

The Institutional Sources of Economic Transformation: Explaining Variation in Energy Transitions

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Why are some governments more effective in promoting economic change than others? We develop a theory of the institutional sources of economic transformation. Institutions can facilitate transformation through two central mechanisms: insulation and compensation. The institutional sources of transformation vary across policy types, whether policies impose costs primarily on consumers (demand-side policies) or on producers (supply-side policies). Proportional electoral rules and strong welfare states facilitate demand-side policies, whereas autonomous bureaucracies and corporatist interest intermediation facilitate supply-side policies. We test our theory by leveraging the 1973 oil crisis, an exogenous shock that compelled policymakers to simultaneously pursue transformational change across industrialized countries. Evidence from the generalized synthetic control method, case studies, and discourse network analysis support our hypotheses. The findings have important implications for contemporary transformations, including climate change policy and low-carbon transitions.

Why are some governments more effective in promoting transformative economic change than others? This question has long engaged scholars across political science, sociology, and economic history. It has gained renewed urgency for advanced industrialized economies as their governments have taken on a more active role during the 2008 financial crisis and COVID-19 pandemic (e.g., Lipscy 2020). In addition, intensifying concerns over climate change have refocused attention on the role of the state in facilitating transformational change in the energy sector (Aklin and Urpelainen 2018; Colgan, Green, and Hale 2021; Hochstetler 2020; Mildemberger 2020; Stokes 2020).

Russia's invasion of Ukraine and resulting energy price volatility has only reinforced pressure on governments to achieve energy security.

We define an economic transformation as a structural change that fundamentally and durably reconfigures economic activity.¹ Policy-driven economic transformations can advance long-term aggregate welfare. Historically, they have often focused on enhancing economic growth and productivity, but they can also reduce inequality, improve health or education, enhance energy security, and mitigate climate change. A central challenge that policymakers—both elected officials and bureaucrats—face in facilitating transformative

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1. These types of policies are also sometimes described as structural reforms or economic adjustment policies.

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change is opposition from societal actors that stand to lose from change. Structural economic change reallocates resources across and within sectors, creating winners and losers. Incumbent interest groups can resist and block change through countermobilization (e.g., Hacker and Pierson 2011; Haggard and Kaufman 1992; Lindvall 2017; Mildemberger 2020), and voters can express their displeasure at the ballot box or in the streets (Haggard and Kaufman 1992; Jacobs 2011; Pierson 1996). The politics of economic transformation thus raise fundamental questions about the conditions under which policymakers can overcome such opposition to enhance aggregate welfare over the long run.

Existing research offers valuable insights about these questions but often focuses on single countries or regions or a specific mechanism that facilitates the adoption of transformative policies. For example, in analyzing market reforms in formerly Eastern Bloc countries, scholars emphasize the key role of compensatory transfers in easing adjustment costs for losers (e.g., Roland 2002). Such transfers have also been shown to facilitate reforms in issue areas like trade and decarbonization (Finnegan 2022b; Katzenstein 1985; Lindvall 2017; Trebilcock 2014). In East Asian countries, strong, independent bureaucracies played an important role in phasing out obsolete industries to foster rapid economic development (e.g., Evans 1995; Johnson 1982). Relatedly, neoliberal reforms in developing countries were facilitated by institutions that shielded policymakers from societal interests (e.g., Haggard and Kaufman 1992). Ikenberry (1986) highlights the role of state structure, including government institutions, state-society relations, and interest group associations, in promoting energy sector reforms in response to the oil price shocks of the 1970s. Welfare state researchers have argued that, because retrenchment entails electoral risks, reform-minded governments take advantage of various strategies to protect themselves from voter punishment (Garrett 1993; Pierson 1994; Wenzelburger et al. 2020).

We advance this body of work by proposing a parsimonious theory focused on generic causal mechanisms that enable policymakers to adopt costly policy reforms, with applicability to a wide variety of cases. We argue that governments have two general mechanisms at their disposal through which they can pursue transformative economic policies: insulation and compensation. The more policymakers are insulated from policy losers, the fewer opportunities losers have to block major reform. Governments can also compensate the losers, with the goal to render cost-bearing groups cooperative and induce them to support reform. If governments cannot rely on insulation or compensation, losers will have both the will and the ability to stymie policy reforms, increasing the likelihood of government retreat. By considering the mechanisms of

insulation and compensation jointly, we thus integrate disparate existing work into a general theory of the political sources of economic transformation, with broad applicability across policy areas.

A variety of factors will shape whether governments insulate, compensate, or retreat when attempting to adopt transformational policies. Indeed, transformational change is a multicausal process. In this article, we focus on the role of political institutions. We develop predictions about the institutional sources of insulation and compensation and hypothesize that variation in institutions affects the capacity of governments to undertake major reforms. We operationalize our theory by considering the foundational institutions of advanced capitalist democracies—electoral systems, bureaucracy, interest group intermediation, and welfare regimes—but the theoretical mechanisms of insulation and compensation are directly applicable to transformational change in a wider set of countries.

We test our theory by examining an exogenous shock that compelled simultaneous government efforts to pursue transformative change: the 1973 oil crisis. Major structural change in energy systems is an increasingly salient, yet underexplored, type of economic transformation (Aklin and Urpelainen 2013; Keohane 2015). The abrupt and sharp increase in oil prices in 1973 constituted a common energy and economic shock across the industrialized world. During the oil crisis, governments became instantly aware of their economic vulnerability in the face of energy price volatility, generating a common imperative to reduce oil dependence. Countries varied widely, however, in the extent to which they successfully shifted their economies away from oil. This divergence in response to a common exogenous shock provides an opportunity to study how domestic institutions structure the ability of governments to pursue transformational change.

We use a multimethod approach. First, we use the generalized synthetic control method (GSCM) to quantitatively analyze the effects of institutions on energy policy and outcomes. Second, we undertake comparative case studies to evaluate the proposed causal mechanisms related to insulation and compensation. Third, we complement the case studies with discourse network analysis, drawing on an original dataset based on contemporaneous media accounts of meetings among government policymakers and interest groups. The evidence consistently supports our theoretical propositions.

The remainder of this article unfolds in four steps. First, we develop our theory on the institutional sources of insulation and compensation in the context of debates on the politics of economic transformation. Second, we test our theory in the empirical setting of the oil price shocks of the 1970s. Third, we

discuss the findings from our case studies. Finally, we conclude by drawing out broader implications for research on the politics of economic change in advanced economies.

GOVERNMENT STRATEGIES: INSULATE, COMPENSATE, RETREAT

Economic transformation can be a long, gradual process that takes place without deliberate government intervention. However, governments sometimes face a strong impetus to facilitate or accelerate change. Government interest in economic transformation can result from idiosyncratic country-specific drivers or from a global shock. Some governments, such as those in East Asia, have pursued active economic intervention as a developmental strategy (Amsden 1989; Evans 1995). Major crises like economic depressions and pandemics can also reveal shortcomings of the status quo and create an impetus for government intervention. Energy and environmental crises have also produced varying degrees of government interest in economic transformation as policymakers seek to address energy security and pollution.

Economic transformation can be conceptualized as a joint product that has both public and private good characteristics. For example, energy security benefits all members of society by reducing vulnerability to external supply shocks. The adoption of new technologies or practices can generate diffuse benefits such as higher economic growth rates, time savings, or improved national defense capabilities. However, government-led economic transformation is also associated with a distributive dimension, imposing costs on some groups in society. Government regulations and manipulation of prices to discourage certain types of activity, such as fossil fuel consumption, benefit some actors while creating a burden on others. Thus, while governments have a general interest in promoting energy security, policy losers have a clear incentive to mobilize, oppose, and impede change (Olson 1982).²

2. Our theoretical premises parallel those of Milner and Solstad (2021), who use similar assumptions and develop a formal model of technological adoption. A key assumption of their model is that technological adoption has two distinct effects: (1) it benefits all members of society (e.g., by strengthening national defense against external threats); (2) it creates a distributive conflict between domestic winners and losers. From this, they argue and demonstrate that governments tend to accelerate technological adoption under the intensification of external systemic threats (i.e., when national security benefits of technology outweigh the loss of political support from domestic opponents). Milner and Solstad develop important insights about the tradeoff governments face when policies are associated with both public and private good characteristics. However, they focus specifically on technological adoption and national defense, while we argue that a wider range of transformative economic policymaking is associated with joint products characteristics. Furthermore, we build on their work by moving beyond temporal, system-level variation to examine cross-national variation and the domestic political mechanisms that enable or impede change.

There are two logically exhaustive pathways through which government-led economic transformation can occur, which are distinguished by the final disposition of policy losers. First, transformation can occur despite the continuing opposition of policy losers. Second, transformation can occur with the approval or indifference of policy losers. Based on these premises, we propose two distinct mechanisms through which governments can pursue transformation: insulation and compensation.

Insulation describes the extent to which policymakers can pursue reforms without interference from policy losers. It is possible for insulation to vary idiosyncratically based on factors specific to a particular policy proposal, such as the number of actors who stand to lose and the intensity of their preferences. For example, if the costs associated with a policy are diffuse and each actor stands to bear only a trivial cost, losers may face a severe collective action problem. Their inability to organize and lobby could give policymakers greater latitude to pursue reforms. Insulation may also vary temporally, for example, with greater sensitivity to electoral backlash immediately prior to major elections. However, insulation also varies in more systematic and predictable ways as a function of political institutions. Most obviously, democratic institutions provide less insulation from voters compared to autocratic institutions. Among democratic countries, existing research associates economic, social, and climate reforms with institutions that insulate politicians from policy losers, such as centralized decision-making with limited veto points, autonomous bureaucracies, and low levels of electoral competition or electoral accountability (Evans 1995; Finnegan 2022a; Garrett 1993; Haggard and Kaufman 1992; Jacobs 2011; Johnson 1982).

The second mechanism is to compensate policy losers. Compensation reduces the costs that incumbent groups face as they transition to the new status quo. The goal is to secure the cooperation or indifference of cost-bearing groups, thus mitigating their opposition (Lindvall 2017; Roland 2002; Trebilcock 2014). Compensation can take a variety of forms, including direct financial payments, targeted tax cuts, policy exemptions, phased implementation, or grandfathering. Scholars have demonstrated how compensation plays a key role in easing the costs of adjustment during a variety of cases of major policy change, including labor market reform (Knotz and Lindvall 2015), trade liberalization (Katzenstein 1985; Rodrik 1998), and climate change (Finnegan 2022b; Kono 2019). The feasibility of compensation can also vary idiosyncratically based on policy-specific factors, such as the size of the group requiring compensation and the magnitude of financial transfers required to secure their support. However, there is also an institutional basis for compensation. Political institutions, such as corporatist interest mediation

and welfare state institutions, can affect both the feasibility and credibility of compensatory arrangements.³

The two mechanisms we describe should both be associated with successful reforms that are observationally equivalent in terms of outcomes, but with variation in the nature of policymaking processes. If policymakers are unable to rely on either insulation or compensation, losers effectively have both the will and ability to block transformative change, making it likely that governments will be forced to retreat from their policy goals. In this case, change may still occur due to economic and social forces, but the role of government as a facilitator will be limited.

In contexts where both insulation and compensation are available, governments may rely on both mechanisms, one mechanism exclusively, or take advantage of insulation and compensation selectively depending on specific circumstances, sectors, and policy levers. Factors like norms, pre-existing laws and policies, and issue linkage may compel compensation even if governments are insulated. On the other hand, it is also possible that governments will prioritize insulation over compensation when both are available due to fiscal, dilution, transaction, or audience costs associated with compensatory policies (Lindvall 2017; Roland 2002). Our framework is flexible and easily adapted to complex interplays of insulation and compensation. In this article, we focus our attention on the core theoretical prediction that there should be a meaningful difference in policy outcomes between settings where mechanisms of insulation and/or compensation are available and those where both mechanisms are absent.

Importantly, losers can be both producers and consumers. For example, in the case of climate change mitigation, fossil fuel companies are policy losers on the producer side, while household energy consumers may face the burden of higher energy prices. We refer to policies imposing costs on consumers as demand-side policies and policies imposing costs on producers as supply-side policies.⁴ Both types of policies have been used across a variety of economic transformations. Supply-side policies are central in industrial policy: to alter the

sectoral composition of the economy, governments impose costs on some producers with the goal of upgrading and phasing out obsolete industries. Demand-side policies are also critical: to incentivize behavioral shifts, governments impose diffuse costs on consumers through measures such as taxes, fees, or subsidy reform.

Last, the politics of demand- and supply-side policies operate through distinct channels. Demand-side policies typically seek to alter the diffuse consumption behavior of a large number of citizens through legislative measures like fuel and carbon taxes. Demand-side policies thus operate through an electoral politics channel that links politicians and voters. Conversely, supply-side policies impose adjustment costs on producers and therefore operate through an interest group politics channel that links governments to interest groups. Producers are relatively more concentrated and thus better able to lobby the government directly, and regulating production activity often involves targeted and complex interventions that necessitate the involvement of regulatory agencies. The result is that demand- and supply-side policies operate according to distinct logics, even within the same country.

DOMESTIC INSTITUTIONS AND ECONOMIC TRANSFORMATION

Institutions mediate distributional struggles, providing opportunities for and obstacles to policy change (Steinmo, Thelen, and Longstreth 1992, chap. 1). A rich scholarship has shown how institutions influence, among other things, industrial policy, labor market regulation, privatization, consumer prices, taxation, and varieties of capitalism (e.g., Hall and Soskice 2001; Katzenstein 1985; Martin and Swank 2012; Rogowski and Kayser 2002; Steinmo 1989). By applying and extending this literature, we develop a typology of institutional sources of insulation and compensation for demand- and supply-side policies. We focus on the foundational macropolitical institutions of capitalist democracies: electoral rules, bureaucracy, welfare states, and interest group intermediation.

Domestic institutions are a source of predictable and stable variation, which allows us to derive generalizable and empirically testable hypotheses to evaluate our theory. As we noted above, a government's capacity for insulation and compensation may also vary idiosyncratically across policy issues and over time. However, in the interest of parsimony, we focus our attention on cross-national variation in institutions and carefully control for other factors that might affect insulation or compensation in our empirical analysis. If the institutions we examine are confounded by other factors or only associated with the predicted outcomes

3. Note that we do not consider the possibility that opponents of transformation can be swayed through nonmaterial strategies such as persuasion or public information campaigns. We believe this is a reasonable assumption based on the material and often existential stakes of transformative economic change for policy losers (Colgan et al. 2021). However, insofar as such strategies are common and useful, it will create bias against findings consistent with our theory in the empirical analysis.

4. Political economy scholarship sometimes refers to interest groups as the demand side and political institutions as the supply side. Note that our terminology differs from this and relates to policies that stimulate or constrain demand for or supply of goods and services.

under specific conditions, it will make it less likely that the empirical analysis will produce results consistent with our predictions.

The institutional sources of insulation

Demand-side policy measures impose costs to shift consumption patterns in a direction supportive of economic transformation. In democracies, consumers who bear the cost of these measures—such as intensive automobile users confronted by a gasoline or carbon tax—can express their objections at the ballot box. One important institution that influences the extent to which politicians are insulated from voter backlash is electoral rules. Scholars have shown how electoral institutions affect a range of outcomes, including, for example, party systems (Ferree, Powell, and Scheiner 2014), governments' dependence on geographically concentrated interest groups (Rogowski 1987), and government partisanship and redistribution (Iversen and Soskice 2006). We focus our attention on how electoral rules structure the relationship between politicians and voters, particularly as it relates to the imposition of diffuse costs on consumption behavior necessary to promote demand-side change. Broadly, we expect greater insulation from voter backlash under proportional representation (PR) versus majoritarian rules.

Under PR, seats-votes elasticities are lower than under majoritarian rules, meaning small changes in vote shares do not tend to produce dramatic swings in seat shares (Rogowski and Kayser 2002). As a result, electoral competition is dampened (Kayser and Lindstädt 2015), which insulates policymakers as marginal changes in votes are less likely to remove the government from office (Finnegan 2022a, 2022b; Garrett 1993; Jacobs 2011). Similarly, by decreasing the impact of votes, lower seats-votes elasticities under PR decrease politicians' sensitivity to the interests of diffuse consumers (Persson and Tabellini 1999; Rogowski and Kayser 2002). Second, PR rules tend to produce multiparty coalition governments, while majoritarian rules tend to produce single-party ones. Since under multiparty governments it is generally more difficult for voters to identify the governing party responsible for policy changes they dislike and sanction them accordingly, PR tends to reduce electoral accountability (Persson, Roland, and Tabellini 2007; Powell and Whitten 1993).⁵

5. PR can also lead to more frequent minority governments, and this could plausibly decrease insulation. However, in countries where minority governments are most common, particularly Scandinavia and Spain (Field and Martin 2022), a number of complementary institutional and contextual factors, such as cross-party agreements and opposition influence in policymaking, mean that minority governments are not highly vulnerable to defeat (Strom 1990). We nonetheless control for government type in

Our expectation is that governments experience higher levels of electoral insulation under PR compared to majoritarian rules, and therefore less fear of backlash by consumers bearing the costs of transformative policies. Indeed, previous studies find evidence that PR is associated with both higher consumer prices (Rogowski and Kayser 2002; Chang et al. 2010; Weinberg 2012) and higher policy costs imposed on consumers for the promotion of climate and energy reforms (Finnegan 2022b; Lipsky 2018).

H1. PR rules facilitate demand-side reform by insulating governments from electoral backlash.

When attempting structural reforms, governments face pushback not only from voters but also organized producer groups. The sources of insulation from producers differ, however, from those of consumers. Due to their concentrated interests and organizational and financial advantages, producers are better positioned to lobby governments directly. Furthermore, compared to diffuse consumption behavior—which is typically influenced through broad-based taxes enacted through legislative processes—production activity is more readily subject to direct government oversight and regulation. Hence, an important institution that structures the insulation of policymakers from producer groups is bureaucratic autonomy. We follow scholars of state capacity and define bureaucratic autonomy as the extent to which decision-makers can enact policy goals over the opposition of powerful business interests (Evans 1995; Johnson 1982; Levy 2015; Woo-Cumings 1999).

Bureaucratic autonomy is characterized by a public administration staffed with elite civil servants recruited meritocratically and with an expectation of long-term employment. Decision-makers enjoy substantial discretion to intervene in the economy using a wide variety of policy levers and in accordance with defined policy goals. This style of state-led policymaking can be imposed from above or involve close coordination between state technocrats and business elites. In the latter case, “embedded autonomy” provides decision-makers with important private-sector information while also insulating them from business pressure (Evans 1995).

Bureaucratic autonomy serves to insulate not only civil servants from lobbying pressures, but also politicians. While politicians are not insulated in the original decision to delegate authority, delegating decision-making authority over

our empirical analysis to account for the potential impact of minority governments.

an issue to an independent agency effectively ties the hands of politicians in policy design and implementation, stages at which many of the distributional effects of policies are determined. For example, the California State Assembly frequently delegates broad policy authority over climate and clean energy policy to the California Air Resources Board (Meckling and Nahm 2018). Once delegated, politicians can deflect interest group demands, given the agency's authority over the issue.

The literature on economic development has long emphasized the importance of autonomous bureaucracies in implementing structural economic reform in countries such as Japan, the Four Asian Tigers, and France (Amsden 1989; Evans 1995; Johnson 1982; Levy 2015; Woo-Cumings 1999). Similarly, scholars of structural economic adjustment, especially in Latin America, have pointed to the key role of autonomy in enabling governments to implement reforms over the wishes of policy losers (Haggard and Kaufman 1992, chap. 1).

We generalize this insight. In countries with high levels of bureaucratic autonomy, policymakers should be better insulated from policy losers amongst producer groups. As a result, we expect these governments to have higher capacity to undertake transformative supply-side reforms.

H2. Autonomous bureaucracies facilitate supply-side reforms by insulating policymaking from producers.

The institutional sources of compensation

We turn next to institutions that facilitate the compensation of consumers and producers. On the demand side, it is impractical to negotiate detailed compensatory arrangements directly with a large number of individual citizens. Adjustment costs are diffuse and compensatory mechanisms must be equally broad based. We thus focus on welfare state institutions, which can compensate individuals both directly and indirectly for the costs incurred from reforms and cushion associated economic dislocations. The generosity and credibility of this compensatory mechanism varies considerably; in some countries, economic dislocation creates an immediate risk of destitution and homelessness, while in others, a robust safety net eases the burden of transition. By easing the costs of adjustment to the new status quo, a robust welfare state should reduce political resistance to reform amongst consumers.

The case of trade reform is illuminating. Scholars have shown how compensatory policies shape the politics of trade liberalization. Individuals are more likely to support trade liberalization when social spending is high (e.g., Hays, Ehrlich, and Peinhardt 2005). Similarly, politicians from con-

stituencies with generous unemployment benefits are more likely to support free trade (e.g., Kono 2011). Lastly, countries with large welfare states and high social spending tend to be the most open to international trade (Katzenstein 1985; Rodrik 1998).

Well-developed welfare state institutions facilitate economic transition through two principal mechanisms. First, welfare states embody significant automatic stabilizers that provide predictable, generous compensation to economic losers in a society. Mechanisms such as direct financial transfers, unemployment insurance, vocational training, and pensions automate support for struggling citizens, obviating the need for direct government intervention. While governments in countries with weak welfare states sometimes implement ad hoc compensatory measures in response to crises, these are generally limited in scope, prone to partisan disagreement, and vulnerable to delay, obstruction, or reversal (Starke et al. 2013). Second, in countries with a long history of welfare state institutions and a "habit" of compensation, compensatory commitments are more likely to be seen as credible by voters, and therefore more likely to be trusted (Campbell 2012). The automatic, credible compensation offered by strong welfare state institutions reduces the costs and risks of transitions, mitigating the opposition of demand-side losers. Thus:

H3. Welfare states facilitate demand-side reform by enabling governments to compensate consumers.

In the case of the supply side, we expect institutions that structure the relationship between the state and business to affect the feasibility of compensatory measures. Under corporatist forms of interest group intermediation, peak associations for business and labor are granted privileged access to pre-legislative policy design. These types of fora should increase the capacity for compensatory bargaining between government and producers. First, negotiations take place between a few highly organized actors. Second, decades of repeated, face-to-face interactions generate trust. Specifically, producers come to trust that the government will uphold its commitment to future compensation and the government trusts that producers will uphold their commitment to support the reform. Small group size, repeated interactions, and trust can reduce the transaction costs associated with compensatory bargaining (Lindvall 2017; Warren and Mansbridge 2016). Lastly, because negotiations are often held in private, audience costs are reduced (Warren and Mansbridge 2016).

Existing studies offer evidence that corporatism facilitates governments in reaching compensatory bargains with

producers. Katzenstein (1985) points to corporatism as the key institution that enables governments in small European states to adopt industrial policy reforms by compensating business and labor. Similarly, corporatism facilitated the compensation of labor unions for wage restraint during times of high inflation. More recently, there is evidence that corporatism facilitates climate change policy by enabling governments to compensate cost-bearing industry (Finnegan 2022b; Meckling and Nahm 2022).

H4. Corporatism facilitates supply-side reforms by enabling governments to compensate producers.

It is important to note that, across countries, corporatism often co-occurs with PR. The reasons for this are in part historical (Katzenstein 1985; Martin and Swank 2012). However, while they are correlated, they are distinct institutions with, as we argue above, theoretically distinct effects. We expect PR to insulate politicians from voter backlash and corporatism to better enable policymakers to reach compensatory bargains with business. In countries with both institutions, policymakers can insulate from voters while compensating business. Indeed, recent evidence from climate change policy suggests that countries with PR and corporatism do just this (Finnegan 2022b). Nonetheless, in the empirical section, we will use several strategies to tease out the distinct effects of each institution.

Before moving on, let us clarify how our arguments differ from theories of veto points (Immergut 1992) and veto players (Tsebelis 2002). Both of these strands of theory focus primarily on political institutions and actors and how they can block policy change. Our focus is different. We are concerned with opposition to policy change from social and economic actors outside of government—that is, consumers and producers. Facing opposition from these forces, we argue that far-reaching reforms are not a straightforward function of the number of veto points or players, but rather depend on the extent to which governments can use the mechanisms of insulation and compensation to overcome resistance. In addition, our framework differentiates demand- and supply-side policies and theorizes the institutions that enable reform in each case. That said, while veto points and players are not our theoretical focus, we are mindful of the impact that they can have on policy change and are therefore careful to control for them in our empirical analysis below.

Retreat

If countries possess no institutional sources for insulation or compensation, we expect policymakers to face difficulty in facilitating economic transformations. Incumbent producers

will be able to block ambitious supply-side policies, and politicians will shy away from demand-side measures for fear of punishment at the ballot box. Hence, we expect that the presence of insulating or compensatory institutions will be associated with policy-driven transformative change, while the absence of both will be associated with retreat. To be sure, economic change may still occur, but it will be driven by markets rather than policy.

RESEARCH DESIGN: THE 1970S OIL PRICE SHOCKS

There is a large universe of economic transformations we could potentially examine to test our arguments. Disruptive, transformational economic change has been an important feature of modern society going back to at least the Industrial Revolution, including the shift from sailing to steam ships starting in the 1780s and equine transport to automobiles in the early 19th century (Geels and Schot 2007) as well as industrial mobilization during World War II (Kennedy 1999). More recent examples include active state intervention to facilitate rapid economic growth in late-industrializing countries (Amsden 1989; Johnson 1982), shock therapy in post-communist transition countries (Roland 2002), and the global response to major challenges like climate change and COVID-19 (Finnegan 2022b; Lipsy 2020).

There are several important empirical challenges presented by these cases. Government efforts to pursue economic transitions are often idiosyncratic and occur gradually or at different points in time; this was the case with the shift to export-oriented development among East Asian countries and cross-national responses to climate change. Even the COVID-19 pandemic affected different countries at different moments in time and with varying severity. This makes it tricky to control for potential temporal confounders such as technological change and learning from prior transformations. Furthermore, government efforts to pursue economic transformations can go hand-in-hand with institutional reforms, confounding the effect of institutions. An obvious example of this is post-communist transitions, but efforts to create independent central banks or regulatory agencies as part of broader economic reforms pose similar challenges. To evaluate our theory, it is important to focus on a case where institutions are plausibly exogenous and stable and therefore not confounded by omitted variables causing both institutional and economic change.

For this case, we leverage the impact of the 1970s oil crisis on advanced industrialized countries. From the end of World War II until 1972, international oil prices remained stable and low. Partly as a result, national energy systems underwent significant fuel switching from coal to oil. However, in October 1973, global energy markets underwent a major disruption.

To punish Western countries for supporting Israel in the Yom Kippur War, the Organization of Arab Petroleum Exporting Countries announced oil price increases, production cuts, and an outright embargo against the United States and the Netherlands (and subsequently Portugal, South Africa, and Rhodesia). Moreover, the Organization of the Petroleum Exporting Countries also agreed to sharp price increases.

The international price of oil quadrupled from \$2.90 nominal USD per barrel in mid-1973 to \$11.65 by the start of 1974. A second price shock hit the world in 1979 due to fears of reduced supply resulting from the Iranian Revolution, further doubling oil prices from their 1978 levels to \$31.61. Because oil is an internationally traded commodity, the price increases hit all countries in a virtually identical manner regardless of whether they were directly embargoed or not. By 1980 (the earliest year for which country-specific oil price data is available), the countries in our sample were all paying between \$30 and \$35 nominal USD per barrel (see supplementary information).

These common energy price shocks induced all advanced industrialized democracies to simultaneously attempt significant, state-led transformations of their economic and energy systems. In early 1974, the countries of the Organisation for Economic Co-operation and Development laid out three common goals at a meeting in Washington: diversify oil imports away from the Middle East, diversify national energy systems away from oil to other fuels, and adopt conservation measures to reduce energy consumption (Ikenberry 1986, 107). That same year, the industrial economies founded the International Energy Agency (IEA) with the Agreement on an International Energy Programme. The treaty explicitly states that founding members are “determined to reduce their dependence on imported oil” (IEA 1974). Yet, as we show below, reform success varied widely across countries despite common goals.

In all countries we examine, the institutional variables we hypothesize long predate the 1973 oil shock and are therefore plausibly exogenous. Furthermore, based on the data we describe below, none of the countries saw a meaningful shift in the variables we use to measure institutions in the immediate period surrounding 1973. Another advantage is timing. The oil price shock was exogenous, simultaneous, and imposed essentially the same change in oil prices across industrialized countries. The shocks also elicited simultaneous, public commitments by all governments to pursue transitions away from oil. The shock thus allows us to account for potential confounders such as technological change, learning from prior transitions in other states, and idiosyncratic changes in government preferences for reform. It is important to emphasize that we leverage the oil price shock because the presence of a simultaneous exogenous shock is

attractive for empirical reasons: our theory is not predicated on price shocks being the motivation for economic transformations.

We utilize a mixed methods research design. First, we use the GSCM to evaluate the relationship between institutions and energy policy outcomes quantitatively. Second, because our quantitative approach does not allow us to directly test mechanisms, we use a comparative case design and discourse network analysis to show in detail how institutions shaped policy responses in three countries (France, Germany, and the United Kingdom). For both the supply- and demand-side analysis, we examine the period before and after the first oil price shock of 1973.

QUANTITATIVE ANALYSIS

Data

For our dependent variables, we focus on energy policies in two substantively important sectors that can be clearly distinguished for being targeted by supply- and demand-side measures: electricity generation and transportation. Our dataset includes the 18 industrialized democracies of the period.⁶ In the case of electricity generation, governments sought to encourage fuel switching away from oil and toward coal, nuclear, or renewable energies. Reforming the electricity supply system entailed transition costs for oil producers, coal producers, and electric utilities. Expanding coal to substitute for oil was relatively low cost, since oil-fired plants could be converted to coal and continue operation. However, expanding into relatively new technologies, such as nuclear, represented a more significant transition and meant writing off assets early and incurring major capital investment costs. Lastly, reduced dependence on oil would decrease demand for sector-specific skills and jobs, potentially eliciting backlash from labor unions. We measure each country’s supply-side policy response using data from the IEA on the percentage of electricity generated from oil between 1960 (the first year of available data) and 1985.

On the demand side, transportation fuels were the primary way that the average household directly consumed oil. Moreover, these fuels comprised a substantial portion of overall oil consumption in most industrialized countries. Politicians sought to encourage conservation through taxes and fees, fuel-efficiency standards, and speed limits, among other policies. To measure each country’s demand-side policy response, we compiled an original dataset of gasoline

6. Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

tax rates in national currencies from national and international sources (see supplementary information). Gasoline taxes are especially useful to test our arguments because they impose direct and highly visible costs on voters. This data is available from 1965 onward.

As argued above, we expect two institutions to be associated with transformative change on the demand side: PR electoral rules and robust welfare states (hypothesis 1 and hypothesis 3). To measure electoral rules, we code each country dichotomously based on whether they used non-majoritarian rules for lower-house elections using data from Armingeon et al. (2016). To measure welfare states, we rely on Esping-Andersen's (1990) typology from the period, which distinguishes social democratic and conservative welfare states from less generous, liberal ones.

On the supply side, we expect two types of institutions to facilitate transformational policies: bureaucratic autonomy and corporatism (hypothesis 2 and hypothesis 4). Measuring bureaucratic autonomy is notoriously difficult (Fukuyama 2013), and there are no existing quantitative measures that extend back to the 1970s. We thus rely on contemporaneous, qualitative scholarly work on states and bureaucracies and more recent quantitative, survey-based measures. France and Japan are routinely singled out as having archetypal autonomous bureaucracies before and after the oil shocks (Ikenberry 1986; Johnson 1982; Levy 2015; Lucas 1985), and more recent survey-based measures also identify them as having the most "closed" public administrative systems (Dahlström, Lapuente, and Teorell 2012). We thus code a dichotomous measure with France and Japan, identified as countries with autonomous bureaucracies. To measure corporatism, we use data from Jahn (2016) to generate a dichotomous variable. Countries are coded as corporatist if they had an average corporatism score larger than 0 from 1960 to 1972.

Based on our theoretical expectations, we predict that the presence of insulating or compensatory institutions should be associated with equivalent observable policy outcomes—transformational change—while the absence of both should result in retreat. Hence, we code countries with either PR electoral rules or social democratic or conservative welfare states as 1 for demand-side institutions, while countries with majoritarian electoral rules and liberal welfare states are coded as 0. Analogously, we code countries with either autonomous bureaucracies or corporatist institutions as 1 for our measure of supply-side institutions, and the remaining countries are coded as 0. The detailed country coding is available in the supplementary information. We predict common observable outcomes but distinct policy processes for insulation and compensation institutions, which we will examine in the case study section.

Method

To quantitatively test our arguments, we rely on the GSCM developed by Xu (2017), which builds on the synthetic control approach from Abadie, Diamond, and Hainmueller (2010).⁷ These methods use predictor variables from control units to construct a synthetic counterfactual for the treated unit(s). It is then possible to examine the divergence of the dependent variable of interest between the treated unit(s) and synthetic counterfactual. In the case of the GSCM, the counterfactual for each treated unit is generated using control group information and linear interactive two-way fixed effects models.

The GSCM has several methodological advantages for our purposes. Unlike traditional difference-in-difference analyses using two-way fixed effects, it does not rely on the parallel trends assumption or homogenous effects between groups and over time. Moreover, the approach generalizes the synthetic control method to cases where multiple units are treated. Relatedly, the GSCM can estimate a single model with causal estimates for the average treatment effect on the treated (ATT) across all treated units. Lastly, the method allows for the generation of standard errors using a parametric bootstrap procedure.⁸

Our identification strategy focuses on countries that had either insulating or compensatory institutions when the first oil price shock occurred in 1973. Conceptually, the treatment is defined as the joint presence of an impetus for government-led transformation—generated by the oil shock—and institutions theoretically predicted to facilitate transformation. We compare this group of treated countries to a synthetic counterfactual of these same countries without the institutions of interest generated from information from the control countries. While this approach can establish a relationship between our institutional variables and our outcomes of interest, it does not allow us to directly test the mechanisms of insulation and compensation, as mentioned above. For this, we analyze case studies in the next section.

In our model, we include a number of predictor variables that may affect our outcomes of interest. We include domestic oil production per capita because countries with larger oil

7. The synthetic control method was originally applied to examine the impact of terrorism on economic variables in the Basque Country, and it has been subsequently applied to examine the impact of a wide range of political phenomena (e.g., Abadie and Gardeazabal 2003; Beckley, Horiuchi, and Miller 2018; Lipsy and Lee 2019). The GSCM is useful for examining cases where multiple units are treated (e.g., Bischof and Wagner 2019; Gilens, Patterson, and Haines 2021). We conduct our analysis in R using the *gsynth* package from Xu (2017).

8. We use this approach because we have fewer than 40 units in the treatment group (Xu 2017) and utilize the expectation-maximization algorithm proposed by Gobillon and Magnac (2015).

resources may have been less anxious to reduce their oil dependence. For instance, in countries with high domestic oil production per capita, politicians could have faced greater opposition from fossil fuel-related industries and workers. We thus control for a leading alternative explanation to our institutional argument: cross-national variation in the strength of opposition to change. Because the 1973 price shock precipitated major economic disruption, which varied across countries and may have constrained government decision-making, we include real gross domestic product (GDP) growth, real GDP per capita, inflation, and unemployment. Last, we include urbanization rates and vehicles per capita in the demand-side models since these may have influenced how sensitive consumers were to gasoline tax increases.

In our main analysis, we exclude variables that may be correlated with the outcome variables but are plausibly consequences of our institutional variables of interest, and as such, could lead to post-treatment bias in our results. These include the variables we discussed above as potentially affecting policy reform, especially government type (single-party, coalition, minority, etc.) and veto players, but also covariates like government partisanship and trade openness. We instead include these variables in robustness checks in the supplementary information. The findings do not meaningfully change from the main results presented below.

Results

We first turn to the results for the demand-side analysis (fig. 1). Panel A depicts the trend in gasoline taxation for treated countries with demand-side insulating or compensatory institutions (solid line), along with the estimated tax level in the counterfactual scenario (dotted line). We observe that

the tax level for treated countries is well matched with the counterfactual before the 1973 oil shock. After 1973, the trends diverge sharply. Consistent with hypothesis 1 and hypothesis 3, tax rates rise more rapidly and dramatically in the treatment group compared to the counterfactual.

Panel B depicts the ATT over the sample period with 95% confidence intervals based on parametric bootstraps of 1,000 times and the expectation-maximization method. Again, we see that the treated countries and the counterfactual are well matched before 1973, after which a large, persistent, and statistically significant difference is observed. The estimated average effect is around an 8 cent per liter increase in the gasoline tax rate compared to a sample mean of 15 cents (see table A4 in the supplementary information). This is a substantive difference in tax rates experienced by drivers, who would face strong incentives to drive less and utilize other means of transportation, such as public transit.

The results for the supply side are presented in figure 2. Panel A depicts the trend in oil share as a percentage of total electricity production for treated countries with supply-side institutions (solid line) along with the estimated level of oil share in the counterfactual scenario. As the figure shows, the evolution of the oil share of electricity production for treated countries is well matched with the counterfactual before 1973. After 1973, a large divergence opens up, with oil share in treated countries falling relatively rapidly compared to the counterfactual. This evidence is consistent with hypothesis 2 and hypothesis 4. Panel B indicates that this difference is statistically meaningful. For the treatment period as a whole (1973–1985), the estimated average effect is around a 12-percentage point decrease in electricity generation from oil compared to a sample mean of 19% (see table A4 in the supplementary information). Again, this is a substantive difference consistent

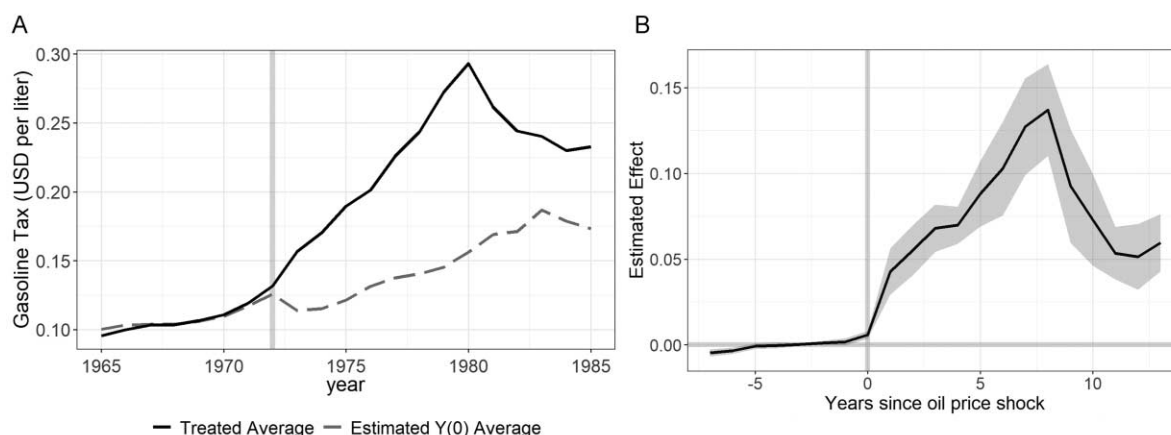


Figure 1. The effect of demand-side institutions on gasoline taxes (results from the generalized synthetic control method). (A) Difference between the average for the treated countries (solid line) and the counterfactual (dotted line). (B) ATT with 95% confidence intervals.

with a major divergence in national dependence on oil for power generation.

To check the robustness of the results, we carry out a wide variety of additional tests, which are available in the supplementary information. We first confirm that the results are not sensitive to the inclusion of predictor variables, especially additional predictors that are plausibly correlated with the outcome variables, but which are also likely consequences of our institutional variables: government type, veto players, government partisanship, and trade openness. In addition, we confirm that our results are not sensitive to the length of the pretreatment period.

We next conduct three placebo tests. First, we examine whether our results are driven by our theorized institutions. This is a concern because our institutions of interest overlap to some degree in our sample. We rerun the same models but switch the key institutional variable. For demand-side policy, we include supply-side institutions as the key predictor, and for supply-side policy, we include demand-side institutions. We do not expect a relationship between these variables, and the results of the test indicate no consistent relationship between them. Second, we run another placebo test by moving the treatment year to 1968. Third, we perform a placebo outcome test to see if our institutions of interest are associated with energy-related outcomes for which we do not have strong theoretical expectations. In all cases, we find no placebo effects.

To confirm that the results are not sensitive to the choice of specification and method, we conduct an additional set of tests. First, we flip the dichotomous treatment variable—so that 1 equals the lack of enabling institutions—to inspect whether having more countries in the control group affects the

results. Second, we repeat the analysis with a more standard difference-in-differences model with two-way fixed effects across a range of specifications. As part of this, we examine heterogeneous treatment effects by leveraging each country's dependence on imported oil in 1972. The results do not substantively change the main findings. Finally, to test an additional observable implication of our theory, we confirmed that countries with both demand- and supply-side institutions significantly reduced their total economy-wide oil consumption compared to the counterfactual characterized by neither set of institutions.

Taken together, the results offer robust support for our theoretical arguments that institutions structured the ability of governments to reduce their countries' dependence on oil after the 1973 price shock, and in doing so, hastened or impeded state-led transformation of the energy system. On the supply side, countries with autonomous bureaucracies or high levels of corporatism shifted away from oil more rapidly in the electricity sector. On the demand side, countries with PR electoral rules or strong welfare state institutions adopted higher gasoline tax rates.

CASE STUDIES

While the quantitative analysis provides evidence consistent with our proposed hypotheses, it does not allow us to observe the political processes that produced divergent policy outcomes. To evaluate causal mechanisms, we conducted detailed comparative case studies of how France, Germany, and the United Kingdom responded to the oil shocks. These countries capture the full range of variation across our institutions of interest and are similar in terms of economic, population, and geographic size. We further supplemented

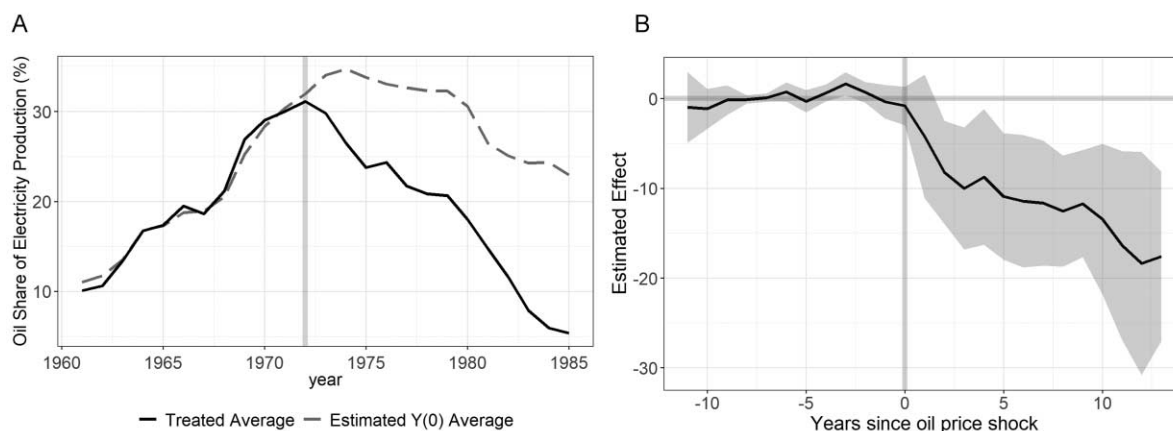


Figure 2. The effect of supply-side institutions on oil share of electricity production (results from the generalized synthetic control method). (A) Difference between the average for the treated countries (solid line) and the counterfactual (dotted line). (B) ATT with 95% confidence intervals.

the case studies with discourse analysis of newspaper articles during the period. Here we highlight our main findings and summarize the institutional arrangements, theoretical expectations, and empirical observations for each country (see table 1). We encourage readers to read the full-length case studies in section 9 of the supplementary information.

Our theory generates observable implications about *how* transitions unfold under different institutional settings. For demand-side policies, we expect PR to provide politicians with relative insulation from voter backlash, and therefore, politicians in countries with PR (Germany) to be less concerned about imposing costs on consumers compared to their counterparts in majoritarian systems (France and the United Kingdom). We also predict welfare state institutions to support demand-side transitions through compensation. In countries with strong welfare states (France and Germany), we expect the generosity of compensatory transfers and expectations about their continuation to mitigate voter backlash by reducing the salience of higher costs for consumers. In countries

that lack strong welfare state institutions (the United Kingdom), consumers face cost imposition without compensation and should express stronger concerns about energy costs.

For supply-side policies, we expect that autonomous bureaucracies (France) will be able to implement energy transitions rapidly and technocratically without engagement with policy losers. While we expect corporatist interest intermediation (Germany) to support transitions as well, this will occur through bargaining and agreement on a compensatory arrangement with policy losers. As a consequence, we should observe direct involvement of policy losers in policy discussions, and the process of reaching a compromise may lead to some delay in policy implementation relative to countries with autonomous bureaucracies. In the absence of both types of institutions (the United Kingdom), we expect producers that stand to bear costs of the transition to play a significant role in stymying attempts at government-led transition.

Evidence from the comparative case studies and discourse analysis, which is presented in detail in section 9 of the

Table 1. Summary of Case Studies

Country	Demand- or Supply-Side	Institutions	Expectation	Observations
France	Demand-side	Majoritarian with strong welfare state	Successful transition, only compensation possible	Costs imposed on consumers but with limited visibility; politicians express concern about backlash; welfare spending mitigates impact
	Supply-side	Bureaucratic autonomy with mixed interest intermediation	Successful transition, insulation and compensation possible	Large-scale transition to nuclear power implemented rapidly and technocratically; opponents unable to block reforms
Germany	Demand-side	PR with strong welfare state	Successful transition; insulation and compensation both possible	Costs imposed on consumers without effort to conceal them; some financial support to cushion energy costs
	Supply-side	Corporatism with limited bureaucratic autonomy	Successful transition; only compensation possible	Gradual transition toward nuclear with continued incorporation and subsidization of fossil fuel interests
United Kingdom	Demand-side	Majoritarian with weak welfare state	Blocked transition	High salience of energy costs and few costs imposed on consumers; continued reliance on fossil fuels
	Supply-side	Pluralism with limited bureaucratic autonomy	Blocked transition	Nuclear expansion fails; fossil fuel sector lobbies against and successfully stymies transition

Note. This table presents an abridged version of our findings. Please see the appendix for full results.

supplementary information, is broadly consistent with our expectations described above (see table 1) and lends support to our core theoretical claims that insulation and compensation are the key political mechanisms through which transformational change plays out.

Lastly, we supplement our analysis with additional case material to address two potential concerns. First, while our focus on the oil crisis is useful for evaluating variation in national responses to a common shock, it raises potential questions about generalizability across time periods. Second, there are no instances of institutional change during the oil shock. We therefore include complementary case studies of energy policymaking in the United States and Japan over longer time periods in the supplementary information. The United States is characterized by the consistent absence of institutions associated with insulation and compensation. Japan underwent institutional change in the 1990s, which altered institutions associated with demand-side insulation. In both cases, we observe patterns of energy policymaking consistent with our theoretical predictions.

CONCLUSION

In this article, we set out to explain why some governments are more effective at promoting transformative economic change than others. Building on a rich tradition in comparative politics and political economy, we proposed two general mechanisms that enable major policy reform on both the demand- and supply-side: insulation and compensation. Our contribution lies in integrating existing research focused on single mechanisms into a parsimonious theory of the institutional sources of economic transformation. Our theory can explain cross-national variation across a wide range of issue areas and contexts. It also produces important policy implications: compared to existing work that focuses selectively on single mechanisms, our theory recognizes greater potential for transformative change in response to pressing challenges like economic recovery, inequality, and climate change.

We operationalized our theory by examining four types of institutions that affect insulation and compensation in high-income democracies. Proportional electoral rules tend to provide higher levels of insulation than majoritarian rules. Thus, countries with proportional electoral systems should be more likely to adopt transformative demand-side measures that rely on manipulation of prices. Similarly, bureaucratic autonomy can insulate the policymaking process from organized producer interests. Our quantitative analysis and case studies suggest these institutions played an important role in energy transformations in the 1970s.

We also highlight the role of compensatory mechanisms in economic transformations. In settings where relations be-

tween the government and organized interests are highly coordinated over time, distributive bargains are more easily struck. Such bargains are likely to include compensation for producers expected to lose out from reform. Our case study of Germany illustrates significant government-producer coordination and producer compensation in striking bargains on supply-side policies. In the case of France, we observed the implementation of demand-side policies in tandem with a large expansion in social welfare spending, which effectively compensated diffuse consumers who faced adjustment burdens stemming from higher energy costs.

Our theory and findings raise important questions for research on the politics of economic transformation. First, we operationalized our theory of insulation and compensation in the context of advanced democracies. Yet, these two mechanisms should play a role in enabling policymakers to adopt transformative economic policies across a wider range of political systems. With the rise of China and other emerging economies, the sources and mechanisms of economic transformation in authoritarian contexts and developing countries have taken on greater substantive importance. While we expect the mechanisms of insulation and compensation to also apply to those settings, their institutional sources may differ to some extent. For instance, in authoritarian systems the nationalization of resource extraction sectors and the existence of state-owned enterprises likely conditions the capacity for economic transformation (Mahdavi 2020). Also, the ability of developing countries to pursue compensation may rely more on the existence of international institutions that provide finance than domestic institutions. Thus, a natural extension of our work is applying our theory of insulation and compensation to a wider set of political contexts.

Second, we demonstrate the institutional sources of initial policy choices in response to a price shock. Yet, economic transformations—and infrastructure-heavy energy transitions in particular—are multidecade processes that require policies to be durable and to evolve in view of long-term policy goals. This brings in important questions of temporal dynamics and long-term governance (Finnegan 2022b; Jacobs 2011; Pierson 2004). Our data is suggestive, though not conclusive, that the same institutions and mechanisms that enable initial policy adoption play an important role in policy durability, for example, through their effect on veto points (Birchfield and Crepaz 1998). Future research needs to grapple with the institutional sources and mechanisms of long-term policy durability. For instance, a research design that examined country responses to the reverse oil shock of 1986, when the oil price dropped, could begin addressing the question of policy stability.

Our theory and findings have important implications for contemporary economic transformations, including the clean

energy transition, the broader renaissance of industrial policy in Western economies, and policy responses to the COVID-19 pandemic. We expect the magnitude and pace of structural economic change to vary considerably across institutional settings. Majoritarian, liberal market economies such as the United States largely lack the institutional sources of insulation and compensation that enable policy-driven transitions that impose costs on producers and consumers. In the absence of institutional reform, we envision the following pathways to economic change in these jurisdictions. First, these countries can utilize policy instruments that impose few direct and visible costs on economic actors, such as subsidies, research and development spending, procurement policies, and loan guarantees. For example, the Inflation Reduction Act in the United States relied primarily on subsidies and included almost no penalties for polluters. Second, these countries may take advantage of spillover effects from jurisdictions with supportive institutions, which can reduce the cost of technologies that then allow for more market-driven transitions. The decline in the cost of solar photovoltaics and wind technologies and the subsequent global diffusion of these technologies reflect such a pattern. Even where policy-driven transformation is blocked, international cooperation to accelerate market-driven transformations may still be viable. Last, even in countries with low bureaucratic autonomy at the national level, it may be possible to create or exploit pockets of greater autonomy. This might mean agencies in subnational jurisdictions or bureaucracies that have been operated with a degree of autonomy for other reasons, such as central banks or defense agencies. These may offer opportunities for policy-maker insulation from producer backlash and thus for the adoption of supply-side policies.

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