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SINGAPORE'S RECURRENT BUDGET SURPLUS THE ROLE OF CONSERVATIVE GROWTH FORECASTS

by

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ABSTRACT

Aided by strong economic growth the Singapore government has been able to keep both the tax rate and the government expenditure rate low and yet generate healthy budget surpluses year after year. Although the gap between the tax rate and the government expenditure rate is the obvious source of the surplus, this paper shows the presence of another subtle source, a surplus generated by conservative growth forecasts that lay the base for revenue projections. An omitted variable bias in a model based on the tax smoothing hypothesis led us to consider the role played by the growth forecast error in predicting the budget surplus. Our computations show that on average the under-prediction of the tax base (GDP) must have contributed about $376 million per year to the realized budget surplus over the period 1990-2005. This appears to be simply a by-product of the Government's philosophy of "fiscal prudence".

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1. Introduction

The public sector has played a pivotal role in the economic and social progress of Singapore. Nevertheless, the Keynesian advocacy of deficit financing had no role in Singapore's fiscal policy operations. Instead, perhaps driven by Confucian ethics of thrift and frugality, the Singapore government has stayed lean relative to the size of the economy[1] and managed to secure healthy budget surpluses in many good years. These surpluses have yielded a robust fiscal position for Singapore with total public assets standing at $437 billion by the end of March 2005.[2]

In recent years, however, the budget balance has not been that favourable due to volatile economic conditions, lowered income and corporate tax rates and the emergence of new spending priorities (Budget Speech, 2006). The introduction of "special transfer" programs has especially added to the reduction of the surplus. For example, the planned $3.59 billion "Progress Package" that included growth dividends, workfare bonuses, national service bonuses and CPF top-ups led to a projected $2.86 billion deficit in 2006. Without the Progress Package the projected budget balance was a surplus of $ 0.73 billion.

Analysts, however, have drawn a distinction between the reported budget balance and the actual budget balance. The difference arises from a conservative accounting method that the government has adopted on the revenue side of the budget (Asher, 2002, 2003). Two major items are excluded from the budget. One is receipts from the sale of land and other capital goods. The volatile nature of these receipts is the reason for not considering them

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[1] In Singapore, government consumption and investment expenditures have constituted about 10 and 4 percent of GDP respectively over 1990-2005. Over the same period the percentage of government consumption spending alone was 20 in Canada, 20 in the U.K., 16 in Japan, and 16 in the U.S.
[2] Financial Statements for the Financial Year 2004/2005, Accountant-General Department.

as a regular revenue component. The other item is the net investment income (NII)[3] generated by investing government reserves. As a constitutional requirement only up to 50% of the NII can be included in current revenues and the rest has to be protected as past reserves. The contention is that these are government revenue items and be part of the budget account. As reported in the local news papers they would turn the apparent deficit in 2006 into a handsome surplus.[4]

The objective of this exercise is not to dwell so much in the accounting methods but to bring out a less known source of the budget surplus, a surplus attributable to conservative growth forecasts that the government has adopted in making the budget projections. Since budget estimates are based on a predicted GDP growth rate any systematic forecast error in the growth rate should be reflected in the realized budget balance. We try to quantify this relationship and assess the amount of the budget surplus that can be attributed to conservative growth forecasts. Since there is no theoretical basis for such a relationship our exercise is essentially an attempt to establish a missing link in a regression model on tax smoothing.

2. Methodology

We adopt Barro's (1979, 1981, 1986) tax smoothing model to arrive at a regression model that can be used to examine the relationship between budget surplus and growth forecast errors. Under Barro's tax smoothing formulation the government tries to spread the

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[3] NII is defined as the interest and dividend income earned from investing Government's reserves, net of debt servicing costs and expenses on investment. It does not include any capital gains or losses arising from the disposal of investments. (http://app.mof.gov.sg/faq)

[4] See, for example, the article "Near $3b budget gap sparks fresh debate" by Narendra Aggarwal in the *The Straits Times*, 27 Feb. 2006.

deadweight loss of taxation over time by choosing a smooth path for the tax rate. In other words, unexpected rises in government expenditures are financed not by raising the tax rate, but by issuing bonds. The optimization problem involved here leads to the hypothesis that the tax rate is constant under certainty or the expected tax rate is the same as the current tax rate under uncertainty. Subsequently there have been many attempts to test the implications of tax smoothing on the budget balance. Bohn (1998) used Barro's (1986) formulation to examine the response of primary budget surplus to debt-income ratio. Studies such as Huang and Lin (1993), Ghosh (1995), Olekalns (1997), Serletis and Schorn (1999), Cashin et al. (2002), Kula (2004) and Fisher and Kingston (2005) examine whether the fiscal deficit is informative of future changes in government expenditures.

It would be instructive to begin with Barro's (1986) basic formulation and then move on to formulate a regression model. Here we present the model in discrete time units instead of the mixed continuous-discrete time frame that Barro adopted. From the one period budget constraint, the present value of the government borrowing constraint can be written as:

$$\sum_{i=0}^{\infty} (1+r)^{-i} \tau_{t+i} Y_{t+i} = \sum_{i=0}^{\infty} (1+r)^{-i} G_{t+i} + B_{t-1} \tag{1}$$

where τ is the average tax rate,[5] Y is real income or output (the tax base), r is the average real rate of return on capital, G is real government expenditure excluding interest payments, and B is government's real debt stock.[6] If the tax rate is stable over time, (1) can be written as

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[5] The tax rate is defined broadly as the revenue-income ratio.
[6] We could write the condition in (1) as expected present values and work out the derivations as in Jayawickrama and Abeysinghe (2006). This, however, does not add much value in the present context.

$$\tau = \left[\sum_{i=0}^{\infty} (1+r)^{-i} Y_{t+i} \right]^{-1} \left[\sum_{i=0}^{\infty} (1+r)^{-i} G_{t+i} + B_{t-1} \right] \tag{2}$$

Assuming that Y and G grow at the same rate (μ) in the long-run, the trend values of Y and G can be written as $Y_{t+i}^* = (1+\mu)^i Y_t^*$ and $G_{t+i}^* = (1+\mu)^i G_t^*$. Since the present value of Y^* is the same as that of Y, and the present value G^* is the same as that of G, we have

$$\sum_{i=0}^{\infty} (1+r)^{-i} Y_{t+i}^* = \sum_{i=0}^{\infty} (1+r)^{-i} (1+\mu)^i Y_t^* = \sum_{i=0}^{\infty} (1+r)^{-i} Y_{t+i} \,,$$

$$\sum_{i=0}^{\infty} (1+r)^{-i} G_{t+i}^* = \sum_{i=0}^{\infty} (1+r)^{-i} (1+\mu)^i G_t^* = \sum_{i=0}^{\infty} (1+r)^{-i} G_{t+i}$$

which can be solved, assuming $r > \mu$, to obtain

$$Y_t^* = (r-\mu) \sum_{i=0}^{\infty} (1+r)^{-i} Y_{t+i} \,, \quad G_t^* = (r-\mu) \sum_{i=0}^{\infty} (1+r)^{-i} G_{t+i} \,.$$

Plugging these into (2) we obtain:

$$\tau = \frac{1}{Y_t^*} \left(G_t^* + (r-\mu) B_{t-1} \right) \,. \tag{3}$$

The overall government budget surplus at time t can be written as

$$S_t = \tau Y_t^f + \tau (Y_t - Y_t^f) - G_t - rB_{t-1} \tag{4}$$

where the first right-hand term represents the projected tax revenue and the second term is the change in the tax revenue resulting from the income forecast error. Plugging (3) into (4) and rearranging the terms we obtain:

$$S_t = \gamma_1 (Y_t^f - Y_t^*) + \gamma_2 (Y_t - Y_t^f) - (G_t - G_t^*) - \mu B_{t-1} \,. \tag{5}$$

where $\gamma_1 = (G_t^* + (r-\mu)B_{t-1})/Y_t^*$ represents the trend government expenditure rate including interest payments net of the growth effect. In (5) we allow for the possibility $\gamma_2 = \gamma_1 + \tau$ such that it can be expressed in a regression format as follows:

$$S_t = \beta_0 + \beta_1(Y_t - Y_t^*) + \beta_2(G_t - G_t^*) + \beta_3 B_{t-1} + \beta_4(Y_t - Y_t^f) + \varepsilon_t. \tag{6}$$

In (6) $\beta_1 = \gamma_1 > 0$ should estimate the average government expenditure rate. Obviously the trend government expenditure rate should be approximately constant for the formulation in (6) to be meaningful.[7] We also expect $\beta_2 = -1$ and $\beta_3 < 0$; the magnitude of the latter provides an estimate of the long run growth rate. Having controlled for these effects, $\beta_4 > 0$ captures the effect of output forecast errors on the surplus.

Model (6) embodies very explicit theoretical implications which can easily be tested. If income forecasts are correct or the forecast errors are purely random then (6) reduces to

$$S_t = \beta_0 + \beta_1(Y_t - Y_t^*) + \beta_2(G_t - G_t^*) + \beta_3 B_{t-1} + \varepsilon_t. \tag{7}$$

If we try to test the tax smoothing hypothesis within the Singapore context by testing its implications embodied in (7) we would be led to rejecting the hypothesis. This prompted us to suspect the presence of an omitted variable bias in the regression coefficients and to consider growth forecast errors as the possible missing variable from the model. This was the basis for the formulation in (6).

3. Data Sources

The sample period of this study runs from 1990 to 2005. We limit our study to this period because data on growth forecasts are traceable only back to 1990. Actual and projected data for government revenue and its components, government expenditure and its components and budget surplus are from the annual Budget Speech and Budget Statements published by the Ministry of Finance, Singapore. Projected GDP growth rates

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[7] We observe this is to be the case in Singapore since early 1990s.

are from the Budget Speech for the period 1997-2005 and from Singapore Public Finance Press Clippings for the period 1990-1996. Nominal GDP and the GDP deflator (base 2000) are from the Singapore Time Series (STS) database. Public debt is from the IMF International Statistical Yearbook.

4. Accounting Method and Budget Surplus

It would be useful to estimate the model in (6) using both the reported budget surplus and adjusted surpluses since Singapore's budgetary account system is not very similar to the standard IMF system (Asher, 2002, 2003). In Singapore's budget accounts, government revenue consists of tax revenue, fees and charges, net investment income (NII) contributions and other revenues. Tax revenue consists of income taxes (both corporate and personal income taxes as a single item), asset taxes, custom and excise taxes, motor vehicle taxes, goods and service taxes and other taxes. Nearly 50 percent of the tax revenue comes from corporate and personal income taxes. A bulk of the income from fees and charges comes from licences and permits, rental receipts, service fees, sales of goods and fines and forfeitures. Government expenditure constitutes operating expenditure, special transfers and development expenditures. Operating expenditures are mainly classified as running costs and transfers. Running costs include expenditure on manpower, supplies and services, equipment, military expenditures and grants-in-aid. Expenditure on transfers includes social transfers and subventions. The government has exercised special transfer schemes since early 1990s to redistribute a part of its accumulating surpluses. Development expenditures are spending on direct development projects, capital grants and other capital injections.

As stated earlier the reported budget surplus does not include the full amount of the net investment income and omits the receipts from the sales of lands and other capital goods. These two items are the most volatile revenue components. The coefficient of variation of the growth rates of investment and interest income and capital receipts over our sample period was 30% and 41% respectively as opposed to only 2.4% for income tax revenues.[8] It is therefore prudent not to consider them as regular revenue streams in setting the expenditure targets. However, their realized amounts could be made available for budgetary purposes. Since the government is considering a constitutional change for this purpose, it would be useful to examine government's financial position with and without these items.

We consider two possible adjusted surpluses. One is where the full amount of capital receipts is made available as a revenue item with no change to the NII contribution rule. The second is where the full amounts of both capital receipts and NII are made available to the budget. Since the data on total NII is not available, we use investment and interest income net of interest payment on government debt as a proxy for NII. We have to caution the reader that this proxy may over-estimate the NII by a fare margin. The computations for 2005 are shown in Table 1 and Figure 1 plots the reported and adjusted surplus series for the whole sample period. Obviously the adjusted surpluses are markedly higher than the reported surplus. Although the reported surplus varies from -2 to 8 percent of GDP over 1990-2005 the adjusted surplus1 remains positive and varies from 0.4 to 17 percent of GDP and the adjusted surplus2 varies from 3 to 19 percent of GDP. The mean

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[8] The following number pairs show the mean and the standard deviation of the growth rates (%) of the major revenue components; the items are ordered by the standard deviation: income tax (4.24, 0.10), Other tax (4.99, 0.12), fees and charges (1.69, 0.22), Others (2.29, 0.23), investment and interest income (0.93, 0.28), capital receipts (0.99, 0.41).

values of the reported and the two adjusted budget surpluses are 3, 8 and 11 percent of GDP respectively. Based on these figures one could go to the extreme and recommend using up capital receipts and NII fully for budgetary purposes. However, the government's dilemma would be how to strike a balance between strengthening and protecting the country's reserve position and maintaining a healthy budget balance.

Table 1: Budget surplus, reported and adjusted – 2005

Budget item	$ billion
Revenue	
1. Tax revenue	25.04
2. Fees and charges	2.30
3. Net investment income (NII) contribution[a]	2.67
4. Investment and interest income	7.39
(i) Interest on investment and bank deposits	2.04
(ii) Dividends	3.57
(iii) Interest on loans[b]	1.78
5. Capital receipts[c]	5.12
6. Other	0.14
Expenditure	
7. Operating expenditure	21.59
8. Special transfers	0.88
9. Interest payments on govt. debt	0.20
10. Development expenditure	7.25
Budget surplus (revenue-expenditure)	
11. Reported budget surplus [(1+2+3+6)-(7+8+10)]	0.43
12. Adjusted budget surplus1 [(1+2+3+5+6)-(7+8+10)]	5.54
13. Adjusted budget surplus2 [(1+2+4+5+6)-(7+8+9+10)]	10.07[d]

Source: Ministry of Finance, Singapore.
Notes: (a) Only up to 50 percent of total NII is included in this item. (b) Prior to the Constitutional amendments to protect 50% of NII in FY2000, interest on development loans was classified as "Other". (c) Capital receipts include revenue from sales of land and capital goods and other capital receipts. Sale of land is the largest component (nearly 90 percent) of capital receipts. (d) This may have overestimated NII contributions.

Figure 1: Reported and adjusted budget surplus, $ billion
Source: Based on data from the Ministry of Finance, Singapore.

5. Forecast Error and Budget Surplus

To estimate the model in (6) we need measures of the trend series Y^*, G^* and the forecast series Y^f. For the first two we use Kalman-filtered smooth series obtained from the STAMP package. As for the forecast series, we computed one-year ahead forecasts as $Y^f_{t+1} = (1 + \mu^f_{t+1})Y_t$, where μ^f_{t+1} is the government's predicted GDP growth rate for the year ahead. Instead of a point-forecast, the government provides a range-forecast for the growth rate. We, therefore, computed three forecast GDP series, lower bound ($Y^{f,LB}$), upper bound ($Y^{f,UB}$), and the average or the mid-point ($Y^{f,AV}$) forecasts.

Table 2 provides the government's forecast growth rates, observed growth rates and the forecast error ($Y - Y^{f,AV}$) based on the average of the lower and upper bounds. We can see from the table that when the economy was growing along a trend line between 1990 and 1997 even the upper bounds of the government growth forecasts were mostly below the observed growth rates. These conservative forecasts have under-predicted GDP by

$2.1 billion on average per year. The picture changes when the economy entered the turbulent period after 1997. Obviously forecasting is far more difficult during turbulent periods compared to steadily trending periods. Even then the average forecast error was a positive $1.1 billion. Over the whole period the forecast error was about $1.6 billion per year. In other words, the actual tax base was higher by about $1.6 billion per year compared to the projected one.

Table 2: Forecast and actual growth rates of GDP, 1990-2005

Year	Forecast growth rate when budget was set (%)	Actual growth rate (%)	GDP forecast error ($ billion)	Year	Forecast growth rate when budget was set (%)[a]	Actual growth rate (%)	GDP forecast error ($ billion)
1990	6.0 to 8.0	9.19	1.55	1998	2.5 to 4.5	-1.41	-6.75
1991	3.0 to 6.0	6.55	1.58	1999	-1.0 to 1.0	7.19	9.74
1992	4.0 to 6.0	6.34	1.10	2000	4.5 to 6.5	10.03	6.58
1993	6.0 to 7.0	11.73	4.57	2001	5.0 to 7.0	-2.28	-13.24
1994	6.0 to 8.0	11.56	4.45	2002	2.0 to 4.0	4.04	1.62
1995	7.5 to 8.5	8.16	0.17	2003	2.0 to 5.0	2.93	-0.92
1996	7.0 to 8.0	7.77	0.32	2004	3.5 to 5.5	8.72	7.05
1997	5.0 to 7.0	8.33	2.96	2005	3.0 to 5.0	6.38	4.33

Notes: Forecast GDP growth rate is from the annual Budget Speech. Forecast error is computed using the average of lower and upper bound projections.

Table 3 provides the regression estimates based on Model (6) and the reported budget surplus deflated by the GDP deflator. The first column of the table shows the regression estimates without the forecast error term ($Y - Y^f$). In this case the coefficient of the output gap ($Y - Y^*$) substantially over estimates the average government expenditure rate of about 15 percent observed over 1991-2005. The coefficient of the expenditure gap ($G - G^*$) is also much larger in magnitude than the expected value of unity. The coefficient of the debt variable (B_{t-1}) is, however, not too far off from the average GDP growth rate of about 6.5 percent observed over the sample period. Unless one suspects an omitted variable bias, the first two estimates would be taken as evidence against the tax

smoothing model. As we correctly suspected, however, adding the forecast error into the regression brings these estimates very close to their expected values and remain robust regardless of the type of forecast error used in the regression.

Before discussing the results further it would be worthwhile to draw attention to Figure 2 which plots the recursive estimates of the coefficients of Model 4 in Table 3. As we can see these estimates settle down to constants remarkably well. The diagnostics reported in Table 3 are also highly satisfactory. The regressions 2-4 in Table 3 explain about 93 percent of the variation of the reported budget surplus and the fitted values track the turning points of the surplus series very closely (the graph is omitted for brevity).

The similarity of the regression estimates of Models 2-4 in Table 3 is remarkable. The statistical significance of the forecast error coefficient clearly indicates the presence of systematic forecast errors. After controlling for the output gap, expenditure gap and public debt, the GDP forecast error can explain about 13 percent of the variation of the budget surplus. Although the estimated coefficient of 0.24 is slightly above the average tax rate of 0.2 observed over the sample period, it captures some data regularities that are not captured by the other coefficients. It indicates that a $1 change in the forecast error has contributed 24 cents on average to the surplus. This translates to about $376 million surplus per year that is attributable to about $1.6 billion under-prediction of the GDP.

Replicating the above exercise with the adjusted budget surpluses proved less promising. This is a result of the high volatility of capital receipts and investment and interest income that are less correlated with the predictor variables in the model.

6. Conclusion

"Fiscal prudence has been the hallmark of Singapore's economic management. We must never fall into the trap of structural budget deficits…" declared the Minister of Finance in his 2004 Budget Speech. This philosophy is well reflected in the accounting method and the revenue projection method that the government has adopted. The former has been geared towards enhancing and protecting the country's reserve position and the latter, perhaps inadvertently, provided the government with a buffer surplus. Although "conservative growth forecasting" may not sound right, to err on the conservative side is an obvious choice even the individuals and firms make. The forecast error in an overly optimistic forecast may translate into a huge budget deficit. The caution in government revenue projections will become even more imperative as the gap between the average tax rate and the government expenditure rate narrows further.

Table 3. Determinants of budget surplus
Dependent variable: Reported surplus S_t

Independent Variable	1	2	3	4
Constant	9.299**	9.137**	9.096**	9.115**
	(7.33)	(11.9)	(11.5)	(11.7)
$(Y_t - Y_t^*)$	0.259*	0.132*	0.145*	0.138*
	(2.54)	(1.94)	(2.11)	(2.03)
$(G_t - G_t^*)$	-1.482*	-1.007*	-0.989*	-0.996*
	(-2.49)	(-2.68)	(-2.55)	(-2.62)
B_{t-1}	-0.058**	-0.057**	-0.062**	-0.060**
	(-5.39)	(-8.80)	(-9.21)	(-9.07)
$(Y_t - Y_t^{f,UB})$	---	0.243**	---	---
		(4.49)		
$(Y_t - Y_t^{f,LB})$	---	---	0.243**	---
			(4.29)	
$(Y_t - Y_t^{f,AV})$	---	---	---	0.244**
				(4.41)
R^2	0.800	0.934	0.930	0.932
DW	1.73	1.61	1.44	1.52
Reg. F	14.68 {0.000}	35.22 {0.000}	33.05 {0.000}	34.33 {0.000}
AR(1) F	0.159 {0.698}	0.080 {0.783}	0.245 {0.632}	0.155 {0.703}
ARCH F	0.363 {0.562}	0.012 {0.916}	0.061 {0.810}	0.011 {0.920}
Normality Chi^2	2.818 {0.244}	0.201 {0.904}	0.285 {0.866}	0.189 {0.910}
RESET F	0.026 {0.875}	0.904 {0.366}	0.121 {0.735}	0.434 {0.526}

Note: Effective sample period is 1991- 2005. In parentheses below the estimates are t-values. * and ** denote statistical significance at the 5% and 1% levels (one-tail tests except the constant term). p-values of diagnostic test statistics are given in braces. $Y^{f,UB}$, $Y^{f,LB}$, and $Y^{f,AV}$ are GDP forecast upper bound, lower bound and the average of the two.
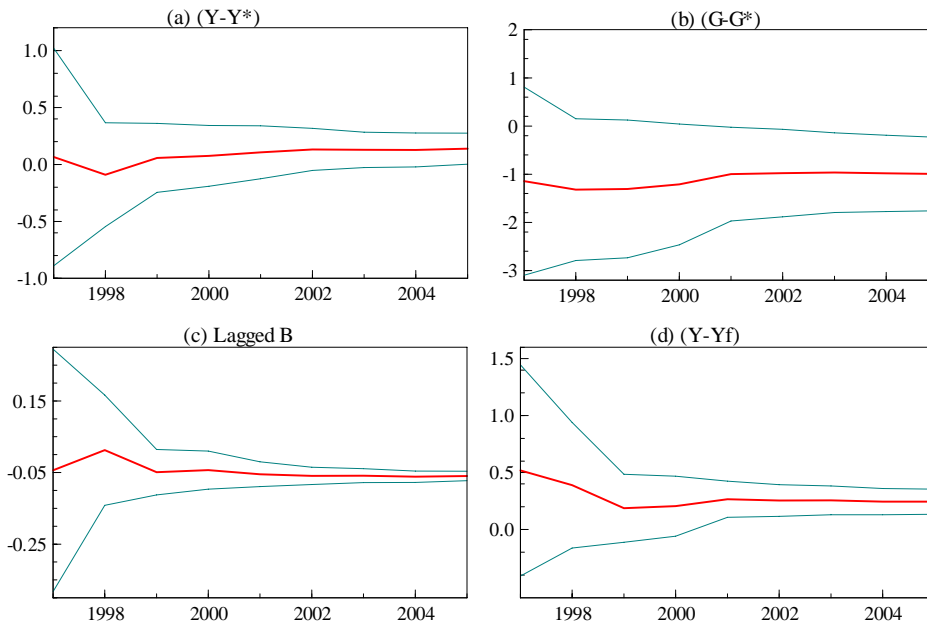
Figure 2. Recursive estimates of the slope coefficients of Model (6)

REFERENCES

Aggarwal, N. "Near $3b budget gap sparks fresh debate" *The Straits Times*, 27 Feb. 2006.

Asher, M. G. 2002. "Globalization and fiscal policy: Rationale for reforms." 93-120. In M. G. Asher, D. Newman and T. P. Snyder (eds.) *Public policy in Asia: Implications for business and government*. London: Quorum Books.

Asher, M. G. 2003. "Fiscal policy challenges facing a mature Asian economy: The case of Singapore." 175-201. In Ramkishen S. Rajan (ed.) *Sustaining competitiveness in the new global economy: The experience of Singapore*. Cheltenham, UK: Edward Elgar

Barro, R. J. 1979. "On the determination of public debt." *Journal of Political Economy* 87: 940-971.

Barro, R. J. 1981. "On the predictability of tax rate changes." Unpublished manuscript (published in Robert J. Barro (1990) *Macroeconomic Policy*. 268-297. Cambridge: Harvard University Press).

Barro, R. J. 1986. "U.S. deficits since World War I." *Scandinavian Journal of Economics* 88(1):195-222 (reprinted in Robert J. Barro. 1990. *Macroeconomic Policy*. 236-267. Cambridge: Harvard University Press).

Bohn, Henning. 1998. "The behaviour of U.S. public debt and deficits." *Quarterly Journal of Economics* 113(3): 949-963.

Cashin, P., N. U. Haque and N. Olekalns. 2002. "Tax smoothing, tax tilting and fiscal sustainability in Pakistan." *Economic Modelling* 20: 47-67.

Department of Statistics, Singapore. 2006. Statistics Singapore: Singapore time series online. http://www.lib.nus.edu.sg/bib/ss/ .

Fisher, L. A. and G. H. Kingston. 2005. "Joint implication of consumption and tax smoothing." *Journal of Money, Credit and Banking* 37(6): 1101-1121.

Ghosh, A. R. 1995. "Intertemporal tax smoothing and government budget surplus: Canada and the United States." *Journal of Money, Credit and Banking* 27: 1031-1045.

Huang, C.-H. and K. S. Lin. 1993. "Deficits, government expenditures and tax smoothing in the United States: 1929-88." *Journal of Monetary Economics* 31(3): 317-339.

IMF. 2006. International statistical yearbook CD-ROM. Washington DC: International Monetary Fund.

Jayawickrama, A. and Abeysinghe, T. 2006. A direct test of tax smoothing: The experience of some OECD economies. Manuscript. National University of Singapore.

Kula, M. C. 2004. "U.S. states, the medical program and tax smoothing." *Southern Economic Journal* 70(3): 490-511.

Ministry of Finance, Singapore. 1990-2004. The budget for the financial year (for years from 1990 to 2004). Singapore: Singapore National Printers.

Ministry of Finance, Singapore. 1996-2006. Budget speech (current and archives). http://appp.mof.gov.sg/index.asp .

National University of Singapore. 1989-1997. Singapore public finance press clippings. Singapore: National University of Singapore.

Olekalns, N. 1997. "Australian evidence on tax smoothing and the optimal budget surplus." *Economic Record* 73: 248-57.

Serletis, A. and R. G. Schorn. 1999. "International evidence on the tax- and revenue smoothing hypotheses." *Oxford Economic Papers* 51: 387-396.