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Article

Reassessing Political Legitimacy and Its Potential Influence in Constraining Technology Transfer Public Policy in the United States of America [†]

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Abstract

Despite significant government intervention, the incidence of technology transfer in the United States of America is still less than desired. There appears to be policy options to address this problem, but policymakers have not pursued them. One conjecture is that notions of what are politically legitimate actions are restraining policymakers from pursuing certain kinds of technology transfer policies. This paper presents the results of an examination of two questions. First, how have the current conceptualizations of political legitimacy potentially contributed to the lack of public policies that directly mitigate circumstances that hinder the transfer of technologies from universities and federal laboratories to the private sector? And second, what alternative conceptualization of political legitimacy can potentially encourage lawmakers to pursue such public policies? The primary conclusions are that the concept of political legitimacy has been reified on a normative basis and does not align with the behaviors of constituents. Moreover, current conceptualizations are potentially restraining policymakers in several ways that curb their willingness to pursue certain kinds of technology transfer policies. The paper presents an alternative conceptualization of political legitimacy that might enable policymakers to pursue a more diverse array of public policies that will more directly address factors that curtail technology transfer.

Keywords: political legitimacy; policy process; research policy; science policy; technology policy; technology transfer; technology commercialization

JEL Classification: L50; L52; O38

Introduction

The federal government of the United States of America (USA) has implemented a significant amount of public policy regarding the creation and transfer of technologies developed at universities and federal laboratories to the private sector for use that benefits the public interest (i.e., technology transfer). Although the term *technology* is used regularly in both scholarly and public discourse, its meaning is not precise. For the purposes of this examination, technology is defined as "culturally influenced information that social actors use to pursue the objectives of their motivations, and which is embodied in such a manner as to enable, hinder, or otherwise control its access and use" (Townes, 2022, p. 7). Technology transfer is thus defined as the voluntary conveyance of technology (as specified above) from the possession of one social actor (i.e., universities, federal laboratories) to the possession of another social actor (i.e., private sector organizations) for the purpose of applying the technology in a context in which it has not previously been applied (Townes).

Research and development activity is the primary source of technological development. Currently, the U.S. government outlays more than \$150 billion each year for research and development with nearly \$40 billion of that being directed to universities and colleges (National Center for Science and Engineering Statistics, 2022). To date, the U.S. government has enacted at least 16 major pieces of legislation and executive actions regarding technology transfer (see Table 1). Additional major legislation has also been proposed or is contemplated (see e.g., “Endless Frontier Act,” 2021; “Energizing Technology Transfer Act,” 2021; “United States Innovation and Competition Act,” 2021). These facts clearly illustrate that the federal government has taken and will likely continue to pursue significant action regarding technology transfer.

Table 1. Technology Transfer Public Policy.

Policy	Relevant Provisions
Pub.L. 96-517 Bayh-Dole Act of 1980	Permitted universities, nonprofit firms, and small businesses to take title to inventions derived from federally funded research as a way to incentive these organizations to facilitate the use of the inventions to benefit the public interest.
Pub.L. 96-480 Stevenson-Wydler Technology Innovation Act of 1980	Mandated that federal laboratories establish an Office of Research and Technology Application (ORTA) to facilitate their active technical cooperation with the private sector.
Pub.L. 97-219 Small Business Innovation Development Act of 1982	Mandated that federal agencies set aside a specific portion of their extramural research budgets to fund research and development projects within the scope of their agency missions to be performed by small businesses in the private sector.
Pub.L. 98-462 National Cooperative Research Act of 1984	Enabled private sector businesses to participate in joint pre-competitive research and development ventures without violating federal antitrust laws. Eliminated treble damages in antitrust litigation arising from such ventures.
Pub.L. 99-502 Federal Technology Transfer Act of 1985	Established the Federal Laboratory Consortium (FLC) for Technology Transfer and enabled government-owned, government-operated federal laboratories (GOGOs) to directly enter into cooperative research and development agreements (CRADAs) with private sector businesses.
Executive Order 12591 Facilitating Access to Science and Technology	Further specified Pub.L. 99-502, Pub.L. 98-620, and Pub.L. 96-517 for administrative purposes to ensure that federal agencies and laboratories assist the technology transfer efforts of universities and private sector organizations.
Executive Order 12618 Uniform Treatment of Federally Funded Inventions	Expanded upon Executive Order 12591 to harmonize across all Federal agencies the policies for administering patents and licenses for inventions created with federal funding support.

Pub.L. 100-418 Ominbus Trade and Competitiveness Act	Established Manufacturing Technology Centers (MTCs) and designated the National Institute of Science and Technology (NIST) as the lead agency to administer them. Specified requirements regarding the equitable access for United States persons to foreign-developed technology and the export of technologies.
Pub.L. 101-189 National Competitiveness Technology Transfer Act of 1989	Extended the ability to execute CRADAs with private sector businesses to all government-owned contractor-operated federal laboratories (GOCOs).
Pub.L. 102-245 American Technology Preeminence Act of 1991	Authorized appropriations to be available for Regional Centers for the Transfer of Manufacturing Technology, State Technology Extension Program, Advanced Technology Program, and Satellite Manufacturing Centers.
Pub.L. 103-160 National Defense Authorization Act for Fiscal Year 1994	Directed the Advanced Research Projects Agency (ARPA) to promote dual-use technology via technology reinvestment.
Pub.L. 104-113 National Technology Transfer and Advancement Act of 1995	Enacted changes to ease the ability of private sector businesses to obtain exclusive license to inventions that result from cooperative research with the federal government.
Pub.L. 106-404 Technology Transfer Commercialization Act of 2000	Requires license applicants for federally owned inventions to commit to achieving practical application of the invention within a reasonable time.
Pub.L. 108-453 Cooperative Research and Technology Enhancement (CREATE) Act of 2004	Amended federal patent law to clarify the criteria for obviousness and created a framework to facilitate inter-organizational research collaborations that do not create prior art that would serve as a bar to obtaining a valid patent.
Pub.L. 112-29 Leahy-Smith America Invents Act	Reformed patent laws and instituted “first inventor to file” patent registration system.
Pub.L. 117-167 CHIPS and Science Act	Authorizes funding to support technology transfer capacity building for research institutions to advance the development, adoption, and commercialization of technologies.

Note. Source: Townes (2025).

Despite this intervention, the incidence of technology transfer is still less than desired. It is estimated that greater than 80% of patented technologies created with federal funding support are not licensed and thus their commercialization is not being pursued (see Figure 1). Although the current percentage of licensed technology patents is nearly 4 times greater than the percentage prior to the passage of the Bayh-Dole Act of 1980, there is still significant ineffectiveness in technology transfer.

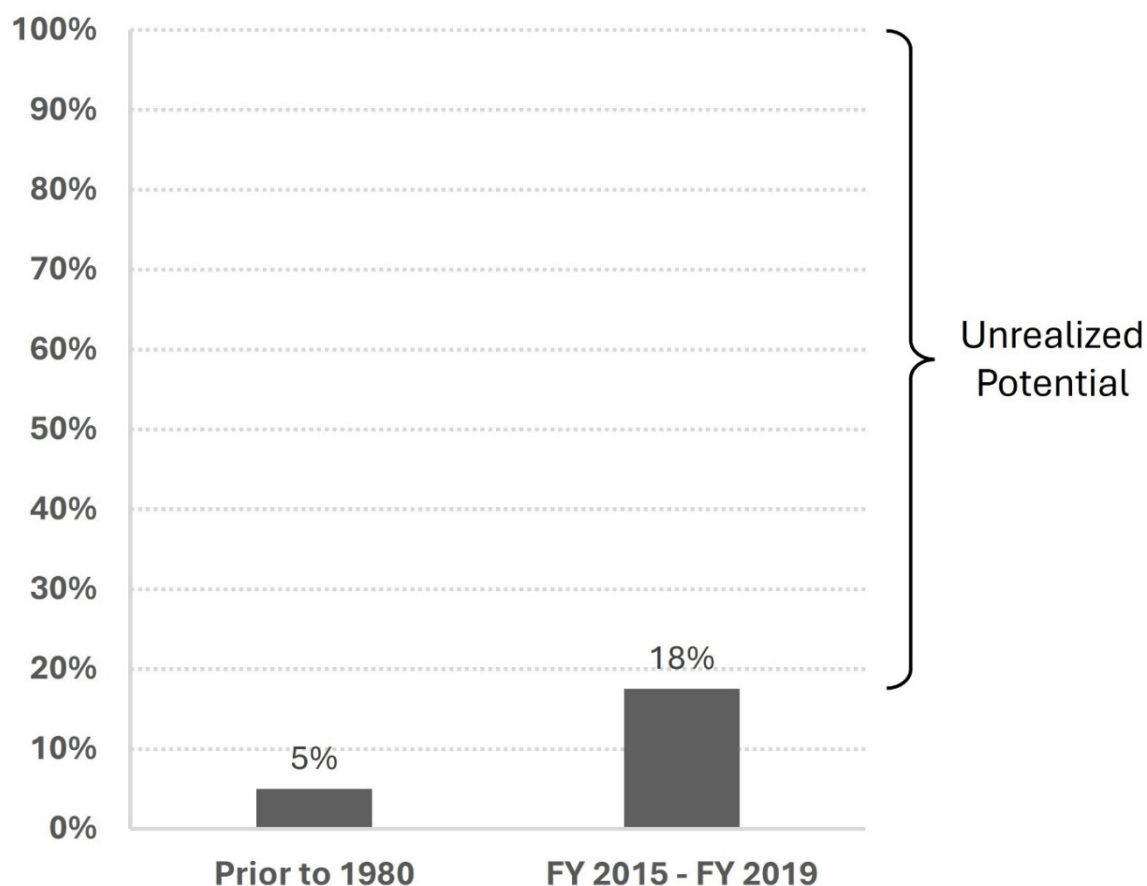


Figure 1. Estimated Percentage of Licensed Federal Laboratory and University Technology Patents. *Note.* Figure created by author.

There are possible public policy actions that can be taken to address this ineffectiveness in technology transfer, which raises an obvious question. Aside from resource constraints, political gridlock, and personal incentives, why have legislators not implemented public policy that could more directly address ineffectiveness in technology transfer? One reasonable conjecture is that notions of what is politically legitimate are somehow restraining policymakers from pursuing certain kinds of technology transfer policies. As such, the purpose of this examination is to consider two questions. First, how has the current conceptualizations of political legitimacy potentially contributed to the lack of public policies that directly mitigate the circumstances that hinder the transfer of technologies from universities and federal laboratories to the private sector? And second, what alternative conceptualization of political legitimacy can potentially encourage lawmakers to pursue such public policies?

Review of the Related Literature

This section of the paper surveys and summarizes the relevant extant literature. It begins by reviewing the literature on the political legitimacy of government intervention in technology transfer. It then summarizes the broader literature about political legitimacy, how the construct of legitimacy has been applied in organization studies, and how political legitimacy is determined.

The Political Legitimacy of Technology Transfer Policy

A review of the literature revealed little discourse examining the political legitimacy of government intervention in technology transfer at the macro level. Studies generally concentrate on legitimacy as a necessary condition for an administration to justifiably expend public money on particular kinds of technology development projects and ways to assess political legitimacy (see e.g.,

Bergek et al., 2008; Blankesteyn & Bossink, 2020; Pace et al., 2017). Macro-level and meso-level perspectives in the literature on the political legitimacy of technology transfer policy, particularly as it relates to federal efforts to encourage and facilitate the transfer of technologies from federal laboratories and universities to the private sector, appear to be sparse, cursory, or prescriptive in nature.

Wijnberg (1994) is one of the few works found in the literature that conducts a more macro-level examination of the political legitimacy of technology policy. This was undertaken to warrant legitimacy claims for public support of the arts. The analysis is firmly rooted in neoclassical economics theory that conceptualizes technology as an impure public good and applies the concepts of market failures and merit goods. However, the examination focused on the creation of technology through publicly funded research and development. It did not extend to the transfer of such technologies for use in the private sector.

Innovation scholars have broached the subject of the political legitimacy of government intervention in the transfer of knowledge and technology at the macro- and meso-level (see e.g., Bozeman, 2000; Correa & Zuniga, 2013; Kochenkova et al., 2016; Townes, 2022). Again, neoclassical economics theory is the predominant lens through which the political legitimacy of government intervention in technology transfer is considered.

The Construct of Political Legitimacy

The concept of legitimacy is a topic that is studied across multiple disciplines. The idea of political legitimacy has been debated for millennia (see Du, 2017). There currently are at least six main streams of research on political legitimacy (see Table 2). How political legitimacy is conceptualized and defined varies across research streams. However, studies in every research stream tend to reify the construct of political legitimacy.

Table 2. Streams of Research on Political Legitimacy.

Research Stream	Construct Conceptualization	Exemplar Research Questions	Literature Sources
Sources	An attribute of a political figure or institution	<ol style="list-style-type: none"> 1. What are the different types of political legitimacy? 2. What are the sources of political legitimacy? 3. What do political leaders attain and maintain the authority to rule? 	(Dogan, 2009; Mayntz, 2011; Peter, 2023b; Rigby, 1982; Weber, 1922/2020, 1958; Wikipedia contributors, 2026, February 19)
Normative analysis	A values-based status that the governed confers upon political leaders, institutions, and actions	<ol style="list-style-type: none"> 1. How should one define political legitimacy? 2. When should one person or group have the right to rule over another? 3. Are only just actions politically legitimate? 	(Brinkmann, 2024; Gilley, 2006; Levitov, 2016; Peter, 2020, 2023a; Wikipedia contributors, 2026, February 19)
Meta-normative analysis	A feature of political actions	<ol style="list-style-type: none"> 1. What makes a political authority and its decisions legitimate? 	(Peter, 2020, 2023a; Wikipedia contributors, 2026, February 19)

		<ol style="list-style-type: none"> 2. What does political legitimacy mean across cultural contexts? 3. Can an action of a governing authority be politically legitimate even if most constituents oppose it? 	
Dimensional analysis	A multi-dimensional trait of government institutions	<ol style="list-style-type: none"> 1. How do perceptions of political legitimacy differ across governing systems? 2. What variables influence individual-level beliefs about political authorities? 3. To what extent do beliefs about how a political system should function differ across governing systems? 	(Gilley, 2006; Harfst & Wiesner, 2024; Maffettone & Ulaş, 2019; Parkhurst, 2017; Wikipedia contributors, 2026, February 19)
Construct measurement	A characteristic of political systems, governing authorities, and institutional performance that is comprised of normative and empirical dimensions	<ol style="list-style-type: none"> 1. How does one operationalize the concept of political legitimacy so that it can be measured? 2. How does one measure political legitimacy? 3. How can one integrate various dimensions of political legitimacy into its measurement? 	(Gilley, 2006; Harfst & Wiesner, 2024; Von Haldenwang, 2016; Weatherford, 1992; Wikipedia contributors, 2026, February 19)
Legitimation processes	A non-static property of a governing authority that is established, maintained, or lost through a dynamic social process	<ol style="list-style-type: none"> 1. How is political legitimacy formed, maintained, and lost? 2. How effective are various legitimation strategies? 3. What is the correlation between specific legitimation strategies and specific constituent beliefs and behavior? 	(Johnson et al., 2006; Lippi, 2024; Peter, 2023b; Wikipedia contributors, 2026, February 19)

Note. Table created by author.

Because of disciplinary specialization, the term “legitimacy” has come to mean different things to philosophers, social scientists, and lawyers (Greene, 2019). Trover (2011) defined legitimacy as “a state of appropriateness ascribed to an actor, object, system, structure, process, or action resulting from its integrations with institutional norms, values, and beliefs” (p. 350). This definition suggests that in some respects, political legitimacy is a reflection of values and preferences, but it also reifies the construct by treating it as an intrinsic trait. Suchman (1995) defined legitimacy in an organization studies context as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions” (p. 574). This definition minimizes reification of the construct. Moreover, it is broad-based and is quite applicable to government institutions, governing authorities, and their actions. More recently, Greene proposed conceptualizing political legitimacy as a system-level property produced when those who are subject to a governing authority voluntarily and willingly agree to being ruled by it. This conceptualization also seems to reify the construct. In essence, Greene argues that political legitimacy is a social-political good produced when the members of a society willingly provide affirmative consent to being ruled by a governing authority but offers the caveat that not all voluntary willingness to being ruled contributes to political legitimacy.

Scholars generally maintain that there are different kinds of political legitimacy, and each relies on different mechanisms to establish authority. The legitimacy typology that Weber (1922/2020) outlined is probably among the most well-known frameworks. It describes three types of political legitimacy termed legal-rational, traditional, and charismatic. More recently, Lenowitz (2019) argued that there are at least three types of political legitimacy, namely moral legitimacy, legal legitimacy, and sociological legitimacy. Other scholars have proposed alternative frameworks and conceptions of legitimacy (see e.g., Beetham, 2012; Habermas, 2015; Lipset, 1969; Stillman, 1974). The predominance of one form of political legitimacy over all others at any given time seems to be implicit in these frameworks. The common idea among all these conceptions of political legitimacy is that if people (as a collectivity) consider a governing authority to be legitimate, then they will accept its actions and abide by its requirements even if they are not what the people would have preferred or considered the best course of action in the given circumstances.

Although most studies on political legitimacy occur at the macro-level, political legitimacy also applies at the meso-level and micro-level. For any government policy to be effective and long enduring, a significant majority of the population must deem it legitimate. Otherwise, efforts to undermine or overturn the political order by those who do not consider the policy to be legitimate will gain traction, cause political strife, and destabilize the social order. However, it should be noted that considering a policy ineffective, undesirable, or even harmful is not the same as considering it illegitimate.

Organization Studies Perspective of Legitimacy

In the fields of organization studies and management studies, legitimacy denotes the reaction of a collectivity to the pattern of behavior of an organization as observed by the collectivity (Suchman, 1995). The conceptualization of legitimacy in organization and management studies closely aligns with its conceptualization in the political context. When legitimacy exists, organization members and stakeholders, as a whole, accept the behavioral pattern of the organization, despite the reservations that any single person may have about a single behavior or isolated action of the organization or their knowledge of concerns that other persons might have about such behavior or action (Suchman). This can be applied not only to organizations, but also to government institutions, governing authorities, and policy actions as well.

Organization and management studies scholars have developed legitimacy theory to explain what constrains and enables organizational actors within a given society. Suchman (1995) described a typology of three primary kinds of organizational legitimacy (see Figure 2). This typology can be applied in a political context.

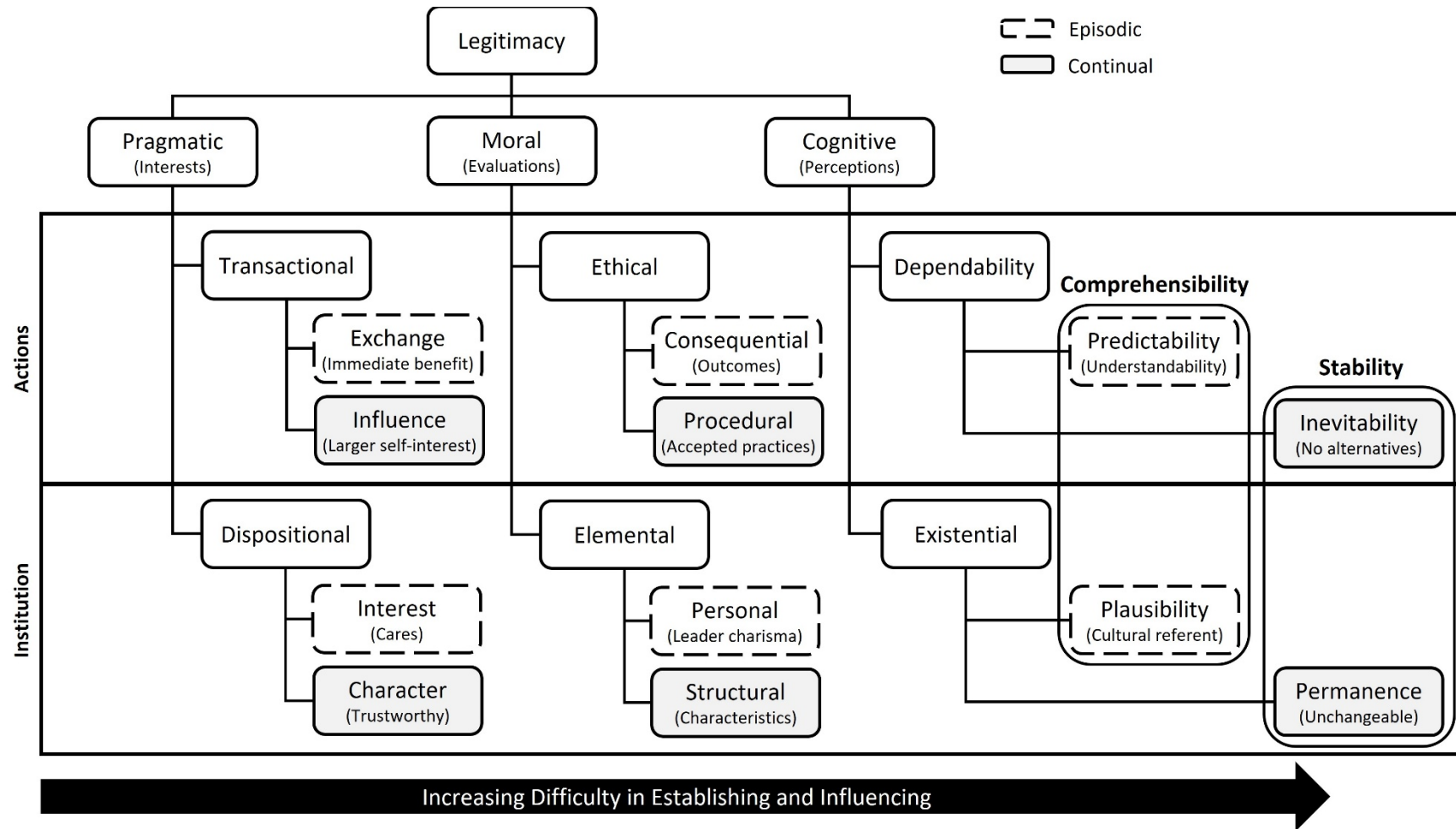


Figure 2. Suchman's Typology of Legitimacy. Note. Figure created by author.

The 1995. described is not strictly hierarchical. No one form of legitimacy is necessarily superior to another. However, Suchman postulated that legitimacy is generally expected to be more difficult to establish and influence, harder to notice, more visceral, and more self-reaffirming as one moves from pragmatic to moral to cognitive. This suggests that perceptions of political legitimacy for government action in a policy domain, such as technology transfer, will be more stable and long-lasting if its cognitive form can be established among the public. Moreover, it appears that various kinds of legitimacy can co-exist under this framework.

Determining Political Legitimacy

To one degree or another, all the streams of research on political legitimacy explore issues relevant to how the political legitimacy of a governing authority or its actions are determined. Many scholars and policymakers have long used neoclassical economics theory, either implicitly or explicitly, to assert claims of political legitimacy for government actions. Economics theory, which is built upon normative postulations, argues that market failures (i.e., when markets are less than Pareto efficient) establish the political legitimacy of such intervention (see Stiglitz, 2000; Wijnberg, 1994). According to neoclassical economic theory, six characteristics tend to produce markets that are not Pareto efficient – public goods, negative externalities, failure of competition, incomplete markets, information failures, and macroeconomic disequilibria (Stiglitz).

There are also conditions outside of market failures that neoclassical economics theory considers to be reasonable grounds for government intervention. One is an undesirable distribution of income, and the other is the case of merit goods (Stiglitz, 2000). It is quite possible for markets and economies that are Pareto efficient to leave many people without the resources to achieve a minimally acceptable standard of living according to the values and mores of society. The criterion of Pareto efficiency does not consider the distribution of income throughout a society (Stiglitz). Circumstances in which people cannot secure the necessary resources for a minimum standard of living may conflict with the generally accepted norms of the population. Moreover, they can lead to social strife. In the case of merit goods, the government forces consumption because, in the absence of such action, individuals will fail to consume goods and services that benefit them (Stiglitz). Scholars argue that this kind of government intervention can be warranted. There is no guarantee that people's perceptions of their own welfare will be accurate and reliable for making judgments about actions that affect their welfare, even when people are fully informed (Stiglitz). Under such circumstances, people's failure to consume goods and services beneficial to their welfare could also impose negative externalities on society.

Schumpeterian theory (also called dynamic theory or evolutionary theory) is another framework that one might employ to establish the legitimacy of government actions. Schumpeterian theory also takes the position that government intervention is politically legitimate only under certain specific circumstances, such as cases of market failures (see Martin & Scott, 2000; McCraw, 2012). However, advocates of Schumpeterian theory define an improperly functioning market not as the neoclassical economics concept of a venue in which buyers and sellers exchange goods and services where such exchanges have not achieved and maintained a Pareto efficient equilibrium, but instead as a setting that has not maximized the amount of innovative evolution of goods and services (see Bofinger, 2025; Hospers, 2005; Wijnberg, 1994; Zhang, 2024). Advocates argue that only a market that is in a state of continuous disequilibrium can achieve such maximization and thus a market that is not continuously in disequilibrium is a market failure (see Bofinger; Zhang). They further contend that the stipulations for what constitutes a perfect market as defined in neoclassical economics theory are impractical and unachievable (see Hospers; Wijnberg). Therefore, employing the neoclassical economics conception of a properly functioning market as the benchmark by which one judges the political legitimacy of government intervention is fundamentally flawed according to advocates of Schumpeterian theory.

Although Schumpeterian theory conceptualizes a properly functioning market differently than neoclassical economics theory, it is still bound to the same ontological anchor found in neoclassical economics theory which reifies political legitimacy by treating it as an absolute, objective

characteristic of government action that can be specified by whether and to what degree such action eliminates market failures or facilitates merit good consumption. Neither Schumpeterian theory nor neoclassical economics theory accommodate the fact that the political legitimacy of government intervention is a socially produced judgment. This is because both Schumpeterian theory and neoclassical economics theory model society in a way that ignores the sociological aspects that significantly influence the behaviors and judgements of people.

Both neoclassical economics theory and Schumpeterian theory are economics perspectives. Using them as the basis on which to make decisions about the political legitimacy of policy is useful but not without shortcomings. It is important to recognize that arguments supporting their use for making judgments about the political legitimacy of technology transfer policy or any other government intervention are themselves normative in nature. They approach the issue by arguing for “what ought to be.” The aim of this analysis is to understand political legitimacy descriptively and apply that understanding to technology transfer policy.

Constraining Technology Transfer Policy

This section discusses how the current conceptualization of political legitimacy has likely constrained technology transfer policy. It begins by explaining how government intervention in technology transfer has traditionally been justified. It then explains how the traditional view has likely influenced technology transfer policy and the resulting impact.

The Traditional Case for Political Legitimacy

Public sector economics has traditionally been used to warrant claims of political legitimacy for the government’s intervention in technology transfer. The justification for this intervention is rooted in the conception of technology and technology transfer as impure public goods and merit goods. In many respects, technology can be viewed as an impure public good whose consumption is non-rivalrous but excludable. The information and knowledge aspects of technology have public good characteristics (Lall, 2001). Once a technology is developed, its use by one person generally does not impede its use by another. However, technology can be made excludable by the nature of its embodiment or by conferring property rights in the form of intellectual property rights (i.e., patent rights, copyrights, and protections for trade secrets) that one can enforce using the coercive powers of the state.

Generally, technology transfer can also be thought of as an impure public good as well as a merit good. The marginal cost of an additional actor using a given technology is often negligible. Thus, technology transfer can be considered non-rivalrous. However, technology transfer can be made excludable through legal mechanisms such as options and licenses for intellectual property. This combination of non-rivalry and excludability are the characteristics of an impure public good.

A merit good satisfies a public want and could be provided through a market mechanism because it can be made excludable, but it is under-consumed simply because of consumer choice, not necessarily because of market failure (Desmarais-Tremblay, 2017; Musgrave, 1959). In the case of technology transfer, there are numerous instances in which technologies are not transferred because of private sector choices. Moreover, the consumption of a merit good produces positive externalities that far outweigh any negative externalities that such consumption might generate (Desmarais-Tremblay; Musgrave). As such, the government intervenes for the purpose of forcing public consumption rather than to mitigate a market failure (Desmarais-Tremblay; Musgrave). Technology transfer seems to satisfy the definition of merit goods. It produces societal, ecological, and economic benefits (Libecap, 2009; Link & Scott, 2019). These benefits generally seem to far outweigh any negative consequences.

Influence on Technology Transfer Policy

The traditional approach for considering the political legitimacy influences the formulation of technology transfer policy in several ways. First, it has led to public policy that prioritizes profit maximization in the short term over the maximization of public benefits in the long term. This emphasis on financial gain often conflicts with other considerations such as protection of the environment, stewardship of the commons, and the minimization of negative externalities.

The prominence of justifications for government intervention in technology transfer based on neoclassical economics theory has led to public policy that influences the operations of universities in ways that are potentially undesirable. Current technology transfer policy incentivizes universities to pursue patents for research regardless of societal impact so long as there is the potential for financial gain. Moreover, there is a disincentive for universities to pursue the identification of applications for socially valuable research outputs and facilitate their adoption if they have no obvious profit-generating potential.

Finally, the traditional view of political legitimacy as applied to technology transfer policy has indirectly led to a narrowing of how technology transfer practitioners conceptualize technology. It encourages political leaders to limit their consideration of technology transfer interventions to only those that satisfy the criteria of neoclassical economics theory, which prioritizes profit maximization. Patents are generally considered necessary for technology-based ventures to create a sustainable competitive advantage that can generate profits and make it easier for universities to extract a portion of the value created by the commercialization of university-owned technology. This has resulted in university technology transfer practitioners predominantly focusing on technologies that are patentable. Thus, the conceptualization of technology in practice has effectively narrowed to patentable subject matter, which varies to some extent across geopolitical contexts (see Townes, 2025).

Reconceptualizing Political Legitimacy

This section of the paper attempts to revise and expound upon extant knowledge by modifying the perspective used to apply the concept of political legitimacy in the context of technology transfer policy. The examination begins by problematizing the current conceptualizations. While doing so, the analysis expands upon the need for a reconfiguration or shift of perspective to better align the conceptualization of political legitimacy to desired influence on technology transfer policy. The section then attempts to integrate disparate concepts into a more conceptually robust framework for considering the political legitimacy of government intervention in technology transfer.

Concerns and Issues

There are several concerns and issues with the orthodox conceptualizations of political legitimacy that not only constrain technology transfer policy, but also potentially impede theory development and hamper the effectiveness of political legitimacy as a concept to guide the actions of policymakers regarding technology transfer and other societal issues. To begin, the traditional approaches to political legitimacy reify the construct. They treat political legitimacy as a component of physical existence, which it is not. Political legitimacy is not a fundamental phenomenon akin to the fundamental physical interactions of the universe, such as gravity or the electromagnetic force, that hold true irrespective of human activity. The human tendency for self-preservation is probably the closest thing to a fundamental social principle. People will tend to act and leverage whatever agency and power is available to them in pursuit of self-preservation, fulfillment of a self-interest, or attainment of a greater objective of intrinsic value. To quote Thucydides – “The powerful exact what they can, and the weak have to comply.”¹ Thus, political legitimacy is not a natural element of material reality. There are only what actions constituents will and will not allow government authorities to take, the reasons constituents will and will not allow government authorities to take them, and the consequences of defying the will of the people.

Another concern is that the goal of satisfying economics criteria as the primary or sole requirement for government action to be politically legitimate is itself a normative criterion, to which

the public has no obligation to abide. There is no reason that people could not or should not use other criteria to make judgments about the political legitimacy of government intervention in technology transfer or any other area of society. A descriptive and positivistic examination makes it clear that “the public makes decisions based on an array of inputs, including but not limited to scientific facts” (Leshner, 2021). Additionally, only a small portion of the population is likely to even have a sufficient understanding of the relevant economics theory. Moreover, there is no requirement that people apply economics theory as the basis for judgments about the legitimacy of government actions regarding technology transfer even when it is explained to them.

It seems that one of the aspects of the economics perspective that its advocates appreciate is the notion of rationality. However, there are in fact several types of rationality that one can apply to establish decision criteria for making judgments about government actions (Dunn, 2016). Economic efficiency is often used as the criterion for selecting policy prescriptions. However, basing such decisions on whether an alternative achieves a valued outcome irrespective of how efficiently it uses resources (i.e., effectiveness) or the extent to which a given level of a valued outcome satisfies a specific standard irrespective of economic efficiency (i.e., adequacy) are also socially justifiable criteria.

Another problem with the traditional approach to political legitimacy is the notion that individuals make assessments about political legitimacy irrespective of the concerns of others. Suchman (1995) also accepts this proposition when applying the construct of legitimacy to organization studies. However, this does not correspond with what has been empirically demonstrated about human behavior. Judgments about political legitimacy are essentially choice decisions. There is a socio-political dimension to decision-making, and social processes such as sensemaking and sense-giving are important factors (see e.g., Balogun et al., 2008; Hodgkinson & Starbuck, 2008). Sociological phenomena can even affect the judgments and decisions of individuals (see e.g., Asch, 1951, 1956).

Most philosophical approaches treat political legitimacy as a regulative ideal, and often an unattainable one (Greene, 2019). It is an abstract normative principle to which people should aspire but sometimes fall short. These treatments of political legitimacy seem to imply an all-or-nothing dichotomy in which a governing authority and its actions are either legitimate and accepted or illegitimate and rejected in their entirety. This conceptualization is of limited usefulness from a practical perspective. Moreover, it may constrain research on the topic and reduce the usefulness of the construct as a guide for elected officials and policymakers.

While conceptualizing social concepts as such dichotomies is a useful way to understand them, social phenomena often manifest in terms of degree (Schneider & Wagemann, 2012). Thus, one technology transfer policy can tend towards legitimacy, and another technology transfer policy can tend toward illegitimacy, with neither of them being completely legitimate nor completely illegitimate. Moreover, the consequences of a governing authority pursuing actions regarding technology transfer that are more on the illegitimate end of the spectrum may not be as severe as pursuing analogously illegitimate actions in other areas. These are important nuances that seem to have been lost in the general discourse about political legitimacy and technology transfer policy.

An Alternative Conceptualization

An alternative conceptualization of political legitimacy is now offered. In this alternate approach, political legitimacy is conceptualized as an emergent phenomenon that arises from the judgements of individuals within a population about whether the actions of a governing political authority are sufficiently egregious to cause a critical number of people to act to either nullify the actions, preemptively remove the governing authority, or overturn the political framework itself. Political legitimacy is conceptualized as the outcome of a social process, instead of reified intrinsic attribute of an institution, institutional action, political figure, governing authority, or policy action. Thus, political legitimacy is defined as the nonoccurrence of rebellious action by a sufficient portion of the population to either subvert or force the enactment of changes in the political order in response

to the actions of a governing authority or its gain of governmental control. With this conceptualization, an effort is made to conduct a more descriptive, non-normative examination of the political legitimacy of technology transfer public policy.

The examination of the political legitimacy as an emergent phenomenon is aided by the lenses of social constructionism and the concept of morality tales. Social constructionism provides a framework for understanding legitimacy as a social phenomenon, which is not a concrete phenomenon like universal physical constants that exist outside of human social interaction. The concept of morality tales facilitates the consideration of how ideology and worldview influence political considerations such as the legitimacy of government actions. These frameworks address the sociological aspects of how political legitimacy is judged, which are lacking in the economics-based perspectives.

Fundamental to social constructionism is the idea that people develop meaning about social phenomena primarily through interactive communication with others and not individually (Littlejohn & Foss, 2009). Political legitimacy is a human construct and not a phenomenon of nature. When studying political legitimacy, one must be cautious about reifying the concept. Judgments about political legitimacy are based on the meaning that people attribute to the actions of political institutions and governing authorities. Moreover, social phenomena do not have meaning independent of the historically informed mental and linguistic representations that people ascribe to them (Berger & Luckmann, 1966/2011).

The question of how constituents come to judge government intervention as legitimate or illegitimate is essentially a question of how people apply various forms of knowledge to attribute meaning to governing authorities and their actions. One cannot exist as a fully formed human being without regular interaction and communication with other people through various mechanisms that can be physically or temporally close together or removed (Berger & Luckmann, 1966/2011). Much of this communication employs narratives, which people use to cognitively organize new information, and serves an important function in formulating rationales for individual beliefs and actions (Jones et al., 2014). There is an ongoing correlation between one's own comprehension of the world and that of others (Berger & Luckmann). One's own thinking is invariably influenced by this interaction.

Empirical research demonstrates that people use two distinct modes of thinking when forming judgments and making decisions (Kahneman, 2011). One mode is intuitive and emotionally driven while the other is analytical and intentional. Human decision-making is largely driven by the former and the latter mode (i.e., analytical and intentional) is often only triggered when the first fails to readily produce a solution (Kahneman). However, the analytical thinking mode defaults to a positive test strategy and tends to be uncritical (Kahneman). Thus, the analytical and intentional thinking mode does not offer complete inoculation against the vulnerabilities of the intuitive thinking mode. This suggests that constituents likely default to accepting or rejecting a governing authority's legitimacy claims for its public policy based largely on how they might feel about the governing authority. Even if their analytical and thinking mode is triggered causing them to evaluate policy action, it is likely that the tendency to employ a positive test strategy will bias them to seek and notice information that affirms their default acceptance or rejection of the legitimacy of the public policy. Additionally, people evaluate their options relative to a reference point rather than on an absolute basis when making decisions and formulating judgments (see e.g., Kahneman & Tversky, 1979, 2013; Tversky & Kahneman, 1992). When making judgments about the political legitimacy of government actions, such as technology transfer policy, people are likely to employ morality tales and their perceptions about the previous actions of a governing authority as a component of their referent.

The morality tale is how people understand themselves, their society, and what they desire for themselves and their community. It helps people interpret and explain social reality and informs what people come to expect of their fellow citizens and government (Reich, 1987). Reich's typology of morality tales comprises four basic types applicable to the experience of the USA, each with a liberal and a conservative variant (see Figure 3). However, regardless of the specific variation that

captures each person's ideology, the basic theme of all the morality tales according to Reich is that the USA is:

“a nation of humble, immigrant origins, built out of nothing and into greatness through hard work; generous to those in need, those who cannot make it on their own; a loner among nations, suspicious of foreign entanglements, but willing to stand up against tyranny; and forever vigilant against corruption and special privilege.” (pp. 4-5).

The primary difference between the liberal and conservative variants of this theme centers around who is assigned to the roles of villain and hero.

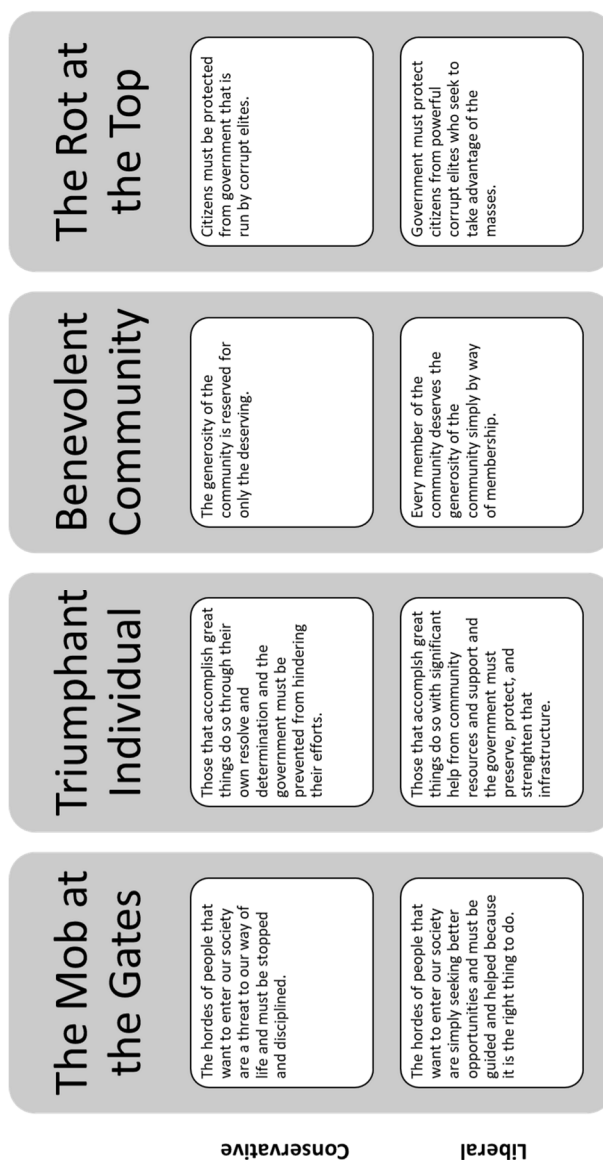


Figure 3. Typology of Morality Tales. *Note.* Figure created by author.

An alternative proposition is that political legitimacy is not so much attained, but that illegitimacy is avoided. Thus, political legitimacy is the outcome of the aggregation of judgements of individuals within a population that a governing authority or its actions are not egregiously inappropriate according to the norms of society as they know them and thus do not warrant “rebellious action”. The corollary is that illegitimacy (i.e., not legitimate) is the outcome of the aggregation of the judgements of individuals within a population that a governing authority or its

actions are so egregiously inappropriate according to the norms of society as they know them that they are willing to take “rebellious action” against the government and disrupt the political order.

It is proposed that people, in effect, tend to tacitly assume the political legitimacy of a governing authority or public policy. By analogy, they act like scientists testing the null hypothesis that a governing authority or its actions are legitimate. They only discard it in favor of the alternative hypothesis that the governing authority or its actions are not legitimate if significant evidence causes them to do so. As such, the question becomes what constitutes such evidence and how much evidence is required?

Given what is understood about decision-making and human sociological processes, one can posit that people do not assess the political legitimacy of the individual actions of a governing authority in isolation. That is, constituents do not assess the political legitimacy of a government policy in a stand-alone fashion. However, constituents may deem any given policy at any given time to be illegitimate in the context of the totality of government actions. Thus, a single policy could become the proverbial “straw that broke the camel’s back” and cause a significant majority of constituents to assess the policy, the governing authority, or even the institution itself, to be illegitimate.

By way of analogy, think of illegitimacy in terms of a large container suspended over the heads of policymakers by twine – something akin to the sword of Damocles.² In the absence of actions that constituents consider illegitimate, all is well. The container remains suspended, and the policymakers are unaffected. But for every action that constituents do find illegitimate, weight is added to the container and the amount of weight added depends on the degree of the infraction. Weight is removed from the container based on the amount of time that elapses between infractions and the number of subsequent actions that the policymakers take that constituents consider legitimate. But if too much weight accumulates in the bucket the twine will break, and the weight-filled container will fall on the policymakers causing significant harm.

This analysis postulates that people make judgments about the political legitimacy of governing authorities and their actions through a sociological process in which social constructionism and morality tales act as key mechanisms (Figure 4). Subjectivation greatly influences what one perceives as normal (see Baltes-Löhr et al., 2015; Berger & Luckmann, 1966/2011). Additionally, people filter their observations and the information they receive through one or more morality tales that serve as a referent to help people make sense of the governing authority and its actions. The morality tales with which a person identifies are distillations of what they perceive as true about the world (i.e., worldview) and what they believe is morally correct (i.e., ideology). How well a policy aligns with a person’s worldview and ideology will influence whether they perceive it to be legitimate or not.

In addition to the influence of one’s own cognitive processes on judgments about political legitimacy, social constructionism suggests that people influence one another’s judgments about legitimacy. Agents of the other two actor groups in the triple helix model of innovation (i.e., industry firms and universities) participate in this interaction as advocates of either the legitimacy or illegitimacy of policy or serve as sources of other data and information that constituents perceive as relevant. In the course of everyday life, people comprehend reality through a variety of typifications that are more abstract as they become more physically and temporally removed from the individual (Berger & Luckmann, 1966/2011). This process produces social order, including political legitimacy. Social order is an ongoing human production (Berger & Luckmann). Thus, political legitimacy as an outcome of sociological processes, is an ongoing human productions as well.

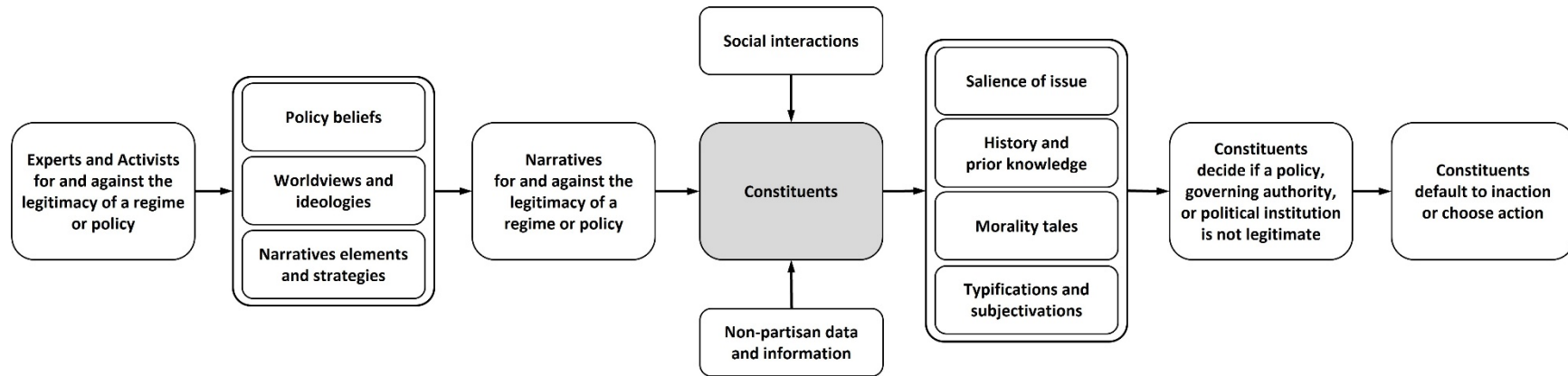


Figure 4. Descriptive Model of Political Legitimacy. *Note.* Figure created by author.

The number and variety of typologies that scholars have proposed for the concept of legitimacy suggests that one should approach political legitimacy as a multidimensional construct. Suchman's (1995) typology of legitimacy is a useful foundation upon which to build. One can apply this typology to integrate the various aspects of the proposed reconceptualization of political legitimacy. Instead of thinking of Suchman's typology as a classification of the various kinds of legitimacy, one can apply it as a classification of the dimensions of the construct of political legitimacy. One can think of political legitimacy (or "not politically illegitimate") as the outcome and the various subtypes as causal conditions that can be conjunctively combined to produce judgments of whether governing authorities or public policies are legitimate or illegitimate. Assuming causal complexity applies (as it usually does with most sociological phenomena), then the various conditions or conjunctions of conditions are either necessary or sufficient to avoid illegitimacy. Another way to reinterpret Suchman's typological approach is to think of political legitimacy as a higher-order construct in which the various subtypes are components or dimensions of that higher-order construct rather than distinct types of legitimacy. Causal complexity is still applicable with this conceptualization.

With this alternative conceptualization of political legitimacy, it becomes necessary to reconsider the possible actions and outcomes that may cause people to deem a governing authority or public policy to be illegitimate. The American political framework affords people recourse short of armed revolt in the face of illegitimate government action. One can think of the political order as consisting of three tiers (see Figure 5). Action can be taken in response to illegitimate government behavior at any of these tiers. However, determining whether constituents' actions against a policy, governing authority, or political framework are indications that they consider them to be illegitimate requires one to consider the reasons for the actions.

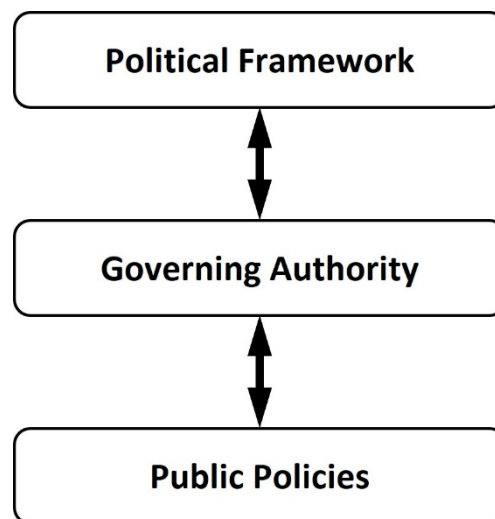


Figure 5. Tiers of the Political Order. *Note.* Figure created by author.

At the lowest level, people may rebel against the policy that they believe is not legitimate. If a person considers a policy legitimate, they will accept it as the way things are even if they disagree with the policy. That is, the person will not act rebelliously against the policy even if they disagree with it. However, if a person does judge a policy to be illegitimate, there is a spectrum of rebellious actions they could take from subversive action against the policy to actively working to end or replace the policy. For example, individuals and coalitions might file lawsuits against the government to overturn what they consider to be illegitimate policies or prevent them from taking effect. However, just because a policy is deemed legal does not necessarily mean that it is legitimate.

In a perfect world, politically legitimate actions, legally valid actions, and pursued policies would align but this is not always the case (see Figure 6). In reality, these are moving targets with fuzzy boundaries. Often, they are not perfectly aligned, and the perceived degree of misalignment can vary from individual to individual. Moreover, how constituents perceive the degree of alignment

among the three depends to some extent on the lens through which they view public policies and make judgements about political legitimacy. If the actions pursued fall too far outside of the boundary for what is considered politically legitimate, there can be serious negative consequences even if those actions are within the bounds of what is deemed legally valid. Additionally, establishing political legitimacy is not a one-time event. Legitimacy must be regularly reaffirmed because the public is often fickle, its memory tends to be short, and the environment in which the government implements public policy is continually changing.

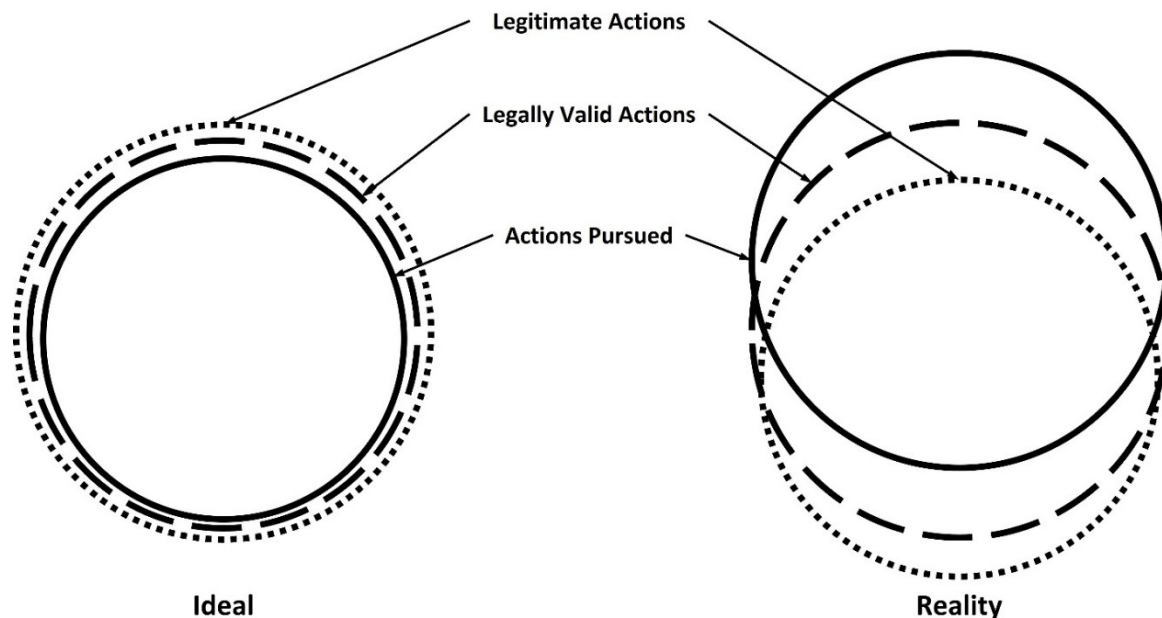


Figure 6. Politically Legitimate Actions, Legally Valid Actions, and Pursued Actions. *Note.* Figure created by author.

People may also rebel against governing authorities they believe have pursued illegitimate policies. The simplest action they can take is to simply withdraw their support by either not voting or voting for another candidate during elections. More severe actions that a person can take include financially supporting opposition candidates and advocacy groups and campaigning against an incumbent. A *coup d'état* is the most extreme response at this level.

Finally, people can rebel against the political framework if they believe the situation to be so dire that it cannot be corrected through action at the lower tiers of the political order alone. The quintessential example is probably the American revolution in which the colonies broke away from England through armed revolt and established a new political order because a significant portion of the colonists judged the actions of England to be illegitimate and unlikely to be satisfactorily corrected through the established political mechanisms. A less extreme example is civilian protests at the local level that put pressure on elected officials to make changes such as the Montgomery bus boycott from 1955 to 1956 during the civil rights movement that inspired legal challenges and led to changes in policy regarding racial segregation on public transportation. A more recent example is the protests in Ferguson, Missouri in 2014, which led to Department of Justice investigations into the city's policing practices and the subsequent implementation of reforms.

Discussion

The traditional approach to political legitimacy treats it as an intrinsic quality of governing authorities and their actions. In short, it reifies the construct of political legitimacy. The alternative conceptualization proposed above conceives of political legitimacy as a multidimensional, socially constructed outcome in which constituents judge whether the actions of a governing authority are

within the bounds of its authority and thus, they affirmatively choose not to undermine those actions by disrupting the political order even if they do not agree with them.

This reconceptualization of political legitimacy accommodates the traditional approaches as well as sociological considerations. The economics-based normative arguments are expert opinions that advocates of the legitimacy or illegitimacy of a governing authority or public policy consider and use to craft their narratives. Constituents ultimately judge the political legitimacy of a governing authority or public policy. They may or may not consider these expert opinions when forming their judgements. This is not to say that neoclassical economics theory and other economics-based analyses of the political legitimacy or illegitimacy of government intervention do not matter. They just matter in a different way.

Applying the proposed reconceptualization, the traditional neoclassical economics argument for the legitimacy of technology transfer policy is primarily based on the presence of transactional, dispositional, and ethical conditions. Specifically, it appeals to exchange, influence, and plausibility dimensions to convince constituents that technology transfer policy is politically legitimate. The conjunction of the presence of these conditions is sufficient to avoid the perception of egregious illegitimate action. This conceptualization avoids the reification of the construct of political legitimacy that is present in the traditional approaches to the topic.

This suggests that the basis for which policymakers can assert claims that government intervention in technology transfer is politically legitimate can be more broad-based than the focus on economic rationality of traditional neoclassical economics arguments. Economic rationality is not the only basis for making such claims. There are several other sociological and psychological levers that policymakers can pull to assert claims of the political legitimacy, or avoid the perception of illegitimacy, of technology transfer policy.

Value and Merits

The proposed conceptual framework adds value to the fields of technology transfer and public policy in several ways. Relative to other approaches, it transforms political legitimacy from an unattainable normative theoretical construct into a practical concept that can be applied instrumentally and understood with descriptive and positivistic methods. The discourse on political legitimacy has been heavily rooted in normative conceptions of morality and what “ought” to be. The alternative conceptualization presented in this paper nudges the discussion toward what is and what will be. Reification of the construct of political legitimacy has led scholars to treat political legitimacy as though it is a property of governing authorities and their actions rooted in physical reality. However, the alternative conceptualization described above minimizes the reification of political legitimacy and emphasizes the practical implications of constituents’ judgements about political legitimacy.

Additionally, the proposed conceptual framework described above can potentially affect technology transfer practice. It offers a path for policymakers to address broader technology transfer problems and pursue more creative and impactful public policy options. It also enables broader problem-structuring analyses. Moreover, the implementation of new policies will undoubtedly affect the way technology transfer is practiced, ideally for the better.

Implications

There are several propositions that one can logically deduce from the proposed alternative conceptualization of political legitimacy described in this paper. One is that political legitimacy is likely far more malleable than previously believed. Additionally, its multidimensionality suggests that it is possible to successfully establish the political legitimacy of a policy without the need to satisfy economics-based criteria. This significantly expands the range of potential problems associated with the phenomenon of technology transfer with which the federal government can realistically concern itself as well as the kinds of remedies that policymakers can consider for solving

or mitigating those problems. The only real limit is the degree to which policymakers can influence the long-term perceptions and beliefs of constituents and avoid judgements of political illegitimacy.

In the context of technology transfer, there is likely the opportunity to influence the public's perceptions about the political legitimacy of possible technology transfer policies to expand options for government action rather than treat the construct as a quality of the policies considered that predetermines which ones can be pursued and which cannot. Policymakers may be able to use narratives to influence the judgments of constituents about the political legitimacy of expanded technology transfer policy.

The range of policy options that people are probably willing to accept likely varies based on the policy problem domain. Strong feelings about an issue do not necessarily result in actions. As such, one can postulate that only those policies that exceed a certain salience threshold will spur constituents to act against government intervention that they believe is illegitimate. When it comes to technology transfer, there may be a greater range of policy options available to policymakers than most currently assume. This is primarily because the topic likely has relatively low saliency to the general public. Policies regarding less salient topics are likely to receive less scrutiny. Consequently, constituents are likely to give the government more leeway in the type and degree of actions it can pursue. The perceptions of interest groups are likely to be of more relevance. There appear to be few interest groups that would oppose more government intervention to encourage and facilitate an increased level of technology transfer based on perceptions of the political legitimacy of such actions.

The proposed conceptual framework may also support future efforts to develop theories regarding both technology transfer processes and political legitimacy. Greater clarity regarding the boundaries of politically legitimate actions of the government within the domain of technology transfer will expand the kinds of phenomena that scholars can justifiably investigate. This may enable a generation of new insights that will support theory development.

Recommendations for Future Research

There are several opportunities to extend the research presented in this paper. For example, it would be worthwhile to empirically test the hypothesis that policymakers' perceptions of what are politically legitimate options are restraining them from pursuing certain public policies that could mitigate the circumstances that curtail technology transfer.

Additionally, one could test the proposed model of how political legitimacy is determined and manifested or specific aspects of the model. Questions that can be further examined include whether and to what degree the salience of an issue influences the judgments of constituents about the political legitimacy of government action, to what degree are certain dimensions of political legitimacy more malleable than others, what kinds of evidence do constituents consider when making judgments about the political legitimacy or illegitimacy of governing authorities and their actions, and what narrative strategies are most effective in influencing constituents' judgments about political legitimacy?

Finally, given that political legitimacy is a social phenomenon, it is likely subject to causal complexity. Configurational comparative methods can be used to examine which conjunctural arrangements of conditions are necessary or sufficient to produce policy actions that are politically illegitimate. Such analysis can apply a reinterpretation of Suchman's typology of legitimacy as conditions that produce political legitimacy as an outcome of sociological processes. The results of such an analysis may prove quite useful to policymakers and legislators.

Conclusion

The study presented in this paper sought to understand why policymakers have failed to implement public policy that more directly mitigates the circumstances that hinder technology transfer in the USA. Aside from resource constraints, political gridlock, and personal incentives, a reasonable conjecture is that notions of what actions are politically legitimate are somehow restraining policymakers from pursuing certain kinds of technology transfer policy. Two questions

were examined. First, how have the current conceptualizations of political legitimacy potentially contributed to the lack of public policies that directly mitigate the circumstances that hinder the transfer of technologies from universities and federal laboratories to the private sector? And second, what alternative conceptualization of political legitimacy can potentially encourage lawmakers to pursue such public policies?

The extant literature was reviewed to identify the current conceptualizations of political legitimacy. Logical reasoning was then used to understand how these conceptualizations have possibly impacted technology transfer policy. The theory of social constructionism and the concept of morality tales was then applied to develop an alternative model of how political legitimacy is determined and manifested that is more descriptive in nature and value neutral.

The primary findings of the study are that the concept of political legitimacy has been reified to echo normative standards and does not align with the behaviors of constituents. Moreover, it is possible that the current conceptualization of political legitimacy is restraining policymakers in the USA from pursuing certain kinds of interventions regarding technology transfer. The primary implication of this study is that adoption of the proposed alternative conceptualization of political legitimacy might enable policymakers to pursue a more diverse array of public policies that will more directly address factors that depress the incidence of technology transfer. Opportunities for further research include performing empirical studies to test the hypothesis that policymakers do not pursue certain possible technology transfer policies because of concerns about political legitimacy and research to validate the proposed model or specific aspects of it.

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Data availability: Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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Notes

1. This quote is from Thucydides' *History* and has traditionally been translated as "The strong do what they can, the weak suffer what they must," which Beard (2013, pp. 32-34) argues is a mistranslation.
2. The Sword of Damocles is an apocryphal anecdote in which Dionysius II of Syracuse demonstrates to Damocles the constantly looming danger that he faces as a ruler by having Damocles sit on the king's throne not realizing, until Dionysius makes him aware, that a sword hangs above held at the pommel only by a single hair from a horse's tail (Wikipedia contributors, 2022, August 1).

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