

The Innovation-Institution Connection: One Simple Diagram

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Letter

Abstract. The purpose of this note is to introduce a simple diagram that provides an intuitive and useful way of looking at the connection between institutions and innovations, regardless of what level of institutions one is concerned with. The ‘back-of-the-envelope’ diagram focuses attention on the effects of a new idea on the existing ideas that some institution might represent, and the sort of innovated institution that it might help engender.

Keywords. Innovation; Institutions; Ideas.

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1 Introduction

The purpose of this note is to propose a simple diagram that captures the link between ideas and institutions, and, in so doing, to shed light on the process of both innovation and institutional change taken together.

The quality of a particular set of institutions has long been remarked upon as being of essential importance to a range of observed outcomes, such as economic performance (North, 1981; Acemoglu and Johnson, 2012), efficient social outcomes (Coase, 1960 and Williamson, 1985), and political development and social justice (Hirschman, 1970). This, then, would seem a good reason for the immense literature across the social sciences that devotes itself to making vivid why institutional structures matter, and why some matter more than others.

Jones and Romer (2010), taking stock of the state of the field, suggested that economic growth theory has evolved over the past fifty years to making the role of ideas and institutions indispensable inputs to any consideration of growth. Lieberman (2002) proposed using a dynamic model between ideational change and institutional structure in order to examine periods of political change. The notion of ideas being reified within institutions has been used to study a number of other issues, including attitudes to welfare (Somers and Block, 2009) and the role of the First Amendment in creating a ‘marketplace for ideas’ (Blocher, 2008).

Taking the broader view, it seems obvious that the unifying theme across such investigations is that of an innate interplay between ideas and institutions, and it deserves consideration in its own right, devoid of the effects it generates on economic growth, political development, sociological change or scientific progress. Ideas are hypostatized within institutional structures; institutional structures frame the context for ideational change that brings about shared experiences, memories and knowledge; new ideas emerge as accretions from these institutionally reified repositories, and the overall process is obviously one that is recursive.

Any institution is, essentially, simply an instantiation of some set of shared fundamental ideas that stands in contrast to some other set – a firm, a religion, a culture, a scientific tradition, have all been seen from the lens of an ‘institution’. To blunt any biases, therefore, in this note we undertake an examination of this relationship between ideas and institutions by using a simple diagram that is devoid of any inherent connection to any particular application. In doing so we shall attempt to see innovation, which is to say a *change* in the set of some ideas, as being intrinsically related to a process of change in the institutional structure.

It may seem overly reductionist to be trying to capture the complexities of the dynamic between institutions and all genres of ideas in a simple and deterministic manner, using just a solitary diagram. It is worth considering two reasons for why such an approach is actually both overdue and useful.

First, both these topics are intensely loaded with preconceptions – both are suffused thoroughly with our predispositions for what constitutes ‘progress’. The quality of institutions matters because, definitionally, a first-best is presumed to exist in each context. Innovations matter, in similar vein, because some ideas are very strongly considered to be ‘better’. However, the two are not readily separable.

This interrelation is convincingly shown, and directly so, by a vast literature on how ideas can be affected in a network to influence the adoption of new products in markets (Bass, 1969); to cause social segregation (Schelling, 1978) and to alter political institutions (Murphy and Shleifer, 2004, for instance). The point is that, even when institutions are considered separable from ideas and the latter are examined directly, such investigations *still* rest on whether some institutional context motivates the sequential influence by a new set of ideas (Bikhchandani et al., 1992) or whether it serves to confine the population over which the influence of a new idea overspreads (Granovetter, 1978).

Conversely, when one does not care much about the desirability of some institution or other, only whether some new innovation emerges from it, the relevance of resulting institutional orderings takes a back seat. A majority of the literature on disruptive innovations, for example, is unconcerned with whether such disruptions hold the potential to alter the institutional context within which they were generated. Yet, the fact is that they do. Innovations have done and routinely still do disrupt institutions.

The second point begins with the admission that the previous point is not a criticism. It would be exceedingly difficult, impossible perhaps, to never think about either institutions or ideas as subjects in their own right. Both topics – institutions and innovation – are so widely examined that it is almost too daunting to attempt to gain any useful and intuitive understanding of the relationship between the two without making it a career's worth of a pursuit.

The benefit, however, of exploring the mechanics of how institutional form interacts with the robustness of ideas is too alluring to abandon the task altogether. In that spirit, in this note we propose a single diagram that holds promise to be highly useful to anyone who wishes to keep the idea-institutions association in mind as a backdrop, as just about any topic of more immediate relevance is examined.

2 Institutional change

Before we introduce the diagram, consider two broad stories at entirely different levels of institutional analysis to help the imagery along. While they may seem somewhat discursive, their relevance is rather keen to the topic at hand.

First, recall some history in broad brushstrokes; specifically, the effect of the barbarians on the great settled civilizations (Guzman, 1988). The barbarians – who include the Hittites, Aryans, Scythians Huns, and Mongols – were the horsed nomads of the vast steppes of central Eurasia, and are generally regarded as a brutal scourge upon the civilizations that they conquered, or otherwise harangued and invaded.

Yet, there is a growing acknowledgment of a more complex story that involves some essential aspects that are easily overlooked. Their lifestyles, for example, were a hybrid of pastoralism and hunting over vast territories that were not as fertile as the coastal lands that fringed their borders, where the settled societies thrived. As a consequence, they developed expertise with what we would now recognize as 'frugal innovation', 'lateral thinking' and 'flat hierarchies'.

Besides developing excellence in horseback riding and archery, they also developed dynamic

hierarchies within the hordes. These loose affiliations could be galvanized rapidly in times of conquest and revert back to a dispersed way of life over the vast territories at other times, maintained by a system of tributes, intermarriage and rewards. When they did conquer civilized centers, they would readily settle into the more vertical hierarchies of these societies and, through the introduction of new ideas and strong leadership, bring about a period of prosperity and innovations within these societies. Eventually, however, they would settle into the decadent leadership roles of those they vanquished somewhat too freely – coopted by their new ways of life, as it were – and leave themselves open to a fresh wave of attacks from barbarians.

For the second imagery, consider the Schumpeterian model of the free-roaming entrepreneur as an innovator. It is fair to say that this constitutes the traditional perception of an entrepreneur – an intrepid individual, especially adept at acquiring new information, and with foresight and gumption to assume the requisite risk to engage in the creative destruction of extant models of business and prevailing market equilibria.

This conceptualization rests on the presence of a broader environment of ideas; in other words, there are knowledge spillovers generated across an entire society that are generated by a complex of conducive institutions that an entrepreneur benefits from and that enable her to bring an innovation to the market.

This view can be contrasted with that of innovation within a firm, by an intrapreneur. While several famous case studies exist of intrapreneurs at research institutions such as Bell Labs and DARPA, as well as at firms such as L’Oreal, Google, and Lockheed Martin, these aren’t isolated examples. In a fairly exhaustive cross-national study, the role of entrepreneurial activity by employees has been shown to be at least as important in magnitude as the ‘independent’ entrepreneur, and quite likely even more so (Stam, 2013). The knowledge-spillovers, in other words, can be generated within the institution of a firm and its industry, just as readily as they might be generated from beyond its confines.

Naturally, there are stark differences across firms. Some are more conducive to employee innovation than others. One possible reason for this takes us back to institutional structure and the example of the barbarians: the *type* of hierarchy in place at a firm. Well-known examples from the corporate world include Valve and Oticon. Flatter hierarchies (including dynamic hierarchies and spaghetti organizations) are associated with more inventiveness than are taller ones, possibly because they emphasize a freer exploration of ideas, whereas taller hierarchies are associated with greater control and stability in uncertain times. Therefore, one is not ‘better’ in all cases, as, for example, the literature on the dual-routines approach to the managerial role suggests; the value of managers is not merely in overseeing a systematized operational routine mechanically, but also in changing this routine to permit the flow of information (see, for instance, Knott, 2001).

Again, this is a class of observations that can be made in the context of other institutions as well. Tsebelis (1995), for example, proposed the veto-player model, which makes much the same point in terms of a tradeoff between structural stability and amenability to change at the level of entire political systems.

Generally, the proximate purpose of the two examples above is merely to show the link between a variety of institutional forms and innovation; they both suggest that changing hierarchies

– as a method for effecting institutional change – might be seen as a proxy for changing the embeddedness of ideas within an institutional system. Rather than focusing on the structure of the hierarchy, we might simplify the approach by looking at the effect of embeddedness on innovation directly.

3 Ideas as stressors

We draw inspiration for the diagram that follows from a stress-strain diagram. It succinctly captures several elements that are worthwhile visualizing in the construction of an intuitive method for the evaluation of the link between a system described by some institutional arrangement and innovation.

At the broadest of level, we draw our attention to just two aspects: the stress impact of a new idea and the strain effect of this idea on the system.

Any institutional system reifies a set of ideas. No matter how tenuous these ideas might be, the very reason that they deserved to be reified in a shared system – embedded within it, as it were – in the first place is because they held value to those individuals subscribing to it in order to guide behavior. Therefore, it stands to reason that these ideas will hold at least some ability to withstand being challenged by any new set of competing ideas.

It is this ability to stand fast against the stress imposed by the new ideas – the absorptive capacity of the incumbent ideas – that the diagram shows as a *zone of accommodation*. The institution **accommodates** the new ideas without resistance because they represent no ability to alter the institutional system. This ‘elastic ability’ of institutions permits them to work in a world that need not be entirely insulated to all other ideas at all times so long as the core ideas that are instantiated by the institution are unfettered.

As the strain of the new ideas increases, a point is eventually reached where existing ideas within the institution are irrevocably affected, and it then enters a *zone of replacement*. Innovations arise either through the sequential assembly of ideas or from a combinatorial approach, and very often through a process that involves both. As such, the case where the ‘collapse’ of an institution signals a complete **rejection** of all of its ideas in subsequent innovated institutions ought to be relatively rare. However, if that occurs we are left with no sign of the previous ideas, at least within the context of our interest. Several examples exist in science. The phlogiston theory of combustion and a theory of disease based on miasmas are examples. Both sets of ideas were the basis of institutions that first went through protracted periods of accommodation, before being entirely replaced.

More often, however, such replacement of ideas by the new ideas is only partial, and a *zone of transformation* ensues, at the end of which the institution emerges in a revised form with a mix of ideas that are of the old institution and those that are new. The endpoint of this process is where the *innovated institution* emerges as a new and stable entity.

Much about this transformation can be deduced by examining the degree to which the initial ideas have been replaced. Consider three cases as broad exemplars:

- When replacement is significant though not complete, as shown by the green path, the stress exerted by the new ideas has been resisted by the system at some maximum level it can feasibly exert after the replacement commences. The innovation rests on the basis that some fundamental merit in the institution's ideas are **reinforced** in the new innovated institution. As an example, consider the case of the car replacing the horse and carriage as a mode of transportation, yet deriving a basis of inspiration from coachbuilders.

Stress Impact of Idea

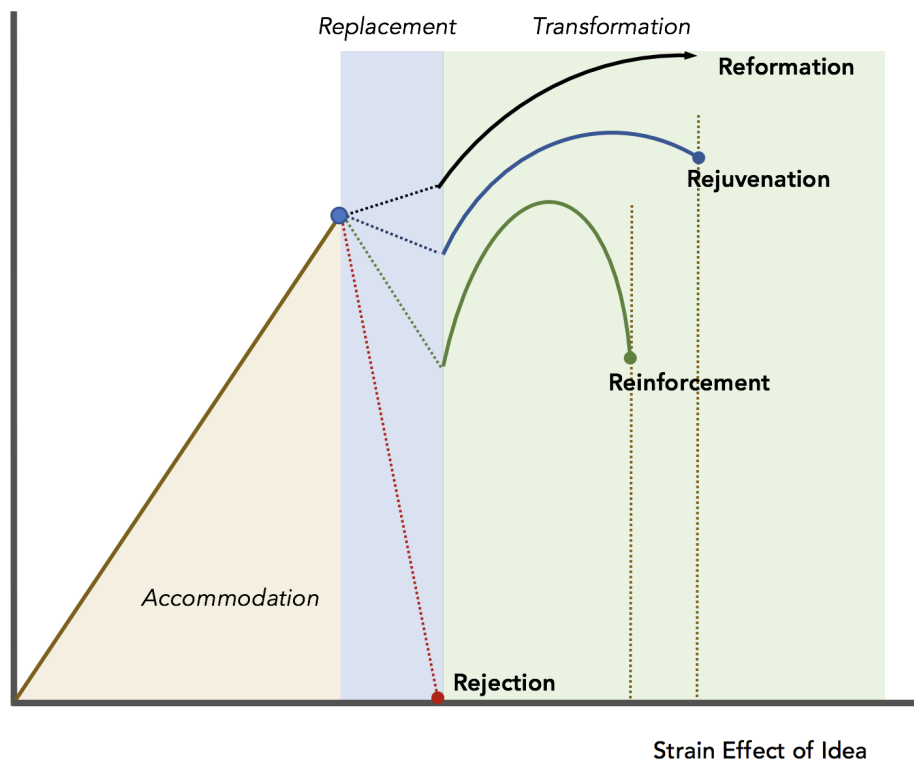


Fig. 1. The first part of the curve shows a *zone of accommodation*, where the increase in an idea's stress impact is absorbed by the system without causing any permanent fundamental change. Provided there is a cost for sustaining the idea's stress on the system, when the idea is withdrawn the system returns to its original institutional parameters. Beyond the blue dot, the blue rectangle then represents a *zone of replacement*, where we can imagine a permanent slippage in the ideas inherent in the system; the incumbent ideas within the system are replaced by the stressing idea, and the original system's configuration is now irrevocably lost. The extent of idea replacement determines the degree to which the new idea's stress needs to be maintained in order to effect fundamental transformations to the subsequent configuration of the new and innovated system. In the *zone of transformation*, the idea's stress impact creates fundamental transformations in a variety of ways ranging from a rejection of all old ideas to a reformation of them in conjunction with the new idea.

- We may, of course, have only a marginal replacement of the institution's ideas, yet yielding a meaningfully new and innovated institution, **rejuvenated** with new ideas. When replacement of ideas is only slight, we might imagine a situation where the innovation represented by the new system largely retains the previous ideas, but enhances them in a manner that makes them distinct from before, yet essentially recognizable. As an example, one might consider the case of a cuisine being introduced to a new country, and evolving in such a manner that it incorporates some new ideas without abandoning most essential ideas from its place of origin.
- We can imagine the phase of replacement for some institutions yielding a period of innovated ideas that are retained and deemed compatible with the extant institution's ideas before the period of transformation occurs. The stress effect of the new ideas then yields fundamental transformations in the ideas of the institution without overtly replacing any of them. In the new, **reformed** innovated institution, the ideas would *all* seem to be similar, yet palpably 'improved' from the influence of the new ideas. The advent of online modes of instruction in the education sector, involving distance-learning options for enrolled students, as well as several platforms that offer MOOCs for independent learners, is an apt example of this sort of innovated institution.

4 Concluding thoughts

The principal utility of the diagram we have considered rests in its simplicity. In a single 'back-of-the-envelope' diagram it manages to paint a useful picture by focusing attention on the effect of a new idea on the existing ideas that some institution might represent. Naturally, simplicity requires concentrating on essentials, but the benefit is that it provides a common basis for embarking on the analysis of an innovation, while remaining cognizant of the 'context' that the broader institutional ordering an environment represents.

Still, it is worth observing that several further insights can readily be derived from the diagram in order to examine other features of the process that results in an innovated institution. For example, the area under the curve within the zone of accommodation represents an institution's inherent absorptive capacity in the face of new ideas, whereas the area under the entire curve until the new innovated institution emerges represents the inherent resilience of the institutional form prior to the emergence of an entirely new innovated institution.

The diagram could perhaps also be usefully employed as a basis for incorporating a visual representation for observational study. For example, we might use it to contrast the effects of the introduction of a set of similar ideas on two different institutions, such as the effect that the theory of evolution had on the course of some set of religions of interest or the advent of blockchain technology on some set of financial intermediaries or supply-chain management companies. Such investigations would force us to consider the stress impact of the new idea on the inherent ideas of the institution that we are examining, as well see what strain effects are manifested as the institution evolves.

The accuracy of such a diagram in the context of examining institutional innovation would,

needless to say, be far from its use in mechanical engineering, but its ability in helping us keep track of the broader innovation process seems far from trivial.

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Biographies



Prateek Goorha. Prateek Goorha writes on the economics of innovation. He received his BA from the University of Virginia, his PhD from Vanderbilt University and was a Post Doctoral Fellow at the IQSS at Harvard University. He has held academic appointments in Australia and the United States, and has experience in the capacity of an entrepreneur and consultant in the private sector. His recent book, coauthored with Jason Potts of RMIT University, is called *Creativity and Innovation: A New Theory of Ideas*, and was published by Palgrave MacMillan.