The Strategic Timing behind Position-taking in the US Congress: A Study of the Comprehensive Immigration Reform Act

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Roll call voting by members of the US Congress has been frequently studied. In contrast, the various decisions leading up to roll call voting are relatively unexplored. This article analyses one of those decisions: when senators announce their final passage vote intention. The authors use the same set of variables to analyse both the timing of the announcement and the final passage vote. They find that different independent variables predict these two different decisions, though the constituency and the senator's institutional setting matter in both. Furthermore, this study corroborates an assumption in the rational choice literature that those members with the most information are the first movers.

The roll call votes that members of Congress cast are exceedingly important. The aggregated 'yeas' and 'nays' determine the laws of the land. In accordance with their importance, they are rigorously, vigorously, and frequently, studied by political scientists. The roll calls, though, are not the only important decision members make during the legislative process. The best evidence of this proposition is that the outcomes of few final passage votes are ever in doubt. Members' announcements of how they are going to vote frequently forecast the chamber's ultimate decision. More than that, though, the announcements of particular well-placed or well-respected members may also help determine the final outcome. These decisions on when members announce their vote intentions receive almost no attention from political scientists.[1]

In this article, we apply survival analysis to investigate the timing of US senators announcing their vote intention and multivariate regression analysis to examine their final passage vote on the Comprehensive Immigration Reform Act (CIRA) of 2006.[2] Although immigration reform has occupied the centre stage of political debate in the United States from time to time for more than a century, the issue took on an added importance from the middle of the last century.[3] Although the issue has recently become more salient, the American public has not spoken with one voice – in fact, public opinion is frequently downright perplexing. Large majorities of Americans wanted to increase the number of federal agents (79 per cent), to send illegal immigrants back to their home

countries (55 per cent), *and* to allow illegal immigrants to apply for temporary worker status (63 per cent).[4] Perhaps the only aspect that has united the American public was that immigration was a 'serious' problem (86 per cent). With the status quo seemingly broken, the public's eyes turned to Congress to see how it would reform a policy that was roundly described as 'broken' by both liberals and conservatives.

The Senate answered their constituents' calls for reform by passing the Comprehensive Immigration Reform Act on 25 May 2006. The bill was truly comprehensive in nature, including both conservative provisions (such as adding border agents and authorising a border fence) and liberal provisions (guest worker permits and a pathway to citizenship). Given immigration's importance and the particular dynamics that played out during the Senate debate, this legislation presents a worthwhile opportunity to examine one of the earlier decisions affecting the final roll call vote. In this article, we not only analyse that final passage roll call vote, but also the temporal dynamic of individual senators' announcements by building upon Krehbiel's (1991) signalling models and Box-Steffensmeier, Arnold, and Zorn's (1997) dynamic model. By analysing both decisions we can assess the underlying systematic causes of each and compare and contrast those causes.

Our investigation yields three noteworthy results. First, consistent with the informational theory of legislative organisation, those senators with the most and, presumably, best information are the first movers in determining a bill's legislative path. Second, the constituency matters in both the timing of making an announcement and voting on CIRA, though various dimensions of the constituency matter in different ways at the distinct parts of the process. Third, the variables that predict early announcements are an almost perfect complement to the variables that predict the final vote. In other words, both processes have underlying systematic causes, though, in this case, they were almost entirely different.

This article proceeds as follows. First, we discuss immigration reform during the 109th Congress (2005–06). Second, we develop models to test the hypotheses that we proffer. Third, we discuss the results. Finally, the article concludes with suggestions for measurements and analyses worthy of future study.

Immigration Reform

Immigration policy in the United States has gone through numerous stages. The Chinese Exclusion Act of 1882 was the first significant immigration restriction in the United States. In the 1920s, Congress restricted immigration even more by implementing a strict national origins quota system that was heavily weighted towards Europe. The 1965 Immigration and Nationality Act replaced the quota system with one that favoured the reunification of families and the permission of immigrants with needed skills. Even though Congress passed two rounds of revisions to this landmark piece of legislation in 1986 and 1990, the 1965 law is still largely in operation today.[5] As this law's ability to deal with the

immigration situation has waned, and as the public's clamour for reform has intensified, the House passed the Border Protection, Anti-terrorism, and Illegal Immigration Control Act (H.R. 4437) on 16 December 2005. Contrary to the desires of President Bush[6] and most Democrats, this bill focused mostly on securing the border. The House Republicans reasoned that the current law needed to be fixed prior to dealing with the illegal immigrants currently living in the United States.

When the Senate Judiciary Committee took up immigration reform in 2006, they recognised that an enforcement-only bill was inadequate for two reasons: first, and more instrumentally, it could not secure enough votes to end a liberal filibuster against the bill, and, second, it was unlikely to solve the multifaceted immigration problems. Nonetheless, Majority Leader Bill Frist gave the committee a strict deadline of 31 March to report a comprehensive bill or he was going to move on his enforcement-only bill (S. 2454: Securing America's Borders Act). The committee sought a comprehensive bill that combined the House's provisions with a solution for the undocumented workers currently living illegally in the United States. It took six mark-up sessions,[7] but eventually, with much fanfare (literally, applause from the audience and committee members), the committee reported the bill with the support of all eight Democrats and four of the ten Republicans.

As the Senate debated immigration, the country erupted into public demonstrations on both sides of the issue (see, for example, Purnick 2006; Schwartzman 2006). The nation's major newspapers followed the dynamics inside and out of Congress, frequently focusing on potential compromises between the parties (see, for example, Weisman 2006). The issue was tied not only to the 2006 congressional elections, but also to the presidential race in 2008 (Cillizza 2005; see also Kiely 2006, Swarns 2006). The nation lived the drama of the bill's debate – bipartisan coalitions were built and collapsed as various amendments and compromises were bandied about (Klein 2006, Swarns 2006).

Although the legislation twisted and turned during the debate, no senator who pledged support for the comprehensive bill ever changed their mind; nor did any senator who vowed to oppose the bill. Ultimately, on 25 May 2006, the Senate passed CIRA, 62 to 36 (*The Congressional Record* 2006, Vol. 152, No. 67, pp. S.5133–5191).[8] Ultimately, however, the bill died, as the House and Senate were unable to resolve the differences between their bills. The controversial nature and the complex provisions of the comprehensive immigration reform plan and the uncertain outcome of CIRA forced lawmakers to act strategically throughout the debate. As senators announced their positions, the debate took form as the remaining undecided senators looked at growing support and opposition coalitions. Its passage, with two more votes than was required to break a filibuster, demonstrated the precarious nature of the bill. The visibility of the issue, the intensity with which the Senate focused upon it and the compact timeframe surrounding its life on the Senate floor make this legislation an appropriate case study to test and evaluate various theories of not only senators' roll call votes

but also when they chose to announce their voting intentions. Undeniably, other bills may provide the same, or an even better, window though the precise factors underlying the systematic explanation would vary by issue. It is not our contention that CIRA is the only bill that could be examined or even the best bill, just that it provides an appropriate testing ground. While we encourage other studies to gain more insight into these timing decisions, we think it is important to get the micro story right on a particular bill prior to generalising results across other issues.

Constructing Models for Position Pronouncements and Final Decisions

In this section, we develop our multivariate models to test senators' announcements and roll call votes. First, we discuss the importance of the timing behind the vote intention announcements. Second, we introduce the method of duration analysis. Third, we explicate our hypotheses for both the timing of position taking and the direction of the final passage vote. In the following section, we describe the results.

The Importance of Timing

The timing of senators' announcements of their vote intention plays in two different arenas. First, constituencies can infer important information about their representatives or their representatives' views based on when they publicly announce their positions. Senators who announce early in the process demonstrate that they are leaders on the issue, which portrays them as able legislators to their constituents. Members of Congress, of course, need to be sensitive to constituencies' policy preferences, which are not always well-formed at the beginning of a policy debate. If their constituency speaks with one voice, the senators need to obey lest they be electorally punished (Sinclair 1982, Maass 1983, Kingdon 1989). If the senators' constituents are more at odds, the senators need to tread more carefully. Frequently, constituent opinion only crystallises when the issue has a full public airing. As such, early announcers run the risk of either being on the wrong side of their constituents' preferences or reneging (flip-flopping) on the issue.

The second arena for a senator's announcement of their vote intention is the Senate itself. In choosing to announce positions at the most opportune moment, members can either create momentum for the legislation or they can construct major roadblocks to its success. Early announcements help condition future announcements. Furthermore, as the pronouncements gather, the issue gains greater prominence inside and outside Washington, DC (Box-Steffensmeier *et al.* 1997, p. 325). Alternatively, if early announcements are not followed up with additional announcements, the issue is likely to lose momentum and subsequently stall in the legislative process.

All announcements, especially within the Senate, are not treated equally. Legislators need detailed information to make good decisions, yet the amount

of information available far exceeds a senator's time and ability to process it. As such, they rely on their colleagues to provide cues on how they should evaluate the legislation (Matthews and Stimson 1975, Kingdon 1989) or to offer incentives to vote in a particular way (Boehmke 2006). In arguing, 'the essence of legislative signaling is informational power', Krehbiel (1991, p. 99) formalises it as a game in which members who lack information turn to those colleagues who have more information to provide cues. He operationalises these cue-givers as the members who serve on the relevant committees. Based on the committee's actions, receivers make inferences about not only the substance of the bill, but also the prospects for the bill's disposition. These inferences help members update their beliefs, which may ultimately influence their final decision on the legislation. Members who face cross-pressure from their own parties and their constituencies are particularly sensitive to the early announcers and announcements. Furthermore, indifferent senators whose constituents are less concerned with the policy are likely to wait for key players to offer inducement by intentionally delaying their position (Boehmke 2006).

On an important and controversial issue, casting a vote is difficult. Deciding when to announce a position on the issue is even trickier. Early pronouncements showcase a senator's legislative acumen, which if correct enhances the senator's reputation within their state and among their colleagues. If the issue changes as it becomes more salient or if the member misreads either their constituents' or their colleagues' ill-formed preferences, early deciders can face the uncomfortable decision of reneging on their announcement (flip-flopping) or casting a vote that is either legislatively or electorally imprudent. If the process follows the predicted course, early announcers can influence undecided colleagues and enhance their reputations in their constituencies. If, however, the process strays from the predicted course, early announcers put their reputations at risk among both their colleagues and their constituents. Given the unpredictability of the legislative process, immigration reform in the 109th Congress is particularly well-suited to test the underlying dynamic of the timing of senators' public pronouncements. As it turned out, the debate over immigration in 2006 did not change so much that early deciders on either side were left out in the cold.

Modelling the Decision and the Timing of the Decision

Constructing a model to predict members' roll call votes is long-established terrain for political scientists. Modelling the timing of that decision, though, has not had nearly as long a history. Survival analysis can be used to examine how long it takes an individual to experience an event of interest. Duration analysis[9] sometimes invokes the language of 'failures' because it was developed to analyse medical treatments for diseases and 'respondent failure' became a euphemism for 'patient death'. In this study, the unit of analysis is the individual senator. The event of interest is the timing for a senator to state their position publicly on the bipartisan immigration reform bill. The duration of survival is the length of time between the introduction of the immigration reform debate to

the Senate of the 109th Congress and the public announcements by individual senators.

From the time that the House passed the immigration bill in December 2005, senators faced pressure to take a position on the bill. To measure the duration times for each senator, we examine newspapers, wire services, senator web pages, and *The Congressional Record* to find the first date on which a senator makes a clear indication of their vote choice on CIRA. We begin searching for a senator's position on the day after the final passage vote in the House (16 December 2005) and end at the last possible point at which the announcement could happen – the day of the final passage vote in the Senate (25 May 2006).[10] Given Chairman Specter's desire to start with a fresh bill after the House vote, we think it wise to start our search for public pronouncements at the same time so as not to rely upon earlier proclamations when the debate was less settled, though even those senators with pre-House vote announcements maintained the same position throughout the debate.

We use the Cox proportional hazards model because of the data generation process of the dependent variable, which in our analysis is the hazard rate of taking positions on CIRA. Nothing in the legislative debate suggests that the hazard rate will necessarily monotonically increase or decrease *over time*. Box-Steffensmeier and Jones (2004) warn that few strong theories in social science suggest whether the hazard function is monotonically increasing or decreasing, or non-monotonically shifting over time. Under the condition of ambiguity, the Cox proportional hazards model is preferred.

The Cox proportional hazards model leaves the baseline hazard function unspecified as it estimates the *hazard ratios* between the observed hazard rates and the baseline hazard function. This proportionality assumption of the model permits analysts to estimate the hazard ratios without restricting the baseline hazard function (Singer and Willett 2003, Box-Steffensmeier and Jones 2004). This assumption, however, can easily be violated in a model that includes time-varying covariates. Values of a time-varying variable differ over time recording an individual's potential changing on each associated measurement occasion (for example, senators' daily or weekly job approval evaluated by their constituents).[11] In addition to the almost insurmountable difficulty to record the changing values for each unit of analysis at every failure time, it is very likely that the value of a time-varying predictor for individual i at time t_1 depends on the value for i at t_0. This time dependence further complicates the computation process and estimation of the Cox proportional hazards model. In Cox proportional hazards models, even if the value of a predictor does not vary over time, its effects on the hazard ratios may still differ over time.[12]

The above caveats of applying the Cox proportional hazards model, however, do not exist in our study. In this duration model of senators' position-taking timing, independent variables such as demographic factors are drawn from the aggregate data, which usually stay the same during a single election cycle. Individual senators' political factors, such as ideology and party affiliation, and the

Figure 1. Date of Vote Intention Announcements
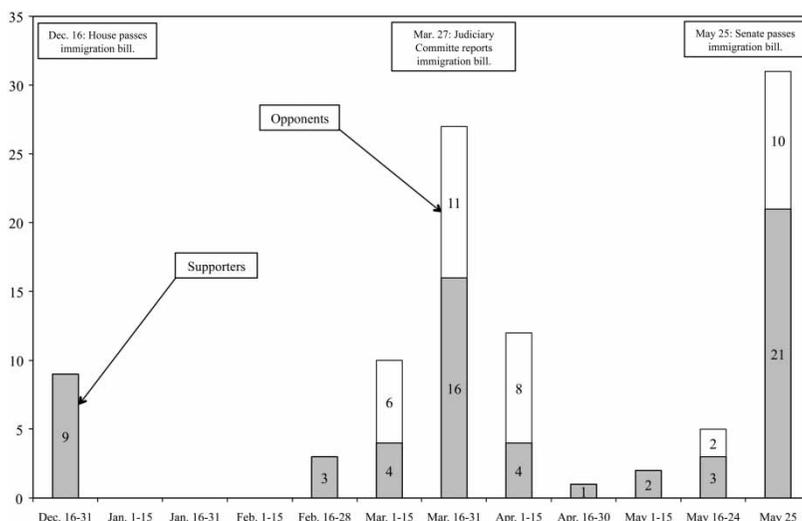
political structure, such as leadership and committee membership, barely change within an election cycle either. The result of the test on the proportional hazards assumption strengthens our confidence in applying the Cox proportional hazards model, for we find no violation of the proportionality assumption (results shown in the Appendix).

We present the pronouncements distribution by month in Figure 1. The nine senators who made their announcements after the House's passage of H.R.4437 were all long-time advocates of comprehensive reform on immigration – they had earlier signed up to a bipartisan reform effort led by Senators Kennedy and McCain. The 27 announcements in the second half of March coincide with the Judiciary Committee's report of the CIRA bill to the Senate floor. Finally, 31 senators made their announcement only with their final passage vote on 25 May 2006.

The Independent Variables

Just as a variety of independent variables should predict the senators' positions, we expect a variety of factors to predict the timing of senators' public pronouncements. We present 10 independent variables that we break down into two groups – constituency pressures and institutional considerations. In this section, we outline our hypotheses on the decisions of how to vote and when to announce that vote intention. The following section presents the results from our data analyses.

Constituency Pressure

Members of Congress, who single-mindedly seek re-election (Mayhew 1974), are keen to represent their constituents' interests. Although the full characterisation

of the constituencies is complicated and multi-dimensional, especially where immigration is concerned, it can be approximated by several different independent variables. First, in the case of CIRA, the presence of the US–Mexico border makes immigration reform more salient for both the senators and their constituents. Border state status, though, does not necessarily point in any one policy direction. Conservative politicians would treat the border as a potential threat that needs to be managed. On the other hand, liberal politicians would treat the border as an opportunity that can be mutually beneficial to both countries. Border state senators, then, are pulled in different directions. In these cases, senators, rather than vacillating between opposing groups, usually align themselves with one segment of their constituency (Fiorina 1974). While the presence of the border muddles the policy direction for the senator, it does not muddle the salience of the issue. Border state residents would expect their senators to be leaders on immigration issues, whether to protect the homeland or to reunite families. As such, border state senators should be first announcers in the immigration reform debate.

Second, the proportion of Hispanic constituents should play an important role in determining senator behaviour in the immigration debate. A high proportion of Hispanics in a state should both propel a senator to support the reform efforts and to take an early position.[13] As with the presence of the border, a high percentage of Hispanic constituents should indicate a high salience for immigration issues. Constituents with high salience on an issue should expect their senators to be early announcers. Senators, in an effort to placate Hispanic constituents, should support comprehensive reform, though this desire may be muted by the perceived threat of Anglo constituents (see Gimpel and Edwards 1999, Gonzalez and Kamdar 2000, Milner and Tingley 2008). The percentage of the Latino population in a state is based on the 2005 Census Bureau data.[14]

The third constituency-related variable is the socio-economic status of their constituents. Immigration increases economic resources for low-wage labour at the same time as causing competition among native workers (LeMay 1994, Citrin et al. 1997, Fry 2001). Consequently, states with lower income levels are anticipated to have senators who are less supportive of CIRA because immigrants compete with other low-wage residents. Consequently, poor state senators should be early announcers because of the higher salience immigration reform would have on their low-wage constituents. To measure the socio-economic condition of each state, we use the median household income based on the 2003 Census Bureau data.[15]

Fourth, the partisan makeup of a senator's constituency should have more influence on the final vote than on the timing of the senator's publicly stated position on the issue. A senator from a state with lots of Republican voters is expected to be against the passage of CIRA. While CIRA contained both conservative and liberal elements, the primary alternative to CIRA in the immigration debate was the conservative House-passed bill, which would, by comparison, render CIRA the more liberal alternative. We would expect that the clearer the

political direction of the state, the clearer the constituents' signal – or potential signal – for the senator. Therefore, we would expect the early deciding senators to be from overwhelmingly Democratic and overwhelmingly Republican states. To capture the political flavour of a state, we use the two-party vote share that Bush received in the state in the 2004 presidential election. To account for the intensity of constituent signals in the duration analysis, we include the square of the two-party vote for Bush to test the curvilinear relationship we expect on the timing of the announcement.

Finally, the 2006 November midterm election may play a role in the debate on immigration. Senators seeking re-election, depending upon their state, could be propelled in either direction on their CIRA vote. With respect to the timing of the decision, though, we would expect those up for re-election to take a position sooner than those who do not immediately face the voters for two reasons. First, constituents and the media have more opportunities to quiz senators, who are on the campaign trail, about their views. Second, early announcements suggest to the electorate that the senator is a key player in Washington, DC policy debates.[16] Although earlier decisions are riskier, especially in an election year, incumbents who avoid important issues are likely to face criticism at home.[17]

Institutional Considerations[18]

As Congress has become more polarised, the ideological standard bearers play a more important role in determining the frame through which policy debates are understood. As such, we expect the most ideologically extreme members to make the first announcements because of their clear preferences. Though we would like to include an independent variable measuring ideology in the final passage analysis, we are tied to only measures that are based on roll call votes. We do not think it is prudent to use votes to predict a vote. Thus, we do not include an ideology measure for the senators in the logit model. To operationalise extremism, we take the absolute value of the senator's DW-NOMINATE score (Poole and Rosenthal 1997), which is based on all non-consensual roll call votes and varies from -1 (very liberal) to 1 (very conservative).[19]

Second, to capture the effect of individual partisanship, we include an indicator variable (Republican as 1, other as 0). Because of the House-passed bill, again, we would expect Republicans to view the Senate's comprehensive effort more sceptically. The effect of member partisanship on the final vote is obscured because five out of the six primary CIRA sponsors were Republicans (Senators Brownback, Hagel, Martinez, Graham, and McCain joined Democratic Senator Kennedy). Because Democrats would view the House-passed measure and Frist's enforcement-only bill more sceptically, we would expect them to have an easier decision, propelling them to make earlier announcements.

Third, committees play an important role in the legislative process. Members seek committee assignments either to highlight their particular expertise or to curry favour with their constituents (Shepsle 1978, Fenno 1989). In Krehbiel's (1991) theory of legislative organisation, committees specialise to create the

incentives for reducing the uncertainty between policy alternatives and outcomes. Specialists harbour this expertise and can release it strategically either to propel or hinder legislation. Membership on the Judiciary Committee is important in two respects. First, when the committee reported the bill, it sent its signal in support of the bill, though not unanimously. Second, information released by the committee becomes a resource for other senators. Given the salience of such positions, members of the Senate Judiciary Committee have the potential to play the role of cue-giver. Together with declaring their positions at the best possible timing, a senator could create policy momentum among their colleagues. Thus, committee membership should compel members to take early positions in favour of the bill. While the Judiciary Committee has many other issues within its jurisdiction and while many other senators who do not serve on Judiciary have taken an active role in immigration policy, we think committee membership offers the most objective measure for immigration expertise.

Another important institutional factor is party leadership. Throughout the debate, leaders from both major parties were active in building the bipartisan coalition in favour of CIRA (Billings and Stanton 2006, Hulse and Swarns 2006, Orin 2006). We would expect party leaders to declare their positions earlier in order to provide useful and compelling cues to their colleagues. As

Table 1:   Hypothesised Effects on Pronouncement Timing and Final Vote

	Position Taking Timing	Final Vote (Supporting CIRA)
Constituency Pressures		
Mexican Border State	+	?
Hispanic/Latino	+	+
Household Income	+	−
Republican Voters	−	−
(Republican Voters)^2	+	n/a
Run for Re-election	+	?
Institutional Considerations		
Ideological Extremity	+	n/a
Republican	−	−
Committee Membership	+	+
Party Leadership	+	+

Table 2:   Summary Statistics of Continuous Independent Variables

Variable	Mean	Standard Deviation	Min.	Max.
Duration (days)	113	47	1	161
Constituency Pressures				
Hispanic/Latino (%)	9.04	9.48	0.90	43.40
Household Income ($)	43,172	6237	32,397	56,409
Republican Voters (%)	53.3	8.4	37	72
Institutional Considerations				
Ideological Extremity	0.44	0.17	0.02	0.95

such, party leadership is expected to have a positive impact on early position taking on the bill and in supporting its final passage.[20]

Table 1 summarises the hypothesised effects of the independent variables on the timing of position taking and the final vote. Table 2 presents the summary statistics of continuous variables. In the next section we describe and discuss our results.

Results and Discussion

This section analyses the results of our multivariate models for, first, the timing of the pronouncement on the comprehensive immigration reform act in the Senate, and, second, for the senator's final vote on the bill. Both models adequately predict the dependent variable. Although in both the duration and logit models, three variables achieve statistical significance, different dimensions of the constituency pressures and institutional consideration are in play.

The Timing of Position-taking on the Comprehensive Immigration Reform Act of 2006

The Cox proportional hazards model estimates *hazards ratios*, which we transform to *coefficients* of covariates by taking the antilog of the hazard ratios.[21] These coefficients are presented in column A of Table 3. As the dependent variable is hazard ratios, positively signed coefficients indicate higher hazard rates; in other words, lower survival probabilities. To be clear, a positively signed

Table 3: Estimates from the Duration and Logit Models Coefficients (Standard Errors)

	Column A: Pronouncement Timing	Column B: Vote Choice
Constituency Pressures		
Mexican Border State	−3.24 (0.95)**	−0.60 (1.94)
Hispanic/Latino	0.09 (0.03)**	0.04 (0.06)
Household Income	−0.00001 (0.00003)	−0.0001 (0.0006)
Republican Voters	−0.17 (0.20)	−0.10 (0.04)†
(Republican Voters)^2	0.002 (0.002)	
Run for Re-election	0.24 (0.29)	−1.45 (0.65)†
Institutional Considerations		
Ideological Extremity	0.90 (0.80)	
Republican	0.13 (0.32)	−2.19 (0.68)**
Committee Membership	2.96 (0.45)***	0.38 (0.76)
Party Leadership	0.76 (0.64)	
Constant		2.87 (3.54)
Log-Likelihood	−206.22	−42.08
χ^2	59.66	
Pseudo R^2		47.62
p < 0.001	<0.001	<0.001
N	100	100

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, †$p < 0.1$.

coefficient indicates that as the values of the independent variable increases sena-
tors are likely to make earlier pronouncements.

Rather than providing commentary on all of the independent variables'
results, we discuss the results in the two categories of independent variables.
First, the evidence for constituency pressures is mixed. Senators from states
with a higher density of Hispanics tended to make earlier pronouncements,
which was consistent with our hypothesis. On the other hand, border state sena-
tors were more likely to delay their position on CIRA, which was inconsistent
with our hypothesis.[22] A comparison of survivor functions of senators from
states bordering Mexico to those senators whose states do not border Mexico
reveals a clear gap for the first three months; after that, the remaining senators
acted similarly.[23] By and large, we did not find evidence supporting our other
constituency-based expectations – the socio-economic status of constituents,
the partisanship of the state, and seeking re-election did not systematically
affect the timing of senator's decision-making. In several instances, we suspect
that these variables did matter, but they mattered in opposite ways for different
senators. While one senator may have been encouraged to make an early
announcement because of their impending election, another senator up for re-
election may have tried to run away from the issue because of its controversial
nature. In the data analysis, these two motivations would, in essence, cancel
each other out, rendering the variable insignificant.

For institutional considerations, we find that committee members made
earlier pronouncements than their colleagues not serving on the Judiciary Com-
mittee, which is consistent with both Krehbiel's (1991) understanding of the leg-
islative process and, not unrelated, our hypothesis. We estimate that the hazard
for senators serving on the Judiciary Committee to announce their position is
approximately 19 ($=\exp(2.96)$) times the hazard for their counterparts.[24] By
the time the Judiciary Committee reported the bill to the floor, all committee
members had taken a position and, hence, the estimated conditional probability
of surviving was zero. While the vote to report the bill on 27 March forced the
committee members to take a position on the bill, many had done so even
prior to committee vote (or even the committee mark-ups). Fourteen of the 18
committee members revealed their position prior to the committee vote (the
last of the 14 did so on 16 March). Eleven senators who did not serve on the Judi-
ciary Committee also announced their position on the comprehensive effort prior
to the committee reporting the bill. So, while the legislative process necessarily
made the committee variable significant, it may have been so even without the
committee vote on 27 March.

Perhaps as a sign of the information conveyed by the committee vote, 34
senators announced their position within two weeks of the committee vote,
though only 18 members served on the panel. One of the 12 Democrats to
announce during these two weeks opposed the bill; the other 11 supported it.
Republicans were more split: 14 opposed it and eight supported it. This pro-
portion of support (0.36) closely mirrored the 40 per cent support that the

committee Republicans gave the bill. Five of the senators who announced in this two-week period had same-state, same-party senators on the Judiciary Committee. All five announced in the same direction as their already-decided-and-announced colleagues.

The other institutional considerations – senators' ideological extremity, partisanship, and party leadership – did not systematically affect the timing of their pronouncement. Again, we suspect that some cross-cutting motivations rendered these variables insignificant in the multivariate model. Though ideological extremity reflects clear signals, the senators must have their constituencies' best interest at heart. When ideological extremity is congruent with their state's partisanship, we suspect senators made early announcements, but when it was incongruent with their constituency, senators were likely to hold back from making an early pronouncement. Fine-tuning this hypothesis to take into consideration such interplay simply demands more from the data than they could provide.[25]

The Final Vote

Because the final vote model is a logistic regression, its coefficients, which are reported in column B of Table 3, are neither directly comparable to the coefficients for senator pronouncements nor easily interpreted. At best, a comparison of which variables achieve statistical significance can suggest the underlying systematic causes of the timing of announcements and the decision on the final vote. Because the dependent variable is coded as 1 if a senator voted 'yea' on final passage of CIRA, positive coefficients correspond to higher probabilities of supporting final passage as the variables increase in value.

Constituency pressures, as in the pronouncement model, have an important effect on the final vote. Interestingly, though, the variables that are insignificant in the pronouncement model are significant in the final vote model and vice versa. The less wealthy a state is and the higher proportion of Republican voters in the state, the less likely the senator is to vote for the bill. Logit coefficients can be transformed into probabilities enabling more straightforward interpretation. Unlike regular regression coefficients, the predicted dependent variable changes nonlinearly as the values of the other independent variables change. To measure the effect of the significant variables, we hold all other variables at their means and change only the variable of interest from one standard deviation below to one standard deviation above the mean. When we change a state from $37,000 median income to $49,000, the senator's probability of supporting the bill increases from 0.60 to 0.86. Because of the importance of party in determining the senator's final passage vote, we evaluate Republicans and Democrats separately. When the percentage of a Republican senator's Republican voters changes from 50.0 to 64.4, their probability of supporting the bill decreases from 0.62 to 0.27. When the percentage of a Democratic senator's Republican voters changes from 41.3 to 55.7, their probability of voting for final passage drops from 0.97 to 0.89.

The constituency influence is also contingent on whether the senator is up for re-election. Senators who would be facing the voters in just over six months were more likely to oppose the bill. Changing their status from 'not imminently facing the voters' to 'imminently', their probability of supporting the bill decreases from 0.83 to 0.52. This result lends credence to the conventional wisdom that it is safer to vote no on legislation that passes because it is easier to avoid blame.

The same relationship that exists with the constituency variables appears among the institutional variables – they matter, but not the same ones as in the pronouncement model. In the pronouncement model, committee membership was very important, but in the final vote model, it insignificant. Given that the committee's proportion of support (0.66) was similar to its parent chamber (0.62), this result it not surprising.

Partisanship, which did not have an effect on the timing of the announcement, had an important effect on senators' final votes. Changing a Democrat into a Republican decreases their probability of supporting the bill from 0.91 to 0.53. Furthermore, the model could not estimate a coefficient for party leadership because all four party leaders supported the bill.

Conclusion

A cursory reading of the congressional literature would leave the impression that roll call votes are the only decisions that members face in the legislative process. While some good studies also analyse co-sponsorship, committee activity, floor speeches, and bill introductions (see, for example, Hall 1996, Kessler and Krehbiel 1996, Krutz 2005), they are vastly outnumbered by the articles that focus exclusively on roll call votes. We do not disparage the analyses on roll call votes – indeed, half of our analysis in this article is on roll call votes. We think that more information is needed to illuminate other parts of the process in order to grasp more fully how a bill becomes a law.

When senators take a final passage vote, the outcome is usually not in doubt. It is the days, weeks, and months leading up to the vote that typically forecast the chamber's ultimate disposition of the legislation. The announced support and opposition by key senators clarify the vicissitudes inherent in the legislative process. These announcements, both pro and con, dictate the dynamics that shape the bill's final outcome. We argue that a proper understanding of this process is key to understanding how the Senate works its will. To this end, we develop a duration model that captures the temporal nature of the legislative process in the Senate. In doing so, we draw from the signalling models and informational theory in legislative studies (Matthews and Stimson 1975, Kingdon 1989, Krehbiel 1991) and the dynamic model methods of Box-Steffensmeier *et al.* (1997).

We highlight three results from our analysis. First, committee members play a key – perhaps, determinative – role in shaping the bill's final outcome. Senators on the Judiciary Committee, with the expertise that comes with their position,

made earlier pronouncements than their Senate colleagues not on the committee. This result, while hardly surprising, provides quantitative support for Krehbiel's (1991) information theory of legislative organisation. Just as it should, the selective information revealed by the senators who know the most about the legislation largely dictates the path of the legislation and its ultimate disposition by the parent chamber. Although this result seems obvious, in a highly polarised Congress with an issue as toxic as immigration reform, it was not clear that the ideological warriors would hold their fire until the committee members announced their positions. In short, most did.

Second, the dual sets of results on the duration and the final vote models clearly demonstrate that the factors that influence the timing of senators' decisions do not necessarily affect the final vote choice or vice versa. The timing of position taking on a controversial issue reflects the dynamic process from the earliest stage of a bill to the final floor vote. The final vote reveals information related to policy preferences: support or opposition to a bill. Both are parts of the legislative process, but have fundamentally different systematic causes.

Third, the senators' constituencies matter at both stages of the process, though different aspects mattered at different times. States with a higher proportion of Hispanics had senators that made earlier pronouncements, while senators that bordered Mexico delayed their announcement most likely because they experienced the most cross-pressure. To some degree, this confirms Gomez's (2001) conclusion that members of the House of Representatives were affected more by the informative behaviour of their colleagues than by the information derived from their electoral constituencies. However, neither the size of Hispanic population nor being bordered by Mexico systematically predicts a senator's final vote. Although senators with a higher proportion of Republican voters were no more likely to make early announcements, they were much more likely to oppose the bill's final passage.

We conclude with one methodological reminder and one suggestion for further investigation. First, Cox proportional hazards models are not preferred in terms of prediction. One common difficulty is that the baseline hazard function in the Cox proportional hazards model is closely adapted to the observed data (Box-Steffensmeier and Jones 2004). Also, due to the flexibility of the unspecified baseline hazard function, if researchers are interested in the specification of the time dependency, parametric approaches are usually preferred over the Cox proportional hazards model.

The survival analysis using the Cox proportional hazards model, however, sheds some light on the understanding of the temporal dynamic in the legislative process. The results presented in this article suggest that the baseline hazard function appears to be monotonically increasing and the survival function monotonically decreasing. In such cases, parametric approaches can be used to estimate the hazard function and survival function.

Further research may want to investigate multiple or repetitive announcements from the same senator. When a senator repeatedly announces or changes

his or her positions on a single issue (which did not occur on this issue in this year), senators must be responding to either a change in the internal dynamics inside the Senate or a change in the external dynamics of their constituents. We assert, with only the memory of 2004 Democratic Presidential Candidate John Kerry wind surfing with his words 'I voted for it before I voted against it' reverberating, that such flip-flopping is dangerous. Further analysis should investigate the causes and consequences of such action. At a minimum, more research should investigate the announcement of such decisions to see which of our findings are consistent across issues and which are specific to the Comprehensive Immigration Reform Act of 2006.

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Notes

1. For some good examples of political studies that have addressed the temporal dimension of decision-making, see Box-Steffensmeier *et al.* (1997, Jones (2003), Caldeira and Zorn (2004), and Boehmke (2006). For a seminal article on the temporal importance of voting decisions, see Fenno (1986).
2. Only Jones (2003) has applied this analysis to the US Senate; the other studies cited in note 1 all analysed the US House.
3. For example, *International Migration Review* designated its spring issue as a special edition on the 'The Puerto Rican Experience on the United States Mainland' in 1968. An earlier example is *American Immigration Policy, A Reappraisal* edited by Bernard and the National Committee on Immigration Policy (1950).
4. Polling numbers come from a Fox News/Opinion Dynamics Poll in the field, 16–18 May 2006; see http://www.pollingreport.com/immigration.htm (accessed 24 July 2008). These poll results are consistent with a flurry of results published around the same time. Polls taken during 2009 do not present a more unified vision. In fact, the only thing that is clear from more recent polls is that more Americans than ever think the system is broken (see, for example, the ABC News/Washington Post Poll, in the field from 21 to 24 April 2009. Available from: http://www.pollingreport.com/immigration.htm (accessed 6 August 2009).
5. As summarised by US Citizenship and Immigration Services, the IRCA of 1986 was 'passed in order to control and deter illegal immigration to the United States. Its major provisions stipulate legalization of undocumented aliens who had been continuously unlawfully present since 1982, legalization of certain agricultural workers, sanctions for employers who knowingly hire

undocumented workers, and increased enforcement at US borders', while the Immigration Act of 1990 'increased the limits on legal immigration to the United States, revised all grounds for exclusion and deportation, authorized temporary protected status to aliens of designated countries, revised and established new nonimmigrant admission categories, revised and extended the Visa Waiver Pilot Program, and revised naturalization authority and requirements'.

6. Bush's emphasis on an immigration reform was to provide guest worker visas to illegal immigrants, which faced conservative opposition within his own party (see Hendricks 2005). Although the inclusion of immigration issues to his 2000 and 2004 State of Union Addresses implied that Bush saw immigration reform issues as one of his priorities, his influence with Republicans had ebbed with the decline of his approval ratings (see Martinez 2005 and Rutenberg 2006).

7. 'Mark-up' is the process by which congressional committees and subcommittees debate, amend, and rewrite proposed legislation.

8. The *Congressional Record* is substantially a verbatim account of the remarks made by senators and representatives while they are on the floor of the Senate and the House of Representatives.

9. We use the term of 'survival analysis' and 'duration analysis' interchangeably in the article.

10. Although several senators announced their advocacy of comprehensive reform even before the House voted on their bill, we opted to begin our search only on the day after the House passed their bill because the House passage sufficiently shifted the immigration debate. For similar reasoning, the Judiciary Chairman, Arlen Specter, also started the process anew in his committee.
    Only two senators, Jay Rockefeller and Ken Salazar, missed the final passage vote. Salazar was an early proponent of comprehensive reform and announced fairly early on that he would support the comprehensive bill. Rockefeller, who missed the vote because he was recuperating from surgery, announced, for the first time on the day of the final passage vote, that he would have voted 'no' on the bill had he been in the chamber. We have left both of them in our analysis, though their exclusion does not affect either our duration or cross sectional regression analyses.

11. For a survey of various types of time-varying predictors, see Singer and Willett (2003, section 5.3.4, pp. 177–179).

12. Unlike Gordon's observation on the position switch of 34 House Representatives in the passage of NAFTA (2002), we did not see any senator announce a position which clearly contradicted their own previous pronounced position. Our focus is on the timing of when a senator publicly announced their position on CIRA (that is, experiencing failure or not). In addition, though a senator may take a position due to pressure from party leaders, from their colleagues, or from their constituents, unfortunately we could not distinguish the exact reason that forced them to take a position on IRA. Therefore, we did not consider incorporating the alternative of competing risk in the modelling.

13. Economic competition and conflict is one major aspect of the literature on public opinion to immigration policy. For example, Burns and Gimpel (2000) find the potential adverse effects of immigration fall heaviest on individuals of low skill or education; Hood *et al.* (1997) find that those who believe a higher tax burden derived from growing numbers of Hispanics, and those who are concerned with increased job competition, strongly opposed increasing immigration.

14. Since one focal point of CIRA is the US–Mexico border, the percentage of Hispanics or Latinos reflects the size of the target population quite well. We used the statistics found under 'State & County QuickFacts' function on US Census Bureau webpage. This statistic is updated each year by the Population Estimates Program under the Census Bureau: http://factfinder.census.gov/home/saff/main.html?_lang=en (accessed 5 December 2007).

15. We use the statistics found under 'State & County QuickFacts' function on US Census Bureau webpage. This statistic is updated each year by the Small Area Income & Poverty Estimates Program under the Census Bureau to provide more current estimates: http://factfinder.census.gov/home/saff/main.html?_lang=en (accessed 5 December 2007).

16. Although we would also like to know how early announcements affect later announcements, unfortunately we are unable to measure this potential effect quantitatively. Whether early announcers exert influence on their colleagues' decision-making cannot be collected objectively, only by asking each senator whether his or her decision was influenced by another senator. Even through qualitative methods (for example, interview), senators might consciously or unconsciously pretend to be independent from their colleagues. Kingdon (1989) finds that colleagues provide an important cue for undecided representatives. Furthermore, Boehmke (2006) finds that behind-the-scenes lobbying by party leaders and the administration is likely to influence members.

17. Several of these constituency variables would be best operationalised as an interaction with party. For example, a Democratic senator who represents a state with a large proportion of Hispanics should be compelled to view comprehensive reform in a different light than a Republican senator with many Hispanic constituents. We wish we had enough data to include all these interesting and important interactions. When we include these and other interactions in our models, they are not statistically significant. Furthermore, they do not affect the statistical or substantive results for the other independent variables. As such, we have opted to leave these interactions out of the final model.

18. The changing climate within the Senate imposes structural pressure upon senators as well as offering incentives to them. Early deciders can help shape the final outcome by providing cues and inducements to their undecided colleagues. While earlier works show that announcements influence legislative content (for example, Boehmke 2006), few have explored its effect on position timing (the only exception is Gomez's 2001 within-chamber dynamics measures in analysing House Representatives' decision-making on NAFTA). Since the cumulative number of deciders is exactly the same as the counting process, which is isomorphic with the cumulative hazard (the quantity modelled in a Cox PH model), the time dependency of event occurrence is already well-captured in the Cox PH Model by allowing hazard to change at every time point. For the sake of parsimony, we decided not to include additional measure on the cumulative and relative certainty of whether the bill will pass or not in our model.

19. Downloaded from Keith T. Poole's website: http://voteview.com/dwnl.htm (accessed 18 December 2008).

20. For this analysis, we code Bill Frist (TN, Majority Leader), Mitch McConnell (KY, Majority Whip), Harry Reid (NV, Minority Leader) and Richard Durbin (IL, Whip) as 1, others as 0.

21. The Cox proportional hazards model permits the functional form of the baseline hazard function to be unspecified, which avoids a problem often confronted in parametric models. Estimates of fully parametric models are sensitive to model specification, whereas Cox models relax this requirement and estimate the hazard ratios instead. Intuitively, they let the data speak for themselves, though estimates of the baseline hazard and baseline survivor functions can still be retrieved if researchers are interested in the specification of the duration dependency or prediction beyond the sample. This article addresses the relationship between covariates and the duration time (that is, formally, the hazard rates), instead of the specification of the baseline hazard function or prediction. Therefore, the following demonstration only focuses on estimating the hazard ratios. In such models, the hazard function for the ith individual is:

$$h_i(t) = h_0(t) \exp(\beta' x) \qquad (1)$$

The ratio of the hazard function of the ith individual and the baseline hazard function can be expressed as:

$$\frac{h_i(t)}{h_0(t)} = \exp(\beta x_i) \qquad (2)$$

which demonstrates that the ratio is a fixed proportion across time. The duration times are parameterised as a set of covariates:

$$\log\left(\frac{h_i(t)}{h_0(t)}\right) = \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_k x_{ik} \qquad (3)$$

Since the baseline hazard function is unspecified, there is no constant term in (3). The constant term in most models is absorbed into the baseline hazard function, which is unspecified in Cox models. If there is no strong theoretical justification for any particular form of the baseline hazard function, Cox models are usually preferred.

The tied events in this study refer to the fact that multiple senators announced their positions on the same day. In standard Cox models, ranked values need to be unique. In real data, ties are inevitable. As a result, 'statisticians have developed several modifications to Cox's basic approach' (Singer and Willett 2003, p. 522). To avoid this problem, we use the exact partial-likelihood method (specifically, Efron approximation), which is the most compelling approach according to Singer and Willett. The exact likelihood method takes *all* possible orderings of

tied event times into account instead of arbitrarily assuming certain order by which observations experience the event. Under this approach, to calculate each tied observation's contribution to the partial likelihood, this value under all possible underlying orderings that might exist is evaluated. Since we reach almost the same conclusion using different approaches (Breslow, and Efrom) to handle tied events, we stick to the exact method. The Cox model's ability to adapt to data with tied events indeed is another advantage over parametric approaches (Box-Steffensmeier and Jones 2004).

In justifying our choice of the Cox proportional hazards model, we argue that our model 1) does not violate the independently and identically distributed (i.i.d.) assumption, and 2) examines the tackled hypotheses better than alternative models. Though one may suspect, for instance, that senators from border states share the same baseline hazard as compared to their counterparts, which leads to potential violation of a random variable being independently and identically distributed. The diagnosis of the proportionality assumption, however, shows no evidence. To validate our argument on this matter, we ran shared frailty models using partisanship, re-election, border states, party leaders, committee membership, and the directions of announcements (support or oppose) as filter variables, respectively. The results showed that the only significant difference only occurred between groups of committee members versus non-committee members. The shared frailty models, however, come with the trade-off that we would not be able to estimate the effect of committee membership on the timing of announcements. Methodologically, we did not employ shared frailty models because the big difference in size of subgroups (eight committee members compared to 92 non-committee members); substantively, the impact of committee membership on the timing of announcements is one of our central interests. Therefore, we choose to estimate the impact of committee membership directly to answer questions addressed in this paper.

22. Alternatively, we also try to use the percentage of language other than English spoken at home and that of foreign-born persons to indicate constituency characteristics. The results are similar to that using the percentage of Hispanic population. Therefore, for the sake of parsimony, we do not include those parts in the paper.

23. Comparison results are not shown in the text, but available from authors upon request.

24. Derived from equation (2) in note 22, the ratio of the hazard function of the ith individual and the baseline hazard function can be estimated by $h_i(t)/h_0(t) = \exp(\beta)$. Because this ratio does not depend on any other function of time, the effect of the predictor is constant over time.

25. We tried multiple operationalisations of this fine-tuning and none of them yielded better results than those presented in Table 3. We suspect that the results in the alternative specifications suffered from the low number of observations.

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Appendix: Test the Proportional Hazards Assumption and Regression Diagnostics

Applying the Cox proportional hazards model implies that we assume the proportionality assumption to be true. To validate this assumption, we save scaled Schoenfeld residuals, also known as partial residuals. Singer and Willet (2003, p. 578) give a clear description elaborating this concept: 'A Schoenfeld residual of a predictor, X, is calculated through the comparison between individual i's value of X to the "average" value of X among everyone still in the risk set when i experiences the event.'

For discussion on its reliability, Winnett and Sasieni (2001) present further investigations. We then use plots and 'estat phtest, rank detail' command in Stata 10.0 to test the proportionality assumption. First, from plots of scaled Schoenfeld residuals against time with a superimposed smooth summary, no non-horizontal trend is found. Second, literally to present the result of the test, Table A shows the simple correlations between scaled Schoenfeld residuals and time. As results appeared in the Appendix, we find no violation of the proportionality assumption.

We also compute Martingale residuals, Deviance residuals, and Score residuals to detect unobserved variation (For a survey of definition and specifics

Table A1: Correlation between Scaled Schoenfeld Residuals and Ranked Event Times

Explanatory Variable	ρ	p
Constituency Pressures		
Mexican Border State	0.13	>0.01
Hispanic/Latino	−0.13	>0.01
Household Income	−0.11	>0.01
Republican Voters	0.05	>0.01
(Republican Voters)^2	−0.05	>0.01
Run for Re-election	0.02	>0.01
Institutional Considerations		
Ideological Extremity	0.04	>0.01
Republican	−0.03	>0.01
Committee Membership	0.02	>0.01
Party Leadership	0.12	>0.01

Global Test: $\chi^2 = 8.65$, $p > 0.01$.

of these residuals, see Singer and Willet 2003, Section 15.4 'Regression Diagnostics', when fitting Cox models). These diagnostics strengthen the confidence in our findings. Though plots of residuals are not shown, they are available upon request from the authors.