

## Fundo de Seguranca Social, Government of Macau Special Administrative Region Consultancy Study on Fundo de Seguranca Social (the "FSS") Executive Summary

### Introduction

In the study set out in our report dated 18 April 2012 (the "Main Report") and the two Attachments dated 29 May and 27 June 2012 (the "Additional Scenario Analyses 1 and 2"), we projected the FSS asset value by taking into account the expected money inflow (i.e. contributions from members, transfers from Government Revenue, employment fees for foreign workers and investment return), and outflow (i.e. benefit payments and administrative expenses) based on a set of baseline assumptions. We then assessed the adequacy of the FSS asset value and determined the required additional Government injection or member contributions in case the FSS would be short of money by the end of 2042, 2052 and 2062. The study was supplemented by a series of scenarios to assess the financial impact when different assumptions or parameters were altered.

### Summary of Population Projection

Below is a summary of the projected population for the next 50 years under the baseline assumptions:

	2012	2022	2032	2042	2052	2062
<b>Total Macau Population</b>	<b>567,218</b>	<b>711,224</b>	<b>833,002</b>	<b>928,729</b>	<b>997,763</b>	<b>1,041,847</b>
<b>By Gender</b>						
• Male	272,603	342,796	400,701	444,158	476,147	499,198
• Female	294,615	368,428	432,301	484,571	521,616	542,649
<b>By Age</b>						
• 0 – 14	68,213	92,785	92,911	91,144	97,969	100,304
• 15 – 64	451,671	520,700	567,804	613,870	625,940	633,010
• 65 or above	47,334	97,739	172,287	223,715	273,854	308,533

The total population is expected to increase by around 1.2% per annum. The projection indicates a rapidly aging population. The percentage of the population over age 65 is expected to increase significantly from 8% in year 2012 to 30% in year 2062. On the other hand, the age group from 15 to 64, mainly the working population, is expected to decrease significantly from 80% in year 2012 to about 60% in year 2062.

### Summary of Results

We performed 23 projections under different assumptions and parameters and the results are shown on page 4 of this executive summary.

The current contribution level from members of MOP 45 by itself is not sufficient to fund the cost of the promised benefits. The FSS is now mainly financed by the transfers from Government Revenue for its sustainability.

The expected transfers of MOP 4,021 million in 2012 raise the value of the Fund Assets by over 35%. This large amount of expected transfers in 2012 could significantly enhance the financial position of the FSS.

Our projection and analysis are based on the assumption that there would be transfer from the gaming tax on a regular basis (in addition to the regular transfer from general revenue) to the FSS each year over the next 50 years. **Please note that the future transfers are projected in our modal based on the value of MOP 4,021 million in 2012 and then increased by 4% per annum under the Base Case of the Main Report while under the Additional Scenario Analyses 1 and 2 dated 29 May and 27 June 2012, such transfers are assumed to be MOP 4,021 million in 2012 and then increased by 2.5% per annum.**

Even with the rapidly aging population in Macau, the Fund Assets would be expected to remain positive over the next 50 years under the Base Case and the other 16 scenarios as shown in the Main Report. However, the Additional Scenario Analyses 1 and 2 reveal that the Fund Assets would become negative in 2038 or 2058 under the assumption of increase in Government transfer is only reduced by 1.5% (from 4% to 2.5%) per annum, despite that an additional transfer of MOP 5,000 million would be made in each of 2013 and 2014 and the member contribution would be increased.

As shown in our analyses, the financial position of the FSS is also very sensitive to the increase in the monthly Old Age Pension and Disability Benefit. Therefore, it is important to consider any future benefit increases together with the sources of financing – the contributions from members, and more importantly, the level and persistency of transfers from Government general revenue and gaming tax.

The results of four critical scenarios are highlighted as follows:

Report Reference	Scenario	Benefit Level	Transfers from Government Revenue	Total Contribution from Members	Estimated Fund Assets in			Year in Which the Fund Assets Become Negative
		MOP/month	MOP Million	MOP/month	2042	2052	2062	
Main Report	3	3,000 in 2012, and then increase by 2.5% p.a.	4,021 in 2012 and then increase by 4.0% p.a.	45	71,599	62,077	32,537	N/A
Additional Scenario Analysis 2	1	<b>2,000 in first half and 2,050 in second half of 2012,</b> and then increase by 2.5% p.a.	4,021 in 2012 and then increase by 2.5% p.a., <b>with additional transfer of 5,000 each in 2013 and 2014</b>	45	134,769	145,593	116,726	N/A
	3	2,000 in first half and 2,500 in second half of 2012, <b>and then increase by 5.0% p.a.</b>	4,021 in 2012 and then increase by 2.5% p.a., with additional transfer of 5,000 each in 2013 and 2014	<b>45 in first half and 47.25 in second half of 2012, and then increase by 5.0% p.a.</b>	(65,880)	(418,662)	(1,257,255)	2038
	4	<b>2,000 in first half and 2,300 in second half of 2012, 2,600 in 2013, 2,900 in 2014, 3,200 in 2015, and then increase by 2.5% p.a.</b>	4,021 in 2012 and then increase by 2.5% p.a., with additional transfer of 5,000 each in 2013 and 2014	<b>45 in first half and 100 in the second half of 2012 145 in 2013, 190 in 2014, 250 in 2015, and then increase by 2.5% p.a.</b>	97,400	54,678	(70,903)	2058

Our key observations of the above four scenarios are:

- Scenario 3 in the Main Report indicates that the FSS is expected to have a positive fund asset value by the end of 2062 if the monthly benefit level is increased to MOP 3,000 in 2012 and then grows at 2.5% per annum, and the Government transfer of MOP 4,021 million is expected to grow at 4.0% per annum.
- Scenario 1 of the Additional Scenario Analysis 2 indicates that the FSS is expected to have a positive fund asset value by the end of 2062 if the monthly benefit level is slightly increased to MOP 2,050 in the second half of 2012 and then grows at 2.5% per annum, and the Government transfer of MOP 4,021 million of 2012 is expected to grow at a lower rate of 2.5% per annum but with an additional transfers of MOP 5,000 million each in 2013 and 2014.
- Compared with Scenario 1 of the Additional Scenario Analysis 2, Scenarios 3 and 4 indicate that if the monthly benefit level is assumed to grow at a higher rate or level, even though with the increase in monthly member contributions, the FSS is expected to be short of fund by 2038 and 2058 respectively, and therefore additional Government injection or member contribution is required.

### Summary of Key Assumptions

The key economic assumptions are summarized below:

Economic Assumptions	Baseline as in Main Report	Additional Scenario Analysis 2
Investment return on Fund Assets	3.5%	3.5%
Inflation	2.5%	2.5%
Increase in median income level for resident workers	5.0%	5.0%
Increase in transfers from Government Revenue	<b>4.0%</b>	<b>2.5%</b>
Increase in administrative expenses	6.0%	6.0%
Increase in monthly employment fee for foreign workers	2.5%	2.5%

Please refer to the Main Report for the demographic assumptions (i.e. mortality, fertility, immigration and emigration), and benefit coverage assumptions (i.e. coverage, contributing, disability, unemployment and early retirement percentages) used in our projections.

Please note that this executive summary is subject to the disclaimers and limitations as stated in the Main Report, and shall be read together with the Main Report and the two Attachments.

Towers Watson Hong Kong Limited

3 August 2012

## Actuarial Analyses: Summary of 23 scenarios

All monetary numbers in MOP

Report Reference	Scenario	Benefit level		Transfer from government revenue		Total contribution from members		Additional government injection required per year for Fund Asset to remain positive until			Additional member contribution required per month for Fund Asset to remain positive until		
		Amount in 2012 (per month)	increase p.a. thereafter	Amount in 2012	increase p.a. thereafter	Amount in 2012 (per month)	increase p.a. thereafter	2042	2052	2062	2042	2052	2062
Main Report	Base	2,000	2.5%	4,021m	4.0%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	1	2,000	0.0%	4,021m	4.0%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	2	2,500	2.5%	4,021m	4.0%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	3	3,000	2.5%	4,021m	4.0%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	4	2,000	2.5%	4,021m	3.0%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	5	2,000	2.5%	4,021m	5.0%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	6	2,000	2.5%	4,021m	4.0%	0.6% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	7	2,000	2.5%	4,021m	4.0%	1% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	8	2,000	2.5%	4,021m	4.0%	3% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	9	2,000	2.5%	4,021m	4.0%	5% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	10	2,500	2.5%	4,021m	4.0%	1% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	11	2,500	2.5%	4,021m	4.0%	3% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	12	2,500	2.5%	4,021m	4.0%	5% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	13	3,000	2.5%	4,021m	5.0%	3% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	14	3,000	2.5%	4,021m	5.0%	5% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	15	3,000	2.5%	4,021m	3.0%	3% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
	16	3,000	2.5%	4,021m	3.0%	5% of median income	5.0%	Nil	Nil	Nil	Nil	Nil	Nil
Additional Scenario Analysis 1	1	2,500 in 2012 2,900 in 2013 3,300 in 2014	5.0%	4,021m	4.0%	90 in 2012 90 in 2013 165 in 2014	5.0%	955m	4,132m	8,284m	279	983	1,882
Additional Scenario Analysis 2	1	2,000 in 2012 first half 2,050 in 2012 second half	2.5%	4,021m in 2012 extra 5,000m in 2013 & 2014	2.5%	45	0.0%	Nil	Nil	Nil	Nil	Nil	Nil
	2	2,000 in 2012 first half 2,500 in 2012 second half	2.5%	4,021m in 2012 extra 5,000m in 2013 & 2014	2.5%	45 in 2012 first half 46.125 in 2012 second half	2.5%	Nil	Nil	446m	Nil	Nil	97
	3	2,000 in 2012 first half 2,500 in 2012 second half	5.0%	4,021m in 2012 extra 5,000m in 2013 & 2014	2.5%	45 in 2012 first half 47.25 in 2012 second half	5.0%	1,190m	4,649m	9,047m	267	1,023	1,966
	4	2,000 in 2012 first half 2,300 in 2012 second half 2,600 in 2013 2,900 in 2014 3,200 in 2015	2.5%	4,021m in 2012 extra 5,000m in 2013 & 2014	2.5%	45 in 2012 first half 100 in 2012 second half 145 in 2013 190 in 2014 250 in 2015	2.5%	Nil	Nil	510m	Nil	Nil	111
	5	2,000 in 2012 first half 3,000 in 2012 second half	2.5%	4,021m in 2012 extra 5,000m in 2013 & 2014	2.5%	45 in 2012 first half 100 in 2012 second half 200 in 2013 250 in 2014 260 in 2015	2.5%	Nil	Nil	543m	Nil	Nil	118