

**Competition for foundation patronage and the differential effects of prestige on  
the grant market success of social movement organisations**

**ACCEPTED AUTHOR MANUSCRIPT**

To appear in *Social Networks*

Please consult final published version before citing.

April 19<sup>th</sup> 2016

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**ABSTRACT:** *Extant models of the financial patronage of Social Movement Organisations (SMOs) by private foundations exclusively use population density to account for competition. However, density fails to reveal how SMOs win grants whilst neglecting the strategic decision-making of foundation-investors. Here I recast patronage as a mutualistic network represented by a dynamic bipartite graph wherein SMOs and foundations cooperate across class whilst SMOs compete within class for financial support. A SMO's competitiveness rests with its position in a network-based prestige hierarchy and a foundation's propensity to invest is mediated by its structural position within the grant market. While previous research has predicted a positive monotonic relationship between status and patronage, using Stochastic Actor-Oriented Models I find a tendency for status-based disassortativity in the mutualistic system such that high-status foundations prefer to invest in low-status SMOs. I attribute this counterintuitive finding to foundations' preferences for grantees that can innovate around social problems. Relative to their peripheral counterparts, well-funded SMOs may suffer a rigidity of goals due to the risk of alienating an existing support-base through organisational change. Data consist of 3,261 grants given from 2003-2007 by 136 private foundations to 66 professional SMOs with nonprofit status loosely mobilised against the notion of anthropogenic climate change.*

**KEYWORDS:** *Status, Competition, Grants, Markets, Mutualistic Networks, Social Movements, Nonprofits*

### **HIGHLIGHTS**

- \*The grant market is reconceptualised as an evolving bipartite graph*
- \*Dynamics are driven by network-based status hierarchies of grantors and grantees which operate in tandem*
- \*The effect of grant-market status on the likelihood of investment varies across the foundation population*
- \*High-status foundations prefer to invest in low-status SMOs, indicated by status-based disassortativity*
- \*Predictions of positive monotonic returns to status are too simplistic*

*Introduction*

The considerable wealth of private foundations has fuelled examination of the ways in which endowed institutions may influence both beneficiaries and the broader socio-political environment. For those taking Social Movement Organisations (SMOs) as their focus, inquiry around foundation giving has been devoted to detailing the degree to which goal displacement occurs in the face of lucrative grant dollars. However, this work has adopted a fairly narrow view of foundation contributions, failing to complicate an implicit assumption of invariability in the allocation of capital amongst heterogeneous SMOs. This has coincided with a lack of acknowledgement and direct treatment of the agency of foundations as strategic decision-makers.

Owing to an almost universal handling of resource derivation as an independent variable, previous scholarship on patronage — the allocation of grants to SMOs with nonprofit status by private foundations — has effectively black boxed the competitive dynamics which underpin financial investment. Though research on the effects of patronage is valuable, it inevitably raises questions around how, precisely, does such financial support come about. The omission of a direct treatment of competition amongst SMOs is curious given that capital is one of the most visible of movement resources and that the notion of competition is a prominent aspect of resource mobilisation theory (McCarthy & Zald, 1977).

Traditionally, scholars of social movements and, more generally, scholars working within the organisational ecology tradition invoke density dependence (i.e., regulation of population growth rates through constraints associated with the number of organisations in existence) in their attempts to capture competitive pressures within populations of organisations (c.f. Soule & King, 2008 in the context of SMOs). Yet density dependence is intentionally vague about competitive dynamics in order to parsimoniously capture long-term demographic processes (e.g., on the order of decades) across various types of organisational

1 populations (see Carroll & Hannan, 1989, p .527). In order to avoid conflation of two related,  
2 but distinct, concepts, it is more appropriate to view the intensity of competition as a function  
3 of density relative to the amount of available resources (Hannan & Freeman, 1987, p. 918).<sup>i</sup>  
4 Therefore, I break with previous research to explore a scenario where density as largely fixed,  
5 alongside making an assumption of finite resources, in order to explicitly model the  
6 allocation of capital to SMOs by foundations. Without a more complete account of systems  
7 of patronage, understanding of resource-related outcomes and, more broadly, a SMO's  
8 potential for survival is incomplete. Thus my concern here lies not with the effects of  
9 patronage. Instead, I exclusively investigate its antecedents — leading me to ask what  
10 explains the allocation of capital to professional SMOs by private foundations?

11 In answering this question, I maintain the importance of the structure that foundations  
12 and SMOs co-create via the formation of ties of patronage. Specifically, I take a relational  
13 perspective to argue for a re-conceptualisation of the grant market as a mutualistic network  
14 that may be modelled as a dynamic bipartite graph.<sup>ii</sup> Within this network a population of  
15 foundations and a population of SMOs cooperate across classes to mutual advantage and  
16 SMOs compete within-class for finite financial resources.<sup>iii</sup> Mutualistically, SMOs benefit  
17 from financial investment as it allows them to meet their primary goal of survival and  
18 continue their pursuit of social change goals which may broadly align with those of their  
19 patrons (McCarthy & Zald, 1977; 1973). Concurrently, foundations benefit from financial  
20 investment in SMOs as contracted services gives foundations a route to cost minimisation  
21 and flexibility in financial commitments relative to shifts in the public's prioritising of  
22 various social problems (Faulk, 2011).<sup>iv</sup>

23 As the mutualistic system evolves, a foundation's perception of the quality of various  
24 SMOs is continuously shaped as its helps produce a network-based prestige hierarchy by  
25 dynamically adjusting its status-conferring gesture (i.e., grant giving) in accordance with the

1 aggregated action of other grantors in the system.<sup>v</sup> Such path-dependency results in a self-  
2 reinforcing status rankings of SMOs which directly impacts foundations' propensity to invest.  
3 Based on an assumption of information asymmetry in markets, these dynamics may be  
4 attributed to mimetic processes within a population of foundations which induces copying  
5 amongst grantors as a strategy to manage high levels of uncertainty about the quality of  
6 SMOs (DiMaggio & Powell, 1983; Galaskiewicz & Wasserman, 1989).

7         Nevertheless, a foundation's funding decision is not independent of its own structural  
8 position (i.e., its outdegree; portfolio breadth), here understood to be an indicator of status to  
9 the extent that it captures a grantor's role as a major provider of capital to some population of  
10 SMOs. In this respect, a mutualistic model of patronage hosts two status hierarchies which  
11 operate in tandem to endogenously drive network dynamics that structure the population of  
12 foundations and SMOs (see Podolny, Stewart & Hannan, 1996, p. 662). Thus the empirical  
13 objectives of this work is to detail those dynamic, status-based tendencies on the part of  
14 foundation-investors that lead to the emergence of the mutualistic network. Ultimately, this  
15 requires approaching the mutualistic network as both the independent and dependent variable  
16 as its future state is understood to be determined solely by that of the present.

17         The empirical scenario is the financial patronage of 66 professional SMOs with  
18 formal charitable status that have been linked to the Climate Change Countermovement.<sup>vi</sup>  
19 Primary data, a subset of that collected by Brulle (2013), consists of 3,621 grants given by a  
20 population of 136 largely conservative private foundations to the 66 SMOs from 2003-2007.  
21 This was supplemented with the collection of various organisational information (e.g. total  
22 revenue, administrative expenses) using the IRS Form 990 in 2014.

23         Hypotheses are tested using Stochastic Actor-Oriented Models (SAOMs; Snijders,  
24 1996; 2001), a type of agent-based model for the statistical inference of longitudinal network  
25 dynamics (Snijders & Steglich, 2013; Snijders, van de Bunt & Steglich, 2010). Results from a

series of SAOMs indicate a dynamic tendency (See section IV.3) for degree disassortativity – the inverse relationship between the cumulative activity of foundations and the cumulative advantage (Merton, 1968; Price, 1976) of SMOs. This suggests parallel but opposite funding logics based on structural position within the grant market. The first sees a SMO’s cumulative advantage being driven by a global herd mentality on the part of peripheral foundation-investors, i.e., those with narrow portfolios. In this scenario, the stability and trustworthiness signalled by possessing a number of patrons serves to attract investors on the edge of the mutualistic system that may have limited finances and/or information about the population of SMOs and thus must efficiently assess the risk of a potential backing.

Concurrently, the tendency for cumulative activity in the presence of high-status avoidance indicates that major foundations *prefer to invest in peripheral, low-status SMOs*. Counter to the expectation of “status-based homophily” found in the organisational literature, this suggests that foundations may perceive the possession of many benefactors as “locking in” a SMO’s immediate goals. I maintain that this is due to the risk of alienating an existing support base through the organisational change required to adapt to an ever-shifting agenda of social problems. Collectively, these results indicate that the status of SMOs leads to differential outcomes across the population of foundation-investors and that previous research suggesting a positive monotonic relationship between nonprofits’ grant market status and foundations’ propensity to invest (c.f. Faulk, Lecy & McGinnis, 2012) is too simplistic.

The outline of this paper is as follows. In Section II I review previous work in social movement studies on resource derivation in order to clarify the monetary relationship between SMOs and foundation patrons with the aid of historical data on giving. This is supplemented with a discussion of cognate work in public administration on the funding of nonprofits to outline what might be called an “informed donor model” constitutive of traditional approaches to assessing nonprofits’ competitiveness for grants. I then move on to

1 discuss the utility of a network perspective in capturing foundation-SMO funding dynamics  
2 relative to prestige, presenting hypotheses related to operation of status in the patronage  
3 system in Section III. In Section IV I detail the case study, data and SAOMs. Results follow  
4 in Section V and I conclude with a discussion in Section VI.

## 6 *II. Financial Resource Derivation and Social Movement Organisations*

7       Stemming from McCarthy & Zald's (1977) classic distinction between a movement's  
8 direct beneficiaries and its conscientious constituents — individuals and organisations,  
9 typically elites, who do not stand to receive direct tangible benefits from the achievement of  
10 movement goals — scholarship on resource derivation has been most concerned with the  
11 impact of the source of support on organisational and movement-level goals and tactics (see  
12 Pichardo, 1988 for an overview). This work typically explores internal, i.e., “indigenous”,  
13 support versus external aid and social control. Arguments primarily take the form of one of  
14 two hypotheses: (a) elite support leads to the transformation of SMOs' goals, ultimately de-  
15 radicalising the movement (Haines, 1984; McAdam 1982; Morris 1981; 1984); or (b) elite  
16 support channels SMOs into more publicly palatable entities through professionalisation  
17 (Jenkins & Eckert, 1986; Wilson, 1983). While scholarship in this area has proved potent in  
18 facilitating conversation about resource derivation, it is silent with regard to explanations for  
19 variation in the distribution of resources amongst SMOs relative to their individual  
20 characteristics or their structural position in markets.

21       Failure to fully characterise competition may largely be attributed to the positioning  
22 of resource derivation as an independent variable and using it to drive arguments about social  
23 control. However, the relative importance of external support varies from movement to  
24 movement (Cress & Snow, 1996), calling into question the implicit universality of statements

1 about the role of elite patrons. Further still, SMOs are likely to receive a combination of  
2 internal and external support (Edwards & McCarthy, 2004).

3 Of particular concern here is the well documented tendency for private foundations to  
4 fund *professional* SMOs involved in public interest movements.<sup>vii</sup> As Jenkins (1998) details,  
5 professional SMOs constitute the core of such movements and there is little evidence to  
6 suggest that professional SMOs have displaced the niche indigenous operations of  
7 empowerment movements. From 1953 to 1977 foundation giving to SMOs rose from \$85,700  
8 to just over \$25 million and grew steadily through the 1980s to blossom at approximately \$90  
9 million in 1990. Of the total number of grants given from 1953 to 1980, 69.5 percent (75.5  
10 percent of grant dollars) went to professional SMOs (Jenkins, 1998; Jenkins and Halcli, 1999)  
11 Given that such a large proportion of foundation giving goes to professionalised affairs, it is  
12 peculiar that previous work has not studied how capital is allocated more directly. Save  
13 organisational militancy, existing scholarship on resource derivation has little to say on what  
14 aspects of professional SMOs impact the likelihood of financial support. This is perhaps due  
15 to scholarship in this area painting a rather thin picture of foundations' attendant concerns  
16 and, more broadly, their agency as strategic actors. McCarthy et al. (1991) point to formal  
17 charitable status and financial responsibility as facilitative of the receipt of grants, however.  
18 In light of this gap, I turn to cognate discussions in public administration where scholars of  
19 nonprofits have actively explored how a number of organisational traits impact the degree to  
20 which foundation patrons are won.

## 21 22 *II.1 Traditional Explanations of Foundation Patronage*

23 If social movement scholars have overlooked the various motives of foundations,  
24 scholars in public administration have similarly failed in their treatment of nonprofit agency  
25 and strategic awareness. As Frumkin and Kim (2001) note, much of this research has focused



on donor motivation relative to changes in the funding environment whilst failing to extensively characterise recipient organisations. Scholarship in this area has explored the effects of such things as the “price” of purchasing charitable output (Weisbrod & Dominguez, 1986), the impact of taxation on corporate giving (McIlnay, 1998) and the degree to which government contributions displace those by charitable organisations (Brooks, 2000). An alternative to these foundation-centric approaches is advocated by Frumkin and Kim who emphasise the strategic positioning of nonprofits. Starting with an assumption that the market for charitable contributions is characterised by information asymmetry (Akerloff, 1970), this perspective sees nonprofits actively court potential patrons by communicating the importance of their mission and operational excellence.

While mission is the most obvious means of positioning, organisational inertia leads to the rigidity of aims and thus learned excellence through repeat behaviour. This ties radical change in mission to a risk of alienating an existing support base that harbours specific expectations of organisational action. Notwithstanding, the proliferation of nonprofits with broadly similar goals has resulted in foundations’ compassion fatigue (Frumkin & Kim, 2001) and a need for nonprofits to stand out. Given the intractability of mission adaptation and competitive pressures within goal-based niches, financial efficiency has emerged as a more viable strategy for organisations to best their rivals (Frumkin & Kim, 2001).<sup>viii</sup>

This shift towards efficiency is characterised by the public’s demand of greater transparency in charitable activity, nonprofits’ acute awareness of bottom lines and foundations’ expectations of lower cost ratios. Efforts to economise promise increased organisational legitimacy and heightened donor confidence for those that streamline their operations, particularly with regard to how much is spent on management and fundraising.

Financial benchmarking on the part of foundations is largely a strategy to manage risk, moving descriptions of grants away from the notion of gifts to that of investments which

1 contract nonprofits in accomplishing foundation patrons' mission-related goals. Foundation  
2 altruism is embedded in a self-interest framework (Faulk, 2011; Graddy & Morgan, 2006;  
3 Jenkins, 1998) and thus these organisations invest in nonprofits (i.e., grant giving) to  
4 maximise their utility relative to bringing about mission-related social change or maintaining  
5 the status quo (see Bartley, 2007). Drawing on Coase (1937), Faulk (2011) argues that the  
6 outsourcing of services reduces the costs foundations face when tackling the complex  
7 problems their missions tie them to in addition to affording foundations flexibility in funding  
8 priorities as the agenda of public problems evolves.

9         An emphasis on efficiency measures, typically derived from the IRS tax document  
10 Form 990, constitute what might be called an “informed-donor model.” Despite the seeming  
11 comprehensiveness of the 990 and the relative ease with which foundation decision-makers  
12 can use it to access centralised organisational information, debates about the usefulness of  
13 such data to potential funders are inconclusive (see Tinkelman & Mankaney, 2007 for a  
14 review and critique of this work). Concerns around the utility of the metrics in the informed-  
15 donor model are further compounded in light of issues related to the accuracy of financial  
16 reporting and outright accounting malfeasance on the part of nonprofits in attempts to capture  
17 more support through the illusion of efficiency (see Krishnan, Yetman, & Yetman, 2006).

## 19 *II.2 Network-based Status Signals and Patronage*

20         Given such impediments to the quality of objective metrics, how might foundations  
21 overcome information asymmetries and mitigate the uncertainty associated with grant giving?  
22 Alternatively, what traits of SMOs might better capture their competitiveness in the grant  
23 market? Past research (Galaskiewicz, 1997; Galaskiewicz, Bielefeld & Dowell, 2006;  
24 Galaskiewicz & Wasserman, 1989, also see Podolny, 2003) suggests network-based signals  
25 of status — prestige accorded to individuals from accumulated acts of deference that may

1 vary in their level of formality, ritualism and self-evidence (Podolny & Lynn, 2010) — may  
2 serve as proxies for the quality of nonprofit services, ultimately becoming a means of  
3 acquiring some resource. Largely rooted in DiMaggio and Powell's (1983) thesis on mimetic  
4 isomorphism and an understanding that networks provide access to information that allows  
5 organisations to manage risk (Burt, 1983), this line of reasoning posits that organisations will  
6 copy the behaviour of those respected others when information about quality is poor. As  
7 Galaskiewicz et al. (2006, p.343-344) state, "in hard-to-evaluate situations, it is easier to look  
8 at organisation *j*'s network partners and ascertain *j*'s value using the status of these partners  
9 than evaluate potential returns objectively."

10       Whereas previous work by Galaskiewicz and colleagues is primarily concerned with:  
11 (a) status signals stemming from brokers who connect previously unconnected grantors and  
12 grantees in extra-organisational networks; and (b) a nonprofit's ties to elites, Faulk, Lecy and  
13 McGinnis (2012) explicitly link the concept of status to a nonprofit's structural position in the  
14 grant market, though previous work (c.f. Baum et al., 2005; Lin, Yang, Arya, 2009; Podolny,  
15 2003; and Jensen, 2003) has linked structural position to status in other markets. A key  
16 limitation of Faulk, Lecy and McGinnis' approach to network-based status is their  
17 positioning of status as a function of nonprofits' relations with other nonprofits, specifically  
18 those ties formed when nonprofits share one or more benefactors. This is problematic as it  
19 effectively removes foundations from the network which they actively build, denying their  
20 agency as strategic decision-makers.

21       For the purposes of this work, such a nonprofit-nonprofit network does not help to  
22 elucidate how foundations utilise information based on structural position to make their  
23 decisions as, crucially, the logic for network-based status as a heuristic to judge quality is  
24 from the perspective of foundations. This necessitate a wholly different approach to detailing  
25 the operation of status, and thus the competitiveness of SMOs, as they seek financial support.

What is required is a rethinking of the grant market itself. As the notion of interaction between two distinct organisational populations best captures the allocation of grants to SMOs, to “bring foundations back in” the mutualistic structure within which patronage takes place must be maintained.<sup>ix</sup>

### *II.3 Hypotheses on Status Dynamics*

Given a mutualistic network, how is status expected to operate? Two previously unexplored dynamics are immediately apparent: (a) the inter-mode interaction of degree distributions; and (b) interlocked investment. Substantively, the first dynamic concerns how a foundation’s structural position within the grant market, i.e., the breadth of its funding portfolio, mediates its decision to invest in a SMO relative to that SMO’s status. Here a foundation’s structural position is understood to be an indicator its status to the extent that it reflects dominance of a grant market as a key provider of capital. Past research has documented the operation of “status-based homophily” whereby status is positively correlated in organisational partnerships (Chung, Sing, Lee, 2000; Lin, Yang, Arya, 2009; Podolny, 1994). In the present scenario, such a tendency may be attributed to a type of two-way legitimisation that sees the reinforcement of prestige when high-status foundations cooperate with high-status SMOs (Faulk, Lecy, McGinnis, 2012). Ultimately, this results in bolstered competitive advantage for both a high-status foundation and a high-status SMO such that the SMO continues to enjoy an increased likelihood of success in the grant market and the foundation benefits from reinforced perceptions of legitimacy in action by stakeholders. This leads me to expect that:

*Hypothesis 1 (H1):* There will be a tendency for those foundations  $i$  that support many SMOs  $k$  to invest in SMOs  $j$  that possess a number of other foundation patrons  $h$ .

One can expect the opposite tendency when foundations of any stature have the opportunity to make an investment. I attribute this to the status leakage that results from deference to a low-prestige organisation (Podolny, 2010). Investment in poorly funded, low-status SMOs that may be at risk of failure may damage a foundation's credibility as a social investor by suggesting the squandering of scarce and lucrative grant dollars. Thus I expect that:

*Hypothesis 2a (H2a):* There will be a tendency against foundations investing in SMOs that have zero patrons.

*Hypothesis 2a (H2b):* There will be a tendency against foundations investing in SMOs that have near zero (i.e., 1) patrons.

The second dynamic concerns the immediate, local-level effects of interlocked investment. In a dynamic bipartite scenario, this takes the form of peer referral (Koskinen & Edling, 2012) whereby two foundations' joint-investment in one SMO leads to future joint-investment in a second SMO via the closure of a second interlock. While I have focused exclusively on those factors that contribute to varying levels of competitiveness amongst SMOs, foundations are also understood to be in competition for nonprofit services. Nonetheless, there is no *a priori* reason to assume that foundations in direct competition for SMO services cannot learn from one another. As Trapido (2007) demonstrates, familiarity and knowledge-based trust tend to be *higher* amongst competitors. The offloading of assessments of SMO quality to another foundation with whom there is direct confirmation of relative investor competency, i.e., equivalency in behaviour, presents a route to managing uncertainty. Specifically, foundations that are structurally equivalent in the grant market

belong to a similar status group within which they may monitor and mimic the behaviour of one another. This leads me to expect that:

*Hypothesis 3 (H3):* There will be a tendency for foundations  $i$  to invest in those SMOs  $j$  when  $j$  also receives funding by those foundations  $h$  with whom  $i$  shares a third-party tie in the form of joint-investment in SMOs  $k$ .

Hypothesis 1 is tested with a network configuration for *Out-Indegree Assortativity*. Positive estimates for this configuration indicates assortative mixing whereby high-status foundations tend to be patrons of high-status SMO over time. Hypotheses 2a and 2b are tested with the sibling configurations *In-Isolates* and *In-Near-Isolates*. Positive estimates for these configurations indicate a tendency for foundations  $i$  to invest in those SMOs  $j$  that have zero or near-zero (i.e., 1) patrons *while also continuing* to support those SMOs  $k$  to whom  $i$  is the only patron or one of two patrons over time, respectively. Hypothesis 3 is tested with the *4-Cycle* configuration, the bipartite analogue to the transitive triplet that captures clustering (Robins & Alexander, 2004). Positive estimates for this configuration indicates a tendency for a focal foundation  $i$ , interlocked with another foundation  $h$  via joint investment in SMO  $k$  in year  $t$ , to close a second interlock by investing in a second SMO  $j$  in year  $t + 1$  that received a grant from  $h$  in year  $t$ . Table I provides each network configuration, its statistic and the associated hypothesis.

**[Insert Table I — Bipartite Effects]**

*IV The Case, Data & Method*

*IV.1 Resource Mobilisation and the Denial of Global Warming: The Case of the Climate*

*Change Countermovement*

Despite increasing consensus in the scientific community over the reality and importance of Anthropogenic Climate Change (ACC), there exist a number of cleavages in opinion within the United States. Scholars have sought a number of explanations for the high degree of scepticism amongst the American public, exploring the effects of demographic factors (Dietz, Dan & Shwom, 2007; McCright, 2010), knowledge (O'Connor, Bord & Fisher, 1999), political affiliation (McCright & Dunlap, 2011), and the weather itself (Hamilton & Keim, 2009). Work in this area seeking institutional explanations have argued that large-scale efforts to deny and distort climate science and the public's understanding of it represent a full-fledged countermovement — a social movement with goals aimed at preserving the established order and traditional values relative to the change advocated by the movement it opposes (see Lo, 1982). The Climate Change Countermovement (CCCM; Brulle, 2013) began in 1989 in the wake of the formation of the Intergovernmental Panel on Climate Change (Antonio & Brulle, 2011) and is largely an extension of the conservative movement of the American right (see Himmelstein, 1992 for a review). The CCCM is characterised by: (a) the intermingling of corporate and conservative interests; (b) an aim to position ACC as a scientific non-problem through challenges to its reality and legitimacy; and (c) opposition to government regulation (e.g. policies on carbon emissions) in efforts to stave the effects of climate change (McCright & Dunlap, 2000; see Dunlap & McCright, 2011 for a thorough overview).

Of the CCCM's many political actors, scholars focused on its history, goals and tactics have highlighted its core in the form of highly professionalised and conservative trade associations, advocacy groups and think tanks. Data for this research concerns the SMOs of

the CCCM, largely advocacy organisations, and is a subset of the dataset used by Brulle (2013) in a comprehensive survey of the financiers of the CCCM. The professionalised nature of the SMOs of the CCCM and their history of reliance on wealthy conservative elite (Dunlap & McCright, 2011) place many of the above assumptions about cooperative and competitive dynamics between foundations and nonprofits on solid ground. And despite the association of these SMOs with a countermovement, I see no reason to assume that their survival goals, and the subsequent need to strategically pursue financial resources, systematically differ from professional SMOs of the more progressive movements typically addressed in the sociological literature (e.g. civil rights, feminist and peace movements).

However, the atypically close financial relationship between private foundations and the SMOs of the CCCM warrant caution (see especially Section IV.4.b on Astroturf groups) and limit the generalizability of the funding dynamics observed here. *Thus an important scope condition for hypotheses is that they only applicable to the derivation of external resources by professional SMOs with close links to their population of benefactors.* Less professionalised and/or more radical entities favouring amorphous structure and the avoidance of “mainstream” behaviour are understood to be subject to different constraints.

#### *IV.2 Data Collection*

Here I subset the dataset appearing in Brulle (2013). The full dataset consists of 5,223 grants given to 98 SMOs by 138 foundations from 2003 and 2010 (see Appendix A3 for data collection and coding details). The present analysis uses the 3,261 grants given by 136 of the foundations to 66 of the SMOs from 2003 and 2007. Use of a reduced dataset was done for multiple reasons. As the logic governing the funding of organisations that are donation-dependent are likely to differ for those that are supported via alternative revenue streams generated from fees and services (see Galaskiewicz, Bielefeld & Dowell, 2006), I only focus



on U.S. tax-exempt organisations (501(c) entities) in the nonprofit (501(c)3) and social welfare (501(c)4) categories. I exclude the 21 organisations that had 501(c)6 or 501(c)12 status, largely trade associations, for a total of 77 SMOs.

Of these 77, eleven are born after 2007, which is where I truncate the study period for this work in light of shifts in both the funding logic of the conservative movement and the political opportunity structure. The year of 2008 saw a marked increase in the amount of funding flowing through untraceable sources and coalesced with the rise in “donor-directed” foundations, namely Donors Trust and Donors Capital (see Brulle, 2013). Donor-directed foundations receive money from individuals and nonprofits and then go on to give grants broadly in line with the preferences of the original contributors. This process conceals both the intent and identity of original contributors as there is no legal requirement for transparency, ultimately enabling anonymous giving. The year of 2008 also saw a major economic upheaval in the form of global financial crisis that is likely to have shaped domestic funding dynamics through a negative impact on discretionary funds. Furthermore, after a period of relative stability from 2002 and 2005 public awareness of climate change began to increase in 2006 to peak in 2007 before falling continuously until 2010 when it landed at pre-2007 levels (see Brulle, Carmichael & Jenkins, 2012). Finally, 2003 to 2007 sits within the presidency of George W. Bush, whose administration represented the institutionalisation of the conservative movement within which the CCCM is rooted (McCright & Dunlap, 2010).

Collectively, these restrictions resulted in data for 66 SMOs which the present analysis is based on. Of these 66, 60 have a secondary focus on climate change, whereas just six have a primary focus on climate change. This makeup of organisational interests yields a population of SMOs that is loosely mobilised around anthropogenic climate change. Note that ratios of giving (average of reported total contributions to average reported total revenues

of the 66 SMOs) from 2003-2007 range from 87 to 92 percent, indicating that this population of SMOs is highly donation-dependent.

#### [Insert Figure I — Aggregate Financial Patronage]

##### **Figure I | Bipartite Graph of Foundation-SMO Mutualism for Financial Patronage:**

*Aggregated* financial patronage of 66 SMOs by 136 private foundations between 2003-2007, inclusive. Resources (money) flow from the lower level (foundations) to the higher (SMOs). The width of each resource flow is scaled to reflect the raw dollar amount given by a foundation to a SMO during this period. Rectangles representative of actors in each class are scaled to reflect the amount of resources they give (receive) to (from) the other organisational population. Rectangles representative of actors are ordered from the largest giver (receiver) from left to right. Across all five years, the top four givers of grant dollars are: (a) The Scaife Affiliated Foundations [\$26 Mil.]; (b) Donors Trust/Donors Capital Fund; (c) The Lynde and Harry Bradley Foundation; and (e) The Koch Affiliated Foundations. The top four receivers of grant dollars are: (i) The Heritage Foundation [\$46 Mil.]; (j) The American Enterprise Institute for Public Policy Research; (k) The Hoover Institution on War, Revolution and Peace; and (l) The Manhattan Institute for Policy Research. Isolates are not shown.

Figure I depicts the bipartite graph capturing aggregate flows of capital from the 136 foundations to the 66 SMOs across the five-year study period. Tables II and III provide summary statistics for the patronage networks, their change over time and counts for organisational births. Appendices A2.a and A2.b enumerate all 66 SMOs and 136 foundations.

#### [Insert Table II — Descriptive Statistics (Networks)]

#### [Insert Table III — Summary of Network Change]

Finally, in 2014 additional data was collected to construct financial efficiency measures (Section IV.4.b) using information obtained from the IRS form 990. As noted earlier, there are a number of issues with IRS data related to the accuracy of reporting and outright accounting malfeasance (c.f., Gordon, Greenlee & Nitterhouse, 1999; Krishnan et al., 2006), despite its general consistency with data obtained directly from organisations (Froehlich & Knoepfle, 1996). Tinkelman and Mankaney (2007) suggest that researchers

1 restrict their samples to organisations that report realistic administrative or fundraising  
2 expenses (greater than \$1000). While the removal of data is fairly simple in atomistic  
3 frameworks and the variable centred statistical analyses which typically accompany, the  
4 network approach used here gives rise to a number of issues related to the interdependence of  
5 entities and the biasing of network boundaries. The valid identification of boundaries is a key  
6 component of rigorous statistical network analysis (see Shalizi & Rinaldo, 2009). As the  
7 removal of actors is not an option, I treat unrealistic values for administrative and fundraising  
8 expenses as missing while retaining the organisational actor and its relational data.

#### 10 *IV.3 Stochastic Actor-Oriented Models: Assumptions and Estimation*

11 I test my four hypotheses using Stochastic-Actor Oriented Models (SAOMs) which  
12 enable statistical inference about network evolution on the basis of a series of observed  
13 networks. SAOMs represent a methodological improvement over the time series and cross-  
14 sectional regression typically featured in studies of foundation patronage (c.f. Jenkins &  
15 Eckert, 1986; Tinkelman & Mankaney, 2007) and are better able to capture the dynamism of  
16 status deference in grant markets. These models are defined in terms of an actor's (ego)  
17 choices in establishing his/her/its *outgoing* ties to some alter, easily suiting my argument that  
18 models of patronage deal directly with foundation-investor decision-making. The key  
19 assumptions of SAOMs are as follows: (a) network evolution happens in continuous time via  
20 one tie change at a time (micro-steps); (b) network evolution is the result of a Markov process  
21 — for a given point in time, the current state of the network probabilistically determines its  
22 further evolution, disallowing effects from earlier periods; (c) only one actor  
23 (probabilistically determined) may change just one tie at a time, disallowing coordination; (d)  
24 actors are purposeful, controlling their outgoing ties; (e) tie changes are reactionary in  
25 response to one another sequentially (path dependence), ego's structural position and ego's

and potential alters' attributes; and, finally, (f) actors make decisions based on the limited information available in their immediate network (varies by configuration; see Table I).

The SIENA algorithm (Ripley et al., 2015) used to estimate SAOMs simulates changes between each observed network via the probabilistic and sequential micro-steps. During simulation, actors respond to shifting states of the network in that the probability of making a micro-step at a given moment depends on the (unobserved) state of the network at that same moment. Each additional micro-step changes the state of the network thus making the context within which actors are embedded ever changing (Zeggelink, 1994). Using method of moments, the estimation procedure conditions on the first observed network (i.e., the first "wave") to model the change between successive time points (see Snijders, 1996; 2001).

During this process, the average frequency in which actors get the opportunity to change their ties is determined by the rate function ( $\lambda$ ), where actions include creating a new tie, terminating a tie or abstaining. For simplicity, I assume  $\lambda$  is homogenous across the foundation population. Furthermore, actors are allowed to join and leave the network during simulations. This is used to handle organisational births and deaths. When an organisation does not exist, dyads including the organisation are indicated as being structurally impossible. This is respected in the simulations. Here, population density is largely fixed as no SMOs die during the four periods and few are born.

The evaluation function (1) determines the probabilities of various tie changes in the network. Similar to generalised linear models, the evaluation function is assumed to be a linear combination of various effects.  $f_i(\beta, x)$  is the value of the evaluation function for actor  $i$  given the network state  $x$ .  $s_{ki}(x)$  are the posited effects of interest associated with the network, actor attributes, or dyadic covariates.  $\beta_k$  are the estimated parameters which weight the effects, taking the form of log-odds ratios.

$$f_i(\beta, x) = \sum_{k=1}^n \beta_k s_{ki}(x) \quad (1)$$

Estimates of zero indicate that the effect plays no role in network dynamics, positive estimates indicate a tendency for ego to create ties which move the network into a state where there is a higher occurrence of the effect, whereas the converse for negative  $\beta_k$ . Here the evaluation function is understood to represent the attractiveness of moving from network  $x^0$  to  $x^1$  for a given actor. From this perspective, estimates reflect the dynamic tendencies of actors who have the opportunity to move from  $x^0$  to  $x^1$  by changing a single tie. Significance is determined with Wald-type tests using  $t$ -ratios equivalent to the absolute value of the ratio of the moment estimate  $\beta_k$  to its standard error.  $t$ -ratios greater than two indicate that  $\beta_k$  is significantly different from zero at the 95% confidence level.

When working with three or more waves of data, it is advisable to assess the degree to which  $\beta_k$  varies over time. Here I use an unrestricted SAOM which allows for time heterogeneity in all effects (see Lospinoso et al., 2011 for a technical treatment). Briefly, the evaluation function now takes the form:

$$f_i(\beta, x) = \sum_{k=1}^n \left( \beta_k + \delta_k^{(a)} \right) s_{ki}(x) \quad (2)$$

Where  $\delta_k^{(a)}$  represents the time-dummy interacted effect parameter for effect  $k$  in period  $a \in A$  where the number of periods of change in  $A$  is equal to the number of waves minus one. By convention  $\delta_k^{(1)} = 0 \quad \forall k \in K$  such that the first period represents the base period.

Significance of  $\delta_k^{(a)}$  in periods after the first is determined using the score-type tests of Schweinberger (2012), consisting of tests for joint-significance across all periods, effects and individual estimates of  $\delta_k^{(a)}$ , period-wise significance, effects-wise significance and individual significance  $\delta_k^{(a)}$  for each effect in each period. There are two issues for

consideration. Currently there is no formal strategy for incorporating the large amount of information from the various tests. Additionally, time heterogeneity of one parameter may be related to that of another (especially degree-based effects). Here my strategy consisted of iteratively including individual estimates  $\delta_k^{(a)}$  found to be significant, giving special attention to degree-based effects, until the period-wise, effects-wise and joint-significance tests for time heterogeneity were failed.  $p$ -values for the joint-significance test are given in for each model with results.

#### IV.4 Control Variables

##### IV.4.a Structural Controls

As degree distributions are understood to drive many of the status dynamics in mutualistic networks, I include a number of degree-related controls:

*Indegree Popularity (Linear & Square Root)*: Following previous work predicting a monotonic relationship between grant market centrality and the receipt of grants, I include an effect for the sum of the square root of the indegrees (i.e., number of grants received in year  $t$ ) of all those SMOs whom a foundation is tied to.<sup>x</sup> Positive values for this effect indicate cumulative advantage whereby large indegrees reinforce themselves over time leading to high levels of dispersion in the indegree distribution (Snijders, van de Bunt & Steglich, 2010). This effect represents the global status hierarchy of SMOs based on their number of patrons. Here I use the square root of the indegrees as it is more realistic to assume that higher indegrees represent an increase in the competitiveness of SMOs as grantees, but that the impact of competitiveness decreases at high values, i.e., a falling marginal effect. Inclusion of the linear effect helps to fit the lower tail of the indegree distribution. Relative to

the square root version, the linear effect has no substantive interpretation and the net effect of indegree popularity is yielded by summation of the linear and square root variants.

*Outdegree Activity (Linear and Square Root):* The foundation analogue for degree dispersion. These effects consist of the sum of and the square root of foundation outdegree, which reflect of the number of grants they give in year  $t$ . Positive values for these effects indicate that foundations in the network who are more active funders will be extra inclined to invest in SMOs over time. I refer to this as cumulative activity. Similar to indegree popularity, these effects capture the global status hierarchy of foundations based on breadth of their funding portfolios.

$1/(outdegree+c)(outdegree+1+c)$ : This function controls for non-linearity in the outdegree distribution. The internal parameter  $c$  controls the concavity of the function, with higher values approximating a linear shape. Here  $c = 1$  due to the sharp decline in the number of actors with outdegrees greater than two. In the models presented here  $\beta_k$   $1/(outdegree+c)(outdegree+1+c)$  is fixed as estimation suggests it should be included in the model but that its precise value is not well approximated. As Ripley et al. (2015) describe, this is indicated by a large estimated value of  $\beta_k$ , a large standard error and a lack of convergence of the algorithm. In these cases, it does not matter how large  $\beta_k$  is just that it is included in the model. Here,  $\beta_k$   $1/(outdegree+1)(outdegree+1+1)$  is fixed arbitrarily at 22.

*Outdegree Truncation Up to One:* Controls for the tendency for actors to be isolates with respect to their outgoing ties (i.e., outdegree truncation at one). Note that for this effect negative values of  $\beta_k$  represent a tendency for the occurrence of isolates whereas positive values represent a tendency *against* being an isolate, i.e., having an outdegree equal to one.

*Outdegree Truncation Up to Two:* Controls for the modal outdegree across the entire study period. Across the five years, the majority of foundations had at outdegree of two or less.

#### IV.4.b Monadic Controls

*Informed-Donor Model:* The informed-donor portion of the SAOM consists of a slightly modified version of Frumkin and Kim’s (2001) specification in their model of the effect of nonprofit financial efficiency on the receipt of grant dollars. Their specification maintains parsimony while still possessing good explanatory power compared to other models of efficiency and patronage (see Tinkelman & Mankaney, 2007). The modified specification used here consists of: (a) the administrative cost ratio (the share of total expenses going to management expenses); (b) logged programme expenses; (c) logged fundraising expenses; (d) organisational size as logged total revenue; (e) staff pay ratio (the share of total expenses going to salaries and wages); and (f) organisational age (logged years of nonprofit status).<sup>xi</sup> Each of the money-based covariates are lagged by one year to deal with simultaneity bias.

*Primary Focus:* Variable reflecting whether or not a SMO has a primary focus on climate change (six SMOs) or a secondary focus on climate change (60).

*Organisational Type:* Categorical variable for whether the SMO is an advocacy group (28 SMOs), think tank (37), or media organisation (one).

*Share of Grant Dollars:* The percentage of total grant dollars in  $t^{-1}$  taken home by a SMO. This is to control for market domination.

*Average Percentage of Contributions Controlled by Foundations:* Astroturf groups — entities created to lobby and campaign on behalf of sponsors who wish to remain anonymous — are



an active organisational component of the CCCM. Arguably, these groups are the result of the heavy intermingling between the CCCM and commercial interests, representing a key difference between this countermovement and peer progressive movements. To the extent that these groups are the domain of only one or a very small number of private foundations, not accounting for their disproportionate financial backing by “host” foundations would bias analyses. To correct for this, I first calculate the percentage of a SMO’s total contributions provided by the foundation population in the year prior. This percentage is then divided by a SMO’s total number of patrons in that same year producing a measure of the average share of contributions controlled by its patrons. Large values of this measure indicate concentration of contributions around a small numbers of foundations.

*Age of Foundation:* As Sing and Lumsden (1990) note, organisational age may be a surrogate for multiple correlated constructs such as aptitude at survival and institutional support. While composing an admittedly thin characterisation of foundations’ attributes, I include a variable for the logged number of years since the foundation was founded. This is used as an omnibus proxy to control for foundations’ reputation, size and the amount of resources at their disposal.

Table IV provides summary statistics for each monadic covariate.

**[Insert Table IV — Descriptive Statistics (Monadic Covariates)]**

*IV.4.c Dyadic Controls*

*Foundation-SMO State Match:* While earlier studies in the literature on organisational ecology emphasised geographic invariance with regard to the strength of ties between

organisations in the same population, this assumption has largely been relaxed through attempts to highlight sub-systems based in regions, states and cities (see Freeman & Audia, 2006 on geographic space). As this work suggests that organisational populations are agglomerations of more localised communities, I include a binary dyadic indicator for whether or not any foundation–SMO couple were located in the same state in the year prior.

#### *IV.5 Missing Data*

SAOMs allow for missing data at both the network and actor level. It is treated as non-informative. One can expect no problems with estimation at levels of missingness as high as around 20 percent, though at these levels a non-informative assumption may be unreasonable. To minimise the impact of missingness on results, calculation of target statistics during the simulations only uses non-missing data, however, simulations are carried out as if data were complete using imputation. Missing data for the covariates are replaced with the mean of the variable for the observation period in which it is missing. Missingness of network ties is handled with the last-observation-carried-forward method; if there is no earlier value for the tie then a zero is imputed.

Three monadic covariates (Fundraising Expenses, Share of Grant Dollars, and Average Percentage of Foundation Control of Contributions) have levels of missingness over 20 percent. For share of grant dollars and average percentage control of contributions, 23.86 percent missingness is intentional due to design constraints. These two variables are computed using the patronage network in each year. In order to directly address issues around simultaneity, money-based covariates are lagged. However, this lagged structure results in missing values for variables created using grant data for the first wave (2003) as Brulle's (2013) dataset does not cover 2002. High levels of missingness for fundraising expenses is

the result of employing Tinkelman and Mankaney (2007) cut-off of \$1000. Without this cut-off, only 15.2 percent of observations for fundraising expenses are missing.

Some evidence of misreporting emerged upon review of the data. A grant from Donors Trust/Donors Capital Fund to The Free Enterprise Education Institute was found to comprise over 100% of the latter's total contributions in 2005. Additionally, a grant from the Koch Affiliated Foundations to The Americans for Prosperity Foundation was also found to comprise over 100 percent of the latter's total contributions in 2005. A search of the IRS form 990 PF for the foundations confirms that grants were given in 2005 despite what was reported on the 990s of the SMOs. Here I treat these two grants as missing. This is the only missing data at the network level (less than 1%).

## *V Results*

My analysis consists of two stages. The first is a series of SAOMs: (a) an attributes-only model reflective of "informed donor" explanations of foundation patronage; (b) a structure-only model used to detail the endogenous dynamics of the mutualistic system; and (c) a social selection model whereby structure and attributes are modelled jointly. Given strong tendencies for popularity and activity effects, the second stage consists of graphical exploration of their joint contribution to the evaluation function in order to decompose status dynamics.

Effects for density represent the likelihood that a foundation will invest in a random SMO and might be thought of as an intercept term. However, substantive interpretation is best avoided as human socio-economic networks tend to be sparse. This almost always leads to large negative estimates for density.

Moreover, some readers may balk at the size of these models given the sample size ( $n = 202$  organisations). It may be useful to think about the size of the dyadic observation pool,

though observations may not always be independent depending on the network configuration in question. The 136 x 66 adjacency matrix representing capital flows from foundations to SMOs contains 8976 dyadic observations. Across five years, and after accounting for the two missing ties, there are 44,878 dyadic observations from which to base the inferences for structure on.

Finally, it is important to note that the networks of patronage are built from successful bids for grants. While this does not violate the key assumption of SAOMs – that actors control their outgoing ties – it does require that structural effects be understood as conditional on some focal SMO having submitted a grant application to one or more foundations (varies by configuration) in order for some focal foundation to have the opportunity to decide whether or not to invest.

**[Insert Table V – Results]**

*V.1 Summary of Models*

This first model presents the impact of various organisational attributes on the likelihood of a SMO winning foundation-investors. All continuous monadic covariates are centred at their global means. Results for this model indicate that foundations have roughly four opportunities to invest in a SMO per period. There is a net tendency for foundation giving to be confined within states and for think tanks to receive grants over advocacy and media-type SMOs. Those SMOs with a primary focus on climate change are less likely to receive funding compared to SMOs with a secondary focus on climate change. Of the measures composing the informed donor model, only total revenue has an effect on the likelihood of a SMO's receipt of a grant. Consistent with past research, SMOs with above average revenues, an indicator of size, are more likely to receive grants. Additionally,

investments are very likely to go to those SMOs who command the share of grant dollars in the year prior. Finally, older foundations are more likely to give grants.

The structure model indicates a small but significant positive tendency for four cycles, providing some evidence for the operation of a peer-referral mechanism (H3). There also exists a net tendency for foundations to invest in popular grantees because of their popularity. However, there is tendency against very active foundations investing in those SMOs with very many patrons (H1). Additionally, there is a tendency against foundations investing in SMOs with zero (H2a) or near-zero patrons (H2b). Inversely, this also represents a tendency for foundations to divest in SMOs when they serve as the sole provider or one of two providers of funding, respectively. Furthermore, results indicate a net propensity for very active foundations to give grants precisely because of their activity. Lastly, there is a tendency against foundations not investing in any SMOs over time alongside a tendency for foundations to tend to fund no more than two SMOs over time. Foundations again have roughly four opportunities to create financial ties.

For the social selection model, structural results are largely the same with slight fluctuations in magnitude. The key difference with regard to structure is the loss of significance for the in-near-isolates effect (H2b). In the presence of structure, one now observes a tendency for SMOs who spend above average amounts on administrative expenses to receive investments, though this effect becomes strongly negative during the 2004/2005 period. Furthermore, SMOs that spend above average amounts on fundraising and who are older are now found to be less likely to receive funding. Lastly, age no longer impacts the propensity of foundations to invest.

Regarding the heterogeneity of estimates, significant estimates of  $\delta_k^{(a)}$  are added to  $\beta_k$  to yield the net effect for a given period. The only variable that warrants further discussion in this regard is Administrative Cost Ratio in the social selection model. Significant estimates of

$\delta$  for all other variables do not result in the sign of the net effect changing and there is no *a priori* expectation for fluctuation in strength. See Appendix A5 for a discussion of the sign of the estimate for Administrative Cost Ratio in addition to a discussion of other attribute effects that disagree with findings in the public administration literature.

As information criteria such as AIC and BIC have not been developed for SAOMs, I assess the fit of each of the three candidate models with respect to auxiliary statistics. These statistics are used to judge the plausibility of the networks generated from each of the three models. Specifically, plausibility is determined by comparing the distribution of values of an auxiliary statistic calculated using simulated networks to the value of that same statistic calculated using the observed networks. Importantly, auxiliary statistics are not explicitly fit by a particular effect in the model, but are still features of the network that should be faithfully represented (see Lospinoso, 2012; also Snijders & Steglich, 2013).

Following Koskinen and Edling (2012), I assess the fit of the models using SMO indegrees, foundation outdegrees, SMO-SMO geodesics and foundation-foundation geodesics. The results of the goodness-of-fit assessment indicates that the social selection model best summarises those processes leading to the emergence of the patronage system. This assessment is based on 4000 simulated networks (1000 for each period). For the social selection model, fit is excellent and the model outperforms both the attribute and structure-only variants. Appendix A1 provides graphs for the distribution of auxiliary statistics from observed and simulated networks and additional information on goodness-of-fit assessment.

Finally, the size of these models demands a comment on the multicollinearity of estimates. Taking the absolute value, the largest correlation coefficient for estimates in: (a) the attributes model is 0.25; (b) the structure model is 0.19; and (c) the social selection model is 0.48. These values are well below those recommended by Ripley et al. (2015). Within the SAOM framework, correlation coefficients between the estimates have a secondary threshold

of 0.8, though correlations may be as high as 0.95 if standard errors are stable across successive estimations.

## V.2 Decomposition of the Popularity Effect

In their tabular form these results do not reveal how status dynamics operate across the foundation population, particularly in light of the negative out-indegree assortativity estimate. To further explore the effects of status on foundations' propensity to invest, I use the estimates from the social selection model to decompose the SMO choice process into three different scenarios. These scenarios are based on foundations' levels of funding activity and are designed to assess how the structural position of foundations' mediates their propensity to invest. Using the distribution of observed outdegrees (range 0-34) from 2003-2007, I construct profiles for peripheral, median and major activity foundation-investors. Respectively, these profiles represent the bottom 25th percentile (outdegree = 0), the 50th percentile (outdegree = 2), and the top 5th percentile (outdegree = 15) of the global outdegree distribution. The global average outdegree is 3.7.

$$\beta_{inPopSqrt} \sum_j x_{ij} \sqrt{x_{+j}} + \beta_{inPop} \sum_j x_{ij} x_{+j} + \beta_{outActSqrt} x_{i+}^{1.5} + \beta_{outInAssort} \sum_j x_{ij} x_{i+}^{1/2} x_{+j}^{1/2} \quad (3)$$

Equation 3 gives the joint contribution to the evaluation function using the square root and linear popularity effects, the square root outdegree activity effect, and the out-indegree assortativity effect where  $i_+$  indicates the outdegree of  $i$  and  $+j$  indicates the indegree of  $j$ . Figure II presents the shape of the joint contribution in the form of (3) for each investor profile ( $i_+ = 0$ ,  $i_+ = 2$  or  $i_+ = 15$ ). Diamonds are the values of the joint contribution for a SMO with an average number of patrons ( $+j = 8$ ) excluding the potentially incoming tie from the foundation represented by each profile. Circles indicate the maximised value of the joint

contribution for the range of observed indegrees (0-42) from 2003-2007. Each profile is accompanied by rug plots representing the distribution of observed indegrees across the study period, where the position of each tick is dodged to aid visual assessment. Note that direct calculation of the probabilities for various tie is not pursued as the intricate interdependencies between the structural effects could lead to unrealistic scenarios.

## [Insert Figure II — Foundation-investor Profiles]

**Figure II | Foundation-investor Profiles:** Graphs depict the joint contribution (log odds ratio) to ego's evaluation function using the popularity effects, the outdegree activity effect and the outdegree assortativity effect across the range of observed indegrees from 2003-2007. Diamonds indicate the value of the joint contribution for the global average indegree (7.6, rounded to 8). Circles indicate the maximised value of the joint contribution for a given indegree. Rug plots depict the distribution of indegrees. Each panel represents one of three foundation-investor profiles: Peripheral (Bottom 25th percentile; Outdegree = 0; A), Median (50th percentile; Outdegree = 2; B); and Major (Top 5th percentile; Outdegree = 15; C). Global average outdegree = 3.7.

In interpreting these graphs, it may be useful to recall that when a foundation in class  $A$  has an opportunity to change a tie relative to its set of choice options (SMOs in class  $P$ ), where options include  $P$  changes and one non-change, a foundation is understood to make tie changes in such a way that the value of its evaluation function is maximised given the constraints of its local network. In this sense, the evaluation function represents actors' short-term objectives given both preference and structural constraint. Given the opportunity to act, which action an actor chooses follows the logic of discrete choice models (Snijders, van de Bunt & Steglich, 2010; see McFadden, 1973; Maddala, 1983).

For peripheral foundation-investors the joint contribution has a range of 0.01 to 6.3, falling to virtually zero should a potential grantee have no other patrons and peaking should the potential grantee have very many patrons (maximised at  $+j = 42$ ). In contrast, the joint contribution for median foundation-investors has a range of 4.1 to 6.8 and is maximised at  $+j = 33$ . While the curves for median and peripheral investors differ in their range of values, both indicate a strong preference for investments in very popular SMOs.



For major activity investors there is a stark difference when compared to the first two profiles. The shape of the joint contribution for this group of foundations drops steadily across the range of observed indegrees from 84 to 80. Interestingly, the joint contribution for major activity foundations is maximised at  $+j = 0$ . Collectively these graphs serve as provocative evidence for the avoidance of assortative mixing between high-status SMOs and high-status foundations. Those foundations at the extremes of the outdegree distribution very clearly prefer to invest in SMOs at the opposite end of the indegree distribution.

## *VI. Discussion*

Through the present analysis I have attempted to craft one answer to a simple question: what explains the allocation of capital to professional SMOs by private foundations? The simplicity of this question betrays the complexity of the attendant processes at work. Here I have argued for reconsideration of the grant market as a mutualistic network, introducing a powerful and flexible analytical framework for theorising and empirically testing the intricate interplay between SMOs' status and strategic positioning, foundations' attempts to overcome information asymmetries as they make their decisions to invest, and the mediating effects of foundations' prestige relative to that of a potential grantee. This has resulted in a much more nuanced picture of external resource derivation than that which is currently found in the sociological and organisational literature on SMOs and, more broadly, nonprofits. Results indicate that the structural positions of both foundations and SMOs operate in tandem to produce multiple network dynamics, unique to bipartite graphs and beyond snapshots of point centrality, that powerfully shape foundations' propensity to invest. Methodologically, results suggest that SAOMs are a plausible alternative to measures of population density and aggregate foundation giving in variable-centred modelling

frameworks (e.g., OLS regression or time series) when scholars seek to detail the dynamics of competition and cooperation which govern external resource derivation.

This work makes an important and provocative substantive contribution at the intersection of the sociology of status and work on professional SMOs/nonprofits with regard to understanding how differing levels of prestige impacts the receipt of resources. In line with Kovács and Sharkey's (2014) recent call for a perceptual view of status, my findings indicate that the effects of SMOs' grant-market prestige manifests in different ways across various segments of the population of foundation-investors. Counterintuitively, results indicate a dynamic tendency for degree disassortativity, an inverse relationship between cumulative advantage and cumulative activity, such that high-status foundations prefer to invest in SMOs with few patrons — an indicator of lower status in this framework. The converse is true for peripheral foundation-investors and high-status SMOs.

This is surprising as one would assume status to be positively correlated in organisational partnerships. What then explains this tendency against status-based assortativity? Extant scholarship on elite patronage and social control would suggest that the avoidance of high-status SMOs by major grantors be attributed to a perception of high-status grantees as ill equipped to address a foundation's individual interests amongst a number of others. However, there have been mixed conclusions about patronage and social control alongside a growing acknowledgement of the similarities between foundations and those that they fund (c.f. Cress & Snow, 1996). Following Phillips and Zuckerman (2001), I suggest that a second, more plausible, conclusion rests with status and behavioural constraint. Specifically, the security that comes from being a high-status provider of capital may erode major foundations' concerns about prevailing notions of what is and is not a legitimate investment (see Sauder, Lynn & Podolny, 2012 for a review of status-based constraints on organisational behaviour). This, alongside possessing extensive capital, enables major

foundations to take risks, “gambling” with their investments by serving as patrons for low-status SMOs.

Such gambling may be attributed to a preference for innovation, or being in the vanguard, with regard to addressing social issues on the part of foundations. Grantors of a philanthropic orientation, such as those studied here, are characterised by their permanent and independent revenue streams which afford considerable freedom in expressing preferences via the allocation of funds. This freedom allows philanthropic foundations to occupy an entrepreneurial role through which they bring attention to new ideas, service models and organisations.<sup>xii</sup> Moreover, philanthropic foundations have been shown to be acutely aware of the shifting docket of social problems, leading to the strategic modification of interests in response to changes in the policy environment (see Mosley & Galaskiewicz, 2010).

Given tendencies for social entrepreneurship and adaptation to the socio-political environment, a preference for innovation on the part of major grantors may foster the perception that those SMOs who benefit from an extensive support base are inert due to the risk of patron alienation that comes with organisational change. While having a multitude of revenue streams allows SMOs to weather unexpected financial shocks, such a large number of patrons may “lock in” their immediate goals. This effectively limits organisational transformation in response to shifts in the importance of social problems, leaving well-funded SMOs out-of-sync with the more fluid interests of entrepreneurial foundations-investors.

Further still, high-activity funders may be extra prone to compassion fatigue around certain issues. By investing in peripheral, poorly-funding SMOs with an incentive to strategically position themselves relative to the wider organisational population, major-foundations capitalise on an opportunity to best their competitors in the search for novel solutions to some social problem. Arguably, this opportunity is even more pronounced given the pre-occupation of peripheral grantors with high-status SMOs. Again drawing on the work

of Phillips and Zuckerman (2001), the security of being high-status affords grantors an additional strategy to source innovative solutions for what they perceive as socio-economic ills.

Notwithstanding, there is a limit to how peripheral a SMO may be for it still be competitive despite the maximisation of the joint-contribution of status to major-foundations' evaluation function occurring at an indegree of 0. The large effect for the in-isolates configuration indicates that there is a penalty for exclusive resource dependence. Specifically, foundations tend to divest from SMOs when they serve as the only patron whilst tending to not make investments in SMOs with zero patrons. Together, these dynamics suggest that there is some avoidance of investment in those SMOs most in need within this particular population of grantors.

## *VI.2 Limitations and Conclusion*

With all work there are limitations. The SAOMs presented here are fundamentally analyses of resource derivation by actors within a single movement, though I eschew any conclusions specific to the CCCM. Additionally, I have not given treatment to one of the most visible components of ecological analyses of organisational populations — birth and death. These two limitations are linked in that they are artefacts of my use of an organisational population wherein both density and the competitive logic are stable in order to make an explicit move away from the effects of resource derivation to focus on its antecedents. This ultimately required a well-defined population of SMOs and a smaller period or study, and thus less variation in births and deaths. Larger fluctuations in the composition of organisational populations are likely to be observed across longer time periods. More work must be done on: (a) the sensitivity of the network dynamics detailed here to changes in the sizes of the population of SMOs and foundations; and (b) the degree to

1 which these dynamics differ across diverse populations of SMOs associated with  
2 heterogeneous social movements. Notwithstanding, it is worth stating that these dynamics  
3 resonate quite strongly with previous work on status and information asymmetry in markets  
4 and are likely not artefacts of the use of the CCCM as a case study.

5       It should also be said that by focusing exclusively on money I have taken a very  
6 narrow view of an SMO's resource space. As Cress & Snow (1996) make clear, there are a  
7 number of other resources in addition to financial patronage that combine in different ways to  
8 ensure organisational viability. By focusing only on capital, this work misses these  
9 combinations and thus the various differentiation strategies SMOs pursue in a multi-resource  
10 space. Though this limitation is mitigated somewhat by the fact that the SMOs studied here  
11 are professionalised nonprofits that are highly donation dependent, future work should pursue  
12 co-evolving mutualisms and other resource related networks in order to untangle how  
13 combinations of resources constrain derivation. Relatedly, the patronage networks I have  
14 constructed are based on successful bids for grants, providing no information on the  
15 dynamics of the failed solicitation of patrons. A focus on grant applications would shift the  
16 locus of action in these models from foundations to SMOs, providing needed insight into  
17 foraging patterns.

18       An additional limitation is the qualitative assessment of patronage through a focus on  
19 whether or not a grant was given as opposed to how much money was given to a SMO by  
20 some foundation. This is largely a methodological limitation. Currently, SAOMs may be fit  
21 to ordered networks in the style of Russian Dolls, where the values of ties are binned using a  
22 small number of integer values (e.g., 1-3) with each value constituting its own unique  
23 network. However, this variation is still very much in the development phase, leading me to  
24 adopt the qualitative strategy. Thus work must be done on how the network dynamics  
25 discussed here play out across various levels of support.

1           And, finally, I have given a thin treatment to the multi-layered nature of  
2   organisational populations by only using matched geographic location. Future research  
3   should look to multiplexity in further detailing the dynamics of financial patronage as  
4   concurrent ties amongst SMOs, amongst foundations, and between foundations and SMOs  
5   are likely to play an important role in resource derivation.

6           Nonetheless, these trade-offs are justified for a first attempt at precisely detailing  
7   competition for foundation patronage amongst professional SMOs through the lens of a  
8   mutualistic network. Overall, my analysis indicates that dynamic, status-based tendencies  
9   play a non-trivial role in determining the competitiveness of SMOs by governing  
10   foundations' propensity to invest. Although I used patronage as an empirical context, I  
11   strongly suspect other resource-related movement relationships are amenable to exploration  
12   as mutualistic networks using dynamic bipartite graphs. For example, consider competition  
13   between SMOs for coverage in various media outlets. Here, there are multiple attendant  
14   concerns on the part of both organisational decision-makers leading them to act strategically  
15   in the face of finite resources, even whilst both stand to benefit from collaboration.  
16   Furthermore, I expect mutualistic models of patronage in the vein presented here, along with  
17   requisite assumptions around status and the SAOM methodology, to fruitfully map onto  
18   competition for patrons amongst nonprofits in more traditional sectors such the arts,  
19   education and development.

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<sup>i</sup> Scholars of strategy have explicitly modelled competition with an eye to relational dynamics for some time. In particular, see Poldony, Stuart and Hannan's (1996) model of competition in the semiconductor industry which, similarly to the model presented here, integrates organisation-environment dynamics with organisational attributes. Also see Stuart & Podolny (1996).

<sup>ii</sup> A bipartite network is composed of two classes of entities where there are relationships between classes and no relationships within classes. The prototypical example in the organisational literature is a network of interlocking directorates. Bipartite networks are also known as "two-mode" or "affiliation networks."

<sup>iii</sup> From this perspective, competition connotes a struggle of conflicting interests (Ely, 1901) akin to a rivalry between actors who seek something not all may obtain (Stigler, 1987). Functionally, competition is a selective process that sees the survival of the fit (Ely, 1901) and is understood to be a property of the relationship between actors as opposed to the state of some market (Trapido, 2007; Vickers, 1995). Importantly, here there are no

normative elements attached to competition, whether as a market state or a relational property, with regard to the degree to which it is good or bad for resource derivation in social movements.

<sup>iv</sup> The rationale behind this conceptual model comes from Saavedra, Reed-Tsochas and Uzzi (2008). Taking serious the ecological metaphor found in much organisational research, these authors develop a simple bipartite model of cooperation and apply it to plant-animal pollinator networks and to producer-consumer inter-organisational networks. In an intriguing development, the authors find that a number of structural features (e.g., within-class degree distributions, modularity) of networks composed of manufactures and contractors in the New York garment industry (1985 to 2003) exhibit striking similarities to those observed in the pollinator networks. See also Saavedra et al. (2011).

While it is unreasonable to expect the determinants of cooperative behaviour in ecological scenarios to map directly to those governing the interaction between foundations and SMOs, empirical evidence suggests that there is overlap in general dynamics. Thus the term “mutualistic” is appropriate for those organisational scenarios where two distinct classes of actors closely cooperate to mutual advantage.

<sup>v</sup> While grant giving is fundamentally an event, i.e., money is given by party A to party B at time  $t$ , it is unreasonable to assume that the decision to invest is independent of past decisions. In this sense, financial patronage creates monetary relationships between foundations and SMOs. This approach to patronage is in line with previous work in social movement studies on grant giving and social control which implicitly assumes sustained relations between foundations and SMOs as opposed to isolated events.

<sup>vi</sup> While idyllic images of SMOs resonate with the organisational structure and tactics typically employed by grassroots organisations, the boundary between a SMO, an interest group and a nonprofit is best described as porous. While I primarily address the social movement dimension of the 66 organisations under study, their charitable status and professionalised nature lead me to adopt Andrews and Edwards’ (2004) umbrella notion of “advocacy organisation” in order to have a wider conceptual toolkit for thinking about how these organisations seek external financial support. However, nonprofits may be viewed as distinct political entities in their own right (LeRoux & Goerdel, 2009).

<sup>vii</sup> Following Jenkins (1998), movements may be in the public interest or geared towards empowerment and SMOs themselves may be indigenous or professional. As their name suggests, empowerment movements attempt to redistribute power relative to marginalised groups based on such things as race or sexual orientation whilst public interest movements pursue broad collective goods such as environmental protection or consumer rights. Professional SMOs are staff driven entities that derive their resources from institutions and isolated constituencies, and represent, rather than directly mobilise, their beneficiaries. This is in contrast to indigenous SMOs which are heavily involved in face-to-face organising and derive the bulk of their support from their movement’s beneficiaries.

<sup>viii</sup> It is worth noting that the drive towards efficiency and increased performance is largely attributed to heightened pressure on nonprofits to professionalise (Frumkin, 1998; Hwang & Powell, 2009). In this respect, many of the arguments about the institutional channelling of SMOs (see McCarthy et al., 1991) resonate with trends in organisational behaviour across the nonprofit sector.

<sup>ix</sup> Following Diani (2015; 2013), I view the empirical aspects of social movements as constitutive of an organisational field that is fundamentally relational in nature and fruitfully analysed as a social network. Specifically, social movement organisational fields are understood to consist of a population of SMOs that are united in their issue interests and tied by relations indicative of domination, cooperation, information exchange and mutual awareness (see also Diani & Pilati, 2013 and Minkoff & McCarthy, 2005). The most complete notion of field includes both the focal actors of interest and those other entities they routinely engage, here limited to private foundations — though other actors, such as individual activists and government entities, are sure to play a role. In the context of external resource derivation, the logic governing interaction between a field of SMOs and a population of foundations — a field in its own right — is understood to be mutualistic.

<sup>x</sup> Organisational research has a long history of operationalizing status as power centrality/eigenvector centrality (c.f. Faulk, Lacey & McGinnis, 2012; Lin, Yang & Arya, 2009; Poldony et al., 1996). At the time of writing, there is no option to estimate SAOMs for bipartite networks with a two-mode measure of power/eigenvector centrality. Use of indegree centrality represents a limitation of this work as it is tantamount to measuring the status of a SMO in a way that does not reflect variation in the status of its financial patrons. While indegree centrality is an unrefined measure of status relative to power/eigenvector centrality, there are benefits to employing the former given the actor-oriented nature of the models used here. Raw popularity requires a much less tenuous information assumption on the part of ego. Specifically, indegree centrality only assumes some focal foundation is aware of the patrons of a potential grantee. On the other hand, power/eigenvector centrality

assumes that the focal foundation: (a) knows what foundations serve as the patrons of a potential grantee; and (b) is also privy to the composition of the funding portfolios of each of the patrons of a potential grantee.

<sup>xi</sup> See Appendix A4 for the rationale behind this modification.

<sup>xii</sup> This is in contrast to foundations with a charitable orientation who serve the public by attempting to alleviate suffering via support of programmes that the government cannot or will not provide. Though charitable and philanthropic orientations are contrasted, they are not mutually exclusive. As Mosley and Galaskiewicz (2010) demonstrate, foundations may take actions that represent both of these behavioural logics. Nevertheless, this mixing is more apparent amongst progressive and centrist foundations compared to their conservative counterparts.



## Appendix

### A1 Goodness of Fit

Figures A1.a and A1.b depict distributions of auxiliary statistics used to assess the fit of each model. The solid red lines indicate observed values. The box plots represent the distribution of 4000 simulated values for each observed value of the statistic. The dashed blue lines are the 95% confidence interval for the distribution of simulated statistics.  $p$ -values are given for a test of Mahalanobis distance. These values, along with visual inspection, indicate how well a model recreates the observed features of the network.  $p$ -values very close to or greater than 0.5 indicate that the model-based distribution is not significantly different from the observed. For example, looking at the distributions depicted in Figure A1.a, fit for the social selection model is quite good ( $p = 0.33$  for the SMO indegree distribution and  $p = 0.05$  for the foundation outdegree distribution) whereas for the attributes model fit is unacceptable ( $p =$  approximately 0 for both the indegree and outdegree distributions). Save dramatic changes in simulated values (e.g., see Figure A1.b for a comparison of the geodesic distribution generated by the attributes models versus those generated by the social selection model), relative assessment of fit is crude. Nonetheless, a SAOM's reproduction of observed values is a powerful way of judging the plausibility of a particular specification.

Note that geodesic distance is calculated using the weighted projections of the mutualistic network, i.e., matrices retain the number of SMOs two foundations both invest in or the number of patrons two SMOs share. Distance is rounded to the nearest whole integer where a unit of distance refers to one step with the average tie weight in the network (see Opsahl, n.d. and Opsahl, Agneessens & Skvoretz, 2010 for details on this calculation).

#### [Insert Figure A1.a: Goodness of Fit – Degree Distributions]

**Figure A1.b | Goodness-of-Fit for In and Outdegree Distributions:** Distribution of auxiliary fit statistics for the attribute (A), structure (B) and social selection (C) models. Distribution of observed values given by solid red line. Dashed blue lines represent the 95% confidence interval for simulated statistics for each observed value. Distributions are joined across all waves. For example, across all waves, 70 SMOs had an indegree of 0.  $p$ -values (inset) are given for a test of Mahalanobis distance.

#### [Insert Figure A1.b: Goodness of Fit – Geodesic Distributions]

**Figure A1.b | Goodness-of-Fit for Within-Class Geodesic Distributions:** Distribution of auxiliary fit statistics for the attribute (A), structure (B) and social selection (C) models. Distribution of observed values given by solid red line. Dashed blue lines represent the 95% confidence interval for simulated statistics for each observed value. Distributions are joined across all waves. For example, across all waves, roughly 3500 dyads in the unimodal SMO-SMO network were connected by 1 step of the average weight of the network (i.e., the average number of shared foundation patrons).  $p$ -values (x-axis label) are given for a test of Mahalanobis distance.

### ***A2.a Social Movement Organisations***

1. 60 Plus
2. Advancement Of Sound Science Center
3. Alliance to Save Energy
4. American Coal Foundation
5. American Conservative Union Foundation
6. American Council for Capital Formation Center For Policy Research
7. American Enterprise Institute for Public Policy Research
8. American Friends of the Institute Of Economic Affairs
9. American Legislative Exchange Council
10. American Policy Center
11. Americans for Prosperity Foundation
12. Annapolis Center for Science-Based Public Policy
13. Atlas Economic Research Foundation
14. Capital Research Center
15. Cascade Policy Institute
16. Cato Institute
17. Center for the Defense of Free Enterprise
18. Center for the Study of Carbon Dioxide And Global Change/Co2 Science
19. Collegians for a Constructive Tomorrow-Upper Midwest
20. Committee for a Constructive Tomorrow
21. Competitive Enterprise Institute
22. Congress of Racial Equality
23. Consumer Alert
24. Environmental Literacy Council
25. Free Enterprise Education Institute
26. Free Enterprise Foundation
27. Free Enterprise Fund
28. Free Enterprise Institute
29. Freedomworks
30. Freedomworks Foundation
31. Frontiers of Freedom Institute
32. George C. Marshall Institute
33. Heartland Institute
34. Heritage Foundation
35. Hoover Institution On War, Revolution and Peace
36. Hudson Institute
37. Independence Institute
38. Independent Institute
39. Independent Women's Forum
40. Institute for Energy Research
41. Institute for the Study of Earth And Man
42. James Madison Institute for Public Policy Studies
43. John Locke Foundation
44. Landmark Legal Foundation
45. Mackinac Center for Public Policy
46. Manhattan Institute for Policy Research
47. Media Research Center
48. Mercatus Center
49. Mountain States Legal Foundation
50. National Center for Policy Analysis
51. National Center for Public Policy Research
52. National Taxpayers Union
53. National Taxpayers Union Foundation
54. Oklahoma Council of Public Affairs
55. Oregon Institute of Science and Medicine
56. Pacific Research Institute for Public Policy
57. Reason Foundation
58. Responsible Resources
59. Science and Environmental Policy Project
60. Southeastern Legal Foundation
61. Sovereignty International
62. State Policy Network
63. Texas Public Policy Foundation
64. Thomas Jefferson Institute for Public Policy
65. Ts August/The Second of August
66. Washington Policy Center

### ***A2.b Private Foundations***

1. Aequus Institute
2. Alfred C. Munger Foundation
3. American Petroleum Institute
4. Annenberg Foundation
5. Assurant Health Foundation
6. Barbara and Barre Seid Foundation
7. Barney Family Foundation
8. Bialkin Family Foundation
9. Bill & Melinda Gates Foundation
10. Brady Education Foundation
11. Carnegie Corporation of New York
12. Charles and Ann Johnson Foundation
13. Charles F. De Ganahl Family Foundation
14. Chase Foundation of Virginia
15. Claws Foundation
16. Communities Foundation of Texas
17. Coors Affiliated Foundations
18. Covenant Foundation
19. Daniels Fund
20. David J. & Mary L. G. Theroux Foundation
21. Dean & Barbara White Family Foundation
22. Dodge Jones Foundation
23. Donors Trust/Donors Capital Fund
24. Dorothy D. And Joseph A. Moller Foundation
25. Douglas & Maria Devos Foundation
26. Dunn's Foundation for the Advancement of Right Thinking
27. E. A. Morris Charitable Foundation
28. Earhart Foundation
29. Ed Foundation
30. Ed Uihlein Family Foundation
31. Eli Lilly and Company Foundation
32. Ewing Marion Kauffman Foundation
33. Exxonmobil Foundation

34. F. M. Kirby Foundation
35. Galashiels Fund, Ltd.
36. General Motors Foundation
37. Gilder Foundation
38. Gordon V. & Helen C. Smith Foundation
39. Greater Kansas City Community Foundation
40. H. Smith Richardson Charitable Trust
41. Hatton W. Sumners Foundation for the Study and Teaching of Self-Government
42. Henry R. Kravis Foundation
43. Herrick Foundation
44. Hilton Family Foundation
45. Hirsch Family Foundation
46. Howard Charitable Foundation
47. Iowa West Foundation
48. J. P. Humphreys Foundation
49. Jaquelin Hume Foundation
50. John Dawson Foundation
51. John S. And James L. Knight Foundation
52. John Templeton Foundation
53. John William Pope Foundation
54. K. C. Ames Foundation
55. Koch Affiliated Foundations
56. Koret Foundation
57. Lakeside Foundation
58. Lillian S. Wells Foundation
59. Lilly Endowment Inc.
60. Lovett & Ruth Peters Foundation
61. Lumina Foundation for Education
62. M. J. Murdock Charitable Trust
63. Malott Family Foundation
64. Mercer Family Foundation
65. Modzelewski Charitable Trust
66. Pacificorp Foundation
67. Pierre F. And Enid Goodrich Foundation
68. Richard & Barbara Gaby Foundation
69. Robert & Ardis James Foundation
70. Rose-Marie and Jack R. Anderson Foundation
71. S.d. Bechtel, Jr. Foundation
72. Scaife Affiliated Foundations
73. Searle Freedom Trust
74. Sid W. Richardson Foundation
75. Smith Richardson Foundation
76. Stephen Bechtel Fund
77. Susquehanna Foundation
78. Sweetfeet Foundation
79. Taube Family Foundation
80. The Abstraction Fund
81. The Achelis-Bodman Foundations
82. The Alice M. & Thomas J. Tisch Foundation
83. The Ambrose Monell Foundation
84. The Andrew Cader Foundation
85. The Anschutz Foundation
86. The Armstrong Foundation
87. The Bristol-Myers Squibb Foundation
88. The Capital Group Companies Charitable Foundation
89. The Carson Family Charitable Trust
90. The Challenge Foundation
91. The Chisholm Foundation
92. The Chrysler Foundation
93. The Community Foundation Serving Richmond & Central Virginia
94. The E. L. Craig Foundation
95. The Gordon and Mary Cain Foundation
96. The Grover Hermann Foundation
97. The Harry and Jeanette Weinberg Foundation
98. The Hofmann Family Foundation
99. The J. M. Kaplan Fund
100. The Jean I. & Charles H. Brunie Foundation
101. The Jeld-Wen Foundation
102. The JM Foundation
103. The John D. And Catherine T. MacArthur Foundation
104. The Kern Family Foundation
105. The Kovner Foundation
106. The Lynde and Harry Bradley Foundation
107. The Marcus Foundation
108. The Meadwestvaco Foundation
109. The Paul Singer Family Foundation
110. The Pew Charitable Trusts
111. The Richard and Helen Devos Foundation
112. The Richard Seth Staley Educational Foundation
113. The Robert Wood Johnson Foundation
114. The Roberts Foundation
115. The Rodney Fund
116. The Roe Foundation
117. The Samuel Roberts Noble Foundation
118. The San Francisco Foundation
119. The Starr Foundation
120. The T. Boone Pickens Foundation
121. The Thomas and Stacey Siebel Foundation
122. The TWS Foundation
123. The Ups Foundation
124. The Weismann Foundation
125. The William and Flora Hewlett Foundation
126. The William and Inez Mabie Family Foundation
127. The William H. Donner Foundation
128. The Woods Charitable Foundation
129. Timken Foundation of Canton
130. Tully and Elise Friedman Fund
131. Vanguard Charitable Endowment Program
132. Walton Family Foundation
133. Wellpoint Foundation
134. William E. Simon Foundation
135. William Howard Flowers, Jr. Foundation
136. William K. Bowes, Jr. Foundation

### ***A3 Further Details on Data Collection and Coding***

Data collection for the full dataset in Brulle (2013) was as follows. Candidate CCCM SMOs were determined by enumerating any organisations that: (a) sent a speaker to or sponsored any of the eight conferences by the Heartland Institute's International Conferences on Climate Change between 2008-2012; (b) are members of the Global Climate Change Coalition, the Alliance for Climate Strategies, or the Cooler Heads Coalition; or (c) were addressed in accounts of CCCM activity by Oreskes and Conway (2010), Greenpeace (2010), The Union of Concerned Scientists (2007) and the National Committee for Responsive Philanthropy (1997). This resulted in a list of 538 candidate SMOs of the CCCM.

These 538 organisations were coded as having climate change as a primary focus, a substantive, but secondary, concern, a peripheral concern, or no concern at all. For example, the Science and Environmental Policy Project was coded as having a primary focus on climate change whereas the Cato Institute was coded as having a secondary focus on climate change due to its participation in a number of different policy arenas. Coding was based on a review of candidate SMOs' activism, summaries of their activities by Greenpeace and the Centre for Media and Democracy's SourceWatch, a review of its mission and objectives, the nature of its arguments about climate change (e.g., "climate change is a hoax" versus "addressing climate change is expensive" versus "there are more important problems than climate change"), and its advocated actions to address climate change which includes "No Action". The test of intercoder reliability yielded a Krippendorff's Alpha coefficient of 0.87 for the two independent coders. Of the 538 candidate SMOs, 123 had either a primary or secondary focus on climate change. This constitutes the core population of SMOs in the CCCM. Of these, IRS data was available for 98 SMOs between 2003-2010. These 98 SMOs were used in Brulle's original analysis.

Upon my examining of the full dataset used in Brulle (2013), small data entry errors were found leading to discrepancy between the original number of organisations listed in Brulle (2013; 140 foundations, 91 SMOs). Subsequent discussions with Brulle confirm that the numbers used here are correct. To assess the robustness of this sample to alternative efforts to enumerate the core SMOs of the CCCM, Brulle (2013) compared the 123 SMOs to the listings of CCCM SMOs presented in two previous studies (McCright & Dunlap 2000; Jacques, Dunlap, & Freeman, 2008), finding that more than 90% of the organisations analysed in previous work were included in the set of 123 SMOs.

Selection of private foundations was considerably more straightforward. The Foundation Centre's grants database (<http://www.foundationcenter.org/>) in addition to the

IRS 990 PF was used to identify all grants given to the 98 SMOs from 2003-2010. This resulted in 9,094 grants from 1170 private foundations totalling approximately \$620 million. All grants were included regardless of purpose. To retain those grantors that are active contributors to the CCCM, only foundations that gave \$500,000 or more to the 98 SMOs over the 2003-2010 period or \$200,000 in any one year were retained. This resulted in a population of 145 private foundations. This was reduced to 138 foundations as those entities under the same directorship were consolidated in order to not bias the picture of their activity in the network. Consolidations include a combination of the activity of: (a) the Castle Rock and Coors foundations; the Sarah Scaife, Carthage, and Allegheny foundations; (c) the Charles Koch, David Koch, and Claude Lambe Foundations; (d) Donors Trust and Donors Capital; and (e) the Achelis and Bodman foundations. Finally, one grantor (The Foundation to Promote Open Society) was removed as it was born after 2007 and a second (The Atlantic Philanthropies) was removed as its business operations are based outside of America. This resulted in a population of 136 private foundations.

#### ***A4 Rationale Behind the Modification of Frumkin and Kim's Original Model Specification***

Originally, the Frumkin and Kim model consists of: (a) the administrative cost ratio (the share of total expenses going to management expenses); (b) logged programme expenses; (c) logged fundraising expenses; (d) organisational size as logged total revenue; and (e) logged government grants and contracts. In an attempt to clarify the relationships between 12 commonly used independent variables in models of foundation investment, Trussel and Parsons (2007) conduct a factor analysis and find that these variables load on four distinct organisational constructs — efficiency, stability, information provision and reputation. In their analysis, both age, size (as total assets) and government contracts loaded on the reputation construct when using their entire sample and not distinguishing by sector. Of these, size loaded the highest on reputation. In light of these results, I exclude a measure of government contracts, and instead use organisational age (logged years of nonprofit status). Use of age is further supported by its theoretical import in studies of organisational populations.

Finally, while professional SMOs are understood to be more attractive to foundation-investors compared to their grassroots counterparts, varying degrees of professionalism may impact foundation decision-making. Following Hwang and Powell (2009) and Staggenborg (1988), I include the ratio of staff pay to total expenses as a measure of professionalism.

***A5 A Note on the Behaviour of Estimates in the Informed-Donor Portion of the Social Selection Model***

That SMOs who have higher administrative cost ratios are more likely to receive funding is counter to the efficiency arguments found in work in public administration. Tinkleman and Mankaney (2007) caution against serious interpretation of positive relationships between giving and administrative cost ratios as the degree to which a sample of organisations is restricted based on the anticipated information needs of decision-makers and the degree to which those organisations in the sample are large and less donation-dependent may preclude expected negative association. Interestingly, results here indicate that the estimate changes sign over time. During the 2004/2005 period the estimate for administrative cost ratio becomes large and negative and returns to its positive form for the 2005/2006 and 2006/2007 periods. Given the political nature of these organisations and the prominent role of think tanks, a plausible explanation for fluctuation in the estimates for administrative cost ratios lies with foundations' responsiveness to the broader political environment.

The period of 2004/2005 was an election year. It is possible that conservative foundations responded to the environmental pressure of a potential regime change from that of George W. Bush by diverting funds away from those SMOs who spend "too much" money maintaining their individual organisations towards those that may be better equipped to maintain conservative goals by being more outwardly focused.

As for the negative effect of age, while seniority can serve as a proxy for organisational quality, Tinkelman (1999) suggests that in models where quality is controlled for in some other way (status in the present models), the favouring of younger nonprofits by foundations may indicate a preference for organisations that are perceived as dealing with more topical causes.

## References

- Andrews, Kenneth T., and Edwards, Bob. 2004. "Advocacy Organizations in the U.S. Political Process." *Annual Review of Sociology* 30: 479-506.
- Antonio, Robert J., and Robert J. Brulle. 2011. "The Unbearable Lightness of Politics: Climate Change Denial and Political Polarization." *The Sociological Quarterly* 52(2): 195-202.
- Akerlof, George. 1970. "The Market for Lemons: Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics* 84: 488-500.
- Bartley, Tim. 2007. "How Foundations Shape Social Movements: The Construction of an Organizational Field and the Rise of Forest Certification." *Social Problems* 54(3): 229-255.
- Baum, Joel AC, Timothy J. Rowley, Andrew V. Shipilov, and You-Ta Chuang. (2005). "Dancing with Strangers: Aspiration Performance and the Search for Underwriting Syndicate Partners." *Administrative Science Quarterly* 50(4): 536-575.
- Brooks, Arthur C. 2000. "Is There a Dark Side to Government Support for Nonprofits?" *Public Administration Review* 60(3): 211-18.
- Brulle, Robert J. 2013. "Institutionalizing Delay: Foundation Funding and the Creation of US Climate Change Counter-Movement Organizations." *Climatic Change* 122(4): 681-694.
- Brulle, Robert J., Jason Carmichael, and J. Craig Jenkins. 2012. "Shifting Public Opinion on Climate Change: An Empirical Assessment of Factors Influencing Concern Over Climate Change in the US, 2002-2010." *Climatic Change* 114(2): 169-188.
- Burt, Ronald. S. 1983. *"Corporate Profits and Cooptation: Networks of Market Constraints and Directorate Ties in the American Economy."* Academic Press
- Carroll, Glenn R., and Michael T. Hannan. 2004. *"The Demography of Corporations and Industries."* Princeton University Press.
- Carroll, Glenn R., and Michael T. Hannan. 1989. "Density Dependence in the Evolution of Populations of Newspaper Organizations." *American Sociological Review* 54(4): 524-541.
- Chung, Seungwha Andy, Harbir Singh, and Kyungmook Lee. 2000. "Complementarity, Status Similarity and Social Capital as Drivers of Alliance Formation." *Strategic Management Journal* 21(1): 1-22.
- Coase, Ronald. H. 1937. "The Nature of the Firm." *Economica* 4(16): 386-405.
- Diani, Mario. 2015. *"The Cement of Civil Society: Studying Networks in Localities."* Cambridge University Press.
- Diani, Mario. 2013. *Organizational fields and social movement dynamics.* In: van Stekelenburg, J., Roggeband, C., Klandermans, B. (Eds.), *The Future of Social Movement Research: Dynamics, Mechanisms and Processes.* University of Minnesota Press.
- Diani, Mario, & Katia Pilati. 2013. Interests, identities, and relations: drawing boundaries in civic organisational fields. *Mobilization* 16(3), 265-282.
- Dietz, Thomas, Amy Dan, and Rachael Shwom. 2007. "Support for Climate Change Policy: Social Psychological and Social Structural Influences." *Rural Sociology* 72(2): 185-214.
- DiMaggio, Paul J., and Walter W. Powell. 1983 "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48(2):147-160.
- Dunlap, Riley E., and Aaron M. McCright. 2011. "Organized Climate Change Denial" in *The Oxford Handbook of Climate Change and Society*, eds. John S. Dryzek, Richard B. Norgaard, and David Schlosberg, 144-160. *Oxford University Press.*
- Edwards, Bob, and John D. McCarthy. 2004. "Resources and Social Movement Mobilization." in *The Blackwell Companion to Social Movements*, eds. David A. Snow, Sarah A. Soule, and Hanspeter Kriesi, 116-52. *Blackwell.*
- Ely, Richard T. 1901. "Competition: Its Nature, its Permanency, and its Beneficence." *Publications of the American Economic Association*: 55-70.

- Faulk, Lewis, Jesse Lecy, and Jasmine McGinnis. 2012. "Nonprofit Competitive Advantage in Grant Markets: Implications of Network Embeddedness." Available at SSRN <http://ssrn.com/abstract=2247783>.
- Faulk, Lewis. 2011. "*Nonprofit and Foundation Behaviour in Competitive Markets for Grants*." Unpublished PhD Thesis. Georgia Institute of Technology and Georgia State University
- Freeman, John H., and Pino G. Audia. 2006. "Community Ecology and the Sociology of Organizations." *Annual Review of Sociology* 32: 145-169.
- Froelich, Karen A., and Terry W. Knoepfle. 1996. "Internal Revenue Service 990 Data: Fact or fiction?" *Nonprofit and Voluntary Sector Quarterly* 25(1): 40-52.
- Frumkin, Peter, and Mark T. Kim. 2001. "Strategic Positioning and the Financing of Nonprofit Organizations: Is Efficiency Rewarded in the Contributions Marketplace?" *Public Administration Review*, 61(3): 266-275.
- Galaskiewicz, Joseph, Wolfgang Bielefeld, and Myron Dowell. 2006. "Networks and Organizational Growth: A Study of Community Based Nonprofits." *Administrative Science Quarterly* 51(3): 337-380.
- Galaskiewicz, Joseph. 1997. "An Urban Grants Economy Revisited: Corporate Charitable Contributions in The Twin Cities, 1979-81, 1987-89". *Administrative Science Quarterly* 42(3): 445-471.
- Galaskiewicz, Joseph, and Stanley Wasserman. "Mimetic Processes within an Interorganizational Field: An Empirical Test." *Administrative Science Quarterly* 34(3): 454-479.
- Gordon, Teresa P., Janet S. Greenlee, and Denise Nitterhouse. 1999. "Tax-exempt Financial Data: Availability and Limitations." *Accounting Horizons* 13(2): 113-128.
- Graddy, Elizabeth A., and Donald L. Morgan. 2006. "Community Foundations, Organizational Strategy, and Public Policy." *Nonprofit and Voluntary Sector Quarterly*, 35(4): 605-630.
- Greenpeace. 2010. "Koch Industries Secretly Funding the Climate Denial Machine." Greenpeace: Washington DC
- Hannan, Michael T., and John Freeman. 1987. "The Ecology of Organizational Founding: American Labor Unions, 1836-1985." *American Journal of Sociology* 92(4): 910-943.
- Haines, Herbert H. 1984. "Black Radicalization and the Funding of Civil Rights: 1957-1970." *Social Problems* 32(1): 31-43.
- Hamilton, Lawrence C., and Barry D. Keim. 2009. "Regional Variation in Perceptions about Climate Change." *International Journal of Climatology* 29(15), 2348-2352.
- Himmelstein, Jerome L. 1992. "*To The Right: The Transformation of American Conservatism*." University of California Press.
- Hwang, Hokyu, and Walter W. Powell. 2009. "The Rationalization of Charity: The Influences of Professionalism in the Nonprofit Sector." *Administrative Science Quarterly* 54(2): 268-298.
- Jacques, Peter J., Riley E. Dunlap, and Mark Freeman. 2008. "The Organisation of Denial: Conservative Think Tanks and Environmental Scepticism." *Environmental Politics* 17(3): 349-385.
- Jenkins, J. Craig. 1998. "Channeling Social Protest: Foundation Patronage of Contemporary Social Movements." in *Private Action and the Public Good*, ed. Elisabeth S. Clemens, 206-216. Yale University Press.
- Jenkins, J. Craig, and Craig M. Eckert. 1986. "Channeling Black Insurgency: Elite Patronage and Professional Social Movement Organizations in the Development of the Black Movement." *American Sociological Review*: 812-829.
- Jenkins, J. Craig, and Abigail Halcli. 1999. "Grassrooting the System?: The Development and Impact of Social Movement Philanthropy, 1953-1990." in *Philanthropic Foundations, New Scholarship, New Possibilities*, ed. Ellen Condliffe Lagemann, 229-256, Indiana University Press.
- Koskinen, Johan, and Christofer Edling, 2012. Modelling the Evolution of a Bipartite Network — Peer Referral in Interlocking Directorates. *Social Networks* 34(3), 309-322.
- Kovács, Balázs, and Amanda J. Sharkey. 2014. "The Paradox of Publicity: How Awards Can Negatively Affect the Evaluation of Quality." *Administrative Science Quarterly* 59(1): 1-33
- Krishnan, Ranjani, Michelle H. Yetman, and Robert J. Yetman. 2006. "Expense Misreporting in Nonprofit Organizations." *The Accounting Review* 81(2): 399-420.



- LeRoux, Kelly, and Holly T. Goerdel. 2009. "Political Advocacy by Nonprofit Organizations." *Public Performance & Management Review* 32(4): 514-536.
- Lin, Zhiang John, Haibin Yang, and Bindu Arya. 2009. "Alliance Partners and Firm Performance: Resource Complementarity and Status Association." *Strategic Management Journal* 30(9): 921-940.
- Lo, Clarence Y. 1982. "Countermovements and Conservative Movements in the Contemporary US." *Annual Review of Sociology* 8:107-134.
- Lospinoso, Joshua. A. 2012. "Statistical Models for Social Network Dynamics." Unpublished PhD Thesis. University of Oxford.
- Lospinoso, Joshua A., Michael Schweinberger, Tom A. B. Snijders, and Ruth M. Ripley. 2011. "Assessing and Accounting for Time Heterogeneity in Stochastic Actor Oriented Models." *Advances in Data Analysis and Classification* 5(2): 147-176.
- Maddala, Gangadharrao S. 1983. "Limited-Dependent and Qualitative Variables in Econometrics." No. 3. Cambridge University Press.
- McAdam, Doug. (1982). "Political Process and the Development of Black Insurgency, 1930-1970." University of Chicago Press.
- McCarthy, John D., David W. Britt, and Mark Wolfson. 1991. "The Institutional Channeling of Social Movements by the State in the United States." in *Research in Social Movements, Conflict and Change*, vol. 13, 45-76. JAI Press.
- McCarthy, John D., and Mayer N. Zald. 1977. "Resource Mobilization and Social Movements: A Partial Theory." *American Journal of Sociology* 82(6):1212-1241.
- McCarthy, John D., and Mayer N. Zald. 1973. The Trend of Social Movements in America: Professionalisation and Resource Mobilisation. Centre for Research On Social Movements Working Paper. No. 164. Available at: <http://hdl.handle.net/2027.42/50939>
- McFadden, Daniel, 1973. "Conditional Logit Analysis of Qualitative Choice Behavior." in *Frontiers in Econometrics*, ed. Paul Zarembka, 105-142. Academic Press.
- McInay, Dennis P. 1998. "How Foundations Work: What Grantseekers Need To Know About The Many Faces Of Foundations." Jossey-Bass.
- McCright, Aaron M. 2010. "The Effects of Gender on Climate Change Knowledge and Concern in the American Public." *Population and Environment* 32(1):66-87.
- McCright, Aaron M., and Riley E. Dunlap. 2011. "The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001-2010." *The Sociological Quarterly* 52(2):155-194.
- McCright, Aaron M., and Riley E. Dunlap. 2010. "Anti-reflexivity: The American Conservative Movement's Success in Undermining Climate Science and Policy." *Theory, Culture & Society* 27(2-3): 100-133.
- McCright, Aaron M., and Riley E. Dunlap. 2000. "Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement's Counter-Claims." *Social Problems* 47(4): 499-522.
- Merton, Robert K. 1968. "The Matthew Effect in Science." *Science* 159(3810): 56-63.
- Minkoff, Deborah, and John D. McCarthy. 2005. Reinvigorating the study of organizational processes in social movements. *Mobilization* 10, 298-308.
- Morris, Aldon. 1981. "Black Southern Student Sit-In Movement: An Analysis of Internal Organization." *American Sociological Review* 46(6): 744-767.
- Morris, Aldon. (1984). "The Origins of the Civil Rights Movement: Black Communities Organizing for Change." Free Press.
- Mosley, Jennifer, and Joseph Galaskiewicz. 2010. "The Role of Foundations in Shaping and Responding to Social Welfare Policy Change: The Case of Welfare Reform." in *American Foundations: Roles and Contributions*, eds. Helmut K. Anheier and David Hammack, 182-204. Brookings Institution Press

- Navarro, Peter. 1988. "The Income Elasticity of Corporate Contributions." *The Quarterly Review of Economics and Business* 28 (4): 66-75.
- O'Connor, Robert E., Richard J. Bord, and Ann Fisher. 1999. "Risk Perceptions, General Environmental Beliefs, and Willingness to Address Climate Change." *Risk analysis* 19(3): 461-471.
- Opsahl, Tore, Filip Agneessens, and John Skvoretz. 2010. "Node centrality in weighted networks: Generalizing degree and shortest paths." *Social Networks* 32(3): 245-251.
- Opsahl, Tore. n.d. "Shortest Paths in Weighted Networks." Retrieved September 21, 2015  
from <http://toreopsahl.com/tnet/weighted-networks/shortest-paths/>
- Oreskes, Naomi, and Erik M. Conway. 2010. "Merchants of Doubt: How a Handful of Scientists Obscured the Truth On Issues from Tobacco Smoke to Global Warming." Bloomsbury Publishing.
- Phillips, Damon J., and Ezra W. Zuckerman. 2001. "Middle-Status Conformity: Theoretical Restatement and Empirical Demonstration in Two Markets." *American Journal of Sociology* 107(2): 379-429.
- Pichardo, Nelson A. 1988. "Resource Mobilization: An Analysis of Conflicting Theoretical Variations." *The Sociological Quarterly* 29(1): 97-110.
- Podolny, Joel M. 2010. "Status Signals: A Sociological Study of Market Competition." Princeton University Press.
- Podolny, Joel M., and Freda Lynn. 2009. "Status." in *The Oxford handbook of Analytical Sociology*, eds. Peter Hedström, and Peter Bearman, 554-565. *Oxford University Press*.
- Podolny, Joel M., Toby E. Stuart, and Michael T. Hannan. 1996. "Networks, knowledge, and niches: Competition in the worldwide semiconductor industry, 1984-1991." *American Journal of Sociology* 102(3), 659-689.
- Podolny, Joel M. 1994. "Market Uncertainty and the Social Character of Economic Exchange." *Administrative Science Quarterly* 39(3): 458-483.
- Podolny, Joel M. 1993. "A Status-based model of Market Competition." *American Journal of Sociology* 98(4), 829-872.
- Posnett, John, and Todd Sandler. 1989. "Demand for Charity Donations in Private Nonprofit Markets: The Case of the U.K." *Journal of Public Economics* 40(2), 187-200.
- Price, Derek de Solla. 1976. "A General Theory of Bibliometric and Other Cumulative Advantage Processes." *Journal of the American Society for Information Science* 27(5): 292-306.
- Ripley, Ruth. M., Tom A. B. Snijders, Zsófia Boda, András Vörös, and Paulina Preciado. 2015. "Manual for SIENA." Ver. 4.0 (August 13, 2015). University of Oxford, Department of Statistics.
- Robins, Garry, and Malcolm Alexander. 2004. "Small Worlds among Interlocking Directors: Network Structure and Distance in Bipartite Graphs." *Computational & Mathematical Organization Theory* 10(1): 69-94.
- Saavedra, Serguei, Felix Reed-Tsochas, and Brian Uzzi. 2008. "A Simple Model of Bipartite Cooperation for Ecological and Organizational Networks." *Nature* 457(7228): 463-466.
- Saavedra, Serguei, Daniel B. Stouffer, Brian Uzzi, and Jordi Bascompte. 2011. "Strong Contributors to Network Persistence are the Most Vulnerable to Extinction." *Nature* 478(7368): 233-235.
- Sauder, Michael, Freda Lynn, and Joel M. Podolny. 2012. "Status: Insights from Organizational Sociology." *Annual Review of Sociology* 38: 267-283.
- Schweinberger, Michael. 2012. "Statistical Modeling of Network Panel Data: Goodness-of-fit." *British Journal of Statistical and Mathematical Psychology* 65(2): 263-281.
- Shalizi, Cosma Rohilla, and Alessandro Rinaldo. 2013. "Consistency under Sampling of Exponential Random Graph Models." *The Annals of Statistics* 41(2): 508-535.
- Singh, Jitendra V., and Charles J. Lumsden. 1990. "Theory and Research in Organizational Ecology." *Annual Review of Sociology* 16: 161-195.
- Snijders, Tom A. B. 2001. "The Statistical Evaluation of Social Network Dynamics." *Sociological Methodology* 31(1): 361-395.

- Snijders, Tom A. B. 1996 "Stochastic Actor-Oriented Models for Network Change." *Journal of Mathematical Sociology* 21(1-2): 149-172.
- Snijders, Tom A. B., and Christian E. G. Steglich. 2013. "Representing Micro–Macro Linkages by Actor-based Dynamic Network Models." *Sociological Methods & Research*: 1-50.
- Snijders, Tom A. B., Gerhard G. Van de Bunt, and Christian E. G. Steglich. 2010. "Introduction to Stochastic Actor-Based Models for Network Dynamics." *Social Networks* 32(1): 44-60.
- Soule, Sarah A., and Brayden G. King. 2008. "Competition and Resource Partitioning in Three Social Movement Industries." *American Journal of Sociology* 113(6): 1568-1610.
- Staggenborg, Suzanne. 1988. "The Consequences of Professionalization and Formalization in the Pro-Choice Movement." *American Sociological Review* 53(4): 585-605.
- Stuart, Toby E., and Joel M. Podolny. 1996. Local search and the evolution of technological capabilities. *Strategic Management Journal*, 17(S1), 21-38.
- Stigler, George J. 1987. "Competition." in *The New Palgrave: A Dictionary of Economics*, eds. Herbert A. Simon, John Eatwell, Murray Milgate, and Peter Newman, 532-533. Macmillan.
- Tinkelman, Daniel. 1999. "Factors Affecting the Relation between Donations to Not-For-Profit Organizations and an Efficiency Ratio." *Research in Governmental and Nonprofit Accounting* 10(1): 135-61.
- Tinkelman, Daniel, and Kamini Mankaney. 2007. "When is Administrative Efficiency Associated with Charitable Donations?" *Nonprofit and Voluntary Sector Quarterly* 36(1): 41-64.
- Trapido, Denis. 2007. "Competitive Embeddedness and the Emergence of Interfirm Cooperation." *Social Forces* 86(1): 165-191.
- Trussel, John M., and Linda M. Parsons. 2007. "Financial Reporting Factors Affecting Donations to Charitable Organizations." *Advances in Accounting* 23: 263-285.
- Union of Concerned Scientists. 2007. "Smoke, Mirrors & Hot Air: How Exxonmobil uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science." Union of Concerned Scientists.
- Vickers, John. 1995. "Concepts of Competition." *Oxford Economic Papers* 47(1): 1-23.
- Wilson, John. 1983 "Corporatism and the Professionalization of Reform." *Journal of Political & Military Sociology* 11(1): 53-68.
- Weisbrod, Burton A., and Nestor D. Dominguez. 1986. "Demand for Collective Goods in Private Nonprofit Markets: Can Fundraising Expenditures Help Overcome Free-Rider Behavior?" *Journal of Public Economics*, 30(1), 83–95.
- Zeggelink, Evelien. P. 1994. "Dynamics of Structure: An Individual Oriented Approach." *Social Networks* 16(4): 295–333.

**FIGURE I**

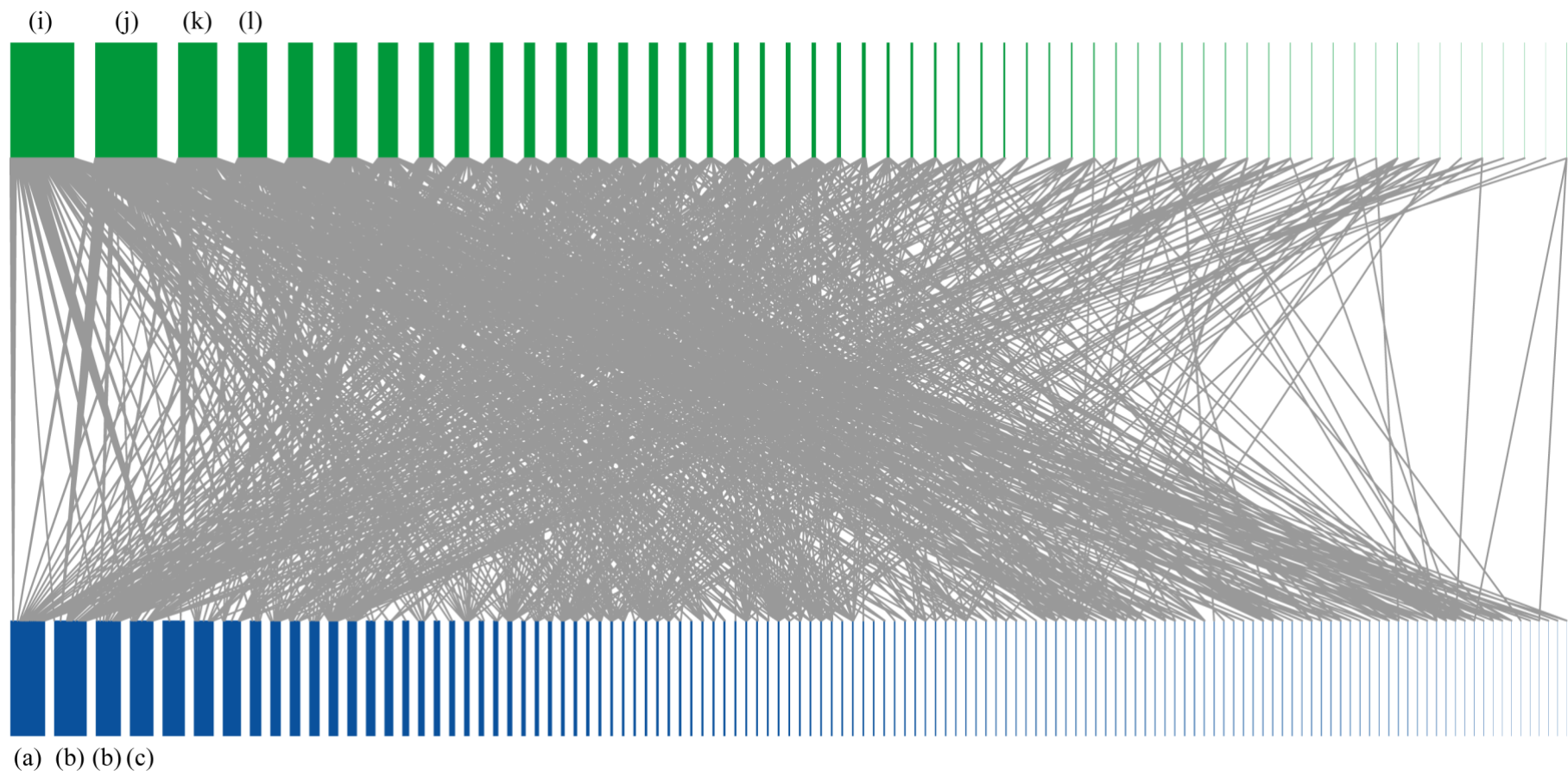
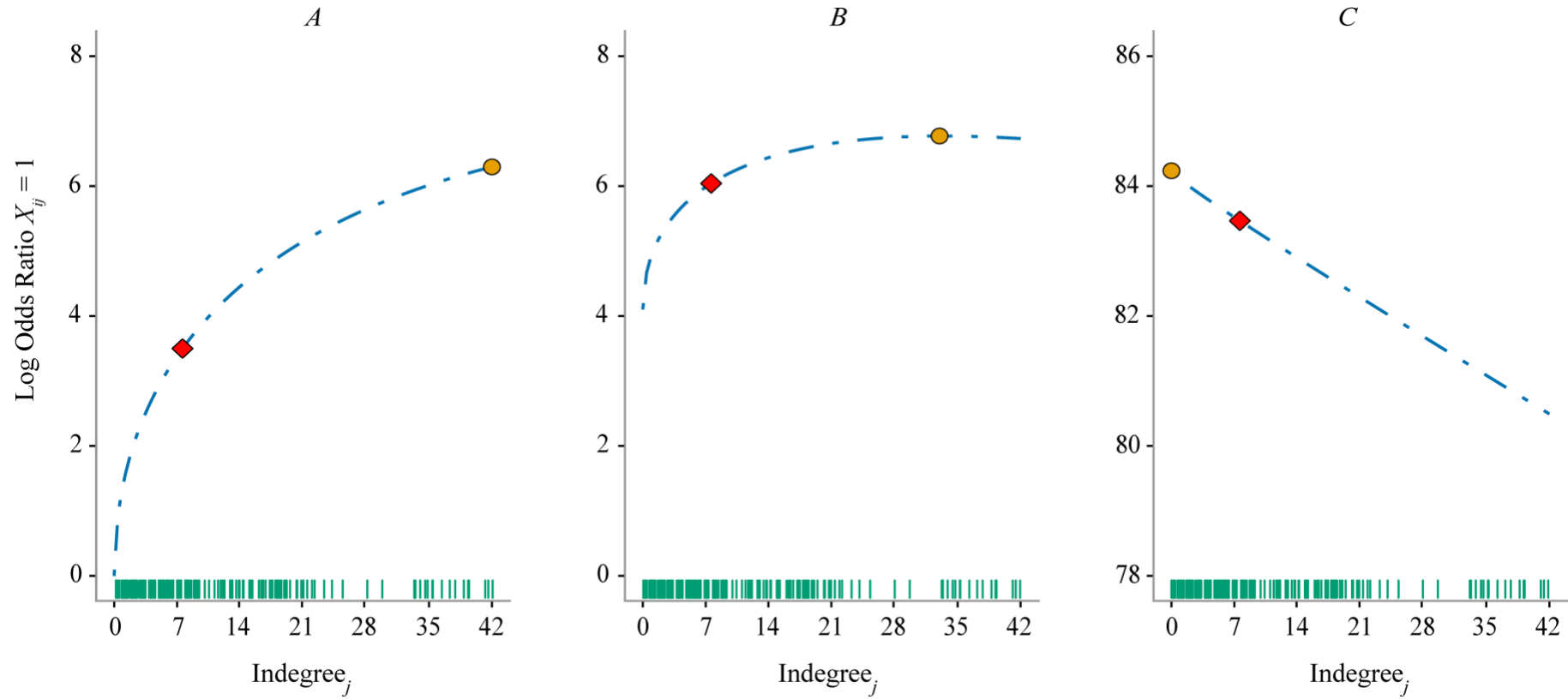


FIGURE II



**Table I — Hypothesised Bipartite Effects**

Hypothesis	Effect	Description	Statistic	Network Configurations
H1	Out-in Degree Assortativity	Test for the propensity of egos that are highly active funders to make investments to SMOs with many patrons	$\sum_j x_{ij} x_{i+}^{1/2} x_{+j}^{1/2}$	
H2a	In-Isolates	Test for ego's propensity to invest in SMOs that have zero patrons (dashed) <i>alongside</i> a propensity to continue to invest in those SMOs that would otherwise have zero lines of financial support (black; solid)	$\sum_j I\{x_{+j} \geq 1\}$	
H2b	In-near-Isolates	Test for ego's propensity to invest in SMOs that have one patron (dashed) <i>alongside</i> a propensity to continue to invest in those SMOs that would otherwise have just one line of financial support	$\sum_j I\{x_{+j} \geq 2\}$	
H3	4 Cycles	Test for ego's propensity to invest in those SMOs who are funded by ego's joint investment partner.	$\sum_{j,k,h} x_{ij} x_{ik} x_{hj} x_{hk}$	

$i+$  indicates the outdegree of  $i$  and  $+j$  indicates the indegree of  $j$ .  
Foundations (ego) are represented by squares. SMOs (alter) are represented by circles.  
Red dashed lines are proposed tie changes during network evolution.  
Grey solid lines represent the state of the local network within which ego is embedded and responds to when deciding to establish a financial tie.  
Configurations used for structural and monadic controls are not depicted.

**Table II: Descriptive Statistics — Networks**

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
<i>Number of Ties</i>	493	488	524	516	507
<i>Density</i>	0.06	0.05	0.06	0.06	0.06
<i>Average Outdegree</i>	3.63	3.59	3.85	3.79	3.73
<i>SMOs To Be Born</i>	3	1	1	0	0
<i>Foundations To Be Born</i>	13	9	5	2	0

**Table III: Summary of Network Change**

<i>Period</i>	<i>0 → 0</i>	<i>0 → 1</i>	<i>1 → 0</i>	<i>1 → 1</i>	<i>Jaccard Index</i>	<i>Missing Ties</i>	<i>SMO Births</i>	<i>SMO Deaths</i>	<i>Foundation Births</i>	<i>Foundation Deaths</i>
<i>1 → 2</i>	8333	150	155	338	0.53	0	2	0	4	0
<i>2 → 3</i>	8313	173	137	351	0.53	2	0	0	4	0
<i>3 → 4</i>	8295	155	165	359	0.53	2	1	0	3	0
<i>4 → 5</i>	8318	142	151	365	0.56	0	0	0	2	0

*Jaccard Index: Measure of overlap between sets. Higher values indicate less change between waves.  
Values should be greater than 0.3, reflecting a process of steady change.*

*0 → 0: Number dyads that remained empty from wave  $t$  to  $t+1$*

*0 → 1: Ties created from wave  $t$  to  $t+1$*

*1 → 0: Ties terminated from wave  $t$  to  $t+1$*

*1 → 1: Ties maintained from wave  $t$  to  $t+1$*

**Table IV: Descriptive Statistics — Continuous Monadic Covariates (Global)**

<i>Variable</i>	<i>Mean</i>	<i>Min</i>	<i>Max</i>	<i>Percent Missing (Global) ^</i>	<i>Avg. Percent Missingness*</i>
Administrative Cost Ratio	0.14	0.00	1.00	15.53	0.06
Fundraising Expenses (Log) §	11.88	7.10	15.50	25.76	0.10
Program Expenses (Log)	13.32	0.00	17.20	11.36	0.04
Total Revenue (Log)	13.84	6.90	17.80	11.36	0.04
Staff Pay Ratio	0.33	0.00	0.90	11.36	0.04
Years of Non-Profit Status (Log)	2.83	0.00	4.10	7.95	0.03
Share of Grant Dollars †	0.02	0.00	0.20	23.86	0.09
Avg. Percent Contributions Control †	0.06	0.00	1.00	23.86	0.09
Foundation Age (Log)	3.02	0.00	4.60	3.31	0.01

<sup>^</sup> Missing percentages do not reflect missing data for organisations when they do not exist.

\* For SMOs there are 264 possible observations across the four periods (66 observations/per period) minus 5 (the number of impossible observations for those SMOs yet to be born). For foundations, there are 544 observations across the four periods minus 29 (the number of impossible observations for those foundations yet to be born). Here, Average Percentage of Missingness = Percent Missing (Global) ÷ Total Number of Possible Observations

† High percentage of missingness is by design due to the lagged structure of the data (i.e., data is missing for all 66 SMOs for the first period). This variable is created using total contributions and grant data. Grant data for 2002 was not available in Brulle's (2013) original data.

§ High level of missingness is the result of employing Tinkelman and Mankaney's (2007) cut-off of \$1000. Without this cut-off only 13.26 percent of observations for fundraising expenses are missing.

Administrative Cost Ratio = Management Expenses ÷ Total Expenses

Staff Pay Ratio = (Annual Compensation to Directors & Officers + Other Salaries & Wages) ÷ Total Expenses



**Table V: Stochastic Actor-Oriented Models of Financial Patronage (2003–2007)<sup>†</sup>**

		<i>Attributes Model</i>		<i>Structure Model</i>		<i>Social Selection Model</i>	
		<i>Rate ( <math>\lambda</math> )</i>	<i>s.e.</i>	$\lambda$	<i>s.e.</i>	$\lambda$	<i>s.e.</i>
<i>Period I</i>	<i>Rate (2003–2004)</i>	3.89	0.30	4.46	0.34	4.68	0.37
<i>Period II</i>	<i>Rate (2004–2005)</i>	3.85	0.28	4.62	0.35	4.78	0.34
<i>Period III</i>	<i>Rate (2005–2006)</i>	4.02	0.28	4.58	0.35	4.72	0.36
<i>Period IV</i>	<i>Rate (2006–2007)</i>	3.54	0.26	4.15	0.32	4.35	0.34
<i>Key Structural Dependencies</i>		$\beta$ (Log Odds)	<i>s.e.</i>	$\beta$	<i>s.e.</i>	$\beta$	<i>s.e.</i>
	Outdegree (Density)	<b>-2.31</b>	<b>0.07</b>	<b>-6.36</b>	<b>0.69</b>	<b>-6.09</b>	<b>0.66</b>
	$\delta_{\text{Period 2}}$	0.18	0.16	<b>-0.37</b>	<b>0.17</b>	<b>-0.58</b>	<b>0.23</b>
	$\delta_{\text{Period 3}}$	0.04	0.11	-0.05	0.17	-0.14	0.21
	$\delta_{\text{Period 4}}$	-0.10	0.11	<b>-0.59</b>	<b>0.17</b>	<b>-0.68</b>	<b>0.22</b>
<i>Hypothesis 1</i>	Out-in Degree <sup>(1/2)</sup> Assortativity			<b>-0.55</b>	<b>0.08</b>	<b>-0.40</b>	<b>0.07</b>
<i>Hypothesis 2a</i>	In-Isolates			<b>-1.22</b>	<b>0.28</b>	<b>-0.91</b>	<b>0.29</b>
<i>Hypothesis 2b</i>	In-near-Isolates			<b>-0.67</b>	<b>0.32</b>	-0.29	0.31
	$\delta_{\text{Period 4}}$			<b>-1.73</b>	<b>0.86</b>	<b>-1.76</b>	<b>0.82</b>
<i>Hypothesis 3</i>	4 Cycles			<b>0.05</b>	<b>0.01</b>	<b>0.04</b>	<b>0.01</b>
	$\delta_{\text{Period 2}}$			0.00	0.00	<b>-0.01</b>	<b>0.00</b>
	$\delta_{\text{Period 3}}$			<b>0.01</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>
	$\delta_{\text{Period 4}}$			0.00	0.00	0.00	0.00
<i>Structural Controls</i>							
	Outdegree Activity ( <i>sqr</i> t)			<b>1.91</b>	<b>0.32</b>	<b>1.45</b>	<b>0.28</b>
	$\delta_{\text{Period 2}}$			<b>0.20</b>	<b>0.06</b>	<b>0.25</b>	<b>0.07</b>
	$\delta_{\text{Period 3}}$			-0.04	0.07	-0.01	0.07
	$\delta_{\text{Period 4}}$			<b>0.21</b>	<b>0.07</b>	<b>0.19</b>	<b>0.08</b>
	Outdegree Activity (Linear)			<b>-0.04</b>	<b>0.02</b>	-0.02	0.02
	Indegree Popularity ( <i>sqr</i> t)			<b>1.70</b>	<b>0.23</b>	<b>1.49</b>	<b>0.21</b>
	Indegree Popularity (Linear)			<b>-0.06</b>	<b>0.02</b>	<b>-0.08</b>	<b>0.02</b>
	Outdegree Truncation (At most 1; Isolates)			<b>2.77</b>	<b>0.41</b>	<b>3.08</b>	<b>0.43</b>
	Outdegree Truncation (At most 2)			<b>1.85</b>	<b>0.34</b>	<b>1.87</b>	<b>0.34</b>
	1/(outdegree+1)(outdegree+1+1)			22.00	FIXED	22.00	FIXED
<i>Dyadic Covariates</i>							
	State Match ( $t^{-1}$ )	<b>0.96</b>	<b>0.10</b>			<b>1.17</b>	<b>0.10</b>
	$\delta_{\text{Period 2}}$	<b>-0.51</b>	<b>0.24</b>			-0.40	0.22

*A Mutualistic Model of Resource Derivation*

<i>Monadic Covariates</i>		$\beta$ (Log Odds)	s.e.	$\beta$	s.e.	$\beta$	s.e.
	Primary Focus Climate Change	<b>-1.03</b>	<b>0.24</b>			-0.51	0.31
	$\delta_{\text{Period 4}}$	0.77	0.47			<b>1.49</b>	<b>0.60</b>
	Type: Media (Ref. Advocacy)	0.28	0.18			0.16	0.19
	Type: Think Tank (Ref. Advocacy)	<b>0.30</b>	<b>0.07</b>			<b>0.26</b>	<b>0.09</b>
<i>Mean Centred</i>	Administrative Cost Ratio ( $t^{-1}$ )	-0.26	0.44			<b>1.33</b>	<b>0.49</b>
	$\delta_{\text{Period 2}}$	<b>-2.09</b>	<b>0.91</b>			<b>-3.43</b>	<b>1.00</b>
<i>Mean Centred</i>	Programme Expenses (Log; $t^{-1}$ )	0.07	0.09			0.02	0.08
<i>Mean Centred</i>	Fundraising Expenses (Log; $t^{-1}$ )	-0.06	0.04			<b>-0.11</b>	<b>0.04</b>
<i>Mean Centred</i>	Total Revenue (Log; $t^{-1}$ )	<b>0.31</b>	<b>0.10</b>			<b>0.27</b>	<b>0.11</b>
<i>Mean Centred</i>	Staff Pay Ratio ( $t^{-1}$ )	0.17	0.21			-0.45	0.25
<i>Mean Centred</i>	Years of Non-Profit Status (Log)	-0.02	0.07			<b>-0.17</b>	<b>0.08</b>
	$\delta_{\text{Period 2}}$	<b>-0.42</b>	<b>0.16</b>			-0.22	0.19
	$\delta_{\text{Period 3}}$	<b>-0.36</b>	<b>0.16</b>			-0.30	0.19
	$\delta_{\text{Period 4}}$	<b>-0.51</b>	<b>0.17</b>			-0.32	0.21
<i>Mean Centred</i>	Share of Grant Dollars ( $t^{-1}$ )	<b>3.73</b>	<b>0.90</b>			<b>4.72</b>	<b>1.13</b>
<i>Mean Centred</i>	Avg. Percent Contributions Control ( $t^{-1}$ )	0.42	0.49			-0.02	0.72
<i>Mean Centred</i>	Age of Foundation (Log)	<b>0.16</b>	<b>0.04</b>			0.05	0.03
	$\delta_{\text{Period 2}}$	<b>0.56</b>	<b>0.13</b>			<b>0.32</b>	<b>0.10</b>
	$\delta_{\text{Period 3}}$	0.10	0.11			-0.03	0.09
	$\delta_{\text{Period 4}}$	<b>0.38</b>	<b>0.12</b>			0.17	0.10
<i>Joint Test For Time Heterogeneity (p -value)</i>			0.95		0.88		0.99

*Significance determined by Wald-type test of t-ratios which equal  $\text{abs}(\beta/\text{s.e.}\beta)$*

**BOLD** estimates are significantly different from zero with t-ratio > 2 approx.  $p < 0.05$ ; Note that for rate parameters tests of this type do not apply

*Estimation Settings (All Models): Number of Sub-phases in Phase 2 = 6, Phase 3 Iterations = 4000*

<sup>†</sup> The overall maximum convergence ratio for all models is <0.25. All t-ratios for convergence are < 0.1 in absolute value. See Ripley et al. (2015) for details.