

## **BUDGET MODEL**

53. Taking into account the changes that have taken place over the last decade, the Task Force has estimated the likely future government surpluses or deficits under existing revenue and expenditure policies, on the assumption that the economy would grow at its “normal” (i.e. mid-cycle) level in the long term. The objective is to determine if the deficits would continue when the economy returns to a “normal” growth trend. Should the deficits not disappear with the return of the economic cycle to “normal” levels, Hong Kong would be seen to have a structural fiscal problem.

54. The Task Force, with the help of a consultant with experience in modeling similar economic projections for other governments in the region, has developed a budget model to examine the long-term sustainability of the fiscal system for a 20-year period, up to 2021-22.

55. The model incorporates three sets of parameters - economic, demographic, and revenue and expenditure. The key model parameters and assumptions are set out in Annex IV. The model takes into account the prevailing government expenditure and revenue policies, the likely impact arising from changes in the economy in recent years and in the future (e.g. consolidation of the property market and ageing population). Beyond these, the Task Force has not made any assumptions as to what future changes in the economy could have a serious impact on our fiscal system.

Annex IV

56. The model seeks to test the fiscal impact by manipulating the key variables. In theory, some parameters will interact with other parameters. For instance, the revenue yield of salaries tax (expressed as a percentage of the compensation of employees of the Hong Kong economy) may be marginally higher in a high economic growth situation than a low economic growth situation. For the purpose of the budget model, the Task Force has decided to keep constant the revenue and expenditure parameters and sensitivity-test them using the economic parameters. Admittedly this will not bring out the exact effect arising from the interaction of the parameters but for the purpose of long-term modeling, it should provide a plausible picture of the major budgetary trends, which are the focus of this study.

57. The Task Force notes that a model with a projection horizon spanning over two decades is a useful tool to identify directions in assessing fiscal sustainability, particularly when it takes account of forecast demographic changes. However, it also wishes to stress that projections extending over such a long time scale are inherently exposed to uncertainties. The reliability of the projections decreases as the horizon expands because a change in any one of the more significant variables will impact on the results overall. The longer-term projections, in particular, should be viewed with a degree of caution and be regarded more as illustrations of the plausible future fiscal position rather than as firm results.

### **Economic Parameters**

58. The model's key economic assumptions are as follows –

Calendar Year	2002	2003 - 2006	2007-2021
	%	%	%
Real GDP Growth Rate	1.0	3.5	3.0
GDP Deflator	-1.5	0.9	2.0
Nominal GDP Growth Rate	-0.5	4.4	5.1

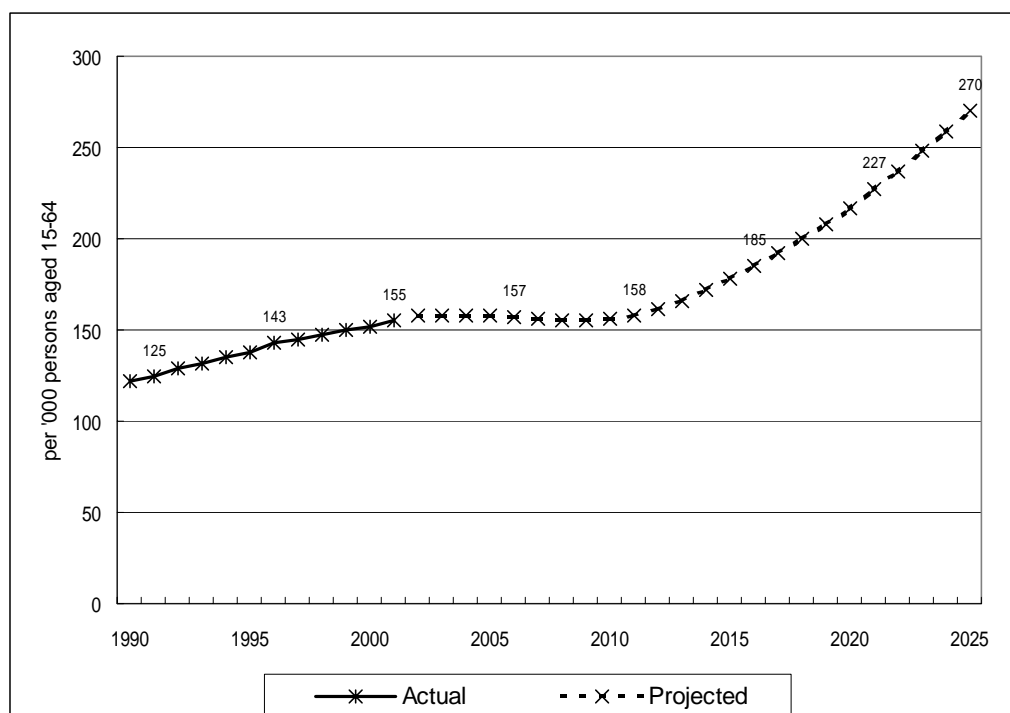
59. The model has been sensitivity-tested with alternative assumptions to reflect higher and lower economic growth situations. The assumptions are set out below –

Calendar Year		2002	2003-2006	2007-2021
		%	%	%
Real GDP Growth Rate	Higher	1.0	4.7	4.0
	Lower	1.0	2.3	2.0
GDP Deflator	Higher	-1.5	2.1	3.0
	Lower	-1.5	-0.5	0.5
Nominal GDP Growth Rate	Higher	-0.5	7.0	7.1
	Lower	-0.5	1.7	2.5

### Demographic Parameters

60. The population projections in *Hong Kong Population Projections 2000-2029* and the population figures from the 2001 Population Census are used in the model. The population continued to age during the last ten years. The ratio of the number of persons aged 65 and over to 1,000 persons in the 15-64 age group increased from 125 in 1991 to 155 in 2001. The ratio is projected to increase to 157 in 2006 and rise further to 185 in 2016 and 227 in 2021 (see Chart 12 below).

**Chart 12 - Elderly Dependency Ratios**



61. The implication of an ageing population on government expenditure in respect of social security payments has been taken into account in the modeling of long-term budgetary positions.

### **Revenue and Expenditure Parameters**

62. Under the model, each major revenue item has a designated driver that aligns it to an economic variable. This allows future movement to be projected into the longer term. For example, the profits tax yield is assumed to be a certain percentage of the gross operating surplus<sup>10</sup> of the Hong Kong economy of the previous year. For salaries tax, this is a percentage of compensation of employees of the economy for the previous year. The major model parameters and their drivers are set out in Annex IV. Not all of the drivers are necessarily as directly relevant as the two cited above but they are plausible proxies without affecting the model's overall validity. The following is an overview of the key revenue and expenditure parameters.

#### ***Revenue Parameters***

63. Table 12 below provides an analysis of the different revenue items for the period from 1991-92 to 2001-02.

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<sup>10</sup> Gross operating surplus (GOS) measures the return to capital and entrepreneurship from production for the economy as a whole. It is calculated as a residual item by deducting from the GDP the compensation of employees (which measures the return to labour, i.e. largely salaries and wages, bonus, employee benefits, etc) and taxes on production and imports.



64. **Profits tax** is historically the largest contributor to direct tax revenue. Although in its initial stages of development there was a fear that electronic commerce might lead to a substantial erosion of profits tax yield due to Hong Kong's source-based tax system, it has not, to date, materialised. Nevertheless, while advanced telecommunications technology enhances Hong Kong's competitiveness, it may also increase the mobility of businesses and thus pose a threat to Hong Kong's profits tax base under the territorial source principle for tax liability demarcation. There is another element of uncertainty for profits tax yield - the contribution of the property-related and banking sectors of the economy as described in paragraph 40 above.

65. Taking these developments into account and using the established budget forecasting method, the Task Force has projected the profits tax yield until 2006-07. Expressed as a percentage of Hong Kong's gross operating surplus for the previous year, it fluctuates between 9.1% and 9.6% (details at Annex IV). For the longer term, the Task Force has used the average 9.3% of the gross operating surplus for the previous year to project profits tax yield beyond 2006-07. This is slightly higher than the average profits tax yield of 8.9% in 1998-99 to 2001-02 but much inferior to the average 11.2% recorded in the pre-Asian financial crisis years in the 1990s.

Annex V

66. In recent years, the **salaries tax** base has been shrinking. One of the contributing factors is the increase in salaries tax concessions in recent years. The rate of increase in personal allowances and concessionary deductions has exceeded the rate of inflation over the past ten years (see Annex V). From 1991-92 to 2001-02, the percentage of the working population paying salaries tax has dropped from 47.1% to 37.0%. In absolute terms, the salaries taxpayer population reduced by almost 80,000, from 1,280,000 in 1991-92 to 1,200,000 in 2001-02. This is in spite of the increase of the working population from 2.72 million to 3.24 million over the same period.

Annex VI

67. Furthermore, the restructuring of the marginal salaries tax rates in recent years has reduced the overall tax burden for individuals but at the expense of the tax yield. Annex VI provides an illustration of the effect of the adjustments in marginal tax rates. The narrow salaries tax base has shrunk further and the share of the total tax paid by the top 100,000 salaries taxpayers has been consistently increasing. In 1991-92, this group paid 51.8% of all salaries tax and this is estimated to increase to 61.2% in 2001-02.

68. In the medium to longer term, Hong Kong will face two challenges from a salaries tax perspective – an ageing population and cross-border employment. As Hong Kong's population ages, the proportion of the population of working age will, in percentage terms, decrease relative to the total population. In the longer term, Hong Kong residents working in the Mainland (who may still live in Hong Kong) will also constrain the growth of the size of the local workforce and put a strain on the salaries tax base due to Hong Kong's territorial-based tax system.

69. Having regard to the above developments and using the established budget forecasting method, the Task Force has projected the salaries tax yield until 2006-07. Expressed as a percentage of the compensation of employees of the previous year, this fluctuates between 4.6% to 5.3% (details at Annex IV). For the longer term, the Task Force has used the average of 5.0% of the compensation of employees of the previous year to project salaries tax yield beyond 2006-07. This is on the low side compared with the average of 5.8% in the early 1990s before the Asian financial crisis but is an improvement over the 4.1% average between 1998-99 and 2001-02.

70. The yield from **stamp duty on property transactions** is driven by the performance of the property market. Transaction numbers in absolute terms and the property price levels determine the amount of collections. The economic pressure currently driving the property market into consolidation has adversely affected stamp duty revenue because transaction numbers and considerations have fallen considerably from their levels of a few years ago. The Task Force has projected an average of 1.2% of gross operating surplus for stamp duties on property transaction for the next five fiscal years. The same percentage is adopted for the longer term.

71. **Stamp duty on stock transactions** is driven by the performance of the stock market in terms of volume of transactions and stock price levels. The Task Force has assumed in the model that revenue from stamp duty on stock transactions, expressed as a percentage of gross operating surplus, would be at 1.1%, being the average yield projected for the next five fiscal years.

72. **General rates** revenue is dependent on the number of rateable units and the rentals level. Based on the current level of rates charged, the Task Force has assumed in the model that the revenue from this source would be around 3.6% of gross operating surplus in the longer term, being the average yield forecast in the next five fiscal years.

73. **Land premiums** arise from the sale of government land leases and approvals to change the use of private land. An improved land supply mechanism has brought a large and steady supply of land to the market. More stable property prices will not produce the windfall gains that characterised the market until 1997-98. Expressed as a percentage of GDP, the Task Force has assumed in the model that land premium would be around 2.0% of GDP in the longer term.

74. **Investment income** is earned on the fiscal reserves. Any fiscal reserves that are not required for cash flow reasons or to finance budget deficits are largely invested in bonds and equities to yield investment income for the Government. In the model, the income is calculated by matching the level of the projected fiscal reserves against an assumed rate of return of 5.5%. Assuming that any deficit will be financed by government borrowing when the reserves are depleted, an assumed rate of 6.0% is used to calculate the borrowing cost<sup>11</sup>. This reflects a much less favourable fund-raising position for Hong Kong after the reserves are depleted as against the status quo when any potential borrowing can be backed by the substantial fiscal reserves.

### *Expenditure Parameters*

75. On the expenditure side, the Task Force has adopted the established guideline for controlling the growth of government expenditure in the budget model, but with the exception of one expenditure item in “other charges” which is determined from the population projections. This methodology allows the model to bring out some of the financial implications of an ageing population with an increase in social security payments in tandem.

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<sup>11</sup> The borrowing approach is assumed for illustration purpose only. It is not a suggestion that the Government should, or will, continue to draw down the fiscal reserves to finance deficits and then engage in borrowing.



76. The established guideline for controlling the growth of government expenditure specifies that government expenditure as a whole should be in line with the trend growth of GDP in real terms. This notwithstanding, since 1993-94 the growth of government expenditure in nominal terms has outstripped the nominal growth of the economy, as shown in Chart 13 below and explained in paragraphs 48 to 50 above. In recognition of the systemic phenomenon of having a higher rate of change in the price deflator of government expenditure (i.e. GCE deflator) than the GDP deflator, the Task Force has assumed that the GCE deflator would be higher than the GDP deflator by 0.8 percentage point in the budget model.

Chart 13 – Cumulative Growth Rate in Government Expenditure and GDP in Nominal terms

