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Research Article

Developing an Elite Formation Index for Comparative Elite Studies: The Case of the Schooling of Irish and UK Cabinet Ministers

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Elites and their formation have become a matter of increasing public concern and research interest in recent years. The lessons from such research can be made more generalisable if a measure of elite formation could be developed that is comparable across different elite formation systems, whether they differ by elite, time or country. But, the nature of elite formation renders this a complex task. Nevertheless, in this article, by building upon measures employed in other fields such as industrial economics, indices are constructed that facilitate the comparison of elite formation systems. This is illustrated through a comparison of the schooling of Irish and British cabinet ministers.

Keywords: cabinet ministers; elites; elite formation; schools

Introduction

Although the origins of the global economic crisis have been blamed on the easy availability of credit, sub-prime lending, deregulation and incorrect pricing of risk (Blundell-Wignall and Atkinson, 2009; Calomiris, 2009; Tobias and Shin, 2010; Von Peter, 2009), important networks of elites in various institutions and countries were blinded to obvious warning signs by a 'groupthink' (Janis, 1972) illusion that 'this time it is different' (Reinhart and Rogoff, 2009). For instance, in the United States mortgage industry, once the perception of the great moderation took hold, this illusion was accepted uncritically by banks and the consultants who advised them, so when the crash occurred all the experts were taken aback by a 'supposed perfect storm' (Kolb, 2010, p. 280). This situation has led to renewed interest in the study of elites (Hartmann, 2009; Khan, 2011). By 'elites', we mean 'small minorities who appear to play an exceptionally influential part in political and social affairs' (Parry, 1967, p. 12).

Our article contributes to the study of elites by developing an index for the comparison of elite formation systems and demonstrates the value of that measure by comparing the role of post-primary education in the formation of two comparable elites. Difficulties in comparing elite formation systems have impeded understanding of the roles played by elites in modern societies. However, by drawing upon indices developed in other fields, we provide an index – an adaptation of the Herfindahl (1950)–Hirschman (1945) index – that facilitates the comparison of elite formation systems.

To illustrate the comparability of the measures we develop, we will compare the role of the post-primary school systems in Ireland and the United Kingdom in the formation of two comparable political elites: politicians who attained the office of cabinet minister in their respective governments in the 75 years between 1937 and 2012. Appointment to cabinet in a democracy places an individual in a position of rare trust and in an exclusive club. By definition, few members of any society will ever hold such high office. While the UK is a much bigger country than Ireland, both countries' cabinets are of similar size and both countries possess a shared political lineage and parliamentary structure. We selected 1937 as our starting point as that year saw the introduction of the Irish Constitution (*Bunreacht na hÉireann*), which, through Articles 15, 16, 18 and 28, established Ireland's current form of cabinet government under a parliamentary system, thereby allowing for a more meaningful comparison of Irish and UK cabinets.

We begin by drawing from the literature on elites. We then show how an index facilitating cross-country comparison of elite formation can add to the literature and, in particular, justify our comparison of the role of post-primary school systems in the formation of Irish and UK cabinets. Thereafter, we set out the reasoning and formulae behind our comparative measure – the elite index – and its constituent dimensions of influence and exclusivity. These formulae, their construction and application represent the value added of the article. We finish with a discussion of our results and conclusions.

Theoretical perspectives on elites

Early works on elites include *The Ruling Class*, a study of the division of societies into a ruling and a ruled class – the elite and the masses (Mosca, 1939); *Political Parties*, a work on how elites used the power of being organised (Michels, 1999); and *The Mind and Society*, a study of how power moves within the elite social class (Pareto, 1935). These authors were in some way responding to the contemporary development of mass democracy and their view was that there was always, even in a democracy, a small ruling class that held the real power (Blad, 2009). For Michels (1999), 'the rule of the few is inevitable, in all times and in all places, however democratic the organisation may seem to be' (Slattery, 2003, p. 52). This 'iron law of oligarchy', as Michels (1999) referred to it, arose because individuals were deemed to be naturally unequal and society functioned better with the masses led by a better qualified elite.

The Power Elite argued that big corporations, the military and the federal government ruled the US (Mills, 2000 [1956]). Fascinatingly, this perspective was repeated in President Eisenhower's farewell address in 1961, when he referred to the dangers posed by 'the military-industrial complex' (Hartung, 2001). Nevertheless, some see the elite as essential to the functioning of democratic society (Higley and Burton, 2006; Putnam, 1976). In part, this view of elites is due to social scientists regarding them as a less cohesive, more pluralistic and meritocratic alternative to a single monolithic ruling class empowered solely through capital ownership. Higley, Kullberg and Pakulski (1996) and Murphy (2006) argue that in Eastern Europe, following the collapse of the Soviet Union, the continuity of political elites provided a relatively high degree of cohesiveness and security conducive to democratic competition.

Despite such a functionalist view of elites, Hartmann (2009) amassed evidence that there remains a strong connection between social class and the ability to become a member of the elite. But, if an elite is more hereditary than meritocratic, it loses legitimacy based on rare skills and enough connections with the rest of the society to make decisions on its behalf. A key to discerning whether particular elites are meritocratic or hereditary are comparisons

across countries of how elites are formed. Bourdieu (1996) focused on the reproduction of the elite, stressing the role of particular educational institutions, *doxa* (unconscious beliefs that support extant social arrangements that privilege the dominant) and *habitus* (a set of dispositions and learned habits that align individuals with their positions in society). Educational institutions provide hidden services to certain classes 'by concealing social sections under the guise of technical selection and legitimating the reproductions of the social hierarchies' (Bourdieu and Passeron, 1990, p. 153). Cookson and Persell (1985, 2010, p. 27), examining boarding schools in the US and UK over a span of 25 years, found that these institutions remain a pipeline to selective colleges, continue to socialise students for upper-class membership and retain preparation for power as their core mission. It is to the role and measurement of post-primary educational institutions in the production of the political elite that we now turn.

Comparing elite formation systems: the case of the schooling of Irish and UK cabinet ministers

Through comparative studies, we can discover trends and achieve an understanding of broader socio-political characteristics (Blondel, 1995, p. 3). Comparison gives perspective, through either geographical or chronological juxtaposition, that facilitates the building of a body of increasingly valuable explanatory theory (Mayer, Burnett and Ogden, 1993). Our elite formation index can be used in comparing elite formation systems both synchronically (either across comparable elites in different countries or different elites in the same country) and diachronically (e.g. to analyse whether or not a formation system is becoming more or less elite across the decades). As elite formation institutions tend to differ most obviously by country, we focus on an international comparison here.

Ireland and the UK were selected using the most-similar case selection technique (Gerring, 2007). Both share the overarching criteria of being longstanding democracies since the first quarter of the twentieth century, when Ireland gained its independence from the UK. As a result of that historical link, the Irish parliamentary system still manifests many similarities to the Westminster system in structure and culture (Gallagher, 2009; Lijphart, 1999). Consequently, cabinet government – encompassing the characteristics of collective cabinet responsibility, cabinet consensus and ministerial responsibility for departments – is of critical policy-making importance in both countries (Richards and Smith, 2007). Thus, 'in the Westminster model, parliament is not seen as a real maker of law, but instead provides a forum where the issues raised by a government proposal can be fully aired' (Gallagher, 2009, p. 209).

The historical development of elites in Ireland and the UK, given Ireland's incorporation into the UK until 1921, are intertwined. Towards the end of the eighteenth century, 'a very rapid fusing of English, Welsh, Scottish and Irish elites through marriage and inheritance saw a convergence of perspectives and increased the cohesion of the British ruling class' (Moe, 2007, p. 64). Assisting in this process was education. Whereas in the early eighteenth century, the ruling classes had their children privately tutored, by the turn of the nineteenth century the vast majority of the elite received their education at places like Eton, Winchester and Harrow (Colley, 1992, p. 167). These exclusive schools are confusingly called 'public schools' as they were open to anyone who could pass the entrance examinations and afford the fees, without religious or other restrictions. The public school system contributed 'a disproportionate number of its members to the controlling institutions and key decision-making groups of the country' (Domhoff, 1967, p. 5).

Following Irish independence in 1921, the ascendancy class – the propertied elite associated with the former British regime – became socially marginalised (Collins and Cradden, 2001). Thereafter, the Irish gradually developed their own indigenous elite upon the foundations of a rising mercantile class (Lee, 1989). As the country is small, there is a certain homogeneity that characterises the Irish elite. By the mid-1990s, higher and lower professionals were disproportionately represented in the Dáil (lower house of the Irish parliament). Higher professionals constituted almost a quarter of TDs (members of parliament), compared with just 4 per cent of society (Constitutional Review Group, 1996).

Following the Second World War, post-primary education in the UK was provided free up to the age of 14. The comprehensive post-primary school was introduced to England and Wales in the mid-1960s, and now accounts for almost 90 per cent of UK post-primary school students. Today, there are still around 2,500 independent or private schools in the UK, of which about 10 per cent are the 'public schools' discussed above. Post-primary education has been free in Ireland since 1967 (Barry, 2010), though there remains 56 'private' Irish post-primary schools charging fees, albeit with the state paying the teachers' salaries.

Measurement and components of the elite nature of a formation system

In examining how elite a particular system of institutions is in the formation of a specific societal group (e.g. how elite the UK post-primary school system is in relation to the composition of the UK cabinet), it is desirable to capture both the influence and exclusivity of that system. A measure of what we mean by the influence of a particular institution upon a specific societal group is that proportion of the group that is affiliated with that institution (e.g. the percentage of UK cabinet ministers who were past pupils of the 'public school' Eton College). We will term those institutions that have influence, in the sense of their affiliates being members of an elite group, 'elite institutions'. So, for example, Eton College might be termed an 'elite school' in relation to the UK cabinet since it has past pupils who have been cabinet members. Those institutions without affiliates in the elite group are non-elite institutions and have no influence in the sense used here.

The other component of how elite a system of institutions is in the formation of a specific societal group is exclusivity. Exclusivity is a condition closely associated with elite schools (Khan, 2011). These schools were seen by many scholars, Mills (2000 [1956]) among them, 'as agents in a conspiracy of the already privileged to perpetuate their privilege forever' (Powell, 1997, p. 85). With the rise of neoliberalism, some have spoken of the 'exclusive society' (Young, 1999). What we mean by the exclusivity of a particular institution might be roughly measured by the degree to which being socialised there is an uncommon experience (e.g. the proportion of all UK school children that attend Eton). However, both the influence and exclusivity of a particular *system* of institutions is more complex than intuition suggests. Consequently, we will examine measures of influence and exclusivity separately, before combining them to provide an index of how elite a system of institutions is.

Measuring the influence element of elite formation systems

The influence of a particular set of elite formation institutions comprises two dimensions: the proportion of the selected elite that are associated with those institutions, along with the limited number, or 'fewness', of the institutions. For example, Hartmann (2009, p. 69) not

only points out that, since 1945, over 60 per cent of permanent secretaries in the UK's civil service were educated in elite schools, but also notes that the most important of these schools are the 'Clarendon Nine'. Both the large share (i.e. 60 per cent) of this elite group of civil servants who attended these schools and the small number (i.e. nine) of the schools themselves are marshalled by Hartmann (2009) to show that these institutions are elite.

These two dimensions of institutional influence have made it hard to compare the role of institutions in the production of elites across countries as one dimension may be higher and the other lower, making it increasingly more complex to keep in mind both dimensions as one compares and contrasts an increasing number of countries. Similar problems have been encountered in studies of international trade concentration (Hirschman, 1945), biological diversity in particular environments (Simpson, 1949), supplier concentration in markets (Herfindahl, 1950) and sociological heterogeneity (Blau, 1977). For example, in comparing how monopolised markets are, industrial economists may know there are only ten sellers in Market A, while there are 100 in Market B. Since there are fewer suppliers in Market A, it might appear, looking at the 'fewness' component of monopoly power alone, that Market A is more monopolised than B. However, the picture would be confused if it turned out that in Market A each of the ten sellers controlled 10 per cent of market sales, whereas in Market B the top seller controlled 90 per cent of sales while the remaining 99 companies shared just 10 per cent. To combine both the 'fewness' and 'share' aspects of monopoly power, economists use concentration measures.

An adapted version of this concentration measure provides an index of institutional influence that captures both the share factor of eliteness and the fewness factor in a set of institutions. Our Institutional Influence Index (I-Index) is the sum, across the total number of formation institutions (n), of squared shares (s) of affiliates of each institution (i) in the elite, so that

$$I = \sum_{i=1}^{i=n} S_i^2 \quad (1)$$

or

$$I = \sum_{i=1}^{i=n} \left(\frac{m_i}{M} \right)^2 \quad (2)$$

where m_i is the number of affiliates of the i^{th} institution that are members of the elite in question and M is the total number of members of that elite.

This formula is an adaptation of the Herfindahl-Hirschman Index (H-Index), as described by, for example, Davies et al. (1991, p. 82) and in common usage in industrial economics. Adapting this formula not only means the desirable properties of the index are supported by its years of development and use in industrial economics, but that particular values of the I-Index can be compared with the many measures of market power that have been carried out using the H-Index.

In terms of our study, the influence of secondary school systems on the formation of cabinet ministers depends both on the frequency of schools with any alumni as cabinet ministers, and on how evenly these few schools share in the total of such ministers. Our I-Index goes up if,

other things being equal, a greater proportion of those in ministerial office are graduates of any one school. The value of our I-Index will also go up if there are fewer schools involved in producing elite alumni.

Measuring the exclusivity element of elite formation systems

The other side of elite formation is the exclusivity of the institutions involved. Like institutional influence, there are two dimensions of exclusivity among a population of institutions. First, the more alternatives there are to any one institution, the more exclusivity there can be, other things being equal. For example, if all of a relevant population attends a single educational institution there is no exclusivity, though there may be much influence. The other aspect of exclusivity is inequality of the shares of each institution: the more unequal the shares, the more exclusivity there is. Thus, we are not using the simple percentage of the relevant population that attend elite-producing institutions as our measure of exclusiveness.

In defining our Institutional Exclusiveness Index (X-Index), we are, for the moment, ignoring how influential the institutions may be. If P is the total number in the relevant general population and p_i is the number of the relevant general population in the i^{th} institution and n is the number of institutions, then a measure of exclusivity (X-Index) would be:

$$X = \frac{\sum_{i=1}^{i=n} 1 - \left(\frac{p_i}{P}\right)^{0.5}}{n} \quad (3)$$

The X-Index rises if the shares institutions have of the relevant population become more unequal for whatever reason. This is as we might expect if, for example, an elite school like Eton halved its intake of students. In such a circumstance, we would naturally think of this resulting in increased exclusivity in the system and our X-Index will increase accordingly. At the extreme inclusivity of all students going to a single school, the X-Index will be equal to 0, as the exclusivity disappears. As the inequality of school sizes increases, the X-Index will go towards 1.

Though the X-Index is a good measure of the exclusivity for a system of institutions, it is very exacting in needing full information on the shares of all institutions in the relevant population. In the case of the UK system of post-primary schools, with over 3,000 state-funded schools in England alone (Department for Education, 2011, p. 14, Table 2a), this is quite an informational demand. Though one can have confidence, perhaps, in the statistics in the UK being sufficiently accurate, this informational demand may not be satisfied sufficiently in other countries. Furthermore, whereas the X-Index gives a good measure of exclusiveness of the total formation system, it measures exclusiveness regardless of influence. So the X-Index may be confusing for those interested in the formation of elites as not only will the X-Index increase if an elite school like Eton halves its intake, as noted above, but X will also rise if a school that has no alumni in the elite reduces its intake.

So, to reduce data requirements and to focus on the elite formation element of exclusivity, a more practicable exclusivity index acceptable for studying elite formation systems is the XE-Index. Where, P is, as above, the total relevant population, p_k is the population in the k^{th} elite institution and t is the number of elite institutions, then

$$XE = \left[\frac{\sum_{k=1}^{k=t} 1 - \left(\frac{p_k}{P} \right)^{0.5}}{t} \right] \quad (4)$$

The XE-Index measures the exclusiveness of elite schools only. It is not affected by how non-elite schools vary in size, but does measure changes in both the proportion of the relevant population that goes to elite schools and how that proportion is shared out among the elite schools. Like the X-Index, whose structure is very similar, the XE-Index behaves appropriately as a measure of elite formation systems.

Combining measures of influence and exclusivity into a measure of the eliteness of a formation system

The elite index of a system of institutions is not a simple product of their exclusivity and influence indices; rather, it requires a measure that links exclusivity and influence at the level of each institution, before aggregation to the level of the system. After all, institutions may be very exclusive without being elite if their affiliates have no positions of influence. So, even if a particular institution contributes to the exclusivity of a system, if it has no affiliates in the particular elite being measured, it should make no contribution to the eliteness measure of that system. Similarly, an institution may be very influential, in the sense of having many affiliates in influential positions, but be so inclusive of the entire population that it cannot be claimed to contribute to the eliteness of the system. For example, being baptised as a Roman Catholic in twentieth-century Ireland may have admitted one to a very powerful institution, but would confer no rare power on any individual. Rather, eliteness is the linked combination of exclusivity and influence.

The influence and exclusivity measures can be combined into a linked Institutional Eliteness Index (E-Index)

$$E = \sum_{i=1}^{i=n} I_i X_i \quad (5)$$

$$E = \sum_{i=1}^{i=n} \left(\frac{m_i}{M} \right)^2 \left(1 - \left(\frac{p_i}{P} \right)^{0.5} \right) \quad (6)$$

where, as above, m_i is the number of affiliates of institute i that are members of the elite in question and M is the total number of members of that elite. P is the total number in the relevant general population and p_i is the number of the relevant general population in institution i . In calculating E , there is no need for individual information on non-elite schools since the I_i of non-elite schools will be zero, so such information will count for nought in the calculated E-Index.

The E-Index, like any summary measure, cannot be expected to capture every nuance in the data that compose it. However, the E-Index has some desirable qualities as a measure of the elite nature of a set of institutions. If all institutions have an equal share of the relevant general population, and all institutions have an equal share of their affiliates in the elite, then the E-Index will be equal to zero. Likewise, if the share of each institution's affiliates is exactly proportional to their share in the general relevant population, then the E-Index will be zero.

If any institution's affiliates have a larger share of membership of the elite, then the E-Index will rise. If an elite-producing institution takes a smaller share of the general population, this increased exclusivity of the institution will be reflected in a rise in the E-Index.

An advantage of the three indices developed here is that the results they produce all move between zero and one, with zero representing no influence, no exclusivity and no eliteness, and one standing for the opposite. Consequently, the indices produce results that are easily comparable and comprehensible across institutions, jurisdictions and time.

Sample and procedures

We focus upon the post-primary schools attended by cabinet ministers from Ireland and the UK between 1937 and 2012 to gain an insight into the eliteness of these institutions. Being a cabinet minister in any democratic society places one in an exclusive club. Under the Irish Constitution, the cabinet, vested with executive authority and consisting of 7–15 members, though usually 15, is the government of Ireland. In the UK, the cabinet is made up of the prime minister and some 22 senior ministers.

Between 1937, when Ireland adopted a form of cabinet government similar to that in the UK (Farrell, 1971), and 2012 there were 157 ministers in Irish governments and 336 in UK governments. While it might have been expected that these figures would have been higher, given that there have been 29 governments in Ireland and 19 in the UK over the 75 years, it tends to be the case that senior politicians are often reappointed as ministers in various governments. We identified the post-primary schools attended by each of these ministers – 89 schools for Irish ministers and 162 for UK ministers. Having identified the population of post-primary schools, we gathered data on the number of students enrolled in each school.

The I, XE and E indices for post-primary schools in Ireland and the UK

Employing the E-Index, we compare the eliteness of the Irish and UK post-primary school systems in the formation of Irish and UK cabinets (1937–2012). Crucial to our measure of influence is how membership of the elite is counted. A simple way is to count every person in the elite who is an affiliate of an institution regardless of how long that person was in the elite group. For example, this straightforward way of counting membership means that Garret FitzGerald and Frank Cluskey, both members of the Irish cabinet, would enter our measure of institutional influence as one for Belvedere Secondary School (fee-paying school) and one for St Vincent's Glasnevin Secondary School (free school), respectively. This straightforward procedure is adopted here.

However, it is worth considering the implications of this procedure. We chose FitzGerald and Cluskey to illustrate some issues with our cabinet (elite) membership measurement: FitzGerald served for ten years in cabinet, occupying the office of Taoiseach (prime minister) for over four years, while Cluskey served just under one year as a cabinet minister. These very different cabinet experiences contribute equally to the influence index and the eliteness index in our approach. Thus, we adopt a method that focuses upon being in cabinet, as opposed to duration or rank. This is because while data for our particular cases are rich, and more nuanced measures of membership are attainable, we are keen to show that the measures can be useful with the kind of data that would be attainable for many elite groups in diverse situations. Furthermore, since the elite formation institutions we are studying are post-

primary schools, there is a sense that the influence of these schools would be conflated with, and perhaps outweighed by, the effect of making it to the elite group itself. Once a person has become a cabinet minister, it may be that this is the key influence on that person continuing in cabinet, rather than the post-primary school attended. The I-Index calculations for those post-primary schools whose former pupils were/are in the Irish and UK cabinets are illustrated in Appendices A and B.

On the exclusivity side, crucial to our measure is the total number in the relevant general population and the number of the relevant general population in each elite-producing institution. For our measure of the relevant general population, we took the total post-primary school population in each jurisdiction in 2010 and for p_i we took the total number of students in each school in 2010. Although it would be possible to construct arguments for other measures of relevant general populations and numbers in each school, we have again chosen the most straightforward measures. This choice shows the indices working with easily available data. The use of current data, rather than, say, moving averages, also shows the most up-to-date state of affairs.

By examining the post-primary school systems in this manner – providing aggregate summary measures for their eliteness, influence and exclusivity – we provide a potentially powerful tool for comparisons of elite formation systems. Thus, these indices are capable of being applied to the study of a wide variety of elite formation systems and can also be applied across a wide range of countries. This is crucial: while schools are relevant in Ireland and the UK in defining social status, the same does not necessarily apply elsewhere. In other societies and cultures, religious affiliation, ethnic group, employment in certain private/state companies, military service, or property ownership may be more important than educational institutions in determining social status (Hall, 1996; Hsu and Ketchen, 2013). However, given that elite formation in Ireland and the UK, in particular, is well-studied and understood, applying our methodology to these cases allows the robustness of our comparative measures to be examined in the light of previous work (Cohan, 1972, 1973; Hartmann, 2009; Keating and Cairney, 2006).

Results and discussion

In Appendix A, we detail calculations of the E-Index, the I-Index and the XE-Index for the post-primary schools that provided Irish government ministers between 1937 and 2012. Appendix B shows similar calculations for the UK. The E-Index, the I-Index and the XE-Index are comparable across both countries. Although not the focus of this work, the index scores for the individual schools (see Appendices A and B) are comparable with each other.

E-Index scores for Ireland and the UK

In Table 1, we set out the values of the E-Index for the post-primary school systems in Ireland and the UK that supplied ministers to Irish and British cabinets between 1937 and 2012. From Table 1, we see that the E-Index for Ireland was approximately 0.0109 and 0.0253 for the UK. Thus, the post-primary school system in the UK that produced cabinet ministers was more than twice as elite as the comparable Irish system. The finding that the UK post-primary school system supplying cabinet ministers is more elite than its Irish equivalent is consistent with the investigations of other researchers (e.g. Hartmann, 2009). Thus, our E-Index figures

Table 1: Elite indices for the Irish and UK post-primary school systems supplying cabinet ministers

	E-Index*
Ireland	0.0109
United Kingdom	0.0253

** These rounded values are taken from calculations detailed in the appendices.*

Table 2: Influence indices for the Irish and UK post-primary school systems supplying cabinet ministers

	I-Index*
Ireland	0.0114
United Kingdom	0.0257

** These rounded values are taken from calculations detailed in the appendices.*

are analogous to the arguments made by other researchers relying more on thick description and impressionistic evidence than the comparative and more quantitatively precise approach we have developed.

We now move on to consider the influence and exclusivity components of eliteness in the two systems. Thus, we provide further comparison between the two systems using the same data as employed in calculating the overall E-Index.

I-Index scores for Ireland and the UK

From Table 2, we can see that the I-Index for Ireland was approximately 0.0114, while it stood at approximately 0.0257 for the UK. We can see that the I-Index for the UK schools supplying cabinet ministers is over twice that for Ireland, which again reflects the impression one gets from a more intimate reading of the situation. Before exploring this further, it is worth considering how the measures of influence compare to other contexts. Should the UK I-Index value of 0.0257 be considered high? The answer lies in comparison. This UK value is clearly high relative to the Irish one. Application of the index to other systems will allow a more holistic judgement. Our construction of the index, drawing as it does on the industrial economics measure (H-Index), also means we have another source of comparative values. Thus, I-Index values can be compared to values of the H-Index for different markets. The I-Index scores for Ireland and the UK are effectively a measurement of supplier (post-primary

school) concentration in the production of the political elite in both countries. In the industrial economics context, markets with an H-Index of less than 0.2 would be considered competitive. Thus, from an industrial economics perspective that views schools as sellers and cabinets as buyers, there is no evidence of monopoly power being held by elite schools in supplying ministers to the Irish or UK cabinets between 1937 and 2012.

Of course, concerns about elitist schools supplying cabinet ministers are broader than the traditional industrial economics concern with monopoly power. First, there is the social concern about the lack of diversity in elite formation – an elite that lacks diversity may be more subject to the problem of groupthink. Second, there is the representativeness by elites of experiences in the general population – it is unhelpful if a governing elite is unfamiliar with the experiences of the governed. Third, there is the social concern that the exclusivity of those schools is restricting access to elite positions unfairly. The first two concerns mean that we might have issues at lower levels of the I-Index than industrial economics would lead us to expect. The third concern – unfair restriction of opportunity – is more directly addressed by the other component of our eliteness measure: the exclusivity or XE-Index.

XE-Index scores for Ireland and the UK

Whereas the I-Index was used to measure the influence of the elite formation institutions, the XE-Index seeks to measure the exclusivity of these institutions. From Table 3, we can see that the XE-Index for Ireland was approximately 0.96, while the comparable score for the UK school system stood at 0.98. According to our XE-Index, the post-primary school system supplying cabinet ministers in the UK between 1937 and 2012 is just a little more exclusive than the Irish system. What accounts for this exclusivity – be it hereditary, meritocratic or some mixture of the two – is something that warrants future investigation, but lies outside the scope of this paper.

A measure that might appear more intuitive would be to see how unusual it is for members of a relevant general population to be part of an elite forming institution. For example, we can calculate the ratios, from the data in Appendix A, that in Ireland 1 in every 7.5 students is attending a school that has supplied a cabinet minister in the past 75 years; while we can also calculate, from Appendix B, that in the UK only 1 in every 27 students is attending such a school.

Table 3: Exclusiveness indices for the Irish and UK post-primary school systems supplying cabinet ministers

	XE-Index*
Ireland	0.96
United Kingdom	0.98

** These rounded values are taken from calculations detailed in the appendices.*

While such figures provide an intuitive feel of exclusivity, they do not tell us if a system of elite post-primary schools is characterised by further exclusivity within that system, or if within that exclusive set all schools are equally accessible. For example, consider two scenarios, A and B. Imagine that in A you had identified an exclusive set of 100 post-primary schools whose past pupils became cabinet ministers and each of those schools were equally sized, say 1,000 students each. Contrast that with scenario B, where you again had 100 post-primary schools whose past pupils became cabinet ministers, but in this scenario, while 20 of them had 100 pupils each, the other 80 had 1,225 pupils. Our XE-Index has the desirable property of giving a higher measure of exclusivity for the B scenario, whereas mere ratios of pupils attending the exclusive 100 schools to the relevant cohort of the general population show no difference.

Our XE measure shows that while the Irish post-primary school system that produces cabinet ministers is not quite as exclusive as that of the UK, the smaller size (the average elite-producing school size in Ireland has a mere 530 students, compared to the UK equivalent of 964) means that the Irish system is closer to the UK's exclusivity than might first appear.

Conclusion

Despite the existence of a wide-ranging literature on elites that dates back to the late nineteenth century, no study has previously sought to establish indices for influence, exclusivity and eliteness of elite formation systems that are broadly applicable and comparable. Nor have there been any studies of this nature, where the influence, exclusivity and eliteness of the educational institutions attended by senior politicians, in two countries, over 75 years, are compared and contrasted. As our approach allows us to measure three separate indices, it means constituent elements that equate to eliteness can be identified, quantified and compared. Thus, at the macro level, we can see how each of the dimensions of eliteness varies between all of the post-primary schools supplying ministers in Ireland and the UK. This direct comparability constitutes a major contribution to the extant literature on elites, overcoming a limitation that has restricted our ability to fully comprehend the relationships between different elites.

At the macro level, our research indicates that, over the 75 years between 1937 and 2012, only a small percentage of the post-primary schools in Ireland and the UK, out of the total number of such institutions, provided ministers, with even fewer providing more than one minister and just a few providing many ministers. This eliteness of the formation system was much greater in the UK than in Ireland, with the UK E-Index being over twice that of the Irish E-Index. The concentration of influence in the UK was also much higher, as measured by our I-Index being over twice that of Ireland. Surprisingly, perhaps, the XE-Index for the UK system was only slightly higher than that for Ireland, but this draws our attention to how the particularly small size of Irish elite post-primary schools adds to their exclusiveness. Up to now, while we might have had the general impression that the Irish system was less elite than the UK one, we had no way to quantitatively scrutinise it. Consequently, the indices set out here constitute a significant new tool for use in comparative elite studies, bringing a level of transparency and facility in comparison to the topic that was previously absent.

These indices provide a means of comparing different elite formation systems. Systems that can be compared may differ by country, as in the case of the Irish and UK systems examined here. The systems could also differ by time periods studied and so the indices could be used to compare, say, the elite formation systems for pre-1980 and post-1980 UK cabinets. The indices could also compare the role of the different elite formation systems – for example, the relative eliteness of France's '*grandes écoles*' system with the UK's post-primary school system. This latter

example is particularly useful given the many ways different societies’ elite formation systems vary. The indices can equally be applied to sub-systems of elite formation – for example, dividing secondary schools into free and fee-paying institutions – or even used to look at the individual schools. The indices also provide a breakdown, into exclusiveness and influence, of the components of elite formation systems. The indices do not wipe out the relevance of contextual analysis, nor do they provide a mechanical answer to all the great questions of elite studies, such as whether elites are formed meritocratically or hereditarily, or whether the private schools train better leaders than public schools. However, our indices do add a powerful tool to the arsenal of those comparing elites and so help to address such questions.

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Appendix A: Irish data and indices calculations

Total relevant population =	357459	Note: Notation explained in main text of paper.						
Total number of Cabinet minister =	157							
Formula			$I = \sum_{i=1}^{i=n} \left(\frac{m_i}{M}\right)^2$			$XE = \left[\frac{\sum_{k=1}^k \left(1 - \left(\frac{Pk}{P}\right)^{0.5}\right)}{t} \right]$	$E = \sum_{i=1}^{i=n} I_i X_i$	
						0.962612065		
Totals	132	47162	0.011359487	89	0.13193681	3.327526202	85.6724738	0.010931449
School Name	m_i	pk	$\left(\frac{m_i}{M}\right)^2$	Elite school count	Pk/P	Sqrt of $(Pk/SumP)^2 - [SqRt of (Pk/SumP)]$		E
Clongowes Wood College	7	446	0.00198791	1	0.001247696	0.035322734	0.964677266	0.001917692
O’Connell Schools, Dublin	5	338	0.00101424	1	0.000945563	0.030750008	0.969249992	0.000983052
St. Flannan’s College, Ennis	4	1206	0.000649114	1	0.003373814	0.058084538	0.941915462	0.00061141

The above shows Irish data and calculations detailing data for just three schools. A spreadsheet containing all calculations and data used is available as supporting information in the online version of this article at the publisher’s web-site and to download at: <http://arrow.dit.ie/buschmaroth/5/>

Appendix B: UK data and indices calculations

Total relevant population =	4249700	Note: Notation explained in main text of paper.						
Total number of Cabinet minister =	336							
Formula		$I = \sum_{i=1}^{i=N} \left(\frac{m_i}{M}\right)^2$		$XE = \left[\frac{\sum_{k=1}^{k=N} 1 - \left(\frac{P_k}{P}\right)^{0.5}}{t} \right]$			$E = \sum_{i=1}^{i=N} I_i X_i$	
				0.985390768				
Totals	285	156185	0.025696216	162	0.036752006	2.37641553	159.6235845	0.0252659
School Name	m_i	P_k	$(m_i/M)^2$	Elite school count	P_k/P	SqRt of $(P_k/SumP)_1$	$1 - [SqRt of (P_k/SumP)]$	E
Eton College	47	1316	0.019566681	1	0.000309669	0.017597412	0.982402588	0.019222358
Winchester College	13	672	0.001496953	1	0.000158129	0.012574928	0.987425072	0.001478129
Harrow School	10	800	0.000885771	1	0.000188249	0.013720371	0.986279629	0.000873618

The above shows UK data and calculations detailing data for just three schools. A spreadsheet containing all calculations and data used is available as supporting information in the online version of this article at the publisher's web-site and to download at: <http://arrow.dit.ie/buschmaroth/6/>

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table S1: Irish Calculations.

Table S2: United Kingdom Calculations.

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