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MICHAEL D. STROUP *

Naval Postgraduate School, Defense Resources Management Institute, Monterey, CA 93943, U.S.A.

Abstract. An empirical analysis of the distribution of Department of Defense (DOD) personnel (both military and civilian) across states is developed with a commonly used Public Choice model of resource allocation in a legislative setting. The model specification employs Congressional seniority, Congressional committee representation, Presidential electoral votes, and the per capita dollar value of prime defense contract awards to explain the variation of DOD personnel across states over time. The empirical analysis is performed over the last three decades, and the results indicate that this particular Public Choice legislative model performs well in explaining the variation in DOD personnel allocations across states. The results also provide some limited evidence of a possible political market between the states for DOD personnel allocations. This analysis has implications for future testing of whether the Base Realignment and Closure Commission (established in 1988 under President Reagan), and the Defense Base Closure and Realignment Commission of 1990 (under President Bush) were effective in significantly decreasing the legislative politics involved in the selection and approval process for base closure and realignment.

1. Introduction

The local communities surrounding U.S. military bases enjoy the economic activity that these bases generate, and the magnitude of this economic activity varies directly with the size and scope of each base. One would expect these communities to actively monitor federal budget changes and variations in activities assigned to their local base. These communities would also have strong incentives to preserve or even augment the size and scope of local base activities by influencing government decisions regarding the allocation of defense personnel and resources.

Although the ability of Congress to directly affect the geographic allocation of military personnel is somewhat restricted, the legislative processes

governing the allocation of the Department of Defense (DOD) resources that accompany these personnel is much less restricted. Additionally, the legislative process of selecting military bases for closure and realignment has a direct impact on the subsequent allocation of DOD personnel (both civilian and military) across the states. Thus, it seems reasonable to assume that these communities would find it worthwhile to enter the political marketplace to try to influence the legislative process that allocates DOD resources and personnel across those military bases.

These communities will express their respective economic interests through the federal legislative process via their elected U.S. Congressmen. The relative ability of a given state constituency to influence the legislative process is largely dependent on the effectiveness of their respective Congressmen. Public Choice theory pertaining to the legislative process of representative governments can be used to develop the appropriate proxies in order to quantify the relative abilities of these communities to influence such legislation. These proxies can then be used to try and explain the subsequent variation in the allocation of DOD resources (like budget expenditures, base locations, or personnel assignments) across constituencies.

The following empirical analysis is an attempt to use political variables derived from Public Choice theory of the legislative process to explain observed variation in DOD personnel allocations across states and over time. Section 2 provides a brief history of the legislative process governing the selection of military bases for closure and realignment. This section also describes aspects of Public Choice theory regarding the legislative process in allocating productive resources. Section 3 explains the model specifications and proxies that were used in the regression analysis and recalls similar econometric models that have been used to explain legislative resource allocation. The resulting empirical findings are also described and evaluated in this section. Finally, Section 4 briefly summarizes the empirical findings and suggests future avenues of analysis pertaining to the more recent changes in federal government selection of military bases for closure and realignment.

2. The political market for the legislative allocation of resources

Throughout the 1960s, the criteria governing which bases were to be selected for closure was largely developed by the Executive branch of federal government through the Office of the Secretary of Defense (OSD). During this and subsequent decades, the military needed to significantly decrease and realign their military base infrastructure across the country in order to increase military effectiveness and take advantage of scale efficiencies. Hundreds of com-

munities surrounding these bases would feel the negative economic impact under this initiative.

In the early sixties, Secretary of Defense McNamara and OSD unilaterally developed and subsequently implemented a comprehensive base realignment and closure program for the U.S. armed forces with only limited consultation with Congress.[1] However, this process was met with vigorous Congressional opposition. Initially, Congressional efforts at staving off military base closures were largely ineffective, and many military bases were successfully closed or realigned. Gradually, enough Congressional opposition was mustered by the early 1970's to complicate the base closure selection process and significantly decrease the number of bases that were closed each year. Congress eventually passed a bill, signed into law by President Carter in 1977, which required advanced Congressional confirmation of any planned military base closure involving more than 300 civilian employees. This bill also required the DOD to prepare various complex environmental and economic impact studies that were to be reviewed by Congress. As a result, military base closures ground to a halt.

This legislative procedure for military base closings remained in effect during the creation of the Grace Commission in 1983, which had as one of its many responsibilities the assignment of looking into ways of possibly increasing the efficiency and effectiveness of the armed forces, potentially through the process of decreasing the unnecessarily large military base infrastructure (as compared to the available levels of military manpower). Even though very few domestic military bases were actually closed in the late 1970's and early 1980's, there was general agreement between the executive and legislative branches of government that the national defense of our country could be made more effective and more efficient by reducing the military infrastructure across the country (Office of the Secretary of Defense, 1988).

The result of that investigation prompted the Executive and Legislative branches to create the non-partisan Base Realignment and Closure (BRAC) Commission under President Reagan. This commission was created to develop a comprehensive list of military bases to be closed or realigned, using as the only selection criteria the goal of increasing the over-all effectiveness and efficiency of the armed forces in providing for the national defense. The BRAC committee's list of bases was then to be presented to Congress for approval, supposedly without modification by Congress or the Executive branch.

It is easy to see how closing military bases has become so difficult. The anticipation of lost regional benefits (declining employment rates and lower aggregate payrolls) and high costs of transition (the necessary community adjustments to decrease economic dependency) combine to create a difficult

political climate for military base closures. The positive impact that bases have on the these communities has been empirically documented in both the short run (Henry and Oliver, 1987) and the long run (Mehay and Solnick, 1990). The transition costs borne by those communities can be quite high, but many communities have successfully repositioned themselves.

A recent guidebook published by the OSD's Office of Economic Adjustment focuses on successful cases of civilian reuse of military base infrastructures and illustrates the many creative ideas that communities have implemented for civilian reuse of former military bases (Office of Economic Assessment, 1993). Their report details how many of these communities have succeeded in the long term in replacing most or all of the lost civilian jobs by employing innovative and flexible policies for new business entities. However, the transition has proven to be costly to these communities in the short term.

Based on the characteristics of this type of economic environment, it is reasonable to try to quantify the extent to which each state constituency has been successful in influencing the legislative allocation of DOD personnel across constituencies, either directly by affecting the base closure selection decisions, or indirectly by influencing the allocation of DOD resources through the budget and procurement processes. The next step would be to build an appropriate framework of analysis. In a survey of the development of Public Choice theory on the legislative politics, Robert Tollison (1988) discusses how state constituencies can influence the federal legislative process. He notes that the seniority of a state constituency's representative has proven to be a useful and quantifiable indicator of the relative influence that each state constituency has over the legislative process. For example, Crain and Tollison (1977) found that seniority of Congressional representation had a significant impact on the relative level of federal expenditures across state constituencies.

Tollison's survey article also describes how Public Choice theory has come to understand the stabilizing role that Congressional committees play in the legislative process, which is modeled as a type of political marketplace. While majority coalitions of support are necessary for the successful production of any given piece of legislation, these coalitions can be continuously constructed and dissolved in an endless cycling process as the legislative body searches in vain for a sustainable, long run equilibrium coalition to consistently produce needed legislation. Shepsle and Weingast (1981, 1987) have developed a legislative model where the more senior party leadership establishes a clearing house for political deal making by organizing and sustaining stable majority coalitions. Stability is attained by creating committees that exercise monopoly control of the political agenda over which pieces of legislation can be voted upon, thereby ending the cyclical behavior that would otherwise prevail.

This model of legislative activity implies that if a given state has Congressional representation on the appropriate committee, this would be a distinct advantage (all else held equal) for that state to influence the legislative allocation of a productive resources, like DOD personnel. Additionally, if a state constituency is represented on other important committees in addition to the Armed Forces Committee, this may further increase a state constituency's ability to influence the allocation of DOD personnel across states. For example, representation on both the Appropriations Committee (a committee widely believed to play the largest role in the establishment of a clearing house for the political market in each branch of the Congress) and the Armed Forces Committee could prove a meaningful combination in determining DOD personnel allocation across states.

Anderson and Tollison (1991) analyzed non-military federal spending across states during the New Deal era of the Great Depression, and they have shown that political patronage through federal expenditures can be distributed across states via the executive branch as well as the legislative branch. They use the number of electoral votes from a given state that are received by the President as an explanatory variable in order to predict the occurance of future political favors that are received by that state in exchange for having provided their political support.

With these basic concepts of how political influence over the allocation of federal resources (or federal costs) is employed, an estimate of the relative political influence that each state constituency might exercise over base closure decisions and DOD resource allocations can be developed to explain the observed changes in DOD personnel allocated across states over time. The next section explicitly details the regression specification used in the analysis, and presents the resulting estimates of the relative abilities of each state constituency to influence the political market for DOD personnel allocations.

3. The specification of the model

In the analysis below, it is assumed that the percent change in total DOD personnel (both civilian and military) in a given state over a given period of time is going to be a function of the following political variables: 1) the relative seniority of each state's Congressmen within their own party (with both houses of Congress considered separately), 2) representation of each state on the Armed Forces Committee (with both houses considered separately), 3) the simultaneous representation of each state on both the Appropriations Committee and the Armed Forces Committee (with both houses considered separately), and 4) the number of electoral votes cast for the presiding President in the previous election.

Table 1. Definition of variable (source of data)

1) SENATE	The Congressional seniority of a given state's U.S. Congressmen is determined within their own party. An ordinal ranking is used, with	
2) HOUSE	a value of 1 being the most senior. The seniority rank of each Congressman is averaged with all the other Congressmen in that state. (Congressional Quarterly Almanac, published annually)	
3) SARM	A state's representation on the Armed Forces Committee of the Senate or House, these variables are binary dummy variables with	
4) HARM	a value of 1 if the state has at least one Congressman on the committee and 0 if there is no representation. (Congressional Quarterly Almanac, published annually)	
5) SARMAPP	A state's simultaneous representation on both the Armed Services Committee *and* the Appropriations Committee, for both the Senate	
6) HARMAPP	and the House, these are also binary dummy variables. (Congressional Quarterly Almanac, published annually)	
7) ELECT	The number of electoral votes cast in each state for the presiding president in the previous election. (Congressional Quarterly Almanac, published annually)	
8) PCTDOD	Total DOD personnel as a percent of state population. (All DOD personnel data used in the regression analysis were obtained through a special data request from the Directorate for Information, Operations and Reports, Arlington, Virginia, and the Defense Manpower Data Center, Monterey, California).	
9) PRIME	The percent change in the per-capita dollar value of DOD prime contracts awarded to a state over a four year period. (Prime contract awards data from Directorate for Information, Operations and Reports, Arlington Virginia)	

Additionally, two other explanatory variables are included in this regression. First, the total number of DOD employees (both military and civilian) as a percent of the state population is included as an explanatory variable to determine whether there has been a "leveling out" effect, such that those states which received disproportionate increases in personnel during times of national build-up were also hit with disproportionate decreases in times of decline. Next, the change in per capita dollar value of DOD prime contracts awarded to each state is included in order to account for the effects that such procurement and service contract awards might have on DOD personnel allocation across states. This variable would also capture any familiarity that a given state's Congressmen might have with DOD bureaucrats. A complete list of the explanatory variables and their definitions appears in Table 1.

The regression specification used below is similar to previous investigations into the legislative allocation of productive resources, or even the allocation of certain economic costs when it is deemed to be in the nation's best interest to bear them, in a federal legislative market. An example of the latter type of

model was developed by Goff and Tollison (1987) in an effort to explain the variation of per-capita battle casualties suffered across the states during the height of the Vietnam conflict. Their analysis revealed that both House and Senate seniority were significant in explaining per-capita casualty rates, and their model explained 68% of the total variation across states.

The legislative process governing military base closures and DOD resource allocation decisions implies that Congress considers and debates policies which will be implemented in future periods. These periods vary from as little as one or two years in advance for DOD budget appropriations decisions, to a multi-year schedule of anticipated base closures. For this analysis, the lag time between Congressional deliberation over these decisions, and the actual implementation of these decisions, is referred to as the implementation lag.

The time frame with which these decisions are carried out and fully realized also varies. For example, a base closure decision may be phased in over many years, where as a particular support activity (and its related personnel) which is located at the same base could be eliminated within a year. The time that transpires before the complete impact of a given Congressional decision is fully realized is referred to as the realization period. Thus, the appropriate implementation lag and the realization period need to be determined in the model in order to accurately predict the percent change in DOD personnel assigned to a given state.

Additionally, when any time series data is used, such as the DOD population changes in question, the Autoregressive-Moving Average (ARMA) structure must be determined to capture any year-to-year momentum in the value of the dependent variable. The potential for serial correlation in the regression errors must be dealt with before any substantive implications can be drawn from the coefficients of the independent explanatory variables in the regression specification. Thus, finding the appropriate regression specification for this analysis entails: 1) identifying the appropriate realization period for measuring the percent change in DOD personnel, 2) identifying the appropriate implementation lag for political decisions to begin to affect the change in DOD personnel, and 3) identifying the appropriate ARMA specification for the time series data.

Clearly, this is a computationally intensive task. Given that the implementation lag could reasonably vary from one to three years, the realization period could vary anywhere from one to five years, and the ARMA specification could have eight different specifications (assuming that at most, an ARMA (2,2) would be sufficient), this amounts to well over a hundred possible specifications to check. Yet the process of narrowing down this field of potential specifications was not as difficult as it first appeared. This process is described later in the Appendix.

The dependent variable measures the percent change in total DOD personnel in each state over a four year realization period, with the dependent variable starting in 1964–68 and ending in 1988–92. The Senate and House political variable series, including all the committee variables, begin in 1961, to reflect the three year implementation lag. The percent change in prime contract awards over a four year realization period begins in 1963–67 to reflect a one year implementation lag on the effect that these contracts would have on DOD personnel assignments.[2] DOD personnel as a percent of the state population begins in 1964 to correspond with the first year of each four year change in DOD personnel.[3]

The explanatory variables representing presence on the Armed Services Committee and the simultaneous presence on that committee and the Appropriation Committee, were found to be correlated within the House (0.823) and within the Senate (0.594). Electoral votes were also found to be correlated with both of the House Armed Forces Committee variable (.521) and the House simultaneous committee variable (0.583), though these two variables were not correlated in the Senate. No other pairs of variables generated correlation coefficients greater than 0.200.[4]

What emerges from these results is intriguing. Equation #1 in Table 2 explains 59% the total variation in the change in DOD personnel across states throughout the 25 year time period. The House and Senate seniority variable coefficients were found to be significant and of the expected sign (since a lower value of the variable indicates a higher seniority ranking within the party), where greater seniority implies greater increases (and smaller decreases) in DOD personnel assigned to that state. For example, the difference between a high Senate seniority ranking of 1 and a lower ranking of 25 would increase DOD personnel by 1.8 percent, all else held equal. In the House, a difference in seniority ranking of 1 and a lower ranking of 100 would increase DOD personnel by 2.0%, all else equal. This compares with a 1.8 percent decrease as the average value of the dependent variable observed over the entire time period.

The regression variables which reflect state representation on the Armed Forces Committee generated the expected positive sign for their coefficients, such that presence on the Armed Forces Committee in either house of Congress tended to increase DOD personnel in that state. However, the Senate variable failed to generate a significant coefficient at the 90% level, and the House variable generated only a marginally significant coefficient (at the 85% level). This may be the result of the high degree of colinearity between the committee variables within each house of Congress.

The simultaneous committee representation variables, however, were found to have significant coefficients of a surprising sign. It appears that the simul-

Table 2. Regression results

Dependent variable:	Pct. change in DOD personnel over four years		
Time period:	25 years, from 1964–68 to 1988–92		
No. of observations:	50 states by 25 years = 1250 total obs.		
Mean of dep. var.:	–1.84%		
Confidence intervals:	* => 85%	** => 90%	*** => 95%

Independent Variable	Equation #1 Coefficient (Std. error)	Equation #2 Coefficient (Std. error)	Equation #3 Coefficient (Std. error)
CONSTANT	2.466***	2.306***	2.076**
	(1.121)	(1.092)	(1.100)
SENATE	–0.071***	–0.073***	–0.058**
	(0.034)	(0.033)	(0.033)
HOUSE	–0.020**	–0.019*	–0.017*
	(0.012)	(0.012)	(0.012)
SARM	1.028		–0.231
	(0.929)		(0.728)
HARM	1.901*		0.118
	(1.274)		(0.739)
SARMAPP	–2.419***	–1.343*	
	(1.222)	(0.953)	
HARMAPP	–2.264**	–1.106**	
	(1.325)	(0.689)	
PRIME	0.013***	0.014 ***	0.013***
	(0.003)	(0.003)	(0.003)
ELECT	–0.080***		–0.083***
	(0.041)		(0.040)
PCTDOD	–0.401**	–0.332*	–0.411**
	(0.223)	(0.220)	(0.223)
LAG(1)	0.829***	0.835***	0.834***
	(0.027)	(0.027)	(0.027)
LAG(2)	–0.152***	–0.150***	–0.147***
	(0.027)	(0.027)	(0.027)
Adj. R^2	.59	.58	.58

Note. When the variable ELECT is dropped from Equation #1 and Equation #3, no appreciable change in the sign, magnitude, or significance of any other variable coefficient is produced.

taneous representation on both committees seems to generate lower increases (and greater decreases) in DOD personnel allocated to that state. If one accepts the assumption that DOD personnel represent a positive economic impact on

a given state constituency, and that committee representation increases the relative influence of a state constituency over legislatively allocated resources, then a likely explanation for this result is that simultaneous representation on both committees facilitates political trades for legislative support, and significantly decreases the transactions cost of clearing the political market for favorable legislation for that state.

This idea is illustrated by the notion that in an environment of DOD downsizing, as would be indicated over the time period analyzed by the mean of the dependent variable being negative, political trades might be made where larger shares of total DOD personnel decreases are accepted by a given state constituency in return for their receiving greater Congressional support on other non-DOD related legislation that was relevant to that state. In this case, those states with simultaneous representation on the Armed Forces and Appropriations Committees would be in an advantageous position to initiate and facilitate such log-rolling trades. The relative magnitude of the coefficient for this binary variable appears large compared to the mean of the dependent variable, but interpreting the specific magnitude of the coefficient is made less trustworthy due to the multicolinearity between the two committee variables within each house of Congress. One can only have real confidence in observing the sign of the coefficient.

Another surprising result from this regression is that the number of electoral votes received by the presiding President has a significant and negative effect on the change in DOD personnel across states. However, the magnitude of this coefficient appears small relative to the average percent change in DOD personnel. Historically, the executive branch of government has been ineffective in influencing the base closure and realignment process over the past twenty years, and most of this time period saw a Congress dominated by the party opposite that of the President. Perhaps this combination has made DOD personnel allocation a poor indicator of possible political patronage to be distributed across the states by the executive branch.

The percent of state population employed by the DOD also had a significant and negative effect on the change in DOD personnel across states. This is evidence that a leveling out effect has taken place, suggesting that there has been a conscious effort to draw down greater numbers of DOD personnel from those states that enjoyed greater concentrations of DOD employees in the past. The magnitude of the coefficient indicates that a three percent increase in the proportion of DOD employees in a given state will increase the loss of DOD personnel in that state by 1.2%, all else held equal. The percent change in prime contract awards per capita also generated a significant coefficient, such that a $100 increase in per-capita prime contract awards increased DOD personnel over the four years by 1.3%, all else held constant.

The results from two additional regression specifications are included in Table 2 in order to explore the robustness of the surprising sign on the coefficients for both the House and Senate variables which reflect the simultaneous committee representation. The high degree of correlation between the two committee variables within each house of Congress, as well as between the House committee variables and the electoral vote variable, warrants a comparison of the different regression specifications which exclude these correlated variables. Equation #2 is the same specification as #1, except that it drops the electoral variable and the House and Senate variables indicating representation on the Armed Forces Committee alone. Equation #3 is the same specification as #1, except that it drops the House and Senate variables indicating simultaneous committee representation.

Equation #2 reveals that on the Senate side of Congress, the coefficient on seniority remained unchanged, but the simultaneous committee representation coefficient fell to only the 85% significance level. On the House side the seniority coefficient also fell to the 85% confidence level but the magnitude and sign remain unchanged. The House simultaneous committee coefficient retained it's sign and statistical significance but the magnitude declined by half. The remainder of the coefficients remain unchanged in sign and significance, with only the DOD contract coefficient showing appreciable decline in magnitude.

Equation #3 reveals little change in the significance, sign, and magnitude of the remaining variable coefficients, with two exceptions. The House seniority variable coefficient decreases in significance to only an 85% confidence level, and the House Armed Services Committee coefficient becomes decidedly insignificant.

Finally, dropping the electoral variable from Equation #1 and Equation #3 resulted in no appreciable change in the value or significance of any of the remaining variables. The comparison of all three specifications implies that the implications derived from Equation #1 appear to be fairly robust to the exclusion of any of the highly correlated explanatory variables.

4. Conclusion

Using data on DOD personnel distributed across all 50 states over the last three decades, the legislative allocation regression model constructed above has provided limited evidence that a legislative political market for DOD personnel assignments exists. Although some political theorists specializing in DOD policy have expressed doubts as to whether legislative allocation of private benefits is the root cause for observed correlations between political influence indicators and DOD resource allocations (see Thompson, 1988),

they still acknowledge that the observed correlations exist. In this study, the relative seniority of a state constituency's Congressional representation in both the House and Senate were found to be significant in explaining the change in personnel allocated to that state, as might be expected. Changes in the number of DOD personnel were also found to vary directly with changes in the per capita dollar value of DOD prime contract awards across states. States such with greater concentrations of DOD employees per capita were also found to experience disproportionate decreases in DOD personnel allocated to their state.

However, the results also indicate that simultaneous state representation on the Armed Forces Committees and on the Appropriations Committees generated significant *decreases* in the relative amounts of DOD personnel assigned to those states, and these results were obtained for both the House and the Senate. This is an indication that political markets may exist in which those states with representation on both committees are more able to facilitate trades of DOD personnel allocations in the political marketplace. This log-rolling scenario would suggest that increased support for favorable, non-military legislation was received by a state constituency in exchange for bearing a disproportionate share of the nation wide reduction in DOD personnel. To test this possibility directly, one would need to include changes in federal, non-military spending in the regression specification to explain changes in DOD personnel over time. However, such an analysis would require a simultaneous equations approach, since changes in DOD personnel would also be included as an explanatory variable in explaining changes in non-military federal spending across states. This project is left for future research.

In an era of declining DOD budgets, decreasing civilian and military DOD personnel numbers, and increased base closures and realignments, the above analysis would indicate that the on-going military draw down has not been accomplished without significant political costs. The time period of the analysis above stopped at a point in time where the effects of the BRAC Committee decisions would begin to become evident in the DOD personnel data. The goal of this committee was to develop a better base closure selection criteria and avoid the usual pitched political battles over base closures that have prevailed historically. A logical extension for future research would be to investigate whether results similar to those generated above could be found over the allocation of DOD personnel after the BRAC Committee recommendations were approved by Congress and the base closures implemented.

Notes

1. The condensed historical information that follows is summarized in Office of the Secretary of Defense (OSD), 1988.
2. Changes in the implementation lag for this variable were explored, and changes in the lag of one year either way had negligible effects on the coefficients for the remaining variables.
3. Adjusting this lag by one year in either direction had no appreciable effect on the magnitude or significance of any of the regression coefficients. There may also be concern that these contracts are themselves likely to be considered substitutes for DOD personnel by the state constituencies. Evidently, this substitution effect is not strong, however, since per-capita contract dollars are strongly and positively correlated with DOD personnel across states (the correlation coefficient between these two variables from 1960 to 1993 is 0.621).
4. The relatively high correlation between the variables suggests a degree of multicolinearity in the regression equation, which still leaves the OLS regression coefficients as best, linear unbiased estimators (BLUE) and the R-squared is unaffected. However, the standard error of the coefficients *on the affected variables* will be overestimated, their confidence intervals understated, and their specific magnitudes less trustworthy. See Kennedy (1992) pp. 177.

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Appendix

The criteria used to determine the appropriate specification for this analysis involved a two-step process: 1) the Akaike information criterion (see Greene, pp. 245, 515) was used to first determine the optimal ARMA configuration for each specific combination of implementation lag and realization period, followed by 2) choosing the best combination of the highest adjusted R-squared value and maximum number of significant independent variables in order to determine the optimal implementation lag and realization period for each remaining ARMA specification. A general pattern emerged in the search for the optimal specification. Any moving average specification, whether isolated or accompanied by autoregressive specifications, always performed poorly compared to any lower order autoregressive specifications for all of the initial combinations of implementation lags and realization periods that were tried. Since dozens of different combinations of lags and periods from across the spectrum were tried without any change in this pattern, ARMA configurations involving moving averages were dropped after about 35 combinations, significantly reducing the search time necessary. Finally, the combination of a three year implementation lag and a four year realization period stood out as the optimal specification, when coupled with an AR(2) configuration. This final specification was double checked by noting the effects of changing the respective implementation lag or realization period first by one year in either direction, then by two years in either direction, to isolate the effects of this perturbation. In each case the explanatory power and the number of significant variables fell off monotonically as the specification grew farther away from the one chosen.