Public Management Review

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/rpxm20

Complexity, errors, and administrative burdens

Matthew M. Young, Mallory Compton, Justin B. Bullock & Robert Greer

To cite this article: Matthew M. Young, Mallory Compton, Justin B. Bullock & Robert Greer (2024) Complexity, errors, and administrative burdens, Public Management Review, 26:10, 2847-2867, DOI: 10.1080/14719037.2023.2288247

To link to this article: https://doi.org/10.1080/14719037.2023.2288247

PUBLIC MANAGEMENT REVIEW
2024, VOL. 26, NO. 10, 2847–2867
https://doi.org/10.1080/14719037.2023.2288247

Complexity, errors, and administrative burdens

Matthew M. Young [a], Mallory Compton [b], Justin B. Bullock [c] and Robert Greer [b]

[a]Institute of Public Administration, Faculty of Governance and Global Affairs, Leiden University, Den Haag, Netherlands; [b]Public Service and Administration Department, The Bush School of Government and Public Service, Texas A&M University, College Station, TX, USA; [c]Evans School of Public Policy and Governance, Seattle, WA, USA

ABSTRACT

Errors in administrative processes cost clientele and organizations, yet are understudied. Beyond efficiency losses, errors impose administrative burdens on clientele. Automation is a common tool for reducing errors. Little is known, however, about the factors that may augment automation's effectiveness. We theorize that administrative errors are a function of program complexity. We expect automation to improve accuracy in less complex programs but worsen with increased complexity. With U.S. Unemployment Insurance program audit data, we use longitudinal Poisson analysis to test our expectations. Complexity is associated with greater incidences of administrative errors. As expected, automation's effects vary with level of complexity.

ARTICLE HISTORY Received 29 April 2023; Accepted 21 November 2023

KEYWORDS Administrative error; administrative burdens; complexity; technology; automation

Introduction

Errors in public organizations have consequences for many aspects of public administration. Bureaucratic organizations are meant to be technical, rational, and consistent, which serves to maximize predictability in part through minimizing the risk of errors (Gajduschek 2003; Weber 1964). Yet it is plainly true that no organization is infallible; errors occur, even if the relative risk is low. And even if the relative risk is low, processes that occur in large volumes can still generate many errors in absolute terms. Depending on the nature and consequence of the errors involved, this can have serious implications for public organizations and their constituents as a form of administrative burden (Moynihan, Herd, and Harvey 2015; Peeters 2020). Our purpose here is to examine how program complexity shapes the incidence of administrative errors in routine bureaucratic processes, with the goal of shedding light on the sources of administrative burden.

Administrative burdens exist when citizens experience policy compliance requirements as onerous (Burden et al. 2012). Their origins are often ascribed to either benign

CONTACT Matthew M. Young m.m.young@fgga.leidenuniv.nl
Supplemental data for this article can be accessed at https://doi.org/10.1080/14719037.2023.2288247

neglect or attempts to indirectly limit participation in programs or receipt of benefits (Baekgaard, Moynihan, and Kjærgaard Thomsen 2020; Moynihan and Herd 2010; Pamela and Moynihan 2018). Here, we examine administrative errors as a source of burdens. Errors of processing or interpretation in public organizations can lead to burdensome consequences for individuals. This approach is in-line with recent efforts by the Biden Administration's efforts to reduce administrative burdens. In a recent report from the White House on reducing burdens to assessing critical benefits and service, the Department of Labor's efforts to modernize the Unemployment Insurance (UI) system to reduce burdens is highlighted (OIRA 2023). More specifically, one burden reduction initiative involves streamlining the process of applying for and receiving UI benefits by reducing learning, compliance, and psychological costs.

UI has also received attention from U.S. policy makers and scholars with respect to administrative errors. Political contests over the scope and even existence of social insurance programs make them relatively complex to administer as eligibility and benefit level criteria are added and modified over time. Yet, for as much attention as these errors receive in terms of executive and legislative oversight, too little is known about their source. We address this gap by using the U.S. UI program as an empirical context to generate and test hypotheses on the origins of administrative errors and the factors that affect their rate of occurrence.

We argue that administrative burdens and administrative errors are interrelated. Our argument takes two primary forms. First, we build on prior work establishing administrative errors as a source of administrative burdens (Peeters 2020; Compton et al. 2023). We then extend the connection between errors and burdens by hypothesizing that they share a common origin: the complexity of the programs that bureaucrats must administrate, and claimants must navigate. We then enrich our theoretical model by considering the potential moderating effect of information and communication technology (ICT)-based automation on both the base rate of administrative errors and increased program complexity.

UI has characteristics that make it both a useful and important subject in this context. In addition to UI's importance, its Benefit Accuracy Measurement (BAM) program is longstanding and data-rich; it was created to detect improper payments more than a decade before the 2002 Improper Payments Information Act required all federal agencies to measure and report such administrative errors. Research on errors in UI is also a timely topic because the COVID-19 pandemic has tested the limits of the program more than any cyclical recession. An improved understanding of the source of administrative errors through the lens of organizational complexity is thus an important topic both for scholars and practitioners of public organizations.

In the following sections, we first review existing work on administrative errors and their causes, including policy complexity and the role of digital automation in routinizing complex processes, in the context of UI. We then offer a series of hypotheses about the policy, administrative, and technological factors we expect to have explanatory power over the incidence of administrative errors. To test our expectations, we analyse panel data from the BAM program using a longitudinal Poisson model.

In sum, we find support for our expectations. First, our results support the expectation that administrative errors are more frequent where program rule complexity is greater, namely, where state eligibility requirements and benefit determination processes are more complex. Second, we find that administrative errors are more frequent where clientele career conditions are more complex, operationalized in terms of

clientele seeking employment in a new occupation. Third, our results reveal that administrative errors occur with greater frequency in contexts with greater utilization of ICT automation.

Administrative errors

Bullock (2014) defines administrative errors as 'any deviation from an intended outcome that is mandated by either law or organizational rules'. Studies of errors in administrative contexts often focus on catastrophic errors. In medicine, this includes errors that result in worse health outcomes for patients, including death (Al-Fedaghi 2014; Suyeon and Nabatchi 2019). Another example is the study of pilot errors in aviation (Loh et al. 2020; Skitka, Mosier, and Burdick 2000). Other subjects include organizations responsible for operating and maintaining nuclear power plants, air traffic control, and other processes and systems that have effectively zero tolerance for error to prevent mass casualties and/or ecological destruction (Hällgren, Rouleau, and De Rond 2018; Weick 1987). In these contexts, the minimization of errors is often central to the organization's mission. Thus, these organizations' structures and cultures are designed with an explicit focus on rigorous quality control and risk management.

To the extent that administrative errors are studied in the context of more 'routine' public organizations, those responsible for administrative welfare programs receive the most attention, likely due to their political salience. The consequences of administrative errors in this context range from root issues of accurately measuring the population of eligible benefit recipients (Bowers and Horvath 1984; Feng and Hu 2013; Hogg 1930; Pina-Sánchez, Koskinen, and Plewis 2014), to the processing of applications for benefits and their distribution by federal and state agencies (Fairley, Izenman, and Bagchi 1990; Farrell, Parent, and Tenney 1984; Mendeloff 1977).

In the U.S., increased politicalization of welfare programs and the social deservingness of claimants over the past several decades corresponded with increased federal attention to administrative errors in those programs – particularly improper (over) payments (Greer and Bullock 2018; Schneider and Ingram 1993). The resulting legislation and policy changes have radically altered both the administration and delivery of these programs. Administrative changes included the measurement of errors as an indicator of organizational performance, with the reduction of payment errors as an objective for public managers (Sangyub, Wenger, and Wilkins 2012). With respect to service delivery, these changes increased the administrative burden imposed on claimants, as the processes for applying and continuing to receive benefits became increasingly difficult (Herd and Moynihan 2018). The relationship between administrative errors and administrative burdens, however, extends beyond political attention.

Administrative errors as administrative burdens

Recent work on administrative burdens has focused on the consequences of reducing errors in the name of performance. Widlak and Peeters (2020) expand the possible causes of administrative burdens to include administrative errors, using Bullock's (2014) definition. Peeters (2020) generalizes this argument in constructing a political economy of the source of administrative burdens within organizations, in which administrative errors are understood as both informal and unintentional sources of burdens. Yet in this work errors are treated as explanatory factors rather than the outcome of interest. For example,

errors may lead to a reduced benefit or impose additional costs on claimants to challenge administrative decisions (Compton et al. 2023).

In addition to being a good case study for administrative errors, UI provides an interesting cross-section of formal and intentional administrative burdens and informal and unintentional administrative burdens (Masood and Azfar Nisar 2021; Peeters 2020). Administrative errors in processing UI claims result in administrative burdens for claimants, but are driven by both policy design as well as implementation and management decisions. For example, to qualify for UI benefits claimants may be required to meet work-search requirements with complex documentation and reporting processes. But both the requirement itself, and the difficulty and complexity associated with meeting it, are political choices expressed through policy design and implementation.

As the literature on administrative burdens across different policy programs has grown, multiple stages in the policy process have been identified as potential sources of burdens. For example, some studies focus on the costs to citizens in the form of long wait times or cumbersome paperwork requirements (Pamela and Moynihan 2018), whereas others focus on the program design itself and administrative capacity of the implementing organizations (Baekgaard, Moynihan, and Kjærgaard Thomsen 2020). Thus, multiple elements of the policy process and program administration can create administrative burdens, and these burdens are layered in such a way that the effects are multiplicative. A program with administrative burdens built into the policy design, charged to an understaffed organization, and implemented with overly stringent and cumbersome rules results in compounding both administrative burdens and administrative errors. Therefore, it is important to break down the layers of complexity in a public program and how these may compound errors and therefore burdens.

Complexity and administrative errors

Public administration scholarship recognizes that both organizations and individuals are complex, but are also embedded in complex environments and institutional arrangements (Battaglio and Jeremy 2019; Gerrits and Marks 2015). Complexity is a concept increasingly used in public administration research, but is rarely clearly defined. Miller and Page (2007, 9) provide a parsimonious though informal definition; complexity 'arises when the dependencies among the [system's] elements becomes important'. Marks and Gerrits (2013, 899) offer a more formal definition of system complexity where

> (1) it is composed of many parts that are connected in many ways; (2) over time, cause and effect are hard to relate and interventions produce unexpected consequences; (3) the emergent behavior of the system is deeply unpredictable, even when the subsystem behaviors are known and predictable; or (4) as a whole, it can perform a unique function that cannot be performed by the constituent elements alone.

Using either the informal or formal definitions above, the administration of unemployment insurance in the United States is a complex phenomenon. Research applying complexity to public administration and management contexts often focuses on one or more of the formal properties of complexity theory, e.g. emergent phenomena or system self-organization and adaptability (Eppel and Lee Rhodes 2018; Taylor et al.

2012; Tsang 2016). Our scope is narrower: we are interested in how the complexity of UI, both the requirements of the policy and the systems required to ensure compliance with those requirements, makes it more or less likely for administrative errors to occur via previously identified contextual characteristics.

If complexity is operationalized as a condition where many parts are connected in many ways leading to emergent behaviour that is hard to predict, then complexity may be increased by either including new connected parts or changing the connections among its parts. The various dimensions of complexity then influence the decision-making environment of organizations. Thus, as complexity of a system increases, the relative risk of errors occurring increases because each subunit of the system is more dependent on other subunits to function properly (Miller and Page 2007).

To the extent that legislators enact policies prioritizing both narrow and contextually varying eligibility requirements and benefit levels and durations, the policy system becomes more complex than one with universal eligibility. These State UI policies with more carve-outs, additional requirements, and an overall more complex rule set makes the case-specific decision-making process harder, and may lead to more errors. Complexity, both of policies and the tools used to implement them, should therefore be considered a contributing factor to administrative burdens, and increase the agency's observed error rate.

Hypothesis 1: Administrative errors will occur more often when state eligibility requirements and benefit determination processes are more complex.

At the same time, not all claimant cases are equally complex. Prior research on administrative errors in Aid to Families with Dependent Children (AFDC) benefits processing found a strong relationship between claimant work and living characteristics and the rate of identified errors in case determinations (Camasso and Jagannathan 1994). For UI, one example of this form of complexity is when a claimant is attempting to transition between career fields. The transition will alter the odds of them exiting, and even quickly re-entering, the program, and potentially trigger additional rules complexity for maintaining eligibility.

Hypothesis 2: Administrative errors will occur more often when clientele career conditions are more complex, because of the complexity introduced by corresponding additional eligibility requirements.

Automation, complexity, and administrative errors

The US UI system is one of the few complex federal programs where we have access to detailed data on administrative errors over time that allow us to explore the relationship between administrative errors and the increasing use of technology to automate administrative processes (Garson 1989; Lipsky 1984). The political desire to reduce administrative errors in the form of benefit overpayments was central to the mandates for these systems' adoption. However, complexity is

a particularly wicked problem for administrative organizations. This is due to a fundamental property of systems: those developed to manage or regulate a complex phenomenon must necessarily be at least as complex as the phenomenon itself (Ashby 1991). In this context the rational-technical approaches to simplifying, controlling, and increasing efficiency so endemic to neoliberal administrative organizations are more difficult to design and implement with minimal error. This includes the automation of administrative processes and decisions using ICT. Whether *in vivo* or *in silico*, system complexity increases the risk of errors occurring.

Prior empirical work offers some support for the idea that automation can reduce administrative errors, particularly in unemployment insurance. Greer and Bullock (2018) found evidence that state implementation of federally provided, standardized ICT systems for data processing was associated with reduced rates of erroneous overpayments. Wenger and Wilkins (2009) found that telephone-based automation for filing claims reduced the number of administrative errors experienced by unemployed women. And Compton et al. (2023) found that ICT automation reduced but did not eliminate disparities in the odds of a claim having an error between racial and ethnic groups.

Our study differs from this prior work in that our outcome of interest is the aggregate error rate produced across the population of claimants, not claimant-level distributional effects or the rate of one specific type of error. In this context, then, whether automation can overcome complexity with respect to the observed aggregate error rate reduces to whether the architects of the automation system – usually computer programmers from a private firm with a contract to provide the technology – are more capable of understanding and accounting for all the possible effects that arise from complex policy interactions than street- and/or screen-level bureaucrats when reviewing claims. Prior research provides evidence where this is not the case. Peeters and Widlak (2023) and Peeters and Widlak (2018) provide evidence that ICT automation can both increase and compound administrative errors, with disastrous consequences. Eubanks (2018) and Pahlka (2023) provide similar evidence of increased errors in the context of state-level UI automation in Indiana and California, respectively. Thus,

Hypothesis 3: Administrative errors will occur more often when more claims are filed using ICT-based automated systems.

To summarize, we argue that administrative errors in the implementation of UI policies are likely to occur more often when either State-level policy or claimant-level case complexity is higher. We further argue that the automation of administrative decision-making via ICT in the context of UI is likely, *ceteris paribus*, to generate more rather than fewer administrative errors. Finally, we concur with prior literature that these administrative errors are important to understand because they contribute to the well-documented problem of administrative burden. Figure 1 visualizes these relationships and their links to our hypotheses.

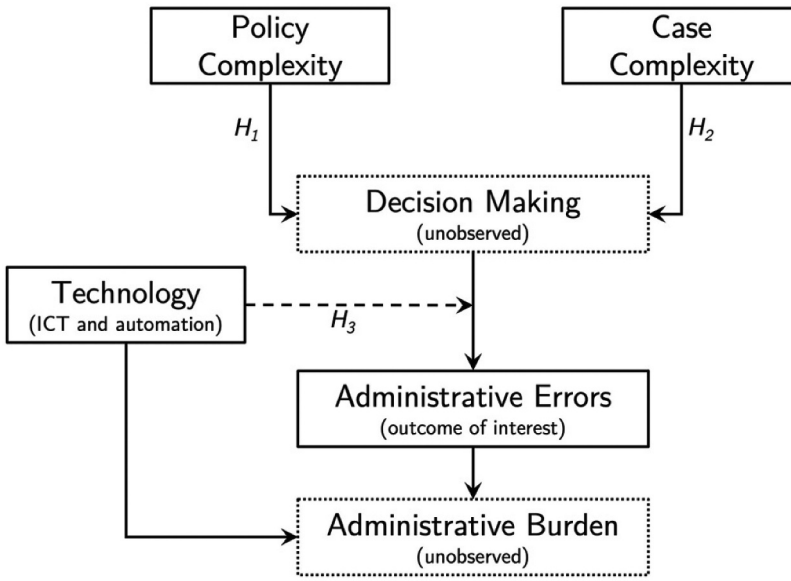


Figure 1. Concept map.

Analytic context and Framework[1]

The U.S. unemployment insurance program is primarily funded through state-levied taxes on employers, but the federal government pays some administrative costs, sets general guidelines, and provides oversight. States are given broad discretion to design their UI programs with respect to tax financing rates, eligibility criteria, benefit rates, and administrative operations. Each state operates a unique UI program, with wage-replacement rates ranging from 23% to 56% and benefit take-up rates ranging from 9.1% to 70%. The resulting system is a complex joint federal-state insurance program that can be difficult for claimants to navigate and for state directors to manage even in the best of circumstances.

UI is an excellent case for studying administrative errors for several reasons. UI is technically complex with a high degree of variation in system design due to its federated implementation structure. It is also data-rich, lending itself to large-*N* analysis over time. UI is also salient, both because it is a longstanding and broad-based program, and because of its central role in mitigating the COVID-19 pandemic's economic impact (Pallasch 2020).

Because State UI programs distribute cash benefits, State Workforce Agencies (SWAs) are subject to strict oversight by the Department of Labor (DOL), and must report a range of performance standards, including improper payment errors. To improve payment integrity, the DOL's Office of Unemployment Insurance implemented the Benefit Accuracy Measurement (BAM) system to identify improper UI payments in the 1980s. Each SWA is now required to audit and investigate a sample of paid and denied claims weekly and report aggregate performance indicators monthly.

Importantly, BAM requires SWAs to *randomly* sample UI claims filed in the reference period – including both paid and denied claims. Agencies follow DOL-

determined procedures to identify an audit sample, such that BAM audits are statistically representative of the population of UI claims in a state-year. If selected for audit, every step of a claim determination is re-investigated, and documentation is (re-)verified on the applicant's prior work experience, socio-demographic background, and, crucially, on the presence, monetary consequence, and source of any errors made in the original processing of the claim application.

We test our theoretical expectations by analysing BAM data from each of the 50 US states, aggregated annually including 2002 through 2018. Our data represents all audited claim reports in all UI programs in the BAM program from each of the 50 US states, including both paid and denied claims. We combine these data with annual state-level data on unemployment insurance policy characteristics, drawn from the Department of Labor's annual *Comparison of State Unemployment Insurance Laws* series (Compton and Bullock 2020).

Measurement of administrative errors

Our primary outcome of interest is the count of administrative errors in SWAs' processing of UI claims in a state-year. In this analysis, we are interested only in payment errors resulting from SWA actions or decisions, and not those errors that result from clientele actions, for example. Our outcome variable, *agency responsible errors*, is the count of all administrative errors audited through BAM for which the SWA 'was either solely responsible or shared responsibility with claimants, employers, or third parties, such as labor unions or private employment referral agencies' (Office of Unemployment Insurance 2018). In 2002–2018, an agency-responsible error was detected in 7.34% of all audited claims. Figure 2 shows the state-level average error rates for our sample period.

Two points merit highlighting about our dependent variable *agency responsible errors*. First, BAM auditors can determine that a claim contains multiple errors by multiple actors, including state employees, clientele, employers, or third parties. Our

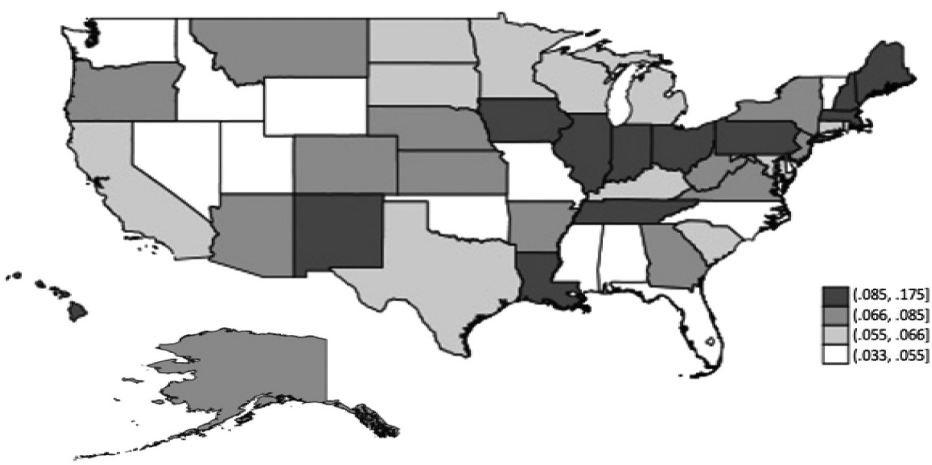


Figure 2. Agency responsible error rates, state average 2002–2018.

count of administrative errors includes only those cases in which BAM auditors determined that (1) a payment error occurred and (2) the SWA holds sole or shared responsibility for the error.[2] Second, a processing error committed by a SWA may result in overpayment of benefits, underpayment of benefits, or a technically correct payment of benefits but for the wrong reasons. We include claims from both BAM audits: Paid Claims Accuracy and Denied Claims Accuracy. Though we do not differentiate between the consequences of administrative errors here, we do include all types of payment errors where a SWA is responsible.

Measurement of program complexity

To operationalize program complexity, we construct an additive index, *complex rules*, that captures the presence or absence of five dimensions of state law governing UI eligibility and benefit rules in each observation year.[3] Each program rule contributes to complexity in claims determinations by increasing the quantity of information needed or the number of decisions necessary to complete determinations of eligibility and benefit amount.

The first component is whether state law requires otherwise eligible claimants to first serve a specified 'waiting period' following separation from employment. In states that require a wait period, agents must determine whether the 'wait period' applies, when the period begins and ends, and whether it may be waived (as some states allow). The second is whether state law makes workers who voluntarily separated from their jobs temporarily ineligible for benefits. This policy allows a certain 'waiting period' before voluntary work leavers may receive UI benefits, rather than complete disqualification, requiring a state agent to collect and consider information on the reason for a claimant's separation from employment and to calculate the necessary wait period. The third component is if state law reduces the benefit amount paid to voluntary work leavers. Again, this rule requires state agents to collect and consider information on the reason for separation, date of separation, and proper calculation of the benefit amount reduction.

The fourth component is whether state law grants a larger benefit amount to UI claimants with dependents. Determining eligibility for dependents' allowance requires state employees to collect and consider information on the claimants' family and relation of dependents. The fifth and final component is whether state law allows claimants who do not qualify for UI benefits using the regular base period of employment to use an alternative period of earned wages to establish eligibility. Calculating eligibility under the regular base period system typically does not include wages earned in the most recently completed calendar quarter. Under the alternative base period system, more recent wages may be used to determine eligibility. Additionally, because changes in eligibility requirements introduce complexity and risk of generating errors, we include a variable, *rule change*, which is a count of the number of rule changes among the elements of complex rules where a state's use of that rule in year t is different at t-1. Table 1 provides counts of each of these policies and the number of observed policy changes throughout our sample period.

Table 1. Complex rules, frequency and change.

Program Rule	No. of states with policy, 2002	No. of states with policy, 2018	No. of policy changes observed 2002 to 2018
Voluntary work leavers are ineligible for benefits	41	47	16
Benefit allowance reduced for voluntary work leavers	10	10	5
State has benefit allowance for dependents	12	13	3
Alternative Base Period Allowed	14	37	33
Total state initial benefit payment waiting period	38	42	12

Measurement of case complexity

We include two measures of case-specific complexity. The first of these, *seeking a different occupation*, is the count, in hundreds, of claimants who indicate they are seeking employment in a different occupation than their previous job. The second, *extended benefits*, is the proportion of all claims in a state-year that have exceeded the baseline statutory length of benefit eligibility but are still able to receive benefits. These claims are subject to additional rules and requirements, making their administration more complex. We, therefore, expect both the share of extended benefits claims and the number of claimants seeking a different occupation to increase the complexity of the caseload for State Workforce Agencies.

Measurement of technological automation

We measure automation of claims processing with *electronic filing*, which is the annual count of audited claims, in hundreds, filed by internet or other electronic means.[4] In 2002, 10% of audited claims were filed electronically, and by 2018, that figure increased to 72%. Over the 2006–2018 period, 46.6% of all audited claims were filed electronically, making it the most used method for filing a UI claim.

Control variables

We include several control variables in our models. First, we control for heterogeneity of claimant characteristics. Previous work suggests that the number of women claimants and claimants of colour predict agency performance in administering UI (Compton et al. 2023; Sangyub, Wenger, and Wilkins 2012; Wenger and Wilkins 2009), so we include *non-white claimants* (log of the count of all claimants in a state-year who self-identify as non-white and/or Hispanic) and *female claimants* (log of the count of all self-identified female claimants in a state-year). We also include a measure of non-typical labour force members: *claimants* < 25 *and* > 65 (log of the count of claimants either under the age of 25 or over the age of 65). These measures represent the characteristics of all UI claimants in a state-year.

We also control for *state government liberalism* to account for the role of government ideology in determining policy and administrative priorities. This is measured as a weighted average of the ideology scores for each chamber of the state legislature and the governor (Berry et al. 1998, 2007, 2010), and is

Table 2. Sample descriptive statistics.

	Obs	Mean	S.D.	Min	Max
Dependent Variables					
Agency Errors, Rate	850	0.07	0.05	0.00	0.29
Agency Errors, Count	850	64.15	40.10	0	280
Program Complexity					
Rule Complexity Index	850	2.70	0.82	1	4
Rule Change, lag 1 year	850	0.09	0.31	0	2
Waiting period for voluntary work leavers	850	0.91	0.28	0	1
Reduced benefit allowance for voluntary work leavers	850	0.20	0.40	0	1
Benefit allowance for dependents exists	850	0.26	0.44	0	1
Alternative base period allowed	850	0.55	0.50	0	1
State has initial waiting period for all claimants	850	0.77	0.42	0	1
Claimants seeking different occupation, rate	850	0.14	0.05	0.02	0.31
Claimants seeking diff. occ., count in 100s	850	1.21	0.49	0.03	3.50
Electronic claim filing, rate	850	0.85	0.25	0.01	1.00
Electronic claim filing, count in 100s	850	7.36	2.67	0.08	22.84
Control Variables					
BAM Sample Size	850	874.34	192.99	151	2490
**Extended Benefit Claims, rate*	850	0.01	0.04	0.00	0.22
**Nonwhite Claimants, rate*	850	0.39	0.13	0.00	0.50
**Female Claimants, rate*	850	0.41	0.06	0.14	0.61
**Claimants Age < 25 and > 65, rate*	850	0.47	0.07	0.00	0.57
**Title XII Loan Balance per ins. emp., real USD*	850	0.54	1.46	0.00	11.12
State Government liberalism, lag 1 year	850	45.44	15.87	17.51	73.62
Year	850			2002	2018

Note:* indicates variables that are included in regression models as natural logs of frequencies and are summarized here as rates for readers' convenience. In Appendix Table A2, we report sample descriptive statistics for all variables as they are constructed in our models.

constructed on a zero to 100 scale, with greater values representing a more leftist ideology. To account for the financial status of states' UI programs, we include *Loan Balance* which is a state's remaining Social Security Act Title XII Loan Balance per covered employee (logged real USD). A higher Title XII loan balance indicates relatively larger financial obligations. Table 2 provides summary statistics for all variables.

Methods

We use a Poisson regression model to estimate the relationship between the annual count of detected errors in UI processing, y_{jt}, where j indicates the state and t indicates time, and complexity of program rules and administration. Because the count of detected errors is drawn from audit samples of heterogeneous size, all reported models include an offset term: a logged count of all audited claims in the same period.[5] Year fixed-effects are included to account for the impact of common macro-economic trends or any change in guidance or policy from the US Department of Labor that may similarly affect all state UI agencies. With Poisson regression, we are therefore modelling the observed count of UI claims with an agent-responsible payment error in a state-year audit sample.

Administrative errors are thus modelled here as a function of (1) a vector of state-level political and administrative variables observed annually, x'_{jt}, (2) a vector of corresponding estimated regression coefficients, β, (3) a vector of binary indicators

for each year, $w_t^{'}$, (4) corresponding vectors of regression coefficients, η, (5) a logged count of all sampled claims in the period (*audit size*) with a regression coefficient constrained to equal one to account for heterogeneous audit sizes, and (6) a common disturbance term ϵ.[6] This model specification is represented as:

$$log(E(y_{jt}|x_{jt}, w_t)) = \alpha + x_{jt}^{'}\beta + w_t^{'}\eta + log\left(audit\ size_{jt}\right) + \epsilon$$

Results

Table 3 reports tests our hypotheses. Models 1 and 2 are estimated by Poisson regression including all control variables. Model 1 includes random effects by state; Model 2 includes both random effects by state and year fixed effects. For ease of interpretation, we report both the coefficient estimates from Poisson regression and the estimated average marginal effects (AME) for key independent variables.[7] Because

Table 3. Count models of agency-responsible administrative errors.

	Model 1		Model 2	
	b/SE	AME	b/SE	AME
Program Complexity Index	0.085***	6.075***	0.052***	3.650***
	[0.06,0.11]	[4.10,8.05]	[0.03,0.08]	[1.82,5.48]
Change in rule complexity, t-1	0.016	1.152	0.033*	2.342*
	[−0.01,0.04]	[−0.89,3.19]	[0.00,0.06]	[0.25,4.43]
Electronic Filing, Count in 100s	0.020***	1.444***	0.028***	1.924***
	[0.02,0.02]	[1.02,1.86]	[0.02,0.03]	[1.48,2.36]
Seeking Diff Occupation, Count in 100s	0.053***	3.789***	0.064***	4.475***
	[0.03,0.08]	[2.01,5.57]	[0.04,0.09]	[2.49,6.46]
Extended Benefits Claims, log	0.004**		0.014***	
	[0.00,0.01]		[0.01,0.02]	
Non-white Claimants, Log	0.018**		0.019**	
	[0.01,0.03]		[0.01,0.03]	
Female Claimants, log	0.073*		0.151***	
	[0.00,0.14]		[0.07,0.23]	
Claimants < 25 and > 65, log	−0.146***		−0.120***	
	[−0.21,-0.08]		[−0.18,-0.06]	
SSA Title XII Loan Balance per covered employee, log real USD	0.030*		0.011	
	[0.01,0.05]		[−0.01,0.04]	
State Gov. Liberalism, t-1	0.004***		0.004***	
	[0.00,0.00]		[0.00,0.01]	
Constant	−2.580***		−4.068***	
	[−2.97,-2.19]		[−4.78,-3.36]	
Var(State)	0.197***		0.182***	
	[0.09,0.30]		[0.09,0.27]	
State Random Effects	Yes		Yes	
Year Fixed Effects	No		Yes	
N	850		850	

Note: Dependent variable is the count of *agency responsible administrative errors* in a state-year. Models 1 and 2 estimated by Poisson regression, with random effects by state and year fixed effects. Columns 2 and 4 report coefficient and standard error estimates, and columns 3 and 5 report average marginal effect estimates of key independent variables. Sample includes each US state observed annually, 2002–2018. Estimated fixed effects not reported here. Estimated coefficient for exposure term (audit size) not reported here. 95% confidence intervals calculated with standard errors and a two-tailed hypothesis test. $p < * 0.05$, $p < ** 0.01$, $p < *** 0.001$

direct interpretation of Poisson regression coefficients is difficult, we will refer to estimated AMEs to interpret magnitude of effects.

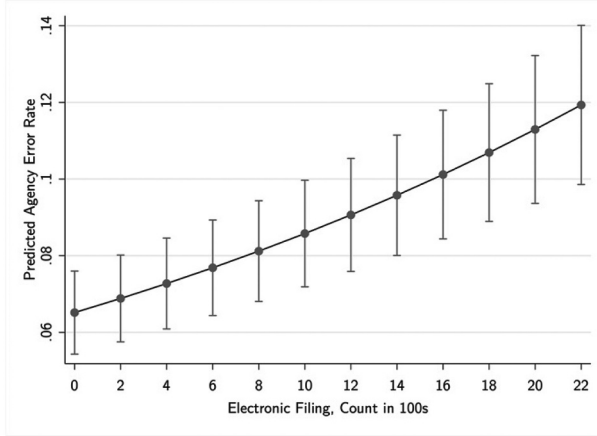
Hypothesis one expects that administrative errors will be greater in frequency where state eligibility requirements and benefit determination processes are more complex. Support for this hypothesis would be evidenced by a positive and significant coefficient estimate on *Program Complexity Index*. Table 3 provides significant positive coefficients on this variable in both models. In Model 2, a more conservative specification, a one-unit increase in program complexity (one additional complex rule) is associated with a significant increase in 3.7 additional agent-responsible administrative errors among the audited sample of UI claims. This is equivalent to a .05% increase in expected administrative errors. We also see that a change in rule complexity in the prior calendar year leads to a significant increase of 2.3 administrative errors, or a .03% increase. These results support our first hypothesis.

Our second hypothesis expects that administrative errors will be more frequent where clientele career conditions are more complex. Support for this hypothesis would be evidenced by a positive and significant coefficient on *Seeking Different Occupation*. The coefficient on this variable reported in Model 2 in Table 3 is positive and significant. For each additional 100 unemployed claimants seeking employment in a new occupation, an additional 4.5 administrative errors are observed in the audit sample. This effect is equivalent to a statistically significant .07% increase in the frequency of administrative errors. These results support our second hypothesis.

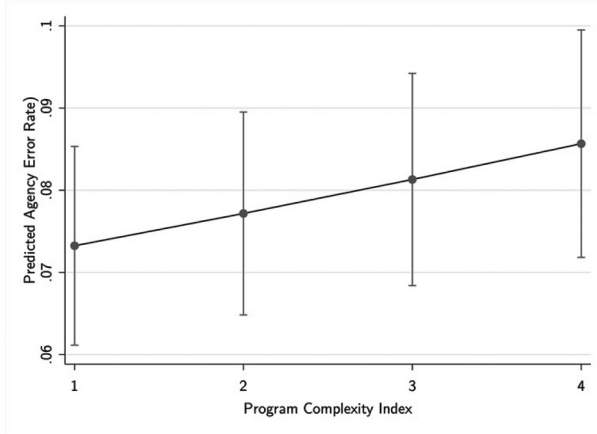
Our third hypothesis expects that administrative errors will occur with greater frequency when more claims are filed using ICT-based automated systems. Support for this hypothesis would be seen in significant and positive coefficients on the variable *electronic filing*. The coefficients and average marginal effects in both models indicate that in state-years with more claims filed by electronic (automated) methods, there are significantly more administrative errors observed in the audit process. Model 2 reports that for each additional 100 claims filed by electronic methods, an additional 4.5 administrative errors are expected. This is equivalent to an increase in the error rate of .03%. Together, the results presented in Table 3 offer statistically significant support our all three of our hypotheses.

To better contextualize these results, we report conditional predicted administrative error rates in Figure 3. Each subfigure represents the total predicted agency-responsible error rate across values of key independent variables. The topmost subfigure (A) illustrates the significant positive effect of greater program complexity on the rate of claims with agency errors. The middle subfigure (B) illustrates the significant positive effect of caseload complexity, operationalized by the number of claimants seeking a new occupation, on the rate of agency errors. Lastly, the bottommost subfigure (C) illustrates the significant positive impact of electronic filing on the error rate.

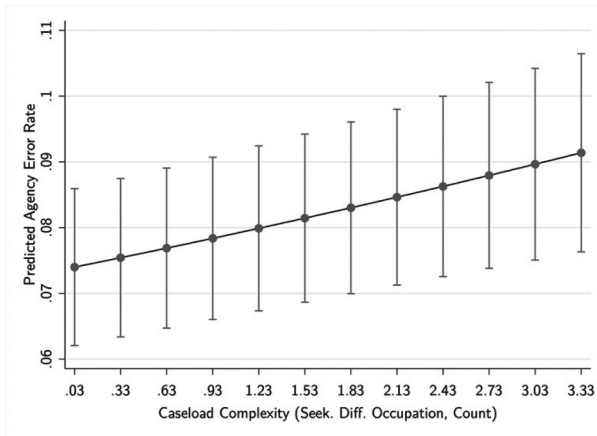
Together, these figures further support our hypotheses and better visualize our results. We would expect the lowest rate of agency errors to be observed in contexts with less complex program rules, fewer clientele seeking new occupations, and fewer clientele filing by electronic methods.



a



b



c

Figure 3. Predicted agency error rates. *Note*: Estimates from Table 3 Model 2 were used to predict conditional rates of administrative errors using postestimation simulation.

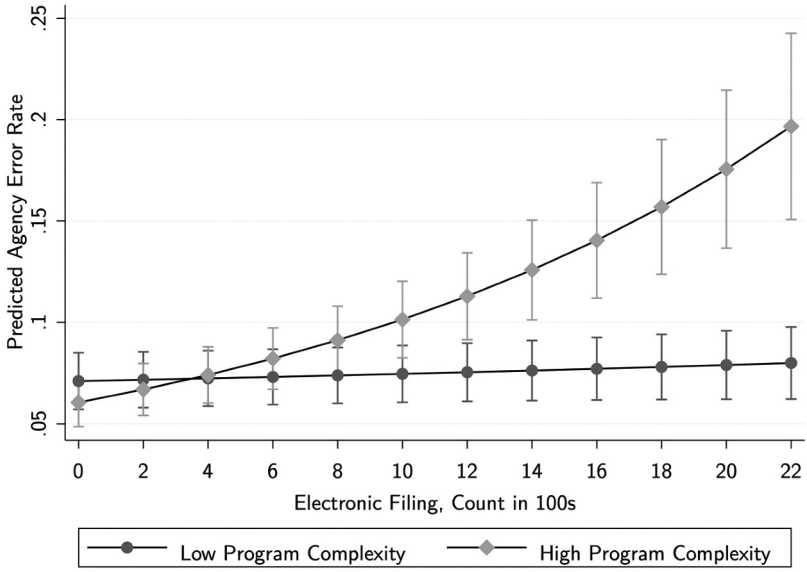


Figure 4. Administrative errors across electronic filing. *Note*: Estimates from Appendix Table A8 Model A10 used to predict conditional rates of administrative errors using post-estimation simulation.

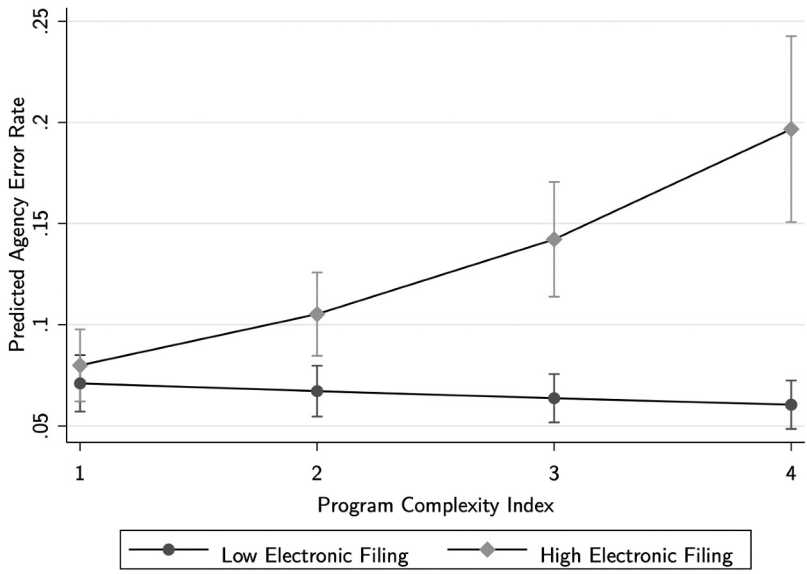


Figure 5. Administrative errors across rule complexity. *Note*: Estimates from Appendix Table A8 Model A10 were used to predict conditional rates of administrative errors using postestimation simulation.

Discussion

Our results support our hypotheses that each of our key independent variables are independently associated with increased agency-responsible administrative errors. Administrative errors are more frequent where program rule complexity is greater,

namely, where state eligibility requirements and benefit determination processes are more complex. Administrative errors are also more frequent where clientele career conditions are more complex, operationalized in terms of clientele seeking employment in a new occupation. And administrative errors occur with greater frequency in contexts with greater utilization of ICT-based automated systems.

It is possible, however, that these effects are not independent. Rather, we might expect the effect of program rule complexity, for example, to be even more disadvantageous to administrative accuracy if caseload complexity or electronic filing are also higher. To explore this possibility, we estimate an interactive model of administrative errors, with multiplicative interactions between each of our three key independent variables.[8] For ease of interpretation, we report the results of this model in Appendix Table A8, and focus here on simulated error rates based on these models. Figures 4 and 5 illustrate selected results from the interactive model of agency errors.

In Figure 4, we report conditionally predicted agency error rates across the sample range of electronic filing at both high and low levels of rule complexity. Several results emerge from this figure. Low rule complexity is associated with an error rate of less than 0.1 across the full range of electronic filing. This suggests that in comparatively less complex rule environments, the disadvantageous impact of electronic filing on error rates is not observed. In high complexity environments, predicted error rates are significantly greater where more claims are filed electronically. This suggests that the disadvantageous impact of electronic filing is evident only in contexts with greater program complexity. When electronic filing is less common, we see no difference in the estimated error rates in more or less complex environments. Where electronic filing is more common, we see a significantly higher agency error rate in more complex rule environments compared to less complex rule environments. And where electronic methods are frequently utilized by clientele to claim UI benefits, the agency error rate is more than twice as high in complex programs than in less complex programs.

In Figure 5, we report conditionally predicted agency error rates across the sample range of program complexity, in two scenarios: high and low electronic filing. Again, several results emerge. Where no electronically filed claims are included in the audit sample, we see no statistical difference in the predicted error rates across values of program complexity. Put differently, we may infer that program complexity has little impact on error rates where electronic filing is not often utilized.

Where program complexity is low, we see no statistical difference in the error rates predicted for low or high electronic filing scenarios. This suggests that the disadvantageous impact of ICT on accuracy is mitigated by low program complexity. However, where program complexity is high, we see a significant and substantively meaningful effect of electronic filing. In this high program complexity scenario, the rate of agency errors is about 2.5 times larger when ICT tools are commonly used compared to state-years in which ICT tools are not. Together, these results suggest that not only do program complexity, ICT tools, and caseload complexity exert upward pressure on the frequency of agency-responsible errors, but these forces are interactive, and each effect magnifies the other.

The failure of technological automation to reduce error rates in complex rule systems deserves further attention from both scholars and practitioners. In our empirical context there are several potential causal pathways. One is that the electronic filing systems are themselves error-prone because their process logic is not faithful to the relevant complex legal criteria. Another is that the rate of electronic filing is

correlated with an unobserved variable, particularly with respect to the competence, resources, caseload, or experience of the remaining human case workers. In other words, as states trade off investing in capital over labour resources in their unemployment agencies, this may increase the baseline error rate among staff such that it increases the overall observed error rate. A third possibility is that electronic filing contributes to the general complexity of the system. Thus, more errors occur if there is not sufficient expansion in monitoring and management to ensure that the automated components are adjusted to account for changes to program rules or participants over time.

Our findings also inform the discussion of administrative burdens by identifying complexity in different phases of a program and how that complexity is associated with more errors and, thus, more burdens. We show that complex rules, which may be set in the policymaking process, such as eligibility requirements and benefit levels, are associated with more errors, and thus higher levels of burdens. Similarly, we find that more complex elements of the individual cases a state workforce deals with are also associated with higher errors. And finally, the administrative decisions around electronic filings and the information technology systems that a state deploys to manage the program are associated with errors. All these causes of errors contribute to compounding administrative burdens. Of course, these claim case elements are not something that the SWA can control, but they should understand how that case complexity contributes to administrator-caused errors, especially in an automated filing environment.

While we have built on the theory and empirical applications of administrative burden for this study, much more work is needed to understand the nuances of how complexity contributes to burdens and the effect complexity has on both organizations and people who interact with social programs. We have also only just begun to conceptualize measures of complexity and the various types of complexity that interact with administrative behaviour and administrative errors. We need a better understanding of the specific mechanisms by which our conceptualizations of complexity impact the distribution of administrative errors and overall organizational performance. Lastly, if our goal is to contribute to an understanding of successful policy implementation and organizations (Compton and Hart 2019), future research should consider focusing on identifying and explaining cases with unexpectedly or notably lower administrative error counts.

Conclusion

In the US, unemployment insurance has become an important social safety net program. Its prominence and political salience were demonstrated during the COVID-19 pandemic. That exposure highlighted the difficulty that individuals face when trying to access the program, how that experience differs from state to state, along with the amount of money and resources that are allocated incorrectly. While there are political disagreements about the specifics of the UI policy, there is wide agreement on the need to improve the accuracy of these payments and a need to better understand how to reduce errors. Yet, public administration research has yet to incorporate a serious understanding of administrative errors.

This article lays a foundation for a more robust discussion of administrative errors as a form of administrative burden and complexity within the field of public

administration, and to extend the study of administrative burdens to incorporate complexity. Similarly, complexity lacks careful explication in public administration research and social science in general.

In seeking to integrate notions of complexity from previous research, we argue that complexity arises when many parts are connected in many ways. This leads to emergent behaviour that is hard to predict, leading to more administrative errors, which are in turn a form of administrative burden when these errors affect service recipients. Administrative errors do appear to be influenced by program complexity. The various ways in which complexity can create administrative burdens and whether technology can mitigate those effects is a topic deserving further study building on these results.

We test whether complexity in program design and target populations affects the observed rate of administrative errors using panel data on state-administered unemployment insurance (UI) claim processing in the U.S. We also test whether technology-facilitated process automation reduces these effects. We find that both higher program complexity and changes to complex rule systems are associated with higher rates of administrative errors across States over time. We also find that automated claims systems are associated with higher error rates in States with more complex program rules.

Notes

1. A supplemental appendix will be made available online.
2. As defined by the Improper Payment Elimination and Recovery Act (IPERA), a 'payment error' is committed when one or more of the following occurs: 1) federal funds go to the wrong recipient; 2) the recipient receives the incorrect amount of funds; 3) documentation is not available to support payment; or 4) the recipient uses federal funds in an improper manner (OMB 2004). Our measure of agency-responsible errors excludes the fourth category in this definition.
3. Results from regression models including each of the five dimensions of state law as predictors, rather than the additive index *complex rules*, are reported in the Appendix.
4. Alternative filing methods include telephone (38%); mail (.92%); in-person (11.1%); or by employer on behalf of claimant (1.4%). Filing method is missing or unreported in 1.9% of audited claims.
5. Additional models estimated with state fixed effects included to account for time-invariant differences in (1) policy or political environment across states that might shape the probability of administrative errors occurring, and (2) the capacity or quality of the state-level independent auditing agency responsible for detecting and reporting claims yield substantively similar inferences, as do models estimated without year fixed effects. Models estimated with alternative specifications are reported in Appendix Tables A6 and A7.
6. We include a logged count of the *audit size* with a regression coefficient constrained to equal one to account for differences in the opportunity for an error to occur across space and time. Including this 'exposure', term improves inferences by normalizing the outcome variable to adjust for variation in audit size. This helps to avoid mistakenly concluding that higher administrative error counts are driven by higher risk (lower procedural accuracy) rather than greater exposure (larger audit size). It also improves consistency and comparability across units. Because the coefficient on logged audit size is constrained to equal '1', we do not report it in regression tables, as is standard reporting practice. See Cameron and Trivedi 2013, for a longer treatment of this topic.
7. An average marginal effect is an estimate of the change in prediction function associated with a change in a specified independent variable. Average marginal effects reported in Table 3 are calculated at mean in-sample values of all variables, including the offset term, included in the model. The magnitude of these effects is relative to the average number claims audited by BAM

in a given year for a given state. The average BAM state-year sample is 874 claims. Moreover, it bears repeating that BAM uses a stratified random sampling approach, so that each state-year sampling frame should be representative of the population of UI claimants.

8. Following (Brambor, Roberts Clark, and Golder 2005), we include four multiplicative interactions, including a three-way interaction between all key variables.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Matthew M. Young http://orcid.org/0000-0002-9262-2346
Mallory Compton http://orcid.org/0000-0002-5124-238X

References

Al-Fedaghi, S. 2014. "Design Principles in Health Information Technology: An Alternative to UML Use Case Methodology." *International Journal of Healthcare Information Systems and Informatics* 9 (1): 30–41. https://doi.org/10.4018/ijhisi.2014010102.

Ashby, W. Ross. 1991. "Requisite Variety and Its Implications for the Control of Complex Systems." In *Facets of Systems Science*, edited by J. Klir George, 405–417. Boston, MA: Springer US. https://doi.org/10.1007/978-1-4899-0718-9_28.

Baekgaard, Martin, Donald P Moynihan, and Mette Kjærgaard Thomsen. 2020. "Why Do Policymakers Support Administrative Burdens? The Roles of Deservingness, Political Ideology, and Personal Experience." *Journal of Public Administration Research and Theory* 31 (1): September. 184–200. https://doi.org/10.1093/jopart/muaa033.

Battaglio, R. Paul, and L. Hall. Jeremy. 2019. "Ordo Ab Chao? Complexity and Its Implications." *Public Administration Review* 79 (6): 807–809. https://doi.org/10.1111/puar.13128.

Berry, William D., Richard C. Fording, Evan J. Ringquist, Russell L. Hanson, and Carl E. Klarner. 2010. "Measuring Citizen and Government Ideology in the U.S. States: A Re-Appraisal." *State Politics & Policy Quarterly* 10 (2): 117–135. https://doi.org/10.1177/153244001001000201.

Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L. Hanson. 1998. "Measuring Citizen and Government Ideology in the American States, 1960-93." *American Journal of Political Science* 42 (1): 327. https://doi.org/10.2307/2991759.

Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L. Hanson. 2007. "The Measurement and Stability of State Citizen Ideology." *State Politics & Policy Quarterly* 7 (2): 111–132. https://doi.org/10.1177/153244000700700201.

Bowers, N., and F. W. Horvath. 1984. "Keeping Time: An Analysis of Errors in the Measurement of Unemployment Duration." *Journal of Business and Economic Statistics* 2 (2): 140–149. https://doi.org/10.1080/07350015.1984.10509382.

Brambor, Thomas, William Roberts Clark, and Matt Golder. 2005. "Understanding Interaction Models: Improving Empirical Analyses." *Political Analysis* 13 (1): 20. https://doi.org/10.1093/pan/mpi014.

Bullock, Justin B. 2014. "Theory of Bureaucratic Error." In *Academy of Management Proceedings, 2014:17469*. Academy of Management Briarcliff Manor, NY 10510.

Burden, Barry C., David T. Canon, Kenneth R. Mayer, and Donald P. Moynihan. 2012. "The Effect of Administrative Burden on Bureaucratic Perception of Policies: Evidence from Election Administration." *Public Administration Review* 72 (5): 741–751. https://doi.org/10.1111/j.1540-6210.2012.02600.x.

Camasso, Michael J., and Radha Jagannathan. 1994. "The Detection of AFDC Payment Errors Through MIS and Quality Control Data Integration: An Application in the State of New Jersey." *Administration in Social Work* 18 (2): 45–68. https://doi.org/10.1300/J147v18n02_03.

Cameron, A. Colin, and K. Trivedi. Pravin. 2013. "Regression Analysis of Count Data." In *Econometric Society Monographs*, 2nd, Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139013567.

Compton, Mallory E., and Justin Bullock. 2020. "State Unemployment Insurance Policy Characteristics 1990-2018." Texas A&M University Bush School of Government.

Compton, Mallory, and Paul't Hart. 2019. *Great Policy Successes*. Oxford, UK: Oxford University Press.

Compton, Mallory E, Matthew M Young, Justin B Bullock, and Robert Greer. 2023. "Administrative Errors and Race: Can Technology Mitigate Inequitable Administrative Outcomes?" *Journal of Public Administration Research and Theory* 33 (3): 512–528. https://doi.org/10.1093/jopart/muac036.

Eppel, Elizabeth Anne, and Mary Lee Rhodes. 2018. "Complexity Theory and Public Management: A 'Becoming' Field." *Public Management Review* 20 (7): 949–959. https://doi.org/10.1080/14719037.2017.1364414.

Eubanks, Virginia. 2018. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York City, NY, USA: St. Martin's Press.

Fairley, William B., Alan J. Izenman, and Partha Bagchi. 1990. "Inference for Welfare Quality Control Programs." *Journal of the American Statistical Association* 85 (411): 874–890. https://doi.org/10.1080/01621459.1990.10474957.

Farrell, W., R. Parent, and M. Tenney. 1984. "Administration and Service Delivery in the SSI Program: The First 10 Years." *Social Security Bulletin* 47 (8): 3–22.

Feng, S., and Y. Hu. 2013. "Misclassification Errors and the Underestimation of the US Unemployment Rate." *American Economic Review* 103 (2): 1054–1070. https://doi.org/10.1257/aer.103.2.1054.

Gajduschek, G. 2003. "Bureaucracy: Is It Efficient? Is It Not? Is That the Question? Uncertainty Reduction - an Ignored Element of Bureaucratic Rationality." *Administration and Society* 34 (6): 700–723. https://doi.org/10.1177/0095399702239171.

Garson, Barbara. 1989. *The Electronic Sweatshop*. London, UK: Penguin books.

Gerrits, Lasse, and Peter Marks. 2015. "How the Complexity Sciences Can Inform Public Administration: An Assessment." *Public Administration* 93 (2): 539–546. https://doi.org/10.1111/padm.12168.

Greer, Robert A., and Justin B. Bullock. 2018. "Decreasing Improper Payments in a Complex Federal Program." *Public Administration Review* 78 (1): 14–23. https://doi.org/10.1111/puar.12809.

Hällgren, M., L. Rouleau, and M. De Rond. 2018. "A Matter of Life or Death: How Extreme Context Research Matters for Management and Organization Studies." *Academy of Management Annals* 12 (1): 111–153. https://doi.org/10.5465/annals.2016.0017.

Hogg, M. H. 1930. "Sources of Incomparability and Error in Employment-Unemployment Surveys." *Journal of the American Statistical Association* 25 (171): 284–294. https://doi.org/10.1080/01621459.1930.10503130.

Lipsky, Michael. 1984. "Bureaucratic Disentitlement in Social Welfare Programs." *Social Service Review* 58 (1): 3–27. https://doi.org/10.1086/644161.

Loh, T. Y., M. P. Brito, N. Bose, J. Xu, and K. Tenekedjiev. 2020. "Human Error in Autonomous Underwater Vehicle Deployment: A System Dynamics Approach." *Risk Analysis* 40 (6): 1258–1278. https://doi.org/10.1111/risa.13467.

Marks, Peter K., and Lasse M. Gerrits. 2013. "Approaching Public Administration from a Complexity Perspective." *Public Administration Review* 73 (6): 898–903. https://doi.org/10.1111/puar.12145.

Masood, Ayesha, and Muhammad Azfar Nisar. 2021. "Administrative Capital and Citizens' Responses to Administrative Burden." *Journal of Public Administration Research and Theory* 31 (1): 56–72. https://doi.org/10.1093/jopart/muaa031.

Mendeloff, John. 1977. "Welfare Procedures and Error Rates: An Alternative Perspective." *Policy Analysis* 3 (3): 357–374. http://www.jstor.org/stable/42796283.

Miller, John H., (John Howard), and Scott E. Page. 2007. *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*. Princeton, N.J: Princeton University Press.

Moynihan, Donald, and Pamela Herd. 2010. "Red Tape and Democracy: How Rules Affect Citizenship Rights." *The American Review of Public Administration* 40 (6): 654–670. https://doi.org/10.1177/0275074010366732.

Moynihan, Donald, Pamela Herd, and Hope Harvey. 2015. "Administrative Burden: Learning, Psychological, and Compliance Costs in Citizen-State Interactions." *Journal of Public Administration Research and Theory* 25 (1): 43–69. https://doi.org/10.1093/jopart/muu009.

Office of Unemployment Insurance. 2018. *Unemployment Insurance Improper Payments by State*. Washington, D.C: The U.S. Department of Labor.

OIRA. 2023. "Tackling the Time Tax." Washington, D.C: Offce of Information and Regulatory Affairs. https://www.whitehouse.gov/wp-content/uploads/2023/07/OIRA-2023-Burden-Reduction-Report.pdf.

OMB. 2004. *Circular A-123: Management's Responsibility for Internal Controls*. Washington, D.C: U.S. Office of Management and Budget.

Pahlka, Jennifer. 2023. *Recoding America: Why Government is Failing in the Digital Age and How We Can Do Better*. New York City, NY, USA: Macmilan.

Pallasch, John. 2020. "COVID-19: More Can Be Done to Mitigate Risk to Unemployment Compensation Under the CARES Act." Inspector General's Report 19-20-008-03–315. Washington, D.C.: U.S. Department of Labor. https://www.oig.dol.gov/public/reports/oa/2020/19-20-008-03-315.pdf.

Pamela, Herd, and Donald P. Moynihan. 2018. *Administrative Burden: Policymaking by Other Means*. New York City, NY, USA: Russell Sage Foundation.

Peeters, R. 2020. "The Political Economy of Administrative Burdens: A Theoretical Framework for Analyzing the Organizational Origins of Administrative Burdens." *Administration and Society* 52 (4): 566–592. https://doi.org/10.1177/0095399719854367.

Peeters, Rik, and Arjan Widlak. 2018. "The Digital Cage: Administrative Exclusion Through Information Architecture – the Case of the Dutch Civil Registry's Master Data Management System." *Government Information Quarterly* 35 (2): 175–183. https://doi.org/10.1016/j.giq.2018.02.003.

Pina-Sánchez, J., J. Koskinen, and I. Plewis. 2014. "Measurement Error in Retrospective Work Histories." *Survey Research Methods* 8 (1): 43–55.

Rik, Peeters, and Arjan C. Widlak. 2023. "Administrative Exclusion in the Infrastructure-Level Bureaucracy: The Case of the Dutch Daycare Benefit Scandal." *Public Administration Review* 83 (4): 863–877. https://doi.org/10.1111/puar.13615.

Sangyub, Ryu, Jeffrey B. Wenger, and Vicky M. Wilkins. 2012. "When Claimant Characteristics and Prior Performance Predict Bureaucratic Error." *The American Review of Public Administration* 42 (6): 695–714. https://doi.org/10.1177/0275074011435151.

Schneider, Anne, and Helen Ingram. 1993. "Social Construction of Target Populations: Implications for Politics and Policy." *American Political Science Review* 87 (2): 334–347. https://doi.org/10.2307/2939044.

Skitka, L. J., K. Mosier, and M. D. Burdick. 2000. "Accountability and Automation Bias." *International Journal of Human Computer Studies* 52 (4): 701–717. https://doi.org/10.1006/ijhc.1999.0349.

Suyeon, Jo, and Tina Nabatchi. 2019. "Coproducing Healthcare: Individual-Level Impacts of Engaging Citizens to Develop Recommendations for Reducing Diagnostic Error." *Public Management Review* 21 (3): 354–375. https://doi.org/10.1080/14719037.2018.1487577.

Taylor, J. K., D. C. Lewis, M. L. Jacobsmeier, and B. DiSarro. 2012. "Content and Complexity in Policy Reinvention and Diffusion: Gay and Transgender-Inclusive Laws Against Discrimination." *State Politics and Policy Quarterly* 12 (1): 75–98. https://doi.org/10.1177/1532440011433589.

Tsang, J. C. 2016. "Coping with Policy Complexity in the Globalized World." *Public Administration Review* 76 (6): 840–841. https://doi.org/10.1111/puar.12643.

Weber, Max. 1964. *The Theory of Social and Economic Organization*. New York: Free Press of Glencoe.

Weick, K. E. 1987. "Organizational Culture as a Source of High Reliability." *California Management Review* 29 (2): 112–127. https://doi.org/10.2307/41165243.

Wenger, Jeffrey B., and Vicky M. Wilkins. 2009. "At the Discretion of Rogue Agents: How Automation Improves Women's Outcomes in Unemployment Insurance." *Journal of Public Administration Research and Theory* 19 (2): 313–333. https://doi.org/10.1093/jopart/mum044.

Widlak, A., and R. Peeters. 2020. "Administrative Errors and the Burden of Correction and Consequence: How Information Technology Exacerbates the Consequences of Bureaucratic Mistakes for Citizens." *International Journal of Electronic Governance* 12 (1): 40–56. https://doi.org/10.1504/IJEG.2020.106998.