

Models of Complex &/or Context-Conditional Temporal Dynamics

Hibbs' (1987) Model of Macroeconomic Performance & Mass Political Support (ch. 5)

Argument:

1. Policymakers control policies that can affect tradeoff between real and nominal economic-outcomes (e.g., unemployment & inflation), at least in the short term.
2. Partisan policymakers enact policies to curry favor w/ their core constituencies.
3. Core constituencies of the left are generally toward the lower ends of socio-economic hierarchies than are core constituencies of the right.
4. Aversions to real-relative-to-nominal bad outcomes are greater among the left's core constituencies than the same relative aversions among the right's core.

For example:

$$[(\text{UE aversion})/(\text{INF aversion})]_{\text{left}} > [(\text{UE aversion})/(\text{INF aversion})]_{\text{right}}$$

Constructing an Empirical Model of Presidential Approval to Estimate the Relative (Approval) Penalties Assessed by Republican, Independent, & Democratic Voters

From first principles: First, a model of individual's approval:

$$U^i = \beta'x^{*i} + \varepsilon^i, \quad U^o = \beta'x^{*o} + \varepsilon^o \quad (5.2)$$

Then, convert these random utilities for candidate i and o to probabilities approve:

$$\begin{aligned} P(Y = 1) &= P = P(U^i > U^o) && (5.3) \\ &= P[\beta'(x^{*i} + \varepsilon^i) > (\beta'x^{*o} + \varepsilon^o)] \\ &= P[\beta'(x^{*i} - x^{*o}) + (\varepsilon^i - \varepsilon^o) > 0] \\ &= P[\beta'x^*\text{diff} + \varepsilon > 0] \\ &= F[\beta'(x^*\text{diff})] \end{aligned}$$

I.e., the probability an individual approves is cumulative-distribution(ε) up to $\beta'x^*\text{diff}$.

Not sure if it helps, but no one shows this kind of figure any more. Here's one way to see what your logit or probit is doing in converting $\beta'x^*$ diff to a probability:

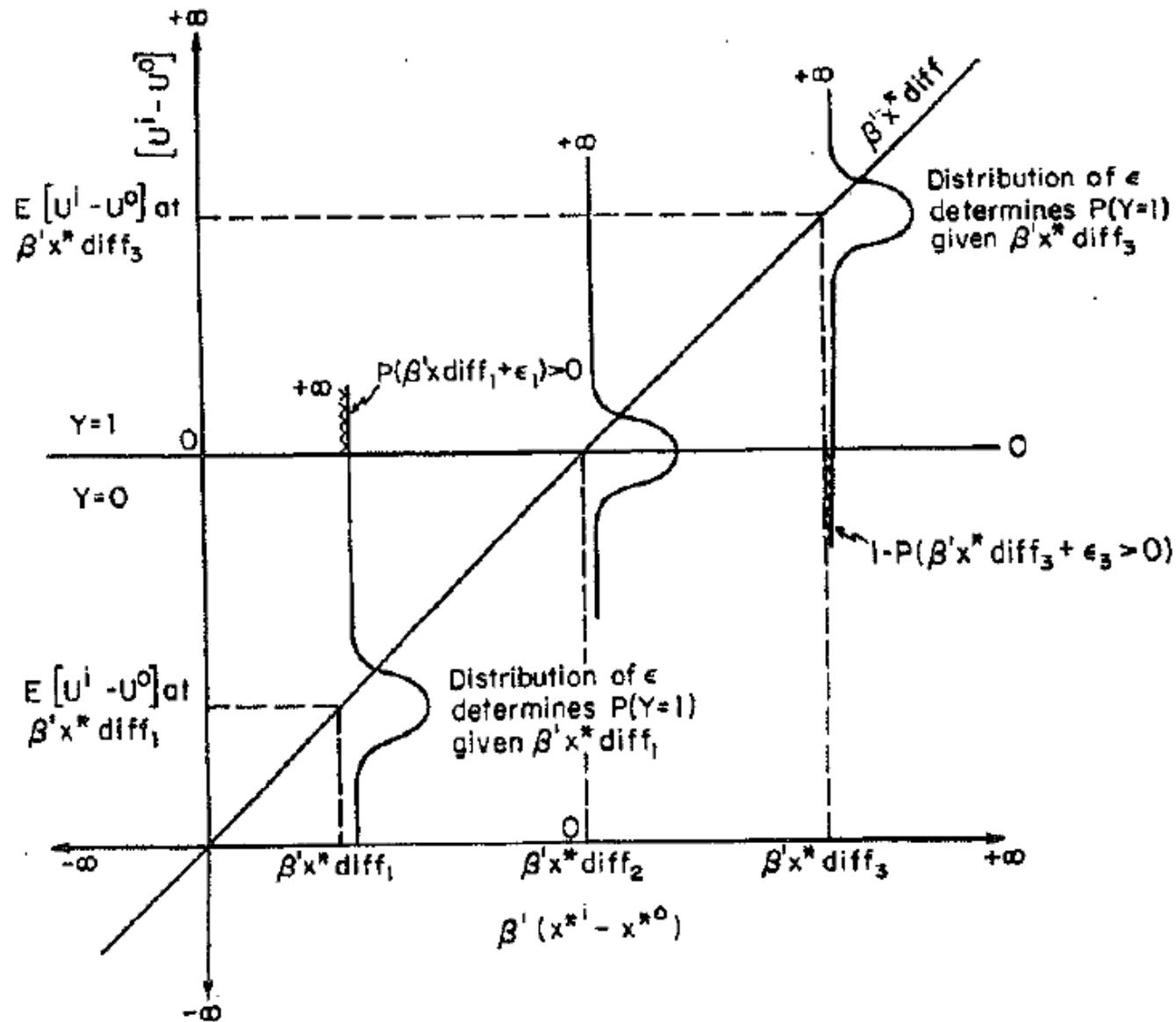


Figure 5.1 Binary political choices ($Y = 1, Y = 0$) under utility maximization.

Now, if ε is type-1 extreme-value (i.e., logistically) distributed, then the CDF is thus:

$$P(Y = 1) = P = \frac{\exp(\beta' x^* \text{diff})}{1 + \exp(\beta' x^* \text{diff})} \quad (5.4)$$

, and so:

$$dP/d(\beta' x^* \text{diff}) = P(1 - P) \quad (5.5)$$

As we've seen many times, we can plot this thus:

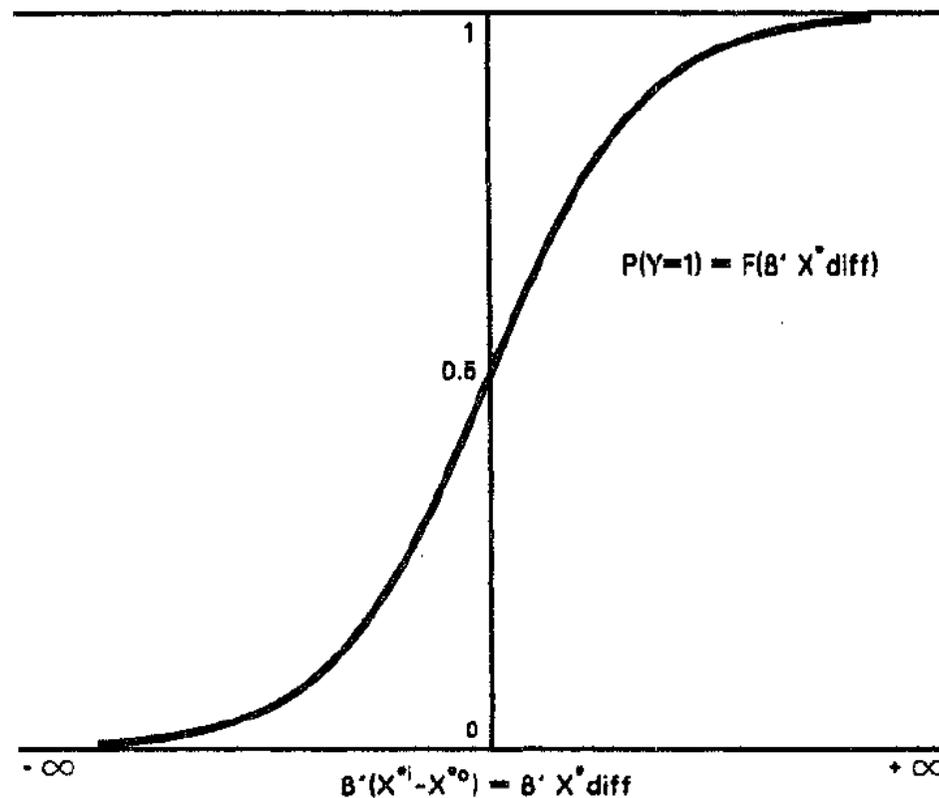


Figure 5.2 Choice probabilities $P(Y = 1)$ from the cumulative logistic func

Now, in a S.R.S. of respondents, we can aggregate simply: $\hat{P}_{jt} = \sum_{n=1}^{n_j} Y_{njt} / N_{jt}$, so

$$\hat{P}_{jt} = \frac{e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}}}{1 + e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}}} \Rightarrow \hat{P}_{jt} (1 + e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}}) = e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}}, \text{ noticing that } (1 + e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}}) = \left(\frac{1}{(1 + e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}})} \right)^{-1}, \text{ and that}$$

$$\frac{1}{(1 + e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}})} = 1 - \hat{P}_{jt}, \text{ we have that } \frac{\hat{P}_{jt}}{1 - \hat{P}_{jt}} = e^{\mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}}, \text{ and so that:}$$

$$\ln \left(\frac{\hat{P}_{jt}}{1 - \hat{P}_{jt}} \right) = \mathbf{x}'_t \boldsymbol{\beta}_j + \varepsilon_{jt}. \text{ V}(\hat{P}_{jt}) \text{ then follows from } \hat{P}_{jt} \text{ being estimated from}$$

$$\text{a binomial as } \frac{1}{N_{jt}} (\hat{P}_{jt})(1 - \hat{P}_{jt}).$$

Accordingly, Hibbs is going to estimate by feasible LS, with dependent variable $\text{Ln}[\% \text{Approving} / (1 - \% \text{Approving})]$, and weights $1 / \sqrt{\frac{1}{N_{jt}} (\hat{P}_{jt})(1 - \hat{P}_{jt})}$.

Utility Model has party-specific & administration-specific component, with weight w & $(1-w)$ on the party- & admin-specific to be estimated:

$$(U_t^i - U_t^o) = w \cdot (\text{Party}_t^i - \text{Party}_t^o) + (1 - w) \cdot (\text{Admin}_t^i - \text{Admin}_t^o) + \varepsilon_t \quad (5.9)$$

The party comparison component is assembled as a running tally, decaying at rate g , to be estimated, of outcomes, x , that enter positively when one party is in office and negatively when the other is:

$$(\text{Party}_t^i - \text{Party}_t^o) = D_t \cdot \sum_{k=0}^{\infty} g^k \beta' (x_{t-k} - \hat{x}_{t-k}) \cdot D_{t-k} \quad (5.10)$$

Analogously for administration's running tally against previous admins:

$$(\text{Admin}_t^i - \text{Admin}_t^o) = \sum_{k=0}^{\infty} g^k \beta' (x_{t-k} - \hat{x}_{t-k}) \cdot I_{t-k} \quad (5.11)$$

Finally, he can substitute these expressions to get:

$$(U_{jt}^1 - U_{jt}^0) = \beta_j' \sum_{k=0}^{\infty} g_j^k [w_j \cdot (D_t \cdot D_{t-k}) + (1 - w_j) \cdot I_{t-k}] \cdot x_{t-k} + S_{j(t)} + \epsilon_{jt} \quad (5.13)$$

where the $S_{j(t)}$ can be shown to equal the “shadow outcomes”:

$$S_{j(t)} = -\beta_j' \sum_{k=0}^{\infty} g_j^k [w_j (D_t \cdot D_{t-k}) + (1 - w_j) \cdot I_{t-k}] \cdot x_{t-k} \quad (5.12)$$

but now he’s just showing off, because really those are just going to be administration-specific intercepts to estimate: some inherent appeal of each President to each group. The final estimation equation is:

$$\begin{aligned} WT_{jt} \cdot F^{-1}P'_{jt} &= WT_{jt} \cdot \ln[P'_{jt}/(1 - P'_{jt})] \\ &= WT_{jt} \cdot \left(\sum_{k=0}^{\infty} g_j^k \beta_j' [w_j \cdot (D_t \cdot D_{t-k}) + (1 - w_j) \cdot I_{t-k}] \cdot x_{t-k} + S_{j(t)} + e_t \right) + \alpha_j \end{aligned}$$

He actually errs here: the constant should be inside (\cdot) to be weighted also.

In words, the final product is:

$$\begin{aligned} \ln[\% \text{ Approving} / (1 - \% \text{ Approving})] = & \dots \\ & +w \times (\text{Cumulative, Discounted, Relative Incumbent-Party Performance}) \\ & + (1-w) \times (\text{Cumulative, Discounted, Relative Administration Evaluation}) \\ & + \text{Fixed Administration-Specific Advantage/Disadvantage} \dots \end{aligned}$$

More formally:

$$\begin{aligned} Y = \ln(\text{Approval}\%) - \ln(1 - \text{Approval}\%) = \\ \dots + w * b * \{ \sum g^k (D_t D_{t-k}) X_{t-k} \} + (1-w) * b * \{ \sum g^k (I_t I_{t-k}) X_{t-k} \} + S \dots \end{aligned}$$

w vs. **(1-w)** estimates degree to which respondents evaluate presidents on basis of their party's cumulative performance relative to the opposing party's, discounted, vs. evaluate presidents by their administration's cumulative performance relative to all other administrations, discounted.

g estimates the rate at which past performances, both of this president & of comparison group (past presidents of other party or past presidents), are being discounted by voters ("fade out of memory").

DD term simply indicates whether this quarter & *k* quarters ago had presidents of same party. If so, that past performance adds to the cumulative party-evaluation; if not, that past performance detracts from it.

II term analogously indicates whether quarter *k* periods ago had current president (adds to cumulative performance) or a previous one (subtracts from it).

X terms are just all the different factors on which presidents are thought to be evaluated: *Vietnam, Rally Events, Watergate, Inflation, per capita real Y^{disp} growth, Unemployment, Energy Prices...*

S term is some fixed unique characteristic of each president. Hibbs calls this the "shadow" evaluation of the hypothetical opponent, but acknowledges that in practice it contains a lot more than that.

Among Democrats, 1961.1-1984.1 (R²=0.98)

$$\ln[(\text{App})/(1-\text{App})] = \dots 0.985(\text{JFK}) + 0.652(\text{LBJ}) - 0.165(\text{RMN}) + 0.154(\text{GRF}) + 0.408(\text{JEC}) - 0.765(\text{RWR})$$

(0.042) (0.040) (0.034) (0.057) (0.037) (0.033)

$$+ .697 \{ \sum .834^k D_t D_{t-k} (-.084 \text{VIET}_{t-k} + .223 \text{RALLY}_{t-k} - .026 \text{WTRGT}_{t-k} - .028 \text{INF}_{t-k} + .011 \text{dRY}_{t-k} - .030 \text{UE}_{t-k} + .002 \text{OILP}_{t-k}) \}$$

(.021) (.005) (.003) (.007) (.001) (.001) (.001) (.002) (.0004)

$$+ (1-.697) \{ \sum .834^k I_t I_{t-k} (-.084 \text{VIET}_{t-k} + .223 \text{RALLY}_{t-k} - .026 \text{WTRGT}_{t-k} - .028 \text{INF}_{t-k} + .011 \text{dRY}_{t-k} - .030 \text{UE}_{t-k} + .002 \text{OILP}_{t-k}) \}$$

(.021) (.005) (.003) (.007) (.001) (.001) (.001) (.002) (.0004)

Among Republicans, 1961.1-1984.1 (R²=0.96)

$$\ln[(\text{App})/(1-\text{App})] = \dots -0.818(\text{JFK}) - 0.852(\text{LBJ}) + 1.43(\text{RMN}) + 1.45(\text{GRF}) - 0.554(\text{JEC}) + 1.44(\text{RWR})$$

(0.045) (0.045) (0.047) (0.070) (0.045) (0.055)

$$+ .748 \{ \sum .771^k D_t D_{t-k} (-.069 \text{VIET}_{t-k} + .290 \text{RALLY}_{t-k} - .017 \text{WTRGT}_{t-k} - .039 \text{INF}_{t-k} + .018 \text{dRY}_{t-k} - .025 \text{UE}_{t-k} + .0011 \text{OILP}_{t-k}) \}$$

(.033) (.012) (.005) (.010) (.001) (.002) (.002) (.004) (.0006)

$$+ (1-.748) \{ \sum .771^k I_t I_{t-k} (-.069 \text{VIET}_{t-k} + .290 \text{RALLY}_{t-k} - .017 \text{WTRGT}_{t-k} - .039 \text{INF}_{t-k} + .018 \text{dRY}_{t-k} - .025 \text{UE}_{t-k} + .0011 \text{OILP}_{t-k}) \}$$

(.033) (.012) (.005) (.010) (.001) (.002) (.002) (.004) (.0006)

Among Independents, 1961.1-1984.1 (R²=0.92)

$$\ln[(\text{App})/(1-\text{App})] = \dots -0.038(\text{JFK}) - 0.321(\text{LBJ}) + 0.476(\text{RMN}) + 0.891(\text{GRF}) - 0.089(\text{JEC}) - 0.019(\text{RWR})$$

(0.049) (0.052) (0.040) (0.072) (0.047) (0.038)

$$+ .783 \{ \sum .842^k D_t D_{t-k} (-.062 \text{VIET}_{t-k} + .246 \text{RALLY}_{t-k} - .020 \text{WTRGT}_{t-k} - .031 \text{INF}_{t-k} + .015 \text{dRY}_{t-k} - .015 \text{UE}_{t-k} + .0017 \text{OILP}_{t-k}) \}$$

(.028) (.007) (.003) (.001) (.001) (.002) (.001) (.002) (.0005)

$$+ (1-.783) \{ \sum .842^k I_t I_{t-k} (-.062 \text{VIET}_{t-k} + .246 \text{RALLY}_{t-k} - .020 \text{WTRGT}_{t-k} - .031 \text{INF}_{t-k} + .015 \text{dRY}_{t-k} - .015 \text{UE}_{t-k} + .0017 \text{OILP}_{t-k}) \}$$

(.028) (.007) (.003) (.001) (.001) (.002) (.001) (.002) (.0005)

Conclusions

- Obvious partisan pattern to “shadow evaluations” of each president
 - Dem’s like Dem’s, Rep’s like Rep’s—(in addition to differential responses to other vars)
 - There is on average a net pro-Republican presidential edge of about 9%
- Lag structure [...what are its substantive implications here?]
 - Relatively homogenous across D, R, I groups; approx. = 0.82
 - Decay Rate:
 - => about 18% of the total impact of each factor is felt immediately (within 1 quarter)
 - About 55% by 1 year, 80% by 2 years, 96 by 4 years.
 - Last quarter of 4-yr term weighted 24X as heavily as first; last year 11X as heavily as first.
- Weight on cumulative, relative, discounted, party performance relative to cumulative, relative, discounted, administration performance in evaluation of the president: [What does this mean substantively?]
 - Also relatively homogenous; 0.75 (but this excludes administration fixed effects, S)
- The Honeymoon Effect:
 - Natural result of the lag structure & the discounting of past evaluations
 - The estimates suggest that “honeymoons” are higher & decay more steeply in new administrations representing partisan shifts than for administration shifts within party
- See **Table 5.3** for some calculations of the impacts of non-economic variables
 - “Rally-Round-the-Flag Effects”: These primarily international events produce...
 - Bipartisan behavior in Washington,
 - Decreased media criticism of White House & Congress,

- Increased focus on president as C-in-C => an emphasis on national unity behind pres.
- Often regardless of “good” or “bad” news, int’l events improve president’s approval rating
- VIETNAM:
 - Severely hurt LBJ, also RMN but less b/c Dem’s disliked incumbents more for casualties
 - About 1000/quarter sustained for a year ==> -4.4% (from R’s) to -6% (from D’s) approval
- EVENTS:
 - Sizable impact of a typical international event [+4.5% (from D’s) to +6.9% (from R’s)]
 - Occur at rate of ±1.5/yr, but JEC hit by 5 events from 1979.4 to 1980.1 (Iran/Afghanistan)
 - Hibbs estimates these provided a +24% gain among Dem’s during the campaign, helping a previously weak JEC overcome a strong challenge from Ted Kennedy in the primary
 - Events receded in time for election, & JEC became first elected incumbent to lose re-election bid since Hoover lost to FDR.
- WATERGATE:
 - Coded here as series of “events”: each quarter during the scandal given a score from 1 to 3 depending on degree to which RMN personally implicated by revelations in that quarter.
 - From 1972:2-1974:3, RMN loses b/w 17%-21% approval from accumulation of revelations
- Pres. cut some, but not much, slack for prob’s arising in OPEC I/II energy-price
- PARTISAN DIFF’S in PRESIDENT EVALUATION on ECON. PERFORMANCE

<i>MARGINAL RATE OF SUBSTITUTION</i>	<i>PARTISAN GROUP</i>		
	<i>Democrats</i>	<i>Republicans</i>	<i>Independents</i>
<i>-(UE^{Gap}/Infl.)</i>	-1.1	-0.65	-0.49

- Independents’ evaluations are much more sensitive to all of these factors than D’s & R’s b/c their evaluation is usually more near the break-point between just approve & just disapprove. [Implications?]