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Judicial Specialization and Ideological Decision Making in the US Courts of Appeals

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We investigate the influence of subject matter expertise, opinion specialization, and judicial experience on the role of ideology in decision making in the courts of appeals in a generalized, as opposed to specialized, setting. We find that subject matter experts and opinion specialists are significantly more likely to engage in ideological decision making than their nonspecialist counterparts and that opinion specialization is a particularly potent factor in ideological decision making. Further, increased judicial experience has no effect on the conditional use of ideology. We discuss the potentially wide-ranging implications of our findings for both theory and policy.

INTRODUCTION

"The dominant image of judges in the United States is one in which they specialize in judging but not in any particular subject matter. In that important sense, we think of judges as generalists" (Baum 2011, 1). Although that impression is a pervasive one, it is not altogether accurate. A number of scholars have begun to challenge this received wisdom, with one going so far as to term it the "myth of the generalist judge" (Cheng 2008, 519). Even so, while there have been some examinations of the ways in which individual subject matter specialization[1] may affect judicial decision making, those investigations have typically been limited to courts with specialized or semispecialized jurisdictions, such as the Court of Appeals for the Federal Circuit (Miller and Curry 2009, 2013), tax courts (Howard 2005), and courts dealing with trade disputes (Hansen, Johnson, and Unah 1995; Unah 1998). One significant exception has been the rather extensive vein of scholarship that examines opinion specialization on both the Supreme Court (Ulmer 1960, 1970; Brenner and Spaeth 1986; Maltzman and Wahlbeck 1996) and the US Courts of Appeals (Atkins 1974; Cheng 2008; Nash and Pardo 2012).

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1. The terms "specialization" and "expertise" are often used interchangeably in the literature. To minimize conceptual confusion in this article, we use the term "specialization" throughout when referring generally to both our constructs of prior subject matter expertise and opinion authorship. By contrast, we denote one's propensity to author a large number of judicial opinions with terms such as "opinion specialization" or "specialization in opinion authorship" and the possession of prior subject matter expertise as "expertise" or "subject matter expertise."

Understanding the influence of subject matter specialization on judicial decision making is important for scholars because the prevalence of specialists on the bench is likely to grow as the workload of the federal courts increases, given that specialization is thought to allow judges to handle cases more efficiently (see Atkins 1974; Baum 2011, 32).[2] Of even greater import, scholars have also recognized that in at least some circumstances, the consequences of such specialization may not be policy neutral (Baum 1990, 2011; Miller and Curry 2009)—an issue that is the focus of our inquiry. As noted above, much of the extant literature on judicial specialization is limited to courts that possess specialized or quasispecialized subject matter jurisdictions. These previous studies notwithstanding, we believe it is possible that specialization may also be consequential for judging on federal appellate courts with more generalized jurisdictions.

This article investigates the potential influence of specialization on judicial decision making in courts with generalized jurisdictions. Specifically, we examine subject matter expertise and opinion specialization as they pertain to antitrust litigation in the federal courts, focusing our analysis on antitrust cases reviewed by judges on the Courts of Appeals for the Seventh, Ninth, and District of Columbia Circuits from 1995–2005. We introduce three constructs—prior subject matter expertise, opinion specialization, and judicial experience—and give particular attention to the ways in which each may interact with ideology to structure decision making on these generalist appellate courts. The relatively high numbers of antitrust cases that comprise the annual dockets of those courts, coupled with the presence of several judges who are antitrust specialists on them (see the Appendix), make these circuits attractive venues for investigating the role played by these varying dimensions of specialization in judging on generalized courts. We focus on antitrust cases because these types of cases are recognized as being factually complex (Baye and Wright 2010), which parallels previous investigations into appellate decision making in subject matter areas such as patents (see Miller and Curry 2009). Unlike many such prior studies, however, our research examines subject matter specialization by individual appellate judges who are regularly called on to hear a much wider variety of cases in generalist, as opposed to specialized, appellate courts. We find that opinion specialization is a particularly powerful influence on the prevalence of ideological decision making in the federal circuit courts.

Our article proceeds as follows. First, we frame our current project by providing a brief overview of antitrust law and outlining our reasons for concentrating on antitrust law in this study. Second, we review pertinent aspects of the extant literature on specialization's role in judging and, in doing so, introduce conceptualizations of judicial experience, subject matter expertise, and opinion specialization in this particular area of law. We also consider possible associations between these constructs and ideology in this section. Third, we point to several distinctions between specialized courts and their more generalist counterparts that could serve to blunt any hypothesized relationships in the present study. Fourth, we discuss measurement and modeling issues before presenting our results. We conclude with a discussion of those results and their potential implications.

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2. Over the time period of our study, from 1995 to 2005, the number of appeals filed in the US Courts of Appeals increased from 50,072 to 68,473, while the number of authorized judges did not change.

ANTITRUST LAW

The foundations of US antitrust law were laid with passage of the Sherman Antitrust Act of 1890 (15 U.S.C.A. §§ 1 et seq.), which represented a political response to public outrage over industrial trusts. The Sherman Act represented something of a legislative compromise that "endorsed competition in markets as a fundamental mechanism for the allocation of resources, but it rejected the view that government can never improve market outcomes by direct intervention" (Page 2008, 1). Since that time, numerous observers have noted the competing views about the relationship between the economy and the state that are inherent in interpretations of antitrust law. One scholar (Page 1991, 2008) has termed the more ideologically conservative position, which embraces principles of economic laissez-faire, the "evolutionary" approach to antitrust law and has identified its alternative as the "intentional" approach. Whatever the precise labels one gives to these competing perspectives, there is substantial agreement that broad ideological distinctions are relevant to individual views on antitrust litigation. Specifically, ideological liberals tend to favor more far-reaching governmental efforts to disrupt monopolies, while conservatives tend to be much more reticent in their pursuit of those monopolies (Landes and Posner 2003). Atkinson and Audretsch flatly conclude that "in the absence of strong empirical evidence, debates over the appropriate approach to antitrust boil down to ideology" (2011, 3).[3]

The US Congress supplemented the Sherman Act over the course of the twentieth century with legislation including the Clayton Act of 1914 (15 U.S.C.A. §§ 12 et seq.) and the Robinson-Patman Act of 1935 (15 U.S.C.A. §§ 13 et seq.). Today, both the Federal Trade Commission and the Antitrust Division of the US Department of Justice enforce antitrust law in an effort to preserve market competition[4] and, in recent years, that authority has been utilized with respect to corporations, including AT&T, Microsoft, and IBM.

Whether the specific topic at issue concerns price fixing, mergers and acquisitions, collusion, or a combination of other allegedly anticompetitive behavior, antitrust litigation is routinely viewed as being highly technical and fact intensive. For instance, Baye and Wright (2010) note that analysis in antitrust cases frequently involves the evaluation of expert econometric assessments on issues such as market share and that many antitrust cases are simply too complex to be handled competently by generalist

3. Atkinson and Audretsch (2011, 29 n1) relay a contemporary example of ideology's role in antitrust enforcement: "For example, under the Bush administration, the Department of Justice issued a report in September 2008, *Competition and Monopoly: Single-Firm Conduct Under Section 2 of the Sherman Act*, that advocated a limited role for antitrust in addressing monopoly. But only a few months later Christine Varney, the Assistant Attorney General for Antitrust appointed by President Obama, repudiated the report's findings, stating that the practice of the DOJ during the Bush Administration, 'advocates extreme hesitancy in the face of potential abuses by monopoly firms. We must change course and take a new tack. For these reasons, I hereby withdraw the Section 2 Report by the Department of Justice' " (internal citations omitted).

4. See http://www.ftc.gov/bc/antitrust/enforcers.shtm (accessed December 1, 2012). Private parties and state attorneys general are also empowered to enforce US antitrust laws, with private litigants now undertaking much of the antitrust litigation in federal courts.

judges.[5] As such, we believe antitrust law represents an appropriate legal area in which to investigate the influence of specialization on judicial decision making in generalized courts, as it is both factually complex and potentially ideological.

AN OVERVIEW OF SPECIALIZATION, IDEOLOGY, AND JUDICIAL DECISION MAKING

"Specialization," Baum (2011, 2) asserts, "leads people to take a narrow perspective that limits and biases their understanding of the matters they address." Indeed, one of the primary debates in the growing literature on specialization in the judiciary centers on the extent to which the specialization that has come to characterize components of the legal profession and, by extension, the perspectives of certain judges, may be consequential for judicial decision making. The results of studies addressing this question have been decidedly mixed for a variety of reasons. For one, there are a number of ways in which individuals might be characterized as "specialists" in particular areas of law. As one example, there is evidence to suggest that prior expertise and accumulated experience are conceptually distinct notions with different influences on judicial behavior (see Miller and Curry 2009, 2013). Beyond that, there are arguably multiple dimensions to the broader concept of "specialization." Here, we examine two: specialization in opinion authorship[6] and prior subject

5. As one example of the complexity included in our dataset, consider the 2002 decision *In re High Fructose Corn Syrup Antitrust Litigation* (295 F.3d 651). In that case, plaintiff purchasers of high fructose corn syrup (HFCS) had brought an antitrust action against manufacturers of HFCS alleging price fixing in violation of the Sherman Act (15 U.S.C.A. § 1) and were appealing the district court's summary judgment against them to the Seventh Circuit. There, the three-judge panel's opinion noted the following: "We turn now to the evidence of noncompetitive behavior . . . Early in 1988 . . . ADM (Archer Daniels Midland) announced that it was raising its price for HFCS 42 to 90 percent of the price of HFCS 55, and the other defendants quickly followed suit. The defendants offer various explanations, of which the most plausible is that HFCS 42 is 90 percent as sweet as HFCS 55. Even if this is correct (there is evidence that the true percentage is only 71 percent), it does not counter an inference of price fixing. In a competitive market, price is based on cost rather than on value. Therefore the fact that buyers of HFCS are willing to pay more for HFCS 55 than for HFCS 42 because it is sweeter just shows that a monopolist or cartel could charge more for the higher grade whereas competition would bid price down to cost . . . Nor is there any evidence that industry-wide adoption of the 90 percent rule followed or anticipated a change in relative costs . . . The plaintiffs' economic expert witness conducted a regression analysis that found, after correcting for other factors likely to influence prices of HFCS, that those prices were higher during the period of the alleged conspiracy than they were before or after . . . The defendants presented a competing regression analysis done by one of their economic experts . . . The plaintiffs rebutted with still another expert . . ."

6. Opinion authorship or, as we later refer to it, opinion specialization, is indicated when a judge is especially likely to write an opinion (or not write an opinion) in a particular area of law. The measure of specialization is taken from Cheng (2008) and is premised on how many opinions a judge writes in an area of law compared to how many we would expect that judge to write if opinions were randomly distributed. In antitrust, all the opinion specialists are positive specialists, meaning they tend to write considerably more opinions than expected by chance. Therefore, we count as opinion specialists those judges who write statistically significantly more opinions than random assignment predicts. More details are available in the Appendix and from Cheng (2008). Opinion specialization is distinct from acquired experience in that it is a trait acquired actively rather than passively—a judge must, presumably, make it known that he or she wishes to write opinions in a particular area of law in order to have the presiding judge assign him or her those opinions.

matter expertise.[7] Opinion specialization has a long history in the judicial politics literature—particularly with respect to the Supreme Court—dating back to Ulmer's work in the 1960s and 1970s (Ulmer 1960, 1970) and more modern scholarship has followed this tradition. This research has generally concluded that opinion specialization exists, but is largely a function of organizational need as opposed to being a mechanism for the facilitation of ideological preferences (Maltzman and Wahlbeck 1996). More to the point, Atkins (1974) and Cheng (2008) have also found opinion specialization to be prevalent on the federal appellate courts. Cheng (2008), most notably, has shown that some judges on the US Courts of Appeals write significantly greater numbers of judicial opinions in certain areas of law than chance alone would dictate. Importantly, however, neither of these authors explores the possible effects of this type of specialization on decision making in the courts of appeals.

Studies of prior subject matter expertise have also appeared in the judicial decision-making literature. However, most such studies have been framed as inquiries into general background characteristics and have not been tied specifically to the literature on specialization or investigated with respect to expertise in particular legal subfields (Goldman 1966, 1975; Walker and Barrow 1985; Gryski and Main 1986; Songer, Davis, and Haire 1994; Hettinger, Lindquist, and Martinek 2003, 2004, 2006). As we have noted, while several studies have considered the role of prior subject matter expertise in areas such as patent rights (Miller and Curry 2009, 2013) and tax law (Howard 2005), these studies have focused on judging in specialized courts. Though we use this research as a point of departure in the present study, we also underscore several contrasts between judging in specialized versus generalized contexts. We detail those potential distinctions in the next section.

Though the influence of ideology on judicial decision making is well established in many contexts (see Segal and Spaeth 2002; Hettinger, Lindquist, and Martinek 2004; Pacelle, Curry, and Marshall 2011), comparatively few studies have examined the relationship in combination with subject matter specialization (see Baum 1977; Hansen, Johnson, and Unah 1995; Unah 1998; Miller and Curry 2009). However, we believe it is important to consider the role of ideology in tandem with specialization—particularly when analyzing judicial behavior in complex areas of law. Prior empirical research on the relationship between these constructs has demonstrated that the possession of prior expertise in technical legal areas leads judges on a specialized court to behave more ideologically (Miller and Curry 2009) and this finding is consistent with numerous psychological studies indicating that domain-specific expertise leads to increased levels of attitudinal consistency (Judd and Downing 1990, 117; Krosnick 1990, 3; McGraw and Pinney 1990).

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7. Subject matter expertise is premised on the notion that some judges come to the bench with backgrounds that suggest proficiency in particular areas of law. The Appendix provides details on how we operationalized subject matter expertise in this instance. Conceptually, subject matter expertise is distinct from opinion specialization in that it is present before ascension to the bench, whereas opinion specialization is acquired over time. Prior subject matter expertise is therefore a more deeply embedded characteristic and one that is more remote from instances of voting in our analyses. Also, opinion specialization is more likely to be visible to other members of the circuit than is prior subject matter expertise. For these reasons, we believe the concepts are conceptually distinct.

More generally, recent judicial decision-making research has begun to consider the influence of context-specific factors on the magnitude of ideological voting. In his investigations of voting on the US Supreme Court, for example, Bartels has found that both issue-related factors (2011) and the Court's choice of legal standards (2009) condition the degree of ideological voting by individual justices. Of particular relevance to our study of specialization, and consistent with the psychological findings cited above, he concludes that "familiarity with issues breeds greater ideological divisions" (Bartels 2011, 165). With this in mind, he and others have made a persuasive case for devoting greater attention to uncovering circumstances in which attitudinal considerations may exert uneven effects on judicial choice (see Unah and Hancock 2006; Edelman, Klein, and Lindquist 2008; Wetstein et al. 2009).

Collins (2008, 868) has noted that ideologically consistent voting is especially likely to occur when judges perceive cases as being salient and, in a sense, a judge's specialization in a particular legal area should operate to enhance the salience of the cases he or she hears that concern that topic. We (Miller and Curry 2009, 844) further note, in summarizing the psychological research on specialization, that "experts tend to think about encountered information more systematically" and that "multiple studies have identified expertise as a 'primary determinant' of attitudinal consistency." Finally, Baum concludes that specialized judges "tend to feel greater confidence in their judgment than their generalist counterparts. Because of this confidence, they are likely to be more assertive than generalists in their policy making" (Baum 2011, 35). Taken together, all this suggests that in contrast to their nonspecialist counterparts, judges who are specialists in particular areas of law should be better equipped to apply ideological principles to a given case (Posavac, Sanbonmatsu, and Fazio 1997; Federico and Schneider 2007). Applying this to the present study, we hypothesize that appellate judges who are specialists in antitrust law—by virtue of specialization in opinion authorship or possessing expertise on the subject prior to their ascension to the bench—should behave more ideologically than their nonexpert counterparts.

INDIVIDUAL SPECIALIZATION IN GENERALIST AND SPECIALIZED COURTS

Before discussing our data, hypotheses, and analytical strategy, we believe it is important to say a word about several contextual distinctions between specialized and more generalist courts. On generalist courts such as the US Courts of Appeals, a large number of judges regularly hear a wide variety of cases. By contrast, more specialized contexts result when individual judges can focus their attention on a relatively narrow range of cases (Baum 2011, 7). This has several potential consequences. For one, it tends to make generalist courts less prone to developing distinctive organizational missions and less susceptible to capture by specialized interests (Baum 1990; 2011, 37–41; Revesz 1990). In part, this may be due to the fact that organized interests are better positioned both to affect the initial selection of judges on specialized courts (Baum 1977; 2011, 38) and to influence how those judges decide cases after they ascend to the bench (Dreyfuss 1990, 380; Bruff 1991, 332). Thus, as Baum (2011, 39) notes, "policy-oriented missions are more likely to develop in courts with a high level of

specialization . . . Both judge and case concentration facilitate the selection of judges on the basis of their agreement with the goals that the court was created to further."

By the same token, it is uncommon for generalist courts to be characterized by policy-oriented missions. Although the importance of organizational missions to judicial outputs has not been scrutinized in great detail (see Baum 2011, 39–40), such missions have been examined in a variety of other institutional contexts (Wilson 1989; Macey 1992; Goodsell 2011). Psychological research also validates the idea that those who work in distinctive contexts tend to tailor their own behavior to reflect their organization's often-specialized institutional goals to a greater extent than do employees in organizations with more generic missions (Vardi, Wiener, and Popper 1989). Indeed, distinctive institutional missions can increase employees' commitments to shared organizational values (Hall and Schneider 1972; Wiener 1982). Such insights are arguably reflected in the conclusions of several studies indicating that the virtues of specialized courts may include increased levels of efficiency and consistency in decision making (Seron 1978; Baum 1990).

More anecdotally, comments by numerous judges on the US Courts of Appeals reflect both an antipathy toward specialization and a vigorous defense of the generalist ideal (see Posner 1983; Wood 1997; Tacha 1999; Walker 1999; Calabresi 2002; Cheng 2008, 521 n2). If nothing else, it seems clear than many judges on generalist courts perceive themselves to be insulated from specialization and view it as imperative that their courts *not* adopt non-neutral organizational missions—aside from the objective of remaining generalist institutions. Even absent a clear organizational mission, as noted in the previous section, we expect specialists in antitrust law to evince more ideological voting than their nonspecialized colleagues;[8] however, we are unsure of the extent to which the distinctions we have posited between judging in these varying institutional contexts may operate to alter how specialization and experience condition ideological decision making or how multiple conceptions of specialization (here, opinion specialization and subject matter expertise) will vary in their ability to explain decision making.

DATA AND VARIABLES

To test the hypothesis that specialization will enhance ideological decision making, we coded antitrust decisions from the Seventh, Ninth, and District of Columbia Courts of Appeal from 1995–2005. As noted, we chose these courts because they each contain a large number of subject matter experts and opinion specialists, because they hear a relatively large number of antitrust cases, and because they offer geographic diversity.[9]

8. By ideological voting we mean that judges vote in a manner that is consistent with the ideological schema typically imposed in antitrust cases; liberals typically seek more vigorous enforcement of antitrust laws, while conservatives are more tolerant of monopolies (see Landes and Posner 2003; Atkinson and Audretsch 2011). Note 3 references a particular incident that helps illuminate these expectations.

9. Our data contain eleven of the fifteen known circuit court subject matter experts (in addition to the two district court judges who are experts and who serve on appellate panels that we observe in our data) based on our search of all the federal circuit judges serving during this time period. Our data contain five of the seven known opinion specialists as coded by Cheng (2008). In addition, there were 774 antitrust cases

TABLE 1.
Descriptive Statistics

Variables	Mean	*SD*	Min	Max
Liberal vote	0.271	0.444	0	1
Ideology	0.001	0.374	–0.65	0.608
Judge experience	14.03	8.17	0	43
Subject matter expert	0.170	0.376	0	1
Opinion specialist	0.078	0.268	0	1
Judge experience * Ideology	–0.156	5.745	–21.06	11.86
Subject matter expert * Ideology	–0.001	0.164	–0.422	0.559
Opinion specialist * Ideology	0.012	0.108	–0.409	0.559
Colleague subject matter expert	0.313	0.464	0	1
Colleague opinion specialist	0.140	0.348	0	1
Memorandum opinion	0.297	0.457	0	1
Summary judgment	0.359	0.480	0	1
JMOL	0.025	0.155	0	1
US named party	0.109	0.312	0	1
Class action	0.044	0.206	0	1
Published	0.693	0.462	0	1
Lower court liberal	0.134	0.341	0	1
Seventh	0.233	0.423	0	1
Ninth	0.624	0.484	0	1

Note: Descriptive statistics for restricted cubic spline omitted.

This time period was chosen to allow for inclusion of the opinion specialization measure developed by Cheng (2008), who has analyzed aspects of that issue in the federal appellate courts. We gathered cases during this time period through exhaustive searches in the Lexis/Nexis database. In total, we coded 202 cases over this time period and 606 votes from 112 judges. No case received en banc circuit treatment in our data. Our dependent variable is *liberal vote*, coded 1 if a judge voted in favor of finding an antitrust violation; 0 otherwise. Table 1 contains descriptive information on the variables included in our model.

There are three independent variables of particular interest: *subject matter expert*, *opinion specialist*, and *judge experience*. *Subject matter expert* is equal to 1 if a judge on the appellate court possessed prior expertise in antitrust law upon his or her ascension to the bench; 0 otherwise. Lists of the judges we coded as experts and our reasons for coding them as such are provided in the Appendix. We counted as experts those judges whose biographies indicated some level of specialization in antitrust law, with indicators ranging from published articles to previous service with the Federal Trade Commission. The important point is that these traits indicate subject matter

decided during this timeframe in the federal circuit courts (according to our Lexis/Nexis searches) and our data set contains 202, or 26 percent. We are therefore confident that we have captured a meaningfully large sample of the antitrust cases available.

expertise.[10] *Opinion specialists* are those judges who write significantly more opinions in this area of law than they would be expected to write given the norm of random opinion assignment.[11] We use Cheng's (2008) measures of opinion specialization. Judges whom Cheng determined to be opinion specialists are also listed in the Appendix, as is a brief discussion of his method for determining whether a judge is an opinion specialist. We also include a variable to account for the potential influence of accumulated experience on the decision making of judges in our data set (*judge experience*). This variable is coded as a count of the number of years a judge has served on his or her respective court at the time of the decision.[12]

To account for the *ideology* of the appellate judge we include the widely used measure developed by Giles, Hettinger, and Peppers (2001), which combines the ideology of the appointing president and any same-state, same-party senators. Higher values of the *ideology* variable represent more conservative judges. To capture the conditional nature of our hypothesis—that experts will be especially prone to exhibit ideological decision making in technically difficult areas of law—we interacted ideology and subject matter expertise (*subject matter expertise * ideology*). Since we also believe it is possible that opinion specialization conditions the use of ideology in these cases, we include an interaction term to capture these effects (*opinion specialization * ideology*). Finally, *judge experience * ideology* captures any conditional effect of judicial experience on the use of ideology in decision making. Because higher values of our ideology measure indicate greater conservatism, we expect these interaction terms to have negative coefficients.

The variable *colleague subject matter expert* is equal to 1 for judges who are not experts but who serve on panels with an expert; 0 otherwise. We include this variable to control for the potential panel effects of expertise on nonexpert decision makers, as scholars have found numerous situations in which the composition of an appellate panel can alter the decision making of a judge. For instance, Farhang and Wawro (2004) find that the presence of women and minorities on a panel alters the decision making of male and white judges in discrimination cases, and Kastellec (2013) finds that adding black judges to otherwise all-white panels substantially alters panel decisions in affirmative action cases. Similarly, we wish to control for any possible panel effects of opinion specialization and so we include a variable, *colleague opinion specialist*, which is

10. We counted judges as experts only if there was a clear indication of prior training in antitrust law. Thus, our coding of prior subject matter expertise in the area of antitrust litigation (see the Appendix) is likely underinclusive. However, we would underscore that any current shortcomings in the operationalization of this construct almost certainly serve to understate the actual influence of expertise in this context. In addition, we noted when a district court judge sat on an appellate panel by designation, including our experts. Excluding these instances from our model in no way alters the conclusions we present below.

11. For a discussion of the rules and norms of random opinion assignment on the various US Courts of Appeals, see Cheng (2008, 523 n17).

12. Multicollinearity is often a concern when measures of closely related constructs are included in regression models. The correlations between our three constructs are not overwhelming, with the correlation between opinion specialization and subject matter expertise highest at $r = 0.328$. This is not high enough to cause concern—if anything it weakens our ability to discern a difference between these constructs, meaning that our findings here are likely conservative to some extent.

equal to 1 for judges who are not specialists but who serve on panels with an opinion specialist.

We incorporate a number of control variables to serve as proxies for the ease of a decision at the appellate and trial levels as well as the factual context of antitrust decision making. First, we include a dummy variable equal to 1 if the appellate court decided the case using a memorandum or per curiam opinion (*memorandum opinion*); 0 otherwise. Memorandum opinions are indicated when the appellate court's decision is brief and unsigned. Second, we include a variable called *summary*, which is equal to 1 if a case is decided on the basis of a summary judgment motion at the trial level and 0 otherwise. Another variable that captures the difficulty of decision making at the trial court level is *JMOL*, which is equal to 1 for cases decided as judgments as a matter of law and 0 otherwise. We treat these measures of case difficulty as control variables and, as such, do not have strong expectations about how they might affect whether a case is decided in a liberal or conservative direction.

Two additional variables capture the factual context of the decision and both should be positively signed. First, *US party* is coded 1 if the United States or one of its agencies is a named party in the case; 0 otherwise. This variable should have a positive coefficient because the federal government will tend to be involved in antitrust cases only in pursuit of an antitrust violation (which is an ideologically liberal decision) and, generally speaking, the federal government is a highly successful litigant (Pacelle 2003). Second, *class action* is coded 1 if the case is a class action lawsuit; 0 otherwise. The literature on class actions indicates that these cases are generally trigged by previous federal government action against a company (Hawthorne 2011); thus, we also expect the coefficient here to be positive, given the previous involvement of the federal government. In addition, we control for the direction of the lower court's decision with *lower court liberal*, which is equal to 1 if the lower court decided a case in a liberal direction and 0 otherwise. We expect that this variable will be positive, given that our dependent variable also codes whether a court of appeals judge casts a liberal vote.

We include both published and unpublished decisions in our data to avoid any bias that might be introduced by the inclusion of only published decisions (Songer 1990). Approximately 70 percent of the decisions in our data are published in the federal reporter. Our dummy variable *published* is coded 1 if the decision is published and 0 otherwise; we have no theoretical expectation for how publication might affect the ideological direction of a decision. We also include two variables intended to capture any of the potential uniqueness in decision making caused by different circuit court cultures or practices that are not already captured in our model (Hettinger, Lindquist, and Martinek 2006). Setting the DC Circuit court as our baseline, we include a dummy variable for whether a decision was made in the *Seventh* Circuit and one for whether a decision was made in the *Ninth* Circuit. We do not have any expectations about the signs of these coefficients.

ANALYSIS

We estimate a series of logit models with errors clustered on the judge. We cluster the errors on the judge to control for the fact that a single judge will hear multiple cases

in our dataset. To control for changes over the time period during which we gathered data, we include a restricted cubic spline with three knots (Beck, Katz, and Tucker 1998), with the number of knots determined by the data (based on the model that returned the lowest Akaike information criterion [AIC] score).[13] In addition, we checked that our choice of parametric estimator did not bias our results by estimating the model using a general estimating equation (GEE) approach with an exchangeable correlation structure and standard errors robust to heteroscedasticity (Zorn 2001, 2006); we display the results of this reestimation for Model 5 in the Appendix. The results were virtually identical to those presented in Table 2.

Our models fit the data reasonably well. The Wald χ^2 statistics are all highly statistically significant. As an additional measure of model fit we analyze the model's ability to discriminate between liberal and conservative decisions by determining the area under the receiver operating curve (ROC): here, the area is 0.71 for all models, which is normally considered an acceptable fit to the data. We estimate a total of five models that include various sets of interaction terms to allow us to distinguish between the effects of the various concepts of interest: subject matter expertise, opinion specialization, and experience. Predictions for variables for which we have a priori theoretical expectations for the sign of the coefficients are listed in parentheses following the variable.

Model 1 includes no interaction terms as a baseline against which to measure other effects, allowing for straightforward interpretation of the included variables. Of most theoretical interest, ideology appears to have no direct effect on decision making in these cases, as might be predicted by the attitudinal model as it has been examined in many so-called technical areas of law (Epstein and Mershon 1996; Moore 2001; Sag, Jacobi, and Stych 2009; Nash and Pardo 2012). A host of case characteristics are important and will remain important in subsequent specifications, so we interpret their effects here and not in subsequent models since there is little change in these variables across models. First, memorandum opinions tend to reduce the likelihood of a liberal vote (a vote for an antitrust violation) by 18 percentage points. In some sense this is not surprising, since it is liberal votes that are rare in the data and therefore it is these findings of a violation that are likely to need greater elaboration than are decisions in which there is no finding of a violation. Both the US party variable and the class action variable have positive effects on the likelihood of a liberal vote, with the presence of the United States as a party increasing the probability of a liberal vote by 27 percentage points and a class action lawsuit increasing the likelihood of a liberal vote by 20 percentage points. These effects are in accord with our expectation that the presence of the United States as a party in a case or its previous involvement in the development of a case (as is true in many class action antitrust cases) would make the finding of an antitrust violation more likely. Finally, among the control variables, the direction of the lower court's decision has a predictable effect on the votes of appellate judges: moving from a conservative to a liberal decision in the lower court increases the probability of a liberal vote by 10 percentage points.

13. We also estimated our regression with fixed-year dummies instead of the cubic spline and the results are identical.

TABLE 2.
Logit Models, Antitrust Decisions, 1995–2005

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	**Coeff.**	**Robust S.E.**	**Coeff.**	**Robust S.E.**	**Coeff.**	**Robust S.E.**	**Coeff.**	**Robust S.E.**	**Coeff.**	**Robust S.E.**
Ideology (–)	0.162	0.285	0.271	0.531	0.009	0.348	–0.025	0.308	0.057	0.352
Judge experience	0.018	0.012	0.013	0.015	0.020	0.012	0.017	0.012	0.018	0.012
Subject matter expertise	0.381	0.236	0.396	0.236	0.334	0.216	0.510*	0.251	0.462	0.234
Opinion specialist	0.323	0.405	0.300	0.402	0.499	0.454	0.413	0.307	0.498	0.370
Judge experience * Ideology (–)	—	—	–0.032	0.041	—	—	—	—	—	—
Subj. matter expert * Ideology (–)	—	—	—	—	–0.954^	0.569	—	—	–0.571	0.614
Opinion specialist * Ideology (–)	—	—	—	—	—	—	–1.938^	0.648	–1.658^	0.723
Colleague subj. matter experts	0.298	0.192	0.506	0.288	0.279	0.191	0.265	0.191	0.258	0.191
Colleague opinion specialist	0.497	0.291	0.295	0.193	0.474	0.290	0.459	0.289	0.453	0.288
Case Characteristics										
Memorandum opinion	–1.774*	0.451	–1.792*	0.450	–1.759*	0.446	–1.767*	0.454	–1.758*	0.450
Summary judgment	–0.076	0.243	–0.080	0.243	–0.087	0.244	–0.101	0.247	–0.104	0.247
JMOL	0.154	0.694	0.167	0.697	0.173	0.692	0.175	0.700	0.181	0.700
US party (+)	1.230^	0.370	1.212^	0.373	1.228^	0.367	1.215^	0.366	1.217^	0.365
Class action (+)	1.020^	0.510	1.016^	0.512	0.972^	0.511	0.973^	0.517	0.952^	0.515
Published	–0.956	0.500	–0.968	0.499	–0.975	0.506	–0.960	0.503	–0.972	0.508
Lower court liberal (+)	0.495^	0.286	0.494^	0.286	0.493^	0.287	0.477^	0.290	0.478^	0.289
Circuit Effects										
Seventh	–0.377	0.360	–0.346	0.365	–0.394	0.343	–0.271	0.346	–0.301	0.342
Ninth	0.357	0.258	0.365	0.265	0.304	0.258	–0.960	0.503	0.323	0.253
N	606		606		606		606		606	
Clusters	112		112		112		112		112	
Wald χ^2	101.25 ($p = 0.000$)		104.98 ($p = 0.000$)		106.09 ($p = 0.000$)		181.09 ($p = 0.000$)		159.04 ($p = 0.000$)	
Area under ROC	0.71		0.71		0.71		0.71		0.71	

Notes: * Significant at $p < 0.05$ (two-tailed); ^ significant at $p < 0.05$ (one-tailed). Cubic spline with three knots included in regression but omitted from display. Each model generated constants, though they are not displayed here.

TABLE 3.
Joint Significance Tests of Interactions

	Joint Significance χ^2-tests			
Interaction Terms	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Judge experience * Ideology	$\chi^2 = 3.35$ ($p = 0.187$)	—	—	—
Subj. matter expert * Ideology	—	$\chi^2 = 8.75$ ($p = 0.033$)	—	$\chi^2 = 6.85$ ($p = 0.077$)
Opinion spec. * Ideology	—	—	$\chi^2 = 23.48$ ($p = 0.000$)	$\chi^2 = 15.83$ ($p = 0.001$)

Models 2–5 contain various combinations of interaction terms that allow us to test the effects of ideology on decision making, conditional on our measures of subject matter expertise, experience, and opinion specialization. In Model 2 we include only an interaction for judicial experience and ideology. None of the variables constituting this interaction are significant and a χ^2 test that all the coefficients are zero cannot be rejected ($p = 0.187$). There is thus little evidence that experience conditions the use of ideology. Table 3 contains a set of χ^2 tests for the included interaction terms in all the models. Model 3 includes an interaction only for ideology and subject matter expertise. Though neither of the constituent terms is significant in this model, the interaction is statistically significant and the χ^2 test indicates that together the coefficients on the interaction terms are statistically significant ($p = 0.033$). The negative sign of the coefficient for the interaction term, combined with statistical significance, suggests that subject matter expertise conditions the use of ideology in the manner we suggest: subject matter experts are more ideological in their decision making than are nonexperts. Similarly, in Model 4 we find that the interaction between opinion specialization and ideology is statistically significant and in the expected direction—opinion specialists are much more likely to make decisions in an ideological fashion than are nonspecialists. A joint test of all the terms in the interaction confirms this effect ($p = 0.000$). Finally, Model 5 includes interactions between ideology and subject matter expertise and ideology and opinion specialization, but not an interaction of experience and ideology. We do not include the interaction of experience and ideology because the joint significance test does not indicate that it is capturing a significant relationship in the data. In Model 5, which we interpret further below, only the interaction between opinion specialization and ideology is statistically significant, with a highly significant interaction term and a test that all the coefficients in the interaction are zero strongly rejected ($p = 0.001$). Though none of the interaction terms in the subject matter expertise and ideology interaction are significant, a joint test of the significance of all those terms together gives a borderline result ($p = 0.077$). Therefore, we feel it is a more stringent test of the effects of both interactions to allow them to compete to explain the variation in the model, which is what we have done in Model 5. As an additional check on the robustness of these results, we reestimated each regression excluding one of the five opinion specialists to ensure that no single judge was driving our results. All our results are robust to the exclusion of any of these specialists.

TABLE 4.
Predicted Probability of Liberal Vote

	App. Judge Ideology	Prob. of Liberal Vote
Nonexpert	–0.428	0.23 [.11, .34]
	–0.367	0.23 [.12, .33]
	0.023	0.23 [.14, .32]
	0.314	0.23 [.15, .31]
	0.559	0.24 [.16, .32]
Subject matter expert	–0.428	0.37 [.24, .50]
	–0.367	0.36 [.24, .49]
	0.023	0.32 [.19, .44]
	0.314	0.29 [.15, .43]
	0.559	0.26 [.10, .42]
Opinion specialist	–0.428	0.49 [.36, .62]
	–0.367	0.47 [.35, .59]
	0.023	0.32 [.20, .44]
	0.314	0.23 [.09, .37]
	0.559	0.17 [.02, .31]

Notes: Ninety percent confidence intervals inside brackets. Predictions are generated using the coefficients from Model 5. All variables are held at their modal (dichotomous) or mean (continuous) values.

Explaining the interaction effects in Model 5 in the abstract is somewhat difficult. To illustrate how opinion specialization and subject matter expertise affect the use of ideology, we present Table 4 and Figure 1. In Table 4 it is apparent that the effect of opinion specialization is greater than subject matter expertise. The difference between a very liberal judge (–.428) and a very conservative judge (.559) in the predicted probability of a liberal vote is 32 percentage points, whereas the difference between a very liberal judge (–.428) and a very conservative judge (.559) who are subject matter experts is a more modest 11 percentage points. Compare both of these effects with those for judges who are neither opinion specialists nor subject matter experts: as these nonspecialist, nonexpert judges become more conservative they actually become slightly more likely to make a liberal decision, although the differences even at the extremes of the ideological distribution are too small to be substantively meaningful. Figure 1 allows for a more intuitive comparison of these effects from Model 5:[14] it is clear that opinion specialists (the line with short dashes and square markers)—those most likely to write the opinion in an antitrust case—are also those most likely to be ideological in their voting in these cases, with subject matter expertise registering a more moderate, but nevertheless discernible, effect. We turn to the implications of these findings next.

14. We have not included confidence intervals in Figure 1 to avoid an overly cluttered and difficult-to-read graph. Those intervals, often represented graphically (see Brambor, Clark, and Golder 2006), are available in tabular form in Table 4.

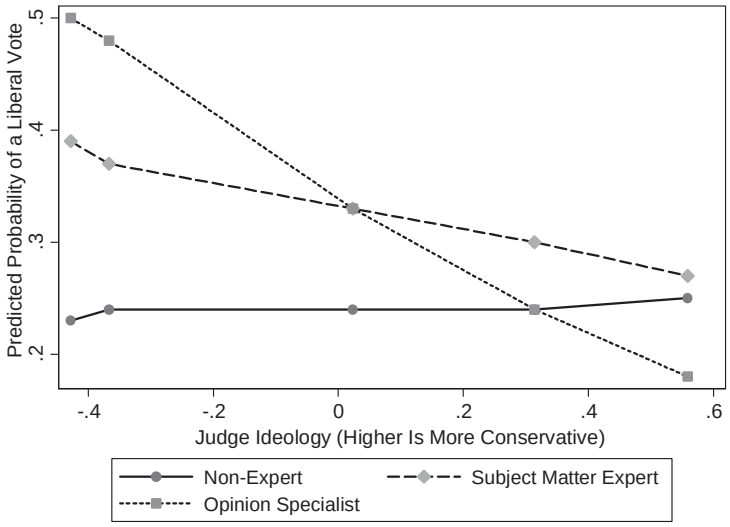

FIGURE 1.
Predicted Probability of Liberal Vote

DISCUSSION AND CONCLUSION

In this examination of specialization's influence on decision making in antitrust cases, we found that appellate judges who specialize in that area of law are significantly more likely than their nonspecialist counterparts to vote in ideologically consistent ways. In other words, our results indicate that judicial specialization amplifies the impact of ideology on decision making and, thus, operates in ways that may increasingly polarize antitrust law. More specifically, although we observed evidence that a judge's possession of prior subject matter expertise in antitrust law accentuated ideological decision making in this technical legal area, specialization in opinion authorship augmented ideological decision making much more extensively. On the other hand, echoing findings from analyses of judging in more specialized contexts (Miller and Curry 2009, 2013), accumulated judicial experience did not exert any effects on judicial voting, either directly or in combination with ideology.

We believe a number of important implications can be distilled from these findings. First, it is notable that the analysis found different dimensions of subject matter specialization to operate in similar ways. While we are not aware of prior studies that have considered the influence of opinion specialization on ideological decision making in specialized courts, it is interesting to note that the possession of prior subject matter expertise appears to operate similarly regardless of whether a judge is situated in a specialized or more generalist environment. With regard to the explanatory power of these two dimensions of specialization, at this stage we can only speculate as to why opinion specialization seems to enhance ideological voting to a greater extent than does prior expertise. The question invites further study, but perhaps this differential influence is partially a function of the generalist—as opposed to specialized—judicial setting we analyze here. Given the generalist orientation of these courts, opinion authorship may provide a more natural outlet for specialization to influence decision

making than prior expertise. It is unlikely, for instance, that subject matter experts will be attracted to the Ninth Circuit in the way that patent experts are attracted to the Federal Circuit.

At the same time, our results here also indicate that *institutional* specialization is not a necessary precondition for *individualized* specialization to exert a systematic influence on judicial decision making—and, ultimately, the content of legal policy. Much has been made of the need to focus on the ways institutional characteristics may help structure the behavior of political actors (March and Olsen 1984) and, quite appropriately, studies of judicial decision making have been particularly active in considering such factors (see Clayton and Gillman 1999; Gillman and Clayton 1999). Moreover, the bulk of scholarship on judicial specialization has probed that concept within courts that are specialized institutions (Unah 1998; Howard 2005; Miller and Curry 2009, 2013; Baum 2011). In other words, prior individual-level examinations of specialization have essentially been undertaken within specialized institutional environments. Institutional considerations are undoubtedly important and specialized courts may even serve to amplify the effects of specialization possessed by individual judges under some conditions. However, the fact that individual specialization's influence on judicial decision making can transcend such institutional arrangements suggests to us that scholars may ultimately find the broad notion of judicial specialization to exert more pervasive, if sometimes subtler, effects than have typically been acknowledged in the literature. This is suggestive to us of the potential for individual specialization to affect decision making across a range of institutional arrangements and in a variety of comparative sociolegal contexts.

Another important implication of this study arguably relates to our finding that those appellate judges who are particularly likely to write majority opinions also happen to be those individuals we can expect to evince the greatest levels of ideological voting. From a substantive perspective, this may tend to yield judicial outcomes that are somewhat more ideologically extreme than would otherwise obtain—perhaps more than other judges on the panel or in the circuit might wish were the case. Considering this result against the backdrop of the congressional literature on committee outliers may help illuminate the point. In Congress, members of the floor generally cede a measure of decision-making authority to members of committees (Maltzman 1997). As a side payment for devoting their time to specializing in a particular policy area, the floor permits committee members to set policy closer to their own ideal points as opposed to the preferred position of the floor median. This specialization, in turn, is beneficial because it is likely to result in better, more informed legislation (see Gilligan and Krehbiel 1995; Londregan and Snyder 1995; Maltzman and Smith 1995).

Some of these same considerations may be operative in opinion specialization on the courts of appeals, especially in technical areas such as antitrust law: nonspecialists frequently permit opinion specialists to speak for the panel and while somewhat more ideological opinions may result, those opinions may also tend to produce better-crafted judicial policy than would be the case absent such specialization. While we cannot say such decisions are inherently "better" ones (Baum 2011, 219), our results do indicate that they are more ideologically extreme than they would otherwise be and that, in turn, antitrust law looks different than it would in the absence of this specialization. From a broader perspective, this study also presses the case for giving further study to the

contingent effects that ideology may play in structuring both the decisions of various political actors and the substance of the policies that result from that decision making.

In addition, because of the oft-cited efficiency benefits that specialization can provide (Atkins 1974; Seron 1978; Legomsky 1990), the existence of such an arrangement could have important implications for judicial productivity. In light of increasing workload pressures on the federal courts, those efficiency benefits themselves could perpetuate the specialization of opinion authorship even further—a cycle that, according to our findings, could lead to increasingly ideological judicial policy outcomes. This reinforces the point we made above, namely, that according to our results, a specialized institutional arrangement is not a necessary condition for specialization by individual judges to have implications for legal policy.

Of course, further examinations of generalist courts in other areas of law will be needed to confirm that we have uncovered a tendency that extends beyond antitrust law in the federal appellate courts. Subject areas of future study might include environmental, Social Security, bankruptcy, securities, and tax cases—all areas of law that are somewhat factually complex and in which there are a number of known opinion specialists (Cheng 2008). Nevertheless, with regard to the interaction of judicial specialization and ideological decision making, scholars now have results from generalist and specialized federal appellate courts that point in the same direction: higher levels of judicial specialization engender more, not less, ideological decision making.

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APPENDIX: CODING ANTITRUST EXPERTISE AND OPINION SPECIALIZATION IN THE SEVENTH, NINTH, AND DC CIRCUITS

The judges we considered experts, as well as our reasons for counting these judges as experts, are listed in Table A1.

We mined a number of sources to generate the list in Table A1. Our search began with the various relevant volumes of *Who's Who in American Law*, *The American Bench*, and the online federal judicial biographical database available from the Federal Judicial

TABLE A1.
Descriptive Statistics

Name	Court	Subject Matter Expertise
Browning, James	9th	DOJ Antitrust Division
Easterbrook, Frank	7th	Publications
Fisher, Raymond	9th	Asst. A.G., Antitrust, Private Practice
Garland, Merrick	DC	Publications
Ginsburg, Douglas	DC	DOJ Antitrust Division
Gould, Ronald	9th	Antitrust practice
McKeown, Margaret	9th	Antitrust practice
Posner, Richard	7th	Attorney with FTC; Publications
Rymer, Pamela	9th	Publications, ABA Antitrust Section
Schwarzer, William*	N.D. Cal.	Publications, ABA Antitrust Section
Tashima, A. Wallace	9th	Antitrust Section Chair, California Bar
Whaley, Robert*	E.D. Wash.	Antitrust practice, Publications
Wood, Diane	7th	Publications; DOJ Antitrust Division

Note: * indicates judge was sitting by designation on a Ninth Circuit panel.

Center. We also looked at the self-provided practice profiles available in Lexis/Nexis for those attorneys who provided them. Finally, where possible, we looked at the practice profiles of the firms at which the judges previously practiced to determine whether they were boutique firms specializing in antitrust litigation. When determining specialization we also took into account any publications that concerned antitrust law. Our list is probably underinclusive of those with some antitrust subject matter expertise, since it is sometimes difficult to tell whether an attorney might have focused on a particular area of law while in private practice or while working for the Department of Justice. We only included those in private practice as experts if their profiles specifically referred to a focus in antitrust litigation.

From Cheng (2008), the following judges write significantly more opinions in antitrust than would be predicted by pure random assignment of opinions: Easterbrook (7th), Posner (7th), Norris (9th), Lay (9th, by designation), and Beezer (9th). We note that Cheng creates scores that can be either positive or negative; that is, a judge can specialize in avoiding writing certain types of opinions as well as in writing them. All the antitrust opinion specialists are positive specialists, meaning they tend to write more than the predicted amount of antitrust opinions. Cheng's measure is calculated using a technique called median polish (Cheng 2008, 532), a method by which a researcher can detect situations in which an observed frequency deviates significantly from a random distribution. We separately confirmed the opinion specialization measure in our data: those described as opinion specialists are 3.5 times more likely to be an opinion author than are nonopinion specialists, a statistically significant difference in our data ($\chi^2 = 65.20$, $p = 0.000$).

Some readers may be concerned about collinearity between our three major constructs: subject matter expertise, opinion specialization, and experience. The highest correlation is between subject matter expertise and opinion specialization, at 0.33, but this is not high enough to induce concerns over multicollinearity. The correlation

between opinion specialization and experience is 0.12 and the correlation between subject matter expertise and experience is –0.16. As a secondary check on the collinearity issue we also attempted to reduce these three variables into a lesser set of components using a factor analysis and the data prove to be irreducible, with no factors emerging beyond the three specified by the variables (i.e., no factors achieving eigenvalues greater than 1). We thank the anonymous reviewers for recommending this check on multicollinearity. In other words, our concepts are distinguishable in the data.

As a check on the robustness of our results, we reestimated our ultimate model, Model 5, using a GEE specification to ensure that the results were not sensitive to parametric specification. Those results are basically identical to the results for Model 5 and are displayed in Table A2. The only difference of note is that subject matter expertise now achieves traditional levels of statistical significance, which it only approaches in Model 5; all other variables have similar coefficients and levels of statistical significance.

TABLE A2.
GEE Robustness Check

	GEE Model 5	
Variables	**Coeff.**	**Robust S.E.**
Ideology (–)	0.172	0.343
Judge experience	0.016	0.012
Subject matter expertise	0.484*	0.247
Opinion specialist	0.508	0.361
Judge experience * Ideology (–)	—	—
Subj. matter expert * Ideology (–)	–0.610	0.628
Opinion specialist * Ideology (–)	–1.866^	0.787
Colleague subj. matter experts	0.308	0.190
Colleague opinion specialist	0.533	0.278
Case Characteristics		
Memorandum opinion	–1.672*	0.470
Summary judgment	–0.054	0.243
JMOL	0.059	0.748
US party (+)	1.248^	0.361
Class action (+)	0.952^	0.503
Published	–0.989	0.515
Lower court liberal (+)	0.539^	0.289
Circuit Effects		
Seventh	–0.297	0.358
Ninth	0.289	0.256
Constant	753.134	512.629
N	606	
Clusters	112	
Wald $\chi 2$	153.42 (p = 0.000)	