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The Political Economy of Abandoned Mine Land Fund Disbursements

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Abstract: What factors determine federal spending on environmental goods? Is severity of the hazard the only metric of consideration, or do other factors play a vital role in explaining spending? This paper seeks to answer this question and to identify disbursement patterns within the context of the Abandoned Mine Land Fund (AMLF) program, a fund created as an aspect of the Surface Mining Control and Reclamation Act of 1977. We explore whether political factors, as well as environmental and health factors, have an explanatory role in disbursement of AMLF monies. The political factors examined include environmental interest group influence and legislator preferences and/or pressures to fund sites in their home states or districts. The results found here suggest that there exists a mix of public and private interests present in AMLF disbursement decisions during the overall span of the program, and that political influences have gained strength in the decision-making calculus in response to changes in the funding structure of the AMLF.

Keywords: public choice; public interest; seniority; mining; political economy

JEL Classification: D7; H5

1. Introduction

What are the determinants of federal spending on environmental goods? Is severity of the environmental hazard the only metric of consideration, or do other factors play a vital role in explaining how funding is disbursed? In this paper, we aim not only to provide answers to these questions, but also to illuminate disbursement patterns of monies from the Abandoned Mine Land Fund (AMLF) that go toward the reclamation of abandoned mine sites throughout the United States. Though the program itself is small, this analytical setting is interesting because of the limited scope of program objectives and the rigidly defined funding source (at least initially). This suggests that the execution of abandoned mine reclamation projects facilitated by the fund should be difficult to influence politically. Within this setting, we examine whether political factors, in addition to severity of abandoned mine site hazard and general abandoned mine site characteristics, influence the distribution of AMLF monies.

This project contributes firstly to the economic analysis of government activity. Broadly, there are two economic strands of thought regarding government action. The first is that government action is motivated primarily by the public interest. Congruent with this perspective, money from the AMLF would go toward sites that pose the most severe environmental risks to the general public. The other perspective sees government action as being subject to the influences of interest groups and politician self-interest. Orthogonal to the vision of a benevolent government, these concentrated interests are seen as the driving influences of fund disbursement. López and Leighton (2013) provide a good overview of both of these theories in their analysis of the role of ideas in political change.

Within the existing literature, little has been said specifically regarding the AMLF as an environmental remediation program. However, work has been done with respect to other similarly intended programs such as Superfund that parallels the questions asked in this paper. Barnett (1985) and Hird (1990, 1993, 1994) offer support for the public interest perspective with their findings that Superfund monies and efforts are allocated toward remediating the most severe sites. The evidence in these works, however, is not strong enough to reject the hypothesis that there are *zero* pork-spending influences in Superfund allocations but does suggest that these influences are minor with respect to total disbursements.

Nonetheless, McNeil et al. (1988) find evidence for the pork-spending hypothesis with respect to tax implementation and subsequent spending. They found that evidence in EPA data that taxes for Superfund were often collected in certain areas, but the bulk of spending occurred elsewhere. Likewise, the theory of rationally self-interested politicians is likewise supported throughout other works. Stroup (1996) and Yandle (1992) argue that Superfund monies are sought by politicians to be brought back to their home constituencies. Tilton (1995) draws comparisons between Superfund and the AML program under the Surface Mining Control and Reclamation Act (SMCRA) in the ways each of these programs dealt with problems of past pollution and finds that AML fares better in terms of assigning responsibility for the past pollution and mitigating future production cost uncertainty associated with liability costs. Nonetheless, the scope of the analysis does not consider how political factors or pure environmental or human well-being concerns affect the execution of either of these pollution mitigation programs. The paper closest to ours in the Superfund literature is Stratmann (1998), who uses a political economy model similar to ours to look at the geographic disbursement of Superfund expenditures to separate out public interest and public choice influences.

We use this literature to inform our study of the Abandoned Mine Land Fund. In Section 2, we provide an overview of the history of the AMLF. We then discuss our theoretical framework in Section 3 and follow that up with information on our data in Section 4. Section 5 presents our empirical results, with Section 6 concluding.

2. History of the Abandoned Mine Land Fund

The AMLF was created as a part of SMCRA in 1977. Bamberger (1997) provides a nice overview of the history of the AMLF through 1997. Yonk et al. (2017) have a more recent overview of the history of SMCRA through a public choice lens. The overarching goal of SMCRA is to establish a federal standard for environmentally responsible surface mining, and restoration of the lands after mining has ceased to ensure mitigation of adverse environmental effects of this method of extraction. Due to lax enforcement of state mining regulations prior to the passing of SMCRA, many smaller sites were subject to "blast and grab" mining techniques where small, independent miners/mining operations, often referred to as wildcatters, would use whatever least cost method was at their disposal to expose and extract coal. Afterwards, they might simply leave the area thereafter with no attempt at reclamation. These practices resulted in degradation of land and environmental quality. While small sites characterized the abandoned mines, the prevalence of these sites was the main contributor to alarm.

Consistent with the broader goals of SMCRA, the objective of AMLF is to provide for a general funding pool to be allocated towards reclamation efforts of already existing abandoned mine sites, in addition to SMCRA's efforts of enforcing reclamation on present and future mine sites. As delineated within SMCRA, monies in AMLF may be used for purposes including, but not limited to, reclamation and restoration of abandoned coal surface mines, processing and disposal areas, sealing and filling of deep mine entries, land restoration to mitigate erosion and sedimentation, waterbed restoration, construction and operation of water treatment plants, pollution mitigation for burning coal refuse disposal, and control of coal mine subsidence.

The coffers of the AMLF are provided for via a fee levied on extracted coal as specified in section 403 of SMCRA:

> All operators of coal mining operations subject to the provisions of this Act shall pay to the Secretary of the Interior, for deposit in the fund, a reclamation fee of 35 cents per ton of coal produced by surface coal mining and 15 cents per ton of coal produced by underground mining or 10 per centum of the value of the coal at the mine, as determined by the Secretary, whichever is less, except that the reclamation fee for lignite coal shall be at a rate of 2 per centum of the value of the coal at the mine, or 10 cents per ton, whichever is less.

These fees were initially slated to expire in 1992, but extensions have been passed by Congress to maintain the collection of fees, thereby continuing the reclamation of abandoned mine sites.

Out of the monies collected from domestic coal production fees, 50% of those collections are allocated to the states. The remaining half is allocated across three broad objectives and falls under federal discretion and the control of the Secretary of the Interior. Ten percent of these funds are marked for allocation into the Rural Abandoned Mine Program. Twenty percent of the funds are funneled into a pool that is used for supplemental grants going toward remediation of more hazardous sites. The remaining 20% can be described as a portmanteau pool where funds are used for emergency projects, federal administrative costs, projects in states without approved reclamation plans, and the Small Operator Assistance Program.

Currently, the Office of Surface Mining (OSM) has collected over $10.1 billion worth of fees toward the AMLF. Out of that total, over $7.6 billion has been distributed. Furthermore, OSM estimates that over $3 billion worth of high priority sites remain to be remediated. Back-of-the-envelope arithmetic suggests that the mission of OSM with respect to reclaiming abandoned mines is nearing its twilight. However, one should be careful to avoid the assumption that the volume and severity of abandoned mine sites exists in a static state. Instead, these should be considered in a dynamic light for reasons such as the potential future hazardous deterioration of presently stable underground mines.

In the nearly forty years since the passing of SMCRA and the creation of the AML reclamation program, various changes to SMCRA itself have been implemented and the funding structure of AMLF has likewise been altered. The first structural change relevant to this analysis is the enactment of the Abandoned Mine Reclamation Act (AMRA) of 1990 that provided for the accruement of interest on AMLF balances that were not appropriated. This marks the first codified instance in the lifespan of the program that incentivizes any change in allocation patterns. Specifically, this act provides the incentive to decrease general allocations and hold a balance in the AMLF from year to year in order to grow the fund absent additional taxes collected or to mitigate cycles in funding due to cyclical coal production.

The next major restructuring of reclamation funding occurred with the passing of the SMCRA Amendments Act of 2006. First, it incrementally reduces the taxes levied per ton of coal produced through September 2021. However, this rate reduction is offset by requirement of "Treasury payments to certified states and tribes in lieu of payments from AMLF." A further stipulation, requiring future AMLF allocations to be based upon historic coal production, also shifts the allocation patterns. The final restructurings of the AML program relevant to this study are tucked away within the passages of Public Law (PL) 112-141, the "Moving Ahead for Progress in the 21st Century Act," and PL 113-40, the "Helium Stewardship Act of 2013." In short, minutia within these bills cap the amount of money allocated to a given state or tribe out of the in-lieu Treasury funds established in the SMCRA Amendments Act annually at $15M and $28M, respectively.

3. Theoretical Framework

This paper's conceptual framework incorporates tenets of economic theories of regulation, bureaucracy, and interest group influences in order to provide a more cohesive and comprehensive explanation of the disbursement of AMLF monies. Within the economic theory of regulation, legislators maximize their acquisition of support from among competing constituencies. Theoretically and practically, this predicts that legislators do not adopt a corner solution with respect to helping one constituency versus another. Instead, in equilibrium, individual legislators make support trade-offs at the margin in order to attain the optimal amount of support. Within the context of AMLF decision

making by politicians, the relevant constituencies to consider are interest groups who may provide financial electoral support and the general public responsible for vote counts. From this scenario, both the severity of environmental hazard posed by the abandoned mine site as well as the interest group strength possess important explanatory power regarding AMLF disbursements.

The equilibrium framework of regulation and interest groups implies that bureaucrats are politicians' pawns in executing legislation (Becker 1983; Peltzman 1976). Therefore, it logically follows that such models have no room for bureaucratic influence in policy decision-making. However, if the bureau has significant enough autonomy in pursuing its own interests, as the Office of Surface Mining, Reclamation and Enforcement generally does, the economic theory of bureaucracy must be introduced into this analysis in order to more accurately explain the patterns of AMLF disbursement.

Within the economics of bureaucracy, there are also multiple competing explanations of the autonomy and objectives of bureaucracies. One hypothesis suggests that bureaucrats pursue their own interests within the organization, and those interests do not consistently align with the law's intent (Niskanen 1971). McCubbins et al. (1989) put forth a hypothesis where bureaucrats and politicians have differing objectives, but that constraints such as budget appropriation, administrative rules, and oversight can effectively curb purely bureaucratically interested actions. Weingast and Moran (1983) suggest an even more constrained theory of bureaucratic action with their congressional control hypothesis.

Potentially more important than the theories of regulation and bureaucracy is the relationship between legislators and the implementation of the regulations they are responsible for enacting. Consistent with the public choice view that politicians act in their own self interest—substantively meaning they take actions that are likely to increase their chances of job security by means of re-election—politicians have a vested interest in securing funds for their respective states and/or districts. Doing so increases local aspects such as environmental quality, real estate values, and potential tourism revenues. Likewise, reclamation activities could be expected to provide positive employment effects in the area. While the employment effects may only be relevant in the short run, they also typically fall within the reelection timeframe, thereby further incentivizing politicians to secure this virtually 'free lunch' money. As such, this interaction suggests that senior politicians will be more effective in funneling AMLF allocations to their home regions.

From a policy perspective, it is important to know the extent to which political factors play a role in the distribution of public funds. This is especially true when politics is not supposed to play a role. If political influence can be identified, then perhaps a change can be made to political institutions to remove politics from the process. For example, Garrett and Sobel (2003) find that Federal Emergency Management Agency (FEMA) disaster expenditures are higher in states where their members of Congress serve on FEMA oversight committees. A post 9-11 reorganization of FEMA, however, removed this form of political influence according to Sobel et al. (2007). Similarly, Twight (1989) highlights how politics prevented the military from closing or realigning any domestic military bases from 1960 to 1988. Reforms in the late 1980s led to political factors no longer playing a role (Beaulier et al. 2011). By looking at all the institutional changes in the AMLF program over time in one paper, we provide insight into how institutional changes may have influenced the role of politics in the allocation of funding.

Furthermore, the nature of AMLF disbursements with respect to whether it more adequately can be described as a disguised welfare program, or general spending on environmental goods has important implications for how we predict funds to be allocated.

4. Data and Model Estimation

As described in the preceding section, the explanatory factors of AMLF disbursement are many. The theoretical underpinning suggests that funding of abandoned mine reclamation projects is a function of hazard severity, and the characteristics of legislators, interest groups, and bureaucratic agents. This general empirical model has been used to study agency dependency (Anderson and Potoski 2016), federal transportation disbursements, (Bilotkach 2018), airport funding under the

Essential Air Service Act (Hall et al. 2015), federal disaster declarations and assistance (Husted and Nickerson 2014), NIH funding (Batinti 2016), antitrust enforcement (Dove and Dove 2014), and even disbursement of the swine flu vaccine (Ryan 2014). Such an empirical model will be used to explain and predict funding tendencies of projects that fall under the umbrella of AMLF reclamation objectives. The empirical model to be estimated is an ordinary least squares model that includes state and year fixed effects in order to account for unobserved variations in political and economic conditions throughout the span of the data set.

For policymakers not familiar with the methodology employed in these analyses, the goal is to estimate an empirical model that explains variation in AMLF funding. If done properly, we can isolate the effect of specific factors holding constant other variables that might influence AMLF funding. For example, a positive and statistically significant coefficient on whether a mine was an underground mine strongly suggests that underground mines receive higher levels of AMLF funding because policymakers believe they are more costly to remediate, other things being equal. Similarly, a positive and statistically significant coefficient on any variables measuring political influence suggests that political oversight of the AMLF influences the allocation of funds.

The equation we estimate is:

$$\begin{aligned}\text{AMLF Disbursements}_{i,t} = {} & \beta_0 + \beta_1 \text{HAppSen}_{i,t} + \beta_2 \text{SHAppSen}_{i,t} + \beta_3 \text{GreenIndex}_{i,t} + \beta_4 \text{Income}_{i,t} \\ & + \beta_5 \text{Private}_{i,t} + \beta_6 \text{State}_{i,t} + \beta_7 \text{Pri1}_{i,t} + \beta_8 \text{Pri2}_{i,t} \\ & + \beta_9 \text{Surface}_{i,t} + \beta_{10} \text{Underground}_{i,t} + \beta_{11} \text{Both}_{i,t} + \beta_{12} \text{Processing}_{i,t} \\ & + \gamma_i + \delta t + \sigma_{i,t}.\end{aligned} \tag{1}$$

The primary dependent variable is the SMCRA-funded AMLF allocation towards reclamation of abandoned mine sites throughout years spanning from 1984 through 2013. These are presented in thousands of inflation-adjusted (1984) dollars. Additional regressions are estimated with the dependent variable as a standardized measurement of SMCRA-funded AMLF allocation per unit of area on a given site to address variation in the size of abandoned mine sites. The data is collected from the Office of Surface Mining Reclamation and Enforcement's Abandoned Mine Land Inventory System, e-AMLIS. This database consists of an inventory of land and water impacted by past mining endeavors. It is detailed to the extent of including information regarding location, type, and extent of damages as well as reclamation costs. Data is provided by the states managing their own abandoned mine problems or through the OSMRE office responsible for managing these cases where states do not bear that responsibility. In this analysis, only reclamation sites that have been funded to some extent by AMLF are included. However, there exist other abandoned mine sites within the database that have simply not been allocated funding or they have been completely reclaimed through private efforts and funding. Table 1 presents summary statistics for the entire sample.

Severity of the environmental hazard is measured by the priority status assigned to each abandoned mine site, per problem type, by OSMRE. There are five tiers of priority assigned to inventoried sites. Within this analysis, priority types are coded as dummy variables, so as to treat each level of hazard independently without assuming a linear scale in the degree of hazard. The most serious abandoned mine land problems are those that pose a threat to health, safety, and general welfare of people. These are assigned either Priority 1 or Priority 2 status, and are the only problems required by law to be inventoried. Within these top two priorities, there are seventeen different problem types accounted for—noted without respect to severity. Those problems that have only environmental impacts are classified as Priority 3 problems and are included in the inventory when reclamation on these sites is funded, in some proportion, out of AMLF. Priority 4 and 5 sites consist of lower severity coal related problems such as public facilities and development of public lands. These lower priority reclamation projects have fewer records kept on them, are less likely to receive AMLF monies, and are not included in this dataset. Intuitively, funding amounts are predicted to align with priority levels; the higher the priority, the greater the funding allocated. (As pointed out by an

astute referee, this suggests that Priority 1 sites are more costly to reclaim. We are not aware of any data on the cost of reclamation per site type. Our intuition here is driven by the fact that the difference between Priority 1 and Priority 2 sites is that Priority 1 sites are categorized as such because they pose a higher threat to the health and safety of the general public. To us, this suggests higher costs related to the urgency of the reclamation project, in addition to the difficulty of remedying health hazards.) For purposes of this analysis, only Priority 1 and 2 sites are considered, and take a value of one if applicable and zero otherwise.

Table 1. Summary statistics for database of abandoned mine land sites, 1984–2013.

Variable	N	Mean	Std Dev	Min	Max
Private Ownership	35,528	66.822	46.192	0	100
State Ownership	34,021	4.062	18.455	0	100
House Appropriations Seniority	36,311	27.715	20.646	0	78
Senate Appropriations Seniority	36,311	7.407	9.653	0	51
Environmental Group Strength	36,314	7.132	2.694	3.400	13.10
Priority 1	36,314	0.208	0.406	0	1
Priority 2	36,314	0.590	0.492	0	1
Underground Site	36,314	0.397	0.489	0	1
Surface Site	36,314	0.345	0.475	0	1
Surface + UG Site	36,314	0.238	0.426	0	1
Processing Site	36,314	0.016	0.125	0	1
AMLF Allocation (1000)	36,314	108.793	352.075	0.0004	13,984
Per Capita (PC) Income (1000)	36,311	26.957	8.447	13.358	68.80
House Appropriations Member	36,311	0.882	0.323	0	1
Senate Appropriations Member	36,311	0.549	0.498	0	1

Along with priority designation, abandoned mine sites can be categorized by the type of mining that occurred on site that now requires reclamation. Here, there are four different mine site types accounted for in the e-AMLIS inventory—surface, underground, both, and processing. Presumably, project sites where only processing mining operations occurred would be predicted to receive larger AMLF allocations since the reclamation project is inherently more involved due to the fact that reclamation activities would predominantly involve cleaning up the chemicals involved in processing coal for use. Processing sites have a higher propensity for causing harm to general health, safety, and human well-being. Surface mines are predicted to receive smaller allocations than processing sites, but the largest allocations with respect to the other extraction sites. This is due to the physical nature of the reclamation project itself. Reclamation of abandoned surface mine sites would involve greater terrain restructuring, re-vegetation, and waterway cleaning and restoration. Purely underground abandoned mine sites would be predicted to have the smallest allocations due to the less involved nature of the reclamation project. In these cases, the reclamation process would be primarily characterized by mineshaft reinforcement to prevent cave-ins, and mine entry sealing to prevent, or at least reduce the risk of people entering abandoned deep mines. Finally, abandoned mine sites where both surface and underground mining occurred are predicted to receive AMLF allocations between the size of purely surface or underground sites receive since costs can be diffused across reclamation of both kinds of operations. In theory, the size of distribution on sites where both surface and underground mines occurred would be on a spectrum from pure surface to pure underground with the amount being a weighted average of the proportional combination of mine types. However, data to this extent of detail is unavailable. As such, the amounts predicted reflect an aggregated average of proportion. All four categories are considered in this analysis. Like the priority sites, the site characteristic variables are coded as dummy variables with a value of one corresponding to the relevant sites and zero otherwise.

Additional site specifics are accounted for by ownership characteristics of the land where the given abandoned mine site is located. By the e-AMLIS classifications, there are seven different possible

categories of landowners, not all of which hold exclusive ownership rights to the given land area. The seven potential stakes are private, state, tribal, Bureau of Land Management, forest service, national park, and a catchall category of other federally owned lands. These ownership stakes are provided as percentages. Among these ownership stakes, we would expect that proportion of private ownership and size of AMLF disbursement will be inversely related. Conversely, higher proportions of state-owned lands on abandoned mine sites are likely to receive the greater AMLF allocations. The remaining five types of land ownership are not considered for purposes of this analysis due to the fact that they make up a miniscule proportion of abandoned mine site ownership on any given site and correspond to a relatively small number of mine sites in the data set. Nonetheless, each of these would be expected to exhibit similar allocation patterns as state-owned lands since they also fall under the broader category of publicly owned lands.

Characteristics of legislators are accounted for by seniority and membership on fiscally relevant congressional committees. The main variables included are cumulative seniority of members on the Senate Appropriations, and House Appropriations committees by year and by state. This data is collected from the respective committee's history websites. For all of these variables, a positive relationship is expected between committee seniority and AMLF allocations. Relatively higher positive relationships are expected for House Appropriations committee members' seniority since they represent a smaller constituency relative to senators.

Variables concerning interest group strength are collected from the 1991–1992 Green Index (Hall and Kerr 1991). Specifically, this index considers membership per 1000 state residents in environmental organizations, namely Greenpeace, the National Wildlife Federation, and the Sierra Club in 1990. Ideally, this index would be more current, perhaps updated annually. Nonetheless, this provides the most current and comprehensive measure of environmental interest group presence across states. This variable is predicted to have a positive influence on the AMLF allocation through the mechanism of these environmental interest groups pressuring representatives to secure funding for reclamation sites in their respective states. If politicians are self-interested, they have an incentive to respond to these vocal members of their constituency. Real state per capita income is included to account for constituent demand for environmental goods.

In addition to the broad inspection of how these factors influence the allocation of AML funds over the recorded lifespan of the program, each of the legal changes in the funding structure previously mentioned are considered, period-by-period to examine the extent to which these changes alter the respective public interest and political influences on AML reclamation funding.

The general predictions regarding these legal changes in the funding structure are simple and intuitive. At the outset of the program, the expectation is that AMLF distribution patterns follow the intentions of the program, to reclaim hazardous abandoned mine sites, without respect to outside political sway. When AML funding expands from being a purely fee-based pool such as with the passing of SMCRA '06, the political influences on allocation decisions will gain gravity. Likewise, as Treasury payments to states and tribes are capped, as is the case with the passage of PL 112-141, that same political influence on allocation decisions will at least wane, if not drop completely out of the distribution calculus.

For purposes of this analysis, abandoned mine sites on Indian Reservation lands are omitted due primarily to the inconsistencies associated with the political variables in question. Given that the reservations are viewed as sovereign entities within United States territory, there exist no measures of seniority within the House and Senate Appropriations committees or within the Green Index for these territories. The lack of a complete set measures render introduction of analysis of AMLF distribution patters on reservations problematic.

5. Empirical Results

Regression results are presented in Tables 2–6. In all tables, specifications (1) and (2) report results with AMLF allocations in inflation-adjusted dollars as the dependent variable, while (3) and (4)

give these same results with respect to the funding-per-metric unit standardization as the dependent variable. All results are estimated using ordinary least squares (OLS). Specifications (1) and (3) do not include state and year fixed effects, while specifications (2) and (4) do include state and year fixed effects.

5.1. AMLF 1984–2013

Table 2 gives an overview of the AMLF distribution patterns over the entire scope of our data set—consisting of 33,947 mine site observations in specifications (1) and (2) and 33,313 observations in (3) and (4) over a nearly thirty-year span. Across all specifications, sites with a Priority 1 ranking are granted larger AMLF allocations. This can be seen in the positive and statistically significant coefficient on the variable Priority 1 in specifications (1), (2), (3), and (4). This result also holds with respect to site-only considerations for Priority 2 abandoned mine sites, though not in funding-per-unit estimations.

Table 2. The determinants of receiving AMLF site funding, 1984–2013.

Variable	(1)	(2)	(3)	(4)
House Appropriations Seniority	0.125	−1.208 ***	0.058	0.263 **
	(0.092)	(0.197)	(0.053)	(0.115)
Senate Appropriations Seniority	3.542 ***	−0.290	1.146 ***	1.217 ***
	(0.203)	(0.356)	(0.117)	(0.206)
Environmental Group Strength	2.639 ***	−29.644 *	−3.006 ***	−39.049 ***
	(0.785)	(16.630)	(0.451)	(10.894)
PC Income (1000)	0.376	−0.249	1.118 ***	1.373 *
	(0.255)	(1.383)	(0.147)	(0.804)
Private Ownership	−0.197 ***	−0.177 ***	−0.028	0.023
	(0.042)	(0.051)	(0.024)	(0.030)
State Ownership	0.582 ***	0.440 ***	0.520 ***	0.571 ***
	(0.106)	(0.111)	(0.061)	(0.065)
Priority 1	48.108 ***	69.563 ***	38.658 ***	39.596 ***
	(5.883)	(6.266)	(3.405)	(3.646)
Priority 2	72.863 ***	80.359 ***	19.313 ***	17.515 ***
	(4.700)	(4.832)	(2.717)	(2.811)
Surface Site	−10.978	28.915	−31.990 **	−4.532
	(27.547)	(27.872)	(16.042)	(16.322)
Underground (UG) Site	−59.629 **	−20.963	−6.573	15.199
	(27.449)	(27.677)	(15.987)	(16.211)
Surface + UG Site	2.272	46.466 *	−18.253	9.503
	(27.609)	(27.942)	(16.078)	(16.363)
Processing Site	43.544	89.884 ***	−11.778	6.480
	(30.910)	(31.189)	(17.959)	(18.233)
Constant	31.794	687.050 ***	20.547	670.500 ***
	(28.832)	(167.982)	(16.759)	(108.005)
State and Year Fixed Effects?	No	Yes	No	Yes
Observations	33,947	33,947	33,313	33,313
Adjusted R^2	0.028	0.059	0.016	0.033
Residual Std. Error	332.785	327.470	189.952	188.332
F Statistic	82.279 ***	33.092 ***	46.128 ***	18.065 ***

Notes: Dependent variable in specification (1) and (2) is per site AMLF allocations in inflation-adjusted dollars, while the dependent variable in specifications (3) and (4) is per site AMLF allocation per metric unit of the mine site. Numbers in parentheses are standard errors. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Priority 2 sites are predicted to receive greater allocations in the site-only specifications. This may be largely accounted for by the fact that Priority 2 abandoned mine sites make up nearly 60% of the full data set, whereas Priority 1 sites make up only slightly more than 20% of the full data set. A snapshot of the distributive patterns suggests that holding other considerations constant, including state and

year effects, an abandoned mine site with approved funding for reclamation is predicted to receive roughly $69,600 if it is categorized as a Priority 1 site, and $80,400 if Priority 2. In specifications where funding is considered on a per-unit basis and the underlying state and year effects are accounted for, sites with Priority 1 designation are predicted to receive $39,600 per unit of area to be reclaimed and Priority 2 sites are predicted to receive $17,500 per unit of area.

Contrary to initial predictions, the type of mine site being reclaimed has little bearing on the allocation received. Specification (2) suggests that an abandoned mine site will receive roughly $46,500 more in AMLF allocation if it was a combination mine site, and $89,900 more if a processing site. Specification (4) suggests that none of the site categories has an influence on monies received. Those virtually anomalous instances aside, there is no sound evidence that the type of mine itself abandoned factors into allocation decisions. It may instead be the case that mine site type is built into the priority designations, thereby rendering these details largely irrelevant.

Ownership characteristics do suggest a substantive relationship across the span of the data set. In all four specifications, percentages of state-owned lands displayed positive and statistically significant coefficients. These coefficients range a short span from 0.440 to 0.582, and seem to have a trivial influence on the AMLF allocations. However, one should bear in mind that, in such a case where abandoned mines are located on 100% state-owned lands, these results suggest that total allocations may be boosted by roughly $50,000 due to ownership stakes alone. For mines on privately owned lands, a negative and significant relationship is suggested when considering funding on per-site basis. By the same logic as before, a site on completely privately held land can expect to see an allocation roughly $18,000 smaller.

The influence that the cumulative seniority of House Appropriations committee members in a given state wields upon AMLF distributions is inconsistent, and weak across the twenty year span. The coefficient from specification (2), −1.208, suggests that an additional year of cumulative seniority decreases AMLF allocations by roughly $1200 to a given mine site, whereas the coefficient from specification (4), 0.263, suggests instead that an additional year of seniority increases the reclamation funding per metric unit on a mine site by roughly $260. While coefficients themselves are small, their real-world significance comes in the aggregation, as examples may illustrate. Suppose a site is granted AMLF monies in the given state and year where House Appropriations seniority is the maximum value, 78 years of cumulative seniority. Per the specifications in column 2, this suggests that a site would be granted around $95,000 less in funding. Taking a less extreme example, consider the average seniority in the set, 25 years. These preliminary regression results suggest that, on average, the seniority of the state's members on the House Appropriations committee contributes to a $30,000 decrease in expected AMLF monies. In the case of the positive coefficient gleaned from specification (4), the aggregated implications are again, quite substantial in their potential. By quick calculations, this result suggests that AMLF allocations can be boosted, on average, by roughly $6,600 per unit of area to be reclaimed at an abandoned mine site. The statistical significance is stronger on the negative coefficient, but, given that significance is suggested in opposite directions, it remains ambiguous whether this particular factor is influential, and in which direction if it is.

Unlike the similar measure for the House, the Senate Appropriations committee seniority is suggested to be influential on the size of AMLF allocations. In all but specification (2), this variable displays a positive, and statistically significant relationship on funding. Specifications (1), (3), and (4) display coefficients of 3.542, 1.146, and 1.217, respectively. Following the same logic as explained with the House variable, these estimates are more meaningful in their aggregates than their marginal values. In a given state with the maximum Senate Appropriations committee seniority (49 years), this influence potentially amounts to roughly $60,000–$175,000 boosts in allocations. While less striking when considering average seniority, the figures are still meaningful with $10,000–$28,000 estimated boosts per site-area-unit or sites broadly considered.

Interest group strength, as measured by the Green Index, exhibits strong evidence about the direction of influence on AMLF allocations. Specifications (1) through (4) give statistically significant

estimates of 2.639, −29.644, −3.006, and −39.049 respectively. Considering the more explanatory second specification, this suggests that, for each additional unit increase in this index, a given mine site is expected to receive nearly $30,000 less in AMLF allocation. Considering the fourth specification, this estimate suggests that a one-unit increase on the Green Index for a given state leads to a nearly $40,000 decrease in AMLF allocation per metric unit area of mine site being reclaimed. While initial predictions consisted of the interest group variable having a positive influence on the amount of funding, it may more likely be the case, in light of these results, that environmental interest groups would actively dissuade their political representatives and the like from channeling federal money going towards abandoned mine reclamation projects and instead attempting to assign responsibility to other potentially responsible parties for bearing the burden of these costs.

Finally, the income variable provides some suggestion that the higher income states receive more funding, ceteris paribus. In specifications (3) and (4), the coefficient estimate for per capita income is positive and statistically significant. The overall trend suggests that, for each additional thousand dollars of per capita income a state has, a reclamation site in that state is expected to receive nearly an additional $1100 in AMLF allocation on a per-site basis, or nearly $1400 per unit area being reclaimed when underlying conditions for states and years are controlled for.

5.2. AMLF Inception through the Abandoned Mine Reclamation Act of 1990

Table 3 gives an overview of the AMLF distribution patterns over the scope of the data set spanning from its inception in 1977 to when the first major changes in the program were instituted, with the Abandoned Mine Reclamation Act of 1990. This subset consists of 1251 mine site observations in all four specifications.

Over this time span, the results subtly suggest that Priority 1 and Priority 2 sites are given larger allocations. This can be seen in the positive and statistically significant coefficients on Priority 1 (specifications (2) and (3)) and Priority 2 (specifications (2) and (4)). The per-site estimates in specification (2) suggest that Priority 1 sites receive allocations nearly $92,500 larger and that Priority 2 sites receive allocations slightly over $100,000 larger. Considering funding per unit reclaimed, specification (3) suggests that Priority 1 areas receive roughly $43,500 more per unit of area reclaimed, but the significance drops out upon the inclusion of fixed effects in (4). However, Priority 2 sites are estimated to receive slightly more than $28,000 per unit area reclaimed by the estimations in (4). Nonetheless, that such results are found only subject to certain regression specifications, suggests that Priority designations alone have little influence over the amounts of funding allocated to specific reclaimed abandoned mine sites.

Results here suggest that the type of mine site being reclaimed has bearing on the allocation received only along a per-site basis. Specifications (1) and (2) suggest that abandoned mine sites will receive smaller AMLF allocations across all four varieties of site. Considering specification (2) only, sites are estimated to receive approximately $571,000, $646,000, $590,000, and $624,000 less per surface, underground, combination, and processing sites, respectively. While the estimates found here seem amiss, much of that is likely explained by the considerably large constant terms estimated across the four specifications.

Ownership characteristics do not suggest a substantive relationship across the span of the data set. In all four specifications, percentages of either privately-owned and state-owned lands displayed no statistically significant coefficients.

The influence that the cumulative seniority of House Appropriations committee members in a given state wields upon AMLF distributions is inconsistent across the span. The specification (1) coefficient suggests that an additional year of cumulative seniority increases AMLF allocations by roughly $1300 dollars to a given mine site, whereas specification (2) suggests instead that an additional year of seniority decreases the reclamation funding per mine site by over $22,000. While the estimates from (1) and (2) suggest ambiguity due to the opposing signs, intuition supports the notion that the more accurate scenario is that seniority out of the House Appropriations committee has a negative

relationship with AMLF disbursements. This logic is supported by the stronger statistical significance found in the second specification, as well as the underlying fact that the included fixed effects account for more unobservables across the states and years in question.

Table 3. The determinants of receiving AMLF site funding, 1984 to AMRA 1990.

Variable	**(1)**	**(2)**	**(3)**	**(4)**
House Appropriations Seniority	1.286 **	−22.043 ***	0.205	3.122
	(0.630)	(5.269)	(0.291)	(2.434)
Senate Appropriations Seniority	11.943 ***	21.700	4.110 ***	−29.318 ***
	(2.061)	(21.816)	(0.952)	(10.076)
Environmental Group Strength	32.068 ***	−595.784	9.727 ***	981.853 ***
	(7.693)	(672.184)	(3.555)	(310.454)
PC Income (1000)	−31.358 ***	−28.958	−8.330 **	−3.004
	(9.143)	(70.858)	(4.226)	(32.727)
Private Ownership	0.123	0.502	0.319	−0.001
	(0.545)	(1.011)	(0.252)	(0.467)
State Ownership	−7.970	17.618	0.533	18.726
	(26.385)	(31.478)	(12.194)	(14.539)
Priority 1	5.241	92.472 *	43.365 **	35.098
	(47.198)	(50.601)	(21.814)	(23.370)
Priority 2	19.267	100.015 ***	22.103	28.074 *
	(32.230)	(34.934)	(14.896)	(16.135)
Surface Site	−566.235 ***	−571.213 ***	−15.395	−11.594
	(152.366)	(151.885)	(70.418)	(70.150)
Underground Site	−653.969 ***	−645.920 ***	−13.370	−6.135
	(152.491)	(151.002)	(70.476)	(69.742)
Surface + UG Site	−566.665 ***	−589.889 ***	−21.545	−25.858
	(153.624)	(153.346)	(71.000)	(70.824)
Processing Site	−570.970 ***	−624.009 ***	−27.180	−6.102
	(179.303)	(178.099)	(82.868)	(82.257)
Constant	963.014 ***	3501.752	95.627	−3159.686 ***
	(205.085)	(2630.303)	(94.783)	(1214.831)
State and Year Fixed Effects?	No	Yes	No	Yes
Observations	1251	1251	1251	1251
Adjusted R^2	0.074	0.110	0.029	0.069
Residual Std. Error	364.857	357.627	168.625	165.174
F Statistic	9.306 ***	5.184 ***	4.164 ***	3.496 ***

Notes: Dependent variable in specification (1) and (2) is per site AMLF allocations in inflation-adjusted dollars, while the dependent variable in specifications (3) and (4) is per site AMLF allocation per metric unit of the mine site. Numbers in parentheses are standard errors. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Like the similar measure for the House, Senate Appropriations committee seniority is suggested to be questionably influential on the size of AMLF allocations. In specifications (1) and (3), this variable displays a positive, and statistically significant relationship on funding, while (4) provides strong evidence to the contrary. Following the same logic as explained with the House variable, intuition suggests that the negative relationship found in (4) may be the best estimate, again due to the included state and year fixed effects.

Again interest group strength, as measured by the Green Index, exhibits strong evidence about the direction of influence on AMLF allocations. Only the second specification fails to give a statistically significant coefficient estimate. The first, third, and fourth specifications give statistically significant estimates of 32.068, 9.727, and 981.853, respectively. During this early time span in the existence of the program, it seems that environmental groups within are a more powerful force in getting resources allocated toward the reclamation of the environmental blights in their respective states.

Finally, the income variable mildly suggests that the allocation of AMLF monies to mine reclamation is more akin to an environmental welfare program. In specifications (1) and (3), the coefficient estimates for per capita income are negative and statistically significant. However,

once fixed effects are included, significance disappears and renders the effect null. Loosely though, we can infer that states with relatively poorer populations require more financial assistance in order to address and reclaim their abandoned mine sites.

5.3. AMRA 1990 through SMCRA Amendments Act of 2006

In the span following the passage of the Abandoned Mine Reclamation Act of 1990 through the SMCRA Amendments Act of 2006, another subset of the data is considered in order to examine the changes in allocation influences in response to the legally changed structure of funding the program. This subsection corresponds to 8825 site observations in the first two specifications, and 8644 in the third and fourth. The results are presented in full in Table 4.

Table 4. The determinants of receiving AMLF site funding, AMRA 1990 to SMCRA 2006.

Variable	**(1)**	**(2)**	**(3)**	**(4)**
House Appropriations Seniority	0.192	−1.080 ***	0.214 **	0.587 ***
	(0.166)	(0.374)	(0.096)	(0.219)
Senate Appropriations Seniority	2.663 ***	1.039	0.793 ***	1.142 *
	(0.374)	(1.148)	(0.216)	(0.669)
Environmental Group Strength	4.893 ***	−26.744	−2.918 ***	−32.798 **
	(1.598)	(24.534)	(0.926)	(16.267)
PC Income (1000)	−1.441 **	−6.276	0.969 **	0.920
	(0.684)	(4.039)	(0.397)	(2.382)
Private Ownership	−0.102	−0.208 **	−0.146 ***	−0.161 ***
	(0.090)	(0.097)	(0.052)	(0.056)
State Ownership	0.411 **	0.022	0.356 ***	0.327 ***
	(0.181)	(0.188)	(0.105)	(0.110)
Priority 1	31.535 ***	46.081 ***	21.874 ***	21.361 ***
	(10.943)	(12.049)	(6.357)	(7.045)
Priority 2	48.244 ***	59.555 ***	3.328	2.987
	(8.719)	(9.076)	(5.063)	(5.316)
Surface Site	−16.452	61.068	−33.796	−6.548
	(45.974)	(47.303)	(26.615)	(27.616)
Underground Site	−60.204	9.170	−16.711	0.641
	(45.843)	(47.032)	(26.540)	(27.459)
Surface + UG Site	4.356	87.575 *	−30.271	−3.612
	(46.174)	(47.536)	(26.731)	(27.752)
Processing Site	20.138	111.172 **	−5.534	7.976
	(52.061)	(53.246)	(30.134)	(31.105)
Constant	81.696	610.762 **	52.290 *	370.194 **
	(50.677)	(249.445)	(29.316)	(161.342)
State and Year Fixed Effects?	No	Yes	No	Yes
Observations	8825	8825	8644	8644
Adjusted R^2	0.020	0.047	0.009	0.017
Residual Std. Error	319.948	315.522	183.359	182.616
F Statistic	15.803 ***	9.306 ***	7.661 ***	3.904 ***

Notes: Dependent variable in specification (1) and (2) is per site AMLF allocations in inflation-adjusted dollars, while the dependent variable in specifications (3) and (4) is per site AMLF allocation per metric unit of the mine site. Numbers in parentheses are standard errors. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Within this subset, the first thing that becomes clear is that, unlike the previous subset analyzed, little evidence is suggested that mine type is a significant determining factor in AMLF allocations. Only for combination mines or processing sites in specification (2) is there any statistically significant coefficient estimate produced by the regression results. On the per site basis, combination sites tend to receive roughly $87,500 more federal monies for reclamation efforts, while processing sites see slightly more than $111,000 additional funds. Certainly, the processing site estimates fall in line with initial

predictions. However, in this subset of the data, much like the overall trend of AMLF allocations, mine type is a trivial detail in the funding considerations.

Hazard severity in this regression setup displays exactly the same characteristics with respect to statistical significance as it did in the overall dataset and results in Table 2. Priority 1 sites across all four specifications display evidence of positive and statistically significant relationships to funding amounts. Furthermore, the range in magnitude across the four specifications is roughly consistent. Additionally, the coefficient estimates for Priority 2 sites provide evidence that, with respect to site-only considerations, being deemed a Priority 2 status reclamation site is positively and statistically significantly related to larger AMLF allocations. Similar to the results and rationale in Table 2, the coefficient estimates on Priority 2 sites are larger in magnitude than that for Priority 1s, but are likely explained by the proportion of Priority 2 sites in this subsection of the data—again corresponding to roughly 60% Priority 2s and 20% Priority 1s.

Evidence for political influences in AMLF allocations reemerges in this timeframe. Across specifications (2) through (4), the seniority measures for the House Appropriations committee members display statistically significant relationships to AMLF distributions. Only for the House variable in specification (2) is this variable estimated to have a negative relationship. Overall, both of these variables positively influence AMLF allocations, with Senate Appropriations seniority being the stronger of the two influences with estimations of 2.663, 0.793, and 1.142 in specifications (1), (3), and (4), respectively. Significance is stronger, but magnitude smaller for House estimations in (1) through (4).

Furthermore, by this time period in the AML reclamation program, the significance of abandoned mine land location comes back into play—much as it did in the overall program estimates. In all but specification (2), a mine site is expected to receive greater funding allocations per percent proportion of site on state owned lands. The corresponding estimates in (1), (3), and (4) are consistent in magnitude at 0.411, 0.356, and 0.327 to suggest a stronger validity of the estimate. Likewise, across specifications (2) through (4), a site being on privately owned lands is associated with lesser amounts of funding. At any rate, evidence is strongly suggestive that abandoned mine sites on state owned lands are deemed a higher priority, in terms of AMLF monies, for reclamation.

Lastly, these estimates provide evidence again that reclamation funds are positively related to a state's per capita income. In specifications (1) through (3), positive and statistically significant coefficients are estimated for the relationship between state per capita income and the AMLF monies received.

Overall, the results in this subsection of the data suggest that a mix of hazard and political aspects influence the allocation of money out of the AMLF to abandoned mine sites. Political influences are stronger in this time span than overall, and during the time frames prior to amendments. Public interest influences are weaker in this roughly fifteen year period than they are overall, but stronger than the first seventeen years.

5.4. SMCRA Amendments Act of 2006 through PL 112-141

Passage of the SMCRA Amendments Act of 2006 marked the starkest change in funding composition of the broader AMLF. In short, this act broadened the scope of funding sources from being strictly coal-fee-funded to having a specific portion of its budget comprised of Treasury allocation. This time frame covers a roughly six-year span from late-2006 to mid-2012, consisting of 1716 observations in specifications (1) and (2) and 1687 in (3) and (4). Full results are presented in Table 5.

In this time frame, the strongest evidence for a public interest view of AMLF allocations is given with the estimates to Priority 1 and 2 sites. In all four specifications, Priority 1 sites are estimated to have positive and statistically significant relationships with the amount of funding granted to a site or per unit area of a site with coefficients of 66.949, 137.052, 47.340, and 55.932 in specifications (1) through (4), respectively. Paralleling the patterns in previous tables, Priority 2 sites have positive and statistically significant coefficients estimated in all four specifications, at 87.625, 112.395, 37.363, and 41.259, respectively. In the site-only considerations, the larger coefficients can be explained through the greater prevalence of Priority 2 sites within the data set. However, the predictions that Priority

1 sites would receive larger allocations comes into alignment when the funding is considered on a per-unit of area basis. This general result is borne throughout a number of alternate specifications.

Table 5. The determinants of receiving AMLF site funding, SMCRA 2006 through PL 112-141 (2012).

Variable	**(1)**	**(2)**	**(3)**	**(4)**
House Appropriations Seniority	−0.094	−0.225	0.137	0.055
	(0.617)	(1.364)	(0.336)	(0.740)
Senate Appropriations Seniority	1.537	0.504	0.885	−2.051
	(1.004)	(3.829)	(0.549)	(2.099)
Environmental Group Strength	−11.290	−70.951	−4.466	30.513
	(7.063)	(52.871)	(3.865)	(29.995)
PC Income (1000)	3.938	30.345	2.450	39.929 ***
	(3.484)	(19.960)	(1.907)	(10.816)
Private Ownership	0.467 *	0.386	0.191	0.229
	(0.258)	(0.269)	(0.141)	(0.147)
State Ownership	2.332 ***	2.204 ***	0.137	0.222
	(0.529)	(0.571)	(0.290)	(0.310)
Priority 1	66.949 **	137.052 ***	47.340 ***	55.932 ***
	(28.808)	(33.300)	(15.756)	(18.010)
Priority 2	87.625 ***	112.395 ***	37.363 ***	41.259 ***
	(23.888)	(24.887)	(13.061)	(13.468)
Surface Site	53.727	105.381	−32.629	−34.226
	(98.572)	(99.636)	(54.980)	(55.094)
Underground Site	20.915	19.310	19.339	5.504
	(97.638)	(96.958)	(54.467)	(53.678)
Surface + UG Site	79.253	120.324	−9.716	−11.065
	(98.433)	(98.645)	(54.891)	(54.545)
Processing Site	28.951	11.698	−12.473	−30.226
	(128.855)	(131.763)	(72.379)	(73.575)
Constant	−121.942	−428.162	−64.696	−2091.367 ***
	(151.155)	(1219.813)	(83.294)	(666.602)
State and Year Fixed Effects?	No	Yes	No	Yes
Observations	1716	1716	1687	1687
Adjusted R^2	0.021	0.048	0.014	0.054
Residual Std. Error	384.271	379.079	207.701	203.468
F Statistic	4.107 ***	3.088 ***	2.979 ***	3.332 ***

Notes: Dependent variable in specification (1) and (2) is per site AMLF allocations in inflation-adjusted dollars, while the dependent variable in specifications (3) and (4) is per site AMLF allocation per metric unit of the mine site. Numbers in parentheses are standard errors. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

None of the other political or economic variables bear consistent evidence of influencing allocation decisions throughout the main and alternative specifications in this shorter time period. Thus, it suggests that despite the changes to the funding structure of the program, the AML program hones its integrity.

5.5. PL 112-141 through PL 113-40

The final subsection of the dataset analyzed consists of the span between the passages of laws that capped the Treasury in-lieu payments to states for abandoned mine site reclamation projects. This specific set covers a roughly 18-month period from the July 2012 enactment of PL 112-141 to the enactment of PL 113-40 in the beginning of January 2014. There are 832 observations analyzed in specifications (1) and (2), and 816 in (3) and (4) in Table 6.

Within this 18-month time span, regression results suggest that the allocation pattern of AMLF monies maintains the originally intended purpose of the program as evidenced by the positive and statistically significant coefficient estimates given for Priority 1 and 2 sites across all specifications except (1) for Priority 1. In (2) and (4), where state and year fixed effects are taken into account,

estimates suggest that a Priority 1 reclamation project is expected to receive roughly an additional $224,000 per site, or roughly $146,000 per unit area reclaimed. Priority 2 projects are estimated to receive roughly an additional $245,000 per site, or roughly $79,000 per unit area from AMLF allocations.

Table 6. The determinants of receiving AMLF site funding, PL 112-141 to PL 113-40.

Variable	(1)	(2)	(3)	(4)
House Appropriations Seniority	−6.191 *	−9.586	−3.056 **	45.847
	(3.224)	(61.732)	(1.527)	(29.571)
Senate Appropriations Seniority	5.301 **	1.664	2.028 *	0.161
	(2.268)	(4.219)	(1.078)	(2.027)
Environmental Group Strength	−2.147	−34.625	−5.658	151.990
	(10.854)	(205.311)	(5.178)	(98.403)
PC Income (1000)	7.622 *	11.931	3.373 *	9.696
	(3.952)	(12.588)	(1.905)	(6.039)
Private Ownership	0.434	−0.051	0.348	0.412
	(0.569)	(0.628)	(0.271)	(0.305)
State Ownership	1.927	1.093	0.079	0.100
	(1.808)	(1.845)	(0.879)	(0.908)
Priority 1	89.946	223.694 ***	123.174 ***	145.645 ***
	(70.781)	(82.097)	(33.687)	(39.776)
Priority 2	185.607 ***	244.542 ***	68.527 **	78.817 **
	(62.766)	(64.825)	(29.791)	(31.242)
Surface Site	245.520	324.284	120.021	161.992
	(363.392)	(363.093)	(171.561)	(173.803)
Underground Site	185.177	250.504	128.050	137.683
	(361.812)	(359.834)	(170.785)	(172.166)
Surface + UG Site	319.017	382.575	161.958	167.584
	(363.769)	(361.811)	(171.681)	(173.102)
Processing Site	1736.858 ***	2275.683 ***	206.145	240.879
	(411.611)	(425.240)	(194.294)	(203.458)
Constant	−593.614	−618.558	−270.164	−2090.760 **
	(414.049)	(2124.185)	(196.509)	(1016.938)
State and Year Fixed Effects?	No	Yes	No	Yes
Observations	832	832	816	816
Adjusted R^2	0.096	0.117	0.018	0.015
Residual Std. Error	609.675	602.616	287.271	287.738
F Statistic	8.389 ***	4.448 ***	2.243 ***	1.382 *

Notes: Dependent variable in specification (1) and (2) is per site AMLF allocations in inflation-adjusted dollars, while the dependent variable in specifications (3) and (4) is per site AMLF allocation per metric unit of the mine site. Numbers in parentheses are standard errors. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Further bolstering the suggestion that AMLF distribution patterns returned to intended purposes are the estimates on the ownership characteristic, political, and economic variables. In none of the four specifications is there evidence that either private or state proportions of land ownership have any influence on funding decisions. With respect to seniority of House and Senate Appropriations committee members, there is evidence in specifications (1) and (3). However, when the state and year fixed effects are introduced into the specifications, all statistical significance drops from the coefficient estimates, thus suggesting that these influences are moot. A similar story can be told with respect to the estimates on the environmental interest group variable. Again, the pattern holds with respect to per capita income in a state; positive statistical significance is estimated on the coefficients in (1) and (3), but significance drops in (2) and (4) once the fixed effects are included.

Once again, there is little evidence in the general trend that mine site type is an influential factor in funding decisions. Out of the four mine types, only processing mines were estimated to receive larger AMLF allocations. Coefficient estimates were found to be positive and statistically significant only at the site level, at 1736.858 and 2275.683 in specifications (1) and (2), respectively. These estimates suggest that processing sites during the July 2012–December 2013 time frame received upwards of two

million dollars in reclamation funding. However, when considering funding per unit area of a site, there is no discernible relationship to be found for any of the potential abandoned mine types.

6. Conclusions

This paper examines the question of what determines the size of disbursements from AMLF to support reclamation projects on abandoned mine sites. Specifically, it examines if the severity of environmental hazard is solely responsible for AMLF allocations and the magnitude thereof or whether other political and economic forces influence the federal funding of abandoned mine site reclamation.

Overall, the evidence suggests that funding for abandoned mine reclamation is a mixture of the products of public and political interests. With the exception of the 1984–1991 time span, sites designated as Priority 1 or 2 consistently are predicted to receive larger disbursements. However, in these time spans, political influences—especially through Senate Appropriations committee tenure and state-ownership of lands—wield consistently strong and significant weight on allocation decisions. This political influence is most pronounced in the years after the AMLF coffers are provided for with Treasury funds in addition to fees levied on domestically extracted coal. After the allocations out of Treasury funds are capped to states, the political influence wanes and the hazard level of sites again becomes the primary influential factor in funding receipts—further bolstering a public interest view of the AML program in total.

From a policy perspective, the biggest takeaway from our findings are that political institutions can be changed to remove politics. While the AML program, and the mission of reclaiming abandoned mine lands in total is but a small mission in the scope of federal activities, examination of the funding distribution trends in light of differing institutional contexts analyzed here shed light on how similar programs can be more effectively implemented under the federal umbrella. In short, a program with minimal scope of objectives and funded via taxes/fees—implying a hard budget constraint—limit the extent to which political influences can sway the decision-making calculus of monies allocated through the program—furthermore, supposing the introduction of a softer budget constraint through federal appropriations toward a given project in question, capping the distributions out of that portion of funding likewise limit the extent of political sway. In this sense, our finding contributes to similar papers in public choice showing how institutional reforms can reduce or remove the influence of politics (Beaulier et al. 2011; Hall and Williams 2012; Sobel et al. 2007).

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