Accounting for Economic Institutions:

How Independent Central Banks Affect Democratic Accountability*

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Abstract

The economic voting literature emphasizes that complex government structures lead voters to weigh the economy less in their voting calculus. While a number of institutional factors have been considered by the literature, these have largely been institutions that voters can directly punish through electoral mechanisms. However, there are numerous institutions that affect political and economic outcomes that voters have no means of punishing for bad results but that are directly dependent upon the choices of elected officials. In this paper, I consider how economic voting is affected by the level of central bank independence. Building from recent work by Duch and Stevenson (2008), I explore how the ability of politicians to change the institutional context through which their actions affect economic outcomes and, in turn, democratic accountability.

Introduction

How do institutions that cannot be directly punished by voters but that, nonetheless, affect economic outcomes affect democratic accountability? In particular, how is accountability affected by institutions, such as central banks, that have policy making authority delegated to them from elected politicians? Delegation of policy making authority to third parties may be problematic if voters hold politicians less responsible for outcomes at the ballot box after delegation than they did before. This reduces incentives for politicians to monitor the actions of the authorities to whom they have delegated responsibility. I argue that just such a situation may occur through the delegation of monetary policy to independent central banks. During bad economic times, politicians use their relationship with voters and the media to pass blame to the central bank. While such delegation may have some positive consequences for the economy, it can also reduce the strength of the relationship between politicians and their constituents. This provides an electorally driven explanation for politicians to increase the autonomy of their central banks.

Most theoretical and empirical research on electoral accountability, and economic voting in particular, has focused on the confusion of voters over whom to assign credit/blame between democratically elected entities. Very little has dealt with the impact of other types of institutions that might also be responsible for the outcomes that voters are interested[1]. Thus, we don't know if voters are taking these other institutions into consideration when making vote choices and, if they are not, we do not know why they are not.

In particular, central banks hold an important place in national economic outcomes since the collapse of Bretton Woods. The general movement from fixed to floating exchange rates in most western democracies and the increased ease of moving capital across borders has resulted in monetary policy having a greater effect on domestic economies than in previous eras (Clark 2003). This increased effectiveness of monetary policy on economic outcomes thus affords those who control the money supply with a greater impact on economic outcomes while subsequently reducing the impact of other actors on those outcomes. If voters are punishing or rewarding politicians based upon macroeconomic performance, then the amount of political control of central banks by politicians

[1]For exceptions, see Naurin 2006 and Duch and Stevenson 2008.

ought to affect how much of the credit or blame is placed upon politicians. The more independent a central bank is from political interference, the less politicians should be held to account for economic outcomes, ceteris paribus, thus making it a particularly appropriate institution to study.

The ceteris paribus assumption, however, may not necessarily hold. This is the case because the decision to change or maintain the current level of central bank independence is a political one, and when independence is increased voters may not always be cognizant of the difference between the central bank and the government in terms of responsibility for economic outcomes. As such, it may be that, regardless of the level of central bank independence voters continue to blame politicians for economic outcomes which they no longer control. Below I explain the circumstances under which voters are most likely to assign credit/blame to the bank and when they are unlikely to do so. The next section lays out extant theories of accountability and economic voting. The impact of central bank independence on economic outcomes and why central banks ought to be studied in conjunction with electoral competition is then discussed. The fourth section gives an overview of Duch and Stevenson's model of economic voting as an attempt by voters to extract a signal of incumbent competence (2008). The following section considers an extension of this model in which the institutional setting is chosen by politicians. The final section discusses next steps in this research agenda.

Accountability and the Economic Vote

There is significant cross-national evidence that both perceived and actual poor economic outcomes reduce the prospects for reelection of incumbent governing parties. Norpoth (1984) finds that higher inflation erodes presidential popularity in the US and Jordahl (2006) arrives at a similar conclusion regarding the impact of macroeconomic variables for Swedish voters. Recent evidence from a series of cross-national surveys indicates that, in fact, the phenomenon of economic voting[2] is present in most western democracies (Duch & Stevenson 2008). Much of this literature has focused on how different institutional configurations of policy making responsibility helps or hinders voters' ability

[2]Economic voting is the idea that people "vote the economy". That is, economic outcomes, or perceptions of economic outcomes, are strong predictors of vote choice.

to assign credit or blame for economic outcomes to the appropriate decision maker (e.g., Duch and Stevenson 2008, Lowry et al. 1998, Powell and Whitten 1993, Whitten and Palmer 1999). This attribution, occurring on an individual-level, aggregates to relationships between the economy and electoral outcomes that differ significantly across countries due to the institutional context in which voters find themselves cross-nationally.

Public opinion scholars interested in how individuals come to their voting decisions have found that the economy is a significant determinant of individual vote choice. Further, in most countries, it is the state of the national economy, not personal financial situations, that most strongly affects vote choice (e.g., Kiewiet and Kinder 1979; Lewis-Beck 1988; Borre 1997). Voters do not hold the government responsible for personal economic misfortunes but do hold them accountable for maintaining a strong national economy[3]. Most scholars find that past economic performance largely determines voter expectations for the future and so focus on indicators of retrospective voting[4] in their analyses of survey data (MacKuen et al. 1992). Further, voters are actually quite well informed about the macroeconomy near elections, though their knowledge seems to dwindle after the election (Paldam & Nannestad 2000). This implies that campaigns may serve as a means through which individuals learn about the current economy. It also implies that the connections that voters make between politics and economics may not be static but be triggered by how politicians frame these connections. Because of the focus on the economy in their voting decisions and the apparent connection that voters make between policy and the state of the economy, the ability of voters to make accurate assessments of responsibility for economic policy is important for the mechanisms of economic voting to function.

If these individual attribution processes are to aggregate to significant differences in economic voting between different countries that persist over time, then it must be that people in some countries are more likely to attribute responsibility for economic outcomes to politicians than in others. The most common explanation for these cross-national differences is that domestic

[3]Nannestad and Paldam (1995) find little evidence of sociotropic voting in Denmark but significant evidence egotropic voting. However, this could be a result of cultural expectations of government responsibility for providing for the economic well-being of the individual.

[4]The literature tends to focus on retrospective, sociotropic voting. That is, the focus is on vote choices arising from past national economic outcomes as opposed to future or personal economic outcomes.

institutional contexts make attribution easier in some locales and more difficult in others. It is argued that institutional context complicates this process for voters because voters are either unsure of who to hold responsible (the punishment model) or they are unable to use the economy as a strong signal of how well the government has done its job (the competence model). In the punishment model institutional configurations affect the ability of reasoning voters to focus their attributions of economic responsibility effectively. Clarity of responsibility created by institutional settings affects the abilities of individual voters to attribute credit or blame for economic outcomes (Powell 2000; Gerring and Thacker 2004). An accountable system of government is one in which responsibility for policy is obvious and citizens have the ability to remove politicians or parties that fail to represent their interests in a manner that can meaningfully change policies (Powell 2000). The ability of voters to assign credit and place blame on the political actors responsible for particular outcomes is imperative if accountability is the normative objective that a polity is interested in pursuing. The existence of multiple actors with overlapping responsibility for a particular policy or outcome thus reduces the ability of voters to observe who actually produced the outcome (Bednar 2007; Powell 2000; Powell and Whitten 1993). When there are multiple agents whose behaviors have an (probabilistic) effect on an outcome the ability to observe the impact of contributions by any individual agent through the knowledge of the final outcome is difficult for principals (Güth et al. 2001). This inability to fully observe the actions of agents and their effects produces incentives for either shirking in cases where all agents have an explicit mandate to contribute to the production of a good (Güth et al. 2001) or for an agent to take actions outside of their immediate mandate in order to be associated with a likely positive outcome (Bednar 2007).

The inability of voters to assign responsibility for outcomes, however, is not simply a result of the actions of their multiple agents but also of the voters limited knowledge about the agents actions. In this way, it is the publicity of actions that allows voters to hold agents accountable (Naurin 2006). People have to know that their elected representatives have taken some actions and be able to link those actions to the outcomes that they observe. This likely occurs through campaigns. The factors that reduce or enhance clarity of responsibility are a combination of both static (e.g., federalism, bicameralism) and dynamic (e.g., divided government, coalition government, increasing trade dependence) properties of political life (Nadeau et al. 2002, Duch and Stevenson

2008). The types of agents that have been most thoroughly examined by the literature (e.g. bicameral opposition, coalition government, independently elected executive, etc.) are typically ones whose presence and actions would be publicized repeatedly over time; their actions would also be publicized more heavily in the lead up to elections (Stevenson & Vavreck 2000). In particular, when there exist multiple actors who impact outcomes (and politicians are among those actors) politicians seeking reelection have an incentive to try to claim credit for good outcomes and to shift blame to someone else for bad outcomes, regardless of how much influence they actually had in that outcome (Cain et al. 1987; Powell and Whitten 1993).

While the punishment model builds from incomplete information models of the relationship between voters and politicians, the competence model begins with the premise of highly informed voters who know precisely the division of power over economic outcomes within the government. These voters are trying to assess the extent to which the economy informs them about the competence of the government to manage the economy (Duch & Stevenson 2008). Voters in this model are aware that the government's policies will affect the economy but that there are things outside of the government's purview that affect economic outcomes as well (Alesina and Rosenthal 1995, Duch and Stevenson 2008). It is the combination of both the concentration of economic policymaking (in a manner similar to that of the punishment model) and the effects of these policies on economic outcomes that lead to the voters' problem of signal extraction and the resulting cross-national differences in economic voting according to Duch and Stevenson. They argue that diminished economic voting in low clarity of responsibility contexts results from a greater diffusion of economic voting across parties and, in cases where national economies are subject to larger external shocks, the *known* inability of governments to affect economic outcomes[5]. This model implies that as elected officials have relatively fewer tools with which to affect the economy, they ought to be held less accountable by voters for economic outcomes. This implies that increasing the autonomy of central banks, under particular circumstance, ought to reduce economic voting.

[5]This model is discussed in greater detail below. Because this model leads to a number of similar empirical implications as the punishment model as well as additional implications, it is the basis of my extension.

An Explanation of Central Bank Independence

The functions and effects of central bank independence, however, have been explored in a manner that is largely disconnected from research on voting and the electoral process. This omission, while reasonable during early periods of research on economic voting, needs to be filled given trends in international political economy. For much of recent history, most central banks have been directly under the control of governments (Goodman 1991). As such, monetary policy was a macroeconomic policy tool that was available to politicians. The past fifteen years, however, have witnessed an increase in the level of independence of a number of central banks, particularly in Western Europe. This occurred in the midst of drastic reductions in barriers to trade and capital mobility and major changes in exchange rate regimes following the end of Bretton Woods.

Clark (2003) shows that when exchange rates are flexible and capital is mobile (as has increasingly been the case in the international financial system over the last 30 years), the independence of the central bank removes any ability of the government to indulge in macroeconomic manipulations prior to elections (i.e., political business cycles). But if the central bank is politically dependent then the government will use monetary policy to engage in small political business cycles. When exchange rates are fixed, however, the government is able to engage in political business cycles through the use of fiscal policy regardless of the level of CBI when capital is mobile. Given that economic growth prior to elections appears to increase the electoral prospects of incumbents and monetary policy has become an increasingly powerful tool for achieving such ends in recent decades, why would politicians want to give this tool away?

I argue that politicians would want to give up this tool for two reasons that relate to their focus on reelection. The first is related to traditional time inconsistent preferences arguments about central bank independence (CBI). As monetary policy becomes a more powerful tool for politicians to use for manipulating growth and employment prior to elections, markets ought to expect increased use of this tool by politicians. The inability to surprise voters leads to no additional growth or employment, only increased inflation (Bernhard et al. 2002). Since increased inflation has a negative effect on electoral prospects for incumbents, they may prefer to take this option away by handing monetary policy over to an independent central bank. Thus, delegating policy author-

ity to an autonomous central bank, through inflation reduction, ought to decrease the frequency and/or magnitude of bad economic outcomes, which would lead to better electoral prospects for incumbents.

Even though inflation may fall with greater central bank autonomy, bad economic outcomes will still happen. Increased central bank independence, however, should result in these episodes of economic downturns having a diminished impact on the electoral prospects of incumbents. This is because, as Duch and Stevenson argue, politicians are less responsible for the economy and so voters will use the economy as less of a signal of competence.

Voters do not need to understand the specific policy instruments that central banks use to manipulate the macroeconomy in order to sometimes place credit or blame on them for economic outcomes. Instead, I argue that politicians have an incentive to inform voters of the importance of the policies pursued by the central bank. A means by which voters learn about the actions of politicians is through media coverage of economic policies and political competition (Chong and Druckman 2008; Salmond n.d.). Politicians from opposing parties have an incentive to expose the actions of one another for electoral gain (Schultz 2001). When the economy is performing poorly, the government can credibly claim that they are not responsible for that outcome, but that the independent central bank is and opposition parties will not be able to easily rebut this fact. Further, voters may more readily project their emotions onto a tangible institution - one that can be named and personified in the central bank's chair - than they could toward something less tangible such as 'the international economy.'

Moreover, the media acts as both a platform for politicians to disseminate their messages and an additional monitor of politicians' behavior. The media reports extensively on the actions of central banks. The statements and reports of central bankers are combed for meaning by financial analysts and make headlines on a regular basis. Changes in interest rates are regularly mentioned on the evening news. This opens the possibility that voters may have at least some basic knowledge that the central bank's actions have some impact on their lives, even if they do not fully understand this impact. Ostensibly, statements by the central bank are not aimed at the electorate, but at market actors who are likely to extract particular information about future policy moves due to profit maximizing incentives. Thus, the availability of this information does not mean that all voters

will fully understand the consequences of these policies or their relationship to the politicians over whom they have more direct control. However, it does indicate that some voters may be able to understand a) that economic outcomes are the result of both monetary and fiscal policies and b) the government's level of control over monetary policy.

There is also evidence of an increase in rhetoric coming from central banks (including those with a high degree of independence) in the period prior to an election, perhaps indicating that central bankers are trying to reassure markets and voters of their competence and reduce inflationary fears (Maier 2002). In particular, the actions of the central bank ought to be most prominent in the minds of politicians and voters during economic downturns. Prospect theory implies that people are more aware of bad consequences than of good ones - taking the good to be natural and not the result of the actions of others but seek to determine responsibility for bad outcomes (Kahneman and Tverski 1979; Lewis-Beck and Paldam 2000). That is to say, voters are less likely to reward someone for a good outcome but will try to punish someone for a bad outcome. Given these behavioral attributes and the assumption that politicians prefer holding office over being turned out of office and are minimally risk averse, politicians are likely to try to avoid bad outcomes. When bad outcomes obtain, politicians would be expected to attempt to pass the buck to another actor in order to avoid punishment. The existence of a politically independent central bank thus provides a potential scapegoat for politicians to skewer. Further, while placing blame on another institution may be feasible, it is unlikely that the independence of the central bank will diminish economic voting during good economic times because of a) the absence of cues from politicians crediting the bank with the good outcome and b) the limited benefit that high growth brings to politicians anyways.

Central bankers, always aware of the possibility of politicians reigning in their independence, are also likely to defend their actions. However, due to the relationships that politicians have with society, it is likely that politicians will be both more likely to have their message(s) exonerating themselves from responsibility heard by the average voter and to be more persuasive in this message than will the central banker. This is because the likely target of central bank messages (markets) is better able to process information efficiently than are individual voters. As such, central banks use more technical jargon in their communication than do politicians, who target the electorate. While

the media may be able to help voters parse out responsibility for economic outcomes, the likelihood that a voter will receive and process a piece of information that excuses politicians from blame increases if politicians have an alternative institution to blame. Because of these relationships, voters ought to be less likely to engage in economic voting during downturns in institutional contexts with higher levels of central bank independence, though not necessarily in boom years.

Some Illustrative Examples

Anecdotally, throughout the recent financial crisis the media and politicians in the United States have heavily criticized the actions of Federal Reserve Chairman Ben Bernanke and former Chairman Alan Greenspan. Headlines such as "Dow Tumbles 508: Blame Bernanke, But Not for Lack of Trying" (Task N.d.) and "Nobel Prize-winning economist: Blame Greenspan, Bernanke for downturn" (Bloomberg 2008) have been common over the past year. In response to comedian Jon Stewart's quip that the government should simply print more money, House Speaker Nancy Pelosi retorted, "[t]hat's one of the issues that we have with the Fed. We keep saying, when they gave the money to AIG, we said 'We didn't know you had ... 80 billion dollars.' ...[The Fed said] 'We have 800 billion dollars'" ("The Daily Show." April 8, 2009). This attempt to claim ignorance is illustrative of the notion that politicians may try to pass blame for unpopular outcomes to an independent central bank when doing so is feasible. Statements coming from politicians during bad economic times likely attempt to pass blame away from themselves. This ought to be particularly true of statements from members of the ruling party. As such, voters receiving these types of messages ought to be less likely to blame politicians for bad economic outcomes than if they were not receiving those messages. However, when the central bank is not independent it is likely that these attempts at blame shifting will be more effectively countered by both the media and opposition politicians. For example, recent attacks on the governor of the Bank of Spain, Miguel Fernández Ordóñez, by Spain's Socialist government have been addressed by newspapers such as the Financial Times stating that, "[w]hat makes the disagreements surprising is that the central bank is not a wholly independent institution. [Central Bank Governor] Mr. Fernadez Ordonez is a Socialist and was formerly a senior government official" (Mallet 2009).

The question then becomes: how are politicians able to justify to voters not reeling in the central bank? Since central banks are established through legislation it is well within the power of politicians to alter that legislation in order to exert greater control over monetary policies. The literature on CBI indicates that since autonomous central banks are established largely by forward looking politicians[6] who are sufficiently interested in the long term interests of the state to either prevent them from reneging on their own accord or to ensure that the opposition cares enough to act as a whistle-blower should the government make overtures of this sort. Because reductions in central bank independence would have negative impacts of various national constituencies (e.g., those with significant capital holdings), these groups would have an incentive to prevent retrenchment. Due to these pressures it is unlikely that central banks would have their autonomy significantly scaled back in countries that are well integrated into international financial markets. As such, we ought to expect such states to experience either no change in CBI or increased autonomy.

Duch and Stevenson's Model of Economic Voting[7]

Raymond Duch and Randolph Stevenson (2008) model economic voting in a manner that diverges significantly from the majority of that literature. Instead of viewing the problem that voters face as one of ignorance over how much responsibility to attribute for economic outcomes to one state agent versus another as in the punishment model, they argue that voters face a problem of determining the quality of incumbents versus alternative governments. They assume that voters know the extent of control that the government has over economic outcomes. They also explicitly model a role for other actors, which they term "nonelectorally dependent decision makers" (NEDDs) (pg. 139). Duch and Stevenson argue that cross-national variation in levels of economic voting can be explained by the differing levels of control that governments, or "electorally dependent decision makers" (EDDs), have on economic outcomes relative to NEDDs.

Building from Alesina and Rosenthal's (1995) model of government competence, Duch and

[6]These politicians are often thought to be interested in reducing variance in economic outcomes and increasing average outcomes over time.

[7]This section serves to introduce the model by Duch and Stevenson (2008). As such, the notation follows very closely from that in the latter half of Chapter 5 of their book.

Stevenson begin with two political parties and a set of identical voters. Voters have the choice of retaining the incumbent party or electing the opposition. The government chooses the rate of inflation. Voters care about economic growth and inflation. Voters are assumed to know current inflation and to never be surprised by the government's inflation policy, and politicians therefore have no reason to choose non-zero inflation[8]. Parties also have an additional attribute that is unknown to the voter: competence. Competence can increase or decrease economic growth; in the model this encompasses "any unobserved economic impact of the behavior of the incumbent administration that is not constant over time or administration" (Duch & Stevenson 2008, pg.133). However, growth is also affected by shocks over which the government has no control over. These shocks are a result of actions taken by NEDDs.

Voters observe only net growth, so when growth diverges from the expected level ($\bar{y}$), the natural rate, they do not know precisely where that difference is coming from. The total shock that voters observe is a combination of the incumbent competency shock (ω) and a shock that is exogenous to the government (ψ), which results from actions taken by NEDDs. Further, they cannot observe the competence of alternative governments and so can only compare the current government to the expectation of the quality of alternative governments, which is normalized to zero. Voters observe economic growth that results from an inflation-augmented Phillips curve model:

$$y_{it} = \bar{y} + \sum_{l=1}^{\alpha} \omega_{ilt} + \sum_{l=1}^{\beta} \psi_{lt} \tag{1}$$

where y_{it} is growth in year t, under incumbent government i, ω_{ilt} is the growth shock associated with the lth decision of i in time t, and ψ_{lt} is the growth shock associated with the lth decision made by the NEDD i time t[9]. The EDD makes α number of decisions while the NEDDs make β number of decisions. The relative impact that the government has on observed economic growth is therefore a function of how many decisions it makes that affect the economy relative to how many are made by NEDDs. The lth shock for the incumbent is assumed to be persistent, such that $\omega_{ilt} = \mu_{ilt} + \mu_{ilt-1}$. That is, the effectiveness of government decisions/actions over the same issue

[8]This assumption makes monetary expansions ineffective for inducing short-run increase in growth. Thus, even if voters have a strong preference for higher growth relative to lower inflation politicians cannot induce electoral business cycles that would increase their chances of being reelected

[9]The decision of the NEDDs are not indexed by i because it is assumed to be independent of incumbent attributes.

in one year ought to be related to the effectiveness of their decisions/actions over those same issues made earlier. Both ω_{ilt} and ψ_{lt} are normally distributed with mean zero and variance σ_μ^2 and σ_ψ^2, respectively.

The growth equation can then be represented by:

$$\sum_{l=1}^{\alpha} \mu_{ilt} + \sum_{l=1}^{\beta} \psi_{lt} = \bar{y} - y_{it} + \sum_{l=1}^{\alpha} \mu_{ilt-1} \tag{2}$$

The individual components of the left side of equation (2) are not observed by voters. Instead, they experience the total shock, k_{it}, where $k_{it} = \sum_{l=1}^{\alpha} \mu_{ilt} + \sum_{l=1}^{\beta} \psi_{lt}$. From k_{it} the voter is able to form a belief about the incumbent EDD's current level of competence using observed growth and the incumbent's overall competence shock in the previous period. Because both components of k_{it} are normally distributed around zero, k_{it} is distributed:

$$k_{it} \sim N(0, \sigma_\mu^2 \alpha + \sigma_\psi^2 \beta) \tag{3}$$

Because both k_{it} and $\sum_{l=1}^{\alpha} \mu_{ilt}$ are normally distributed, their joint distribution is bivariate normal. Thus, a voters belief about the incumbent's competence, given the observed shock, is the conditional expectation of $\sum_{l=1}^{\alpha} \mu_{ilt}$ given the observed k_{it}. Using results from Miller and Miller (2004), the conditional expectation is:

$$\begin{aligned} E\left[\sum_{l=1}^{\alpha} \mu_{ilt} \mid k_{it}\right] &= E\left[\sum_{l=1}^{\alpha} \mu_{ilt}\right] + \frac{\sigma_{\mu,k}}{\sigma_k^2}\left(y_{it} - \bar{y} - \sum_{l=1}^{\alpha} \mu_{ilt-1}\right) - E[k_{it}] \\ &= \frac{\sigma_{\mu,k}}{\sigma_k^2}\left(y_{it} - \bar{y} - \sum_{l=1}^{\alpha} \mu_{it-1}\right) \\ &= \left(\frac{\alpha\sigma_\mu^2}{\alpha\sigma_\mu^2 + \beta\sigma_\psi^2}\right)\left(y_{it} - \bar{y} - \sum_{l=1}^{\alpha} \mu_{ilt-1}\right) \end{aligned} \tag{4}$$

These results indicate that increasing the number of decisions that the government makes that are associated with economic growth ought to increase the amount of responsibility attributed to the incumbent. This is because the numerator will grow at a relatively faster rate than the numerator for any such change, ceteris paribus. By assuming that the variances of both the NEDD and EDD components of the shock are small for any individual decision, Duch and Stevenson

are able to consider the relative control that incumbents in different economic contexts have on economic growth.

The voters make their decision about whom to vote for by comparing their expected utilities from voting for the incumbent i and an alternative government, j. The voters' utility is a function of growth and inflation. Because of the voter rationality assumption above, expected inflation is zero. Due to the persistent relationship between the observed shock and growth today, voters' expectations about the future shock under the incumbent, $E[\sum_{l=1}^{\alpha} \mu_{ilt} \mid y_{it} = E[\sum_{l=1}^{\alpha} \omega_{ilt+1}]$. Further, $E[\sum_{l=1}^{\alpha} \mu_{ilt} \mid k_{it}] = E[\sum_{l=1}^{\alpha} \mu_{ilt} \mid y_{it}]$. From these equalities we can evaluate the expected utility from voting for the government is given by:

$$\begin{aligned} E[u_{t+1} \mid v_i] &= E[u(\pi_{it+1}, y_{it+1})] \\ &= \frac{1}{2}E[\pi_{it+1}^2] + bE[y_{it+1}] \\ &= bE[y_{it+1}] \end{aligned} \tag{5}$$

where b represents the trade-off between inflation and growth. Because of the relationship between the government's current competence and the likely economic outcomes in the future under the same administration, voters' expected utility from retaining the incumbent is the expected competence of the future government given their reelection. This implies that $E[u_{it+1} \mid v_i] = E[\sum_{l=1}^{\alpha} \mu_{ilt+1} \mid v_i]$. Substituting this on the left-hand side and expanding out the expected growth rate from equation 4 we have:

$$\begin{aligned} E\left[\sum_{l=1}^{\alpha} \mu_{ilt+1} \mid v_i\right] &= b\left(\bar{y} + E\left[\sum_{l=1}^{\alpha} \omega_{ilt+1}\right]\right) \\ &= b\left(\bar{y} + \left(\frac{\alpha\sigma_\mu^2}{\alpha\sigma_\mu^2 + \beta\sigma_\psi^2}\right)\left(y_{it} - \bar{y} - \sum_{l=1}^{\alpha} \mu_{ilt-1}\right)\right) \\ &= b\bar{y} + b\left(\frac{\alpha\sigma_\mu^2}{\alpha\sigma_\mu^2 + \beta\sigma_\psi^2}\right)\left(y_{it} - \bar{y} - \sum_{l=1}^{\alpha} \mu_{ilt-1}\right) \end{aligned} \tag{6}$$

While this calculation is required for voters to estimate the likely level of growth if they vote for the incumbent, their calculation is much simpler when considering the future growth under the opposition. Because the expected NEDD and competency shocks are zero, the voters' expected

utility from voting for the opposition k is given by:

$$E\left[\sum_{l=1}^{\alpha}\mu_{jlt+1} \mid v_j\right] = b\bar{y} \tag{7}$$

Thus, this leads to an expected outcome: when the economy is doing worse than expected, voters ought to choose the opposition at the polls. However, as the institutional context leads to fewer decisions that affect growth being made by EDDs, voters should use the economy less in their voting calculus. The term $(\frac{\alpha\sigma_{\mu}^2}{\alpha\sigma_{\mu}^2+\beta\sigma_{\psi}^2})$ in equation (7) represents the "competency signal" that the voter is able to extract from economic outcomes (Duch & Stevenson 2008, page 145). As the institutional context places fewer and fewer economically important decision in the hands of EDDs the economy provides a noisier signal of competence. As such, the advantage of strong economic performance for incumbent electoral prospects is diminished as the government plays a smaller role the economy.

Endogenous Institutional Contexts

There are three sets of parameters to consider from this model in comparing the expected utilities of voters from their alternative vote choices and politicians' goals. The term that differentiates the payoffs between a vote for the incumbent and for the opposition is:

$$b\left(\frac{\alpha\sigma_{\mu}^2}{\alpha\sigma_{\mu}^2+\beta\sigma_{\psi}^2}\right)\left(y_{it} - \bar{y} - \sum_{l=1}^{\alpha}\mu_{ilt-1}\right)$$

Trivially, as b or $(y_{it} - \bar{y} - \sum_{l=1}^{\alpha}\mu_{ilt-1})$ go to zero, the distinction between the incumbent and the alternative government shrinks to zero as well. These are factors that are out of the hands of politicians. Politicians have no real ability to change the preferences of voters for growth and, by design, cannot alter their own quality. Duch and Stevenson focus their analyses on how the "competency signal" that voters are able to extract from the economy about their elected representatives differs between countries and overtime within countries. They treat these differences as exogenous.

However, there is little reason to think that politicians cannot alter their institutional environ-

ments. Through policy changes the proportion of economically influential decisions that electorally dependent decision makers make relative to those made by other actors can be altered. Barriers to trade and capital flows, business tax incentives, market regulations, regional integration and central bank independence are examples of economic institutional contexts that are shaped by explicit choices of politicians. In particular, the past 15 years have seen politicians giving up significant control of monetary policy by increasing the independence of their central banks. While the original model assumes office seeking politicians, these politicians have very few tools at their disposal to enhance their electoral prospects. By allowing politicians to alter their institutional context we can better understand the strategic considerations of institutional change.

Suppose that there is an earlier stage of the game. Prior to the revelation of economic outcomes, the incumbent politician can change the number of decisions that she will make during her administration relative to the number made in $t-1$. This early decision affects the amount of information that voters are able to extract from economic outcomes at the end of the game when they make their vote choices. If the total number of economic decisions made within the economy is constant this implies that any decision delegated away from the incumbent is added to the decisions made by NEDDs. The competency signal becomes:

$$\frac{(\alpha-\epsilon)\sigma_{\mu}^2}{(\alpha-\epsilon)\sigma_{\mu}^2+(\beta+\epsilon)\sigma_{\psi}^2} \tag{8}$$

where $\epsilon \geq 0$[10]. The case in which $\epsilon = 0$ is the case that is explored by Duch and Stevenson (2008) and is used as a status quo against which decisions to choose some $\epsilon \neq 0$ are compared. Retaining informational assumptions from the original model, any change in α and β are known to both the politicians and voters. Under what circumstances does the incumbent want to change the institutional setting? As shown below, this is a function of the size of the variance in politician competence and in exogenous shocks coming from the actions of NEDDs.

[10]Without loss of generality the domain can be restricted from the set of real numbers to only positive numbers. All cases described below are simply the mirror image of those for their negative counterparts. Substantively, given this paper's focus on central bank independence in developed countries during the modern era, we are unlikely to see reversals in CBI making positive values of ϵ reasonable.

Case 1: Equal Variance

Suppose $\sigma_\mu^2 = \sigma_\psi^2$. Equation 8 then simplifies to:

$$\frac{\alpha - \epsilon}{\alpha + \beta}$$

Given this variance any choice of ϵ other than zero leads the politician to be held less accountable than if the status quo were retained. The difference in signal strength is linearly decreasing in ϵ. As such, any choice of ϵ is equally efficient in terms of voter welfare. Because neither the government nor the NEDD is likely to produce worse results than the other there are no welfare gains from one making decisions versus another. The politician, if risk averse, would want to delegate authority in this case, to avoid the bad outcome of losing office due to poor economic performance.

Case 2: Greater Variance in Politician Quality

Suppose instead that $\sigma_\mu^2 > \sigma_\psi^2$. In this case equation 8 does not simplify as in Case 1. However, we can see that both the numerator and denominator are decreasing. The numerator, however, is decreasing more quickly than the numerator. Therefore, the incumbent will be viewed as having less responsibility for economic outcomes than under the status quo. From the point of view of the voters, this delegation may in fact be preferable to the status quo if, instead of being risk-neutral as assumed by Duch and Stevenson they are in fact risk-averse in their utility over growth. By delegating authority over some decisions to the central bank, voters can obtain less varied economic growth, which they would prefer if they are risk-averse. However, the incentive for the politician to increase CBI, while still existent, is less than in the case of equal variance. The intuition behind this is finding is that, because politicians are giving authority over monetary policy to a central bank that is unlikely to make decisions that lead to outcomes that differ much from the mean, any unexpected outcome is much more likely to have been a result of government actions and competence than in other cases. So the reduction in economic voting that occurs because politicians are making fewer decisions is moderated by the fact that the economy is providing a more precise signal of incumbent competence than in other situations.

Case 3: Greater Variance in Exogenous Shocks

Finally, suppose that $\sigma_\mu^2 < \sigma_\psi^2$. The denominator from equation 8 is increasing relative to the status quo. The numerator is growing at the same rate as in Cases 1 and 2, so any ϵ chosen that is not zero will result in less responsibility being assigned to the government than in the status quo, Case 1, or Case 2. Unlike in Case 2, a decision to delegate economic decision making to the central bank makes risk-averse voters worse off than under the status quo distribution of decision making authority. Reducing the number of decisions that the government makes increases the variance of economic growth because governments are less likely to make decisions that have large negative consequences. This is the case, however, in which politicians have the lowest likelihood of losing office because of economic voting. While volatility in economic output is more likely in this situation, politicians are least likely to be voted out for it because they can honestly say "it's not my fault." The weaker signal provided by the economy about the incumbent's quality is reinforced by the fact that the incumbent is making fewer decisions that impact economic output.

If $\sigma_\mu^2 < \sigma_\psi^2$, then politicians may have an incentive to shirk responsibility even though doing so makes voters worse off than the status quo. However, given the voters' utility function based on the competence signal that they can extract from economic growth politicians would, in expectation, increase their likelihood of reelection relative to the status quo.

Conclusions and Next Steps

This extension indicates that there exist numerous circumstances in which politicians have an incentive to delegate decisions to actors that are not accountable to themselves or voters. While this action can, in fact, be welfare enhancing for voters, it need not be.

This model provides a good base for considering the electoral reasoning underlying institutional change. By considering these findings in conjunction with insights from public opinion and political psychology, we can deduce implications on the individual level in addition to those on the macro-level. Voters in this model are assumed to have perfect knowledge of the amount of influence that their government has over economic outcomes. This assumption, however, is highly suspect. It is more likely that voters overestimate $\frac{\alpha}{\beta}$. This may arise from ignorance or simply from a desire to

"blame" someone for economic woes. In the case of ignorance, it seems likely that an overestimation of $\frac{\alpha}{\beta}$ would arise from a failure to note gradual changes in the ratio over time. This is similar to the psychological phenomenon of selective attention which causes people to pay attention to only a small part of the stimuli available to them. People notice things that they see changing in apparently random ways while ignoring the underlying trends.

Suppose that $\frac{\alpha}{\beta}$ is changing over time due to factors outside of the purview of government. Politicians would be expected to observe this change but voters may not. As such, they may be attributing more responsibility to the government than is deserved. If voters are assigning too much responsibility to the government then politicians may want to change voters' perceptions of their level of responsibility. This would be particularly true when voters are looking for someone to blame. While changing institutions is a particularly strong signal that politicians could send to indicate a change in the true levels of α and β, less drastic signals could be the attempts to "pass the blame" during campaigns. However, by delegating responsibility in a public manner politicians can send a signal to at least moderately attentive voters (Zaller 1992). One product of election campaigns is that less informed voters form more solid beliefs about the state of the economy through the agency of politicians (Arceneaux 2005). When combined with a costly institutional change, this would likely lead to politicians handing decisions over to third parties when they have lost a significant amount of control over economic outcomes already. If a large gap between public perceptions and actual responsibility has developed then it is likely in the politicians interests to pay a cost to inform voters of this.

The next step in this research agenda is to develop empirical tests of these various implications. One avenue is to test for systematic differences in economic voting across countries with different levels fo central bank independence. Similar survey data from a number of countries that asks about both vote choice and economic perceptions is needed along with yearly data on central bank independence, exchange rate regime and ease of capital mobility in order to create a hierarchical model of economic voting to consider the implications for cross-national variation. Further, the recent changes in central bank independence that have resulted in the Eurozone countries due to provisions in the Maastricht Treaty and European Monetary Union (EMU) accession provide a sort of natural experiment. In the lead up to the full implementation of EMU in 2002, the European

Union conducted an educational campaign to inform EU citizens about the nature of the changes and, in particular, the European Central Bank. As such, if we were to see changes in the levels of economic voting within countries due to changes in the independence of monetary policy it would be following the introduction of the Euro. In particular, countries such as France and Italy ought to have seen relatively large changes in economic voting over the course of the 1990s due to their large central banking reforms and the fact that, relative to many of the smaller members of the Eurozone, their monetary policy had been (relatively) less tied to the Deutsche Mark.

The mechanisms that ought to lead to these diminished levels of economic voting need to be tested as well. If voters are learning about the bank's role in bad economic outcomes (but not necessarily in good ones) through the actions of politicians, then these should be found in politicians' statements. Conducting content analysis of the largest national newspaper for countries that saw a change in CBI for discussion of the central bank's responsibility for economic outcomes prior to elections needs to be conducted. Significantly more mentions of the bank's role during economic downturns when the bank actually has more of an effect (i.e., after an increase in CBI) would be supporting evidence. This should become particularly acute prior to elections.

Finally, the individual-level mechanisms can be tested. In particular, do statements like Pelosi's about the innocence of politicians for bad economic outcomes actually affect voters? A relatively simple experiment could give some leverage to this question. It would involve asking a random sample of survey participants to read a brief newspaper article about their central bank's role in the current economy. Later in the survey all participants would be asked to state who they think is most responsible for the current state of the economy and their vote choice if an election were to be held tomorrow (along with the normal battery of questions about party identification, economic perceptions, etc. as well as both economic and political knowledge questions). If those who are moderately informed about politics and/or the economy and who received the treatment were found to attribute less responsibility to the government for bad economic outcomes this theory would be supported. Unfortunately, this method is unlikely to allow for variation in economic context (i.e., whether the economy is doing well or not), but would be a step in the right direction.

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