The 'Expansionary Fiscal Contraction Hypothesis' and Uncertainty About the Permanence of Fiscal Consolidations

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Abstract

This paper contrasts the effects of balanced-budget reductions in government consumption on private consumption in the permanent income model and a model allowing for precautionary savings. We compare impulse responses of private consumption to temporary and permanent shocks to government consumption when agents do not observe the shocks directly or can distinguish between temporary and permanent shocks. Our simulations suggest that uncertainty about the permanence of government consumption reductions affect both the impact and the duration of private consumption whereas precautionary saving motives only affect the impact.
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1 Introduction

Recent research on government policy suggests that a fiscal contraction, which leads to the expectation of permanently lower future paths of government consumption and taxation, provides a powerful stimulus to private consumption and output. This non–Keynesian prediction, associated with statements by the German Council of Economic Experts in the

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early 1980s, has been termed the "expansionary fiscal contraction hypothesis" (Giavazzi and Pagano (1990) and Barry and Devereux (1994)).[1] In an infinite horizon perfect foresight model (the permanent income model) where agents observe the shocks to net income directly, they respond immediately to changes in taxation by revising their estimate of permanent income. Permanent reductions of government consumption therefore lead to higher expected future permanent income and, thus, higher current and future private consumption.[2]

These predictions, opposite to conventional economic analysis, rest on several conditions such as sufficiently high wage and price flexibility, a strong supply–side response, well–functioning consumer credit markets and a high degree of credibility that the announced government policy will lead to lower future taxation. If these assumptions are not fulfilled, fiscal contractions may easily lead to declining private consumption and output.[3]

In this paper, we suggest that the expansionary effect on private consumption obtained from the permanent income model will be much smaller when allowing for (i) uncertainty about the permanence of fiscal contractions and (ii) precautionary saving motives. When examining the effects of reductions in government consumption, introducing uncertainty about the nature of fiscal contractions is important. In particular, it is essential to distinguishing between permanent and temporary changes in government consumption. For example, if past experience suggests that temporary changes are predominant, then the initial impact effect of a fiscal contraction will be small even if it is a permanent change. As agents gradually learn that the fiscal contraction was permanent, they revise their estimate of expected future permanent income and actual private consumption. This reinforces the view that the credibility of a fiscal reform is important and plays an important role in determining the response of the private sector. Uncertainty about the permanence of fiscal contractions may therefore affect both the impact and the duration of private consumption.

Uncertainty over future net income may also affect the behavior of individual saving. In the presence of nonincreasing risk aversion (a positive third derivative of the utility function), the slope of the optimal consumption path will be altered and current consumption will be lower. These results hold for both the CARA (constant absolute risk

[1] See also Giavazzi and Pagano (1996), Bertola and Drazen (1993) and Barry and Devereux (1995). For a survey of this literature and the empirical evidence, see Bergman and Hutchison (1999).

[2] Blanchard (1990) shows, however, that even fiscal consolidations with substantial tax increases may have expansionary effects on current private consumption if the tax increase prevents future tax increases. Kimball and Mankiw (1989) show that the timing of taxation influences private consumption.

[3] See, e.g., Barry and Deveraux (1995) who survey several general equilibrium models including the frictionless neoclassical growth model.

aversion) and the CRRA (constant relative risk aversion) felicity functions, see Zeldes (1989), Caballero (1990), van der Ploeg (1993) and Obstfeld and Rogoff (1996). Precautionary saving motives may therefore have important consequences for the response of private consumption following reductions in taxation and government consumption. Particularly, the growing empirical literature suggests that precautionary saving motives are important for the behavior of private consumption and can explain large portions (about 30% to 60%) of actual savings, see, e.g. Skinner (1988), Malley and Moutos (1996), Carroll and Samwick (1997), Kazarosian (1997), Lusardi (1998) and Wilson (1998).[4]

Our starting point is the standard permanent income model where agents cannot distinguish between permanent and temporary fiscal contractions. We then contrast the effects of balanced–budget fiscal contractions in this base line model with a precautionary savings model where utility is described by a CRRA felicity function. Our simulations suggest considerable time lags in the response of private consumption following permanent and temporary balanced–budget changes in government consumption. Uncertainty about the nature of fiscal contractions, whether they are permanent or temporary, affects both the impact and the duration of private consumption responses whereas the degree of risk aversion (the precautionary saving motive) only affects the impact.

The paper is organized in the following manner. In section 2, we develop the basic theoretical models, the permanent income model and the precautionary–savings model upon which the empirical analysis is based and introduce uncertainty about the permanence of fiscal reductions. Section 3 contains the empirical analysis. Section 4 summarizes the main findings.

2 The Model

The expansionary fiscal contraction hypothesis may be illustrated by a simple model with representative, infinitely lived, agents who smooth expected consumption over time. We postulate a model with one tradeable good in a small open–economy framework where the interest rate is exogenous. Extending the model to a 2–good framework is straightforward, thus introducing terms–of–trade as a determinant of private consumption, see Bergman and Hutchison (1996). However, such extensions are not crucial for the analysis performed below. Two familiar features of our model are that it satisfies Ricardian equivalence and that production and investment decisions are treated as exogenous for the small open economy. It is the latter feature that allows us to focus on the behavior of consumption disregarding production and investment changes. Within this small open economy version

[4] However, Dynan (1993) finds evidence questioning the importance of precautionary savings.

of the standard Ramsey model, we focus on the dynamic response of private consumption from shocks to government consumption.

Let us assume that a representative individual maximizes the expected value of lifetime utility,

$$U_t = \mathsf{E}_t \left\{ \sum_{t=0}^{\infty} \beta^t u(C_t) \right\} \tag{1}$$

where $\mathsf{E}_t \{\cdot\}$ is the mathematical conditional expectation given all information up to and including date t, $u(\cdot)$ is the temporal utility function, C_t is real consumption at time t, and β is the discount factor (equal to $1/(1+\theta)$, where θ is the subjective rate of time preference). We assume for the moment a constant world real interest rate, r, and that a riskless bond is the only internationally traded asset.

The consumer's objective is to maximize the present discounted value of expected utility, U_t, by choosing the sequence $\{E_t C_s\}_{s=t}^{\infty}$, subject to the overall wealth constraint. Wealth is defined as the intertemporal budget constraint (assuming the usual no Ponzi game condition), i.e., the present discounted value of expected consumption is equal to the presented discounted value of expected financial and non–financial wealth:

$$\mathsf{E}_t \left\{ \sum_{t=0}^{\infty} \left(\frac{1}{1+r} \right)^t C_t \right\} = \mathsf{E}_t \left\{ (1+r) B_t + \sum_{t=0}^{\infty} \left(\frac{1}{1+r} \right)^t (Y_t - T_t) \right\} \tag{2}$$

where B_t is the consumer's holdings of assets at the beginning of the period, Y_t is labor income (or endowment) at time t and T_t is the lump sum tax at time t. We assume that the consumer incorporates the government's intertemporal budget constraint into their own expected wealth. The government's intertemporal budget constraint (assuming no initial debt level and the no Ponzi game condition) is simply:

$$\mathsf{E}_t \left\{ \sum_{t=0}^{\infty} \left(\frac{1}{1+r} \right)^t G_t \right\} = \mathsf{E}_t \left\{ \sum_{t=0}^{\infty} \left(\frac{1}{1+r} \right)^t T_t \right\} \tag{3}$$

where G_t is government consumption. Substituting the present discounted value of government expenditures for taxes into the consumer's budget constraint gives:

$$\mathsf{E}_t \left\{ \sum_{t=0}^{\infty} \left(\frac{1}{1+r} \right)^t C_t \right\} = \mathsf{E}_t \left\{ (1+r) B_t + \sum_{t=0}^{\infty} \left(\frac{1}{1+r} \right)^t (Y_t - G_t) \right\} . \tag{4}$$

The necessary conditions for intertemporal optimum, i.e., the familiar Euler equation on total real consumption which must be satisfied at every point in time along the optimal consumption path is

$$u'(C_t) = (1+r)\beta \, \mathsf{E}_t \{u'(C_{t+1})\} . \tag{5}$$

Next, we use this model to derive closed–form solutions for the consumption functions under quadratic and CRRA utility functions.

2.1 Permanent–Income Model

The quadratic utility function:

$$u(C_s) = C_s - \frac{\alpha}{2} C_s^2 \ . \tag{6}$$

allows us to derive the optimal level of consumption under uncertainty similarly to the perfect foresight case and, by assuming $(1+r)\beta = 1$, constrains the economy to follow a stationary long–run path. Substituting $u'(C_s) = 1 - \alpha C_s$ and $(1+r)\beta = 1$ into (5), gives the special form of the Euler condition for optimum derived by Hall (1978), $1 - \alpha C_t = \mathsf{E}_t \{1 - \alpha C_{t+1}\}$, which in turn implies that consumption follows a random walk, i.e., $\mathsf{E}_t \{C_{t+1}\} = C_t$. In this special case, $\mathsf{E}_t \{C_s\} = C_t$ for all $s > t$, so we can substitute current consumption for all future levels of expected consumption into the intertemporal budget constraint (4) to derive a reduced form for the level of consumption as a function of the current and expected future values of labor income and government consumption:

$$C_t = \left(\frac{r}{1+r}\right)\left[(1+r)B_t + \sum_{t=0}^{\infty}\left(\frac{1}{1+r}\right)^t \mathsf{E}_t \{Y_t - G_t\}\right] = \left(\frac{r}{1+r}\right) y_t^p \ . \tag{7}$$

According to this expression, private consumption depends on the present discounted value of current and future net income and initial wealth.

2.2 Precautionary Savings Model

Next we turn to a model allowing for precautionary-savings behavior. To introduce prudence (a positive third derivative of the utility function) into our basic framework above while still allowing us to obtain an explicit solution for the consumption function we can assume either a CRRA or a CARA felicity function. In the former case, labor income is fully diversifiable whereas it is not diversifiable in the latter case. On the other hand, the CARA felicity function has the unattractive property that the marginal utility is finite at zero consumption implying that consumption can be negative along the optimal path. CRRA felicity functions rule out negative consumption. In this paper we will assume isoelastic utility and relax the assumption that the individuals rate of time preference is equal to the interest rate. Thus, we assume that an individual's utility can be described by the following isoelastic utility function

$$u(C_t) = \frac{C_t^{1-\gamma}}{1-\gamma}$$

where $\gamma > 0$ is the coefficient of relative risk aversion which is inversely related to the elasticity of intertemporal substitution (the willingness to substitute consumption over time). Finding that $U''' > 0$ is straightforward such that this utility function implies a positive motive for precautionary saving and that the coefficient of relative prudence is $1+\gamma$.[5] Note that higher risk aversion implies that individuals are less willing to substitute consumption over time.

To solve the optimization problem we use the Euler equation above (equation (5)) to obtain

$$C_t^{-\gamma} = \beta(1+r)\,\mathrm{E}_t\left[C_{t+1}^{-\gamma}\right] \tag{8}$$

where the expectation of future utility from consumption is based on information known at time t as above. Using the budget restriction under the assumption that $(1+r)^{1/\gamma-1}\beta^{1/\gamma} < 1$, we obtain the following consumption function

$$C_t = \frac{1+r-(1+r)^{1/\gamma}\beta^{1/\gamma}}{1+r}y_t^p. \tag{9}$$

Comparing this consumption function with the permanent income consumption function, we note that the marginal propensity to consume is smaller in (9) than in (7) if $1/\gamma \neq 0$. Furthermore, when risk aversion goes to infinity such that the willingness to substitute consumption over time approaches zero and under the assumption that $\theta = r$, the consumption function in (9) converges to the permanent income consumption function (7). In general, however, precautionary saving reduces consumption below the certainty–equivalence level implying that the marginal propensity to consume out of wealth or income is smaller when allowing for precautionary saving motives.[6]

Note that income uncertainty does not enter the consumption function in (9) directly. This is due to our underlying assumption that labor income is fully diversifiable. However, if we assume that the log of income is normally distributed implying that the log of consumption is also normally distributed, it can be shown that the variance of income (labor income uncertainty) exerts a positive impact on precautionary savings. An increase in labor income uncertainty, increases consumption growth, i.e., current private consumption decreases and precautionary saving increases, see Hansen and Singleton (1983).

In the next subsection, we use the consumption functions above to examine the effects of permanent and transitory changes in government consumption under certainty about the permanence of fiscal contractions.

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[5] The coefficient of relative prudence is defined by Kimball (1990) as $-\frac{CU'''}{U''}$.

[6] This feature of our precautionary–savings model is also obtained for CARA felicity functions, see Caballero (1990). It is also consistent with empirical findings reported by Campbell and Deaton (1989) who found that the long-run response of consumption to income was only 60 percent of the theoretical unity response predicted by the permanent income model.

2.3 The Expansionary Fiscal Contraction Hypothesis

The expansionary fiscal contraction hypothesis states that a fiscal contraction (a government consumption decline) may signal a permanent government consumption reduction, causing a rise in the present discounted value of wealth and, from (7) or (9), a rise in the current and permanent level of consumption. By operating on expected future net income, the current fiscal contraction could induce a large consumption rise (and have a net expansionary effect on aggregate demand). By contrast, if the fiscal contraction does not lead to the expectation of lower permanent government consumption levels, then current private consumption will not be much affected. In this circumstance, the fiscal contraction will not be offset by a significant rise in current private consumption.

Another point, highlighted in equations (7) and (9), is that factors other than expectations of government consumption expenditure may also prove a powerful influence on private consumption and these may at times have coincided with government consumption expenditure shifts. A rise in real income due to productivity increases and other factors enhancing cost competitiveness would increase wealth and private consumption.[7] This is similar to a rise in consumption possibilities due to a rise in expected real income. Distinguishing between different sources of shocks, i.e., to determine whether expectations of government consumption shifts or other disturbances are responsible for fluctuations in consumption, is important.

2.4 Uncertainty and Dynamics

In this subsection we add uncertainty about the nature of shocks to government consumption, i.e., uncertainty whether a shock is permanent or transitory. Assume that government consumption consists of two parts, a permanent component and a transitory component and that it is generated by the following random walk plus noise model:

$$G_t = \mu_t + \eta_t$$

where the trend component μ_t is generated by a random walk model

$$\mu_t = \mu_{t-1} + \varepsilon_t \ .$$

We assume that both ε_t and η_t are white noise sequences and that $\mathrm{E}[\varepsilon_t \eta_t] = \sigma_{\varepsilon\eta}$. In addition, we assume that the variance ratio of the permanent and the transitory components

[7] Similarly, Bergman and Hutchison (1996), examining a 2–good small open economy extension of the standard permanent model, show that a rise in the terms-of-trade (a decrease in the consumption-based price index lowering the price of obtaining a unit of the consumption index) would also increase wealth and private consumption.

are known *a priori* but that the information set available only includes the observable variable. Note that this assumption implies that the econometrician has more information than the agents. In his seminal paper Muth (1960) shows that the rational expectation (forecast) of G_t, when the information set only includes observations of lagged values of G_t (and not the decomposition between ε and η) can be written as:

$$\mathrm{E}_t [G_t] = \mathrm{E}\left[G_t \mid G_{t-j}, j = 1, 2, \ldots\right] = \sum_{j=1}^{\infty} \upsilon_j G_{t-j} . \tag{10}$$

To obtain the parameters υ_k we minimize the forecast error variance, i.e., $\min(G_t - \mathrm{E}_t [G_t])^2$ using the expectations given in (10). Muth (1960) shows that the solution is, assuming that $\sigma_{\varepsilon\eta} = 0$, $\upsilon_k \equiv (1 - \lambda) \lambda^{k-1}$, $\lambda \equiv \left(z - \sqrt{z^2 - 4}\right)/2$, $z \equiv 2 + \left(\sigma_\varepsilon^2/\sigma_\eta^2\right)$, $1 > \lambda > 0$, and $\partial\lambda/\partial\left(\sigma_\varepsilon^2/\sigma_\eta^2\right) < 0$.

If the changes in the permanent component (σ_ε^2) are small relative to the transitory component (σ_η^2), then λ will be close to unity, υ_1 will be small and the υ_j's will be nearly equal, for $j \neq 1$. The expectation gives nearly equal weight to all past observations in order that the transitory disturbance cancels out. Recent information plays a small role since it has little implication for future net income. By contrast, if changes in the permanent component dominate then λ approaches zero and a large weight (unity in the limit) is placed on υ_1 and very little on υ_j, for $j \neq 1$. The most recent value of net income is weighted heavily in this case since it makes a good forecast of future (and permanent) income.

The rational expectation of G_t, $\mathrm{E}[G_t]$, given by (10), is the forecast for all future periods because it is an estimate of the permanent component, G_t.[8] Hence, net income is expected to be constant over time and the marginal propensity to consume from an observed rise in net income is simply that fraction which is assumed to be permanent, i.e., $(1 - \lambda)$. If past experience suggests that transitory shocks are predominant, then the impact effect of a disturbance on expected net income and consumption — even if it is a permanent disturbance — will be small. This reinforces the view that the credibility of a fiscal reform (expectation of a permanent rise in disposable income) has important consequences for consumption, and in our model past experience plays an important role in determining how the private sector interprets a policy change.

This serves to illustrate that confusion over shifts in government policy (whether permanent or temporary), and the resulting learning process, as expectations are revised, will play an important role in the dynamics of private consumption. It may appear that there are systematic forecast errors following a disturbance due to uncertainty over the

[8]Note that the transitory shock is assumed to effect G_t in only one period so there is no expectation of a gradual adjustment back to equilibrium which may be used in forecasting.

intention of the government. However, expectations are rational and, given the information set, correct on average; output tends to be underpredicted when a permanent shock occurs and overpredicted when a transitory shock occurs.[9] In the next section we use this model to characterize the response of private consumption to changes in government consumption.

3 The Effects of Balanced–Budget Fiscal Contractions

This section examines the effects on private consumption from permanent and temporary balanced–budget reductions in government consumption. In our simulations of the permanent income and the precautionary saving models, we assume that the interest rate (r) is 5 percent on an annual basis whereas the subjective rate of time preference (θ) is set to 2 percent. These parameter values are consistent with our assumption above that $(1 + r)^{1/\gamma - 1} \beta^{1/\gamma} < 1$ when $1/\gamma < 1$. In our simulations, we then let the coefficient of relative risk aversion vary between 1.05 and 9 implying that $0 < 1/\gamma < 1$. We then generate impulse response functions of private consumption for different assumptions about the variances of the permanent and the transitory component of government consumption assuming first that the covariance $\sigma_{\varepsilon\eta} = 0$.

In Table 1, we report the initial (one period) effect and the long-run multiplier of private consumption to a one unit permanent balanced–budget reduction in government consumption for different degrees of risk aversion. When comparing the first period effects in the upper panel of Table 1, we note that the higher risk aversion, the stronger effect on private consumption. Similarly, we also find that the initial impact is determined by the ratio of the variance of the permanent and transitory components of government consumption. For example, when risk aversion is low (1.05) and the variance ratio is unity, private consumption increases by 0.27 units in the first period. However, when agents are more risk averse, i.e., they are less willing to substitute consumption over time, private consumption increases by 0.58 units.

The lower panel of Table 1 reports long-run multipliers for different degrees of risk aversion. Note that the long–run multipliers are independent of the variance ratio and only depend on risk aversion for given real interest rate and subjective time preference. The reason is that the long–run response given by the forecast function in (10) is equal to unity when government consumption changes permanently (with one unit). Moreover, the

[9] See Blanchard and Fischer (1989) for a similar discussion of the effect of (confusion over) permanent and transitory supply shocks on output in a model with wage indexation.

ratio of the impulse responses from the permanent income and the precautionary savings models is constant for all time horizons.[10] Similarly to the first period effects in the upper panel, higher risk aversion implies stronger long-run effects on private consumption following balanced–budget reductions in government consumption. The long-run effect of a one unit permanent reduction in government consumption is 0.44 units when risk aversion is 1.05 but 0.94 units when risk aversion is equal to 9.

Figure 1 shows the impulse response functions of private consumption to a one unit permanent balanced-budget reduction in government consumption for different assumptions about the variance ratio $\sigma_\varepsilon^2/\sigma_\eta^2$. When comparing the four graphs shown in the figure, we find that when the variance of the transitory component dominates ($\sigma_\varepsilon^2/\sigma_\eta^2$ is small), private consumption gradually and slowly adjusts to the change in government consumption and reaches the new long-run equilibrium after about 16 periods. Increasing the variance ratio, the adjustment process becomes more rapid. For example, when the variance ratio is equal to two (the variance of the permanent component is twice as high as the variance of the transitory component), the adjustment process takes about five periods.

These differences again highlight the role of credibility as reflected in the variance ratio. When the variance ratio is small, agents expect current changes in government consumption to be temporary implying only minor revisions of permanent income and hence private consumption. By contrast, when the variance ratio is large, they interpret a change in current government consumption as a permanent one. The effect of increased risk aversion found in Table 1, is also apparent in Figure 1. For a given variance ratio, the magnitude of private consumption responses is larger when risk aversion is higher. This follows from the inverse relationship between risk aversion and the willingness to substitute private consumption over time.

In Figure 2, we show the impulse responses of private consumption to a one unit temporary balanced-budget reduction in government consumption. Similarly to our findings for permanent reductions, the adjustment process is very slow when the variance ratio is small and very rapid when the variance ratio is large. The magnitude of these responses is larger and the adjustment process is faster when the permanent component dominates. We also note that the magnitude of short-run responses following transitory changes in government consumption may be larger compared to short-run effects from permanent

[10] To see this, divide the consumption function for the precautionary savings model with the consumption function for the permanent income model such that the ratio of long–run multipliers can be written as:

$$\frac{1 + r - (1+r)^{1/\gamma}(1+\theta)^{-1/\gamma}}{r} \qquad \forall\, t.$$

changes. In particular, the initial response of private consumption following a transitory reduction in government consumption, when the variance ratio is equal to two, range between 0.33 and 0.70 units whereas the initial effect following a permanent reduction, when the variance ratio is equal to 0.10, range between 0.12 and 0.33 units.

We can also compare initial and short-run effects from permanent reductions in government consumption with multiperiod temporary reductions. Assume, for example, that the fiscal authority reduces government consumption with one unit in four consecutive periods. Figure 3 shows the implied impulse responses of private consumption. From these graphs, we find that the magnitude of short-run effects, when the variance ratio is large, is larger than the short-run effects when the variance ratio is small. This feature of our model is also illustrated in Figure 4 where we compare impulse responses following permanent and temporary reductions in government consumption for different degrees of risk aversion and assuming that the variance ratio is equal to 0.10. From this graph, we find that a four consecutive period temporary reduction assuming that risk aversion is equal to three, gives a stronger short-run impact on private consumption compared to a permanent reduction when risk aversion is equal to 1.05. This finding may have consequences for empirical work on fiscal contractions, for example Alesina and Perotti (1997), where the record of fiscal consolidations for different countries is classified as successes and failures depending on the behavior of private consumption. It is, according to our results possible to misinterpret a temporary fiscal consolidation as a permanent one, in particular when government consumption is dominated by variations in the transitory component. Moreover, if agents are more willing to substitute consumption over time, our evidence suggests only minor positive effects on private consumption in the long-run. Our conclusion is therefore that empirical evidence based only on the behavior of private consumption should be interpreted with caution.

Finally, we allow for a positive covariance between the permanent and transitory components of government consumption. Figure 5 shows the impulse response of private consumption to a one unit permanent balanced-budget reduction in government consumption assuming that the coefficient of risk aversion is equal to three.[11] A positive covariance has only minor effects on the magnitude of the impulse response functions. In general, the impulse response functions are tilted to the left, i.e., smaller initial effects but longer adjustment processes. These tilting effects increase when increasing the variance ratio.

One way to interpret our results above is by asking what risk aversion would be consistent with earlier empirical evidence suggesting that precautionary saving motives are important and explain 30 to 60 percent of total savings. This corresponds to a response

[11] Impulse response functions from temporary and multiperiod temporary reductions in government consumption are not reported here for brevity. These graphs are available upon request from the author.

Table 1: First period and long–run impulse responses of private consumption to a 1 unit permanent reduction in government consumption for different assumptions about the variance ratio $\sigma_{\varepsilon}^2/\sigma_{\eta}^2$ and risk aversion.

variance ratio	γ = 1.05	γ = 3	γ = 6	γ = 9	PIH
0.100	0.119	0.218	0.244	0.253	0.270
0.500	0.220	0.403	0.452	0.468	0.500
1.000	0.272	0.498	0.558	0.578	0.618
2.000	0.322	0.590	0.661	0.685	0.732
	Long-run multiplier				
	0.440	0.806	0.903	0.935	1.000

of private consumption to a one unit permanent reduction in government consumption of 0.70 to 0.4 units. According to our simulations, this is consistent with a coefficient of relative risk aversion between one and three which are considered in the literature as plausible values of risk aversion. Using these values for risk aversion, we can compute the effect on consumption growth caused by precautionary saving motives. Using the Euler equation (5) and assuming for simplicity that the real interest rate is equal to the individual's rate of time preference, we find an excess consumption growth of one to 3 percent on an annual basis.[12] These numbers also correspond to earlier findings reported by, e.g., Caballero (1990). Our simulations above, thus, give plausible magnitudes of private consumption responses to changes in government consumption.

4 Conclusions

The central question posed at the beginning of the paper was whether precautionary saving motives and uncertainty about the permanence of fiscal reductions affect the responses

[12] These numbers can be computed directly from the Euler equation in (5) by allowing the interest rate to vary over time, and taking a Taylor expansion of the Euler equation around $r = \theta = 0$. The resulting relationship can then be written as

$$\mathrm{E}_t\left[\Delta C\right] \simeq \frac{1}{\gamma}\left(\bar{r} - \theta + \frac{1}{2}\gamma\left(1+\gamma\right)\mathrm{Var}\left(\Delta C\right)\right)$$

where $\bar{r}$ is the average interest rate. Using the values for the interest rate and the rate of time preference in the text and assuming that $\mathrm{Var}(\Delta C) = 0.001$ (Dynan (1993)), we can compute the expected growth of private consumption due to precautionary savings.

of private consumption when the fiscal authorities reduce government consumption temporary or permanent. A program with the specific objective of reducing government consumption in the long–run and announced in advance to allow agents time to adjust in the interim period before implementation, have a powerful effect on consumption within a permanent income model framework. However, considering the possibility of precautionary–saving motives and uncertainty about the permanence of fiscal reductions, we show that these effects may be much smaller than expected given the predictions of the permanent income model.

We find that uncertainty about the nature of fiscal reductions, whether they are permanent or temporary, affect both the impact and the duration of private consumption responses. When the permanent component of government consumption dominates, private consumption adjusts rapidly to changes in net income. The smaller this component is, the slower adjustment. The reason for this is that the variance ratio reflects the probability that a current reduction in government consumption is expected to be permanent (or temporary) which in turn determines initial and short–term response of private consumption. As households gradually learn whether the fiscal contraction was permanent or temporary, they adjust their estimate of future expected net income and current consumption. This interpretation is consistent with actual behavior in Denmark in 1982-83, where private consumption fell initially. As agent's learned that the Danish fiscal consolidation was permanent, private consumption boomed. A similar pattern can also be found for the second Irish fiscal contraction in 1989.

Risk aversion (i.e., the willingness to substitute consumption over time) only affects the impact on private consumption following reductions in government consumption. For example, when risk aversion is between one and three, the long–run response of private consumption to a one unit permanent reduction in government consumption is between 0.4 and 0.80 units. We also find that multiperiod temporary reductions in government consumption can have stronger short–run impact on private consumption than permanent changes. Holding the variance ratio constant, we show that the short–term effect on private consumption is stronger when government consumption is reduced with one unit in four consecutive periods assuming that risk aversion is equal to 3, compared to a permanent reduction when risk aversion is equal to 1.05.

Our results also have important implications for empirical studies examining the record of fiscal consolidations. First, our findings suggest that distinguishing between permanent and temporary changes in government consumption is important. Second, even if actual behavior is consistent with the expansionary fiscal contraction hypothesis, detecting this effect may not always be possible if precautionary saving motives are as important as the earlier literature seem to suggest.

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Figure 1: Impulse response of private consumption to a 1 unit permanent reduction of government consumption.

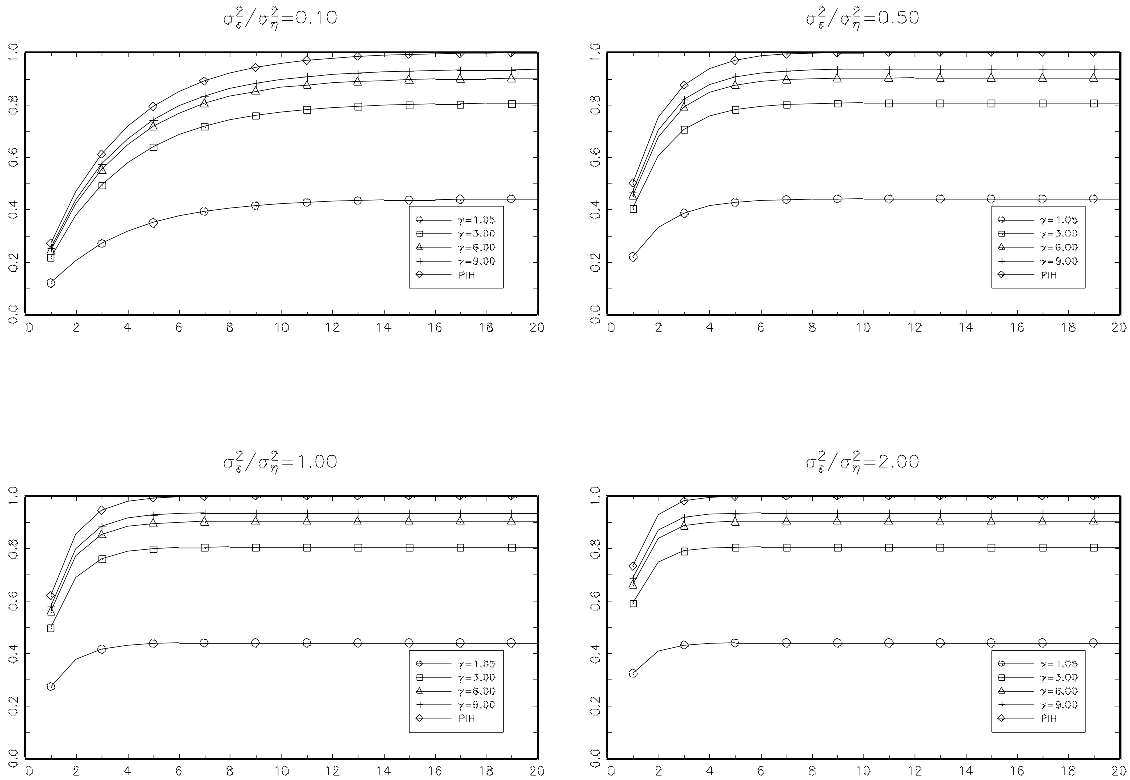

Figure 2: Impulse response of private consumption to a 1 unit temporary reduction in government consumption.

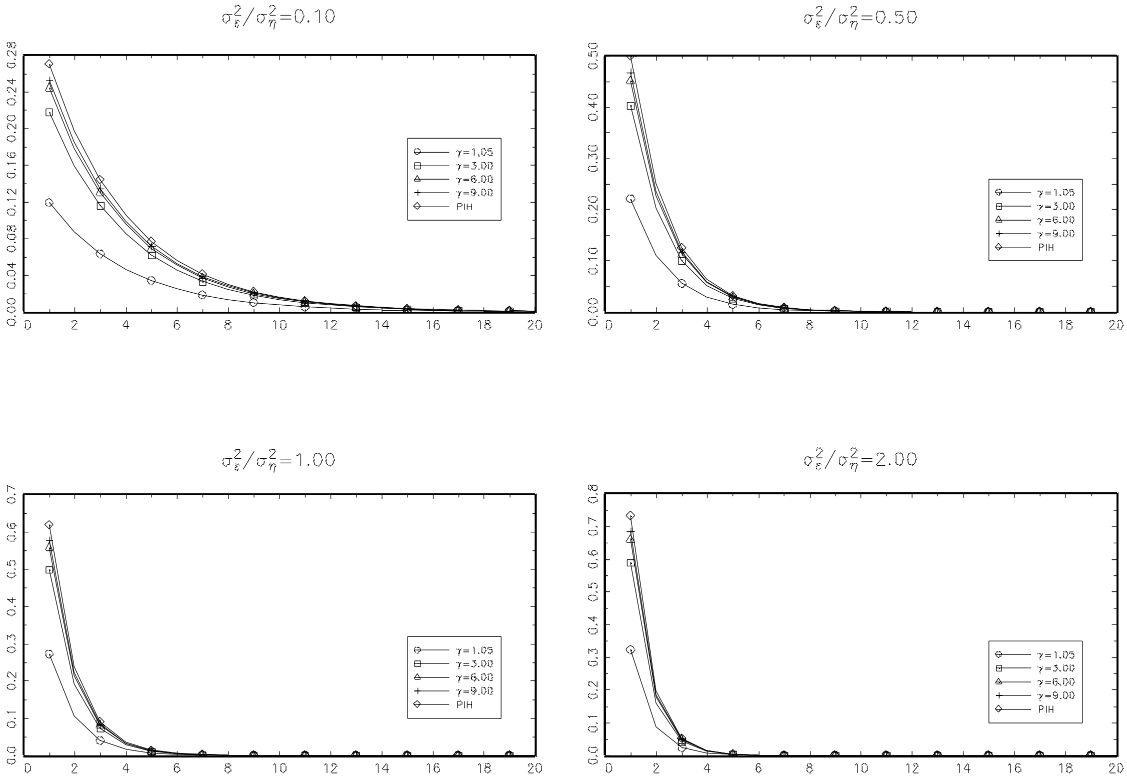

Figure 3: Impulse response of private consumption to a four period temporary reduction in government consumption.

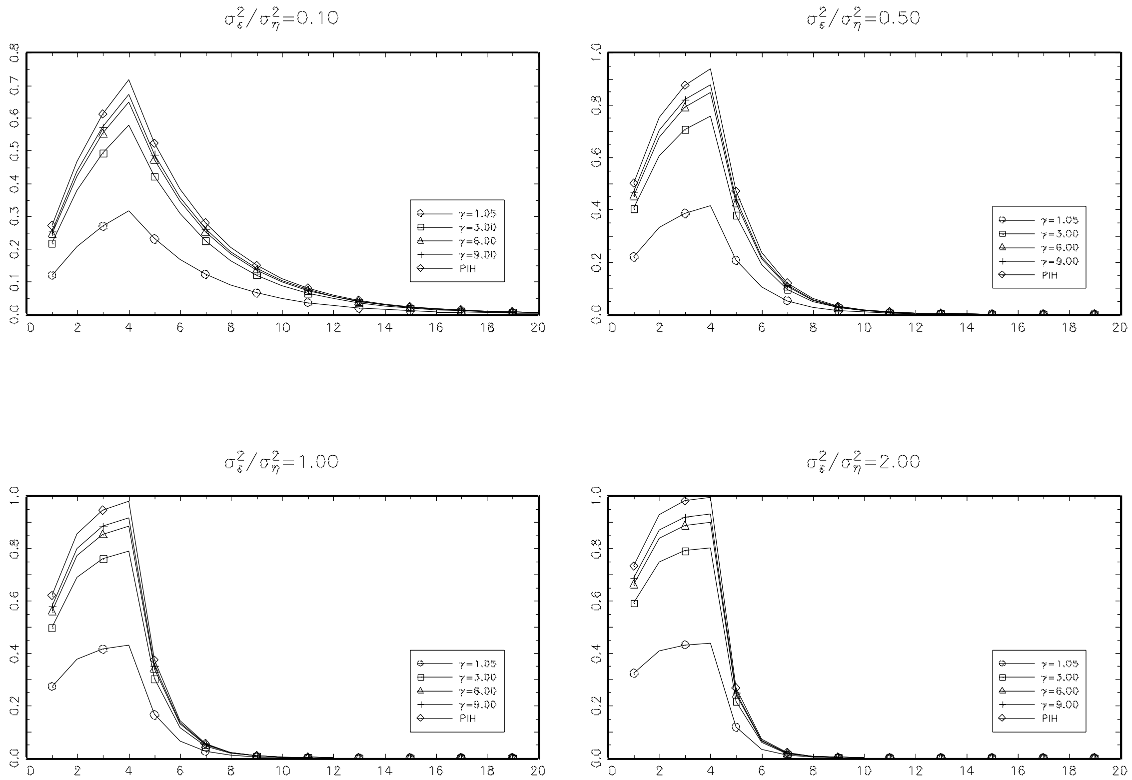

Figure 4: Impulse response of private consumption to permanent and temporary changes in government consumption.

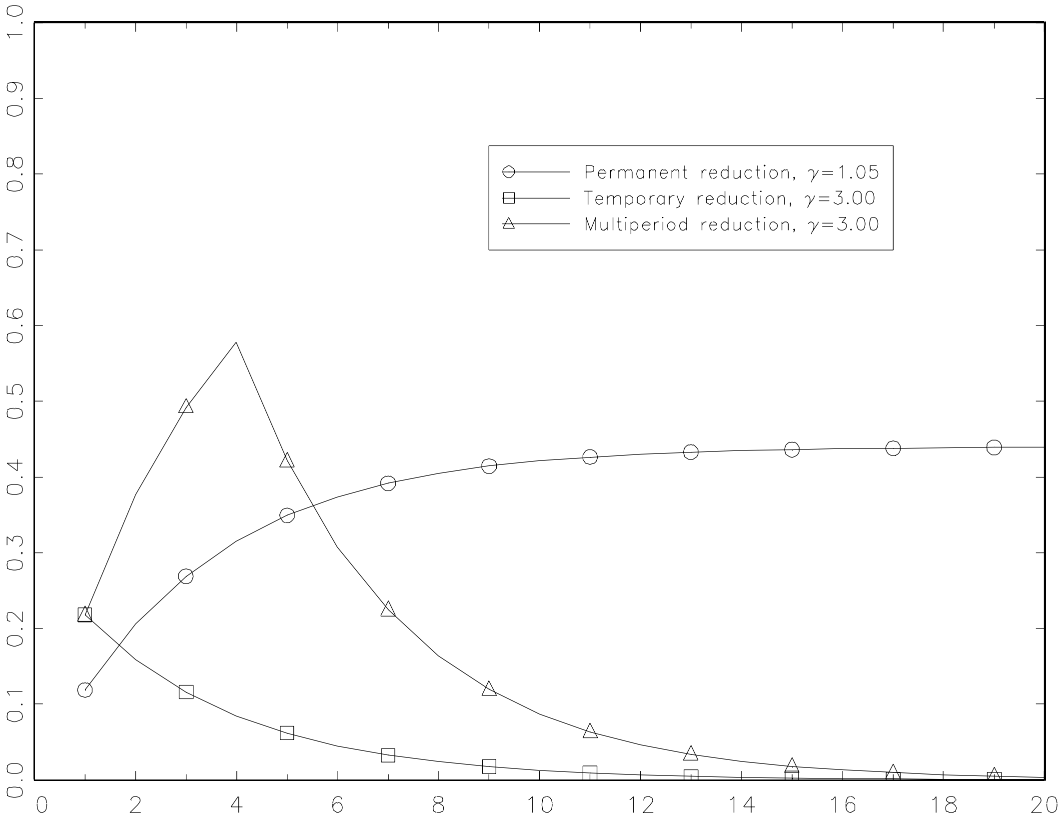

Figure 5: Impulse response of private consumption to a 1 unit permanent reduction of government consumption when risk aversion is equal to 3.