Getting Around Constitutional Limits To Fiscal Policy:

A Model of Political Forecast and Budget Cycles

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October 2011

Abstract

There is empirical evidence that optimistic revenue forecasts can be used by the government to increase fiscal latitude and, thereby, circumvent a constitutional balanced budget or deficit or debt constraint. Transfers can be increased and the incumbent can appear more competent prior to elections. This theoretical paper studies the interdependence of electoral forecast and political budget cycles when some voters are not fully informed, but may have either rational or biased beliefs. Perhaps the most interesting issue which has largely been ignored in the literature: an expected imminent recession is likely to increase forecast manipulations and thus the deficit.

JEL classification: D72, H68, E32

Keywords: political business cycle; electoral forecast cycle; balanced budget constraint; fiscal policy; non-rational expectations; behavioural macroeconomics.

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Acknowledgments: I am grateful to Yilin Hue who inspired me to extend my work on disinformation and political budget cycles in this direction. I am indebted to Eelke de Jong, not only because this paper benefitted greatly from discussions with him. Furthermore, I would like to thank Jianying Qiu and participants of the NAKE conference 2011 in Utrecht for helpful comments.

1 Introduction

There seems to be a general tendency for governments to present themselves in a positive light. With respect to the state of fiscal affairs, Lipford (2001) is – to my knowledge – the first one to clearly distinguish two issues. First, there is plenty of supporting evidence that governments try – at all times – to portray their own fiscal policy in an optimistic way. Inter alia, she quotes Brennan and Buchanan (1980), according to whom "politicians will want to overestimate the benefits of government programs and underestimate the current and future taxes required to pay for those programs." But general "budget propaganda" is already reported, for instance, by Porritt (1910) for early twentieth century England. Second, there is a specific inclination during election years to produce even more optimistic public finance forecasts. Lipford (2001) cites, for instance, Miller (1994) and Alesina and Roubini with Cohen (1997) who argue that the government may deliberately want to misinform the public about the true state of the budget in an election year, thereby justifying higher transfers or expenditures to raise its re-election chances.

When the government attempts to use public and/or research agencies to misrepresent the fiscal situation, we obtain an "electoral forecast cycle", a term coined by Brück and Stephan (2006). Boylan (2008) argues that, in particular prior to elections, revenue forecasts are based on favourable estimates of the macroeconomic environment and unrealistic growth assumptions. As a consequence, pre-election budgets are overly optimistic, thus resulting in unexpected deficits[1], which are typically repaid after elections according to Boylan (2008). His panel data analysis for all 50 US states reveals significant coefficients for underreporting of pre-election deficit figures, irrespective of the stringency of their constitutional balanced budget constraint. Krause and Corder (2007) claim that "less stable [US federal] agencies are more likely to accommodate political pressures for forecast optimism". Moreover, Boylan (2008) argues that "the executive is likely to have the upper hand in determining

[1] Exactly the opposite tactic is uncommon, but can also be observed in reality. Dutch Finance Minister Gerrit Zalm (serving between 1994 and 2006) was know for favouring to underestimate growth, thereby producing unexpected tax revenues. According to the so-called Zalm standard, the resulting budget surplus was (and still is today) to be used exclusively for debt reduction.

the forecasts" on a state level as, for instance, "in 44 states the governor directly appoints the budget director." Overall (and despite some counterevidence), there is strong evidence that many governments in OECD as well as in developing counties try to influence budget forecasts more or less directly, especially prior to elections.[2] Specifically, evidence for pre-election budget balance errors is also found in EU member countries by von Hagen (2010). Brück and Stephan (2006) even suggest that the euro zone Stability and Growth Pact has spurred electoral forecast cycles.

From a theoretical point of view, it is, however, not clear why and under which circumstances forecast manipulations by the government can lead to higher transfers or expenditures, thereby effectively increasing re-election chances. Obviously, if voters are non-rational, for instance backward-looking as in the seminal political business cycle model by Nordhaus (1975), economic manipulations can work. But what about rational voters? Expansionary short run boosts are known to produce negative consequences in the longer term since they create inflation and/or increase the debt burden. Rational voters should foresee the incumbent's incentives to manipulate, ignore the manipulation and vote, instead, on the basis of expected economic outcomes after the election.[3] To formalise this idea, Rogoff and Sibert (1988) and Rogoff (1990) suggest to make the future economic performance dependent on today's competence of the incumbent. To increase re-election chances an opportunistic

[2] Heinemann (2006) contributes evidence for official forecasts of Germany's federal budget from 1969 to 2003. His results support the idea that deficit forecasts are more optimistic prior to elections. Similar, though weaker evidence is obtained for German states by Bischoff and Gohout (2010). Couture and Imbeau (2009) find evidence for a pre-election revenue bias (in Canadian provinces from 1986-2004), Paleologou (2005) for a pre-election expenditure and revenue, but not for a deficit bias (for UK budget forecasts from 1969 to 1995). Ohlsson and Vredin (1996) encounter partisan, but no electoral effects (for Swedish data from 1969 to 1993). Blackley and DeBoer (1993) claim that there is a "substantial bias in outlay proposals", but not in economic forecasts or revenue estimates (for US federal budgets prior to 1989). To my knowledge no econometric study has been conducted for developing countries yet, but Kyobe and Danninger (2005) claim that discretionary adjustments of forecast figures are certainly not uncommon. They report on the revenue forecasting practices in 34 low-income countries. Their study is based on a questionnaire circulated to IMF fiscal economists in 2003. While most countries score low on the quality and the accountability of the forecasting process, discretionary adjustments seem to be particularly severe in countries with low levels of governance.

[3] Brender (2003) even finds that refraining from short-termism may actually increase a politician's re-election chance. In an empirical study of Israeli local elections he can show that responsible fiscal policies had a significant positive effect in the 1998 local elections, though not in two prior elections. His result is confirmed for a larger sample of countries in Brender and Drazen (2008).

incumbent would try to appear more competent than she really is[4], but only if at least some voters cannot correctly infer her current competence from her current actions.

Another theoretical problem is that voters who have been tricked by the government once should have learnt how government manipulations work. The government as an institution should lose its credibility and voters should rationally anticipate the policymaker's behaviour in future election years. However, this is not confirmed by the aforementioned empirical studies which encompass multiple election episodes. Again and again, electoral forecast manipulations seem to work; persistent electoral forecast cycles can be observed. Moreover, Boylan (2008) finds evidence for a "close election bias", i.e. that manipulations are particularly pronounced when the election is closely contested according to independent polls. Overall, this suggests that electoral forecast manipulations do not suffer from an intertemporal credibility loss, but can be employed over and over again.

This paper uses the aforementioned empirical and theoretical insights to build a political forecast and budget cycle model. In particular, it contains the following specific informational and expectational features. First, re-election chances depend on the voters' perception of *competence* as suggested by Rogoff and Sibert (1988). The government tries to appear as competent as possible by manipulating forecasts and the available amount of transfers. However, competence is not known by the goverment in advance, but only revealed afterwards. This could be motivated as follows: the government always faces new tasks or wants to start new programmes and cannot foresee how efficiently it can manage them. As there is no informational advantage for the government, there is no signalling, only moral hazard.

Second, there are *two differentially informed groups of voters* as in Shi and Svensson (2006). In the model here, however, informed voters observe the government's growth forecast,

[4] In a partisan model of the political business cycle such as Blomberg and Hess (2003), the role of competence is to enable the government to conduct its partisan policies in the most beneficial way, i.e. to cut taxes without large spending cuts, if it is a right wing government, or to raise public services without large tax increases, if it is a left wing government. – If higher competence means better policies, Caselli and Morelli (2004) go one step further. In their opportunistic political business cycle model, they argue with Plato that "the city where those who rule are least eager to do so will be the best governed". This is so because competent policymakers have more outside options.

whereas uninformed voters cannot observe the forecasts, are not interested in the forecasts or not able to link the forecasts to the government's economic policies. The point is that a share of the electorate falsely attributes the improved fiscal position of the government to competence of the incumbent. Third, both groups of voters hold different beliefs ex ante and possibly ex post. Informed voters understand what is going on and can deduce government policies from what they observe. Uninformed voters have to form expectations. However, the model does not impose rational expectations – as discussed on page 14. Regardless of being rational or not, it is those not fully informed voters who give rise to a political forecast and budget cycle. Nonetheless, the findings vary for rational or non-rational beliefs. Forth, intertemporal credibility issues which are theoretically important are ignored in this model because there is no indication that they affect the findings in empirical studies. In particular, credibility cannot be used for justifying the rational expectations hypothesis for all agents.

Nonetheless, allowing for biased beliefs and their impact on government manipulations may require some additional justification. Even if agents were fully rational, deliberate misinformation could produce distortions. Eichenberger (1996) argues that incorrect ("dirty") information increases the variance and has "systematic effects at the aggregate level" because of asymmetries in "political decision-making processes". Congleton (2001) discusses biased rational expectations, especially in cases when not all possibilities are known explicitly ("the dimensionality of the event space is, itself, to be learned"). Ursprung (1994) finds that a government can influence an uninformed, but rational electorate to some degree. Obviously, manipulation effects could be larger, if we acknowledged that not all voters deal with manipulated information in a fully rational way (especially when it comes to the implications of budget forecasts).

Are there reasons for believing in biased expectations? First of all, Caplan (2002, 2006) reports strong evidence that non-economists hold very different beliefs from economists (who are trained in rational expectations), thereby suggesting that agents hold biased beliefs on the economy and economic policies.[5] But even if voters anticipate that governments try to

[5] Based on the "Survey of Americans and Economists on the Economy" he rejects the hypothesis that

misrepresent fiscal data in general, governments seem to be particularly keen on increasing such efforts prior to elections. Would all voters anticipate that? Do all voters know that they should trust "stable agencies" (who might be more independent) rather than less stable ones (Krause and Corder, 2007)? Do all voters remember that the government cheated them last time and rationally anticipate the government's behaviour this time? If so, does this also apply for first time voters? We would have to answer all questions with yes and disregard Caplan's findings, it we were to reject the existence of biased beliefs.

The different effects of rational and non-rational expectations on the government's optimal choice of forecast manipulations are brought out in Propositions 2 and 3. In particular, it can be shown that an expected imminent recession increases the magnitude of forecast manipulations and thus the deficit (as stressed in a corallary), if voter expectations are biased. This amounts to countercyclical fiscal policy which is driven by opportunistic government behaviour during election years. Political forecast cycles are relevant under all economic circumstances, but especially when a downturn is imminent. The incumbent may then be particularly keen on producing too optimistic forecasts in order to avoid increases in taxes or cuts in spending programmes just before the election. This is already discussed by Boylan (2008), but he does not test, if recessionary expectations affect the magnitude of forecast manipulations. Kamlet, Mowery and Su (1987) find that recessions affect long-run, but not short-run forecasts. However, their results are based on actual, not expected forecasts; and on federal US data (where only a soft fiscal limit applies) and not data for US states (where constitutional balanced budget constraints are in place). This paper's proposition stating that expected recessions increase the forecast and budget cycle is a new theoretical finding with clear empirical predictions.

The remainder of the paper is structured as follows. The model is outlined in Section 2 (with indications for the solution given in the appendix). Propositions are discussed in Section 3 (with two paragraphs on the empirical implications of the theoretical findings at the end).

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economists are different from the public because of their self-serving bias, i.e. because their beliefs result from their socio-economic background.

2 The Model

In the following political budget cycle model the government faces a *(constitutional) balanced budget constraint* as currently in place in most US states, in Switzerland, and, most recently, in Germany.[6] Increasing fiscal latitude is only possible, if government revenues are expected to improve because of better growth forecasts. The model could also be interpreted in a wider sense as an allegory on the 2011 Euro crisis. Greece managed to extend its fiscal latitude beyond what was prescribed by the Growth and Stability Pact by manipulating fiscal data and forecasts.[7]

Prompted by the aforementioned strong influence of US state governors on budget forecasts this model makes the simplifying assumption that the government can not only influence, but even control the forecasts made by the budget office (or research institutes). So, such *growth forecasts* will be used as the government instrument for expanding its fiscal latitude and, ultimately, affecting its re-election chances. Specifically, the government will use its latitude for increasing *transfers* rather than public goods as, for instance, in Rogoff (1990) and Shi and Svensson (2006). The focus on transfers is motivated by the empirical evidence, but also allows for a simpler model structure. Trying to appear more competent the incumbent will produce overly optimistic economic forecasts, thereby giving room for expanding transfers before the elections. The ensuing deficit can be repaid after the election by cutting transfers or raising taxes then. However, not only do deficits incur repayment costs, but also reputation costs, because voters can see in retrospect that the government violated the balanced budget constraint.

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[6] In the US, all states but Vermont have a more or less stringent balanced budget provision. The German states (Länder) as well as the federal government face an increasingly strict limit with no deficit at all being permitted from 2020 onwards. Poland's constitution prescribes a cap to public debt at 60% (with a self-imposed 55% limit). In Italy, Berlusconi promised to add a balanced budget constraint to the constitution.

[7] Instead of a game between voters and the government we could interpret our model as a game between the Greek government and EU/euro institutions and governments. By manipulating its fiscal forecasts the Greek government can go beyond its 3% deficit-to-GDP ratio prescribed by the Growth and Stability Pact.

Preferences, transfers, competence and deficit

Every alternate period an incumbent politician and a challenger representing different parties run for office. Politicians' motivation is purely opportunistic. Nonetheless, voters' utility does not hinge on economic considerations alone, but also on a more or less strong personal predisposition or sympathy for one of the candidates.[8] The utility function for any voter i reflects both economic and non-economic components:

$$U_t^i = \sum_{s=t}^{\infty} [c_s + \alpha \theta^i z_s]. \tag{1}$$

The economic component c_s (consumption) and the sympathy component $\theta^i z_s$ are additively-separable with relative weight α in each period. Discounting between periods could be added, but does not contribute to substance nor exposition. To keep the model tractable, another simplification is that utility is linear in consumption.[9] Utility derived from sympathy is constrained to $\theta^i z_s \in [-\frac{1}{2}, \frac{1}{2}]$ since z_t is either $-\frac{1}{2}$ (when party a is elected) or $+\frac{1}{2}$ (when party b is elected); and the personal sympathy parameter θ^i is uniformly distributed over the interval $[-1, 1]$.[10] The sympathy component represents any attribute of the candidates that does not affect economic policies, be it their stance on societal issues or their good looks.

Both politicians $j = a, b$ face a utility function similar to the one for voters consisting, again, of an economic and a non-economic component. The non-economic component is, however, different and includes both a political rent and a political (reputation) cost. The politician's

[8] Henceforth the terms voter and individual (agent) are used interchangeably. Similarly, the terms politician and policymaker are used as synonyms. Furthermore, we associate the incumbent with party a and the challenger with party b without limiting the generality of the analysis.

[9] Linear utility in private consumption has been used before, when it does not affect the key mechanism, for instance, in Battaglini and Coate (2008). The more standard assumption of making private and public goods consumption additively-separable and imposing a constant marginal utility on public goods can, arguably, be more problematic, because it is sometimes not clear how that assumption actually affects the results.

[10] If individual i has somewhat more sympathies for party a, say at $\theta^i = -\frac{1}{2}$, then her utility derived from sympathy is positive ($\frac{1}{4}$), if party a is elected ($z_i = -\frac{1}{2}$); but it is negative ($-\frac{1}{4}$), if party b is elected ($z_i = \frac{1}{2}$).

utility function is thus:

$$V_t^j = \sum_{s=t}^{\infty}[c_s + X_s - \xi_s D_{s-1}^2]. \tag{2}$$

The policymaker is always concerned about consumption, but benefits and suffers from being a politician only, if she is in power in period t. Then she receives ego rent X_s and bears reputation costs ($\xi_s D_{s-1}^2$). The reputation costs rise overproportionally as the previous period violation ($D_{s-1} > 0$) of the constitutional balanced budget constraint ($D_{s-1} = 0$) increases.[11]

Voters' and politicians' consumption alike are constrained by each agent's trend income y, additional net-of-tax income $(1-\tau)\epsilon_t y$, and period-specific transfers T_t[12]:

$$c_t = y + (1-\tau)\epsilon_t y + T_t. \tag{3}$$

Tax rate τ and trend output y are taken to be constant. Growth rate shock ϵ_t is a random variable with mean $E(\epsilon_t) = 0$ and variance σ^2. Actual transfers depend upon fiscal latitude L_t minus repayment for last period's deficit[13], $(1-r)(D_{t-1})$, modulo the incumbent's positive or negative competence shock.

$$T_t = \quad L_t \quad -(1+r_{t-1})(D_{t-1}) + \eta_t^j; \tag{4}$$

$$L_t \quad = \tau\epsilon_t^a y. \tag{5}$$

Fiscal latitude is determined by the government forecast ϵ_t^a of growth rate shock ϵ_t. The superscript denotes that government a which is assumed to be in power in period t (without

[11] Including reputation costs produces richer results, but leaving them out would not contradict any of the findings of this paper. The quadratic form is the simplest way of capturing that voters "tolerate" small, but not large deviations and dislike both surpluses and deficits.

[12] T_t may be interpreted as additional transfers facilitated by the government on top of what is normally provided. Arguing along these lines, equation (3) can be obtained by assuming that such a normal level of transfers matches the taxes on trend output y as follows: $c_t = (1-\tau)(1+\epsilon_t)y + T_t^{all}$; with $T_t^{all} = T_t^{normal} + T_t$ and $T_t^{normal} = \tau y$. In any case, deadweight losses and distributional effects are ignored, albeit they do not affect the findings of this paper.

[13] There is no structural deficit. See discussion on p. 10

limiting the general validity of the analysis) can influence the growth forecast. For simplicity, it is even assumed that the government can actually instruct the budget office or forecasting agency to predict what is optimal for the incumbent. The variable ϵ_t^a is thus the incumbent's instrument and forms the basis for her budget calculations. Interest rate r_{t-1}, constant and known by everybody, determines the repayment costs for any level D_{t-1}. If we think of states with no large debt, then interest rate r_{t-1} cannot be influenced by the state and there should not be a state-specific risk premium. Hence the interest rate is exogenous, though not necessarily constant across periods.

Competence could be interpreted, for instance, as tax collection efficiency or transfer allocation efficiency. Competence η_t^j consists of a skills shocks for the current period and another one for the previous period:

$$\eta_t^j = \mu_t^j + \mu_{t-1}^j. \tag{6}$$

Hence competence persistence is modelled as an MA(1) process.[14] Each skills shock μ_t^j is a random variable with mean 0, distribution function $F(\mu_t^j) = F(\bullet)$ and density function $f(\mu_t^j) = f(\bullet) = F'(\bullet)$ which is (weakly) monotonously increasing up to the mean.[15] Past shocks are common knowledge, but current or future shocks are unknown to both policymakers and private agents. Not knowing her own competence, any incumbent has an incentive to provide additional transfers in order to appear more competent and increase her re-election chances. Since policymakers do not have an informational advantage, there is only moral hazard and no adverse selection though.

[14] Limited persistence is a compromise. It allows some persistence while acknowledging that competence also changes over time as new tasks for politicians emerge. For persistence longer than 1 period, the model would not be easily solvable. Rogoff's suggestion of an MA(1) process is one of two conditions (the other being the aforementioned assumption of repayment being costly) for splitting the model into separate 2-period cycles as is so common in this literature. Each cycle consists of an election period and an off-election period. The timing of events and the role of these assumptions is outlined further down. – The strategic implications in an explicitly intertemporal setting are brought out by Milesi-Ferretti and Spolaore (1994).

[15] For more unusual density functions (for instance, with $F''(\mu_t^a) < 0$ for some $\mu_t^a \leq 0$), we could get ambiguous results. However, the limiting case of $F''(\mu_t^a) = 0$ for some $\mu_t^a \leq 0$ or even over the entire range (uniform distribution) is acceptable.

Transfers are actually deficit-financed intertemporal transfers, not income redistribution. Deficits are constitutionally prohibited, but can appear, nonetheless, for two reasons: (i) a growth rate shock and/or (ii) the incumbent's (typically optimistic) growth estimate. This can be seen from the government budget constraint which is residually obtained: the realised deficit (not expected deficit) is defined as government realised expenditures minus realised government revenues. In our model, this corresponds to realised transfers T_t according to equations (4) and (5) minus realised taxes ($\tau\epsilon_t y$):

$$D_t = \tau\epsilon_t^a y - (1+r_{t-1})(D_{t-1}) + \eta_t^j - \tau\epsilon_t y \tag{7}$$

$$= \tau(\epsilon_t^a - \epsilon_t)y - (1+r_{t-1})(D_{t-1}) + \eta_t^j. \tag{8}$$

Even if the incumbent's estimate ϵ_t^a unintentionally (remember that they want to be more optimistic) hits the realised growth rate shock ϵ_t, a deficit could still appear ex post. Similarly, even if the chosen forecast does turn out to be optimistic as planned, there can be a zero deficit because a high level of competence. However, it will become clear from the model solution that the deficit expected by the incumbent, $E_t^a[D_t]$, will be relevant for the government's choice of its growth estimate ϵ_t^a:[16]

$$E_t^a[D_t] = \tau(\epsilon_t^a - E_t^a[\epsilon_t])y - (1+r_{t-1})(D_{t-1}) + E_t^a[\eta_t^j]$$

$$= \tau(\epsilon_t^a - 0)y - (1+r_{t-1})(D_{t-1}) + \mu_{t-1}^j \quad > \quad 0. \tag{9}$$

Government manipulation, timing of events and model solution

Every period, transfers, last period's deficit and last period's competence can be observed by all voters. A share of voters ($1-\psi$, with $0 \geq \psi \geq 1$) also observes the government's policy

[16] Note that growth rate shock and growth forecasts appear in two or three different forms each. *Growth rate shock* ϵ_t is a random variable with the expectational value of $E_t[\epsilon_t]$ or $E_t^a[\epsilon_t]$, if expectations by the incumbent are specifically referred to. In Section 3 a perturbation of $E_t^a[\epsilon_t]$ will also be considered. *Growth forecast* ϵ_t^a refers to the manipulated forecast used by the government to justify its fiscal policy. Voter's perception of the government's forecast is denoted by $\widehat{\epsilon_t^a}$.

choice of growth forecast ϵ_t^a which determines fiscal policy latitude L_t. If the government policy could be observed by all voters, the government would gain nothing from manipulating the forecast and from expanding transfers. The moral hazard problem arises because a share of voters ψ is not informed. They can, therefore, not infer government competence in election period t and hence not form unbiased beliefs ex ante about the incumbent's performance after elections.

The timing of events is as follows. In election period t, the incumbent chooses growth forecast ϵ_t^a, thus providing transfers for the public according to equation (4). Voting individuals observe transfer level T_t and past skills shock μ_{t-1}^j. Only informed voters also observe government growth forecast ϵ_t^a and can deduce current skills μ_t^j. They can, therefore, extract information about the future competence of the incumbent. Uninformed voters can only form expectations of the government growth forecast $\widehat{\epsilon_t^a}$. Then, all voters cast their vote based on their different beliefs and information sets. What matters is that some voters are imperfectly informed.

In period $(t+1)$, the winner (incumbent or challenger) takes office and receives an ego rent. If the incumbent stays in office, she also suffers disutility $\xi_t D_{t-1}^2$ for having violated the balanced budget constraint. Voters are no longer relevant for the period $(t+1)$ policymakers' decision making because they cannot vote in period $(t+1)$. Politicians have no incentive for manipulating their growth estimate ϵ_t^a. They want to repay the previous period deficit because the deficit is costly[17] and voters cannot sanction the policymaker for reducing transfers. That means effectively levying additional taxes to finance the deficit repayment. Given that voters are only concerned about politicians' competence after the election it does not matter that individuals anticipate in election period t that any politician will repay the deficit in the off-election period $(t+1)$. Note also that voters do not consider expected utility in $(t+2)$ in their voting decision in t, because even informed voters cannot

[17] Repayment is guaranteed, technically, because the marginal utility of additional deficit-financed transfers in t (through its 1-for-1 effect on period t consumption) is 1 (given that the discount factor is 1), whereas its marginal cost and, therefore, the marginal disutility is $(1+r_t)$, i.e. greater than 1. The unity marginal utility assumption is also used by Shi and Svensson (2006) for the same purpose as here, albeit with respect to the public goods consumption.

distinguish between the incumbent and her challenger in $(t+2)$ (competence is an MA(1) process only). Politicians, too, are not concerned about the more distant future, because they have no instrument for affecting utility or re-election chances in $(t+2)$.

The model is solved in four steps – with details given in the appendix. First, we can determine the probability that an individual agent votes for the incumbent, to whom we refer as party a, without loss of generality. Second and on this basis, we can derive the probability for the incumbent to win the election for a given level of transfers and the competence level of the incumbent. Third, we can maximise the incumbent's expected utility over any 2-period cycle, i.e. period t utility *plus* period $(t+1)$ utility in case of winning the election multiplied by the probability of winning (as determined in step 2) *plus* period $t+1$ utility in case of losing multiplied by the probability of losing. To characterise the optimal level of deficit we derive two first order conditions (FOCs). Forth, perturbation results are obtained by using the Implicit Function Theorem. We can study the marginal effects of changes in exogenous variables *on* the equilibrium value of the government's optimal choice of the growth forecast $(\epsilon_t^a)^*$. Those variables are political rent X, trend output y, tax rate τ, interest rate r, the weight on reputation costs ξ, and the share of uninformed voters ψ (i.e. we consider a shift between the two groups of voters). We are particularly interested in what happens when there are changes in the *perception* by uninformed voters of the government's growth forecast $\widehat{\epsilon_t^a}$; and when the government thinks that economic prospects turn into recession or boom expectations, i.e. $E_t^a(\epsilon_t)$ changes.

3 Results and Discussion

Proposition 1 - Some Obvious Results.

A. Government Cost Effect: Higher repayment costs r_t and higher punishment costs ξ reduce the optimal growth forecast by the government at the equilibrium:

$$(i) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}r_t} < 0; \qquad\qquad (ii) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}\xi} < 0.$$

B. Government Benefit Effect: *A higher ego rent X increases the optimal growth forecast by the government at the equilibrium:*

$$(iii) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}X} > 0.$$

C. Leverage Effect: *A higher tax rate τ and a higher trend output y increase the optimal growth forecast by the government at the equilibrium:*

$$(iv) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}\tau} < 0; \qquad (v) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}y} < 0.$$

As for part A, if the cost of manipulating the government growth forecast increases, the government will be more careful in expanding fiscal latitude in order to gain an electoral advantage. However, if the benefit from being re-elected increases (as in part B), then the government is willing to incur the additional costs of producing a deficit which results from expanding fiscal latitude (obtained by announcing a more optimistic government growth forecast). In a different setting, such an effect of ego rents on manipulations is also confirmed by Shi and Svensson (2006). In part C, as τ or y increase the effect of a government growth forecast manipulation on fiscal latitude as well as the deficit becomes larger. So the government should reduce its growth forecast to achieve the same optimal level of fiscal latitude.

Proposition 2 - The Role of Voters' Forecast Expectations.

A. Effect of Uninformed Voters: *A larger share of uninformed voters ψ increases the optimal growth forecast by the government at the equilibrium, if uninformed voters form rational expectations in equilibrium. However, if expectations are biased, the result becomes ambiguous.*

$$(i) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}\psi} > 0, \text{ if } \widehat{\epsilon_t^a} = \epsilon_t^a; \qquad (ii) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}\psi} = ?.$$

B. Effect of Voters' Expectations, If Known By the Government: If voters expect a higher government growth forecast ($\widehat{\epsilon}_t^a$ up at the equilibrium) and the government knows it, then it is optimal for the government to increase its growth forecast:

$$(iii) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}\widehat{\epsilon}_t^a} > 0.$$

As for part A, result (i) seems to be the intuitive one: more people who can be manipulated leads to more manipulation by the government. In a different setting, such an effect of uninformed voters on manipulations is also found by Shi and Svensson (2006). There are a couple of problems with applying the rational expectations assumption to uninformed voters though. First, Grossman (1977) points out that there is a conceptual problem. He argues that informed and uninformed agents must hold different beliefs in the equilibrium. Identical beliefs are only possible, if there is an observable economic variable, which contains the entire information the uninformed agent could otherwise not have observed. There is no such variable here (or in the Shi and Svensson paper). Second, rational expectations (i.e. $\widehat{\epsilon}_t^a = \epsilon_t^a$) imply that the probability of being elected specified in the appendix (A.13 and A.14) cannot be affected by the incumbent's manipulations. This is an artificial result and runs counter to empirical evidence. Akhmedov and Zhuravskaya (2004), for instance, do find that winning chances can well be raised by manipulating governments.

What is the alternative to imposing rational expectations? In this paper, we do actually allow for biased beliefs.[18] However, if expectations are non-rational, the effect of increasing the share of uninformed voters is no longer unambiguous as shown by result (ii).[19] For part B it is assumed that the government is aware of changes of voters expectations. If the government anticipates, for instance, that voters better understand the manipulations

[18] Thereby, it is typically assumed that voters underestimate the government manipulation in equilibrium. Results would be more restrictive in the less realistic, but not impossible case of uninformed voters overestimating the manipulations by the government.

[19] In a similar setting, this has already been found by Bohn (2011). That paper argues that it depends on the elasticity of the competence distribution function at the equilibrium. Here, a similar sufficient condition can be obtained (and is reported in the appendix) for the counterintuitive result that an increase in the share of uninformed voters leads to less forecast manipulation by the government.

of the government, the government will respond by increasing the deliberate forecast bias even further.

Proposition 3 - Recession (or Boom) Expectations.

Imminent recession expectations by the government (lower $E_t^a[\epsilon_t]$ in equation A.16) decrease the government's optimal growth forecast at the equilibrium, but underproportionally, unless voters form rational expectations. (Analogously, boom expectations increase optimal growth forecasts.)

$$(i) \quad 0 < \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}E_t^a[\epsilon_t]} < 1; \qquad\qquad (ii) \quad \frac{\mathrm{d}\epsilon_t^{a*}}{\mathrm{d}E_t^a[\epsilon_t]} = 1, \text{ if } \widehat{\epsilon_t^a} = \epsilon_t^a.$$

Consider (i) first. If we perturb the equilibrium so that the government expects a downturn (reduced $E_t^a[\epsilon_t]$), its given growth forecast ϵ_t^a goes down, but not as much as expected growth $E_t^a[\epsilon_t]$. Hence the government growth forecast will be even more optimistic relative to expected growth. This means that the government also *expects* to run an even higher deficit ex post. On the one hand, this is costly. So it is optimal for the government to reduce its growth forecast ϵ_t^a. On the other hand, the government still wants to manipulate the (uninformed) voters as much as possible. So it reduces its growth forecast ϵ_t^a only underproportionally. This can only be understood in the light of such a perturbation analysis. We are changing an exogenous component at the equilibrium leaving everything else constant. In particular, uninformed voters' expectations of the government growth forecast $\widehat{\epsilon_t^a}$ are kept unchanged. Therefore, it is optimal for the government not to reduce its forecast manipulation ϵ_t^a as much as it expects (at the margin) output to decrease (depends on $E_t^a[\epsilon_t]$) in order to preserve a positive effect on re-election chances (which depend on $\widehat{\epsilon_t^a} - \epsilon_t^a$).

This effect would only vanish under rational expectations (result (ii)), i.e. all voters would fully expect the government's forecast manipulation ($\widehat{\epsilon_t^a} = \epsilon_t^a$). Then the government would revise its forecast manipulation ϵ_t^a one for one with its changed outlook for the economy $E_t^a[\epsilon_t]$. Note that – under non-rational expectations – the aforementioned effect does not go away, even if we assume that voters reduce their expectations of government forecasts $\widehat{\epsilon_t^a}$ by

as much as the government's growth expectations $E_t^a[\epsilon_t]$ go down. The effect on voting is only eliminated by rational expectations.

In reality, it is unlikely that all voters adjust their expectations of government policy as soon as recession tendencies are discussed in the media. This would explain why governments may even be keener on using forecast manipulations. Boylan (2008) suggests that "government officials can avoid choosing between raising taxes and cutting government programs by making optimistic forecasts when the economy is headed for a downturn." The government may even expand its transfers despite the expected downturn.

Corollary 1 - The Effect on Debt.
Imminent recession expectations by the government (lower $E_t^a[\epsilon_t]$) increase [boom expectations decrease] the actual deficit at the equilibrium, if voter expectations are biased.

$$\frac{\mathrm{d}D}{\mathrm{d}E_t^a[\epsilon_t]} < 0.$$

Given that the government responds underproportionally to an expected downturn, the corollary follows directly from equation (9). Essentially, the corollary says that political opportunism encourages the government to run countercyclical policies, at least during election years. In the real world, there are two reasons for this result. The first one is captured in the model: some people will probably not fully anticipated the expected downturn and hold biased beliefs. The second one would require a model modification. If the government is running countercyclical policies in a recessionary period, voters will probably not punish the government ex post so much for having missed the balanced budget requirement. As deficits are less costly, this will reinforce the incumbent's willingness to use overly optimistic forecasts for facilitating an expansionary policy during a recession.

Empirical Implications

The main theoretical conclusion is that political forecast und budget cycles are relevant under all economic circumstances, but especially when the government perceives a downturn

to be imminent. The incumbent may then be particularly keen on producing too optimistic forecasts in order to avoid increases in taxes or cuts in spending programmes just before the election. The effect of *expected recessions* has been ignored in the literature thus far. Boylan (2008) tries to capture the effect of actual recessions on forecasts by including changes in unemployment, income and inflation. However, he cannot test, if recessionary expectations affect the magnitude of forecast manipulations. Kamlet, Mowery and Su (1987) find that actual recessions affect long-run, but not short-run forecasts. However, their results are based on federal US data (where only a soft fiscal limit applies) and not data for US states (where constitutional balanced budget constraints are in place).

It may not be straightforward to extract data for true expectations by the government on the economic outlook, because the data published by the states is exactly what we suspect of being too optimistic (on purpose). In the US context we might be able to use the national economic outlook (which is known to be less biased) and break it down to the state level (possibly, by using additional information). Then a panel data set could be used for testing the theoretical prediction that expected recessions amplify forecast and budget cycles.

Appendix

The appendix presents indications for the four steps of the model solution mentioned on page 12.

Step 1: Probability of voting for the incumbent

We consider an individual voter, no matter if informed or uninformed. She votes for incumbent a, if

$$\underbrace{E_t[c^a_{t+1} + \alpha\theta^i(-\frac{1}{2})]}_{\text{exp. utility when } a \text{ in power}} > \underbrace{E_t[c^b_{t+1} + \alpha\theta^i(+\frac{1}{2})]}_{\text{exp. utility when } b \text{ in power}} . \tag{A.1}$$

Depending on who is in power, $t+1$ consumption will typically differ because of differences in policymakers' competence and individuals' expectations about it:

$$E_t[c^a_{t+1}] = E_t[y] + E_t[(1-\tau)\epsilon^a_{t+1}y] + E_t[T^a_{t+1}]; \tag{A.2}$$

$$E_t[c^b_{t+1}] = E_t[y] + E_t[(1-\tau)\epsilon^b_{t+1}y] + E_t[T^b_{t+1}]; \tag{A.3}$$

$$T^j_{t+1} = \tau\epsilon^j_{t+1}y - (1+r_t)D_t + \eta^j_{t+1} \qquad j = a, b. \tag{A.4}$$

Equation (A.4) says that the period t deficit must be repaid in period $(t+1)$. However, the policymaker will try not to borrow in period $(t+1)$ because there is no election at the end of that period. (Note that they will probably end up with a deficit or surplus though. See also the discussion in the paragraph on the timing of events on page 11.) The best growth forecast for the incumbent in $(t+1)$ is, therefore, $\epsilon^j_{t+1} = E[\epsilon_{t+1}] = 0$. As a result, $(t+1)$ transfers are negative (i.e. taxes) corresponding to deficit repayment modulo the effect of the policymaker's competence. Individuals have no idea about the skills shock of either potential policymaker in $t+1$. Nor do they know the skills shock of the challenger in period t, and, therefore, expect 0. However, they can use the incumbent's period t transfer policy to draw conclusions about her skills shock in period t (to be shown further down; the difference between informed and uninformed voters will then be exploited).

$$E_t[T^b_{t+1}] = -E_t[(1+r_t)D_t]; \tag{A.5}$$

$$E_t[T^a_{t+1}] = -E_t[(1+r_t)D_t] + E_t[\mu^a_t]; \tag{A.6}$$

where D_t denotes the deficit according to equation (9). It is a result of the difference of realised growth ϵ_t and the incumbent's optimal choice for the period t growth forecast ϵ^a_t (to be determined further down). It is the same for both policymakers, even if the incumbent were to lose the elections. Combining equations (A.1) to (A.6) we can obtain a condition for an individual to vote for incumbent a:

$$E_t[\mu^a_t] > \alpha\theta^i. \tag{A.7}$$

Using the distribution of the skills shock we can determine the probability (Pr) of any voter, be she informed or uninformed, to vote for incumbent a:

$$Pr[E_t[\mu^a_t] - \alpha\theta^i \geq 0] = \frac{E_t[\mu^a_t] - (-\alpha)}{\alpha - (-\alpha)} = \frac{E_t[\mu^a_t]}{2\alpha} + \frac{1}{2}. \tag{A.8}$$

Step 2: Incumbent's probability of winning

Now, we can determine the probability $Prob$ that incumbent a obtains 50% of the votes in period t elections. It is the probability that the number of voters times their individual probability Pr to vote for incumbent a (as determined in equation A.8) is greater or equal to $\frac{1}{2}$. However, the individual probability Pr is different for informed and uninformed voters because their expectations of period t skills, $E_t[\mu_t^a]$, differ. Here is the probability for the incumbent to win the election:

$$\text{Prob}\left\{\underbrace{(1-\psi)\,[\frac{E_t^{inf}[\mu_t^a]}{2\alpha}+\frac{1}{2}]}_{\text{informed}}+\underbrace{\psi\,[\frac{E_t^{uninf}[\mu_t^a]}{2\alpha}+\frac{1}{2}]}_{\text{uninformed}} \quad \geq \quad \frac{1}{2}\right\}. \tag{A.9}$$

So why is there a difference in expectations for informed and uninformed voters? Rewrite the government transfer equations (4) and (5) for period t:

$$T_t = \tau\epsilon_t^a y - (1+r_{t-1})D_{t-1} + \mu_t^a + \mu_{t-1}^a. \tag{A.10}$$

For informed voters we obtain:

$$E_t^{inf}[\mu_t^a] = \mu_t^a = T_t - \tau\epsilon_t^a y + (1+r_{t-1})D_{t-1} - \mu_{t-1}^a. \tag{A.11}$$

Transfers T_t, previous period deficit D_{t-1}, previous period competence μ_t^a, trend output y, interest rate r and the tax rate τ can be observed by everybody. The point is, however, that informed voters can determine $E_t^{inf}[\mu_t^a]$ deterministically, because they can also observe ϵ_t^a. By contrast, uninformed voters must form an estimate of the incumbent's skills, $\widehat{\mu_t^a}$, based on their *perception* of the government's growth forecast $\widehat{\epsilon_t^a}$:

$$\begin{aligned}
\widehat{\mu_t^a} &= T_t - \tau\widehat{\epsilon_t^a} y + (1+r_{t-1})D_{t-1} - \mu_{t-1}^a; \\
\widehat{\mu_t^a} &= \underbrace{T_t - \tau\epsilon_t^a y + (1+r_{t-1})D_{t-1} - \mu_{t-1}^a}_{\mu_t^a \text{ from (A.11)}} + \tau\epsilon_t^a y - \tau\widehat{\epsilon_t^a} y; \\
E_t^{uninf}[\mu_t^a] &= \mu_t^a + \tau(\epsilon_t^a - \widehat{\epsilon_t^a}) y.
\end{aligned} \tag{A.12}$$

Uninformed voters overestimate the incumbent's competence by $\tau(\epsilon_t^a - \widehat{\epsilon_t^a})y$. Using equations (A.11) and (A.12) we can now determine the probability that incumbent a receives 50% of the votes in period t:

$$\text{Prob} \quad \left\{ (1-\psi)\,[\frac{\mu_t^a}{2\alpha}+\frac{1}{2}] \quad + \quad \psi\,[\frac{\mu_t^a+\tau(\epsilon_t^a-\widehat{\epsilon_t^a})y}{2\alpha}+\frac{1}{2}] \quad \geq \quad \frac{1}{2} \right\}$$

$$= \quad \text{Prob} \quad \left\{ \frac{\mu_t^a}{2\alpha} \quad + \quad \psi\,\frac{\tau(\epsilon_t^a-\widehat{\epsilon_t^a})y}{2\alpha} \quad + \quad \frac{1}{2} \quad \geq \quad \frac{1}{2} \right\}$$

$$= \quad \text{Prob} \quad \left\{ \mu_t^a \quad \geq \quad \psi\,\tau(\widehat{\epsilon_t^a}-\epsilon_t^a)y \right\} \tag{A.13}$$

$$= \quad 1 \quad - \quad F\,[\,\psi\,\tau(\widehat{\epsilon_t^a}-\epsilon_t^a)y]\,, \tag{A.14}$$

where $F(\bullet)$ is the distribution function of the skills shock.

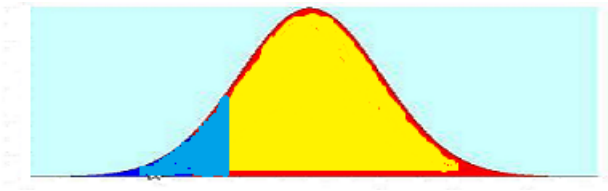

Figure 1: Bell-shaped competence density function as an example

The marked area towards the right (light grey or yellow [if in colour]) under the density function depicted in Figure 1 corresponds to the probability described by equation (A.13) and by the distribution function representation in equation (A.14). The expected competence overall (combine equations A.11 and A.12) is always greater than the actual competence, if the government growth estimate perceived by uninformed voters is smaller than the actual government growth estimate ($\widehat{\epsilon_t^a} < \epsilon_t^a$). Then the probability (see equation (A.14) or the light grey [or yellow] area under the density function) is always greater than $\frac{1}{2}$. We can see that expanding fiscal latitude by choosing an overly optimistic growth forecast increases the government's chance to be re-elected. A similar effect occurs, if uninformed voters were to reduce their perception of the government growth forecast for some reason.

Step 3: Incumbent's maximisation problem

Now, we can maximise incumbent a's utility over the entire election cycle, i.e. periods t and $t+1$. Period $t+1$ utility is the sum of the utilities for winning and losing the election weighted by the probability determined in step 2:

$$max_{\epsilon_t^a}\ V \quad = \quad max_{\epsilon_t^a}\ V_t^a \ + \ V_{t+1}^a \quad =$$

$$max_{\epsilon_t^a} \quad E_t^a\{y + (1-\tau)\epsilon_t y + \tau\epsilon_t^a y - (1+r_{t-1})D_{t-1} + \eta_t^a + X - \xi D_{t-1}^2\}$$

$$+ \quad E_t^a\{ \underbrace{[1 - F[\psi\tau(\widehat{\epsilon_t^a} - \epsilon_t^a)y]]}_{\text{prob. incumbent wins}}$$

$$[y + (1-\tau)\epsilon_{t+1} y + \tau\epsilon_{t+1}^a y - (1+r_t)D_t + \eta_{t+1}^a + X - \xi D_t^2]\}$$

$$+ \quad E_t^a\{ \quad \underbrace{[F[\psi\tau(\widehat{\epsilon_t^a} - \epsilon_t^a)y]]}_{\text{prob. incumbent loses}}$$

$$[y + (1-\tau)\epsilon_{t+1} y + \tau\epsilon_{t+1}^b y - (1+r_t)D_t + \eta_{t+1}^b]\}. \tag{A.15}$$

Substituting for debt and simplifying ($E_t^a[\epsilon_{t+1}] = 0$; the optimal choice for ϵ_{t+1}^j is also $E_t^a[\epsilon_{t+1}] = 0$; the incumbent knows her past, but not her present and future skills and not the skills shock of the challenger) the maximisation problem looks as follows:

$$max_{\epsilon_t^a} \quad (2 + E_t^a[\epsilon_t])y - r_t\tau(\epsilon_t^a - E_t^a[\epsilon_t])y + r_t(1+r_{t-1})D_{t-1} - \xi D_{t-1}^2 - r_t\mu_{t-1}^a + X$$

$$+[1 - F[\psi\tau(\widehat{\epsilon_t^a} - \epsilon_t^a)y]]$$

$$[X - \xi[\tau(\epsilon_t^a - E_t^a[\epsilon_t])y - (1+r_{t-1})D_{t-1} + \mu_{t-1}^a]^2]. \tag{A.16}$$

Having verified the second order conditions for a well-behaved maximisation problem we can focus on the first order conditions (FOC):

$$-r_t\tau y + F'[\psi\tau(\widehat{\epsilon_t^a} - \epsilon_t^a)y]\psi\tau y[X - \xi[\tau(\epsilon_t^a - E_t^a[\epsilon_t])y - (1+r_{t-1})D_{t-1} + \mu_{t-1}^a]^2]$$

$$-[1 - F[\psi\tau(\widehat{\epsilon_t^a} - \epsilon_t^a)y]]2\xi\tau y[\tau(\epsilon_t^a - E_t^a[\epsilon_t])y - (1+r_{t-1})D_{t-1} + \mu_{t-1}^a] = 0; \tag{A.17}$$

where $F'[\bullet] = f[\bullet]$ refers to the probability density function.

As for the interpretation of the FOC, $(-r_t\tau y)$ is the marginal direct net effect of the government's growth forecast on deficit, which is negative, because deficit including repayment is costly. The growth forecast is optimally chosen by the government, when the negative marginal direct net effect on deficit equals the net effect on the expected return if the incumbent stays in power. The latter also consists of countervailing effects. There is a positive marginal impact of increased forecasts on perceived competence of the incumbent and thus on the voting probability of receiving the return $(X - \xi D_t^2)$. There a negative marginal impact of increased forecasts on the punishment (since deficit will be increasing) given the chance of winning the elections.

Step 4: Propositions in Section 3

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}r_t} = -\frac{V_{\epsilon_t^a r_t}}{V_{\epsilon_t^a \epsilon_t^a}} < 0$$

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}\tau} = -\frac{V_{\epsilon_t^a \tau}}{V_{\epsilon_t^a \epsilon_t^a}}$$

$$= \frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}y} = -\frac{V_{\epsilon_t^a y}}{V_{\epsilon_t^a \epsilon_t^a}} < 0$$

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}X} = -\frac{V_{\epsilon_t^a X}}{V_{\epsilon_t^a \epsilon_t^a}} > 0$$

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}\psi} = -\frac{V_{\epsilon_t^a \psi}}{V_{\epsilon_t^a \epsilon_t^a}} =? \quad (> 0, \text{ if } \widehat{\epsilon_t^a} = \epsilon_t^a \text{ [rational expectations in equilibrium]}$$

$$\text{or if } \widehat{\epsilon_t^a} \text{ sufficiently close to } \epsilon_t^a)$$

$$(< 0, \text{ if } \frac{F'[\bullet]}{F''[\bullet]} < (\epsilon_t^a - \widehat{\epsilon_t^a})\psi\tau y)$$

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}\xi} = -\frac{V_{\epsilon_t^a \xi}}{V_{\epsilon_t^a \epsilon_t^a}} < 0$$

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}\widehat{\epsilon_t^a}} = -\frac{V_{\epsilon_t^a \widehat{\epsilon_t^a}}}{V_{\epsilon_t^a \epsilon_t^a}} > 0$$

$$\frac{\mathrm{d}\epsilon_t^a}{\mathrm{d}E_t^a[\epsilon_t]} = -\frac{V_{\epsilon_t^a E_t^a[\epsilon_t]}}{V_{\epsilon_t^a \epsilon_t^a}} > 0, but < 1$$

$$(= 1, \text{ if } \widehat{\epsilon_t^a} = \epsilon_t^a \text{ [rational expectations in equilibrium]}). \quad \text{(A.18)}$$

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