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ASHK MPF Market Size Projection 2015 - 2035

**Actuarial Society of Hong Kong
Pension and Employee Benefits Committee
Published on September 15, 2015**



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1. Purpose and Scope of this Study

- 1.1 The Pension and Employee Benefits Committee (the Committee) of the Actuarial Society of Hong Kong (ASHK) consists of pension actuaries of major MPF providers in Hong Kong. The Committee initiated a study of the MPF market size projection over the next 20 years, from 2015 to 2035. The MPF market size is defined as the net asset values of all MPF schemes. As of December 31, 2014, the MPF market size was HK\$565 billion based on the Mandatory Provident Fund Schemes Statistical Digest as published by the MPFA.
- 1.2 The Committee is aware that the pension actuaries in Hong Kong, from time to time, perform projection of MPF market sizes for business planning or other purposes, based on their own judgment of assumptions. The Committee believes this is beneficial to the MPF community as a whole to publish a study on the MPF market size projection with an independent view of assumptions for the projections.
- 1.3 A taskforce has been formed within the Committee to work on this study. This study was approved to be released by the Committee on Aug 17, 2015 and the Council of the ASHK on Aug 26, 2015. The taskforce consists of the following ASHK members:
- Michele Yuen
 - Tak-chi Wong
 - Gary Lee
 - Billy Wong
- 1.4 The Committee understands that the future MPF market size depends on a number of uncertain factors including but not limited to the following:
- investment returns of the underlying funds
 - members' choices of funds
 - fees of the funds
 - mandatory contribution rates
 - voluntary contribution rates and special voluntary contribution rates
 - salary inflation
 - increase in minimum wage and subsequent adjustment to minimum and maximum relevant income
 - working population growth

- MPF scheme participation rate
- employers' choices of the offer of MPF-exempted ORSO schemes to their employees, and the employees' choices of joining the MPF-exempted ORSO schemes
- numbers of members eligible to early/normal retirement
- retirement age for MPF benefit withdrawal
- legislation allowing phased withdrawal and the members' choices to utilize phased withdrawal mechanism
- permanent departure rate
- death, disability, small balance withdrawal rates

Hence, the projection will not be able to provide a definite prediction of the MPF market sizes over the next 20 years and the Committee expects the actual MPF market sizes in the future will deviate from the projection, depending on the outcome of the above and other relevant factors.

- 1.5 The purpose of this study is to provide an independent view towards the MPF market size projection over the next 20 years based on the discussion and debates among the pension actuaries in Hong Kong.

2. Executive Summary

- 2.1 Hong Kong pension actuaries perform projections of MPF market sizes from time to time. ASHK believes this is beneficial to the MPF community to publish an independent study with a set of central estimate assumptions being agreed among the pension actuaries.
- 2.2 The projection will not be able to provide a definite prediction of the MPF market sizes over the next 20 years since the actual outcomes depend on a number of uncertain factors, which are relating to economics, demographics, regulatory changes, members and employers behaviors. Although the actual future MPF market sizes may deviate from the projection, this study provides an independent view towards the projection based on the discussions and debates among the pension actuaries in Hong Kong.
- 2.3 The key observations of this study are summarized as follows:

- **Projected 2035 MPF market size is HK\$2.6 to 3.2 trillion, which is close to 5 times of that of 2014.** The MPF market size was around HK\$0.6 trillion in 2014, and is expected to reach HK\$ 1 trillion around 2020 to 2021 and HK\$ 2 trillion around 2027 to 2031. The component of the increase are shown below:

All in HK\$ Trillion				
2014 Market Size	Contribution inflows	Withdrawal outflows	Net of fee investment returns	2035 Market Size
0.565	2.5	(1.4) to (1.6)	0.9 to 1.8	2.6 to 3.2

- **In 2035, we expect every MPF member will have an average account balance close to HK\$1 million** (i.e. 3 million MPF members sharing HK\$2.6 to 3.2 trillion). This is broadly consistent to the projected balance if we assume a member contributes HK\$21,980 per year (which was actual 2014 average contributions made) for 20 years, 5% contribution growth and 4% investment return.
- The actual 2014 average MPF contributions of HK\$21,980 included voluntary contributions which were around 20% of the total. Hence, voluntary contribution is a significant part and

further study will be carried to identify the impact of voluntary contribution on the market size.

- **We expect that the future investment return is the most sensitive factor to the projected market sizes. For 1% difference in investment return per annum, the MPF market size differs by around HK\$300 billion in 2035.** Future investment returns depend on the economy, the capital market and members' choices of funds and we expect all of these are contributing to the high uncertainty of the outcome.
- **Even if the investment return is zero from 2014 to 2035, the projected 2035 MPF market size is HK\$ 1.9 trillion, which is 3 times that of 2014.**

3. Data, Methodology and Assumptions

3.1 The projection is based on the data as of December 31, 2014 as extracted from MPF Schemes Statistical Digest¹. The key data are summarized as follows:

MPF Market Size as of Dec 31, 2014	HK\$ 565 billion
Contributions received for 2014	HK\$ 60 billion
Benefits paid for 2014	HK\$ 19 billion
Annualized Internal Rate of Return from Dec 1, 2000 to Dec 31, 2014	4.0%

3.2 The MPF market size is projected by the addition of contributions and net investment returns, as well as deduction of benefit payments. The future contributions are projected with reference to 2014 actual contributions received and then increased by the assumed contribution increase rate. The benefit payments are projected as the assumed benefit payment rates multiplied by the beginning market size of each year. The net investment returns are projected with reference to the assumed investment returns multiplied by the beginning market size of each year, adjusted by the contribution and the benefit payment of each year.

3.3 Key assumptions and the rationale of each assumption are as follows:

Contribution Increase Rate	10% in first year of projection and decrease linearly to 3.5% over 10 years
Benefit Payment Rate	3.1% in first year of projection and increase linearly to 5% over 10 years
Investment Return	4.0% per annum

Contribution Increase Rate

Contribution growth in this industry depends on a number of factors including but not limited to the following:

¹ http://www.mpf.org.hk/eng/information_centre/statistics/mpf_schemes_statistical_digest/index.jsp

- mandatory contribution rates
- voluntary contribution rates and special voluntary contribution rates
- salary inflation
- increase in minimum wage and subsequent adjustment to minimum and maximum relevant income
- working population growth
- MPF scheme participation rate
- employers' choices of the offer of MPF-exempted ORSO schemes to their employees, and the employees' choices of joining the MPF-exempted ORSO schemes

According to statistics published from MPFA, the growth in total contributions over the past 10 years is as follows:

Year	Total Contributions (HK\$m)	YoY growth
2005	26,222	
2006	28,395	+8%
2007	31,679	+12%
2008	34,942	+10%
2009	43,850	+25%
2010	37,792	-14%
2011	41,746	+10%
2012	47,694	+14%
2013	53,640	+12%
2014	59,676	+11%
CAGR		+10%

Source: MPFA Statistical Digest, note the increase 2009 was due to one off government injection contribution of HK\$8.4b

The annual contribution growth from 2005 to 2014 was 10%, but there are signs of the growth slowing down in recent years as the industry start to mature. In the long run, we believe the effects of all the factors except salary inflation will wear off (e.g. no more members will move from ORSO to MPF, working population will remain stable, voluntary contributions will stabilize) and contribution growth should be mainly driven by salary inflation.

Based on these considerations, the wage index obtained from the census and statistics department of Hong Kong was used as a reference for long term contribution increase rate and the following table shows the year on year growth of the wage index:

Year	Wage Index	YoY growth
2005	147.7	
2006	151.0	2.2%
2007	155.2	2.8%
2008	156.6	0.9%
2009	157.9	0.8%
2010	163.1	3.3%
2011	178.3	9.3%
2012	187.5	5.2%
2013	195.2	4.1%
2014	203.3	4.1%
CAGR		3.2%

Source: Hong Kong census and statistics department

The compound annual growth rate (CAGR) of the wage index from 2005 to 2014 was 3.2%. There are signs of this figure increasing in the past few years since the introduction of minimum wage increase. Based on the data above, the long term contribution growth assumption was set to be 3.5% (slightly higher than the CAGR to reflect expected increase in minimum wage). The contribution growth was assumed to start at 10% at the first year of projection (i.e. more aligned with historical experience up to 2014) and it will linearly decrease to 3.5% over a 10 year period.

Further study should be performed in future when more data is available.

Benefit Payment Rate

Benefit payment depends on a number of factors including but not limited to the following:

- numbers of members eligible to early/normal retirement
- retirement age for MPF benefit withdrawal
- legislation allowing phased withdrawal and the members' choices to utilize phased withdrawal mechanism
- permanent departure rate
- death, disability, small balance withdrawal rates

According to statistics published from the MPFA, the benefit payment over the past 10 years was as follows:

Year	Benefit Payment (HK\$m)	Benefit Payment (% of BOY AUM)
2005	3,603	3.0%
2006	5,211	3.4%
2007	6,584	3.3%
2008	6,014	2.3%
2009	7,063	3.4%
2010	8,191	2.7%
2011	8,871	2.4%
2012	11,590	3.3%
2013	14,937	3.4%
2014	18,528	3.6%
Average		3.1%

Source: MPFA Statistical Digest

The historical average benefit payment rate was around 3.1% of AUM at the beginning of year. Such rate is anticipated to increase gradually as the working population ages.² Given there are a number of factors which affect the future benefit payment rates, such as but not limited to member's behavior to use of phased withdrawal, legislation to reasons of (partial) withdrawal and the withdrawal rates such as permanent departure, the long term benefit payment rate was difficult to determine based on limited experiences. It was therefore suggested that the assumption to be set at 3.1%, increased linearly to 5.0% over a 10 year period.

Further study should be performed in future when more data is available.

² According to the HK Population Projections

(<http://www.censtatd.gov.hk/hkstat/sub/sp190.jsp?productCode=B1120015>), the number of population aged 65+ would increase from 0.9M at year 2011 to 2.5M by year 2041, represents a change from 13% (year 2011) to 30% of projected population at year 2041

Investment return

Future investment return depends on a number of factors including but not limited to the following:

- investment returns of the underlying funds
- members' choices of funds
- fees of the funds

The historical net-of-fee investment returns for the MPF system were summarized as follows:

	Net Asset Value Beginning (HK\$m)	Net Asset Value Ending (HK\$m)	Net Investment Return (HK\$m)	Annualized Internal Rate of Return
1.12.2000 - 31.3.2002	-	42,125	(1,753)	-4.9%
1.4.2002 - 31.3.2003	42,125	59,305	(5,837)	-10.7%
1.4.2003 - 31.3.2004	59,305	97,041	15,604	22.0%
1.4.2004 - 31.3.2005	97,041	124,316	5,070	4.7%
1.4.2005 - 31.3.2006	124,316	164,613	16,862	12.3%
1.4.2006 - 31.3.2007	164,613	211,199	21,901	12.4%
1.4.2007 - 31.3.2008	211,199	248,247	10,205	4.5%
1.4.2008 - 31.3.2009	248,247	217,741	(69,010)	-25.9%
1.4.2009 - 31.3.2010	217,741	317,310	70,086	30.1%
1.4.2010 - 31.3.2011	317,310	378,280	29,106	8.7%
1.4.2011 - 31.3.2012	378,280	390,744	(22,224)	-5.6%
1.4.2012 - 31.3.2013	390,744	455,331	26,267	6.4%
1.4.2013 - 31.3.2014	455,331	516,192	19,963	4.2%
1.4.2014 - 31.12.2014	516,192	565,083	16,798	3.1%
1.12.2000 - 31.12.2014	-	565,083	133,039	4.0%

Source: MPFA Statistical Digest

The average annualized internal rate of return for MPF up to end of 2014 was 4.0%. Since investment return is unpredictable, it was assumed this historical figure will be the central estimate assumption going forward.

4. Key Results

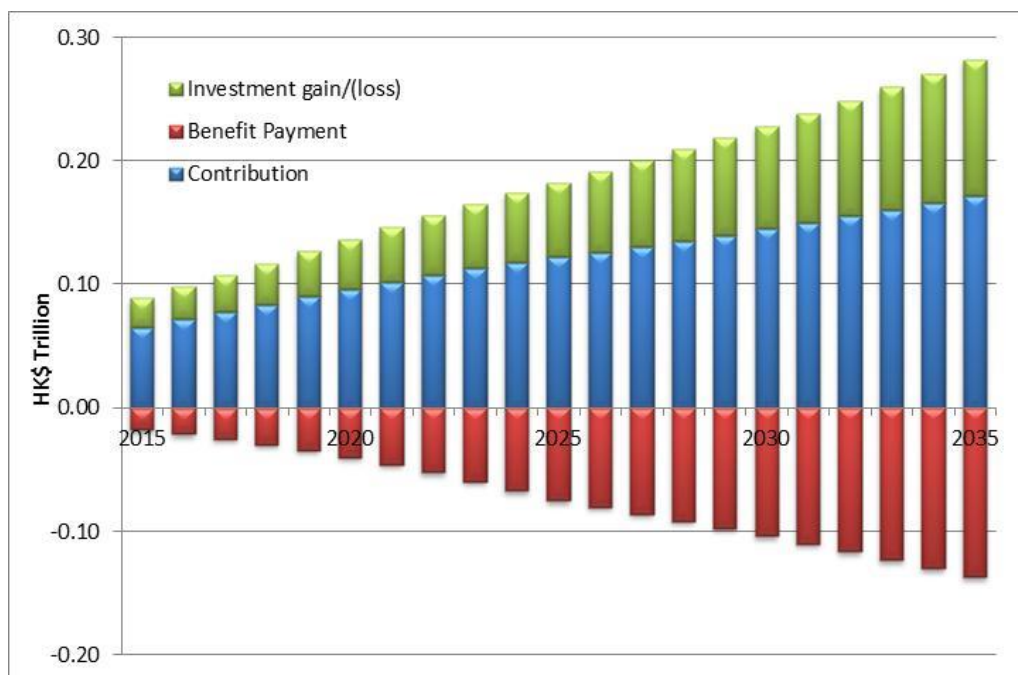
4.1 Based on the assumptions in Section 3, the key results are summarized as follows:

All in HK\$ Trillion						
	Period	Market size at the beginning	Contribution inflows	Benefit Payment outflows	Net of fee investment returns	Market size at the end
Actual	2005	0.12	0.03	-0.00	0.01	0.15
	2010	0.31	0.04	-0.01	0.03	0.37
	2014	0.51	0.06	-0.02	0.01	0.57
Projected	2015	0.57	0.07	-0.02	0.02	0.64
	2016	0.64	0.07	-0.02	0.03	0.71
	2017	0.71	0.08	-0.02	0.03	0.80
	2018	0.80	0.08	-0.03	0.03	0.88
	2019	0.88	0.09	-0.03	0.04	0.98
	2020	0.98	0.10	-0.04	0.04	1.08
	...	í	í	í	í	í
	2025	1.49	0.12	-0.07	0.06	1.60
	...	í	í	í	í	í
	2030	2.07	0.15	-0.10	0.08	2.19
	...	í	í	í	í	í
	2035	2.73	0.17	-0.14	0.11	2.88
	2015-35 Subtotal			2.53	-1.54	1.32
CAGR	2005-2014					16%
	2014-2035					8%

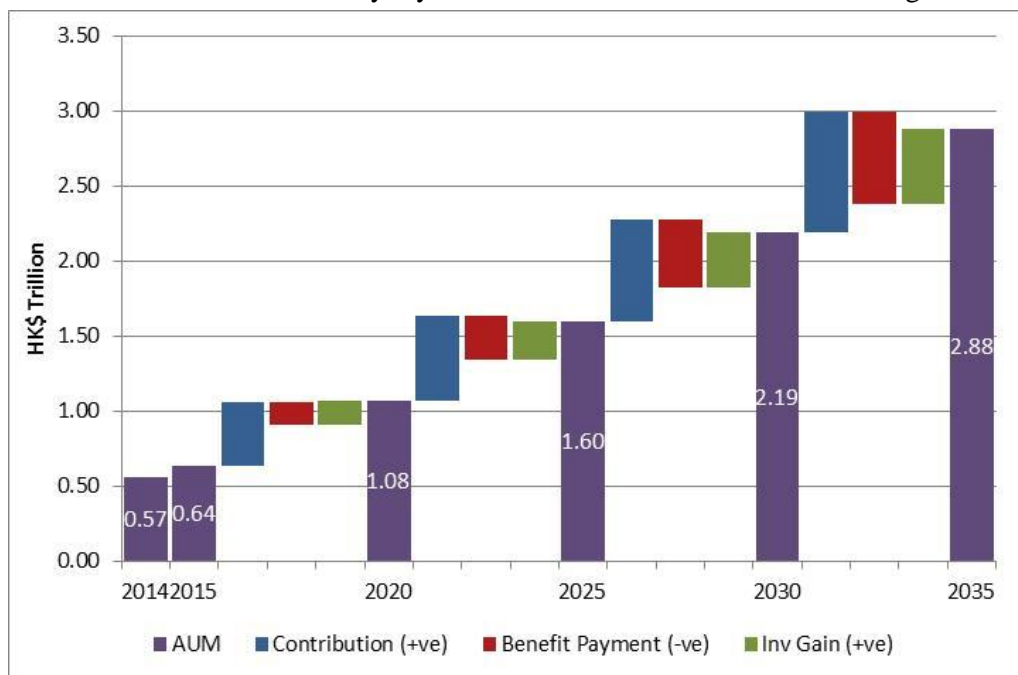
Key observations

- The MPF market size grew by around 4 times from 2005 to 2014. The CAGR was around 16% during the last 10 years. The growth rate was high as MPF is still a young pension system with less than 15 years of history.
- **Projected 2035 MPF market size is about HK\$2.9 trillion, which is close to 5 times of that of 2014.** The CAGR is projected to slow down to around 8% in the next 20 years, due to the lower contribution rate increase rate and increasing benefit payment rate when the system becomes more mature.

- The projected contribution, benefit payment and investment returns are illustrated in the chart below.



- The movement of AUM for every 5 year interval is illustrated in the following chart.

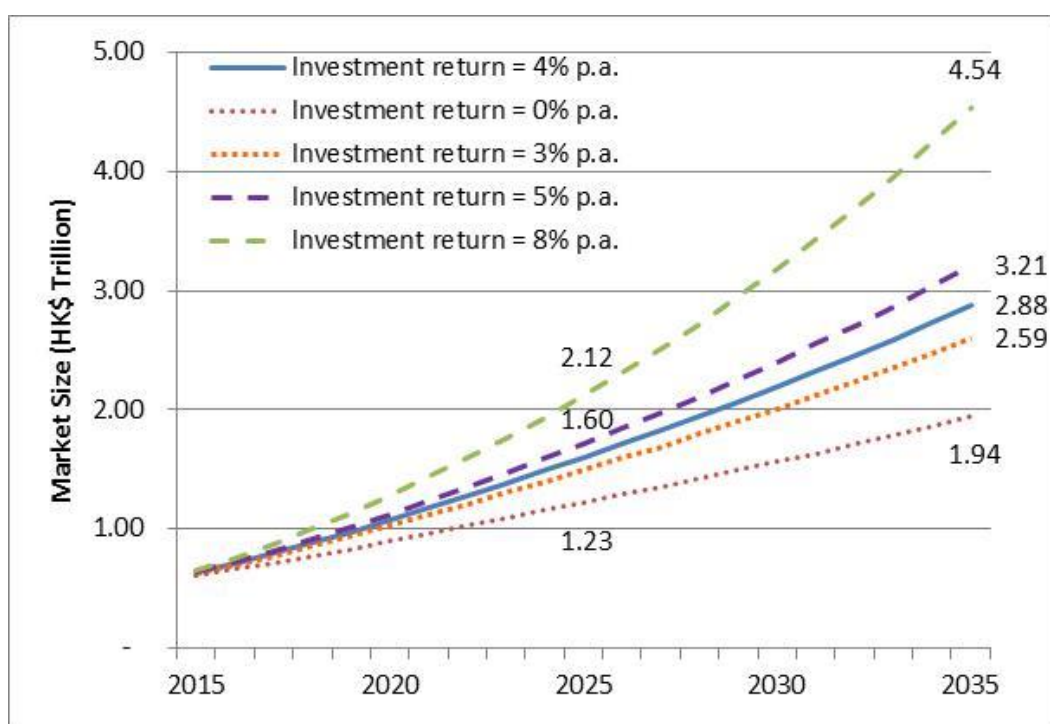


- In 2035, we expect the average account balance per MPF member will be close to **HK\$1 million** (i.e. 3 million MPF members sharing HK\$2.9 trillion). This is broadly consistent to the projected balance if we assume a member contributes HK\$21,980 per year (which was actual 2014 average contributions made) for 20 years, 5% contribution growth and 4% investment returns.

5. Sensitivity Testing

5.1 The sensitivity results to investment return assumptions are shown below:

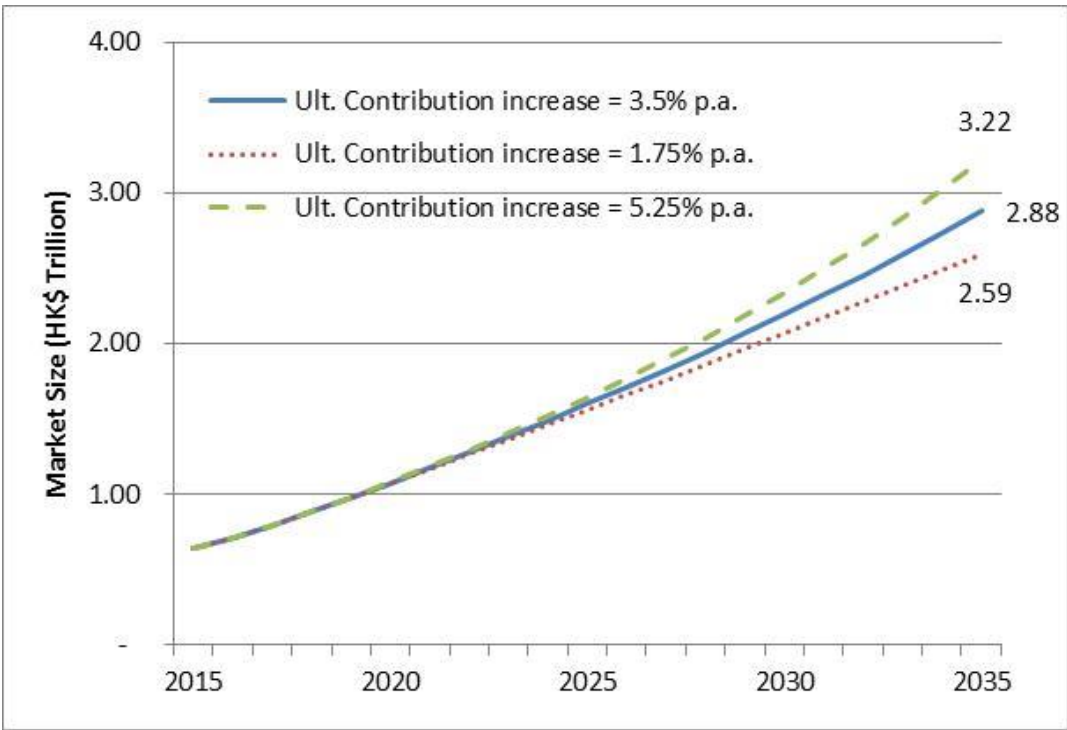
End of Year	Market Size (HK\$ Trillion)				
	Investment return = 0% p.a.	Investment return = 3% p.a.	Investment return = 4% p.a.	Investment return = 5% p.a.	Investment return = 8% p.a.
2015	0.61	0.63	0.64	0.64	0.66
2020	0.90	1.03	1.08	1.12	1.28
2025	1.23	1.50	1.60	1.72	2.12
2030	1.56	2.01	2.19	2.40	3.18
2035	1.94	2.59	2.88	3.21	4.54
CAGR 2015-2035	5.9%	7.3%	7.8%	8.4%	10.1%



- Due to the compounding impact, the future investment return is the most sensitive factor to the projected market size. For every 1% difference in investment return per annum, the MPF market size differs by around HK\$300 billion in 2035.
- Future investment returns depend on the economy, the capital market and members' choices of funds and we expect all of these are contributing to the high uncertainty.

5.2 The sensitivity results to the ultimate contribution increase assumptions are shown below:

End of Year	Market Size (HK\$ Trillion)		
	Ult. Contribution increase = 1.75% p.a.	Ult. Contribution increase = 3.5% p.a.	Ult. Contribution increase = 5.25% p.a.
2015	0.64	0.64	0.64
2020	1.07	1.08	1.08
2025	1.56	1.60	1.64
2030	2.07	2.19	2.34
2035	2.59	2.88	3.22
CAGR 2015-2035	7.3%	7.8%	8.4%

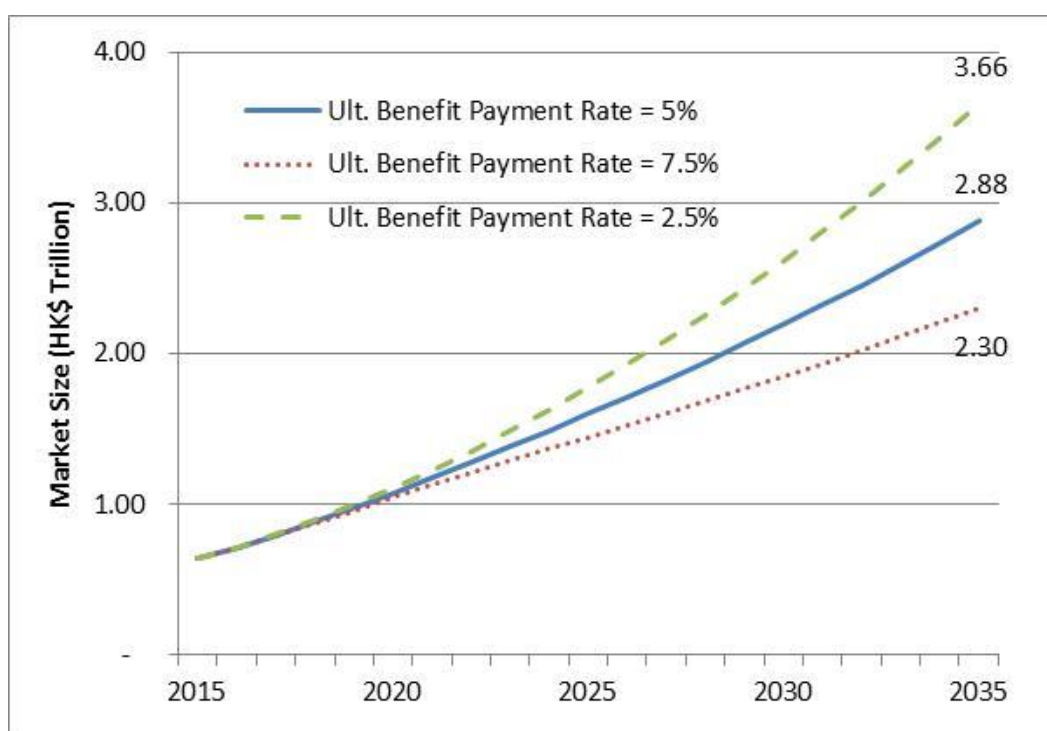


- The impact of increasing/ decreasing the ultimate contribution increase rate³ by 50% to the 2035 MPF market size is around HK\$300 billion. The expected ultimate 3.5% p.a. contribution increase rate is assumed to be in line with the long term economic growth.
- The ultimate contribution increase rate depends on the economy, the government's policy in increasing the mandatory contribution and promoting voluntary contribution. It is highly unpredictable how the regulation will change, and the change in the contribution level may be very different from the base scenario.

³ Change in ultimate contribution increase rate means we keep the 2015 contribution increase rate unchanged, but trend to a different contribution increase rate in 10 years of time.

5.3 The sensitivity results to the ultimate benefit payment rate assumptions are shown below:

End of Year	Market Size (HK\$ Trillion)		
	Ult. Benefit Payment Rate = 7.5%	Ult. Benefit Payment Rate = 5%	Ult. Benefit Payment Rate = 2.5%
2015	0.64	0.64	0.64
2020	1.04	1.08	1.11
2025	1.45	1.60	1.78
2030	1.85	2.19	2.62
2035	2.30	2.88	3.66
CAGR 2015-2035	6.6%	7.8%	9.1%



- The impact of increasing/ decreasing the ultimate benefit payment rate⁴ by 50% to the 2035 MPF market size is around HK\$600 to HK\$800 billion.
- The ultimate benefit payment rate depends on a lot of factors including retirement age for MPF benefit withdrawal, permanent departure rate, death, disability, small balance withdrawal rates. Legislation changes such as allowing phased withdrawal and the members' choices to utilize phased withdrawal mechanism will also have significant impact on the ultimate benefit payment rate.

⁴ Change in ultimate benefit payment rate means we keep the 2015 benefit payment rate unchanged, but trend to a different benefit payment rate in 10 years' time.

End of this Report