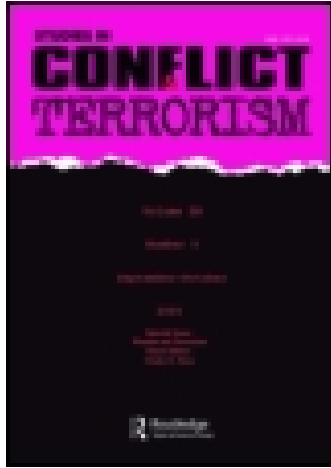


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T-Test for Terrorism: Did the introduction of proportional representation reduce the terrorist threat? A time-series case study of Algeria and Northern Ireland

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Research Note

T-Test for Terrorism:

Did the introduction of proportional representation reduce the terrorist threat?

A time-series case study of Algeria and Northern Ireland

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Abstract: Can electoral reform lead to a reduction in the number of terrorist incidents? Economists have shown that the introduction of constitutional institutions such as courts in the early 18th century had a direct effect on investment. Could there be a similar link between the introduction of proportional representation (PR) electoral systems and a reduction in the number of terrorist attacks? Previous studies using cross sectional data have found a negative correlation between the presence of PR-electoral systems and the number of terrorist incidents. However, earlier studies were based on aggregate figures, not on time-series data. They did not provide a direction that could be used to measure the possible effect of the introduction of PR. This research note addresses this problem. Using a Pair Sampled t-test it is possible to show that the introduction of proportional representation in Northern Ireland and Algeria led to a marked reduction in the number of terrorist attacks. The note thus adds strength to earlier studies

*'At one time that was all we could do, that was the only avenue open to us, was to engage in armed struggle...I think it was inevitable that the nationalist people took up arms. There was no viable democratic alternative'*¹

Irish Republican prisoner interviewed by Richard English.

Can political participation contribute to a reduction of terrorism? In particular can a change of the electoral system from a majoritarian system to a proportional system reduce the number of terrorist attacks? And, if so, why?

Case studies published in *Studies in Conflict and Terrorism*, have suggested that "a considerable democratic deficit enabled a radicalization process" in the Basque Country². Consistent with this finding, increased democratic engagement can limit the prevalence of terrorist attacks. This was shown in research about Quebec also published in this journal. Here it was suggested that the risk of violent action subsided when a political party became regarded as "the legitimate...political voice and representative of Quebeckers"³. And more recent cross-sectional analyses of terrorist attacks in has found a strong negative correlation between having a large number of terrorist attacks and having many political parties (which *ceteris paribus* increases the opportunity for providing input into the political process)⁴.

This research note adds a times-series dimension to this research. After a brief overview of the literature to date, a theoretical model is presented. This argues that proportional representation increases the opportunities for voicing grievances, which in turn, provides a safety valve for democracies. To render this conclusion plausible, however, requires more than cross-sectional correlations (as in the previous literature). To show that the introduction of proportional representation has a positive effect on the reduction of terrorism a pair sampled t-test is carried out for two countries that recently have suffered a large number of terrorist attacks.

Previous Research on the Democracy –Terrorism Nexus

Research on the relationship between terrorism and democracy has yielded different results. But most have shown a negative correlation between democracy and terrorism⁵. Thus, research by, respectively, Schmid⁶ and Sandler⁷ - to name but two - have suggested that non-democratic states have lower levels of terrorism as they are able to ride roughshod over civil liberties and citizens' concerns, as Martha Crenshaw noted in an earlier article making the same point but using a different methodology⁸. However, assuming that most democratic countries do not want to forego democratic practices in an attempt to defeat terrorism, the question arises as to whether there are systemic differences between different kinds of democracies. "Democracies", as Li has noted, "are not homogeneous but have different electoral systems"⁹. This – he hypothesises – has implications for the occurrence of terrorist attacks. As he

explains, "As these systems aggregate political preferences differently, they influence citizen satisfaction and political grievances differently, producing disparate effects on the incentives to engage in terrorism"¹⁰.

Following on from Li, there has been considerable evidence to suggest that there is a correlation between having a proportional representation electoral system and suffering low levels of terrorist activity.

Analysing the effects of different democratic systems on civil wars, Marta Reynal-Querol¹¹ argues that the proportional system has a lower probability of group rebellion than the majoritarian system. This is so because the opportunity cost of rebellion is higher under the more participatory proportional system than under the majoritarian system. Hence, she finds that countries using proportional systems have a lower probability of experiencing civil wars than those which have majoritarian systems.

Based on the analyses by Huber and Powell¹² (1994) and Reynal-Querol's aforementioned study (2002), Quan Li (2005) has argued that variations in democratic electoral systems also systematically influence *transnational* terrorism. Li's argument is that "because the proportional system is most inclusive and has the closest congruence between citizen preferences and public policies, the proportional system is more likely to resolve political grievances than either the majoritarian or the mixed system, reducing incentives to resort to terrorism. Alternative nonviolent solutions to grievances also are more accessible under the proportional system than under the majoritarian system"¹³. This correlation has been supported by comparative studies in Western Europe¹⁴ and in established democracies across the world¹⁵, though some have criticised the methodology¹⁶.

More recent studies have confirmed that there is a link between political institutions and the levels of terrorist attacks perpetrated by what Hoffman has termed domestic terrorist groups¹⁷. In a quantitative cross-sectional study it was reported that there is a correlation between a high score on the so-called *Index of Majoritarian Government* and the presence of fatal terrorist attacks perpetrated by home grown terrorist groups¹⁸.

But a correlation is one thing, it is quite another to show there has been a direct directional effect of a change of electoral system; to show that electoral reform has led to more representation by marginalised groups. What has not been undertaken is a Time-Series study which considers the temporal effect of the introduction of mechanisms of proportional representation.

Before undertaking an empirical analysis it is necessary to consider briefly the possible reasons why the introduction of PR could lower the level of terrorist incidents.

Terrorism and Political Participation: Outline of a Theory

Political scientists often view the political system as an input-output model, in which groups in society *articulate* demands, which are channelled into the *Political System* by *aggregators* (typically political parties) and transformed into policies, decisions and actions, in other words *Outputs*¹⁹. Conceptually speaking, terrorism can be seen as a result of a break-down on the input side of the political system.

When views by a minority groups, fail to be 'aggregated' by political parties or other representatives, the

result may be that groups resort to violence. Terrorism becomes an alternative – and faulty - ‘aggregator’.

This can be illustrated by David Easton’s well-known model (See Figure 1).

Figure 1 in here

Following this model, one would expect that greater influence over policy making –say, by participating in coalitions or concessions on important legislation (which are often the result of multi-party systems found in countries with PR²⁰)- would discourage minority groups from resorting to political violence. Indeed, such an argument has previously been suggested in *Studies of Conflict and Terrorism*²¹. But how can this hypothesis be corroborated? How can we ‘prove’ that lack of democratic influence leads to more terrorist attacks? And how can we show that the introduction of PR has had the effect of lowering the number of terrorist incidents?

While this author certainly does not share Lord Kelvin’s infamous remark, “If you can’t measure it you can’t prove it”²², there is a place for statistical analysis in terrorism research. Quantitative analyses do not reveal the whole truth, but such techniques can help identify patterns which complement more qualitative or ideographic approaches²³. The question –assuming this model is correct – is how this lack of influence can be measured?

There is no perfect way of doing so, but all other things being equal, one would expect that a more proportional – or more representative – political system would offer citizens greater chances of voicing their concerns (As indeed it did in Northern Ireland, and arguably in Algeria²⁴ (See below). Before turning

to the statistical testing, it is useful to consider the logic of institutional change. This can be done through an illustrative short excursus into economic history.

Excursus: Institutions and Policy Outcomes

Some years ago the economist Douglas North (who later won the Nobel prize for this work) and a prominent political scientist Berry Weingast wrote an article about the effect of institutions on economic growth and investment.²⁵ In the article the two scholars found that after Britain had established institutions that could enforce contracts, economic growth grew exponentially. There was, they wrote, a clear link between the new institutions and the increased economic growth. The argument was accompanied by a graph of the growth of the value stock-market, as measured by the number of 'securities' (see Figure One);

Figure Two in Here

The accompanying text read, "In the early 1670s, the volume of these securities averaged £300.000 per year. Ten years later, volume averaged £ 3.400.000 per year, and by the early 1710s, £11.000.000 per year"²⁶. The two scholars did not carry out advanced statistical analyses, but nevertheless concluded – perhaps slightly unwarranted – that "we have...shown how institutions played a necessary role in making possible economic growth and political freedom"²⁷. Now philosophers and avid viewers of the *West Wing* may – rightly warn – that we should not commit the fallacy of *post hoc ergo propter hoc* – which in English translates as something like: "after this, therefore because of this". Nevertheless, if there is a link, it

needs to be investigated. What if we were presented with a similar graph as regards terrorism and political institutions?

Figure Two shows the development of terrorism in Northern Ireland from the early 1970s when the 'troubles' began. Based on a superficial reading of the graph there is clearly a pattern. In addition to a number smaller fluctuations in the mid-1970s (roughly coinciding with the *Sunningdale Agreement*) and the mid-1980s (Coinciding with the *Anglo-Irish Agreement*), there is a marked decline in the number of incidents from the mid-1990s. The first drop in the latter decade coincides – not surprisingly – with the ceasefire declared by the *Irish Republican Army* (IRA) in 1995), which was broken in 1996 after – what was perceived to be - unwillingness by the British Conservative government to negotiate at a time when Prime Minister John Major relied on Protestant/Unionist/Loyalist parties from Northern Ireland to secure his wafer-thin majority in the *House of Commons*²⁸.

Figure Three in Here

But what is above all interesting is that after the introduction of the *Good Friday Agreement* 1998, there is a marked drop in the number of terrorist incidents. Could it be that the introduction of institutions of power-sharing had an effect that was analogous to North and Weingast's courts?

Hypothesis

Combining the input-out model of the political system with the North-Weingast model, we are able to develop a hypothesis regarding the effect of the introduction of proportional representation. We assume that the chances for influence – or even just voicing a concern – will be increased with the introduction of proportional representation as this electoral system, *all other things being equal*, will lead to a larger number of parties in the legislature and hence a greater probability that an aggrieved minority will be represented.

In line with North-Weingast, we conjecture that the introduction of a new institution, in this case proportional representation, will have a measurable effect.

The hypothesis investigated in this research note is:

H1: The Introduction of Proportional Representation resulted in a reduction in the number of terrorist attacks

How can this hypothesis be tested?

Research Design: Pair Sampled T-Test for Terrorism

Just eye-balling the curve and looking for a pattern is not sufficient if we are to draw solid conclusions.

We need to answer three questions:

- 1) What statistical method is appropriate for testing the hypothesis?
- 2) Which cases can we use? and;
- 3) Are the statistical findings sociologically credible?

Statistical Method

What we want to measure is if a change in the electoral system (from a majoritarian system to a PR system) had an impact on the levels of terrorist attacks²⁹. Using two countries that changed their electoral systems we can compare the number of incidents in the ten years before the change and the eight years after the change.

Whereas regression models and other techniques such as *Pearson's Correlation Coefficient* measure a numerical relationship across time and without a time-dimension, a Pair Sampled T-Test is a technique for determining if there has been a change in the findings before and after an event.

Thus a pair-samples t-test is used when you have only one group of cases and collect data from them under two different conditions. Pre-change and post-change are examples of the type of situation where this technique is appropriate³⁰. In other words, this statistical technique is well suited for measuring the statistical difference between before and after the electoral system was changed³¹.

Case selection

Two jurisdictions with high levels of terrorism (more than 25 instances per year³²) changed their electoral systems in the past twenty- five years³³. The two jurisdictions were Northern Ireland and Algeria. In Northern Ireland the system of the *Single Transferable Vote (STV)* was introduced. Algeria introduced the system of *List Proportional Representation* (Largest remainder method using the *Hare quota* for seat allocation)³⁴. Before looking at the statistical findings a bit of historical contextual knowledge is necessary if we are to understand the two cases.

Northern Ireland

In the late 1960 the -largely Catholic- Republican/Irish nationalist minority in Northern Ireland reacted to increased attacks by para-military groups purporting to represent the largely Protestant Loyalist majority in the province³⁵. The Irish Republican Army (IRA), which had been dormant in the province since

partition in 1922³⁶, re-emerged and began a terrorist campaign. In the words of Anthony King, “the uneasy truce between Protestants and Catholics, that had prevailed in Northern Ireland ever since the creation of the Irish Free State in 1922 broke down totally in the late 1960s”³⁷. The IRA’s terror campaign was first directed against loyalist targets in the province itself. After increased tensions, the British Westminster government imposed direct rule and abolished the hitherto existing *Stormont Parliament*, and – in an apt phrase coined by the Conservative Cabinet minister Lord Hailsham – now “governed like a Persian satrapy”³⁸. After a failed attempt to implement a power-sharing agreement in 1974 (the so-called *Sunningdale Agreement*), the IRA began a campaign on the British mainland³⁹. During this time the British government introduced a number of anti-terrorist measures, such as *The Northern Ireland (Emergency Provision) Act 1978*, which were criticised in a *UN General Assembly Resolution*, for its allegedly “flagrant violations of human rights and fundamental freedoms”⁴⁰. These measures did little to reduce the levels of terrorism and the IRA campaign continued. It culminated in the bombing – in 1984 – of the Grand Hotel in Brighton, which nearly killed Prime Minister Margaret Thatcher. After the Brighton bombing, the British and Irish governments reached the *Anglo-Irish Agreement*, which stipulated that the ultimate fate of the province should be decided by referendum⁴¹. In 1995, almost a decade later, the IRA declared a ceasefire, and the loyalist paramilitaries followed suit. The truce was broken a year later following – what the IRA – perceived to be the unwillingness of the then Conservative government to give concessions. After the election of Tony Blair’s *New Labour* in May 1997, the IRA and the Loyalist

paramilitaries declared another ceasefire. This paved the way for the Good Friday *Agreement* or *Belfast Agreement* in 1998, which re-established a parliament for Northern Ireland, a consociational system of power-sharing and a system of proportional representation for the *Stormont Assembly*. After a few setbacks, - including temporary direct rule in 2000 – the Northern Ireland Executive assumed control in 2006 after the British and Irish government signed the *St Andrews Agreement*⁴². Even during the period of direct rule, the Northern Ireland Assembly's had been elected and the elected parties – including parties that had previously been regarded as 'extreme', such as the Catholic/Republican *Sinn Fein* and the Loyalist/Protestant *Democratic Unionist Party* – took part in the negotiations and gave legitimacy to the agreement⁴³.

Algeria

Shortly after independence from France Algeria was ruled as a one-party state⁴⁴. After twenty years of authoritarian rule, Algeria reintroduced democracy in the late 1980s. However, it soon became clear that the radical Islamists were an electoral force, though they did not command a majority of the population⁴⁵. In the first round of the election in 1991 (held under a majoritarian system), *Front Islamique du Salut* (FIS) won 188 out of 231 seats with 47 percent of the vote. In response to the looming defeat, the army – *les décideurs* (or as the army is also known)-- pressurised President Chadli Benjedid to cancel the second round⁴⁶.

Shortly after, in 1992, Benjedid was ousted in a *coup d'état* by General Khaled Nezzar and a group of officers who wanted closer ties with France. (This group is known as *hizb França* – literally the party of France⁴⁷). Nezzar's action was not entirely undemocratic. The FIS did not have a majority, and, as Nezzar said, 'it would be intolerable if men [sic!] coming to power through democracy led us to dictatorship'⁴⁸.

The junta – a committee of five senior officers known as the *Haute Comité d'État* - began by banning all political activity in mosques, prohibited *FIS* altogether – and interned thousands in prison camps in Sahara. To give an air of respectability to the *Haute Comité*, Mohamed Boudiaf – one of the original founders of the FLN – was selected as its figurehead. Boudiaf tried to return the country to a form of democracy but made little headway. On 29 June 1992, Boudiaf's term as chairman was cut short when he was assassinated by a bodyguard during a televised public speech at the opening of a cultural centre in Annaba. He was succeeded by Liamine Zeroual, a retired general who tried to balance between those in the military who favoured repression (*les éradicateurs*) and those who favoured a more consensus-oriented approach (*les conciliateurs*)⁴⁹.

At first the *éradicateurs* prevailed. Internments, extra-judicial killings on a scale not seen since the French repression in the 1950s became the order of the day⁵⁰. The Islamists, now organised in the *Groupe Islamique Armé* (GIA) responded in kind. The GIA leader Abdelkader Hattab issued a leaflet entitled 'Throat-Slitting and Murder until the Power is God's'⁵¹. By the end of 1994 the conflict had cost 30,000 lives⁵². It was in this climate of indiscriminate violence that Liamine Zeroual entered discussions with the FIS leaders Abassi Madani and Ali Belhadj. As a consequence of the negotiations hard-line GIA factions began attacking what they regarded as conciliatory FIS groups. Trying to find a way through the impasse representatives of the FLN and the FIS met in Rome, where they signed up to the 'Rome Platform', which included a commitment to political pluralism, recognition of Berber rights, multi-party democracy and an electoral system of proportional representation⁵³. Having reached a *modus vivendi* with his erstwhile enemies, Zeroual pushed through a series of constitutional reforms, including a system of proportional representation, which ensured that no party would have an absolute majority, and that governments in the future would have to seek a consensus with political parties of a different persuasion or political colour⁵⁴. The platform -and the constitutional reforms it contained - were endorsed by the voters in a referendum in 1996, which was relatively fair given the circumstances.⁵⁵

Did these reforms have a statistical effect on the level of terrorist activity in the two jurisdictions?

Results: Pair Sampled T-Test for Terrorism

When a paired-samples t-test was conducted to evaluate the impact of the introduction of the proportional representation in Northern Ireland, there was a statistically significant decrease in the number of incidents from the period before the Good Friday Agreement⁵⁶.

The pair-samples t-test for Northern Ireland yielded the expected results. There was a statistically significant decrease in the number of terrorist incidents from time one, pre 1998 (M= 122, SD= 81) to time two (post 1998) (M=30, SD 28),, $t(8)=3.979$, $p<.004$ (two-tailed). The mean decrease in incidents was 91.4, with a 95% confidence interval ranging from 38.4 to 144.4. The Eta-Squared statistic (.78) indicates a very considerable statistical effect which is consistent with the cross-sectional results reported by Li⁵⁷.

Needless to say, Northern Ireland can be seen as an isolated case. This pattern seems to corroborate the finding that consensus institutions are correlated with lower levels of terrorist incidents.

Of course, one single example does not prove a theory. What is needed is data from elsewhere from a different setting. So consider the case of Algeria. Like in Northern Ireland, Algeria suffered catastrophic levels of terrorism in the 1990s. In 1997, following the return of democracy in 1995, a system of List Proportional Representation was introduced in 1997 with accompanying power institutions of power-

sharing as outlined in the previous section⁵⁸. If the experience from Northern Ireland is anything to go by we would expect that the levels of terrorism would go down.

Interestingly – and notwithstanding the enormous differences between the two jurisdictions -, we find the same pattern in Algeria. When a Paired-Samples t-test was conducted to evaluate the impact of the introduction of consensus institutions on the level of terrorist incidents in the latter country, there was a statistically significant decrease in the number of incidents in terrorist incidents from time 1 to Time 2.. The Paired-Samples t-test seems – statistically - to confirm the positive impact of the introduction of Proportional Representation on the level of terrorist incidents in the North African country. With a statistically significant decrease in the number of incidents in Terrorist Incidents from time 1 (Mean= 202,7 , SD=113.3) to Time 2 (Mean=58.5 SD=36.5), $t(7) p < .05$ (two- tailed), the mean decrease in the number of terrorist incidents was 144.3 with a 95% confidence interval ranging from 33 to 255.4 and an eta-squared statistic (.42). This indicates a considerable effect size. Indeed, anything above .30 is normally regarded as conclusive evidence⁵⁹

Discussion

The statistical connection between having a lower level of terrorist attacks in Northern Ireland after the introduction of Proportional Representation after the 1998 Good Friday Agreement, is consistent with the hypotheses proposed by earlier writers such as above all Li (See above). The presence of parties

(believed to be) representing terror organisations⁶⁰ gave a voice to hitherto unrepresented parts of both Catholic and Protestant communities in Northern Ireland. The presence of elected representatives in the Northern Ireland Assembly to voice and articulate the demands of the Republican and Loyalist fringes arguably provided an input into the political system which reduced – though not entirely eliminated – the need to resort to terrorist actions. Of course, historical and quantitative evidence is needed to corroborate this, but there is a clear indication that the introduction of proportional representation – and the accompanying increase in representation of hitherto disenfranchised groups – worked to reduce tensions.

Is the same true for Algeria? Needless to say, Northern Ireland and Algeria cannot be compared and the latter country is certainly far from being a well-functioning democracy. To wit, In 2013 *Reporters Without Borders* ranked Algeria at 125th out of 179 countries in their Press Freedom Index⁶¹. But the pattern we found in Northern Ireland is strikingly similar to the statistical findings of earlier writers who have hypothesised that PR leads to reduced levels of terrorism⁶². To be sure, Algeria is not a democracy (the country was categorized as 'Non-Free' by *Freedom House* throughout the period under analysis⁶³), but the presence of political parties that were previously considered to be affiliated to radical Islamic organisations (such as *Mouvement de la société pour la paix*, which is affiliated to the *Muslim Brotherhood*) seems to have added legitimacy to decisions and have arguable given hitherto disenfranchised groups a voice, if not a share of executive power. However, the fact that some of the

Islamist political parties urged a boycott after 2007⁶⁴ (and that terrorist attacks increased after this date)

may suggest there limits to the explanatory value of the hypothesis.

Conclusion

In an article about *ISIS* entitled, 'Iraq Illusions' in the August 2014 issue of the *New York Review of Books*, Jessica Mathews, the president of the *Carnegie Endowment for International Peace*, expressed the view that "the story, which seemed to be all about religion and military development, is actually mostly about politics;...a say in decision-making, and a modicum of social justice"⁶⁵. There is nothing revolutionary or new in these remarks *per se*. Indeed, research in *Studies in Conflict and Terrorism* has previously suggested that lack of genuine democratic input into the political system can engender a process of radicalization⁶⁶. But somehow this connection has been lost on policy-makers who seem more attracted to deterrence as a mechanism for combating terrorism⁶⁷.

This research note has corroborated the connection suggested by more qualitative studies through a *paired t-test*, which found evidence to suggest that – statistically speaking – there was a strong connection between the introduction of PR and a lowering of the total number of terrorist incidents in Northern Ireland and in Algeria. To paraphrase North and Weingast's research on institutions, the research note has shown how institutions, in this case proportional representation, played a necessary role in reducing the number of terrorist incidents⁶⁸.

Why does it seem that there are fewer terrorist attacks in countries with proportional representation? At a fundamental level, this research note argued, terrorism in democracies occurs when the citizens have inadequate opportunities to make them heard and when they fail to be represented in any meaningful way.

Of course, there are many different forms of terrorist attacks. And there are some question-marks over the effect of PR in Algeria. To say that *all* terror attacks have the same aetiology would be sheer folly, and more importantly incorrect. But there is nevertheless be a pattern; a tendency that domestic terror attacks and the electoral system. It is hard to argue with the finding that proportional representation – previously seen as the fancy of anorak constitutional reformers ⁶⁹– nevertheless is strongly associated with fewer terrorist incidents.

Maybe policy-makers should consider electoral reform rather than hard-hitting measures that often end up limiting civil liberties?

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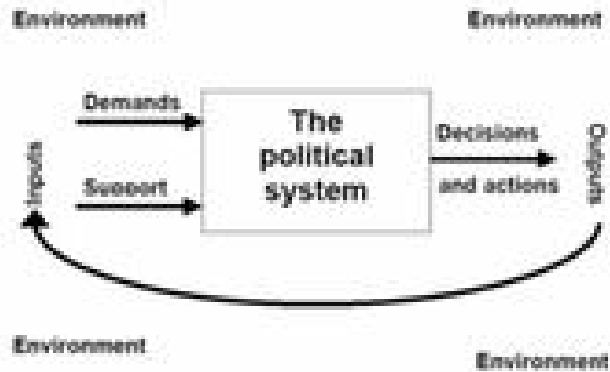
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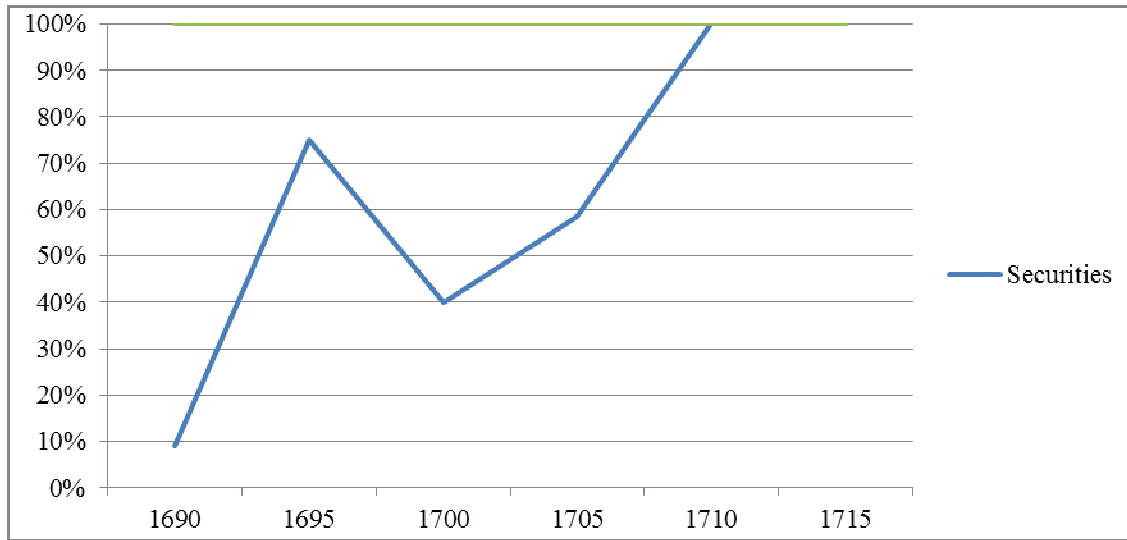
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Figure 1. David Easton's Model of the Political System



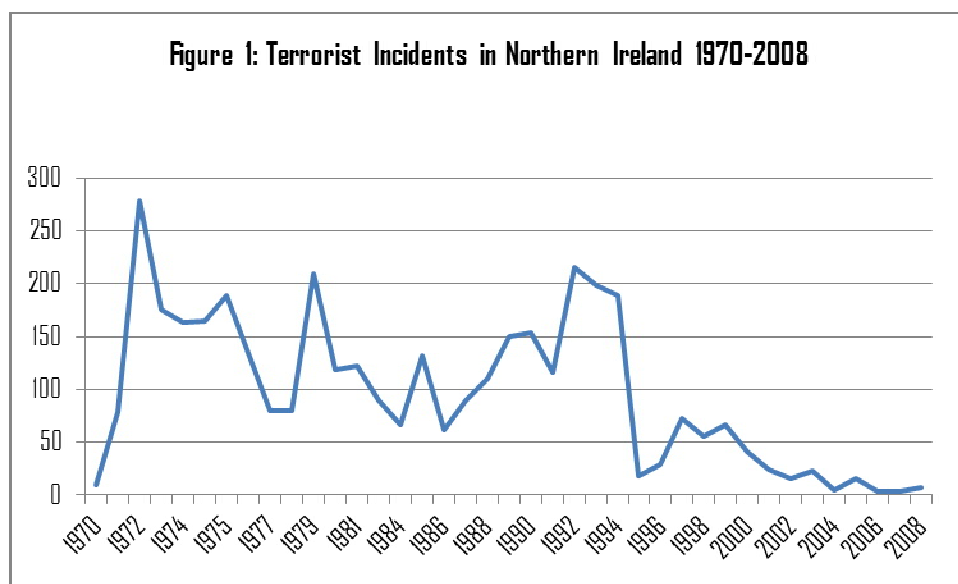
Source: David Easton (1965) *A System Analysis of Political Life*, Wiley, New York, p.32

Figure Two: Growth of the London Stock Market 1690-1715



Source: North & Weingast (1989).

Figure Three: Terrorist Incidents in Northern Ireland 1970-2008



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Security. <http://www.start.umd.edu/start/>