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Is the value added tax a useful macroeconomic stabilization instrument?

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ABSTRACT

The value added tax (VAT) has been proposed as a macroeconomic stabilization instrument. This paper considers some practical implications of a variable VAT. It then develops a dynamic general equilibrium model to assess its usefulness as a stabilization instrument. A variable rate VAT would no longer be less distortionary than other taxes. It would distort between current and future consumption, i.e. savings and investment decisions, and hence raise the economic costs of taxation. Moreover, a variable VAT would be less effective in dampening business cycles than the conventional stabilization tool, an interest rate. This is because of the additional adverse supply effects. A change in the interest rate affects this period's savings and investment decisions, whereas a variable VAT rate would influence savings and investment decisions over time. A variable VAT rate is therefore unlikely to be a useful stabilization instrument.

1. Introduction

The 2008 global financial crisis and subsequent worldwide economic recession led to a recourse by governments to fiscal policy as a tool for macroeconomic stabilization (e.g. Feldstein, 2009). Countries implemented various stimulative fiscal measures. These included increases in public consumption and infrastructure investment, and measures to boost household disposable income through cutting income taxes and increasing benefits and subsidies, as well as tax reductions for businesses. Moreover, the United Kingdom temporarily reduced its value added tax (VAT) to stimulate consumer spending. The rate reduction took effect on 1 December 2008 and temporarily lowered the VAT rate from 17.5% to 15% until 31 December 2009. Further temporary VAT rate cuts have been suggested by the International Monetary Fund (2012) as economic growth has remained sluggish in the United Kingdom and worldwide.

A more active countercyclical use of the value added tax has also been proposed in New Zealand. For example, the New Zealand central bank suggested that "the (VAT) rate could be raised during periods of intense pressures on resources and lowered when inflationary pressures were very weak" (Reserve Bank of New Zealand, 2007).[1]

The purpose of this paper is to investigate the economic effects of a variable value added tax and its usefulness as a stabilization instrument. The paper considers some practical implications of a variable VAT. It then develops a dynamic general equilibrium model to assess its effectiveness in reducing business cycle fluctuations. The framework of analysis is a small open economy that operates under a flexible exchange rate with imperfect competition and sticky prices. The model is calibrated for New Zealand, a small open economy with a comprehensive and broad base value added tax.

The paper proceeds as follows. Section 2 briefly discusses New Zealand's value added tax and the features that make a VAT less distortionary than other taxes. It then considers some practical implications of a variable VAT rate. Section 3 derives the theoretical model and discusses the economic costs of a variable VAT rate. The effectiveness of a variable VAT as a stabilization tool compared to an interest rate is evaluated in Section 4 and the last section summarizes and concludes.

2. Practical considerations

This section briefly discusses New Zealand's value added tax and the economic costs of taxation. It then considers some practical implications of using a variable value added tax rate as a stabilization tool.

2.1. New Zealand's value added tax

New Zealand's value added tax is charged at 15% and applies to a comprehensive and broad base. It is designed to collect tax revenue from the final consumption of goods and services in New Zealand. In line with international practice, it is based on the destination principle. That is, tax is charged according to the destination of goods and services rather than the source of that supply. Under the destination principle, supplies of goods and services are taxed in the jurisdiction in which the goods and services are consumed. This

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[1] The use of the VAT rate as a countercyclical stabilization instrument for monetary policy in New Zealand was initially proposed by Buiter (2006).

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means that exports are zero-rated, while imports are taxed. VAT applies at all stages of production, including imports. However, as a value added tax, VAT paid on intermediate goods and services can be reclaimed.

2.2. Economic costs of taxation

Taxes are needed to finance government expenditure. But raising taxes creates administration and compliance costs. Moreover, taxation has economic costs because it distorts economic behavior.[2] A value added tax is less distortionary than other taxes for several reasons (Auerbach, 2008; Banks and Diamond, 2010). First, VAT is typically charged at a uniform, relatively low rate to a (more or less) comprehensive and broad base. This lowers the economic costs of taxation, which tend to increase the higher the tax rate and the narrower the base. Second, in theory VAT does not distort business or export decisions. This is because the tax paid on production inputs and exports is deductible. Third, VAT does not distort between current and future consumption, i.e. savings and investment decisions.

The remainder of this paper argues that the features that make the value added tax less distortionary than other taxes would no longer hold with a variable rate.

2.3. Practical implications of a variable VAT rate

A variable VAT would disproportionately distort business decisions of certain sectors of the economy. For example, changes in the rate of VAT would have a material impact for businesses that are unable to deduct VAT input tax because they make supplies of exempt goods and services, like the financial services sector.

A variable VAT would increase compliance costs as businesses would need to change prices more frequently. In response to rate changes, businesses would have to conduct physical stock-takes and value work-in-progress to re-price goods and services. Frequently varying the tax rate could make collecting VAT unworkable for some goods and services, such as insurance premiums, telecommunications or power, which are usually invoiced at one point in time but supplied over a number of periods.

Tax administration costs would increase. With a variable VAT the government would need to revise transfer payments to ensure that tax related consumer price movements do not affect the value of such transfers.

A variable VAT rate may also lead to pressures for differential rates across commodities and exemptions. Exemptions and differential rates would raise the distortionary costs of taxation (Atkinson and Stiglitz, 1976; Kaplow, 2007) and impact on the effectiveness of VAT as a stabilization tool. Its usefulness as a policy instrument would be reduced further if consumers tried to mitigate the impact of tax rate changes by “panic buying” or “consumer strikes”.

3. Theoretical model

To illustrate the adverse effect of a variable VAT on investment and savings, this section develops a dynamic general equilibrium model, which is calibrated to New Zealand. There are four agents in the economy: households, firms, a government and a monetary authority.

3.1. Households

Households are infinitely lived and a typical household values streams of consumption and leisure according to

$$E_t\sum_{k=0}^{\infty}\beta^k\{ln(C_{t+k})+\gamma(1-N_{t+k})\} \tag{1}$$

where $\gamma>0$ is a parameter, $\beta\in(0,1)$ is the household's discount factor, E_t is a conditional expectations operator with respect to information available at time t and consumption is given by C_t. Households' time is normalized to one, and N_t and $(1-N_t)$ denote the proportions of time spent in work and in leisure with $N_t\in(0,1)$. The period utility function, $U(C_t, N_t)$, is given by

$$U(C_t,N_t)=ln(C_t)+\gamma(1-N_t) \tag{2}$$

Each household consumes many goods, all of which are domestically produced. C_t is the quantity consumed in period t of an index of these goods with $C_t=[\int_0^1 C_t(j)^{(\theta-1)/\theta}dj]^{\theta/(\theta-1)}$, where $C_t(j)$ denotes the household's period t consumption of good j and $\theta>0$ is the price elasticity of demand.[3] The price of consumption good j is given by $P_t(j)$ and the aggregate price level, P_t, is an index given by $P_t=[\int_0^1 P_t(j)^{1-\theta}dj]^{1/(1-\theta)}$.

Households earn income from supplying labor, N_t, at wage rate W_t and by renting physical capital, K_{t-1}, accumulated last period, to firms at rate R_t. All physical capital is imported. Moreover, households receive dividend payments, Ω_t, from firms and earn income from holding domestic bonds issued by the government, B_t^g, and foreign bonds, B_t^*. B_{t+1}^g and B_{t+1}^* are the amounts of the nominal government and foreign bonds held by the household at the end of period t with $B_t^g\geqq 0$ and $B_t^*>0$ for all t.[4] Domestic bonds, B_t^g, earn a nominal return (in terms of domestic currency) of I_t and the nominal rate of interest paid on foreign bonds, B_t^*, is given by I_t^*. Households also hold money, M_t, as a medium of exchange to purchase consumption and capital goods, where M_{t+1} is the amount of domestic currency held at the end of period t. Households pay taxes on their earned income. The tax rate on their wage, rental, interest and dividend income is given by τ. Capital gains from exchange rate movements are not taxed. The government also imposes a value added tax, τ_t^{VAT}. The VAT rate is fixed when the nominal interest rate is used as the stabilization tool. It is variable when VAT is the stabilization instrument.

The typical household's budget constraint in nominal terms is given by

$$\begin{aligned}&(1-\tau)W_tN_t+((1-\delta)S_tP_t^*+(1-\tau)R_t)K_{t-1}+(1+(1-\tau)I_t)B_t^g\\&+(1+(1-\tau)I_t^*)S_tB_t^*+(1-\tau)\Omega_t+M_t-\left(1+\tau_t^{VAT}\right)P_tC_t-B_{t+1}^g\\&-S_tB_{t+1}^*-M_{t+1}-S_tP_t^*K_t=0\end{aligned} \tag{3}$$

where $\delta\in(0,1)$ is the economic depreciation rate of capital. S_t denotes the nominal exchange rate and P_t^* is the foreign price level.[5] The price of capital, which is imported, is given by $S_tP_t^*$ and the net VAT is zero as the tax paid on production inputs is fully deductible. Households' budget constraint can be interpreted as follows. Each period, households earn income. They then sell their domestic and foreign bonds and physical capital to purchase consumption goods and new financial and real assets. Households' budget constraint is binding and their expenditure is equal to their income.

[2] Taxes affect people's decisions on how much education to obtain, whether or not to enter market paid employment, how much to work, whether or not to apply for promotion, when to retire. They impact on the amount people save and how they save if different tax rates apply to different savings instruments. Taxes also influence risk taking and entrepreneurship and provide incentives for tax planning.

[3] The government's consumption index (discussed below) is given accordingly.

[4] The supply of foreign bonds is infinite and households' demand is always met.

[5] The nominal exchange rate, S_t, is measured as the price of foreign currency in units of domestic currency, i.e. an increase in S_t indicates a depreciation of the domestic currency.