Commitment Compliance in G-7 Summit Macroeconomic Policy Coordination

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Conventional wisdom suggests that the G-7 summit makes few substantive decisions and lacks effective monitoring and sanctioning mechanisms to enforce individual countries' commitments. However, evidence exists that G-7 countries do honor their commitments announced in summit declarations. In this article, I offer and test for the period from 1975 to 1989 several causal explanations for compliance with non-binding commitments dealing with inflation control: institutional constraints on monetary and fiscal policymaking, electoral politics, uncertainty, and reciprocity. Reciprocating behaviors, independent central banks, and high current inflation rates correlate positively with compliance over inflation-control commitments. In addition, there is some evidence that divided/coalition governments and uncertainty reduce compliance. Theoretical and policy implications of the findings are discussed.

Starting in 1975, the G-7 Countries\(^1\) have engaged each other in macroeconomic policy coordination at an annual summit. According to conventional wisdom, the G-7 summit serves merely as a photo opportunity for politicians. The institution is considered unimportant and ineffective in setting and achieving targets because country commitments, embodied in joint declarations, are

\(^1\) The G-7 refers to Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

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not binding and more important, no mechanism exists to monitor and sanction defection and noncompliance. This stands in contrast to the view of Richard Cooper (1994) that the summit is as important a mechanism for policy coordination as the IMF and the OECD. More perplexing is the finding by Von Furstenberg and Daniels (1992) in their quantitative analyses that the G-7 countries sometimes actually comply with their non-binding, non-enforceable commitments (Von Furstenberg and Daniels 1992). The puzzling question is, “Why?” What explains such “self-perpetuated” international cooperation?

Few studies have sought to examine different explanations to this question in a single analysis. In this paper, I examine and test several causal explanations of commitment-keeping by the G-7 countries over the issue of inflation control. In particular, I ask how factors associated with strategic interactions, such as reciprocity and uncertainty, and domestic politics affect international cooperation on the issue. Although by focusing on inflation control, I have to ignore linkages across various issues discussed at the summits. The benefit is a pooled time-series cross-sectional analysis of the G-7 countries' compliance behaviors over a salient and contentious issue.

Inflation has three major negative consequences (Mishkin and Posen 1997). It heightens market uncertainty about the outcomes of business decisions, affecting investment and economic growth. It increases allocation of resources to unproductive activities such as tax code dodges, reducing the resources available to the economy. And it leads to over-investment in financial activities because under high inflation, the demand for financial services increases. Hence, international collaboration to control inflation appears to be desirable. Moreover, international linkages in trade, capital, and exchange rate render national economic policies interdependent in their effects, producing positive or negative externalities for foreign economies; independent policy-making leads to sub-optimal outcomes and cooperation appears necessary for enhancing global welfare (Hamada 1976; Cooper 1985; Canzoneri and Henderson 1991; Turnovsky 1988). Currency substitution, expanding international financial markets and easier capital flows have worsened the consequences of non-cooperative behaviors. The optimal control of inflation cannot be achieved through unilateral actions and macroeconomic policy coordination is necessary in order to reduce negative policy spillovers (Cooper 1985).

However, policy coordination is difficult in a nation-state system of no central authority. In addition, policymakers face competing domestic goals between inflation and unemployment and between internal and external balance. Consequently, the cross-border economic interdependence is associated with conflicts of interest between home and foreign economies over desirable national policies. The problem is beyond free riding as typically the case in international cooperation, involving both domestic dynamics and international interactions. Hence, inflation control can be salient and contentious. It turns out to be the most
frequently discussed issue at the G-7 summits, appearing among the publicly announced G-7 undertakings at 12 summit meetings between 1975 and 1989 (Von Furstenberg and Daniels 1992). The issue provides an excellent opportunity to examine commitment keeping over time and across the G-7 countries.

The next section examines the economic and political significance of the summit inflation-control commitments and explains why compliance in itself is interesting and crucial. Section II discusses four explanations of compliance with international inflation-control commitments: institutional constraints on monetary and fiscal policymaking, electoral politics, uncertainty, and reciprocity. Section III describes concept operationalization, data, and the statistical model specification. Section IV presents the findings and Section V concludes with a discussion of theoretical and policy implications.

I. ECONOMIC INCENTIVE, POLITICAL COST, AND COMMITMENT COMPLIANCE

When summit leaders make commitments on inflation control, are those targets of economic and political significance? Looking at economics first, one finds no exact evidence about the percentage contribution by the summits to inflation control in either national or international economies. This should come as no surprise since even the effectiveness of economic policy has been the subject of debate. The G-7 summits are no exception (Garavoglia and Padoan 1994). However, it is unlikely that inflation targets by the G-7 summits have had no effect on national and international economies. If one asks what inflation performance would have been in the absence of the G-7 summit targets, the most reasonable answer would be that it would have been worse.

With developed, open economies interdependent upon each other, the seven countries hold enormous influence over the health of the world economy through their policies and interactions. A large literature in international economics shows that the lack of policy coordination generates sub-optimal outcomes for international economy as a whole (e.g., Hamada 1976; Cooper 1985; Canzoneri and Henderson 1991; Turnovsky 1988). The G-7 summit is regarded as providing an important mechanism for achieving welfare-enhancing macroeconomic policy coordination (Cooper 1994; Putnam and Bayne 1987).

In addition to facilitating economic cooperation, the inflation targets of the G-7 summits help to stabilize the international economy. International currency markets and investors always look to these summits for reassurances concerning the G-7 countries' resolve to fight inflation. As an assistant deputy minister at the Canadian Department of Finance said regarding the Tokyo summit's promise to

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1 For studies that suggest macroeconomic policy coordination may be counterproductive, see Rogoff (1985). For how uncertainty affects the assessment of welfare consequences, see Frankel and Rickett (1988); and Frankel, Erwin, and Rockett (1992).
fight inflation, "The markets are looking for re-affirmation of that policy agenda [from Tokyo]. The markets will take care of themselves if that re-affirmation comes through" (Morton 1994). In the absence of the G-7 summit pronouncements on inflation targets, market uncertainty will rise, making national economic management and international coordination more difficult. Taking cue from the summit pronouncements, investors penalize countries that pursue policies inconsistent with market expectations and summit targets. In the increasingly integrated capital markets, countries that pursue lax inflation policies find it difficult to attract investment. In sum, the effects of these summits on macroeconomic outcomes and micro-level market expectations pose "the G-7 paradox": even if the summit effectiveness is low and declining, its disappearance would cause severe consequences for the management of the international economy (Garavoglia and Padoan 1994).

To assess the political significance of the G-7 inflation targets, one needs to address a couple of questions: How important is inflation control politically? What political costs, domestic and international, do summit leaders pay for not complying with summit inflation targets? The costs of failing to control inflation can be high domestically for politicians (Putnam and Bayne 1987; Hibbs 1987). In Britain, the defeat of the Callaghan government in 1979 was due in part to its failure to check inflation. In Germany, the fight over inflation led to a new round of party politics that split the ruling coalition between the free-market oriented GDP and the more interventionist SPD, eventually costing Schmidt his office in 1982. In the US, Carter's failure to reduce inflation rates contributed to his loss in 1980 election to Reagan. In these instances when domestic pressures for inflation control are high, they are compatible with the G-7 commitments on inflation. Hence, noncompliance can disappoint voters, elicit criticism from political opponents, and lead to an erosion of support or even loss of office.

However, at times when domestic constituencies are not keen on inflation control, pushing politicians toward not living up to international commitments, G-7 leaders may still face international pressures for compliance. Though the commitments are not legally binding, these leaders do have concerns about international reactions toward noncompliance. A leader who reneges on G-7 inflation targets has to "explain why he hasn't done something he was expected to do, or why he has done something he wasn't expected to do" (Editorial 1989). The result is a decline in reputation though it is not necessarily a matter of dire consequences.

While international disapproval may be a slap on the wrist, a more important international cost of noncompliance is that it undermines a G-7 country's success in foreign affairs and international collaboration. Maull (1994) argues that for Germany and Japan, active participation at the G-7 summit is imperative, for it compensates their absence from the U.N. Security Council. Hence, noncompliance is likely to diminish a country's credibility and its role at an important international forum. In addition, almost all G-7 countries understand their
interdependence and the exigencies of collective action (Mauil 1994; Gilpin 1987; Cooper 1994). As Putnam and Bayne (1987, 101) point out, the US felt unable to keep up its policy of reflation from 1977 without parallel action by Germany and Japan. The welfare of the G-7 nations crucially depends on the policies of other countries. Only by acting together could they hope to secure their own interests. Therefore, regardless of domestic pressures, countries do pay a price internationally for noncompliance. The question is that if both domestic and international costs may affect compliance behaviors, can we determine their relative importance and whether they simultaneously make a difference? It is due to the presence of multiple causes that a multivariate analysis is required to control for confounding influences and avoid spurious findings.

What evidence indicates that policymakers adhere credibly and multilaterally to the G-7 agreements on inflation control? Henry Owen, President Carter's sherpa (personal representative), commented at the 1978 summit in Bonn that "the US agreed to give primary emphasis to fighting inflation, and in the view of our summit partners the President's November 1 decision on fiscal policy and his support of the Federal Reserve decisions on monetary policy represent a satisfactory fulfillment of that commitment" (Putnam and Bayne 1987: 96). Chancellor Schmidt decided at the London summit that it was important to help the U.K. bring its inflation rate of 18 percent down but not to comply with the UK's desire for other members to accept a bit more inflation (Putnam and Bayne 1987: 72).

Institutional changes in the G-7 summit also signify the significance leaders attach to this multilateral institution. Early summits involved only heads of state. However, at later meetings, other national decision-makers also started to participate, including finance ministers and the governors of central banks, rendering the coordination of fiscal and monetary policy much easier. The G-7 have strengthened rather then weakened their ability to implement their summit commitments (Schoettler 1997; Putnam and Bayne 1987).

This article focuses on agreement-keeping behaviors of G-7 summit participants. It is important to note that this emphasis introduces two weaknesses in the analysis that follows. Agreement making and keeping are mutually endogenous. Since summit occurs annually, the substance of agreements affects the ease of compliance, and compliance during the past year will affect the content of new agreements. The first weakness of focusing on compliance alone is the failure to address the intertemporal interdependence between agreement making and keeping. The second weakness is the possibility of underestimating the effects of the causal determinants on G-7 policy coordination because they may affect both compliance and agreement making.

However, looking at compliance should not bias the results systematically. As I explain in detail in the research design section, I adopt the summit commitment compliance measure created by Von Furstenberg and Daniels (1992). The measure is essentially the proportion of fulfilled commitment or ambition after
controlling for the trend inflation rate for each country and therefore, takes into account the confounding role of commitment making. In addition, there is no statistical evidence that the pattern of compliance is predominantly a function of the size of commitment and certain features of individual summit countries. In fact, the commitment ambition, together with unique country effects, can explain only 6 percent of the variations in the level of compliance, and they can not explain the change in the level of compliance at all.\(^3\) The explanations of compliance behaviors lie somewhere else, independent of the commitment size and unique country attributes.\(^4\) In the following section, I examine four theoretical explanations that draw upon previous studies in order to explain compliance with G-7 summit decisions regarding inflation.

II. THEORETICAL EXPLANATIONS OF SUMMIT COMMITMENT COMPLIANCE

Reciprocity

Reciprocity affects commitment-keeping behaviors of government leaders. Intuitively, what others have done in the past with respect to commitment-keeping will influence your willingness to cooperate and keep your commitments in the future. In the international relations literature, reciprocity is not only suggested as a possible solution to the problem of international cooperation in the absence of central authority (Keohane 1986; Martin 1993) but also shown to be a pattern in various types of interstate interactions (Goldstein and Freeman 1990; Goldstein and Pevehouse 1997; Pahre 1998). Two-country monetary or fiscal policy coordination is typically modeled as a Prisoners' Dilemma (PD) game, in which the dominant strategy for both players is to defect if the game is played only once (Hamada 1976; Cooper 1985; Turnovsky 1988; Canzoneri and Henderson 1991). However, Axelrod (1984) finds that in an iterated, N-person PD game, tit for tat (a nice strategy of reciprocity) is one of the most competitive equilibrium strategies, and makes cooperation likely.

Reciprocity may explain the continuation of cooperation in inflation control at the G-7 summits. As suggested by the PD game structure of macroeconomic policy coordination, states always face the temptation to free ride on the policy

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\(^3\) I estimate two models, in which the dependent variables are the level of compliance and the change in the level of compliance respectively. They are regressed on the commitment ambition of each country in inflation control target (computed as the difference between the trend inflation rate and the committed inflation rate) and the country dummy variables. The results show that commitment ambition is a statistically significant predictor of the level of compliance, but the model has only limited explanatory power with adjusted R square 0.06. In the compliance-change model, commitment ambition is not statistically significant, and the adjusted R square is actually negative. Hence, at least from a statistical point of view, commitment is not a dominant explanation of the compliance level, or even a useful explanation of the change in compliance.

\(^4\) I thank one referee for bringing this argument to my attention.
actions taken by other states. With respect to inflation control, the temptation is not irrelevant because international capital markets have not been seamlessly integrated and the increasing ability of investors to punish policymakers has remained limited. But since the G-7 summit takes place each year, the shadow of the future is long, encouraging summit participants to adopt reciprocity. Because the gains from policy coordination are hard to quantify in terms of its distributive effects, leaders will use some rather general rule to monitor the compliance behaviors of other states and adjust their own accordingly. Therefore, conditional reciprocation can be expected to explain the changes in compliance.

Uncertainty

Several scholars suggest that two types of uncertainty may affect the success of international economic policy coordination: strategic uncertainty and analytic uncertainty (Frankel and Rockett 1988; Frankel, Erwin, and Rockett 1992; Iida 1993; Bryant 1995). State leaders from different countries may have asymmetric information about each other's payoff or loss functions. They are not completely certain about the others' objectives. Such strategic uncertainty compels players to question the credibility of other players' promises in an agreement and creates an enforceability problem. When strategic uncertainty is high, reciprocity may not be chosen. States may prefer to defect and policy coordination is likely to fail at the agreement keeping stage.

Furthermore, state leaders may disagree with each other about how the world economy works and the effects of economic policies, generating analytic uncertainty about what is the optimal policy coordination. The lack of consensus on what policy to pursue may cause policy inaction or independent actions. From a welfare point of view, state leaders may fail to choose the best possible policy. From a strategic point of view, state leaders may end up choosing some non-equilibrium strategy and be worse off.\(^5\)

Downs and Rocke (1995) argue that international institutions are often designed and set up to reduce uncertainty in domestic politics and that once institutions are formed, the effects of uncertainty tend to be concealed. This logic is applicable to the G-7 summit. One reason the G-7 summit was initiated was to facilitate information exchange among the seven major economic powers about the world and national economies. This has two implications for my analysis. First, because the analysis begins after the G-7 summit was institutionalized, findings about uncertainty may underestimate the true size of its effects. Second, because the G-7 does not enjoy supranational authority, uncertainty in domestic

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\(^5\) One may argue that over time, leaders learn and analytic uncertainty may decrease. This plausible argument faces two problems. Government turnover prevents consistent learning accumulation, and structural changes in national and global economy make it difficult for leaders to agree on one true model.
politics does not just disappear after the creation of the G-7 summit. It should influence state compliance behaviors at the international level. Given the importance of both strategic and analytic uncertainty to the success of macroeconomic policy coordination, it is truly surprising to find that there is scarcely any systematic empirical effort to assess their impact over the G-7 policy coordination.

Electoral Motives of Summit Participants

G-7 summit participants are either the heads of state or the heads of government who are all democratically elected politicians. They remain in office only if they garner adequate electoral support. Therefore, when considering complying with any international commitment, they have an incentive to calculate the associated cost and benefit for the prospect of their getting reelected.

Previous studies (Lewis-Beck 1986; Powell and Whitten 1993) show that voters hold democratically elected politicians responsible for the management of national economy. A good economy increases the chance of winning reelection while a bad economy decreases the likelihood. The G-7 leaders must evaluate the current inflationary condition in the economy before deciding to comply with the summit policy goal. If domestic inflation is high, political pressures for its control are likely to be strong and the leaders will support the summit target of inflation control. Compliance, then, not only gives the politician something positive to talk about in public but also wins support from international counterparts. Therefore, the higher a country's inflation rate, the more likely it is to meet its summit inflation target.

For reelection-oriented politicians, the electoral calendar drives public policy output and creates policy cycles (Nordhaus 1975; Tufts 1978; Alesina 1995). The office-seeking motivation of summit participants suggests that their electoral horizons influence their incentives to keep international commitments. An inflation-control commitment from the G-7 meeting generally requires some domestic fiscal and/or monetary discipline, constraining the policy autonomy of summit participants in an election year. More important, inflation-reduction policies usually lead to economic contraction, potentially jeopardizing the chance of reelection. Of course, if the domestic inflation is high and the public demands its control, the politicians will take measures and seemingly abide by the agreement. However, ceteris paribus, during an election year, the summit participants are less willing to fulfill any international commitment on inflation control.

One may argue that the effects of the electoral cycle may be sensitive to institutional differences in electoral systems. Except for the U.S., election timing is

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* The literature on economic voting is voluminous, filled with puzzles about the inconsistency between aggregate analyses and individual-level survey-based studies and with debates on why people vote. For my analysis, it is sufficient to know there exists a general consensus that aggregate economic conditions do affect the electoral fortunes of politicians.
endogenous as an incumbent can call for an election whenever it wants, while in the U.S., election timing is exogenous for the U.S., with the presidential election held every four years. Although it is not clear how such differences in timing should affect commitment keeping, it may confound the effects of the electoral motives on compliance.

**Institutional Constraints in Monetary and Fiscal Policymaking**

Inflation control requires domestic discipline in monetary and fiscal policies. The making of these two types of economic policies depends on two institutional arrangements: the degree of central bank independence from the government and the type of government control over fiscal policy. Central bank independence has a significant impact upon price stability (Cukierman 1992; Alesina and Summers 1993). Central banks make monetary policy, but the level of discretion varies across the G-7 countries. An independent central bank is more likely to adopt contractionary monetary policy in the face of imminent inflationary pressures. Its independence helps to shape market expectations of the inflationary trend and renders more credibility to future monetary policy. In addition, it exerts much influence over the level of government spending since an independent central bank is unlikely to finance government deficit. Therefore, summit participants from states with independent central banks face an institutional environment more favorable to maintaining price stability as well as compliance with international promises on inflation control. Those facing dependent central banks, on the other hand, find it hard to resist domestic pressures for higher spending and to deliver their international commitments on inflation control.

The type of government oversight over fiscal policy also affects the commitment to control inflation. Government control over budgetary and tax policies can appear in one of two forms: divided or unified government under a presidential system, and coalition or single party government under a parliamentary system. Only one party controls the government either in the unified government under a presidential system or in the single party government under a parliamentary system; the divided government in a presidential system and the coalition government in a parliamentary system also resemble each other because in both cases, multiple parties share the governing power (Strom 1984; Alesina and Rosenthal 1995; Fiorina 1996; Laver and Shepsle 1996). When a party fails to control government by itself, the head of government faces institutional constraints from other parties, constantly balancing interests. Such power dispersion weakens the leader's control over fiscal policy instruments, the major tools applied to control inflation or promote growth. Political bargaining increases, more internal side-payments have to be made, and the ability to meet an international

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7 For a dissenting view, see Posen (1995).
inflation-control commitment is undermined. Conversely, a unified government under a presidential system or a majoritarian government under a parliamentary system is expected to be better able to fulfill such international commitments.

III. RESEARCH DESIGN

In this research, I am interested in testing different theories to explain governments’ adherence to G-7 summit decisions about inflation control. This section describes the operationalization of the variables and the statistical model specification.

Dependent Variable

The dependent variable is the change in a G-7 country’s compliance with its summit commitment to inflation control, i.e. (Commitment Compliance, \(_t\) – Commitment Compliance, \(_t-1\)). I gauge a summit country’s compliance with its commitment to inflation control with the measure created by Von Furstenberg and Daniels (1992). From the summit declarations between 1975 and 1989, they have identified 84 undertakings where the summit participants made commitments to inflation control.

Based on the committed inflation rates, a compliance measure is constructed.\(^9\)

\[
\text{(1) Commitment Compliance} = \frac{\pi_{\text{Actual}} - \pi_{\text{Nat}}}{\pi_{\text{Committed}} - \pi_{\text{Nat}}}
\]

where \(\pi_{\text{Actual}}\) is the actual inflation rate for a G-7 country over the 12 months following a summit, \(\pi_{\text{Nat}}\) is the linearly interpolated inflationary trend for a country over the 12 months following a summit, and \(\pi_{\text{Committed}}\) is the inflation rate a country is committed to at the summit.

Equation (1) measures in effect the proportion of fulfilled commitment after controlling for the trend inflation rate. The compliance score is bounded between +1 and –1.\(^9\) Positive 1 implies that a promised commitment to fight inflation is completely fulfilled and by symmetry, negative 1 suggests that the promised shift in the inflation rate goes in the wrong direction, an indication of complete non-compliance. The scoring formula rewards moving closer to the committed rate

\(^9\) Von Furstenberg and Daniels (1992) have constructed two measures of G-7 compliance, based on logistic function and linear interpolation methods. I choose the linearly interpolated compliance score for analysis. The logistic membership function score penalizes even small deviations from the commitments. Given that there is a lot of noise about the target variable of inflation control, such an assumption may not be realistic. Besides, the linearly interpolated scores are highly correlated with the logistic scores, with a correlation coefficient of 0.98.

\(^9\) The score is truncated to +1 or –1 if the value overshoots +1 or –1. For the rationale behind the truncation, see Von Furstenberg and Daniels (1992).
regardless the trend. In addition, if the actual inflation rate is lower than the trend, making an overly ambitious commitment (an extremely low inflation rate) actually earns a lower compliance score (a smaller positive compliance score). If the actual inflation rate is higher than the trend, making a small commitment (the committed rate is higher than desirable) also leads to a lower compliance score (in fact, a smaller negative compliance score).

Measuring Reciprocity

I create the following measure of relative compliance to capture the effect of reciprocity.

\[
(2) \text{Relative compliance}_{i(t)} = \frac{\sum_{j=1}^{6} \text{compliance}_{i,j}}{6} - \text{compliance}_{i(t-1)}
\]

where \(i\) denote any G-7 state, \(j\) denote any of the rest of the G-7, \(i \neq j\).

I assume that a G-7 country will decide what it is going to do in the current period, based on its observation of the last period compliance record of the other six countries. It compares its last period compliance record with the mean level of compliance by the other six countries. I examine how the difference between these two in the last period influences the change in state compliance in the current period, which captures the effects of reciprocity. If the difference between the mean for the rest of the group mean and one's own for the last period is less than zero, the country concludes that it has a better compliance record than the rest of the group. So in the current period, it will reciprocate the "noncompliance" of the other six by reducing its current period compliance relative to the previous period. If the difference is greater than zero, it perceives that it may have been free-riding the other six countries in the last period and according to reciprocity, it will increase the current period compliance over the previous period. If states adjust their compliance behaviors systematically according to their last period deviation from the mean for the rest of the group, it suggests that they do follow some type of reciprocity.

Measuring Strategic and Analytic Uncertainty

I use two measures to capture strategic uncertainty. One is the number of G-7 countries that hold elections in the year following a summit, and the other the number of G-7 countries with divided/coalition governments in the year following the summit. The former reflects the impact of the varying prospect of future interactions that is perceived by the summit participants. The latter measures the political or institutional constraint on the other summit participants' ability to deliver their commitments.

The more elections held, the shorter the shadow of the future expected, and the greater uncertainty the G-7 leaders have about who their future negotiating counterparts will be. Consequently, all else equal, they expect less compliance
from each other and will behave more opportunistically themselves. Similarly, when the number of governments controlled by multiple parties increases among the G-7 countries, more governments face institutional constraints in fiscal policymaking. This in turn reduces the credibility of the summit promises on inflation control and increases everyone’s likelihood of unilateral defection. Both variables reflect how uncertainty exacerbates the temptation to defect and worsens the enforcement problem.

Analytic uncertainty is hard to measure because no empirical measure of cognitive consensus is readily available. The measure created here is based on an auxiliary assumption about the relationship between ideology and cognitive beliefs. It assumes that government ideology correlates with cognitive beliefs about how national economy works. The political left is generally associated with Keynesian welfare state economic policies whereas the political right embraces the neoclassical economics. The degree of analytic uncertainty or consensus among the G-7 countries, then, can be measured by the magnitude of the ideological differences among the G-7 governments.

Several commonly used measures of government partisanship or ideology exist, including the left or right dichotomous measure (Alt 1985; Hibbs 1977), the percentage of cabinet portfolios held by the left or right parties (Lange and Garrett 1989; Alvarez, Garrett, and Lange 1991), and the left-center-right trichotomy (Castle and Mair 1984; Blais, Blake, and Dion 1993). A problem with these measures is that they are dichotomous or trichotomous and fail to capture the ideological shades within a government. I use a multiple-category measure of ideological complexion of government in Woldendorp, Keman, and Budge (1993). It measures the proportional shares of the left, center, and right parties in the government on a five point left-right scale: right wing dominance (1), right center complexion (2), balanced situation (3), left center complexion (4), and left wing dominance (5).

The measure of analytic uncertainty, then, is:

\[
(3) \text{Ideological disagreement}_{it} = | \text{government ideology score}_{it} - \text{median government ideology score}_{Gt} |
\]

where \( i \) denotes any G-7 state, \( G7 \) denotes all G-7 countries, and \( t \) denotes year.

The measure is the annual absolute-value difference between a government’s ideology score and the median government ideology score among the G-7 countries. If ideological differences produce cognitive differences, this measure represents the amount of analytic uncertainty or cognitive disagreement a G-7 country perceives between itself and the median position among all G-7 countries. It also assumes that if ideological beliefs converge among different governments, the convergence is more likely to occur toward the median position along the left-right ideological dimension rather than toward the two ideological extremes. High analytic disagreement will reduce the likelihood of compliance.
Measuring Electoral Motive of Summit Participants

I expect that the electoral motive of the summit participants correlate with the prevailing economic conditions and the electoral cycle. Specifically, the current inflation rate is the one-year percentage change in the GDP deflator between the month before each summit and the corresponding month of the previous year. It should be positively correlated to commitment compliance. Data are collected from Daniels (1993).

The electoral cycle variable is coded one if it is an election year for the summit participant and zero otherwise. Data are collected from Gorvin (1989). Summit participants facing election have a shortened shadow of the future and are less likely to comply.

Following the earlier discussion that the endogeneity of electoral timing may affect compliance, two dichotomous variables are created: endogenous election year (relative to endogenous non-election year), and exogenous election year (relative to exogenous non-election year). Both should be negatively associated with compliance, but there is no clear expectation of their differences.

Measuring Institutional Constraints on Monetary and Fiscal Policymaking

The measure of central bank independence is based on the aggregate index of legal independence and the actual turnover of central bankers in Cukierman, Webb, and Neyapti (1992). For each G-7 country, it is the sum of one minus the actual turnover of central bankers plus the aggregate index of legal central bank independence. As an institutional constraint on monetary policymaking, central bank independence is expected to enhance commitment compliance on inflation control.

Representing an institutional constraint on the fiscal policymaking, the divided/coalition government dummy is coded zero when single party controls the government and one otherwise. For example, the variable equals one if (a) in a presidential system, the President’s party fails to control at least one house of the legislature, or (b) in a parliamentary system, a coalition government other than a majoritarian single party government is in power. Data on this variable are collected from Mackie and Rose (1990). A divided/coalition government complies with the G-7 inflation targets less than a unified/single party government. Table 1 presents the descriptive statistics for the above variables.

Statistical Model Specification

The sample includes the G-7 countries from 1975 to 1989, a pooled time series cross sectional (TSCS) design. The statistical model specification is as follows.\(^\text{10}\)

\(^{10}\) The number of observations drops from 84 to 77 due to the construction of the dependent variable and reciprocity.
TABLE 1

DESCRIPTIVE STATISTICS

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Commitment Compliance</td>
<td>-0.027</td>
<td>0.908</td>
<td>-2.000</td>
<td>2.000</td>
<td>77</td>
</tr>
<tr>
<td>Relative Compliance</td>
<td>0.000</td>
<td>0.681</td>
<td>-1.162</td>
<td>1.672</td>
<td>77</td>
</tr>
<tr>
<td>Number of Elections</td>
<td>1.727</td>
<td>1.667</td>
<td>0.000</td>
<td>4.000</td>
<td>77</td>
</tr>
<tr>
<td>Number of Divided/Coalition Governments</td>
<td>3.273</td>
<td>0.755</td>
<td>2.000</td>
<td>4.000</td>
<td>77</td>
</tr>
<tr>
<td>Ideological Disagreement</td>
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<td>1.429</td>
<td>0.000</td>
<td>4.000</td>
<td>77</td>
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<td>Inflation Rate</td>
<td>7.533</td>
<td>5.230</td>
<td>0.270</td>
<td>22.650</td>
<td>77</td>
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<td>Central Bank Independence</td>
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<td>0.880</td>
<td>1.590</td>
<td>77</td>
</tr>
<tr>
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<td>0.502</td>
<td>0.000</td>
<td>1.000</td>
<td>77</td>
</tr>
<tr>
<td>Election Year</td>
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<td>0.434</td>
<td>0.000</td>
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</tbody>
</table>

(4) \( (\text{Commitment Compliance}_{it} - \text{Commitment Compliance}_{i_{t-1}}) = \)

\[ a_i + a_1 \cdot \text{Relative Compliance}_{i_{t-1}} + a_2 \cdot \text{Number of Elections}_{i_{t-1}} + a_3 \cdot \text{Number of Divided/Coalition Government}_{i_{t-1}} + a_4 \cdot \text{Ideological Disagreement}_{i} + a_5 \cdot \text{Election Year}_{i} + a_6 \cdot \text{Divided/Coalition Government}_{i} + a_7 \cdot \text{Central Bank Independence}_{i} + a_8 \cdot \text{Inflation Rate}_{i_{t-1}} + e_{it} \]

where \( i = 1, 2, \ldots, 7 \) denoting the G-7 countries, \( t = 1, 2, \ldots, 11 \) denoting summit years, \( a_i, a_1, a_2 > 0, a_3, a_4, a_5, a_6 < 0 \).

To control for the endogenous electoral timing, I estimate an alternative model in which the election year variable is replaced by an endogenous election year dummy and an exogenous election year dummy.

The pooled time series cross sectional (TSCS) design helps to uncover causal relationships persistent across time and over space. Despite such inferential advantages, the TSCS design involves potentially more serious assumption violations than the non-panel design in terms of heteroskedasticity, autocorrelation and contemporaneous correlation in the error term (Stimson 1985). The conventional estimation procedure is to use some type of feasible generalized least square (FGLS) estimator (Greene 1993), which may correct for state-wise heteroskedasticity, cross-state correlation, and within state autocorrelation in the error term. However, Beck and Katz (1995) find that if the number of time periods does not dominate the number of cross sections, FGLS estimates artificially smaller standard errors for the coefficients. They suggest that in a TSCS design with contemporaneous correlation in the error term, if the number of time periods is not three times the number of cross sections, the recommended estimator
is the OLS plus panel corrected standard errors (PCSE). Diagnostic tests of the
two models based on equation (4) show that groupwise heteroskedasticity and
serial correlation are not problematic, but there is evidence of the presence of
contemporaneous correlation. Hence, Ordinary Least Square (OLS) with panel
corrected standard errors (PCSE) is appropriate. In addition, multicollinearity
does not seem to pose a serious threat to statistical inference with the possible
exception of the number of divided governments.

Since compliance behaviors vary across countries and over summits, there
may be fixed effects unique to individual countries as well as years, confounding
the results. As a control for the possible systematic bias due to these specific
effects, a two-way fixed effects model is estimated and reported in Table 1,
including country and year dummies, with White robust standard errors. Of
course, one should exercise caution when interpreting results from the fixed
effects models. Given that the two-way fixed effects model soaks up a lot of the
variations in the dependent variable that should be captured by theoretically
meaningful variables, it is difficult to accept the statistically insignificant results
as strong disconfirming evidence. The robust findings from such models, how-
ever, deserve greater confidence.

\[ \text{The appropriate asymptotic covariance matrix for the OLS estimator is } \text{Var}[b] = \text{inv}(XX) \text{X} \Omega \text{inv}(XX), \text{where } X \text{ is the stack of } X_i \text{ and } \Omega \text{ is the block matrix, with } i,j \text{th block equal to } \sigma_i \text{. PCSE is a consistent estimator of } \text{Var}[b] \text{ by using } s_{ij} = e_i' e_j / T \text{ for } \sigma_i, \text{which corrects for correlation across the cross sections.} \]

\[ \text{For testing the presence of autocorrelation, the Durbin-Watson statistic is 2.00 and 2.20 for the two models based on equation (4) respectively. The null hypothesis that the autocorrelation coefficient is zero fails to be rejected at the } 1 \text{ percent level for both models. For testing heteroskedasticity, the Lagrange Multiplier test statistic is 6.67 and 6.71 with 7 degrees of freedom for both models respectively. The null hypothesis of state-wise homoskedasticity (equal variance), fails to be rejected at the } 5 \text{ percent level. For tests of contemporaneous correlation in the error term, the Lagrange Multiplier test statistic is 36.84 and 37.24 for the two models respectively. The hypothesis that the off diagonal elements of the disturbance covariance matrix are zero, or that no correlation exists, is rejected at the } 5 \text{ percent level. See Greene (1995) for a discussion of these tests.} \]

\[ \text{A referee raises concern about multicollinearity among variables such as the number of elections in the G-7 and the election year dummy. Although the correlation between the number of elections and the electoral year dummy is as high as 0.56, more formal tests of multicollinearity (such as the variance inflation ratio VIF and the conditional numbers) do not suggest their correlation has caused serious multicollinearity. While a variance inflation factor (VIF) above 10 is considered evidence of strong multicollinearity, the VIF is below 2 for all the independent variables. The matrix of variance decomposition proportions for the independent variables is also examined to check for the dependencies of the variances on the principal components, by looking at the conditional numbers reflecting the dependence of the independent variables. The two relatively high conditional numbers (both larger than 10) and the associated variance decomposition proportions indicate that the number of divided governments, central bank independence, and the constant may be involved in a competing dependency. Therefore, the statistically insignificant result for the number of divided governments may be an artifact of multicollinearity.} \]
IV. FINDINGS

Table 2 presents the statistical results for models of summit commitment keeping. All three models have reasonably good fit. The adjusted R square is 0.44, 0.43 and 0.57 for models (1), (2), and (3) respectively, showing that all three models explain a fair proportion of the variations in the dependent variable.

In model (1), relative compliance is statistically significant and in the expected direction. The G-7 country self-adjusts its commitment keeping behaviors according to its observation of the compliance by the rest of the group relative to its own in the last period. When relative compliance increases by one standard deviation, that is, when the average level of compliance by six other countries is 0.681 (see Table 1) higher than a country's own level of compliance in the last period, this country responds in the current period by an increase of 0.52 in its compliance level over last period. It is about 13 percent of the range between the maximum and the minimum values of the dependent variable—the change in compliance level.

The number of elections is statistically significant and in the expected direction. One additional country holding election reduces its compliance over last year by 0.161, about 4 percent of the maximum-minimum range of the dependent variable. As the number of elections increases, summit participants have greater uncertainty about who their negotiating partners might be, the shadow of the future shortens, and states comply less with their commitments. On the other hand, the number of divided/coalition governments is statistically insignificant.

Ideological disagreement is statistically significant at the 10 percent level and in the expected direction. When ideological disagreement increases by one standard deviation, it induces a decline of 0.09 in a country's current period compliance over last period, about 2.3 percent of the maximum-minimum range of the dependent variable. So, during the commitment implementation stage, ideological differences and the lack of cognitive consensus have a negative impact over the compliance of the summit participants. The finding is consistent with and provides empirical evidence for the argument in Bryant (1995) and Cooper (1994) that analytic uncertainty hinders international economic policy coordination.

The electoral motive, captured by the current inflation rate and the election year dummy variable, affects summit cooperation modestly. The current inflation rate is statistically significant and in the expected direction although the influence is small in magnitude. A 1 percent increase in the inflation rate increases its compliance over last period by 0.058. However, the election year variable is not statistically significant.\(^{14}\)

\(^{14}\) Facing a short-run tradeoff between unemployment and inflation, policymakers may sometimes reduce their compliance with inflation targets in favor of fighting unemployment. To examine this possibility, I estimate equation (4) including unemployment rate and using both the OLS with PCSE and the two-way fixed effects estimators. Unemployment rate is not statistically significant.
### TABLE 2
MODEL ESTIMATES OF CHANGE IN G-7 COMPLIANCE WITH SUMMIT COMMITMENTS TO INFLATION CONTROL: 1975-1989.

<table>
<thead>
<tr>
<th></th>
<th>Model 1*</th>
<th>Model 2*</th>
<th>Model 3*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reciprocity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Compliance</td>
<td>0.7644***</td>
<td>0.7636***</td>
<td>0.8055***</td>
</tr>
<tr>
<td>(0.1137)</td>
<td>(0.1128)</td>
<td>(0.1237)</td>
<td></td>
</tr>
<tr>
<td><strong>Strategic Uncertainty</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Elections</td>
<td>-0.1611**</td>
<td>-0.1610**</td>
<td>-0.0081</td>
</tr>
<tr>
<td>(0.0843)</td>
<td>(0.0843)</td>
<td>(0.1073)</td>
<td></td>
</tr>
<tr>
<td>Number of Divided/Coalition Governments</td>
<td>0.0248</td>
<td>0.0241</td>
<td>-0.1151</td>
</tr>
<tr>
<td>(0.1792)</td>
<td>(0.1793)</td>
<td>(0.1736)</td>
<td></td>
</tr>
<tr>
<td><strong>Analytic Uncertainty</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ideological Disagreement</td>
<td>-0.0651*</td>
<td>-0.0660*</td>
<td>-0.0248</td>
</tr>
<tr>
<td>(0.0417)</td>
<td>(0.0434)</td>
<td>(0.0432)</td>
<td></td>
</tr>
<tr>
<td><strong>Electoral Motive of Summit Participants</strong></td>
<td>0.0576***</td>
<td>0.0577***</td>
<td>0.0790***</td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>(0.0162)</td>
<td>(0.0163)</td>
<td>(0.0330)</td>
</tr>
<tr>
<td>Election Year</td>
<td>0.0263</td>
<td></td>
<td>-0.0034</td>
</tr>
<tr>
<td>(0.1959)</td>
<td></td>
<td>(0.1746)</td>
<td></td>
</tr>
<tr>
<td>Endogenous Election Year</td>
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<td>0.0191</td>
<td></td>
</tr>
<tr>
<td>(0.1971)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exogenous Election Year</td>
<td></td>
<td>0.0555</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.3574)</td>
<td></td>
</tr>
<tr>
<td><strong>Institutional Constraints in Economic Policymaking</strong></td>
<td>0.5330**</td>
<td>0.5288**</td>
<td>3.0901***</td>
</tr>
<tr>
<td>Central Bank Independence</td>
<td>(0.3057)</td>
<td>(0.3168)</td>
<td>(1.1966)</td>
</tr>
<tr>
<td>Divided/Coalition Government</td>
<td>-0.1693*</td>
<td>-0.1695*</td>
<td>0.1603</td>
</tr>
<tr>
<td>(0.1268)</td>
<td>(0.1268)</td>
<td>(0.2081)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.7734</td>
<td>-0.7657</td>
<td></td>
</tr>
<tr>
<td>(0.7259)</td>
<td>(0.7372)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>77</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.44</td>
<td>0.43</td>
<td>0.57</td>
</tr>
</tbody>
</table>

* ***p < 0.01, ** p < 0.05, * p < 0.1. All tests are one tailed.
* OLS estimates with panel corrected standard errors (PCSE) in parentheses.
* Two-way fixed effects model estimates with White robust standard errors in parentheses. The country and year dummies are not reported.
Finally, the dispersion of power over monetary and fiscal policymaking also matters to summit cooperation. The degree of central bank independence is statistically significant and in the expected positive direction. A one standard deviation increase in central bank independence leads to a rise in the compliance level over last period by 0.11, about 3 percent in the maximum-minimum range of the dependent variable. Similarly, the divided/coalition government variable is statistically significant at the 10 percent level and in the expected direction. Relative to a unified/single party government, the presence of divided/coalition government decreases a country's compliance over last period by 0.169.

Model (2) in Table 2 decomposes the election year variable in model (1) into endogenous and exogenous election year dummies. Neither variable is statistically significant. A joint F-test of the hypothesis that the parameters for both variables are simultaneously zero fails to be rejected. For other variables in the model, the results remain unchanged and robust to this new specification. Thus, this institutional difference in electoral timing does not make a difference to the G-7 compliance behaviors.

As a robustness check, model (3) presents the results for the two-way fixed effects model with year and country dummies and with White robust standard errors. Although the atheoretical fixed effects variables soak up a lot of the variations in the dependent variable, relative compliance, central bank independence and inflation rate still turn out to be statistically significant and in the expected direction. Their substantive effects, as reflected by the size of their coefficients, are stronger in the fixed effects model than in models 1 and 2. Not surprisingly, the number of elections, the ideological disagreement, and the divided government variables are no longer statistically significant because the dummy variables may have excessively soaked up variations in the dependent variable.

More on Reciprocity and State Compliance

The results from Table 2 show that reciprocity is an important determinant of summit cooperation. But they do not tell us about the patterns of reciprocity

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A referee suggests that the effects of the electoral cycle depend upon the nature of the government or coalition in power. A right government running on an anti-inflationary platform may over-comply before an election to cement its reputation. I test this claim with a dummy variable that equals one if a right-wing single-party government is in power in the year right before the election year and zero otherwise. The variable has the expected positive sign but is far from being statistically significant. I have also examined three empirical possibilities of this claim, using (1) the interaction between the right-wing single party government and the election year, (2) the interaction between the right-wing single-party or coalition government and the prior-to-election year, and (3) the interaction between the right-wing single-party or coalition government and the election year. None of the three variables is statistically significant. The results are not reported due to space limitation.
among the G-7 countries, that is, how often states engage in cooperation and retaliation in their reciprocated interactions. To answer this question, I transform the two variables of interest, i.e., the change in state compliance and relative compliance, from continuous into categorical and cross tabulate them. Each variable has three categories, +1 if greater than 0.05, −1 if smaller than 0.05, 0 if within the range from 0.05 to −0.05 to control for possible non-responses.\(^\text{16}\) The question of interest is how frequently a positive or negative value in relative compliance in the last period induces a positive or negative change in compliance in this period. Four possible types of interactions may emerge: positive-positive cooperative reciprocity, negative-negative retaliatory reciprocity, positive-negative free riding, and negative-positive altruistic cooperation.

Table 3 presents these interaction patterns. The upper left cell (+1, +1) means that a state follows cooperative reciprocation, and the lower right cell (−1, −1) means that a state follows retaliatory reciprocation. In addition, the upper right cell (+1, −1) and the lower left cell (−1, +1) correspond to free riding and altruistic cooperation. Interestingly, out of 77 cases, about 30 percent fall into the (+1, +1) cell with 23 observations, and about 33 percent fall into the (−1, −1) cell with 25 observations. The G-7 countries use cooperative reciprocity almost as often as retaliatory reciprocity. Reciprocating behaviors constitute 63 percent of the 77 cases. Neither free-riding nor altruistic cooperation is frequently observed. Overall, reciprocation seems to dominate the G-7 interactions.

\(^{16}\) The thresholds of 0.05 and −0.05 serve to control for the confounding influence of values close to zero. But the choice of these values is arbitrary. Sensitivity analysis of the cutoff values produces qualitatively the same results.
V. Conclusion

The continuation of international cooperation hinges on state compliance with commitments specified in international agreements. In this article, I examine why a conventionally considered weak international institution—the G-7 summit—is able to sustain coordination on inflation control and why the G-7 comply with their nonbinding summit commitments. I offer and test four explanations of such "self-perpetuated" international cooperation: domestic institutional constraints over monetary and fiscal policymaking, electoral politics, uncertainty, and reciprocity. The most robust statistical findings concern reciprocity, central bank independence, and the current inflation rate. Reciprocating behaviors, independent central banks, and high current inflation rates correlate positively with compliance with inflation-control commitments. In addition, there is some evidence that divided/coalition governments and uncertainty reduce compliance. These findings are of important theoretical and policy implications for the success of macroeconomic policy coordination. They not only reveal conditions under which states are more likely to comply with international inflation-control commitments but also inform us about how to design methods to promote compliance.

As shown in the analysis, reciprocity has substantively important effects, but both cooperative and retaliatory reciprocations are frequently invoked. By inducing cooperative reciprocity, we are likely to facilitate compliance and promote cooperation. However, countries also elapse into retaliatory reciprocity. Therefore, when is cooperative reciprocity more likely? First, states must know and agree on the extent of compliance or noncompliance by other countries in the past. Without such information and consensus, reciprocation is not likely to be made appropriately or considered as appropriate, which amplifies conflicts and uncertainty. Any efforts that transmit such information or provide accurate assessments of reciprocating behaviors are likely to enhance cooperative reciprocity. Second, cooperative reciprocity is easier to achieve when there is less need for retaliatory reciprocity or in other words, when states have less need for noncompliance. Here, it is important to turn to two other findings of the paper: domestic pressures for inflation control and central bank independence.

Intuitively, when countries simultaneously experience soaring inflation such as in a global crisis, they are more likely to comply with inflation-control commitments and achieve collaborative outcomes. However, when countries are at different stages of the business cycle, facing drastically uneven inflationary pressures, they will react differently toward international inflation-control commitments. Conflicts of interest are likely to ensue, together with retaliatory reciprocity and noncompliant behaviors. However, when the countries all have relatively independent central banks, it has benign consequences for compliance with international inflation-control commitments.

Central bank independence, by suppressing inflation within individual countries, diminishes the gap in their inflation rates, decreases the chance of
conflict of interest, and reduces the need for incompatible, domestically oriented policy adjustments. Therefore, the domestic institution serves as a useful filter. By reducing the demands for greater compliance and cooperation, independent central banks help to sustain and promote compliance and cooperation. Institutional changes that grant more independence to the central banks are likely to bring about successful coordination over inflation control.

From these findings, we may also glean some useful lesson about the promotion of international cooperation in general. If countries can make efforts to induce cooperative reciprocity and if they can design domestic safeguard institutions that reduce the need for demanding compliance, they are more likely to comply with their international commitments and sustain cooperation among themselves.

REFERENCES


Cooper, Richard N. 1985. "Economic Interdependence and Coordination of Eco-


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