mind that it is also the only regression which does not use any input variable for the amount of time people watch TV or listen to the radio.

The effect of the pays for online news variable might be indicative of several things. Firstly, it might mean that fee-based online sources have a tilt that is more favourable of the government. Secondly, the results might be driven by some omitted variables that impact on trust, such as income or placement on a left-right scale[40]. Thirdly, it might be the case that both these things are at play here.

The effect of the second variable is a bit more unexpected. Why would people who discuss political issues via social networks have higher trust in the government and not lower? A possible answer to this question is that some sort of self-selection is taking place there: people who are dissatisfied with the government tend not to convey their discontent on social networks but seek other ways of expressing their opinion. If this is indeed so, then the analysis lends additional support for the hypothesis that social media is an environment that is much less critical of the government than television or daily newspapers.

To illustrate the model's predictions, imagine two people, a man and woman. Both are 35 years old and neither of the two discusses political issues online. The woman, however, has a university degree and pays for online news, while the man has no degree and does not read online news. The estimated levels of trust are 2.33 for the man and 2.95 for the woman. Again, the difference is quite significant and while the woman's trust is far above the average level of trust in 2013 (2.33), the man's trust equals the mean.

When connecting these findings to the results of OxIS 2005 and 2011 stepwise regressions, one can see a somewhat puzzling picture: most of the specific online activities, e.g. reading online news, using social network websites or discussing political issues online, are repeatedly

[40] According to Reuters Institute Digital News Report 2017, people who pay for online news predominantly identify themselves as left-leaning across 36 countries. (Newman, et al. 2017).

associated with *higher levels of political trust* yet the very amount of time people spend on the web in general, although not consistently, is nevertheless estimated to decrease trust.

An educated guess as to why it is so would be that (1) "virtuous online circle" – to adopt Norris' (2000) expression - neutralises negative effects of traditional media and promotes a less critical and more pluralistic environment, which is associated with higher political trust, but (2) when used not as a source of relevant information but as a tool for entertainment or as a "time-killer", the Internet depoliticises users making them more ignorant about and less trusting towards the government.

2.8. Concluding Discussion on Limitations

It is always a good idea to use some caution when interpreting statistical outputs. The results of the analysis presented above require even more modesty, for they are contingent on a whole set of assumptions.

Let me start by addressing some of the possible critique on the part of methodology. It might be argued that the regression as a method is hardly suitable for the data since the dependent variable is measured on a 5-point scale. In replying to this valid critique, it should be noted that most of the literature mentioned earlier treats a 5-point trust variable as continuous. This is of course not the best reason for using OLS models and some researchers would suggest log-linear models as an alternative method. Let me respond to this suggestion in some detail.

Log-linear models are a sophisticated and reliable method for analysing categorical data. Yet it seems to be a somewhat rough tool which favours type II error so as not to give type I error any chance. Because it is not well suited for taking too many input variables with a fair number of categories[41], this method threatens not to identify the effects – if there really are any– of the

[41] A simple 2x3x3 table would result in as many as 18 cells. Adding another dichotomous variable would double this number.

Internet. In addition, log-linear models are prone to a different sort of problems. Results of such models hinge on the way the researcher cuts variables, which is mostly a matter of choice.

This is by no means to say that log-linear models should not be used but rather that for this particular piece of research – which is by its design explorative - OLS models were preferred. It would be indeed interesting to see whether alternative statistical techniques would be able to replicate some of the results obtained here.

On the other part, some might point to the model specifications, suggesting that several important variables, e.g. left-right identification, interest in politics or income, were omitted. True, this is an obvious limitation, which however stems from the availability or rather unavailability of the data. While the first two variables mentioned above are obtainable from OxIS 2003 only, data on income are available for all years. Yet the response rate for this item is well below 50%, which means that including it in the model would cut the number of observation almost in a half. Although such omitted variables might drive some of the results obtained, the stepwise models perform quite well on unseen data. This allows some degree of confidence to argue that the findings are valid and meaningful nevertheless.

In a similar vein, sceptics might suspect that the analysis suffers from a selection bias, since only three out of six years were analysed. Of course, analysing all years would result in a mode reliable conclusion, yet the three omitted waves were ignored for good reasons as described above. Replicating – when possible – the results using different year's data would be another improvement of the present research.

Another data-related shortcoming of the research is that it is based on one country only. While one can legitimately generalise to other developed democracies, the bounds for such generalisations are not certainly clear. It is also true that the context of the British politics for the period in question is completely ignored. While the knowledge of the context could help to

explain fluctuations in political trust, it would add little to the theoretical argument regarding the effects of the Internet.

Last but not least, some could point out to the language of the thesis and say that it does not deliver on its promises, as the analysis above sheds little light on how the Internet *affects* trust. To be honest, this is unfortunately true. Causal terms throughout the text are used in a somewhat irresponsible and ordinary way, whereas statistical analysis does not allow us to make *causal inferences* as to the effects of the Internet. The thesis therefore looks at the association rather than causation between the Internet and political trust. Establishing of a causal link between the two would require the use of more sophisticated statistical techniques such as graphical models (Pearl 2009) or propensity score matching (Imbens and Rubin 2015) which for a number of reasons could not be used in this work.

Rubin and Imbers write: "The fundamental notion underlying our approach is that causality is tied to an action (or manipulation, treatment, or intervention), applied to a unit" (Imbens and Rubin 2015, 4). For these authors such variables as gender or age could not be said *to cause* higher or lower trust to start with, as causality requires a well-defined alternative treatment which is not clear for this sort of variables. Yet online activities seem to be suitable for a causal analysis in Rubin's framework. Such an analysis, however, should be conducted elsewhere.

Conclusion

Designed as an explorative research on the relationship between the Internet and political trust, the thesis approached the task in several ways. Having based its theoretical expectations on media and political communication literature, the research began with a general analysis of the recent dynamics of trust in the United Kingdom. After diagnosing the same problem of declining trust, the analysis proceeded to analyse three types of Internet-users. The results showed that there is only weak and unreliable evidence that non-user and user actually differ in their trust in the government, which signalled the need for a different analysis.

For that reason, multivariate regression models with similar specifications were run for each Oxford Internet Survey starting from 2003. These, however, provided only limited information as to the impact of the Internet, with most of the variation being explained by trust factors. Admittedly, the trust factors – which were initially obtained from factor analysis of sets of trust variables – turned out to explain an ever-greater share of variation as we moved from 2007 to 2013. This puzzling phenomenon is indicative of increasing convergence between trust in the government and trust in other institutions and civil society. Why we see this sort of alignment is a question worth investigating on its own.

Continuing with the analysis, the thesis focused on OxIS 2005, 2011 and 2013. By virtues of stepwise regressions, it was found that most specific online activities, such as getting online news, being a social network user or discussing political issues online, are associated with higher levels trust. Yet most models showed that the very amount of time people spend on the Internet is negatively associated with trust in the government. For each additional hour spend online per week, trust was estimated to decrease by 0.009 or 0.005 depending on the model.

Reading daily newspapers either in print or online turned out to be a strong indicator of lower trust, whereas reading an online news source that is different from paper news sources as well

as paying for online news were estimated to increase trust. So was the fact of being a user of LinkedIn or the fact of discussing political issues via a social network.

In accord with some of the previous findings in the field, the analysis also revealed that age and education are indeed related to trust in the government: the former is associated with lower trust while the latter with higher. Gender however was found unrelated for all models but one.

Each stepwise model was validated using one of two alternative methods, which gave the results additional credibility. Despite the fact that time spent online was found to be negatively related to trust, the findings are suggestive of Internet activities having predominantly positive associations. Although this advances our understanding of the impact the Internet has on people's attitudes, it leaves the question of diminishing political trust unresolved. It seems that eventually the Internet should be acquitted of causing declining trust or at most be charged with complicity. The main culprit therefore is still unknown.

With this in mind, the thesis signals several important directions for further research. Concerning political trust, scholars need to explain why we observe the above-mentioned convergence among trust in the government, institutional trust and general trust. Form a different perspective, it might be also suggested that trust research should move from micro-level explanations to cross-country comparisons. Given the availability of a long time-series, it seems to be a promising direction for research too.

As to the Internet, scholars should put more effort into analysing the content of online and offline media as well as paid and free online media sources. Finally, the use of alternative statistical techniques[42] and a different treatment of the dependent variable (as categorical)

[42] These might include log-linear models discussed above, but also some of the more recent methods such as decision trees or random forests. Nonetheless, the main concern is the amount as well as quality of data available to researchers. It stands to reason that our analytical capacity has far surpassed our data collection techniques.

would be a good way to explore. All this would greatly contribute to the endeavours of disentangling the relationship between political trust and the Internet.

Another important take-away of this thesis touches upon Internet research in general. It stands to reason that even detailed and log-established surveys such as Oxford Internet Surveys fall short of delivering the sort of data that is needed for an innovative Internet-related research. Being no exception to general critique of surveys, OxISs have low response rates for many interesting items, suffer from responders' hindsight bias and insincerity and oftentimes have somewhat odd coding. On top of that, some of the important variables, e.g. time spent online or looking for news, are unlikely to be accurately estimated by responders themselves.

The number of questions which are of interest to Internet researchers is also huge. Do people who follow politicians on social networks have a different level of trust? Are e-petitions predominantly used by more or less trusting individuals? The need for observational data, obtained directly from users is apparently large. Of course, this also touches upon ethical issues and raises concerns about the limits of researchers' curiosity. Still, it seems that doing 21st century research using 20th century data collection techniques is not the best way to go if one wants to keep up with the zeitgeist.

Appendix 1: Examples of Questions from Oxford Internet Surveys

The dependent variable:

For OxIS 2003/2005/2007 (QA17A/QA4/QA4):

Now I'd like to ask you about some institutions. Please tell me how much confidence you have in the people running each. Use a 5-point scale where 1 means you have no confidence at all and 5 means you have total confidence.
b) The Government

For OxIS 2009/2011/2013 (QA05/QA05/QA05):

Now I'd like to ask you about some organisations. Please tell me how much trust you have in the people running each. Use a 5-point scale where 1 means you have no trust at all and 5 means you have total trust.
b) The Government

Some independent variables:

For OxIS 2003/2005/2007/2009 (QH7/QH23/QH19/QH14):

Moving back to the Internet, do you yourself personally use the Internet at home, work, school, college or elsewhere or have you used the Internet anywhere in the past?

For OxIS 2011 and 2013 (QH12/QH13):

Do you, yourself, personally use the Internet on whatever device at home, work, school, college or elsewhere or have you used the Internet anywhere in the past?

OxIS 2003:

QB2. During a typical week, about how many minutes or hours altogether, at home, work and elsewhere, do you use the INTERNET for…READ OUT
j) Getting on-line news

OxIS 2005:

QS6. In the course of a normal week, do you read any daily newspapers either in print or online?

OxIS 2011:

1. Have you or has someone close to you been directly affected by the economic crises? For example, have any of your close friends or family members lost considerable amounts of money on the stock market, been fired, or had cuts in their income?

OxIS 2013:

QC28. I am going to read a list of things some people pay money for online. Do you PAY for…
a. Newspapers or magazines that you read online?

QC35. The next questions are about activities on social network sites. Thinking about all of the social network sites you use, how often do you?
j. Join or start a group that discusses politics or political issues

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