Policy Experimentation and Intergovernmental Grants in a Federal System

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ABSTRACT

Policymaking is a challenging production activity. A public sector organization that is often invoked to aid with this challenging activity is fiscal federalism, for a federation can act as a laboratory for policy experimentation. Yet there is no approach linking laboratory federalism to intergovernmental grants. This lacuna is puzzling, for grants are fundamental policy tools for federations. We develop an approach that fills this lacuna by interpreting grants as fiscal institutions for policy innovation: policy experimentation is encouraged or discouraged depending on the degree of grant conditionality, and a simple heuristic expresses mistake-ridden learning from experimentation. (96 words.)

KEYWORDS

Fiscal institutional design through political compromise; Incentives in laboratory federalism; Intergovernmental grant conditionality; Policy innovation through trial and error; Policy experimentation space.

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Policymaking is about “muddling through” (Lindblom 1959, 1979). Notwithstanding different assertions about how the muddling through occurs, there is agreement that policymaking is a production activity surrounded by uncertainty (e.g., Gilligan and Krehbiel 1987; Bendor 1995; Callander 2011). One organization of the public sector that is often invoked to aid with this uncertain activity is laboratory federalism (e.g., Oates 2008: 326-329),¹ that is, a decentralized fiscal arrangement where federated governments run policy experiments.²

Casual empiricism already suggests that local governments habitually experiment with policy, achieving varying degrees of success. A recent illustration is Mayor Bloomberg’s range of anti-poverty experiments in New York City.³ Another is that of Mayor Mockus of Bogotá who introduced many innovative policy experiments, such as employing mimes to direct traffic to alleviate road congestion.⁴

This paper considers laboratory federalism in conjunction with one of the principal policy tools of a federation – intergovernmental grants. The public economics analysis on grants is extensive (King 1984: 86-198 remains a useful

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¹ This is one of the three classic motivations for fiscal federalism. The other two are: (a) to improve preference revelation for public goods; and (b) to improve incentive alignment between consumer-voters and elected representatives.

² Factually, all states are fiscally decentralized to some degree: even if a state is de jure politically unitary, it is de facto at least partially fiscally decentralized (Oates 1972: 14-20). Immediate cases that come to mind are France, Italy, South Africa, and the United Kingdom. We frame our argument in terms of fiscal federalism because this is the sphere where the literature mostly addresses the subject matter we are concerned with. However, our analysis is equally valid for unitary states with de facto decentralization; for this same reason, some of our decentralization examples originate from states that are de jure unitary.

³ [Link to Bloomberg anti-poverty experiments]

⁴ [Link to Mayor Mockus innovations]
synthesis). At the same time, there is very little literature tying policy experimentation to grants. This lacuna is surprising since grants are frequently used to stimulate policy experimentation.

For instance, grants were used for the State Children’s Health Insurance Program (SCHIP) in the United States. Introduced in 1997 to improve medical insurance coverage for children, SCHIP allocated lump-sum grants to states, enabling them to design and apply the coverage policy in different ways (Weissert and Scheller 2008). Another example from the US is the Patient Protection and Affordable Care Act (ACA). The ACA uses federal support in the form of intergovernmental grants to create incentives for states to innovate on policy. The results of the policy experiments are evaluated, data are collected and made publicly available (Madison 2014).\(^5\) Other countries use grant funding for policy experimentation as well. For instance, public universities in Scotland used lump-sum grant funding to successfully experiment with different fee payment policies (Keating 2005).\(^6\)

Hence, it seems a worthwhile exercise to inquire into how an intergovernmental grant can help local governments to perform policy experiments,

\(^5\) In the US innovative policies are often implemented locally. For instance: Pennsylvania is known for leading policy innovation regarding organ donation (http://www.nytimes.com/1999/05/06/us/pennsylvania-set-to-break-taboo-on-reward-for-organ-donations.html); Oregon has experimented with different voting systems (http://www.washingtonpost.com/wp-dyn/articles/A40032-2004Dec31.html; currently no longer available at this link, but on file with the authors); numerous states experiment with different forms of corporate law (Romano 2006); and Colorado and Washington are leading experiments in legalizing cannabis (Kleiman and Ziskind 2014). In general, however, policy experimentation is not limited to local governments. Kerber and Eckardt (2007) consider policy learning from countries in the European Union and Cai and Treisman’s (2009) model of laboratory federalism assumes that both central and local governments can experiment with policy. US President Franklin D. Roosevelt encouraged policy experiments at different levels of government during the Great Depression (Rodrik 2014: 204).

\(^6\) Intergovernmental grants are used also to promote policy diffusion – the transfer of successful policies among governments. This role of grants is tangential to our concerns.
and to ultimately create novel welfare value from learning through the positive and negative experimental results. Interpreting a federation as an organizational network for creation and utilization of knowledge, we show that a local government grant recipient (e.g., a Brazilian mayor, an Italian regional president, a South African city manager, a US state governor) is likely to have more opportunities to experiment (and possibly also learn more) from a less conditional (e.g., lump-sum) grant than from a more conditional grant (e.g., a closed matching grant). The reason is that – when grants are viewed through a more explicit institutional lens – a less conditional grant allows greater potential for experimentation than a more conditional grant. The moral from endogenizing grant conditionality into laboratory federalism is that different types of grants can be used as policy instruments to incentivize muddling through different experimentation sets at the recipient government level.7

The paper relates to two strands of existing literature: policy experimentation and the Second Generation Theory of fiscal federalism (SGT). Similarly to intriguing recent contributions about policy experimentation (e.g., Callander 2011), we envision a policymaker facing uncertain scenarios over multiple, ill-defined policy choices at the same time rather than once-off, well-defined monodimensional choices. Yet we differ by considering the more specific context of fiscal federalism, by focusing on policy innovation as separate from diffusion, and, more substantively, by

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7 Intergovernmental grants can be given vertically, i.e., from higher-level governments to lower ones (or vice versa) or horizontally, i.e., between governments on the same level. The most common direction is vertically from a higher to a lower level of government; for a model of the reverse (vertically from lower to higher level of government), see Boadway and Keen (1996). Though this paper discusses the case from higher to lower government, its logic can apply to any case, and, as already implied by footnote 2 above, to nonfederal organization too.
by seeing fiscal institutions, most notably intergovernmental grants, as valuable for experimentation. In our approach it is in fact grants, rather than policy uncertainty as such, that simultaneously place limits to and provide for opportunities for experimentation.

To convey the same notion differently, a grant actually can decrease the uncertainty tied to policymaking; although not in some automatic stimulus-response sense in an institutional vacuum – quite the opposite. We posit that there is rationality through conditionality, meaning that the ultimate primitive is not so much the ‘ability’ for social planning or the inner workings of the policymaker (e.g., Simon 1991), but the institutionally embedded scenario faced. To be rational then is to muddle through opportunities for policy design according to rules that govern and discipline purposive action (e.g., Schotter 1981; Rowe 1989).

In parallel, learning enters the scene in two related senses. First, as is typical, learning is captured through a simple heuristic, which, however, was previously not applied to policymaking. The heuristic is close to the original outlook of Lindbom's muddling through given its incrementalism. But, as just pointed out, it is not as mechanical in light of its institutional character, a characteristic that leads us to the second sense of learning. Also new to the literature and conceptually more central, learning from the simple heuristic is ancillary to a space for policy experimentation. The space is grant-generated in the straightforward institutional sense that intergovernmental fiscal relations define it. Thus, the experimental space is ultimately a constraint and an option innate in the nature of the grant. To the best of our knowledge, the approach developed in this paper is the first to consider policy
innovation from trial and error learning as ingrained in the incentives from a fiscal institution.

The SGT studies intergovernmental fiscal relations by borrowing extensively from the theory of the firm, an important subset of institutional analysis concerned with deadweight losses from incentive misalignment (e.g., Weingast 2009, 2014). Like the SGT, this paper is interested in incentives. However, it differs by considering incentives to innovate.

It is possible to extrapolate from the literature two main categories of incentives to innovate from a grant, which are both political: vertical bottom-up and horizontal. The vertical bottom-up refers to the anticipation of not being re-elected if the consumer-voter ascribes grant reductions for public good spending to the local grant recipient. For example, after unconditional lump-sum grants replaced conditional ones in Norway in 1986, local government representatives had an incentive to “use spending decisions as strategic instruments to achieve additional grants” (Carlsen 1995: 56) or else run the risk of losing their political seat. The horizontal incentive regards the desire of local governments to retain the political right to compete for grants from central government (Salmon 1987), an incentive that strengthens when there is the belief that a local policy innovation will be adopted by central government (Callander and Harstad 2015).

The institutional aspect emphasized here directs attention to a third political incentive to innovate: the vertical top-down from grantor to grantee. This incentive refers to the notion that a grant is not merely a ‘parentless’ formula. A grant is the fruit of political compromise between levels of government that conveys knowledge
about preferred spending decisions. Hence, even though, as in all purposive interactions, there is bargaining, the bottom line is that the funds are spent according to the preferences of the grantor.

Our paper more generally connects to the latest work of the late Wallace Oates. In his assessment of the SGT, Oates (2005) critiques the SGT for paying insufficient attention to the institutional aspect of grants. He admits that virtually all pre-SGT contributions, all more or less owing to his Decentralization Theorem (Oates 1972: 35, 54), assume that grants are merely impeccable, centrally designed formulas. Though this logic is rather puzzling, the SGT still has to genuinely address it (Oates 2005: 359). We take head-on Oates’ invitation to consider grants as institutions by considering the laboratory facet of federalism.

THE LACUNA

Broadly speaking, public economics presents two main approaches: public finance and public choice. These approaches differ along a series of foundational aspects, such as what cetera to keep paria, the importance of market failure versus that of government failure, and the inclination of human nature (e.g., Buchanan and Musgrave 1999). What is striking is that, notwithstanding foundational differences, both approaches share a lacuna. They both neglect the role that intergovernmental grants can play for welfare value creation by means of policy innovation through experimentation. Though the lacuna is shared, ingredients about how to remedy the lacuna are found in both.
In public finance one finds the very notion of an intergovernmental grant as a useful policy tool. A grant is most often a funding formula for any of the following: horizontal equalization, interjurisdictional externality internalization, minimum local service delivery, and vertical fiscal imbalance. And, depending on the problem at hand, the grant can take on different characteristics (general revenue, specific purpose non-matching, matching, and so on) creating different effects (income, substitution) on the grantee budget (for the classic statement, see Oates 1972: 65-118). However, the crux of the matter is that it is the main corrective policy tool at the disposal of a central government acting in the public interest. So a grant usually serves the purpose of offsetting various types of welfare losses. Its role for creating novel welfare value is underexplored.

Public choice finds that notwithstanding its formulaic nature, a grant is subject to the same special interest capture that characterizes all other public institutions. Consider the context of US highway grants. “Although highway grants are distributed primarily according to formula, individual legislators, especially those with political power, have available several means for altering the distribution of grants for the benefit of their home state. In reference to highway grants, Senator Patrick Moynihan (D, NY) stated 'You don't have a formula here, you have 50 negotiated numbers'”(Knight 2002: 78). Others document similar scenarios in other countries and other public expenditure sectors (e.g., Banful 2011; Litschig 2012). In brief, a grant is most often perceived as an institutional compromise for

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rent seeking, and less often as an institutional compromise for novel welfare value generation.

This paper shifts the main emphasis about the policy role of intergovernmental grants in a federation by drawing on both public finance and public choice. From public finance we keep the idea that grants are important policy tools that can take on different characteristics that can create different budget effects. From public choice we pick up the more pivotal notion that grants can be interpreted as fiscal institutions from political compromise.\(^9\) We differ in emphasis from both by underscoring that a grant also can be useful to create value from learning tied to various attempts at policy design.

Our different emphasis means that, like others in related contexts (e.g., Wildasin 2004), we are not ready to label all incentives from grants as perverse. For unsuccessful experimentation through grants-as-fiscal-institutions can generate learning: having “mercy” (Kornai 1986: 27) on the grant recipient whose experiment is unsuccessful through “permission to fail” (Osborne and Gaebler 1992: 135-136) is critical to policy (and other) innovation in the public sector. In different terms, what matters is the overall learning function.

A grant therefore can stimulate experimentation as well as cushion unsuccessful experimentation. In the words of Stigler (1957: 219): if “grants were given to local governments without supervision there would be some instances of gross neglect or venality and more variety in the quality of the performance of

\(^9\) Moreover, from the standpoint of argumentation, the aspect of politics as exchange in intergovernmental fiscal relations from public choice is what renders our argument non-tautological: the familiar logic of budget shifting from grants as formulas is insufficient to create scope for experimentation.
public functions. We should also expect to find that much of this variety was eminently sensible, and that many types of experimentation would constantly be embarked upon by the more venturesome and the more foolish communities – with large social benefits from both the successes and the failures.” In a comparable spirit, Bednar (2011) writes that a federation should be organized so as to have sufficient rules in place to at least tolerate “mildly selfish experimentation.” This view of grants where learning from success and learning from failure are equally important is at the core of our approach to laboratory federalism.

**EXPERIMENTAL DEVOLUTION**

The laboratory federalism literature examines three issues: first, whether more decentralized organization produces more policy experimentation than more centralized organization; second, the phenomenon of policy diffusion; and, third, the incentives needed to promote local policy experimentation. Though the three issues can overlap (and indeed are often studied in unison), this paper mostly deals with the third.

Focusing on the incentives of local government to experiment requires first quickly pointing out why the central government would devolve rights to experiment. We can identify three incentives for experimental devolution. The first derives from uneven knowledge distribution (Turgot 1775[1987]; Hayek 1948 passim). The notion that each individual holds idiosyncratic bits of knowledge suggests that individuals can generate different bits of new knowledge if interaction is left to their own devices. The second is that usually complex problems push
diverse individuals to pool resources together (Kollman, Miller and Page 2000). Sharing the pain of policy experimentation entails sharing of the gain: new knowledge. The third incentive concerns the containment of the costs of a possible policy failure.

The three incentives, as parts of our story shall also intimate, often operate together. However, we presuppose that the primary incentive for central government to grant rights to experiment to local governments is the third one. The reason is simple: policy failure is politically unpopular. A significant policy failure (like a perfect policy success) is rare, but it does occur, and usually correlates with ‘bad’ policy design. Recall for instance the UK public expenditure programs on the Concorde aircraft and on the Advanced Gas-Cooled Reactor (Henderson 1977). More recently, we can think about the higher costs that the US would have incurred had the California electricity deregulation experiment of the early 2000s been done nationally; or, in a similar vein, about the costs that would have turned up if Texas’s 1993, multiyear experiment with school finance equalization (the so-called Robin Hood plan) had been national.

Even in authoritarian regimes there is devolution of experiments for political reasons. In China, for example, the strategy is to allow local government to compete on the margin of policy experiments (Xu 2011). The motive is largely in the interest of national political stability: a policy failure should not be allowed to spiral out of control, mainly because one does not want to produce excuses for citizens to voice
their discontent about the regime.\textsuperscript{10} For this reason experiments occur locally where failures, even when resounding, manage to stay relatively contained.\textsuperscript{11}

Having taken the stance that a central government would have an interest in devolving rights to experiment primarily for political concerns, we now turn attention to our main incentive question. How can central government try to engender local experimentation?

**GRANTS AS FISCAL INSTITUTIONS**

Rose-Ackerman (1980), Strumpf (2002), Garzarelli (2006), Bednar (2011), and Madison (2014) all answer our main incentive question by proposing fiscal incentives to promote local experimentation. Madison simply refers to “funding.” Rose-Ackerman instead suggests introducing prizes based on innovative performance, while Strumpf, Garzarelli, and Bednar, in a proposal that we identify with, suggest using an already existing fiscal instrument: an intergovernmental grant.\textsuperscript{12}

As previously mentioned, there are different policy purposes of a grant. No matter the purpose of a grant, however, the economic logic usually proceeds as

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\textsuperscript{10} See \url{http://www.csmonitor.com/World/Asia-Pacific/2016/0604/Inside-China-s-hard-drive}.

\textsuperscript{11} We can report two very recent cases of local experimental failures in China: the first is the city of Datong, Shanxi province, and the second is Lanzhou New Area of the Lanzhou Municipal Government, Gansu province, on China’s Silk Road Economic Belt. In both cases the intent was to attract new investments by means of tourism, urbanization, and whatnot through attempts to promote cultural attractions, create industrial parks, build new residential areas and railroads, and the like. However, the experiments seem to be far from successful, and just add to China’s bad loan situation. Datong remains an open construction site with more than 100 unfinished city redevelopment projects and a debt of USD 3 billion (Zhuo 2015). Lanzhou New Area, which literally seems to be a Chinese cathedral in the desert, is estimated to have cost USD 10 billion (\url{https://www.washingtonpost.com/world/asia_pacific/along-the-new-silk-road-a-city-built-on-sand-is-a-monument-to-chinas-problems/2016/05/29/982424c0-1d09-11e6-82c2-a7dcb313287d_story.html}).

\textsuperscript{12} More precisely, Bednar (2011) suggests grants to create incentives to experiment, but does not discuss relative grant conditionality alluded to by Strumpf (2002), introduced more explicitly into the laboratory federalism discourse by Garzarelli (2006), and developed here.
follows. The central government solves a problem by transferring funds where the local problem is, and, by so doing, perfectly solves the problem. This is the familiar public finance logic applied to federalism whereby grants are formulaic fiscal tools operated by flawless central (and local) government (Inman and Rubinfeld 1997: 45-48). Government, beyond an implied benevolence assumption, remains fairly anonymous in this logic: among other things, there is little said about its features as an organization composed of genuine economic actors (i.e., far from flawless), and, correspondingly, about how a grant can be more than just a funding formula akin to manna from heaven.

For present objectives it is useful to extend the interpretation of a grant beyond the familiar public finance logic, and to think about the origin of the formula in the first place. It is to this end that we suggest considering a grant as an institution, that is, a means to create both options and constraints by eliciting and rewarding some generally accepted rule-following behavior and by containing and punishing behaviors that contradict generally followed rules. The classic example is driving on the same side of the road: conformity yields rewards by creating predictability in behavior while nonconformity is punished with obvious costs. In essence, an institution economizes on conscious ratiocination, and when not conformed to usually entails welfare losses, because it is a rule that contains and transmits useful knowledge about what is and what is not rational to do (e.g., Buchanan 1990).

This institutional interpretation of grants in turn implies that each type of grant is a different type of fiscal institution – a political compromise for a distinctive
spending rule communicating the donor’s spending preferences to the recipient (e.g., a matching ratio and a maximum amount in the case of a closed matching grant). The spending communication can even occur implicitly (by deduction from the political flag of the donor, by verbal suggestions, from the political climate, through early press statements, etc.). In this fashion a grant, analogously to an incomplete contract, amounts to an agreement between levels of government, rather than being a mere spending formula between anonymous economic actors (e.g., Garzarelli 2006).

In accordance with conventional wisdom, we distinguish between two broad categories of intergovernmental grants: conditional and unconditional. For example, a matching grant (whether open- or closed-ended) is considered conditional while a lump-sum grant can be considered unconditional. For conditional grants, the grantor places explicit restrictions on the use of the funds; while for unconditional grants, the grantor does not place explicit restrictions on the use of the funds. A closed matching grant is classified as a conditional grant that specifies that for each dollar spent by the grantee on a particular activity, the grantor will match it, up to an upper limit, with a specified sum – for instance, for each dollar spent by the grantee, the grantor will contribute fifty cents but to a maximum of two million dollars. An unconditional lump-sum grant is a fund transfer with no explicit strings attached.

At the same time, viewing an intergovernmental grant as a fiscal institution that is similar to a contract means that any grant has conditions attached regardless of whether it is conditional or not. A lack of conditionality would be the result of an
interpretation of intergovernmental grants where “the decision makers are” not “real governments” (Breton 1987: 315). An unconditional lump-sum grant therefore is unconditional to the extent that there are no explicit conditions attached, i.e., implicit conditions will still be present. Equivalently, a closed matching grant that is explicitly conditional is likely to have implicit conditions attached as well. Thus a grantor can leverage on both explicit and implicit conditions to instruct the spending of a grant, in that all grants, whether explicitly conditional or not, are actually conditional (Brennan and Pincus 1990).

The grantee has an interest in exhausting the funds from the grant by experimenting on alternative policy conjectures – in following the implicit and explicit conditions attached to the grant – in light of the prospect of receiving future grants (Hart 1995: 45, Proposition 2, Part A). Alternatively stated, the crucial incentive for adhering to conditionality is to “secure general political and bureaucratic approval or to avoid political disfavor” (Brennan and Pincus 1990: 131).

Still, this does not mean that there cannot be exceptions, namely cases of incentive misalignment. Brennan and Pincus (1990: 130) for example report that when in Australia a grantee (a public university) failed to take the preferences of the grantor into account (the government), the result was punishment through a cut in grant funding. A more recent illustration of this vertical top-down political incentive at play is when in March 2015 the South African Treasury withheld one of its grants
to 60 municipalities when the latter did not employ the transferred funds as expected.13

The reasons for incentive misalignment can be various and not mutually exclusive (e.g., local and/or central leadership turnover, end of term in office with no prospect of re-election, lack of experience, plain incompetence, political myopia). Be that as it may, the simple point to underscore is that, on the whole, we expect the policymaker to adhere to the incentives from the grant. For the context of fiscal institutions is political, and the political game is, in general, not one shot (Oates 2008).

With this context in mind, we basically propose to extend conventional wisdom by endogenizing conditionality in laboratory federalism. The degree of conditionality attached to a grant is an overlooked policy tool to provide incentives for local governments to experiment with policy. For conditionality incentivizes rule-following by crowding-in expectations.

We can think of conditionality as one instance of what Greif (2006: 8, 45) terms “motivation,” which is what “mediates between the environment and behavior, whether the behavior is rational, imitative, or habitual.” Motivation is thus the “linchpin” of institutions, representing “incentives broadly defined to include expectations, beliefs, and internalized norms.”

The notion moreover resonates with studies about public service that consider the relative importance of incentives to self-select into politics (e.g., Rainey and Steinbauer 1999; Besley 2005). Indeed, public service motivation is “an individual’s

predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations” (Perry and Wise 1990: 368). The logic of rule-following from motivation through conditionality also resonates with the perspective that bureaucrats and politicians operate under rules similar to those of a market, where reputation effects on political promises glue together intertemporal exchange relations tied to individual career ambitions (Breton and Wintrobe 1982).

In short, the take away from considering a grant in more explicit institutional terms is the recognition that it is possible to leverage conditionality as a control variable for policy experimentation. It is this recognition that delineates our central proposition, namely that a grant that is relatively less conditional allows for more policy trials than a grant that is relatively more conditional.

We articulate our proposition by thinking about unconditional lump-sum grants and conditional closed matching grants as the inclusive polar extremes of a possible grants spectrum. Reasoning in terms of these fiscal institutional extremes encompasses policy considerations for all grants in between (e.g., conditional lump-sum, open-ended matching) as well. The first step in our comparative institutional analysis is to introduce the simple heuristic that proxies for trial and error learning in the uncertain course of policymaking.

**ECONOMIZING RULES**

An individual often solves problems by trial and error action rather than by consciously optimizing: economizing in this case means following rules (most often tacitly) in a fashion similar to an operation of conjectures and refutations (Popper
1957: 83-92; Hayek 1973[2013]: 5, 29). For example, a rational individual breaks down a problem into smaller ones, does not repeat the same error twice, and imitates and repeats successful behavior and discards the unsuccessful one. It is seldom the case that she faces problems where it is possible and it pays off to explicitly maximize. As a definitive voice that significantly contributed to the maximization hypothesis utters: if one assumes that an individual always maximizes rather than also follows rules, then the socioeconomic “system would not work ... . A consequence” of this assumption “would be the end of organized society as we know it” (Arrow 1987: 233). Rule following is about economizing, and therefore rational.

Policymaking is not too different. As we indicated at the outset, it is an uncertain production activity. As such, it usually proceeds in incremental or so-called piecemeal fashion, where one tries out different solutions to actively seek mistakes in order to extend knowledge and improve practice. For instance, in the recent case of legalizing cannabis in the US, reflecting on “the range of potential gains and losses, and of policy options, the probability of finding the perfect combination right from the start must surely be near zero. Thus, the best initial policy will not be the one that comes closest to some calculated optimum, but instead the one easiest to adjust in light of experience, which among other things means building in evaluation and policy feedback mechanisms” (Kleiman and Ziskind 2014: 78).

Said another way, a policy is not an Athena-like output that springs full-blown from the head of Zeus. Rather, policymaking rests upon adaptation from learning
(Nelson 1977), which “can only take place through the attempt to solve a problem and therefore only takes place during activity” (Arrow 1962: 155). It follows that when a policymaker experiments with alternative policies, after receiving an intergovernmental grant for example, the learning must necessarily be mistake-ridden. And, all else equal, learning from mistakes entails that the policymaker will, over a period of time, improve a policy. Policymakers “must anticipate the possibility of a reconsideration of their situation, a reformulation of their problems, and a change of strategies taking into account experience and new information. The condition of human fallibility requires analysis, reason, deliberation, choice, experience, reconsideration, and an opportunity to alter, amend, or change as new information and new understanding give rise to new possibilities” (Ostrom 1971[1987]: 47).

Thus the rational (and fallible) policymaker proceeds gradually by exploring the solution space by taking many small decisions over time on each policy under consideration and treasuring the lessons learned at each step. The lessons learned are what endogenously drive the process forward, because at each moment of choice they build on the outcome from each previous step. The point being that the positive and negative lessons learned serve as rules of decision-making when each policy – each production activity – is considered separately in terms of its value-generating attributes (degree of externality internalization, institutional compatibility, revenue stream generation, etc.), which is the basic intuition behind the dynamics of our simple heuristic. That is, that over repeated trials through time,
the frequency of the selection of a policy is proportional to the accumulated welfare value of selecting that policy.\textsuperscript{14}

If we suppose, for simplicity, that there are a number of experiments on two competing policies, $x_1$ and $x_2$, and that for each experiment there is a corresponding welfare value function, $v_1(x_1)$ and $v_2(x_2)$, then we can render more precise how the frequency of policy selection changes over time through a familiar replicator equation, such as

$$\frac{dx_i}{dt} \bigg|_{i=1}^2 = x_i [v_i(x_i) - \bar{v}(x)].$$

$[v_i(x_i) - \bar{v}(x)]$ is the difference between the average value of the trials of the chosen policy, $v_i(x_i)$, and the average of the values of all policy trials, $\bar{v}(x) = \sum_{i=1}^n x_i v_i(x_i)$. If $v_i(x_i) > \bar{v}(x)$, then $x_i$ will continue to be selected; if instead $v_i(x_i) < \bar{v}(x)$, then $x_i$ will not continue to be selected. There is indifference between policies when they have the same value.

The simple evolutionary dynamic from equation (1), explicitly or otherwise, describes rational behavior under uncertainty in a variety of contexts and fields where repeated trials are involved (e.g., Fudenberg and Levine 1998; Hofbauer and Sigmund 1998; Sugden 2005; Sims, Neth, Jacobs, and Gray 2013). For the purposes at hand, it informs us that the policymaker experiments – learns by trial-and-error – according to average rather than marginal welfare value per unit of investment (a money sum, knowledge, opportunity cost, time, etc.) at each step taken. More precisely, the muddling through occurs at the margin, but the reinforcement

\textsuperscript{14} After Herrnstein’s (1997 passim) “matching law,” where policies are production activities and policy welfare value functions reinforcements.
(negative or positive) to the muddling through is considered in terms of its average return. The heuristic therefore is that the higher the average welfare value from a policy in relation to alternatives, the more a policy will be pursued.\footnote{Different local governments within the same polity, whether homogeneous or heterogeneous, conducting different policy experiments may find different policy solutions to the same problem.}

Besides its intuitive appeal, the heuristic is factually not unrealistic. Take the following tangible policy case. The Johannesburg Roads Agency introduced the freely downloadable \textit{Find it and Fix it} application for smartphones in 2014, which allows drivers to report in real time a pothole with GPS coordinates as well as a photograph.\footnote{In imitation of the City of Seattle: \url{http://www.seattle.gov/customer-service-bureau/find-it-fix-it-mobile-app}.} The app competes with more traditional policies for reporting a pothole, of which the one that requires contacting the relevant authorities by telephone call to report approximate location and description of a pothole arguably remains one of the most familiar.

If we think about these two competing policies as our $x_1$ and $x_2$, then it is patent that, over time and with other conditions remaining the same, $v_1(x_1)$ trumps $v_2(x_2)$. For, among other things, $x_2$ first requires to search – usually after some time from the initial reporting that would also include a description of the size of the pothole – for the precise pothole location so that, usually after some additional time, a repair team can fix it. $x_1$ instead bypasses the description and search steps, implying that it exhibits transaction cost and time saving economies that on average allow for quicker pothole repair compared to $x_2$. Hence, $x_1$ will be preferred to $x_2$.

As a matter of fact, thanks to \textit{Find it and Fix it}, “the average time to resolve a” road infrastructure “service request,” such as “potholes, faulty traffic lights and
other road-related defects,” reduced “from 32.4 days to less than a day.” “The app complements the” Roads Agency’s “ability to plan repairs ... based on reports and data received, thereby enhancing efficiency and increasing productivity.”

GRANTS AND POLICY EXPERIMENTATION

We are prepared now to illustrate how an intergovernmental grant can aid policy experimentation in a federation. The illustration hinges on likening the dynamics of trial and error policy production, as introduced above, to experimenting within a grant-generated policy experimentation space, with the upshot being that the conditionality from different grants-as-institutions creates different policy experimentation spaces.

In line with the discussion so far, we continue to reason in two-dimensions, and take as our comparative-institutional cases two grants of the same amount, but of different type: an unconditional lump-sum and a conditional closed matching. As specified earlier, the reason for selecting these two grants is that the characterizations for all other grants fall within these two. More generally, the simplifications do not entail loss of generality (Oates 1972: 101-102). The Appendix contains a formal treatment.

Assume two levels of government, central and local, the absence of fiscal illusion and of local government borrowing, and that central and local taxes remain constant. In keeping with our previous example, we can keep thinking about experiments on two competing policies, \( x_1 \) and \( x_2 \). Following standard practice, the

number of policies is chosen so that the cost of one unit in terms of the other is unity. The pre-grant local budget constraint, raised only from local taxes, is $AB$, with slope $\tau$. See Figure 1.

![Figure 1 — Experimentation with an unconditional lump sum grant](image)

Suppose that local government, in the form of our policymaker, is the recipient of an unconditional lump sum grant. In terms of Figure 1, the grant shifts the local public budget from $AB$ outward to $CD$. Our primary interest here is on the net experimental effects from the grant.

We know that as an institution the grant serves both as a constraint and as an option for policy experimentation. The constraint is the budget for conducting experiments on $x_1$ and $x_2$. It is equal to the money amount transferred from central to local government through the grant, entailing that experimentation is not unbound. Relatedly, recall that it is in the interest of the grantee-as-policymaker to exhaust the grant amount.
Being from revenue extraction from local taxes, $AB$ does not enclose the institutional linchpin from grantor to grantee that interests us; and the space above the grant is not feasible. The option consequently manifests as a proportionality of the simple policymaking heuristic from equation (1) to the area that, by difference, is created by the grant:

$$\frac{dx_i}{dt}\bigg|_{i=1}^2 \propto ABCD.$$

In other words, relation (2) informs us that experimentation is commensurable to possible experiments.

The constraint and the option jointly define the space for muddling through, which is essentially the budget set for experimentation. That is, the bundles of experiments lying inside and on the boundaries of the shaded region in Figure 1.

Policymaking from the grant proceeds along the following lines. As a starting point, the policymaker can pick any combination of policy experiments within the shaded region. Suppose experimentation starts at a locus where there is an equal number of experiments on $x_1$ and $x_2$, such as $E$. Then, depending on the experimental feedback, the policymaker will take the next step. Thus, the arrows emanating from $E$ are not vectors, but indicative of direction.

If $x_2$ has a relatively higher average welfare return, then the policymaker would move in a north-westerly direction, for example towards point $F$. A movement towards $H$ reflects learning about a relatively higher average welfare
return for \( x_1 \). A diagonal movement between 0-90 degrees represents indifference:
\[
x_1 \sim x_2 \iff [v_1(x_1) = v_2(x_2)] \geq \sigma(x).^{18}
\]

The halt of experimentation is less evident. On the one hand, there is the case of the exhaustion of the funds from the grant, which occurs anywhere on \( CD \). However, lying on \( CD \) can imply either experimental failure or success. The exhaustion of the funds reflects rationality in process, not in result. That is to say that learning through rule following does not automatically guarantee policy success even when the entire grant amount is employed as expected.

On the other hand, there is the case of experimental halt before the grant funds are exhausted. Here too there can be experimental failure or success. Regardless of experimental outcome, the policymaker would be somewhere in the shaded region exclusive of the upper boundary \( CD \) – for example, at point \( I \).

\( I \) represents failure when experimentation stops without stumbling upon a successful policy. In this case, we can think of \( I \) as a manifestation of incentive misalignment between grantor and grantees. That is, there is absence of rule-following, much like the cases of the Australian university and of the South African municipalities reported earlier, which, as we saw, can occur for a variety of reasons.

\( I \) is a success when experimentation stops in light of a successful policy. In this case, the residual funds can be invested in something related to the successful experiment until grant funds are exhausted. The Public Safety Department (which consists of both fire and police) of Fairfield, California for instance was allowed to

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18 There are other cases that can be of interest. For example, a movement can be perfectly horizontal, when \( v_1(x_1) > \sigma(x) \) and \( v_2(x_2) = 0 \); or perfectly vertical, when \( v_1(x_1) = 0 \) and \( v_2(x_2) > \sigma(x) \); and when both \( v_1(x_1) = 0 \) and \( v_2(x_2) = 0 \) the policymaker can choose another set of experiments.
keep savings from a lump-sum grant. This led to a change in strategy from only fighting fires to fire prevention, which lowered the running costs as well as improved the insurance rating of the department (Osborne and Gaebler 1992: 222-226).

Note the asymmetry. Experimentation stops when there is exhaustion of the grant funds, irrespective of success or failure; while the exhaustion of the funds is not necessary for experimental success or failure. The important detail to keep in mind, though, is that learning occurs on both sides of the asymmetry.

Let us now turn to the conditional closed matching grant of the same amount. Since the policymaking procedure is fully analogous to the just-considered case of the unconditional lump sum grant, we can focus directly on the comparative institutional analysis of the two grants in terms of the respective experimental spaces for muddling through.

The explicit conditions involved, as the name of the grant implies, are two: the matching ratio, \( m \in (0,1) \), and the maximum amount at which the grant closes. \( m \) represents the fraction of the cost of the experiment subsidized by the grant (e.g., if the donor funds 50¢ on every dollar spent on experimenting on \( x_i \), then \( m = 0.5 \)).

Let the grant direct more funding to \( x_1 \), as in Figure 2. The local public budget shifts from \( AB \) to \( AJC \). \( m \) pivots the budget about point \( A \) to \( AJ \). The slope of segment \( AJ \) is \((1 - m)\tau\). The grant reaches its maximum amount (which, recall, is the same of the previous grant) at \( J \). The remaining budget constraint \( JC \) has the same slope as the unconditional lump sum grant, \( \tau \), which is also the slope of the original budget.
By inspecting figures 1 and 2 we notice that the constraints and the options for experimentation differ. The constraint of the conditional closed matching grant is twofold. It is the amount of the grant as well as the matching ratio. The grantee receives the full grant amount only by experimenting on $x_1$ to the grantor's satisfaction, which is at least the horizontal distance $BC$. The option is:

$$\frac{dx_i}{dt} \bigg|_{i=1}^2 \propto ABCJ. \quad (3)$$

In consequence, the space for muddling through in Figure 2 is represented by all the bundles of experiments lying inside and on the boundaries of the shaded region.

Further inspection of the two figures shows that $ABCJ < ABCD$. That is to say that the experimentation space is smaller for a conditional closed matching grant than for an unconditional lump sum grant. The intuition is that the matching ratio reduces the experimental space by favoring a specific experiment (in this case, $x_1$). There is therefore less experimentation potential under the conditional closed
matching grant than under the unconditional lump sum grant. Section B of the Appendix presents a formal proof of this result.

SUMMARY AND FURTHER SUGGESTIONS

One common proposal to aid the challenging task of policymaking is to employ a federation as a laboratory. An important issue that laboratory federalism addresses is in fact how to create incentives for local government to experiment with, and to learn from, different policy conjectures. However, the issue is dealt with largely independently of the theory of intergovernmental grants.

The main thrust of the policy experimentation approach developed here is that different degrees of grant conditionality mean different degrees of experimentation. We indicate that this difference in conditionality manifests as different policy experimentation spaces that the local policymaker – the grantee – can span for policy solutions: the more the conditionality, the smaller the experimentation space, and vice versa.

Our approach is about what we may call ‘first instance’ experimentation: it considers experimentation within the same local government rather than across governments. Put more generally, punctuated public policy failures and successes are smoothed out by knowledge growth from trying out alternative policy solutions through different fiscal institutional designs within the same polity. We approximate this learning with a simple heuristic whereby there is investment of resources (e.g., funds from a grant) according to the comparatively more rewarding course of action on average.
We witness policies with widely acknowledged low value persist over long periods of time. An illustration is the Italian Workers' Statute of 1970 – which ended up protecting the incumbent worker irrespective of his productivity rather than job opportunities – that took almost half a century to be reformed. One could easily recall other more striking cases too, such as South African apartheid. In these and similar cases one can sensibly speculate that policies with welfare value below average persist because policymakers do not just survive according to selection of the comparatively better feasible policy. In public contexts survival also depends on capture, populism, preference falsification, sycophancy, and the like. An empirical analysis congruent with our approach then could be the estimation of policy survival functions in relation to different policymaker ideal-types (Fedeli, Forte and Leonida 2014).

The paper considers the quid pro quo intergovernmental fiscal relations that design grants in a parsimonious way (Scott 1952). It concentrates almost entirely on how grants can vary the extent of decentralization in an internal organization of the public sector. It does not direct much attention to how the given internal organization can differ. A priori, one for example could have internal organization based on principles of function and specialization (the U-form of Eastern Europe and the former USSR) or multi-level geographic decentralization more typical of the Chinese M-form (e.g., Blanchard and Shleifer 2001; Xu 2011). As a result, one can reasonably conjecture that different organizations can have different experimental consequences in light of the same grants (Volden 1999). A line of inquiry that
relates our approach to different initial internal organizations is a promising area for further extension of theory.\textsuperscript{19}

\textsuperscript{19} The relevance of different internal organizations reveals itself in the associated sphere of different public finance bargaining fora as well (e.g., Besley and Coate 2003). For example, one can expect political power dynamics in a parliamentary committee that lasts a legislature to weight differently than equivalent dynamics in a permanent, extra-parliamentary committee. This is the case of Italy’s Conferenza Stato-Regioni, the permanent bargaining forum between local and central government. In full: Conferenza permanente per i rapporti tra lo Stato, le Regioni e le Province autonome di Trento e Bolzano, www.statoregioni.it.
APPENDIX

This Appendix is in two sections. The first section presents the two budget sets for experimentation from the two different grants in familiar algebraic notation. The second shows that the two budget sets are not isomorphic: the set from the conditional closed matching grant is a proper subset of the one from the unconditional lump-sum grant. A result indicating that, *ceteris paribus*, a policymaker disposes of more experimental bundles in the unconditional case.

A. Budget sets for experimentation

Let the set of possible policies be $X = \{x_i\}, i = 1, \ldots, n$ with respective costs $C = \{c_i\}, i = 1, \ldots, n$.\(^{20}\)

Similarly to an example from main body of the paper, imagine only the case for experiments with two competing policies for road maintenance: $\{x_i^2\}_{i=1}^2 \in X$, with $\{c_i^2\}_{i=1}^2 \in C$. The pre-grant local public budget ($AB$ in Figures 1 and 2) then is

$$c_1 x_1 + c_2 x_2 = B_A > 0. \tag{A.1}$$

We know that (A.1) can be spent on a variety of experimental policies concerning road maintenance (different paints for road surface markings, pothole repair methods, types of traffic signs, etc.).

The central government locally devolves rights of experimentation by means of an unconditional lump sum grant, $G$. The grant-aided budget for total experiments on the two policies ($CD$ in Figure 1) is

$$c_1 x_1 + c_2 x_2 = B_G, \tag{A.2}$$

where $B_G > B_A$. The budget constraint is the total budget for $\{x_i^2\}_{i=1}^2$, which is equal to the amount of $G$,

$$G = B_G - B_A > 0. \tag{A.3}$$

The option is a proportionality between the policymaking heuristic from equation (1) and the area generated by grant $G$,

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\(^{20}\) We can reason heuristically about costs, and think of $C$ as a collection of sufficient statistics. Thus a cost in $C$ represents not just pecuniary cost (a price). It also stands in for a variety of other economic costs, such as those of infrastructure planning, of political compromise, of policy design and revision, and time. Moreover, as before, the cost per unit of one policy in terms of the other is unity by construction.
\[
\frac{dx_i^2}{dt} \propto \int_0^{x_i} x_2(x_1, B_B)dx_1 - \int_0^{x_i} x_2(x_1, B_A)dx_1. \tag{A.4}
\]

Relations (A.3) and (A.4) jointly define the budget set – the space – for experimentation:
\[\{x_i | x_i \in X, B_A \leq \sum_{i=1}^Z c_i x_i \leq B_G\}. \tag{A.5}\]

Consider now the case of the devolution of rights of experimentation through the allocation of a conditional closed matching grant, \(Z\), of equal size to \(G\). The reasoning is analogous to that of the previous case.

The budget from \(Z\) (\(A/C\) in Figure 2) is
\[
B_Z = \begin{cases} 
(1 - m)c_1 x_1 + c_2 x_2, & \text{if } B_M \leq B_G \\
(c_1 x_1 + c_2 x_2), & \text{if } B_M > B_G
\end{cases} \tag{A.6}
\]

\(m \in (0,1)\) is the matching ratio, which in this case is tied to experiment \(x_1\). The constraint is from the total budget for experimentation,
\[Z = B_Z - B_A. \tag{A.7}\]

The option instead is the proportion
\[
\frac{dx_i^2}{dt} \propto \left( \int_0^{x_i} x_2(x_1, B_M; m)dx_1 + \int_0^{x_i} \frac{B_Z}{(1-m)c_1} x_2(x_1, B_G)dx_1 - \int_0^{x_i} x_2(x_1, B_A)dx_1 \right). \tag{A.8}
\]

Relations (A.7) and (A.8) jointly define the budget set for experimentation:
\[
\{x_i | x_i \in X, B_A \leq (1 - m)c_1 x_1 + c_2 x_2 \leq B_Z, \text{if } B_M \leq B_G \\
\text{and } B_A \leq \sum_{i=1}^Z c_i x_i \leq B_Z, \text{if } B_M > B_G \}\tag{A.9}
\]

**B. Relation between the budget sets for experimentation**

The main body of the paper basically puts forth a constructive proof that the area from the right-hand side of proportion (A.4) is always strictly greater than the one from the right-hand side of proportion (A.8). The intuition is that \(m\), the matching ratio, reduces the area by favoring a specific experiment (such as \(x_1\)). This leads to the implication that, *ceteris paribus*, a more (less) conditional grant effectively reduces (increases) the experimental budget set. This section presents a direct proof of the relation between the areas through simple set-theoretic reasoning.
Let, for simplicity, $M \equiv (A.5)$ and $N \equiv (A.9)$. We need to prove that $N \subseteq M$. That is to say that: $\forall \, x(\, x \in N \rightarrow x \in M) \land \exists \, x(\, x \notin N \land x \in M)$.

Proof. Let $K$ (such as the same point from Figure 2) be the ordered pair $(x_{1k}, x_{2k}) \in M : B_A \leq c_1x_{1k} + c_2x_{2k} \leq B_G$. However, $(1 - m)c_1x_{1k} + c_2x_{2k} > B_Z$ for $m \in (0,1)$.

Moreover, we know that $B_Z \leq B_G : (x_{1k}, x_{2k}) \notin N : N \subsetneq M$. Q.E.D.
REFERENCES


