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# Coup d'États, Institutional Change, and Productivity

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Abstract: Understanding the consequences and recovery for countries hit by adverse national events such as political crises is central to understanding long-run development dynamics. Utilizing the Coleman boat framework, we develop a micro-foundation based theoretical framework grounded in public choice theory and institutional economic theory to theorize about the productivity consequences of political coups. Our theory suggests two consequences. First, coups create regime uncertainty that distorts the judgment of entrepreneurs and firm managers, resulting in their delaying or abandoning altogether investment in potential productivity-enhancing innovation projects. Second, in addition to regime uncertainty, institutional changes in the aftermath of a coup exert long-run impacts on national productivity by creating a misalignment of the formal institutional environment. Our model allows us to disentangle the productivity effects of institutional uncertainty from actual institutional change following a political crisis. We assemble a unique longitudinal dataset consisting of 39 nations covering the period 1950-2012 to empirically test our hypotheses using panel data methods. We further explore some of the boundary conditions of our analysis. Keywords: Coups, regime change, institutional change, productivity

JEL Codes: E02, O31, O43, P47

#### 1. Introduction

Coups d'état are political crises that serve as an external shock to a nation's economy, creating instability with the potential to adversely impact economic performance (Alesina et al., 1996; Fosu, 2002) and create environmental uncertainty for all firms, entrepreneurs, and investors (Chakrabarti, 2015; Di Gregorio, 2005). Following recent global crises such as the global financial crisis and Covid-19 pandemic, management scholars are increasingly interested in firm and entrepreneurial responses to and the economic consequences of crisis events (Archibugi et al., 2013; Conti et al., 2019; Doern et al., 2019; Lee et al., 2015; Nemlioglu & Mallick, 2021; Paunov, 2012). Although some research explores the effects of general political instability (Allard et al., 2012; Krammer & Kafouros, 2022; Waguespack et al., 2005; Witte et al., 2020), few management studies examine the consequences of environmental uncertainty stemming from political crises such as coups d'état.

Additionally, large-scale crises such as political coups are often followed by institutional changes that alter the rules of the game facing economic actors (Bennett et al., 2021). Given that institutions shape the incentives facing economic actors (North, 1991; Williamson, 2000), political coups have both short-term transitory impacts by creating political instability and longer-run effects through institutional changes in their aftermath. While an emerging body of literature examines the economic consequences of political coups (Balima, 2020; Bjørnskov et al., 2022; Grier et al., in press), to the best of our knowledge, existing research has not decomposed the economic consequences of coups attributable to political instability from those attributable to institutional change in the aftermath of a coup. We address this critical gap in the literature by addressing the overarching research question: *How do coups d'état influence national productivity*? In doing so, we make several contributions to the extant literature.

First, we develop a micro-foundations based conceptual model (Cowen et al., 2022; Hill et al., 2022) **Fel! Bokmärket är inte definierat.**to depict how coups have adverse productivity effects by

creating political turmoil that opens a window of opportunity for rapid and unexpected institutional change. By attempting to overthrow the incumbent government, coup-makers seek to gain power to improve their own well-being, as well as that of the groups that they represent, via alteration of a nation's institutional structure (Bennett et al., 2021; Wintrobe, 2012). Following a coup, the "new regime might implement laws aligned with its own goals but at odds with society's values and commercial activities" (Bylund & McCaffrey, 2017, p. 420). Uncertainty about whether institutional changes in the aftermath of a coup will continue to align with common social values and/or business practices creates regime uncertainty that undermines confidence in the future protection of property rights and contract enforcement, thereby raising future anticipated transaction and transformation costs, and distorting the ability of firms and entrepreneurs to assess the long-run relative risks and rewards of potentially productivity-enhancing investments (Bennett et al., 2022; Higgs, 1997). Cumulatively, the effects of regime uncertainty created by a coup reduces national productivity.

Although both failed and successful coup attempts discourage productivity-enhancing activity, they are nevertheless likely to have differential effects because the leaders who emerge in the aftermath are likely to pursue different institutional strategies (Bennett et al., 2021). A successful coup is associated with a regime transition in which the new regime will attempt to replace the existing institutions with ones that are more aligned with the interests of its supporters and its ideology (Aidt & Leon, 2018). Meanwhile, failed coups result in the incumbent regime maintaining power. The incumbent regime is likely to pursue an institutional belt-tightening strategy to punish detractors and raise the costs faced by future prospective coup leaders, as well as potentially implementing institutional changes that keep central interests satisfied with the current regime (Holcombe & Boudreaux, 2013). As such, successful coups will create greater regime uncertainty than failed coups, resulting in greater adverse productivity effects.

While coups influence productivity directly by creating regime uncertainty, Bennett et al. (2021) and Grier et al. (in press) show that coups are followed by a decrease in institutional quality. Because a stable, high-quality institutional environment incentivizes productivity-enhancing behavior (Bjørnskov & Foss, 2013), the resultant institutional degradation in the aftermath of a coup may also reduce productivity. Therefore, in addition to creating regime uncertainty that discourages entrepreneurs and firm managers from investing in productivity-enhancing activity, political coups result in institutional changes that mediate these effects. By modeling institutional change as a mediating factor, we are able to decompose the pernicious productivity effects of coups attributable to regime uncertainty from the effects resulting from actual institutional changes in their aftermath.

To test our hypotheses, we assemble a unique longitudinal dataset for a set of 39 countries over the period 1950-2012. We use coup data from the Regime Types and Regime Change dataset (Bjørnskov & Rode, 2020) to estimate the effects of coup attempts on productivity using two-way fixed effects regression. Our primary measure of productivity is the total economic value added per worker, found in historical data from the Groningen Growth and Development Centre (GGDC) 10-Sector database (Timmer et al., 2014). We also employ Structural Equation Modeling (SEM) to examine the potential mediating effect of institutional changes in the aftermath of a coup using data from the Varieties of Democracy v10 (V-Dem) database (Coppedge et al., 2020). Employing national productivity data, which unlike firm-level data is available for a long enough period of time to capture historical instances of coups, enables us to test our micro-founded theoretical framework on the productivity consequences for firms and entreprenuers following political coups (Hill et al., 2022). Additionally, we perform post-hoc exploratory analyses to examine the heterogenous effects of coups, including whether coup attempts exert differential effects on productivity by industry and whether the coup maker and/or incumbent regime type matter for productivity outcomes.

#### 2. Conceptual & Theoretical Foundations

We utilize the Coleman (1990) boat framework to develop a micro-foundations based theoretical model (Cowen et al., 2022; Hill et al., 2022) that integrates insights from institutional economic theory (Bylund & McCaffrey, 2017; Frølund, 2021) and public choice theory (Buchanan, 2003; Gwartney & Holcombe, 2014) to depict how coups have adverse productivity effects.

#### 2.1. Coleman's Boat

Coleman's (1990) boat provides a useful framework for "using macro perspectives to contextualize micro processes, and exploring how micro phenomena aggregate to explain macro outcomes" and provides "guidance on the key theoretical elements that are needed to successfully connect the macro and micro levels—and vice versa" (Cowen et al., 2022, 2). Coleman's boat framework consists of three sets of mechanisms to facilitate theorizing that integrates macro and micro approaches. First are *situational mechanisms*, or macro-level phenomena that influence individual decision-making behavior, that are "fundamentally about the contextualizing of micro-level phenomena." Next are micro-level *action-formation mechanisms*, or individual characteristics that influence their decision-making behavior. Third are *transformational mechanisms* that depict "how the aggregation of micro-level phenomena comes to explain what we observe at higher levels of analysis" (Cowen et al., 2022, 2). Next, we conceptualize political coups, a macro-level phenomenon, followed by a discussion of national productivity, and institutional theory. We then use these concepts to fill Coleman's boat.

# 2.2. Political coups

A coup attempt, which either succeeds or fails, is an attempt to effectively seize political "executive authority through the threat of use of force" (Marinov & Goemans, 2014, 801). The objective of a

coup attempt must, therefore, be for some actor or actors currently or previously linked to the state apparatus to overthrow the executive branch. We follow the standard practice of distinguishing coups from other events with similar purposes by defining the former as events that cannot last more than a week at most (Bjørnskov & Rode, 2020). The decision-making process underlying a coup attempt can best be described using public choice theory, a sub-field of political economy that applies economic logic to the analysis of political behavior and thereby provides insights into political uncertainty and change. Public choice theory is based on three presuppositions: (1) methodological individualism, or the assumption that subjective individual motivation explains social phenomena; (2) rational choice, or the assumption that individuals make choices that they expect will align with their own best interest; and (3) politics-as-exchange, or the idea that groups of individuals can agree to further their individual interests collectively through the political process (Buchanan, 2003). Public choice adapts the rational behavior model from economics to the realm of politics such that the collective decision-making process is viewed from the perspective of selfinterested individuals seeking to further their own interests, subject to institutional constraints (Gwartney & Holcombe, 2014). Public choice theory has been applied to a wide range of political phenomena, including coups d'états (Bennett et al., 2021; Bjørnskov & Pfaff, 2021; Leon, 2014; Wintrobe, 2012), which we describe next.

Most coup attempts are motivated by a desire within some faction of a political and/or military elite in a country to overthrow the existing government regime and install a new political leader. While some coups may be motivated by a personal desire for power, most coup attempts aim at changing a nation's institutional structure in a manner that favors the coup-makers and the groups they represent (Aidt & Leon, 2018). That is, coup-makers believe that their preferred institutional arrangements will lead to better outcomes for themselves and the interests that they represent. Successful coups can therefore lead to systematically different institutional outcomes depending on

which background interests are effectively represented by the coup-makers (Bennett et al., 2021; Bjørnskov, 2020; Absher et al., 2023). We further describe institutional change in the aftermath of coup attempts below.

While coup-makers holding such beliefs is a necessary condition for a coup attempt to occur, it does not constitute a sufficient condition. Potential coup-makers must also utilize something akin to entrepreneurial judgement to evaluate the risks involved and determine whether the expected benefits of pursuing a coup attempt outweigh the costs (Klein et al., 2010), These costs include either organizing ex ante political support or forming rational expectations of ex post support, mobilizing military and financial resources, and punishment in the event that a coup attempt fails (Albrecht & Eibl, 2018; Bjørnskov, 2020; Galetovic & Sanhueza, 2000; Gassebner et al., 2016). Inspired by Wintrobe's (2012) approach, we illustrate this trade-off in the following. For simplicity, assume that potential coup-makers weigh the potential net benefits (i.e., less the costs of organizing) of orchestrating a coup,  $\pi$ , that will only be realized if a coup is successful, which they believe will occur with subjectively assessed probability  $\rho$ . Assume also that the coup-makers believe that they will face a punishment cost of  $\psi$  if the coup attempt fails. We can thus illustrate a potential coupmakers' economic decision using a simple cost-benefit model in which their expected benefits are  $E[B] = \rho \pi$ , and expected costs are  $E[C] = (1 - \rho)\psi$ . Because a rational actor would only attempt a coup if E[B] > E[C], a potential coup maker will move forward with a coup attempt if, in their subjective judgement,  $\pi > \frac{1-\rho}{\rho}\psi$ . Note that coup-makers need not internalize the potential externalities or spillover effects of a coup attempt. Rather, they only need to consider the potential costs and benefits of the organizers and background interests they represent (or hope to represent). These costs and benefits also include changes to the productivity of society at large, which can affect both the benefits to the interests supporting the coup as well as its legitimacy and thus its durability.

#### 2.3. National Productivity

The focus of our study is national productivity, or the efficiency and intensity of total resource utilization in production by firms and organizations across an economy. Productivity is the portion of a nation's total economic output that is not explained by inputs (i.e., human and physical capital) in the aggregate production process and is a critical component in the long-run economic growth process, which is influenced by the institutional environment (Bjørnskov & Foss, 2013; Easterly & Levine, 2001; Hall & Jones, 1999; North, 1993; Parente & Prescott, 2000). Following Solow (1956), growth economists largely equate advances in national productivity with technological progress (i.e., innovation) (Lucas, 1988; Romer, 1986, 1990). However, we adopt a more nuanced view of national productivity as an aggregate outcome with micro-foundations (Hill et al., 2022), driven by the strategic actions of entrepreneurs and firm managers experimenting with new combinations of heterogeneous resources in an effort to satisfy consumer preferences in the uncertain pursuit of profitable opportunities (Foss et al., 2019; Foss & Klein, 2012; Lafuente et al., 2020). As Bjørnskov & Foss (2013, 52) note, productivity changes result from the "actions of enterprising individuals and firms that seek to turn opportunities into longer-lived rent streams whether through founding startup firms or reshuffling the resource combinations of established firms in the pursuit of new strategies."1

These strategic actions can lead to the development of a new or significantly improved product, process, or business model innovation. Such innovations enable incumbent or new firms to produce the same or similar products with fewer resources or at a higher quality, or to produce

<sup>&</sup>lt;sup>1</sup> When exploring productivity effects at the national level, instead of the firm level, we inevitably also include productivity in the public sector. Assessments of public sector productivity are fraught with difficulties (see, e.g., Somani, 2021). However, given that it develops very slowly, it is unlikely to affect our dynamic estimates in any substantial way.

products that did not previously exist in the market (Bennett & Nikolaev, 2021b). They may also result in new technical or scientific knowledge that "modifies the components, systems, techniques, or methods required for producing organizational outputs...providing new alternatives for configuring capabilities, performing organizational activities, and creating value" (Lavie, 2006, 154). Successful innovation, thus, contributes to a firm's growth and productivity (Hyytinen & Maliranta, 2013; Morris, 2018). Even when such investments do not directly lead to appropriable productivityenhancing innovation by the firms making them, they may still contribute to national productivity in the form of knowledge spillovers when adopted by startups or other firms (Audretsch & Keilbach, 2008; Ugur et al., 2020; Venturini, 2015). In aggregate, these processes contribute to improving the efficiency and intensity with which resources are utilized by firms in an economy, enhancing national productivity (Bjørnskov & Foss, 2013; Hill et al., 2022).

#### 2.4. Institutional Economic Theory

We utilize new institutional economic (NIE) theory to facilitate our theorizing (North, 1991; Williamson, 2000). Institutions, according to North (1990, 1991), are the humanly devised constraints that create order and reduce uncertainty in exchange by establishing a stable (but not necessarily efficient) structure to political, economic, and social interactions. NIE theory is based on several key assumptions about individual agents, including bounded rationality, market imperfections, long-run profit maximization, and opportunism. The institutional environment provides a framework in which human action takes place such that, given the assumptions about individual motives and decision-making, NIE provides a useful "theoretical vehicle for understanding the impact of institutions on the behavior of economic actions, such as entrepreneurs" and firm managers considering risky innovation projects (Bennett, 2021; Dau & Cuervo-Cazurra, 2014, 669; see also Foss et al., 2019). When undertaking an innovation project, firms and entrepreneurs must "devote resources to physically transforming inputs into outputs...transacting for the purchase of inputs, the coordination and monitoring of inputs in the transformation process, and the sale of outputs" (North & Wallis, 1994, 612). These investment decisions take place in a market context that is regulated and shaped by the quality (Foss et al., 2019) and stability (Young et al., 2018) of the institutional environment. Because investments in productivity-enhancing projects require long-run planning that is characterized by fundamental market uncertainty (McMullen & Shepherd, 2006), an institutional environment that supports "the voluntary exchange underpinning an effective market mechanism" (Meyer et al., 2009, 63) provides a stable structure that makes it "easier for decision-makers to anticipate the future, mitigating the effects of uncertainty" (Foss et al., 2019, 1207). The greater certainty provided by a stable (but not necessarily efficient) institutional environment provides incentives for productivity-enhancing behavior by lowering the total costs of production, which include both transaction and transformation costs (Baumol, 1990; North, 1990, 1993).

Transaction costs are "the costs of land, labor, capital, and entrepreneurial skill required to transfer property rights from one person to another" (North & Wallis, 1994, 612). These include the costs of "entering into, bargaining, monitoring, and protecting contractual and ownership rights," as well as the costs of searching for, combining, and adapting heterogeneous resources in the pursuit of profit under conditions of fundamental market uncertainty (Bjørnskov & Foss, 2013, 53). Transformation costs, meanwhile, are "the costs of land, labor, capital, and entrepreneurial skill required to physically transform inputs into output" (North & Wallis, 1994, 612). Transformation costs, therefore, are related to the costs of introducing or adopting a new technology (North & Wallis, 1994), as well as the costs of redrawing firm boundaries (Garud & Munir, 2008). Institutions that lower transaction and/or transformation costs incentivize firms and entrepreneurs to experiment with new combinations of heterogeneous resources and introduce or apply a

technological improvement in the pursuit of profit under conditions of uncertainty (Bjørnskov & Foss, 2013; North, 1993).

While it is widely accepted that a stable institutional environment encourages entrepreneurship (Bjørnskov & Foss, 2016; Boudreaux et al., 2019; Foss et al., 2019), innovation (Allard et al., 2012; Bennett & Nikolaev, 2021a; Zhu & Zhu, 2017), and ultimately national productivity (Bjørnskov & Foss, 2013; Hall & Jones, 1999; Parente & Prescott, 2000), the mass of research done by management scholars has placed relatively little emphasis on uncertainty of the institutional environment itself (Bylund & McCaffrey, 2017; Hartwell & Devinney, 2021). Institutional uncertainty, a particular source of perceived environmental uncertainty (Milliken, 1987), exists when there is a perceived decrease in the predictability of the institutional environment (Bennett et al., 2022).

Entrepreneurs and firm managers assessing the long-run viability of an innovation project will consider the current institutional environment as well as their subjective assessment of the future environment. When these economic agents discern a credible threat to the existing institutional order, doubts "about the relevance of existing institutions" create an environment that can undermine their judgment process (Banalieva et al., 2018; Zahra, 2020, 174). This creates institutional uncertainty about the future stability of the institutional environment that entrepreneurs and firm managers rely on to exercise judgement about their beliefs (Frølund, 2021), which precedes entrepreneurial and strategic action (Foss & Klein, 2012). The resulting institutional uncertainty makes it difficult to decipher the institutional environment, imposing higher transaction and transformation costs on entrepreneurs and firms that hinders their decision-making process (Bennett et al., 2022). This institutional uncertainty potentially thwarts entrepreneurial action (Bylund & McCaffrey, 2017; Frølund, 2021), leading entrepreneurs and firms to adopt a 'wait and sce' strategy (Banalieva et al., 2018).

Institutional uncertainty can arise from many sources and occur at different institutional levels (Bylund & McCaffrey, 2017). Particularly relevant for our study is *regime uncertainty*, a special case of institutional uncertainty that occurs due to a lack of trust in a new government regime, leading to a pervasive lack of confidence among entrepreneurs, firms, and investors in their ability to foresee the extent to which future government actions will alter their private-property rights and other market-supporting institutions that they rely on to reduce market uncertainty (Bylund & McCaffrey, 2017; Higgs, 1997).

When entrepreneurs and firm managers "trust that society holds values beneficial to business and property rights, they can be confident its institutions will be respected" and they will benefit from any profits resulting from their decisions (Bylund & McCaffrey, 2017, 471). Regime uncertainty is created when a nation's political leaders signal that an ideological shift is underway that credibly threatens the future stability and predictability of the existing institutional order (Bennett et al., 2022; Frølund, 2021). As a consequence, regime uncertainty poses a significant problem for firms and entrepreneurs by diminishing confidence that their property and business rights will be protected in the future, resulting in a substantial increase in future anticipated transaction and transformation costs (Bennett et al., 2022). Regime uncertainty may, therefore, leave firms and entrepreneurs "with no choice but to restrain their actions altogether or exit the market" (Bylund & McCaffrey, 2017, 472).

## 2.5. Hypotheses Development

Bringing these elements together, we contend that political coups create regime uncertainty that, by raising transaction and transformation costs (a *situational mechanism*), distort the ability of entrepreneurs and firm managers to evaluate the long-run viability of risky innovation projects (an *action-formation mechanism*). As a result, these projects will be delayed or abandoned altogether,

resulting in reduced investment in potential productivity-enhancing projects that will, in aggregate, contribute to a decline in national productivity (a *transformation mechanism*). Figure 1 depicts this process using the Coleman boat framework.

# [Figure 1]

We focus on the potential effects that coup attempts may have on productivity and the institutional environment in which firms and entrepreneurs make investment decisions. In both the political and economic spheres, coups attempts have two separate effects: (1) they create substantial political instability (Alesina et al., 1996); and (2), when successful, they create the conditions for unexpected and rapid institutional change (Bennett et al., 2021; Grier et al., in press). In this way, coup attempts are large-scale exogenous crises that not only result in a period of regime uncertainty (Bylund & McCaffrey, 2017) – and potentially a more permanent state of political instability – but are also capable of permanently altering the institutional context facing firms and entrepreneurs engaged in long-run planning. In this way, coup attempts create a window of opportunity for rapid and unexpected institutional change (Abell, 1978; Bennett et al., 2021). Following a coup attempt, while this window remains open, entrepreneurs and firms face regime uncertainty as they await clarity on how the institutional environment will unfold.

A coup attempt by definition challenges the status quo and leads to rational considerations that institutional changes may be imminent. First, a risk in the very short run is that the coup might succeed and result in a government with different priorities. Second, the situation creates regime uncertainty as non-political institutions such as the judiciary and bureaucracy may not function during and in the immediate aftermath of the coup attempt. Finally, when a coup attempt fails, it may reveal information about the political environment to the incumbent regime that might cause it to engage in additional coup-proofing (Bove & Nisticò, 2014). All three mechanisms imply that the regime uncertainty facing economic decision-makers increases substantially in the immediate

aftermath of a coup attempt, undermining the ability of business leaders to rationally evaluate risky, long-term innovation projects (*situational mechanism*).

In this way, coup attempts create regime uncertainty that undermines the ability of firms and entrepreneurs to undertake risky innovation projects with the potential to boost productivity. Although some firms and entrepreneurs may view the regime uncertainty created by a coup attempt as an opportunity to invest, institutional economic theory suggests that rational agents will delay action until institutional clarity emerges (Frølund, 2021). As such, these projects will be delayed or abandoned altogether (Bylund & McCaffrey, 2017), resulting in reduced entrepreneurial and firm investment in potential productivity-enhancing projects (*action-formation mechanisms*). In aggregate, the reduced investment behavior by firms and entrepreneurs in the aftermath of a coup will contribute to a decline in national productivity (*transformational mechanism*). This motivates our first testable hypothesis:

#### H1: Coup attempts reduce productivity.

A successful coup often results in regime change when the new regime represents a different set of background interests relative to the deposed regime or proves to represent similar interests more successfully. A failed coup may be a signal to the incumbent that his position is at greater risk.<sup>2</sup> As such, the potential institutional changes that arise from these events will differ. With a failed coup the incumbent may engage in additional coup-proofing of the regime and also punish the supporters of the coup attempt (Easton & Siverson, 2018; Powell, 2012). This response represents an *institutional refinement*, as the political leaders modify the existing institutional structure to ensure continued support of the regime by citizens of interest groups. The institutional refinements that

<sup>&</sup>lt;sup>2</sup> In principle, a failed coup attempt may not come as a real surprise. If so, its failure therefore confirms that the incumbent regime is not at a greater risk than previously thought and that its coup-proofing strategy is sufficient. In that case, we do not expect the regime to engage in any substantial institutional changes.

follow a failed coup are likely to pale in comparison to the *institutional replacements* that occur in the aftermath of a successful coup, as the new regime implements institutions that are more aligned with its ideology and the interests of its supporters (Cuervo-Cazurra et al., 2019). Bennett et al. (2021), for example, find that successful coups have a greater negative impact on judicial restraints than do failed coups. This is to be expected given that a new regime will have a new selectorate to appease and will need to change institutions to accommodate and pay off these coup backers. Following a successful coup, the future stability and structure of the institutional environment is highly uncertain. We theorize, therefore, that the regime uncertainty created in the aftermath of a coup attempt will be greater if the coup succeeds than if it fails. This motivates our second hypothesis.

# H2: Successful coups have a greater negative effect on national productivity than failed coups.

Apart from potentially inducing a period of regime uncertainty in the short run as incumbents attempt to coup-proof their regimes, coups may also lead to institutional changes in the longer run. Bennett et al. (2021), for example, document that coups, and particularly successful military coups, typically lead to more corruption and reduced judicial accountability (see also Yu and Jong-a-Pin, 2016; Grier et al., in press). Changes in the formal institutional environment in the aftermath of a coup may result in institutional changes that align with the objectives of the regime but are "at odds with society's values and commercial activities." As a result of this institutional misalignment, entrepreneurs and firm managers face uncertainty "about their enforcement as well as the enforcement of contracts and agreements that are already in effect" (Bylund & McCaffrey, 2017, 470).

As time elapses following a coup attempt, firms and entrepreneurs will gain clarity concerning the new institutional environment, but institutional misalignments may impose higher anticipated future transaction and transformation costs on firms by creating uncertainty regarding the continued enforceability of formal institutions (Bennett et al., 2022). The increased costs associated with formal

institutional misalignment may discourage firms and entrepreneurs from undertaking risky innovation projects or, if the costs are significant enough, exit the market altogether (Bylund & McCaffrey, 2017). As such, coups may have longer-run consequences for productivity over and above the consequences of political instability (Allard et al., 2012; Wu et al., 2016). We hypothesize, therefore, that in addition to creating regime uncertainty, the long-run effect of coup attempts on productivity is mediated by actual institutional responses in the aftermath of these political crises.

H3: Institutional change mediates the relationship between coups and national productivity

As we note above, institutional change in the aftermath of a coup attempt is likely to differ depending on the outcome. In the case of a failed coup, the incumbent regime is likely to engage in institutional belt-tightening to punish detractors and raise the costs faced by future prospective coup leaders. However, it may also realize that under some conditions, providing better institutions will keep central interests satisfied with the current regime (Holcombe & Boudreaux, 2013). Such institutional change is likely to occur at the margin of the current institutional environment, representing an institutional refinement. Meanwhile, successful coups are more likely to result in more substantive institutional replacement as the new regime reorganizes the rules of the game to accommodate its supporters and safeguard its position (Cuervo-Cazurra et al., 2019). Given this reasoning, we propose our final testable hypothesis.

H4: The mediating effect of institutional change on national productivity is greater for successful than failed coups.

#### 3. Data and Methods

# 3.1. Dependent Variable: National Productivity

We measure national productivity using aggregate value added per worker, i.e., labor productivity, which represents the economic value created (i.e., market value of goods or services production less input costs) from heterogeneous resource combinations. This data comes from the GDDC 10-Sector Database, which provides annual value-added and employment data for ten broad sectors of the economy, as well as for the entire economy, beginning in 1950. The GDDC is available for up to 40 countries, representing each of the major regions of the world (Timmer et al., 2014). We adjust the value-added figures for purchasing power parity (PPP) so that they are comparable across countries and time using the 2011 World Bank PPP conversion factors. We normalize value-added by employment, which includes paid employees as well as self-employed and family workers. Because value-added can take on zero or even negative values, and to reduce the potential influence of outliers in the distribution, we transform value added per capita using the inverse hyperbolic sine function (Bellemare & Wichman, 2020).

## 3.2. Independent Variable: Coup Attempts

In order to capture the effects of coups, we use the recent Regime Types and Regime Change database (Bjørnskov & Rode, 2020), which includes information on 567 coup attempts since 1950. Of these coup attempts, 424 were led by current or former members of the military or members of royal families, while 143 were led by civilians. Approximately half of all military or royal coups succeeded, while about 35 percent of civilian coups succeeded. The 118 coups within our sample are representative of the full mass of coups since 1950. Following Bennett et al. (2021), we code coup outcomes for country-years with multiple coup attempts as successful if any of the coup attempts were successful.

# 3.3. Mediating Variables

To capture institutional change following coup attempts, we turn to the large *Varieties of Democracy* version 10.1 (V-Dem) dataset, which provides a multitude of historical measures, covering more

than 200 nations beginning in 1789. We adopt three central components of a nation's institutional framework that represent conceptually distinct aspects of the institutional environment (Coppedge et al., 2020).

First, we include a measure of corruption. Previous research suggests that corruption may dissuade productivity-enhancing behavior by creating market distortions in the allocation of resources to their highest value use (Fang et al., 2018), reducing the availability of long-term debt and incentives to invest in R&D (Xu & Yano, 2017), undermining the trust necessary to encourage complex economic coordination (Anokhin & Schulze, 2009), and discouraging foreign direct investment (Cuervo-Cazurra, 2006). We account for corruption using the V-Dem political corruption index (i.e.,  $v2x\_corr$ ), a multi-dimensional measure that captures pervasiveness of corruption in different areas and levels of government, including the judiciary, legislature, and the executive branch. It accounts for petty and grand corruption, theft and bribery, and corruption intended to influence law-making and enforcement. Higher scores are associated with more corruption.

Next, we include a measure of the rule of law. Rule of law provides entrepreneurs, firms, and investors with confidence that their property rights will be protected and contracts will be enforced. By doing so, it reduces the reduces the risk of arbitrary expropriation (Levie & Autio, 2011) and lowers the transactions costs associated with the identification and exploitation of innovative ideas (Foss & Foss, 2008). The rule of law also encourages entrepreneurial alertness by providing a sense of internal control and personal agency (Aidis et al., 2012), and is, then, the backbone of a market economy and essential for the enablement of productivity-enhancing behavior (Baumol, 1990). The V-Dem's rule of law index (i.e.,  $v2x_rule$ ) measures the extent to which a nation's laws are "transparently, independently, predictably, impartially, and equally enforced" (Coppedge et al., 2020, 281). The index accounts for institutional features such as judicial independence, constitutional

adherence, access to justice, property rights protections, and rigorous and impartial public administration. Higher values reflect a stronger rule of law.

Lastly, we include a measure of checks and balances, or institutional constraints on the arbitrary use of political power by government officials using the V-Dem government accountability index (i.e., v2x\_accountability). It is comprised of three sources of institutional checks and balances, namely vertical accountability (i.e., accountability to the population via free and fair elections), horizontal accountability (i.e., checks and balances between branches of government), and diagonal accountability (i.e., impartial oversight of government by civil society and the media). Such checks and balances limit the ability of public officials to indiscriminately extract resources from individuals and organizations (Acemoglu et al., 2001). They also help ensure political stability (Holburn & Zelner, 2010), which encourages innovation (Allard et al., 2012), and deter economic entrenchment that inhibits productivity-enhancing competition (Morck et al., 2005). As such, checks and balances reduce uncertainty among entrepreneurs and firms that their investments will be appropriated suddenly and unexpectedly (Autio & Fu, 2015), thereby encouraging more productive behavior (Omri, 2020; Thai & Turkina, 2014).

# 3.4. Control Variables

Given the longevity of the time dimension for our longitudinal dataset, our selection of control variables is limited by data availability. Nonetheless, we control for several potential confounding variables. First, given that our sample includes an economically diverse set of nations, we control for the level of economic development using the natural log of per capita GDP (e.g, Acemoglu et al., 2001; Bennett et al., 2017). Next, we control for regime type by including dummy variables indicating whether the incumbent regime is a military or civilian dictatorship (the omitted regime category is democracy). Additionally, we control for recent coup experience (Gassebner et al., 2016)

by including a dummy variable equal to one if a country experiencing a coup attempt within the previous five years.<sup>3</sup>

#### 3.5. Sample

By combining data from a variety of sources, we were able to assemble a novel macro dataset for a representative sample of countries over a long period, enabling us to empirically test our micro-foundation based theoretical model. Table 1 provides descriptions, summary statistics, and data sources for the variables used in our analysis. Our final sample includes 39 countries spanning the period 1950-2012 for which full data is available. The sample is both economically and regionally diverse and includes countries representing all the major regions of the world and a mix of economic development levels. Table 2 provides a list of the countries in our sample and the number of coup attempts experienced in each country over the sample period. Of the 39 nations in our sample, 23 experienced at least one coup attempt. A correlation matrix is presented in Appendix Table A1.

#### 3.5. Identification

To obtain causal inference, our treatment effect (i.e., coup attempt) must be exogenous. Previous literature suggests that coup attempts are rare and largely unexpected events, and that coup outcomes are largely random (Bennett et al., 2021; Bove & Nisticò, 2014). The implication is that coups, and in particular coup success, are conditionally exogenous. Nonetheless, as we are the first to examine the productivity effects of coups, we take steps to validate our claim that coups are conditionally independent of productivity. First, we run a fixed effects logistic regression to estimate whether productivity predicts whether a country experiences a coup attempt, controlling for

<sup>&</sup>lt;sup>3</sup> We also use coup experience within 10 years as a robustness check in some models.

economic development, our three measures of institutional quality, regime type, a dummy variable indicating whether a recent coup attempt occurred, and year fixed effects. We lag all variables one year relative to coup attempts to minimize potential simultaneity issues. These results, presented in Table 3, show that productivity is not a significant determinant of a coup attempt. They also reveal that coup attempts are not predicted by institutional quality, the level of economic development, the regime type (i.e., our democracy dummy), or recent coup events. These results suggest that coup attempts are indeed random and unpredictable events.

# [Table 3]

Next, we examine the common trends assumption graphically by plotting the average level of productivity across countries within 3-years of a coup attempt by outcome. As illustrated in Figure 2, the average level of productivity follows a nearly identical trend prior to both successful and failed coups; however, the mean productivity level continues to rise in the aftermath of a failed coup, while it falls following a successful coup. This graphical representation provides preliminary evidence in support of H2, but more importantly, it is suggestive that the common trends condition necessary to establish conditional independence between productivity and coup outcomes is satisfied.

# [Figure 2]

Finally, we follow Bennett et al. (2021) in directly estimating the effects of coup outcome on productivity by including dummy variables for both successful and failed coup attempts in the same regression model. This specification is mathematically equivalent to an interaction model that includes a coup attempt dummy and coup attempt-success interaction term. Because coup outcomes are random, we can treat our coup variables as conditionally exogenous (Nizalova and Murtazashvili, 2016). As such, we can therefore interpret our estimates of the effects of coup outcomes on productivity as causal.

#### 4. Empirical Results

#### 4.1. Coups and Productivity

We use two-way fixed effects regression to estimate the effect of coup attempts on national productivity.<sup>4</sup> Specifically, we regress productivity on coup attempts, our baseline set of controls (i.e., institutional quality, economic development, regime type, recent coup experience), and both country and year fixed effects. We lag our control variables one year to minimize potential simultaneity issues. We present these results in Table 4 in which we use coup attempt as the independent variable in models 1-4 while models 5-8 examine separately coup attempts by outcome by including both successful and failed coup attempt dummies as the independent variables of interest. Odd-numbered models include a dummy variable equal to 1 if a country experienced a coup within the past five years, while even-numbered models control for coup experience within the past ten years. Models 1-2 and 5-6 include the full sample of countries, while models 3-4 and 7-8 are constrained to the set of countries that have experienced at least one coup attempt over our sample period.

[Table 4]

<sup>&</sup>lt;sup>4</sup> Given that the countries in our sample have experienced coups at different periods of time (some experienced multiple coups over the sample period) and exhibit heterogeneity in the economic and political environments, it is conceivable that the effect of coups on productivity is heterogeneous across groups and/or time. The presence of treatment effect heterogeneity can result in negative weights that bias the TWFE estimates, potentially resulting in a coefficient whose sign is opposite of the true effect. We address this issue in the Appendix. Using the Stata program *twowayfeweights* we find that none of the weights in our model are negative and that there is a minimal degree of unobserved heterogeneity (de Chaisemartin & D'Haultfœuille, 2020). We report these results in Appendix Table A2. For robustness, we also estimate our models using the fuzzy differences-in-differences estimator, which account for potential heterogeneous treatment effects (de Chaisemartin et al., 2019). The results, reported in Appendix Table A3, suggest that Coup Attempts reduce productivity by 43.7 – 44.5 percent and that successful coup reduces productivity by 52.5 – 55.6 percent. Failed coup attempts have no effect. These estimates are similar to our TWFE estimates.

The results in model 1 show that, consistent with H1, coup attempts have a negative and highly significant statistical effect on productivity. The point estimates and significance levels are very similar in model 3. However, once we constrain the sample to the set of countries that have experienced at least one coup attempt in model 2, and thus exclude never-treated observations, the effect of a coup attempt on productivity drops by more than 40 percent and is estimated much less precisely; we obtain similar results in model 4. Because we applied the inverse hyperbolic sine transformation to our productivity measure, for interpretation we estimate the semi-elasticity using the formula  $\epsilon = 100(e^{LATE} - 1)$  (Bellemare & Wichman, 2020). The results in models 1-4 suggest that coup attempts are associated with a 30.0 to 47.2 percent reduction in productivity, although the results for the sub-sample of countries experiencing a coup are estimated imprecisely.

The results in model 5 show that the negative effect of coup attempts on productivity is driven by successful coups, which have a large, negative and highly significant effect on productivity. Meanwhile, the estimate for failed coup attempts is also negative but estimated imprecisely. In model 6, which constrains the sample to countries experiencing a coup over the sample period, the estimated effect of successful coups on productivity is nearly 20 percent lower, but it remains statistically significant. Meanwhile, the estimate for failed coups becomes slightly positive, but is again estimated very imprecisely. We obtain very similar results in models 7 and 8 when controlling for coup experience within the past ten years in lieu of five years. The semi-elasticities in models 5-8 suggest that a successful coup attempt is associated with a 58.9 to 67.7 percent reduction in productivity.

# 4.2. Coups, Institutional Change and Productivity

We use structural equation modeling (SEM) to test H3 and H4 regarding the potential mediating effects of institutional change. We use the Stata program *gsem* to estimate the mediation model

depicted in Figure 3. Because our theory suggests that institutional changes in the aftermath of a coup mediate the relationship between coup attempts and productivity, we observe productivity j lead years from the time of a coup attempt and account for institutional changes from years t to t+j (i.e.,  $\Delta I_t = I_{t+j} - I_t$ ). We estimate models with j=3, 5, and 7 year leads to consider institutional changes over various time periods following a coup attempt.

Table 5 summarizes the results from our SEM estimates. Panels A, B, and C present the results for leads of 3, 5, and 7 years, respectively. In each panel, we first present the results for the model using coup attempt as the independent variable. We then present the estimates for both successful and failed coups, which we include in the same model. We report the total, direct, and indirect (i.e., mediating) effects, as well as the share of total effects of coup attempts on productivity that is mediated through institutional changes. All of our models control for the same set of covariates from our TWFE model (excluding institutional quality) that we observe at the time of a coup attempt, including fixed country and year effects.

# [Figure 3]

We observe that coup attempts have a negative total effect on future productivity. The coefficient estimates across the models are quite similar, ranging from -0.275 (p=0.087) in panel B to -0.322 (p=0.039) in panel C. Interestingly, the total effect of coup attempts on productivity is almost entirely direct in the shorter term (i.e., j=3), as none of the mediating effects in panel A are practically or statistically significant. However, as time passes following a coup, we observe that the negative effect is partially mediated through institutional change and the mediating effects share appears to increase over time, from 16.0 in panel B to 20.8 in panel C. The mediating effects are almost entirely attributable to reduced checks and balances in the aftermath of a coup attempt. These results provide some support for H3 that the negative effect of coup attempts on productivity is mediated through institutional change.

#### [Table 5]

In the models examining mediation by coup outcome, we once again observe that the negative productivity effects of coup attempts are driven by successful coups. The estimated total effects of successful coups are similar across the three models, ranging from -0.606 (p=0.011) in panel B to - 0.676 (p=0.006) in panel A. Similar to the results for all coup attempts, we also observe that the total effect of successful coups is almost entirely direct in the shorter term (i.e., j=3), but reduced checks and balances partially mediate the effect as time elapses. Conversely, failed coups have very little effect on future productivity across the three models, as the total and direct effects are small and estimated imprecisely across specification. We observe that reduced checks and balances seven years after a failed coup has a slight negative moderating effect on productivity, but the total effect in that model is not statistically significant. Overall, we view these results as supportive of H4 that the mediating effect of institutional change on productivity is greater following a successful than a failed coup.

# 4.3. Exploratory Analysis of Boundary Conditions

We extend our study in several ways to examine some of the boundary conditions of our analysis. This part of our study is exploratory: while we offer brief theoretical considerations to motivate the analyses below, we do not develop specific hypotheses for this post-hoc analysis.

First, we explore whether the potential change in institutions results in heterogeneous industry effects of coups on productivity (cf. Cuervo-Cazurra et al., 2019). In an attempt to consolidate power, the incumbent may change rules or distort their implementation to favor supporters and punish opponents, making it relatively easier for firms in favored industries to engage in unproductive rent-seeking activities (Baumol, 1990; Boudreaux et al., 2017). For industries favored by the incumbent, we expect that the rules will favor their businesses, and thereby reduce any

incentives for innovation and lead to lower productivity growth in these industries. Yet, *a priori* we cannot predict which industries will be favored by the incumbent.

To explore the potential heterogeneous effects of coups on industry productivity by coup outcome, we re-estimated our baseline TWFE model from Table 2 (i.e., model 5) for each of the ten sectors for which the GDDC dataset provides industry-specific economic value-added measures. These results are presented in Appendix Table A4 and show that successful coups have a negative and statistically significant effect on productivity in all ten sectors. The negative effects are greatest in the mining and quarrying sector, followed by the government services and utility (i.e., electricity, gas, and water supply) sectors. Meanwhile, the negative productivity effects are least pronounced in the finance, insurance, real estate, and business services sector.

Next, we examine whether different types of coups and their outcomes have differential effects on productivity. Those who emerge to power in the aftermath of a coup will want to protect or consolidate their position by altering the institutional environment in a manner that reduces the likelihood of future successful coup attempts and rewards the regime's particular supporters. In order to get an analytical grip on these changes, Bueno de Mesquita et al. (2003) note that every autocracy relies on the support of a majority of its selectorate – the set of politically relevant voters and special interests – in the same way as a democratically elected government relies on the continued support from a majority or a blocking minority of the entire electorate. We follow recent literature in public choice on coups in making the simple assumption that any autocracy can be represented by one of two types of selectorates, or two separate factions within the total selectorate in our SEM mediation model by including separate coup type indicator variables (i.e., successful military, failed military, failed civilian).

The results, which we present in Appendix Table A5, suggest that successful military coups have a strong negative direct effect on productivity. We also find that, over the medium run, successful civilian coups reduce productivity by reducing checks and balances. The magnitude of the direct effects of successful military coups is similar to the magnitude of the indirect effect of successful civilian coups. We interpret these findings as suggestive that the negative productivity effects following a successful military coup are attributable to institutional uncertainty, whereas the negative productivity effects of successful civilian coups are attributable to a visible deterioration of institutional quality, namely reduced checks and balances.

Finally, we consider whether the effects of coups on productivity vary by incumbent regime type. Specifically, we explore whether the effect of coups on productivity differs if the regime in place at the time of the coup was democratic or autocratic. The results from these tests, which are presented in Appendix Table A6, clearly show that successful coups against dictatorships have a strong negative effect on productivity. This effect is almost entirely direct and it strengthens with time following a coup, although we do observe that the effect is partially mediated by a reduction in checks and balances in the medium run ( $j \ge 5$ ) following a coup. The indirect effect of reduced checks and balances following a successful coup against a dictatorship mediates 9.1 to 13.5 percent of the total effect. We also observe a strong negative effect on productivity three years following a successful coup against a democracy that is partially mediated (10.4 percent) by reduced checks and balances, but this effect appears to be transitory as the effects are not statistically significant when  $j \ge 5$ . Failed coups against dictatorships also have a negative indirect productivity effect via reduced checks and balances five and seven years following the coup attempt, although the estimated effect sizes are substantially smaller and the total effects are statistically insignificant.

5. Discussion

#### 5.1. Contributions

We develop a micro-foundation based theoretical model to depict how coup attempts, a type of political crisis, generate uncertainty about the institutional environment that undermines the decision-making capability of entrepreneurs and firm managers, leading them to delay or abandon risky innovation projects with the potential to enhance productivity (Bylund & McCaffrey, 2017; Frølund, 2021). In doing so, we contribute to the literature examining the economic and political consequences of coups. While some research links coups to reduced economic growth (Alesina et al., 1996; Blum & Gründler, 2020; Grier et al., in press), our study is the first that we are aware of to consider how these rare and unexpected political crises specifically affect a nation's productivity, a key driver of economic growth (Bjørnskov & Foss, 2013; Prescott, 1998). By discouraging firms and entrepreneurs from pursuing productive activities, coups repress a nation's productivity. Our findings pave the way for future research on the growth consequences of political instability to decompose the effects attributable to the underlying factors that drive growth, including productivity and the institutional environment (Easterly & Levine, 2001). Because our model is developed from micro-foundations, it provides a framework for management scholars to explore the micro-economic consequences of political instability for firms and entrepreneurs (Col et al., 2018; Cumming et al., 2016; Kim & Li, 2014; Witte et al., 2020) that, in aggregate, contribute to the economic trajectory of a nation.

We also contribute to the growing body of literature highlighting the importance of institutions for entrepreneurial and firm outcomes (Ault & Spicer, 2020; Autio et al., 2014; Barbosa & Faria, 2011; Bjørnskov & Foss, 2013; Foss et al., 2019). Much of this research implicitly treats the institutional environment as exogenous, but Acemoglu et al. (2005) argue that institutions are an outcome of the political process such that institutions are endogenous to political change (Bjørnskov, 2020; Lachapelle, 2020). Our framework accounts for this endogeneity by identifying

coups as an exogenous source of political change capable of generating rapid and unexpected institutional change (Bennett et al., 2021; Grier et al., in press). In addition to the regime uncertainty created by a coup attempt, the actual institutional changes implemented in the aftermath of a coup can be detrimental for productivity by creating institutional misalignments that significantly undermine the ability of entrepreneurs and firms to engage in the long-run planning necessary to facilitate productive investments (Bylund & McCaffrey, 2017; Foss et al., 2019; Frølund, 2021). Thus, our model provides insights on how to address the business consequences of institutional uncertainty vis-á-vis institutional change in the wake of large-scale crisis events that create the conditions for rapid and unexpected institutional change.

We also contribute to the literature on institutions and productivity. Nations with stable, highquality institutions provide an incentive for productivity-enhancing behavior by lowering the total costs of production and enabling productivity advances through innovation and/or technological adoption (Bjørnskov & Foss, 2013; North, 1993; Parente & Prescott, 2000). While theory and a growing body of empirical evidence suggest that stable, high-quality institutions are associated with greater productivity (Coe et al., 2009; Gwartney et al., 2006; Hall & Jones, 1999; Lagos, 2006; Manca, 2010), there has been little research on how unstable institutional environments influence the mechanics of productivity. We contribute to this gap in the literature by examining the influence of regime uncertainty in the aftermath of a coup on national productivity, as well as the mediating effect of institutional change.

While our study is concerned with political instability, we believe that our findings have implications for other types of large-scale crises that concentrate power, induce significant environmental uncertainty, and create the conditions for rapid and unexpected institutional and policy change (Higgs, 1987; Packard et al., 2017; Sine & David, 2003). For instance, previous management research has examined the consequences for firms and entrepreneurs to economic

crises such as the 1997 Asian economic shock (Chakrabarti, 2015) and the 2008-2009 global financial crisis (Col et al., 2018; Davidsson & Gordon, 2016; Lee et al., 2015; Nemlioglu & Mallick, 2021), but these studies did not account for the potential mediating effect of institutional changes in the aftermath of the crises (Gamble et al., 2020; Sine & David, 2003). As Winston Churchill famously stated, "never let a good crisis go to waste," meaning that politicians often utilize crises events to expediently enact institutional changes. In this way, crises create a window of opportunity for politicians to enact institutional change (Abell, 1978). Future management research can build on our insights to decouple the effects of a large-scale crisis attributable to environmental uncertainty from those resulting from institutional changes in the aftermath of the crisis.

## 5.2. Practical Implications

Coup d'états are rare and unexpected political crises that generate considerable regime uncertainty and create an environment susceptible to rapid and unexpected institutional change. As we have demonstrated, such political crises significantly undermine productivity, negatively impacting a nation's long-run economic trajectory. While it is conceivable that political coups promulgate institutional improvements that enable productive activity (Acemoglu & Robinson, 2006), empirical evidence to-date suggests that coups are typically followed by institutional degradation (Bennett et al., 2021) and reduce economic growth (Alesina et al., 1996; Blum & Gründler, 2020, Grier et al., in press). Our findings are corroborative and further suggest that successful coups hinder a nation's productivity development by creating significant regime uncertainty as well as fostering a reduction in institutional quality. This suggests that political leaders, particularly in nations characterized by a history of political instability, can encourage productivity as well as remain in power by pursuing strategies that reduce the risk of a coup attempt. Previous research suggests that political leaders may pursue "coup-proofing" measures, including increasing the flow of resources to the military and creating structural obstacles that create coordination challenges (Belkin & Schofer, 2003; Powell, 2012; Leon, 2014), as a means to reduce the risk of a coup attempt and promote political stability. However, a recent robustness analysis finds that coup attempts are more likely in regions with slow economic growth and weak property rights protections (Gassebner et al., 2016). This implies an alternative coup-proofing strategy for political leaders in nations with weak institutional environments, namely enacting institutional reforms that better protect property rights, which in turn facilitate productive economic behavior that contributes to productivity advancements and economic growth (Barbosa & Faria, 2011; Bjørnskov & Foss, 2013; Holcombe & Boudreaux, 2013).

As suggested above, our study has implications for other types of large-scale socio-economic crises. While our findings suggest that the aggregate effects attributable to the environmental uncertainty created by such events are negative, they also imply that political responses to crises resulting in institutional changes that increase transaction and transformation costs exacerbate and extend the adverse economic effects (Congleton, 2009; Higgs, 1987). Thus, policymakers should carefully consider how enacting institutional changes in response to a crisis will affect the incentives facing firms and entrepreneurs.

#### 5.3. Limitations and Future Research Guidance

Like all studies, ours has some limitations that provide guidance for future research. First, our sample is limited to 39 nations due to data availability. While we would prefer to have a larger sample of nations in our dataset, our sample contains countries representative of each of the major regions of the world. Our results are also robust to exclusion of countries that have not experienced any coups. As such, we are confident that our findings of large adverse productivity consequences of successful coups reflect an economic reality that the uncertainty stemming from political instability, as well as the policy effects of coups, undermines the institutional structure necessary to encourage productive activity. Nonetheless, as data for a larger number of nations becomes available, it would be useful to revisit this question.

Next, we utilize a highly aggregated measure of productivity, which enabled us to "expand theorizing in micro research to the macro level" (Hill et al., 2022, 627). While we find that the overall productivity effects of successful coups are large and negative, successful coups bring to power a new regime representing a new set of interests. As such, it is likely that many individual firms, and perhaps some entire industries, with close ties to the new regime benefit economically from such change (Holburn & Zelner, 2010; Zahra, 2020). One of the major benefits of such alignment may be protection from competition, thereby allowing politically-favored firms and industries to operate profitably without having to make productivity-enhancing investments (Cuervo-Cazurra & Dau, 2009; Cuervo-Cazurra & Genc, 2008). The aggregate nature of our data does not allow us to test for the distribution of rents among firms and/or industries following an unexpected regime change, although we do provide some evidence that the negative productivity effects are realized across most of the major sectors in the economy. We are unable to discern, however, whether the reduced productivity across sectors is attributable to general disincentive effects or unproductive rent-seeking behavior that erodes productivity (cf., Baumol, 1990). Additionally, it is conceivable that the emergence of a new political elite in the aftermath of a coup may remove some existing political barriers to entry as a means to gain broad support for the new regime (Acemoglu & Robinson, 2006), enabling new venture creation and innovation in certain sectors of the economy (Davidsson et al., 2020; Gohmann et al., 2008), As more granular longitudinal data become available at the firm and/or industry level, exploring the allocation of entrepreneurial effort (Baumol, 1990; Boudreaux et al., 2017) in the aftermath of coups would provide further insights on how these political crises influence productivity.

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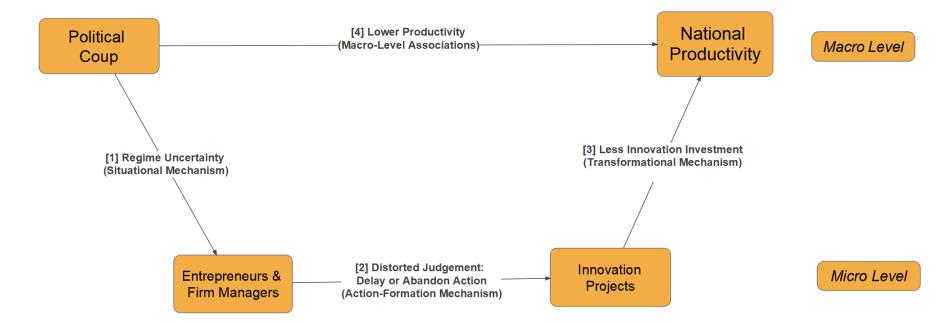


Figure 1: Coleman Boat Model Linking Coups to Productivity

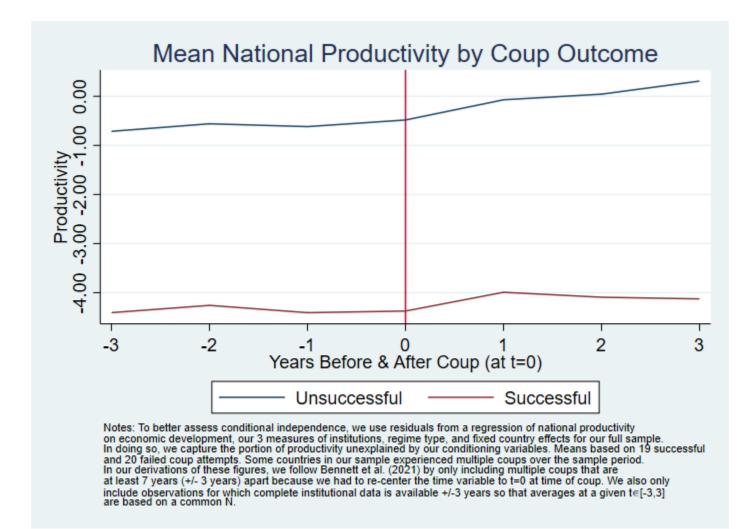


Figure 2: Pre- and Post-Coup Productivity Trends by Coup Outcome

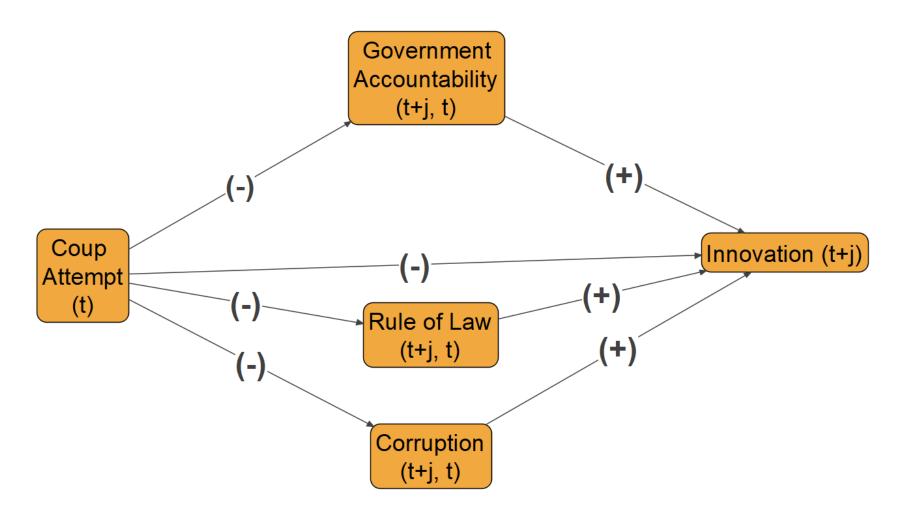


Figure 3: Mediation Model: Coups, Institutional Change, and Innovation

Variable		N	Min	Max	Mean	SD	
	Description						Source
Productivity	Economywide value-added per employee. Figures adjusted using World Bank 2011 PPP figures. Inverse hyperbolic sine transformed.	1905	0.0	19.7	11.5	3.6	Groningen Growth and Development Centre 10-Sector database (Timmer et al., 2014).
Coup Attempt	Dummy variable = 1 if coup attempt occurred in given country-year, 0 otherwise.	1905	0.0	1.0	0.04	0.21	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Coup Success	Dummy variable = 1 if coup attempt successful in given country-year, 0 otherwise.	1905	0.0	1.0	0.02	0.14	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Coup Fail	Dummy variable = 1 if coup attempt failed in given country- year, 0 otherwise.	1905	0.0	1.0	0.02	0.16	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Coup Experience (5 years)	Dummy variabel = 1 if country experienced a coup attempt within previous 5 years	1905	0.0	1.0	0.16	0.37	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Coup Experience (10 years)	Dummy variabel = 1 if country experienced a coup attempt within previous 5 years	1905	0.0	1.0	0.24	0.43	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Military Coup Success	Dummy variable = 1 if military coup attempt successful in given country-year, 0 otherwise.	1905	0.0	1.0	0.02	0.14	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Civilian Coup Success	Dummy variable = 1 if civilian coup attempt successful in given country-year, 0 otherwise.	1905	0.0	1.0	0.00	0.03	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Military Coup Fail	Dummy variable = 1 if military coup attempt failed in given country-year, 0 otherwise.	1905	0.0	1.0	0.02	0.14	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Civilian Coup Fail	Dummy variable = 1 if civilian coup attempt failed in given country-year, 0 otherwise.	1905	0.0	1.0	0.01	0.08	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Military Dictatorship	Dummy variable =1 if military dictatorship regime, 0 otherwise.	1905	0.0	1.0	0.16	0.36	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)
Civilian Dictatorship	Dummy variable =1 if civilian dictatorship regime, 0 otherwise.	1905	0.0	1.0	0.26	0.44	Regime Type and Regime Change dataset (Bjørnskov and Rode, 2020)

# Table 1: Summary Statistics, Variable Descriptions, and Data Sources

Economic Development	Ln(per capita Gross Domestic Product)	1905	6.3	11.0	8.84	1.12	Penn World Tables / The Maddison Project (Bolt & Zanden, 2014)
Checks and Balances	Index capturing institutional constraints on arbitraty use of political power by government officials.	1905	-1.7	2.0	0.65	0.96	Varieties of Democracy v.10 Dataset (Coppedge et al., 2020)
Corruption	Index capturing pervasiveness of corruption in different areas and levels of government.	1905	0.0	1.0	0.43	0.29	Varieties of Democracy v.10 Dataset (Coppedge et al., 2020)
Rule of Law	Index capturing extent to which a nation's laws are transparently, independently, predictably, impartially, and equally enforced.	1905	0.0	1.0	0.62	0.29	Varieties of Democracy v.10 Dataset (Coppedge et al., 2020)

## Table 2: Country List

Country	ISO3	No. Coups	Country	ISO3	No. Coups
Argentina	ARG	9	South Korea	KOR	2
Bolivia	BOL	15	Mexico	MEX	0
Brazil	BRA	4	Mauritius	MUS	0
Botswana	BWA	0	Malawi	MWI	1
Chile	CHL	2	Malaysia	MYS	0
China	CHN	0	Nigeria	NGA	9
Colombia	COL	4	Netherlands	NLD	0
Costa Rica	CRI	0	Peru	PER	6
Denmark	DNK	0	Philippines	PHL	6
Egypt	EGY	3	Senegal	SEN	1
Spain	ESP	3	Singapore	SGP	0
Ethiopia	ETH	5	Sweden	SWE	0
France	FRA	1	Thailand	THA	12
United Kingdom	GBR	0	Taiwan	TWN	0
Ghana	GHA	8	Tanzania	TZA	2
Indonesia	IDN	4	United States	USA	0
India	IND	0	Venezuela	VEN	8
Italy	ITA	0	South Africa	ZAF	0
Japan	JPN	1	Zambia	ZMB	3
Kenya	KEN	1			

00	(1)	(2)
	Coup	Coup
Productivity	-0.243	-0.248
	(0.227)	(0.214)
	[0.286]	[0.248]
LnGDP	-0.296	-0.274
	(1.583)	(0.960)
	[0.852]	[0.775]
Corruption	1.677	1.751
	(2.223)	(3.879)
	[0.451]	[0.652]
Rule of Law	-0.634	-0.674
	(3.205)	(4.823)
	[0.843]	[0.889]
Checks and Balances	0.667	0.681
	(0.927)	(1.172)
	[0.472]	[0.561]
Democracy	-0.227	-0.245
	(0.751)	(0.968)
	[0.762]	[0.800]
Coup Last 5 Years	0.213	
	(0.472)	
	[0.652]	
Coup Last 10 Years		0.205
		(0.458)
		[0.655]
Observations	922	922
Number of Countries	18	18
SE	Bootstrap	Bootstrap
Country FE	Yes	Yes
Time FE	Yes	Yes
PseudoR2	0.211	0.211
Log-Lik	-180.3	-180.3

#### Table 3: Fixed Effects Logistic Regressions

Coup Attempt dummy variable is the DV. Independent variables lagged 1 year relative to DV. Coup Last j Years is a dummy variable equal to 1 if country experienced a coup attempt within the last j years. Bootstrap standard errors in parentheses. P-values in brackets.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coup Attempt	-0.606	-0.357	-0.638	-0.375				
	(0.223)	(0.235)	(0.229)	(0.238)				
	[0.010]	[0.142]	[0.008]	[0.130]				
Coup Success					-1.100	-0.889	-1.125	-0.908
					(0.333)	(0.346)	(0.340)	(0.350)
					[0.002]	[0.018]	[0.002]	[0.017]
Coup Fail					-0.232	0.048	-0.268	0.031
					(0.178)	(0.203)	(0.188)	(0.213)
					[0.201]	[0.814]	[0.161]	[0.887]
nGDP	-1.504	-1.5	-1.534	-1.508	-1.494	-1.488	-1.523	-1.495
	(0.552)	(0.804)	(0.560)	(0.820)	(0.549)	(0.802)	(0.558)	(0.819)
	[0.010]	[0.076]	[0.009]	[0.080]	[0.010]	[0.077]	[0.010]	[0.081]
Thecks and Balances (t-1)	0.649	0.488	0.642	0.488	0.646	0.482	0.639	0.482
	(0.492)	(0.497)	(0.493)	(0.492)	(0.492)	(0.496)	(0.493)	(0.492)
	[0.195]	[0.337]	[0.201]	[0.333]	[0.197]	[0.342]	[0.203]	[0.338]
orruption (t-1)	3.153	5.157	3.177	5.211	3.128	5.132	3.153	5.189
	(2.456)	(2.705)	(2.460)	(2.707)	(2.446)	(2.678)	(2.453)	(2.684)
	[0.207]	[0.070]	[0.204]	[0.067]	[0.209]	[0.068]	[0.206]	[0.066]
ule of Law (t-1)	0.498	2.815	0.534	2.921	0.468	2.780	0.505	2.891
	(2.412)	(2.477)	(2.415)	(2.459)	(2.405)	(2.451)	(2.410)	(2.436)
	[0.837]	[0.268]	[0.826]	[0.248]	[0.847]	[0.269]	[0.835]	[0.248]
lilitary Dictatorship	0.083	0.687	0.021	0.659	0.081	0.676	0.018	0.648
5 1	(0.799)	(0.931)	(0.809)	(0.942)	(0.801)	(0.941)	(0.812)	(0.952)
	[0.917]	[0.468]	[0.979]	[0.492]	[0.920]	[0.480]	[0.982]	[0.503]
ivilian Dictatorship	-0.049	0.685	-0.055	0.710	-0.041	0.692	-0.047	0.719
1	(0.607)	(0.886)	(0.616)	(0.891)	(0.610)	(0.894)	(0.620)	(0.900)
	[0.936]	[0.448]	[0.929]	[0.434]	[0.946]	[0.448]	[0.940]	[0.433]
Coup Experience (5 years)	-0.425	-0.220	L J	L J	-0.426	-0.220	LJ	r - 1
1 1 \ <i>J /</i>	(0.245)	(0.263)			(0.246)	(0.264)		
	[0.091]	[0.410]			[0.092]	[0.412]		
oup Experience (10 years)	[]	[]	-0.184	-0.001	[]	[]	-0.178	0.007
1 F			(0.335)	(0.340)			(0.334)	(0.339)
			[0.586]	[0.999]			[0.597]	[0.983]
Observations	1,897	1,118	1,897	1,118	1,897	1,118	1,897	1,118

### Table 4: Two-Way Fixed Effects Regressions -- Coups and Productivity

3	0	1		2				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Countries	39	23	39	23	39	23	39	23
R-squared	0.63	0.69	0.63	0.69	0.63	0.69	0.63	0.69
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Full	Only Coups						

#### Table 4: Two-Way Fixed Effects Regressions -- Coups and Productivity

Two-way fixed effects estimates. Productivity is the DV in all models. Odd-numbered models based on full country sample, while even-numbered models constrained to sample of countries experiencing at least one coup over sample period. Models 1-2 and 5-6 control for coup experience within past 5 years, while remaining models control for coup experience within 10 years. Robust standard errors in parentheses and p-values in brackets.

		1 /	Indirect Effects					
	Total Effect	Direct Effect	Corruption	Checks and Balances	Rule of Law	% Mediated		
			<b>1</b>	year Lead (j=3)				
Coup Attempt	-0.308	-0.295	-0.002	-0.011	0.000	_		
	(0.065)	(0.076)	(0.741)	(0.469)	(0.877)			
Coup Success	-0.676	-0.649	-0.003	-0.026	0.002	-		
	(0.006)	(0.008)	(0.677)	(0.277)	(0.767)			
Coup Fail	-0.018	-0.017	-0.001	0.000	-0.001	-		
	(0.933)	(0.937)	(0.936)	(0.980)	(0.805)			
			Panel B: 5-	Panel B: 5-year Lead (j=5)				
Coup Attempt	-0.275	-0.231	-0.001	-0.045	0.001	16.0%		
	(0.087)	(0.150)	(0.818)	(0.063)	(0.846)			
Coup Success	-0.606	-0.544	-0.005	-0.058	0.002	10.2%		
	(0.011)	(0.022)	(0.558)	(0.086)	(0.851)			
Coup Fail	-0.027	0.003	0.003	-0.033	0.000	-		
	(0.896)	(0.989)	(0.672)	(0.221)	(0.904)			
			Panel C: 7-					
Coup Attempt	-0.322	-0.255	-0.001	-0.076	0.010	20.8%		
	(0.039)	(0.098)	(0.822)	(0.021)	(0.515)			
Coup Success	-0.634	-0.555	-0.007	-0.092	0.019	12.5%		
	(0.006)	(0.014)	(0.511)	(0.045)	(0.471)			
Coup Fail	-0.084	-0.028	0.004	-0.064	0.004	66.7%		
	(0.676)	(0.890)	(0.621)	(0.100)	(0.685)			

Table 5: SEM Results - Coups, Institutional Change and Productivity

Summary results for SEM estimates. P-values presented in parentheses. Panels A, B, and C use 3, 5, and 7- year lead, respectively. Coup Attempt is independent variable in first set of estimates in each panel. Coup Success and Coup Fail are IV s (both included in same model) in 2nd set of estimates in each panel. Indirect and total effects, along with corresponding test statistics, computed using nlcom command in Stata. Percent mediating in last column reported when at least 1 mediator has p-value < 0.10.