

Tax Adequacy in Hawaii

Bruce W. Kimzey & Brent D. Wilson

Introduction

This paper proposes to examine the potential adequacy of the Hawaii State tax system in generating revenue sufficient to pay for expected expenditures. We will consider only the state general fund, and will examine both expenditures and revenues over the past decade and will make projections for the next five fiscal years. We will establish a baseline for making expenditure projections, and will determine the responsiveness of the tax system, including each individual tax, to changes in total personal income. We will then compare expenditure and revenue projections to determine the potential adequacy of the tax system. We will also attempt to show the impact on Hawaii revenues of major external events that could impact the state's economy.

General Fund Budget

The General Fund of the state had a substantial accumulated surplus by 1990, but it disappeared quickly during the first half of the decade when revenue growth slowed and expenditures increased rapidly, creating large deficits in five of the first six fiscal years. Even with surpluses from 1999-2001, the average deficit during the 1990-2001 period was over \$47,000,000. In fiscal 2002, the General Fund returned to a deficit of over \$215,000,000, as taxes fell following September 11, 2001 and expenditures grew by 8.7 percent. The General Fund figures for 1990-2002 are presented in Table 1.

Table 1
General Fund Expenditures & Revenues (1990-2002)
(000 of \$)

Year	Expenditures	Revenues	Surplus/Deficit
1990	2,624,400	2,449,180	(175,220)
1991	2,799,300	2,687,886	(111,414)
1992	2,680,300	2,705,479	25,179
1993	3,063,100	2,832,030	(231,070)
1994	3,059,400	2,976,710	(82,690)
1995	3,169,100	2,967,293	(201,807)
1996	3,123,700	3,167,788	44,088
1997	3,186,300	3,141,579	(44,721)
1998	3,213,500	3,203,806	(9,694)
1999	3,251,100	3,286,151	35,051
2000	3,201,000	3,291,715	90,715
2001	3,364,600	3,457,246	92,646
2002	3,656,100	3,441,000	(215,100)

Source: Budget and Finance

General expenditures have been erratic throughout the period, rising in 8 fiscal years, and falling in 4 others, although three of the decreases were for \$50 million or less, and the largest increases coming in the final two fiscal years. Expenditures increased by 16.7 percent from 1990 to 1993, then only 4.5 percent from 1993 through 2000, and then rose 14.2 percent from 2000 to 2002. Expenditures for the State Department of Education have grown three times as fast as the rest of the budget since 1999, due to both new appropriations and to new collective bargaining agreements.

General Fund Expenditure Ceilings

Article VII, Section 9 of the 1978 Hawaii State Constitution imposed a ceiling on State government expenditures by limiting growth of General Fund appropriations to the estimated growth of the State's

economy, which has been defined as the rate of growth in total state personal income. Each year's ceiling is based on the prior year's ceiling rather than the level of appropriations. While this constitutional ceiling did exert some pressure on expenditures during the 1980s, the slow growth in expenditures during the 1990s has made the ceiling largely irrelevant for the near future. Table 2 shows the ceiling, appropriations, and actual expenditures for the 1990-2001 period.

Table 2
General Fund Ceiling and Appropriations
(000s of \$)

Year	Expenditure Ceiling	Expenditure Appropriations	Actual Expenditures
1990	2,229,506	2,734,927	2,624,400
1991	2,567,975	2,848,292	2,799,300
1992	2,824,564	2,889,488	2,680,300
1993	3,109,096	3,193,606	3,063,100
1994	3,326,820	3,221,635	3,059,400
1995	3,590,977	3,304,602	3,169,100
1996	3,777,914	3,178,262	3,123,700
1997	3,919,924	3,297,158	3,186,300
1998	4,031,872	3,362,024	3,213,500
1999	4,090,724	3,362,264	3,251,100
2000	4,184,510	3,266,308	3,201,000
2001	4,170,243	3,432,898	3,364,600

Source: Budget and Finance

While appropriations exceeded the ceilings in the first four fiscal years, actual expenditures exceeded the ceilings in only the first two fiscal years. In every year since 1994, both appropriations and actual spending have been below the ceilings by constantly increasing amounts. In 2001, appropriations were 21.5 percent below the ceiling, and actual expenditures were 24 percent below. Actual expenditures are unlikely to reach the 2001 ceiling until fiscal 2006 or later.

General Fund Revenues

General Fund non-tax revenues continued to be highly volatile during the 1990s, ranging from a low of \$294 million in 1992 to a high of \$431 million in 1999, while averaging \$350 million for the 1990-2002 period. Non-tax revenues averaged only 11.5 percent of total General Fund revenue during the period, but ranged from a high of 13.1 percent to a low of 8.7 percent, and fluctuated a great deal. For purposes of this study we will assume that non-tax revenues will average \$350 million a year for the next several years, and will continue to be 11 percent or less of total revenues.

Table 3 shows all General Fund revenues for the 2001 fiscal year, with the percentage each tax constitutes of the total revenues collected. General Excise and Individual Income taxes account for 79.3 percent of total revenues, up from 76.6 percent in the 1990 fiscal year. These two taxes also account for 86.9 percent of total taxes.

Table 3
General Fund Revenues, FY 2001
(Millions of \$s)

	Amount	Percent of Total GF Revenues
Tax Revenue	\$3,142.0	91.3%
General Excise	1,624.6	47.2
Individual Income	1,104.6	32.1
Corporate Income	60.8	1.8
Public Service Co.	134.6	3.9
Insurance Premiums	72.1	2.1
Tobacco	55.1	1.6
Liquor	37.8	1.1
Inheritance & Estate	17.5	.5
Banks & Financial Co.	(2.8)	0
Transient Accommodations	30.6	.9
Miscellaneous	7.1	.2
Non-Tax Revenues	\$ 299.6	8.7%
Interest & Investments	53.0	1.5
Charges for Current Services	109.0	3.2
Fines, Forfeitures, & Penalties	17.4	.5
Other	120.2	3.5
Total Tax & Non-Tax Revenues	\$3,457.2	100.0%

Source: Budget & Finance

Income Elasticity of General Fund Taxes

The income elasticity of a tax measures the revenue responsiveness of the tax to changes in total personal income. It is measured as the percentage change in tax revenues generated by a one percent change in personal income (i.e. the percentage increase in tax revenue divided by the percentage increase in personal income). A coefficient of 1.0 indicates “unitary” elasticity, meaning a one percent increase (or decrease) in personal income will yield a similar one percent increase (or decrease) in tax revenues.

An elasticity coefficient greater than one indicates an “elastic” response, meaning a one percent change in personal income will yield a greater than one percent change in tax revenue. An elastic tax system is generally preferred during periods of economic growth, as revenues will increase faster than the growth in state personal income. But such a system leads to more than proportional decreases in revenues during periods of falling incomes.

A coefficient less than one indicates an “inelastic” response, meaning a one percent change in personal income will yield a smaller percentage change in tax revenue. Such a tax system tends to be more stable over long periods, but tax revenues grow at a slower rate than the overall economy, requiring increases in tax rates if the state wants revenues to keep pace with the economy.

We computed the elasticities of each of the State taxes and the overall elasticity for total General Fund taxes by regressing the logarithm of the respective taxes against the logarithm of nominal state personal income for the 1990-2001 years. For purposes of the regressions, we used total tax collections for the transient accommodations tax rather than amounts allocated to the general fund because GF allocations were very volatile while total collections were not. Table 4 presents the computed elasticities.

Table 4
Tax Elasticities

Tax	Elasticity	Adjusted Elasticity
General Excise	1.04	
Individual Income	1.47	
Corporate Income	-1.19	
Public Service Co.	3.08	
Insurance Premiums	2.23	
Tobacco & License	3.72	
Liquor & permits	- .37	
Bank & Financial Co.	-31.03	-1.52
Inheritance & Estate	2.63	
Transient Accommodations	4.01	1.36
Fuel	1.21	
Motor Vehicle	6.80	
Conveyance	2.90	
All Other	4.43	
Total Taxes	1.16	1.11

Source: Computed from data supplied by the Department of Taxation and the Department of Business and Economic Development.

Table 4 shows that the overall tax system has an elasticity of 1.16, while the two major taxes have elasticities of 1.04 and 1.47. The value of 1.16 indicates the overall responsiveness of the tax system is elastic and should respond positively to growth in personal income, as tax revenues should rise by 11.6 percent for each 10 percent increase in incomes. All but one of the taxes yield an elastic relationship, although some are negative. These elasticity estimates are greater than those estimated in an earlier study by Mak and Ahmad. We would conclude that the overall tax system should be able to generate revenues to meet expenditures, as long as expenditures do not rise faster than the state's total personal income.

While several taxes show very high elasticities, three show negative elasticities, meaning these taxes are not positively related to personal income. Corporate income tax revenues were especially volatile during this period, ranging from \$95 million to \$29 million, with the highest taxes collected in the first two years and then in the last two years of the period. This was the result of a very volatile decade for corporate profits, with many companies paying large amounts of tax on profits in one year, only to incur large losses and file for refunds during subsequent years.

Liquor taxes also showed a negative relationship to changes in personal income, fluctuating between \$11 million and \$28 million during the period, with collections in 2001 only \$1.2 million greater than in 1990. Bank and financial corporations taxes (the final negative elasticity) rose from 1990 until 1994 and then declined steadily through 2000, and were negative in 2001. The steady decline in Banking tax revenues was due to a decrease in the tax rate from 11.2 to 7.92 percent in 1994, and to institutions taking more capital goods credits after 1995. Transient Accommodations tax allocations to the GF ranged from \$82 million to zero, so we used total tax collections, which grew steadily throughout the period.

Because of the rate changes to the bank franchise and transient accommodations taxes in 1995, we also calculated an adjusted series and an adjusted elasticity for these two taxes. The TAT rate was 5.0 percent from 1987 until June 1994, then increased to 6.0 from July 1994 until December 1998, and finally was increased to 7.25 percent after January 1999. We adjusted the revenue series to assume that all years were subject to the 7.25 percent rate. This yields a series with a common tax rate, and allows us to calculate an elasticity based on how responsive the tax would have been if the rate had been constant throughout the decade. The new estimate was a negative 1.52.

We also adjusted the bank franchise series based on a decrease in the rate from 11.2 percent to 7.92 percent beginning January 1994. We used the lower rate and adjusted early figures to reflect what revenues would have been if the rate had been constant throughout the decade. We also made one additional adjustment to this series. The revenue for 2001 was a negative \$294,000. This number distorts any calculations based on percentage changes, and elasticity calculations cannot deal efficiently with zero or negative values. We first used a value of \$1,000 for 2001 and this decreased the elasticity coefficient some, but we still considered this a distortion. We then calculated the bank franchise elasticity using only the values from 1990 to 2000. The adjusted estimate of the elasticity for this tax was 1.36.

The two taxes we adjusted for rate changes also represent a very small portion of the total tax revenues for any of the years in our series. The TAT averaged only 4.2 percent of total taxes during the decade, while the bank franchise tax averaged only .6 percent of the total. Thus, together these taxes averaged only 4.8 percent of total taxes. The impact of the adjusted series on the overall elasticity was to decrease the estimate from 1.16 to 1.11.

Fluctuations in General Fund Elasticities

The elasticity estimates in Table 4 are long run estimates. But, as indicated above, there are substantial short run variations in the responsiveness to changes in personal income. Table 5 shows the short run elasticities for total GF taxes. Elasticities for each tax are given in Appendix Table A-1. These elasticities were calculated by dividing the annual percentage change in tax collections by the annual percentage change in personal income.

Table 5
Short run General Fund Elasticities

Year	% Change Per Income	% Change Tax Rev	Elasticity
1991	5.15	11.20	2.17
1992	6.34	1.50	.24
1993	4.34	4.47	1.03
1994	2.31	4.08	1.77
1995	1.55	-1.12	-.72
1996	0.63	6.42	10.12
1997	2.71	0.48	.18
1998	1.94	2.79	1.44
1999	2.57	0.17	.07
2000	3.48	4.14	1.19
2001	3.96	6.23	1.57
2002	2.38	-3.76	-1.58
Average			1.46

Source: Computed from data supplied by the Department of Taxation and the Department of Business and Economic Development

The elasticities range from a high of 10.12 to a negative 1.58, and the average elasticity for the period is slightly higher than that calculated for the long run period. While growth in the state's personal income follows more closely the overall pattern of changes in state government expenditures (i.e. rapid growth in early years, flat growth during most of the period, and then rapid growth again in later years), the tax system is also responsive to income changes.

While tax revenues grew in response to income changes in most years, there are some obvious exceptions, which seem to indicate how sensitive the Hawaiian State tax system is to external economic events. Examples are the slow growth in 1992 following the Desert Storm war in the Middle East and Hurricane Iniki in Kauai, the slow growth in 1997 following the financial crisis in Asia, and the fall in tax revenues in 2001 following the terrorist attacks on September 11, 2001. The fall in tax revenues in 1995 was the result

of slow economic growth in the state and changes in tax laws, when revenues fell in 1995 and then rose sharply the following year, giving the clearly unusual elasticity over ten in 1996.

General Fund Projections

Forecasts made in 1989 by the Department of Budget and Finance and by Mak and Ahmad projected a large and growing General Fund Surplus. Mak and Ahmad projected expenditures by 1995 to grow over \$400 million more than the DB&F, rising closer to the levels of the expenditure ceilings. Both used the Council on Revenues projections for revenues, which were expected to rise even faster than expenditures, creating a growing surplus. But growth in the state's economy began to slow in 1990, and was stagnant from 1993 until 1999. The result was an almost \$800 million shortfall in actual over projected revenues by 1995, and a growth in expenditures close to the Mak and Ahmad forecast, turning the projected surplus into a series of large deficits.

Experience with past attempts to forecast General Fund revenues and expenditures seem to indicate that expenditure projections are more likely than revenues to follow historical trends, rising in most years, regardless of the state of the economy. As mentioned earlier, total expenditures declined only three times in the past 13 years, and two of those declines were under \$50 million, and occurred during the stagnant economic growth years in the middle of the decade.

In July of 2001, the DB&F again published projections of General Fund revenues and expenditures, but revised those projections after the events of September 11. Both projections are summarized in Table 6 below.

Table 6
DBF Projected General Fund Budget
(in millions of \$)

Fiscal Year	July 01 Revenue	Revised Revenue	July 01 Expenditure	Revised Expenditure
02	\$3,584.1	\$3,491.8*	\$3,654.8	\$3,630.9*
03	3,759.5	3,757.2	3,939.4	3,875.1
04	3,949.5	3,791.0	3,999.1	3,908.0
05	4,166.1	3,982.1	4,087.4	4,003.7
06	4,395.9	4,162.0	4,163.8	4,198.6
07	4,630.5	4,362.3	4,242.7	4,346.7

* Actual Fiscal 02 figures were \$3,441.0 revenues and \$3,656.1 expenditures
Source: Department of Budget and Finance

While both revenue and expenditure projections were lowered in the revisions, revenues were forecast to decline by increasing annual amounts during the period, while expenditures were forecast to fall initially, and then rise during the final two fiscal years. While the initial forecast projected surpluses over the final three fiscal years, the revised forecast projects deficits until the final fiscal year. The revisions reflect the long-term impact of September 11, 2001 on the state's budget, but they also reflect legislative changes in the GET and individual income tax structures that are expected to reduce tax revenues from earlier forecasts.

In 1998 the Legislature expanded the individual income tax brackets and reduced tax rates for the 1999, 2000, and 2001 tax years. They also repealed the food income tax credit and created a low-income

refundable tax credit. The Tax Department estimated that these changes would result in revenue losses of \$72 million in FY99, with losses increasing to \$234 million by FY03. Those projected losses will continue to have an impact on state revenues throughout the decade.

The 1999 Legislature provided for GET de-pyramiding, resulting in projected revenue losses ranging from \$9 million in FY00 to \$150 million in FY07. They also established a new tax credit for hotel construction and remodeling that would reduce revenues by \$13 million to \$99 million, depending on the percentage credit taken, and created a new tax credit for high technology businesses. The 2000 Legislature extending the GET pyramiding relief to amusement services, and extended the hotel construction and remodeling tax credit. A technology infrastructure renovation tax credit was created in 2001, and the construction and remodeling credit was also expanded. These structural changes and new tax credits are already reducing tax revenues by millions of dollars a year, and the impact will continue to grow.

In addition to slower projected revenue growth, the state also faces accelerated expenditure growth as the state struggles to escape a decade long stagnation, and public employee unions win new collective bargaining contracts that DB&F projects will increase spending by over \$230 million a year through most of the period.

Based on the elasticity coefficients calculated here, we have made our own projections of state General Fund expenditures and revenues for the next five fiscal years. These projections are presented in Table 7, and use the “adjusted elasticity” value for revenues.

Table 7
General Fund Expenditures & Revenues
FY 03-07
(Millions of \$)

Fiscal Year	Projected Expenditures	Projected Revenues	Projected Surplus/Deficit
2003	\$3,782.9	\$3,739.3	\$(43.6)
2004	3,914.2	3,888.9	(25.4)
2005	4,050.1	4,044.4	(6.2)
2006	4,190.6	4,206.2	15.6
2007	4,336.0	4,374.4	38.4

Source: Calculated using elasticity coefficients calculated by the authors.

Our projections are slightly more optimistic than those of the DB&F, especially in the early years. We project both revenues and expenditures to grow slower in 2003, but slightly faster throughout the rest of the period. We have assumed that revenues will return to the long run trends earlier than the DB&F projected. The fall in revenues in 2001 makes any projections more risky, but the tax system has been elastic as the state’s economy grows and should respond to future personal income growth and return the revenue system closer to its long-term trends.

It is also obvious that the state tax system is responsive to external and unforeseen events, especially negative events. While we have not attempted to forecast any such events, if they should occur they will have a negative impact on revenues. For example, the events of September 11, 2001, led to a decline in tax revenues of \$119.2 million during fiscal 2001, but this was actually \$250 million lower than revenues would have been if they had maintained their trend of increasing every year. Instead of tax revenues rising by \$131 million they fell by \$119 million. Although revenues fell by 3.8 percent, they actually were 7.9 percent lower than they would have been projected.

External events such as a hurricane may not result in actual revenue losses, but they could lead to much slower growth than projected. For example, hurricane Iniki in 1992 and the slower economy in Hawaii resulting from Desert Storm, led to tax growth of only \$35.6 million in 1992, as opposed to growth in taxes of \$239.2 million in 1991, and \$107.8 million in 1993. By the same token, tax growth in 1997, the year of the Asian financial crisis, was only \$13.4 million, compared to a growth of \$166.3 million in 1996, and \$77.3 in 1998. While the tax system responds favorably to economic growth, it also responds negatively to economic slowdowns. What we have projected is growth based on assumptions that the economy will continue to grow, and the tax system will respond accordingly.

Appendix
Table A1
Short Term Elasticities

Year	Public Service Co	Bank Franchise	TAT	Fuel	Conveyance	Motor Vehicle	All Other
1991	1.45	0.53	-0.30	0.25	-5.82	0.91	1.23
1992	1.56	2.74	0.15	2.87	-4.56	14.48	-7.36
1993	1.11	-0.20	0.10	0.39	-1.49	10.64	10.78
1994	3.04	10.29	-2.04	2.30	44.90	-1.27	15.09
1995	5.74	-27.15	18.14	-0.66	-6.00	4.14	24.96
1996	5.69	0.56	28.65	4.58	-29.10	0.05	77.81
1997	3.62	-15.91	3.10	-0.35	2.20	0.68	-2.72
1998	2.69	30.80	0.66	-0.98	7.89	0.76	-4.53
1999	0.26	-14.45	2.90	0.01	4.31	1.11	-1.53
2000	-0.39	-7.98	6.74	0.07	6.86	5.59	0.22
2001	3.18		1.29	1.23	2.60	1.71	-1.48

Year	GET	Individual Income	Corporate Income	Insurance Premium	Tobacco	Liquor	Inheritance
1991	1.64	4.96	5.49	4.30	2.29	0.22	-5.31
1992	0.20	0.62	-8.57	5.36	0.67	0.27	6.06
1993	0.15	0.40	-7.60	2.48	4.09	-1.19	-6.52
1994	0.97	1.86	14.22	-2.03	0.56	-0.39	60.05
1995	1.50	-2.47	-14.46	-1.47	5.38	-1.05	-26.78
1996	7.93	12.64	94.81	-7.87	18.65	-2.26	10.57
1997	0.65	-0.87	7.15	-2.07	-2.93	0.52	9.72
1998	-1.13	5.67	-10.37	3.32	-0.47	0.74	-5.87
1999	0.60	-0.54	-3.01	-4.56	6.67	-0.39	18.03
2000	1.77	-0.11	17.24	8.85	0.04	0.37	-5.96
2001	1.70	0.95	-2.75	1.27	7.59	-0.79	-5.81