

Prepared by:  
Paul Sinnott  
Michael Daly  
Richard Holloway  
Wing Wong  
Iwan Juwono  
Sojung Lee  
Chihong An

July 2015



# 2014 Embedded Value Results – Asia (excl. Japan) The Growth Story





Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in healthcare, property & casualty, life insurance and financial services, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

[milliman.com](http://milliman.com)

---

## TABLE OF CONTENTS

OPENING REMARKS	2
EXECUTIVE SUMMARY	3
Background	3
EV results	3
New business results	5
New business margins	7
EV methodology hot topics	8
Recent and upcoming regulatory changes	9
INTRODUCTION AND BACKGROUND	10
OVERVIEW OF EMBEDDED VALUE	15
History of EV reporting	15
EV in Asia	16
Components of EV	16
TEV vs. EEV vs. MCEV	19
Indian EV	19
EMBEDDED VALUE RESULTS	20
EV in Asia	20
EV by company	22
VNB in Asia	25
VNB by company	27
New business margins in Asia	29
Detailed country analysis	30
METHODOLOGY HOT TOPICS	47
Construction of RDR	47
Investment return assumptions	52
Expense overruns	52
Cost of capital	52
Time value of options and guarantees	55
DISCLOSURES	56
OTHER MEASURES OF VALUE	58
Market Capitalisation	58
IFRS 4 Phase 2	59
APPENDIX A: TOTAL ASIAN EV BY COMPANY BY TERRITORY	61

---

---

## OPENING REMARKS

Welcome, and thank you for taking the time to read this inaugural Asian edition of Milliman's Embedded Value (EV) Report, an addition to our firm's existing EV report covering Europe and Japan. We at Milliman are strong proponents of life insurers using EV as a key performance management and external financial disclosure metric.

More insurers are reporting EV for their Asian operations but methodology and assumption setting approaches vary widely across the region. The objective of our report is to help compare and contrast EV reporting across Asian markets and insurers. In this way, we hope to contribute to the wider discussion on current and future trends in EV practices within Asia. A "2015 Embedded Value Results Update—Asia (excl. Japan)" report will be produced later in the year containing commentary on the reported mid-year 2015 EV results, as well as any 2014 year-end reporting that has not been disclosed in time for this report.

We would, of course, appreciate any feedback you have on our report content and format.

Best regards,

Paul Sinnott  
Michael Daly  
Richard Holloway  
Wing Wong  
Iwan Juwono  
Sojung Lee  
Chihong An

---

## EXECUTIVE SUMMARY

### Background

Asia's economic growth continues to lead the world, with 5.5%<sup>1</sup> gross domestic product (GDP<sup>2</sup>) growth being recorded for 2014, compared with overall global GDP growth of 3.6%. South Korea, China, and India posted the largest GDP growth in 2014, at 11.1%, 9.4%, and 9.1% respectively.

Similarly, life insurance sales continued to grow strongly in Asia in 2014 with gross written premium (GWP) estimated to have risen by 14.4%<sup>3</sup> over the year, driven largely by increases in household income, a rapidly growing middle class, and increasing consumer awareness. Several Asian governments have goals to increase insurance penetration amongst their populations, providing further impetus for insurers in the region.

The insurance regulatory environment in many Asian markets is changing more quickly than we have seen in the past. China, Singapore, Malaysia, Thailand, Indonesia, South Korea, and Hong Kong have recently introduced, or are planning to introduce or enhance, new Risk Based Capital (RBC) style solvency frameworks. "Point of sale" consumer protection regulation is increasing and insurance company foreign investment limits are changing; India's recent announcement to raise the foreign shareholding cap example.

EV reporting continues to increase in prevalence and importance in Asia, with more multinational corporations (MNCs) and domestic insurers<sup>4</sup> adopting EV for external financial reporting and internal performance management. There are a wide variety of EV methodologies used in the region, including Traditional Embedded Value (TEV), European Embedded Value (EEV), Market Consistent Embedded Value (MCEV<sup>5</sup>) and, most recently, Indian Embedded Value (IEV).

### EV results

This report examines the EV results published by various MNCs and domestic insurers within Asia,<sup>6</sup> excluding Japan. As MCEV reporting is much more prevalent in Japan, we have grouped the Japanese insurers with the European insurers for comparison purposes. Please refer to our report '2014 Embedded Value Results—Europe' for information regarding European results, and to our report '2015 Embedded Value Results Update—Europe and Japan,' incorporating Japanese EV results, along with a '2015 Embedded Value Results Update—Asia (excl. Japan)' report; the latter two will be released later in the year.

The scope of this report is limited to EV results directly related to purely, or predominantly, Asian operations. Insurers with a presence in Asia that do not provide separate results for the region are not included in this report.

In 2014, total reported Asian EV grew by 15% on a comparable basis<sup>7</sup> to USD 346 billion from USD 285 billion. The companies reporting the largest Asian<sup>8</sup> EV at 2014 year-end were China Life, Ping An Life, and AIA at USD 73 billion, USD 43 billion and USD 37 billion, respectively.

---

1 Inclusive of Japan.

2 Nominal GDP.

3 As not all Asian economies have reported their 2014 Insurance premiums as at the date of publication of this report, market growth rates have been estimated by Milliman. A more precise update will be presented in our report '2015 Embedded Value Results Update—Asia (excl. Japan)'.

4 Domestic insurers in this case refers to insurers operating in only one Asian market.

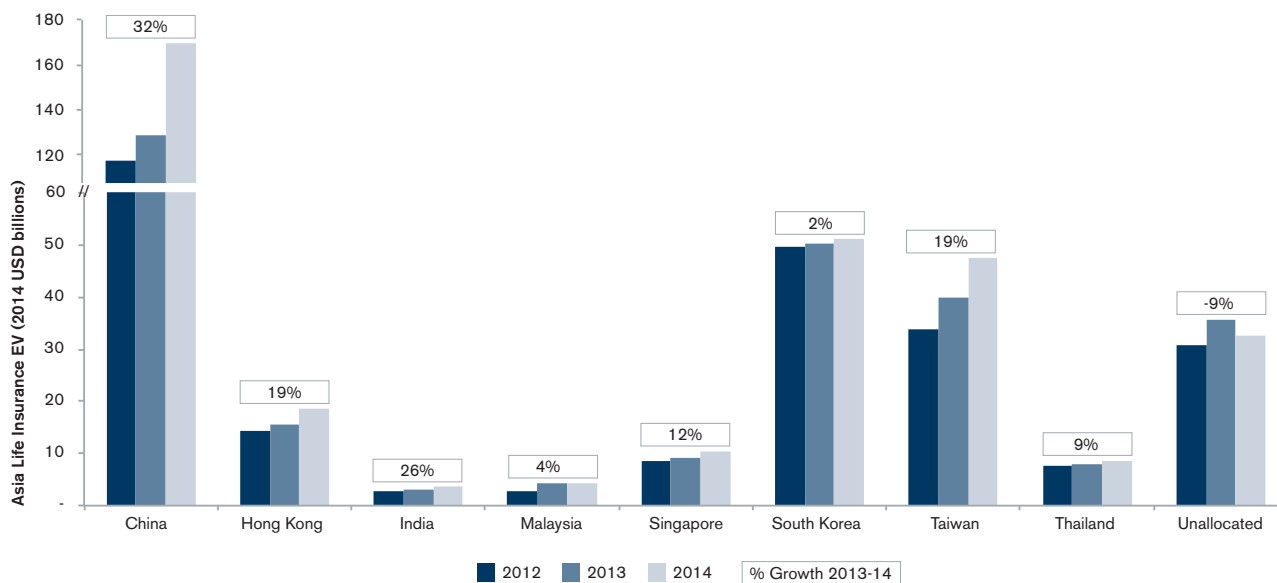
5 The MCEV principles are a copyright of the Stichting CFO Forum Foundation 2008.

6 Asia does not include Australia or New Zealand.

7 Comparable basis = comparing only companies that have reported both 2013 and 2014 EV results for Asia. For example, Manulife, which has reported Asian EV results separately for the first time in 2014, is not included in this comparison. Unless otherwise stated, in this report, to remove the impact of currency fluctuations, all 2012-2013 EV/value of new business (VNB) have been converted to USD using the prevailing exchange rate as at each insurers' 2014 reporting dates.

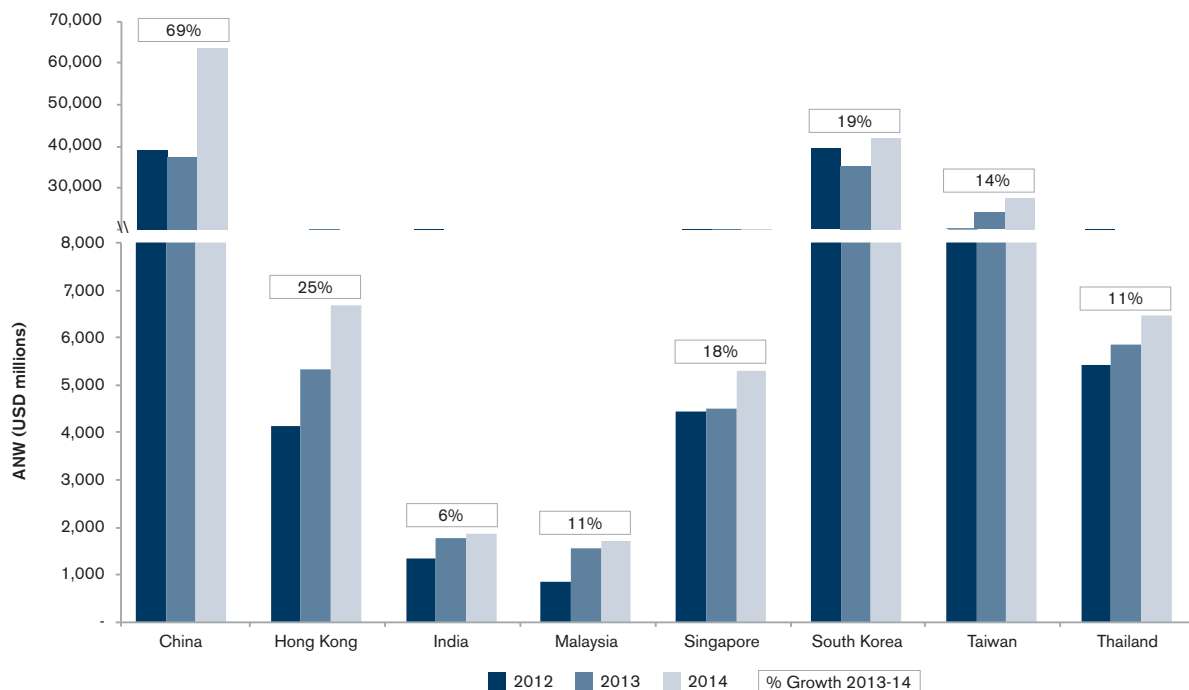
8 Excluding Japan.

FIGURE 1: COMPARABLE ASIAN LIFE INSURANCE COVERED EV BY MARKET,<sup>9,10</sup> 2012 TO 2014



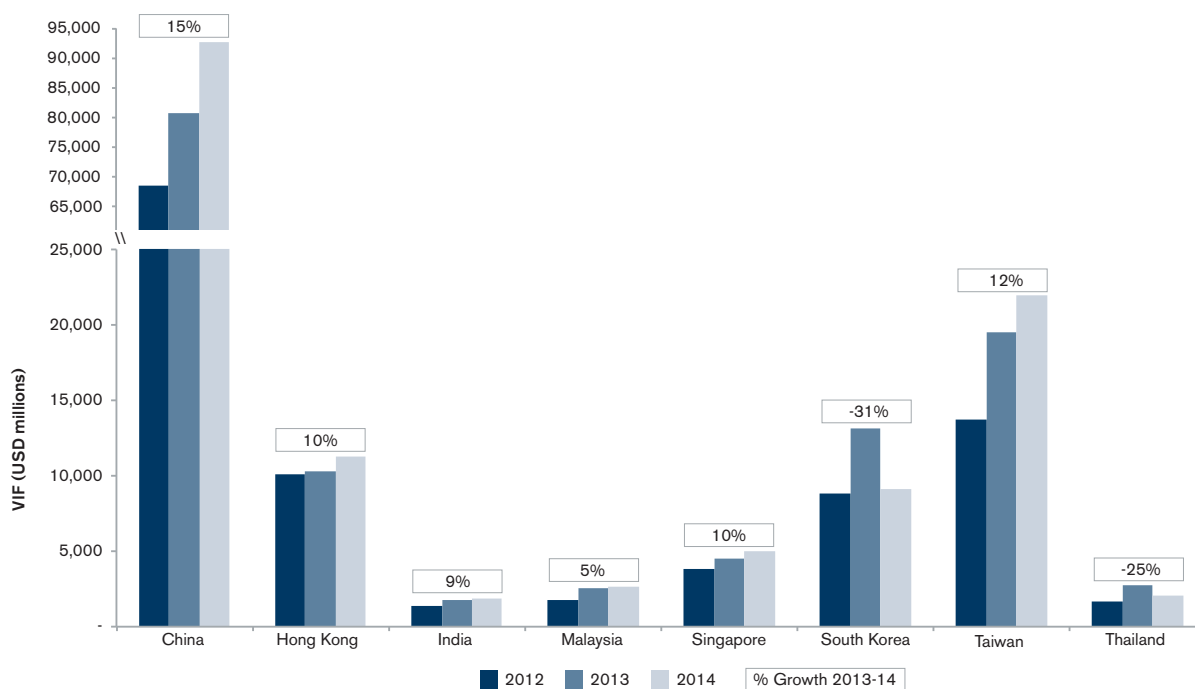
By market, China (32%) and India (26%) reported the highest comparable EV growth in 2014.

FIGURE 2: COMPARABLE ASIAN LIFE INSURANCE COVERED ANW, 2012 TO 2014



9 To provide comparability and eliminate FX effects, results for all years have been converted to USD using the prevailing FX rate as at the FY2014 reporting date.  
10 Unallocated indicates EV figures that are reported by insurers to relate to their Asian operations, but have not been allocated to specific countries.

FIGURE 3: COMPARABLE ASIAN LIFE INSURANCE COVERED VIF, 2012 TO 2014



For most markets, the growth in Asia EV has largely been driven by the growth in adjusted net worth (ANW), with only India reporting greater VIF growth than ANW. For most markets, the growth in ANW has been driven by a lower interest rate environment and improvement in equity markets.

VIF growth remains positive for most countries with the exception of South Korea and Thailand, driven primarily by strong VNB growth. Primarily due to the prevalence of non-participating business in South Korea and Thailand, the low interest environment has been particularly challenging, constraining VIF for many companies in these markets.

By insurer, the largest growth in EV during 2014 was reported by Bangkok Life, China Taiping, and China Life (of Taiwan) with increases of 44%, 44%, and 35% respectively.

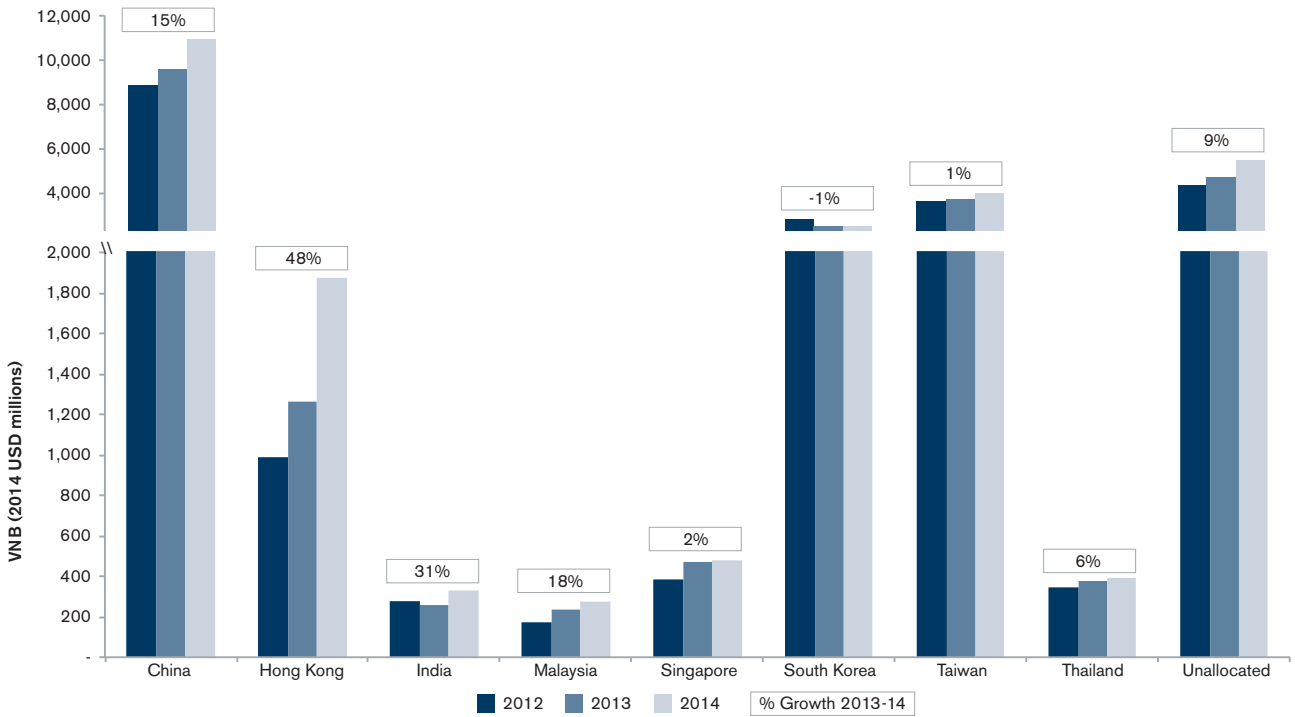
### New business results

Total reported value of new business (VNB) for Asia stood at USD 22 billion in 2014 compared with USD 20.5 billion in 2013,<sup>11</sup> representing growth of 9%.

By market, Hong Kong, India, and Malaysia reported the highest growth in VNB on a constant currency basis, largely driven by higher new business premiums. South Korea and Taiwan reported the lowest growth in VNB, the latter balancing lower new business premiums with more profitable business.

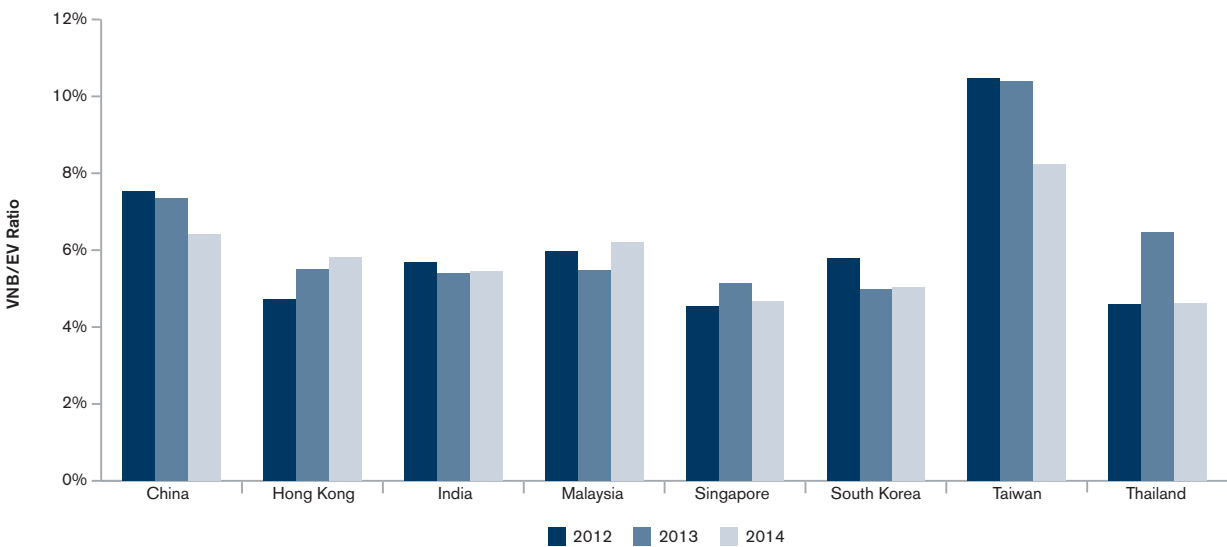
<sup>11</sup> On a comparable basis.

FIGURE 4: COMPARABLE ASIAN LIFE INSURANCE COVERED VNB BY MARKET, 2012 TO 2014



When analysing VNB, it is sometimes instructive to examine the ratio of VNB / EV over time—this gives an indication of the market growth rate, and the relative maturity of the market.

FIGURE 5: VNB/EV RATIO,<sup>12</sup> 2012 TO 2014



12 This ratio has been calculated on a constant currency basis, using the EV and VNB figures of insurers that have reported both EV and VNB during those periods. Companies that only report EV or VNB have been excluded from this analysis.

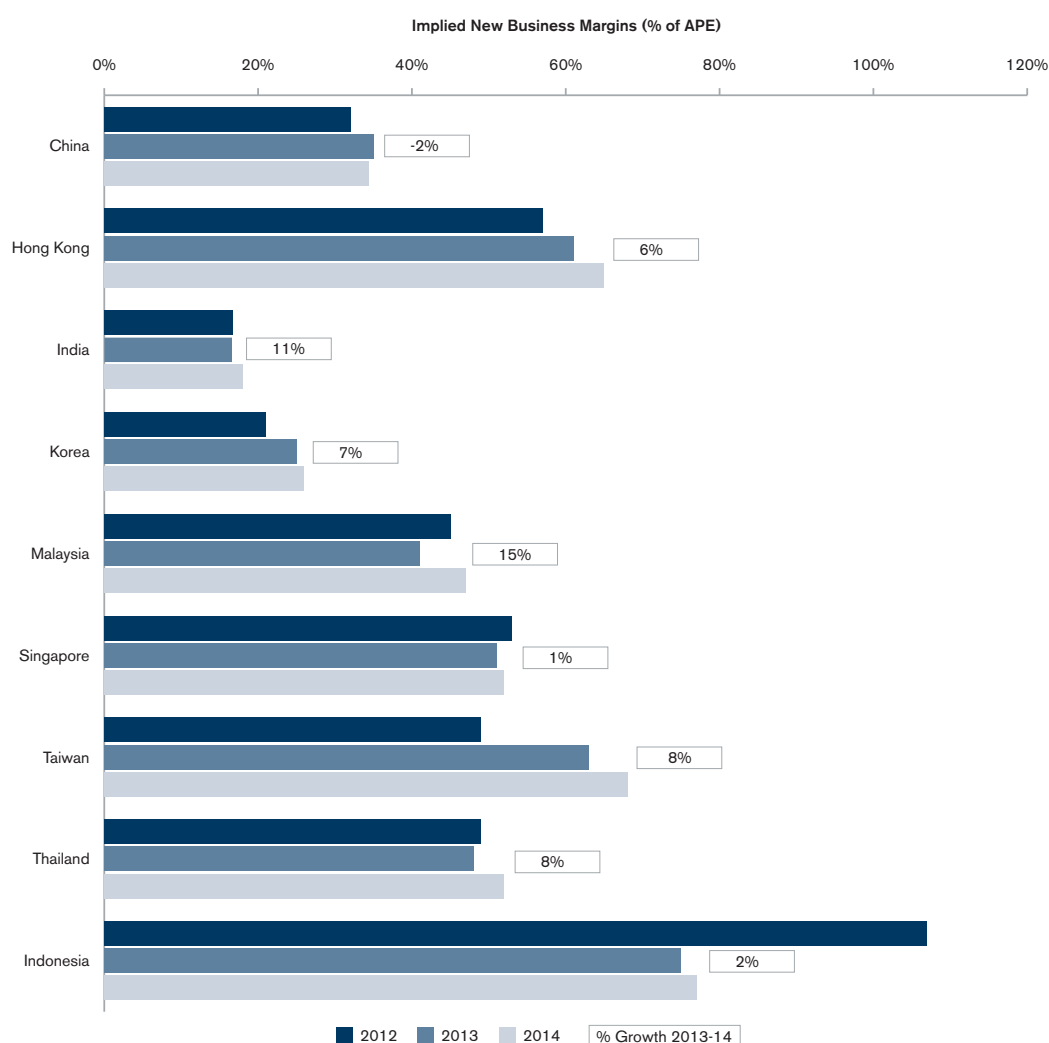


The majority of markets exhibit a relatively stable ratio over the last three years, with Taiwan, India, and Thailand the notable outliers. The problems of new business volumes and margins in Taiwan and India are covered in the specific country sections. The Thailand results are dependent on two insurers—AIA and Bangkok Life. The results for the latter are striking, and are further discussed in the Thailand section.

Within the region, Max Life (92%), Aviva (67%), and Allianz (55%) reported the largest growth in VNB. These results were mainly driven by increased new business volumes, as measured by annualised equivalent premium<sup>13</sup> (APE), but they are also due to improvements in new business margins. In the case of Max Life, there was also an uplift in VNB due to a change of reporting methodology from EEV to MCEV.

## New business margins

**FIGURE 6: IMPLIED NEW BUSINESS MARGINS<sup>14</sup> BY COUNTRY, 2012 TO 2014**



Based on the existing disclosures, the most profitable markets for insurers are Indonesia, Hong Kong and, somewhat surprisingly, Taiwan. The latter two are showing an increasing growth trend, in contrast to the former, which is reflecting Prudential<sup>15</sup> plc's profitability in Indonesia.

<sup>13</sup> Defined to be: regular premiums + 10% of single premiums.

<sup>14</sup> This chart has been calculated by taking the sum of all disclosed VNB in each market, divided by the commensurate APE figure sold by the company in the country. As such, the reliability of this chart will increase depending on the actual number of companies (and their collective market share) disclosing information by geography. This means that for markets with very few disclosures, such as Taiwan, India, Malaysia, Singapore, and Thailand, this analysis may not reflect profitability across the whole market.

<sup>15</sup> Within the report, 'Prudential' refers to Prudential plc, the global insurer domiciled in the UK.

## EV methodology hot topics

Most aspects of EV calculations are based on established industry practise or published guidelines. However, some critical areas remain open for interpretation. The table in Figure 7 summarises the key areas where insurers' interpretations have diverged significantly. Users should be aware of these key differences before comparing the EV results of insurers across the region or within markets.

**FIGURE 7: SUMMARY OF EV METHODOLOGY HOT TOPICS**

HOT TOPIC	COMMENT
<b>Risk discount rate (RDR)</b>	Aside from IEV and MCEV reporting insurers (who use market-consistent yield curves), TEV and EEV reporting firms typically use a risk-free rate plus risk margin as the basis of their discount rates. The area of judgement involves the setting of the risk margin. The majority of companies operating within markets typically have a tight range of assumed risk margins, but exceptions do exist. Hong Kong, South Korea, and Taiwan are outlier markets, where the differences between the lowest and highest risk margins can be as wide as 500 to 600 bps.
<b>Investment returns assumptions</b>	<p>Future investment returns are a key assumption for calculating VIF and VNB. Where insurers disclose investment return assumptions by asset classes, the range of assumptions are generally quite tight. Where portfolio-level assumptions have been disclosed, a wide range can be seen in some markets. The Taiwanese and Chinese markets are outliers in having insurers that assume increasing investment returns in the future with no reference made to asset values being adjusted to reflect yield curve uplift scenarios.</p> <p>There is also some divergence among insurers on the implied link between current market yields and future investment return assumptions. Some insurers take an almost market-consistent approach, allowing future investment return assumptions to decrease in line with capital market movements, while others seem to position their investment returns as long-term return assumptions, not as dependent on current capital market fluctuations. This can potentially introduce some disparity in EV calculations, as insurers may in effect be able to take credit in their ANWs for falling interest rates, yet do not take a hit in their VIFs vis-à-vis falling investment return assumptions.</p>
<b>Cost of guarantees</b>	Only EEV/IEV/MCEV firms are obligated to calculate the time value of options and guarantees (TVOG)—TEV firms typically only include the intrinsic value of such options and guarantees. Of the companies that disclose the cost of policyholder guarantees, Allianz and AXA are striking in the size of their costs of guarantees relative to their EV portfolios.
<b>Expense overruns</b>	The disclosure of expense overruns is critical for both insurers and investors to communicate the current and expected future situation of the company. However, the disclosure practices of some insurers can be improved to provide greater clarity to investors.
<b>Cost of capital</b>	Insurers need to make assumptions on future levels of required solvency margin when projecting distributable earnings. This will typically be based on what insurers perceive to be the minimum level of regulatory intervention. For most markets, there is broad agreement on what this level is—which is primarily due to clear communication from the regulator or industry precedent. Notable exceptions include Singapore, Malaysia, and Taiwan.

## Recent and upcoming regulatory changes

EV by its nature will be impacted by insurance regulations. The table in Figure 8 provides a summary of major upcoming regulatory changes in the region:

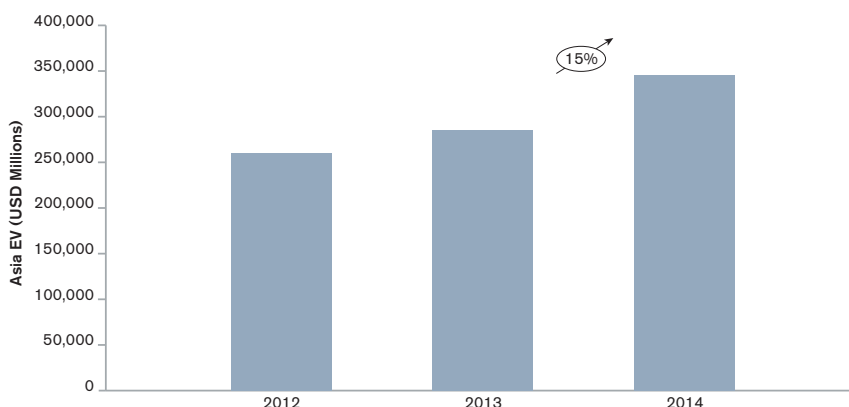
**FIGURE 8: SUMMARY OF RECENT AND UPCOMING MAJOR REGULATIONS BY JURISDICTION**

JURISDICTION	REGULATION	DESCRIPTION
China	China Risk Oriented Solvency System (C-ROSS)	Risk-based capital framework based on three pillars encompassing quantitative capital requirement, qualitative supervisory requirement, and market discipline mechanism.  For more in-depth information and analysis on C-ROSS, please refer to our detailed analysis located at <a href="http://www.milliman.com/insight/Periodicals/asia-ealert/Quantitative-Capital-Requirement-for-Life-Insurers-under-C-ROSS/">http://www.milliman.com/insight/Periodicals/asia-ealert/Quantitative-Capital-Requirement-for-Life-Insurers-under-C-ROSS/</a> .
Hong Kong	Risk-based capital solvency regime	Implementation is not expected before 2017, as a second round of consultation is expected in late 2015 or 2016.  For more information on the new risk-based capital framework in Hong Kong, please refer to the Milliman e-Alert published in October 2014 at <a href="http://www.milliman.com/insight/Periodicals/asia-ealert/Risk-based-capital-framework-for-the-insurance-industry-of-Hong-Kong/">http://www.milliman.com/insight/Periodicals/asia-ealert/Risk-based-capital-framework-for-the-insurance-industry-of-Hong-Kong/</a> .
India	Insurance Laws (Amendment) Act, 2015	This law, passed in early 2015, permits foreign companies to increase their ownership levels from 26% to 49%. This is likely to see the realignment of shareholding in many of the 23 private life insurance companies.  For more in-depth information and analysis on the Insurance Laws (Amendment) Bill of 2014, please refer to our analysis available at <a href="http://in.milliman.com/insight/Periodicals/asia-ealert/The-Insurance-Laws-Amendment-Bill-2014/">http://in.milliman.com/insight/Periodicals/asia-ealert/The-Insurance-Laws-Amendment-Bill-2014/</a> .
Indonesia	Insurance Law (September 2014) Risk Based Supervision (2015)	Key provisions of the recently passed Insurance Law include: <ul style="list-style-type: none"> <li>• The requirement for a single presence—each person or legal entity can only be a controlling shareholder in one life/general/reinsurance/Shariah insurance company.</li> <li>• The mandatory spin-off of Shariah businesses within 10 years.</li> <li>• The introduction of a policyholder protection mechanism in the case of an insurer being liquidated or otherwise unable to operate (e.g., license revoked).</li> <li>• Clarity on legal structures and ownership of insurance companies, where Indonesian shareholders must hold at least 20% of the issued capital of insurers.</li> </ul> For more information and analysis on the new Insurance Law of 2014, please refer to our e-Alert at <a href="http://www.milliman.com/insight/Periodicals/asia-ealert/Indonesia-New-insurance-bill-passed-in-September-2014/">http://www.milliman.com/insight/Periodicals/asia-ealert/Indonesia-New-insurance-bill-passed-in-September-2014/</a> .  Meanwhile, the industry has completed its first self-risk assessment, the first reports submitted to the regulator in February 2015. The regulator has yet to provide feedback to insurers on their submissions, but this is expected later in the year.
Malaysia	Life Insurance and Family Takaful Framework	Regulation is aimed at increasing the professionalism of intermediaries and enhancing the transparency around the provision of products and services to consumers.  For further in-depth information and analysis on the Bank Negara Malaysia (BNM) concept paper, please refer to our discussion paper at <a href="http://www.milliman.com/insight/Periodicals/asia-ealert/Malaysia-Life-Insurance-Family-Takaful-Framework-concept-paper/">http://www.milliman.com/insight/Periodicals/asia-ealert/Malaysia-Life-Insurance-Family-Takaful-Framework-concept-paper/</a> .
Singapore	Risk-Based Capital 2 (RBC2)	Intended to be an improvement to Singapore's existing RBC regime, increasing alignment with other jurisdictions and introducing more risk management concepts.  For more information on the recent RBC2 consultation, please see our e-Alert at <a href="http://sg.milliman.com/uploadedFiles/insight/Periodicals/asia-ealert/singapore-rbc-2.pdf">http://sg.milliman.com/uploadedFiles/insight/Periodicals/asia-ealert/singapore-rbc-2.pdf</a> .
Taiwan	Overseas Insurance Units	Insurance companies can apply to set up such businesses, which are provided tax and other regulatory incentives to start selling business to foreigners either visiting Taiwan or residing in Taiwan. This initiative is primarily aimed at sales to mainland Chinese tourists visiting Taiwan.

## INTRODUCTION AND BACKGROUND

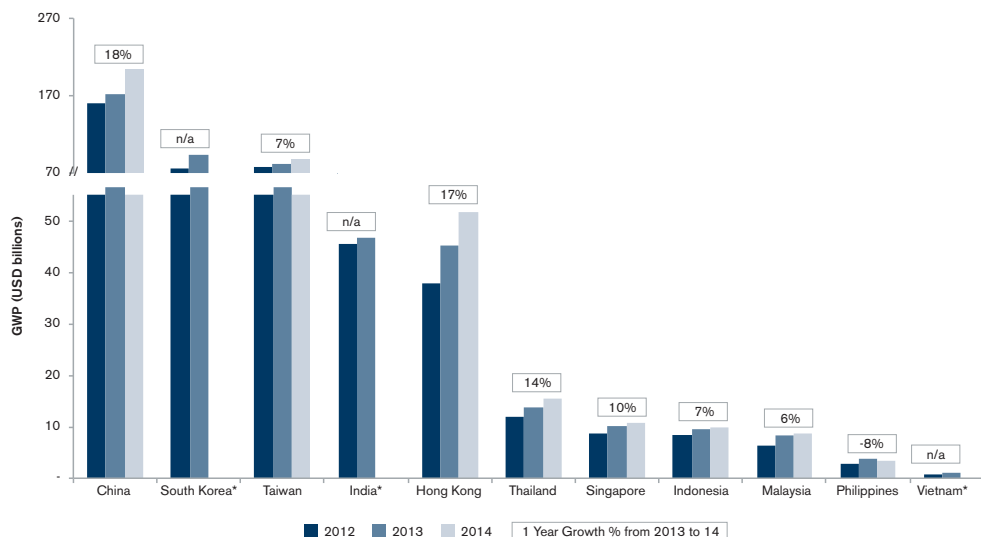
The Asian EV story in 2014 can be characterised by one word: *growth*. Comparing only insurers that have reported financial year (FY) 2012 to 2014 EV figures,<sup>16</sup> Asian Life Insurance EV<sup>17</sup> grew by 15.0% in 2014.

**FIGURE 9: REPORTED ASIA LIFE INSURANCE COVERED EV, 2012 TO 2014**



The main drivers of this impressive growth have been increasing life insurance premiums (see Figure 10), increasing insurance penetration (see Figure 11), increasing household income (see Figure 12), and an expanding middle class, as well as strong performance of equity markets (see Figure 13).

**FIGURE 10: LIFE INSURANCE GROSS WRITTEN PREMIUMS IN ASIA<sup>18</sup> (USD BN)**



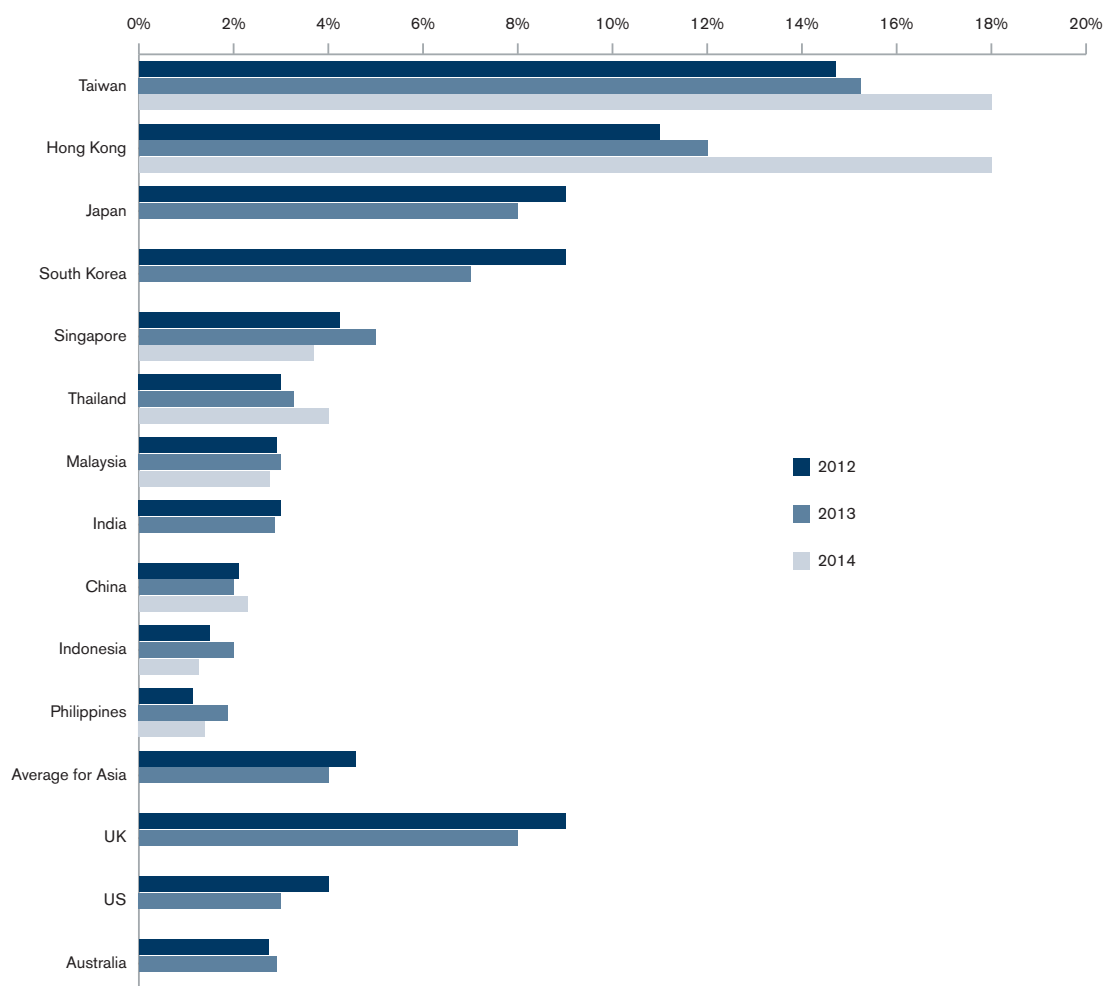
Sources: Various life insurance associations and insurance regulators, and Swiss Re Sigma. Note that the GWP for some countries was unavailable as at publication date.

16 Companies that have not yet disclosed their 2014 EV results have also been excluded in order to provide an appropriate year-to-year comparison. To provide comparability, the EV figures for this chart have been calculated on a constant currency basis, using the FX rate as at each company's 2014 reporting date.

17 Asian Life Insurance EV is defined as the EV of covered businesses (i.e., excluding the net asset value portions of non-covered businesses such as general insurance portfolios, except for long-term insurance written by South Korean general insurers, where EV reporting is available), attributed to Asia excluding Japan. While every effort has been made to strictly use figures relating solely to this definition, some companies report their Asian EV figures as part of a larger reporting unit. Where we have deemed the EV to be driven mostly by the Asian region, the total EV has been reported.

18 Please note that not all insurers have their financial years coincide with calendar years. In this report, we have defined 2014 results to be the financial year results which contain the majority of 2014 calendar year results. For example, the 2014 results presented above for insurers that have a March financial year-end date corresponds to the financial results for the year ending 31 March 2015. In this report, companies with non-coinciding financial years include Indian insurers (March year-end) and AIA (November year-end).

FIGURE 11: ASIAN LIFE INSURANCE PENETRATION,<sup>19</sup> 2012-14, % OF GDP PER CAPITA



Source: Swiss Re Sigma, Milliman estimate from World Bank/IMF Data. Note that estimates were not possible for every country.

While 2014 statistics have not been fully released for all countries in Asia as at the publication of this report, it is clear that there is a continuing growth trend for life insurance in the region. In the near to medium term, China, South Korea, and Taiwan are likely to remain the biggest life insurance markets in Asia, excluding Japan, reflecting their large populations, high GDP per capita and high insurance penetration.

<sup>19</sup> It should be noted that Hong Kong life insurance penetration figures are distorted as a consequence of large volumes of business being sold to mainland Chinese visitors.

FIGURE 12: GDP PER CAPITA<sup>20</sup> OF IN-SCOPE ASIAN COUNTRIES, 2012 TO 2014

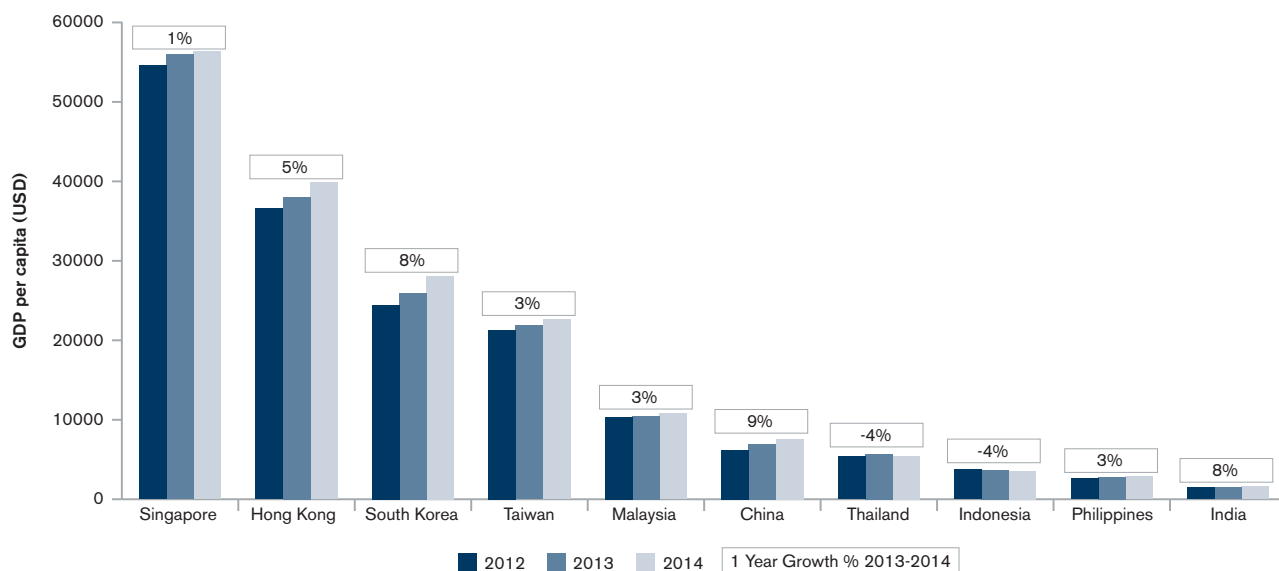
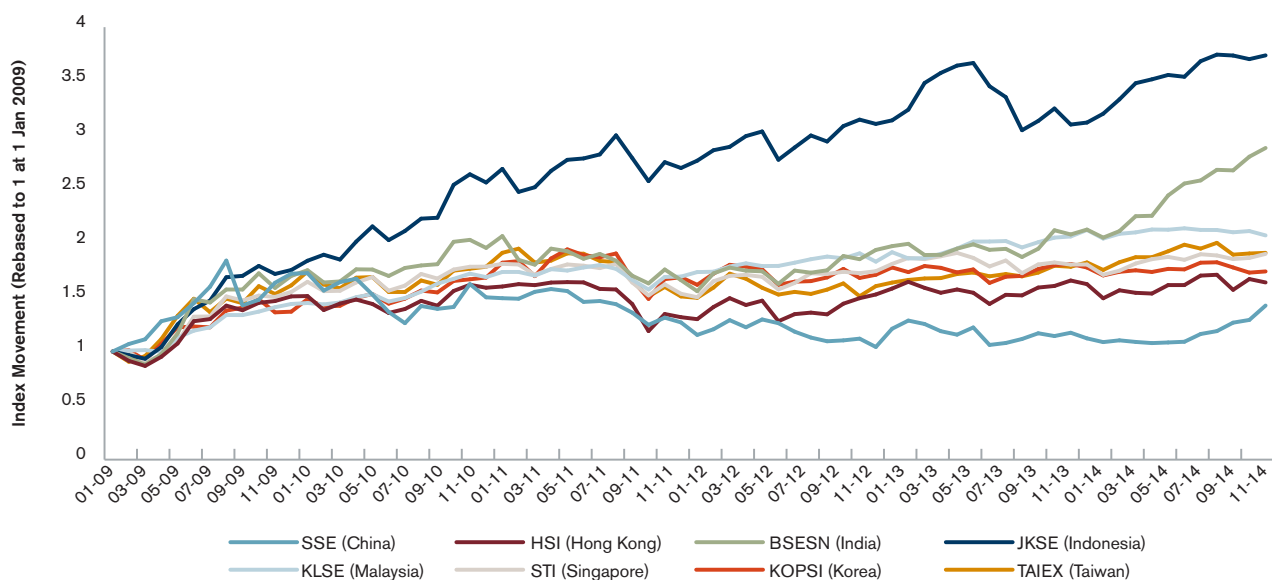


FIGURE 13: RECENT EQUITY MARKET PERFORMANCE: GROWTH OF MAJOR EQUITY INDICES<sup>21,22</sup> FROM 1 JANUARY 2009 TO 31 DECEMBER 2014



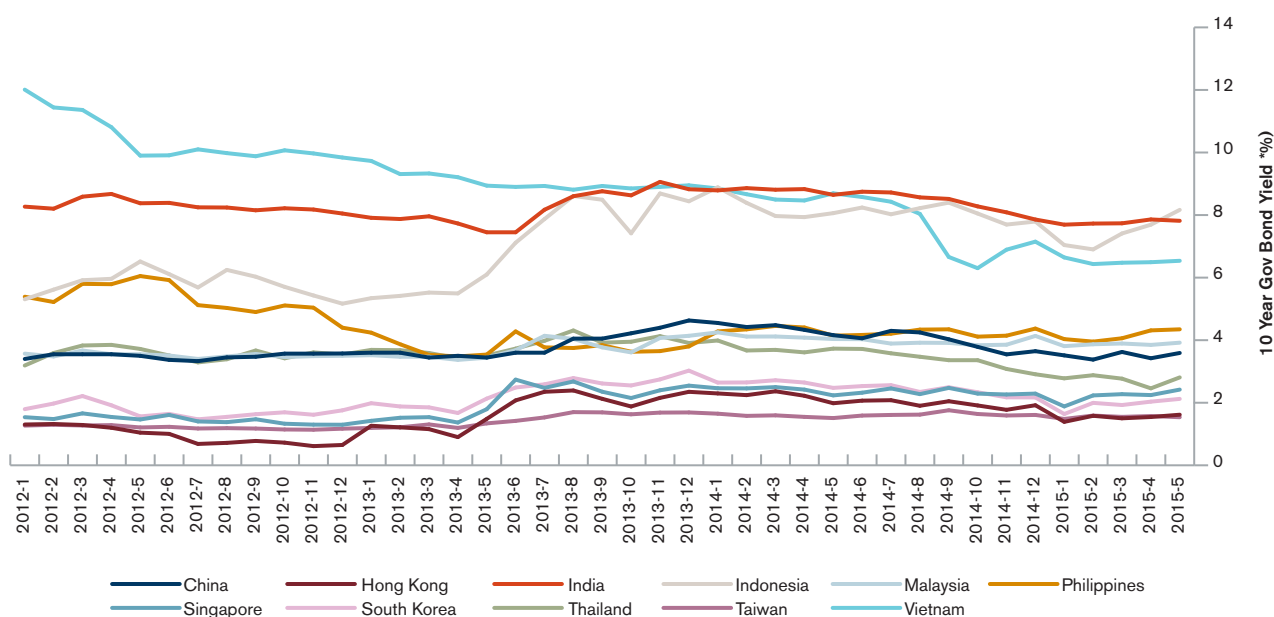
China, India, and Indonesia's equity markets, in particular, performed well in 2014, contributing to EV growth within those markets both from enhanced investment performance and elevated sales of products with material equity exposure.

20 Source: International Monetary Fund, World Economic Outlook Database, April 2015.

21 The following stock indices have been used for each country: China: Shanghai Stock Exchange Composite Index; Hong Kong: Hang Seng Index; India: Bombay Stock Exchange 30; Indonesia: Jakarta Composite; Malaysia: Kuala Lumpur Stock Exchange Composite Index; Singapore: Straits Times Index; South Korea: Korea Composite Index; Taiwan: Taiwan Weighted Index.

22 Source: Yahoo Finance

FIGURE 14: 10-YEAR SOVEREIGN BOND YIELDS,<sup>23</sup> 2012 TO 2014



Asian sovereign bond market yields, which are closely related to the EV discount rates and investment returns adopted by insurers, generally declined during 2014 but most (outside of Japan) remain above the levels seen in Europe.

Broadly speaking, Asian economies are continuing to perform well (relative to the rest of the world, as measured by GDP growth), although several countries are feeling the effects of China’s slowdown and the general malaise of the world economy. Economists are mostly positive about regional economic prospects based on factors such as:

- Continued rebalancing from export-driven growth to domestic-consumption-driven growth in China, with positive impacts on trade partners such as Taiwan, Hong Kong, Singapore, and South Korea.
- Increased industrialisation and services growth in India, Indonesia, Malaysia, the Philippines, and Thailand.

For insurers, continued GDP growth with an associated rapid growth in the middle class and the push for increased life insurance coverage by several Asian governments (most notably China, India, Indonesia, and Singapore) are fuelling rising levels of insurance premiums. As Figure 11 above shows, insurance penetration remains low for emerging Asian economies, compared to the more developed markets for Taiwan, Hong Kong, South Korea, and Japan.

On the regulatory front, RBC-type solvency frameworks are already embedded, or are in the process of being introduced or enhanced in many Asian markets. China’s new China Risk Oriented Solvency System (C-ROSS) regime and Singapore’s ‘RBC2’ are prominent examples. These changes will affect EV cost of capital calculations, although it is too early at the moment to definitively state the direction of impact.

As investors and analysts are increasingly demanding more information from insurers, more domestic Asian insurers may see the value in explicitly disclosing the link between value proposition, corporate objectives, business strategy, and risk management. In this context, comparable key performance indicators (KPIs) are invaluable as a means of communication—a role for which EV is well suited. As a result, we expect EV-based metrics to increase in importance as KPIs in the region.

<sup>23</sup> Source: Investing.com.

EV is important not only as an external KPI, but as an internal metric that can be used to manage the performance of life insurance businesses. Some insurers also use EV-based metrics as part of the long-term remuneration strategy for senior management. Broadly speaking, subsidiaries of MNCs, especially European insurers, are more advanced in the formulation and application of EV in their businesses compared with local Asian insurers. The foremost example of this is the fact that almost all local and regional Asian insurers use TEV as opposed to the potentially more sophisticated and comparable EEV or MCEV. However, this is not to say that the latter approaches are superior and more appropriate for all insurers, which we discuss further in the Methodology Overview section.

Other changes on the horizon for the Asian insurance industry include the International Financial Reporting Standards (IFRS) 4 Phase 2 accounting standard, with the final version expected to be published in mid- to late 2015. Domestic insurers will generally have more time to consider the impact of this change compared with their European counterparts, as local accounting and financial reporting boards choose to customise their implementations of IFRS, or to wait for full implementation elsewhere before following suit. As an example, Indonesia is targeting a one-year delay between the finalisation of IFRS standards and its harmonisation with Indonesian GAAP.

In this publication, we focus on EV results as at year-end 2014. In addition to providing an overview of the methodology insurers used and commenting on any developments, we have included the following current hot topics that insurers may wish to consider when developing and enhancing their EV approaches in the future:

- Determining the RDR
- Setting appropriate investment return assumptions
- Setting appropriate future solvency capital assumptions
- Evaluating the time value of options and guarantees (TVOG)
- Disclosures in EV reporting
- Other measures of value (e.g., market capitalisation, financial reports based on IFRS or GAAP)

Before covering these topics in detail, we provide a high-level overview of the history of EV, the key components of an EV calculation, and the differences between the various types of EV methodologies.



---

## OVERVIEW OF EMBEDDED VALUE

The EV of an insurer is intended to be a measure of the value of the shareholder's interests in the business. Over time, various principles and guidance have been issued by industry bodies to achieve consistency between companies and reporting periods among their own governing territories. For example, guidance notes have been issued in the UK, Canada, and the United States. The two main sets of guidance currently widely used by European companies and their subsidiaries around the world are the EEV principles and MCEV principles.<sup>24</sup>

Common to all the various EV principles are the following two major components:

- Value of in-force (VIF) business: The discounted future distributable earnings arising from policies in-force as at the valuation date.
- The adjusted net worth (ANW): The shareholder's net assets, including free surpluses and required capital, i.e., the amount returned to shareholders should all assets be sold and liabilities settled immediately.

The above two items relate purely to existing policies and do not include new business potentially written in the future. When the value of future new business, akin to goodwill, representing the ability of the insurer to sell profitable future new business, is added to the two existing components, this results in an appraisal value, a common metric used to measure the overall economic value of insurance companies.

EV reporting is typically only applicable to long-term life, accident/health, and group risk insurance business, often referred to as '*covered business*.' This is a critical factor to keep in mind as there are currently no standards or guidance in applying EV to general insurance businesses. Hence, for composite insurers (i.e., those that write general insurance in addition to life insurance), the relationship between market capitalisation and life insurance EV may be weaker than for pure life insurers. In Asia, however, we do have the anomaly that Korean general insurers are allowed to write long-term insurance business which would, in most jurisdictions, be categorised as life insurance business. As listed Korean general insurers produce EV results for their long-term insurance business, we have included these results in this report.

In the following section, we present a brief history of EV reporting, its introduction into Asia, and current practices.

### History of EV reporting

EV reporting started in the United Kingdom in the 1980s as a way for life insurance companies to give more informed guidance to analysts and shareholders on their underlying economic values. At that time, accounting standards were not fully equipped to handle the unique nature of life insurance businesses, and standard financial statements did not represent an insurer's economic value.

The methodology has since spread globally. Early EV methodologies, using a deterministic approach to value cash flows and implicitly allowing for the cost of policyholder options and guarantees, asset/liability mismatch risk, credit and other risks, and the economic cost of capital through the use of a risk discount rate, are often characterised as TEV.

Following some TEV-related criticism in the investment community, a group of leading European insurers known as the European Insurance CFO Forum (CFO Forum) published more detailed agreements on principles for EV calculations and disclosures in 2004, which are now known as EEV. EEV provides more standardisation of definitions, required calculations, and disclosures, providing greater comparability between insurers.

The latest evolution in EV reporting came in 2008, with the introduction of the MCEV principles by the same CFO Forum. These principles introduced mandatory market-consistent valuation of assets, liabilities, and financial risks, while also introducing more specific disclosure requirements. The CFO Forum had originally intended on introducing MCEV as the mandatory standard for its members from 2012 onwards, but this requirement was withdrawn in 2011 pending the development of Solvency II and IFRS.

The prevalence of EV reporting continues to grow among insurers outside of Europe, including those in the United States, Canada, and Asia.

---

<sup>24</sup> Formally known as the European Insurance CFO Forum Market Consistent Embedded Value Principles. The MCEV Principles are a copyright of the Stichting CFO Forum Foundation 2008.

## EV in Asia

EV was initially introduced into Asia through the subsidiaries and joint ventures of European companies. Since then, domestic insurers have taken up EV reporting, with many of the major life insurers in the significant Asian insurance markets calculating and disclosing EV in some form. However, there is a clear difference in EV methodologies being used. Asian MNCs and domestic insurers outside of India tend to report on a TEV basis, while European and Japanese insurers favour EEV<sup>25</sup> or MCEV<sup>26</sup> reporting. A summary of adopted methodologies is shown in Figure 15.

**FIGURE 15: EMBEDDED VALUE REPORTING STATISTICS BY DOMICILE OF INSURANCE GROUP**

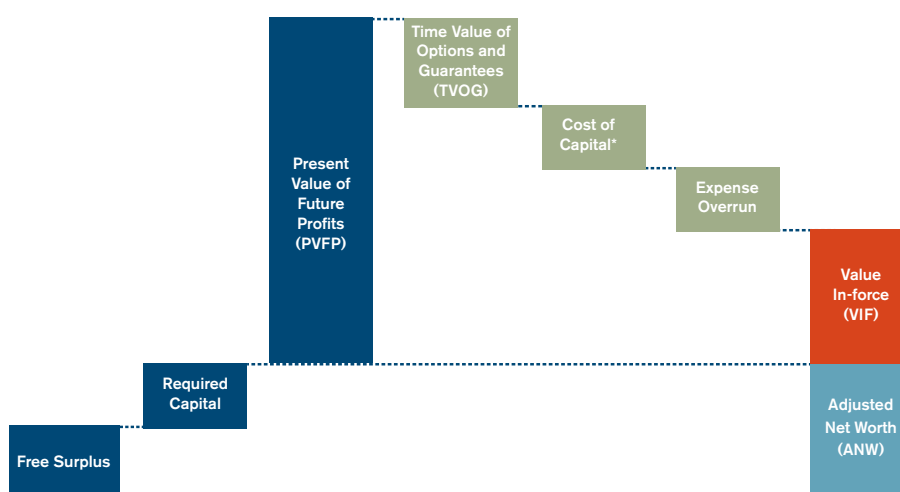
GROUP DOMICILE	TEV	EEV	IEV	MCEV	TOTAL
Asian MNC <sup>27</sup>	2	–	–	–	2
European MNC <sup>28</sup>	–	4	–	3	7
North American MNC <sup>29</sup>	1	–	–	–	1
China	6	–	–	–	6
Hong Kong	1	–	–	–	1
India	1	–	2	2	5
South Korea	4	–	–	–	4
Taiwan	6	–	–	–	6
Thailand	1	–	–	–	1
<b>Total</b>	<b>22</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>33</b>

Apart from European MNCs and Japanese insurers, the only insurers operating in Asia reporting EEV, IEV, or MCEV are Indian insurers. However, none of the Indian insurers reporting EEV/IEV/MCEV currently presents externally reviewed EV results to the extent specified in the disclosure requirements of the EEV, IEV, or MCEV principles.

The adoption of different EV reporting methodologies brings major challenges in comparing EV results, making a good understanding of the differences between the methodologies critical. In the next section, we present a brief overview of the main differences between the three main varieties of EV.

## Components of EV

**FIGURE 16: COMPONENTS OF EV**



25 Including Ageas, AXA, Prudential, and Standard Life.

26 Including Allianz, Aviva, and Zurich.

27 Asian MNCs include AIA (Hong Kong domiciled) and Great Eastern (Singapore domiciled).

28 European MNCs include Ageas, Allianz, Aviva, AXA, Prudential, Standard Life, and Zurich.

29 North American MNCs include Manulife.

---

The *VIF* consists of the following components:

- *Present value of future profits (PVFP)*: The present value of net (of tax) distributable earnings from existing in-force business and the assets backing the associated liabilities.
- *TVOG*: A requirement for EEV, IEV, and MCEV only. This represents the additional value (for policyholders) of financial options and guarantees above the intrinsic value already allowed for in the calculation of the PVFP.
- *Cost of capital (CoC)*: Represents the additional cost (to the shareholders) from investing in assets backing the required capital via an insurer relative to the shareholders required rate of return.

For MCEV, this component is further split into:

- *Frictional cost of capital (FCoC)*: This reflects the taxes and investments costs that arise on the assets backing the required capital.
- *Cost of residual non-hedgeable risks (CRNHR)*: This is the expected cost of capital related to non-hedgeable risks that can have an asymmetric impact on shareholder value (to the extent that these risks have not already been reflected in the PVFP or TVOG). These can include both financial and nonfinancial risk, with operational risk being a typical inclusion.

An *expense overrun* is reported by some insurers, particularly for new operations or those in an expansion phase. The expense assumptions underlying EV are normally based on current 'fully allocated' expense levels, but this can cause insurers with fledgling operations that have yet to achieve scale to show seemingly unprofitable businesses.

As a result, some EV results are presented as 'pre-overrun,' where the EV figures will be calculated based on long-term target expense levels, and as 'post-overrun,' which reflects current actual expense experience. At a company level, the difference between actual current expense level and the targeted long-term level is commonly referred to as the expense overrun.

The *ANW* is typically calculated as the sum of:

- *Required capital*: Defined as the market value of assets attributed to the business over and above that required to back the liabilities for the business and whose distribution is restricted. The level of required capital may be set by reference to regulatory capital requirements, levels of capital requirements that achieve a target credit rating, internal model capital requirements, or a combination of these factors.
- *Free surplus*: The market value of any assets allocated to, but not required to support, the in-force business as at the effective date of the EV calculation.

Figure 17 summarises the main differences between TEV, EEV, and MCEV for each of the above components.

**FIGURE 17: COMPARISON OF TEV, EEV, AND MCEV**

ITEM	TEV	EEV	MCEV
<b>PVFP</b>	Projection of future profits using real-world investment return assumptions, discounted using subjective risk discount rate.	Projection of future profits using real-world investment return assumptions, discounted using a curve based on risk-free rates, adjusted using a risk margin which reflects any risks not allowed for elsewhere in the valuation.  Some EEV reporting firms also opt to use a market-consistent approach, which entails using risk-free rates in the certainty equivalent approach.	Projection of future profits using market-consistent risk-neutral investment return assumptions, discounted using a curve based on risk-free rates. Discount rates can be adjusted to include an illiquidity premium.
<b>TVOG</b>	Sometimes calculated but no standardised requirement.	Mandatory calculation using stochastic models for material guarantees. While both risk-neutral and real-world models are theoretically allowed, most insurers will use risk-neutral models for ease of calculation.	Consistent with PVFP methodology, market-consistent risk-neutral calculation using stochastic models.
<b>Cost of Capital</b>	There is no standardisation of this, but it is included by virtually every insurer.  Typical practice is to explicitly model the cost in the cash flow projections and present it as an adjustment to the EV figure.	Mandatory, calculated as the difference between required capital held at calculation date and the present value of the projected releases of the required capital, allowing for future investment return on that capital.  Disclosed as part of required capital.	Mandatory split into FCoC and CRNHR.
<b>Discount Rate</b>	Subjective assumption, typically calculated as risk-free rate plus a margin or portfolio investment return plus a margin.  A single discount rate is typical, using a curve is rare.	Two possible approaches:  1. 'Top-down,' with one discount curve used for all cash flows based on risks faced by the entire organisation.  2. 'Bottom-up,' where each cash flow is discounted using risk-free plus risk margin based on the exposed risks.	A bottom-up approach is mandatory, and the curve is typically on swap rates with adjustments for illiquidity and risk margin.
<b>Expenses</b>	No standardisation, but typically based on historical experience and expected ongoing experience. Where expense overruns exist, insurers will typically provide both pre- and post-overrun EV/VNB figures.	Future expenses such as renewal and maintenance expenses must reflect expected ongoing operating expenses, including investment in systems to support the business, and allowing for future inflation.  Overheads and holding company expenses must be allocated in a manner consistent with current and historical practice.  Expense overruns must be allowed for.	Similar to EEV principles, with additional guidance.  Favourable changes in unit costs such as productivity gains should not normally be included if they have not been achieved by the end of the reporting period. However, for start-up operations, allowing for improvements in unit costs in a defined period may be allowed for, so long as there is sufficient evidence to justify this.  Exceptional development and one-off costs that have an impact on shareholder value must be disclosed separately, with a description of their nature.  Company pension scheme deficits must be allocated to the covered business expense assumptions in an appropriate manner.
<b>Investment Returns</b>	Can be set as per internal assumptions. Typical practice is to use a risk-free plus risk premium approach for main asset classes, where the risk-premium assumptions differ by asset class.	Can be set as per internal assumptions. Some insurers opt to use a risk-neutral approach, while others use a risk-free plus risk premium approach.	A risk-neutral approach is typically used, where assets are assumed to earn returns based on a risk-free curve.  Where swap rates are not available or liquid enough, government bond rates are used as a proxy for the risk-free rate.

---

### TEV vs. EEV vs. MCEV

The primary advantage that EEV and MCEV have over TEV is the greater *standardisation* of assumptions, methodologies, and disclosures, leading to better comparability from an investor's viewpoint. However, the same standardisation can lead to a relative loss of EV being a *reflection of management's viewpoint* of future potential, e.g., future investment returns assumptions in MCEV reporting.

Insurers reporting on an EEV or MCEV basis will typically experience greater volatility in EV results, especially if a market-consistent basis is used. This can complicate reporting and investor disclosures and is one of the reasons often cited by industry insiders as to why some companies have not yet moved from TEV to EEV or MCEV. Another key reason put forward is the increased *capabilities* required to implement EEV or MCEV. For example, the implementation of TVOG calculations requires the use of stochastic models to value embedded policy options and guarantees. This inevitably means developing specialised economic scenario generator (ESG) software or in-house tools, which will add to financial reporting lead times, in addition to being difficult to calibrate for Asian capital markets, which are in general not as deep as those in the United States or Europe. Given this, it is understandable that Asian insurers are not prioritising moving on from TEV, which is itself already a useful metric for managing their businesses, so long as it is calculated robustly and consistently.

### Indian EV

In 2013, the Institute of Actuaries of India published Actuarial Practice Standard 10 (APS10) 'Determination of the Embedded Value,' establishing a standard for what is now known as Indian Embedded Value (IEV). It explicitly takes inspiration from, and is generally commensurate with, the MCEV principles. APS10 provided minimum disclosure requirements for Indian life insurers that are seeking an initial public offering (IPO) share flotation.

For ongoing reporting and disclosures that are not related to an IPO, Indian insurers are free to choose their preferred EV methodology, with no requirement to adopt IEV. In fact, Indian insurers have chosen almost every variety of EV reporting principles, with IEV, TEV, EEV, and MCEV all present in the market.

## EMBEDDED VALUE RESULTS

This section presents EV results under three different lenses:

- Asia-wide
- Company by company
- Detailed country-level analysis

The majority of the discussion and analysis is included in the Detailed country analysis section.

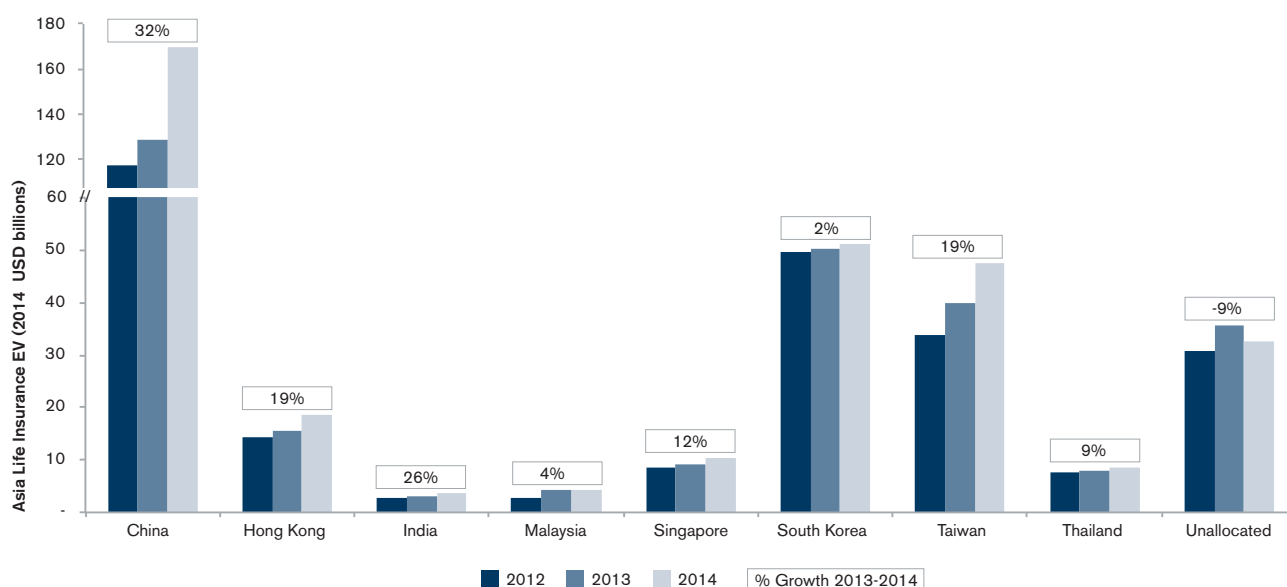
The values presented in this section relate to EV results for life insurance and other long-term insurance operations in Asia, excluding Japan. Because of the way some companies group their businesses, Asian operations are sometimes classed under their 'international' or 'emerging markets' business units, which may include non-Asian operations.

For these mixed business units (i.e., those that include Asian and non-Asian operations), in cases where we believe that a significant majority of the value has been generated in Asia, the total value of the business units have been included in this report.

### EV in Asia

In 2014, reported Asian life insurance EV grew by 15% on a comparable basis.<sup>30</sup> Figure 18 breaks down the total EV growth by country (to the extent that a market breakdown has been disclosed by companies).

**FIGURE 18: COMPARABLE ASIAN LIFE INSURANCE COVERED EV,<sup>31, 32</sup> 2012 TO 2014**



30 As at the date of publication of this report, some insurers have not yet disclosed their FY 2014 EV figures. Hence, this chart and subsequent commentary only include insurers that have a complete set of FY 2013 and FY 2014 EV figures. The performance of the remaining companies will be included in our '2015 Embedded Value Update—Asia (excl. Japan)' report. The missing companies include: Birla Sun Life, Mercuries Life, and Taiwan Life.

31 To provide comparability and eliminate foreign exchange (FX) effects, results for all years have been converted to USD using the prevailing FX rate as at the FY 2014 reporting date.

32 Unallocated indicates EV figures that are reported by insurers to relate to their Asian operations, but have not been allocated to specific countries.

FIGURE 19: COMPARABLE ASIAN LIFE INSURANCE COVERED ANW, 2012 TO 2014

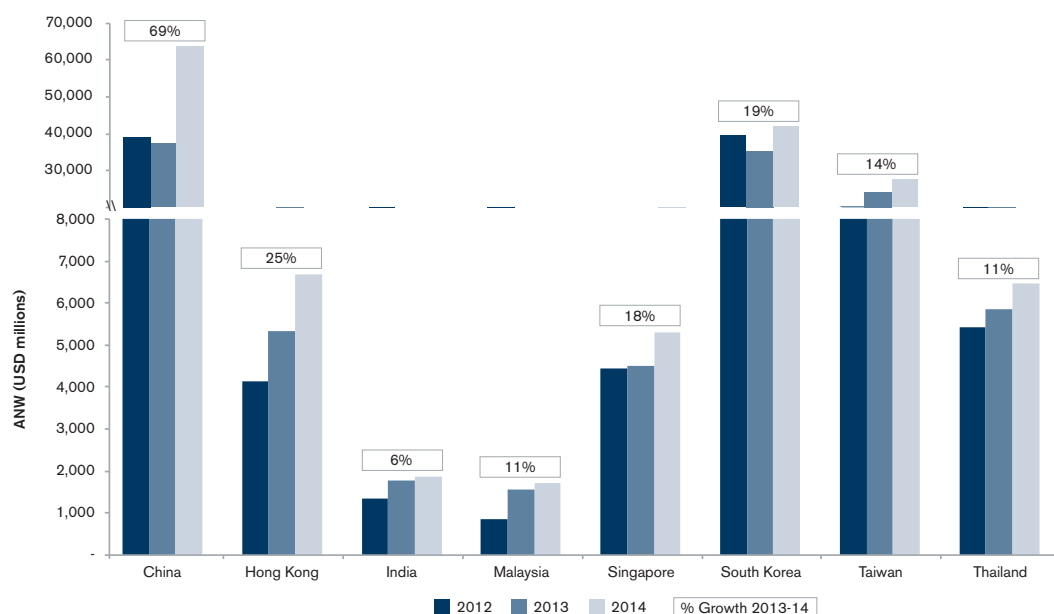
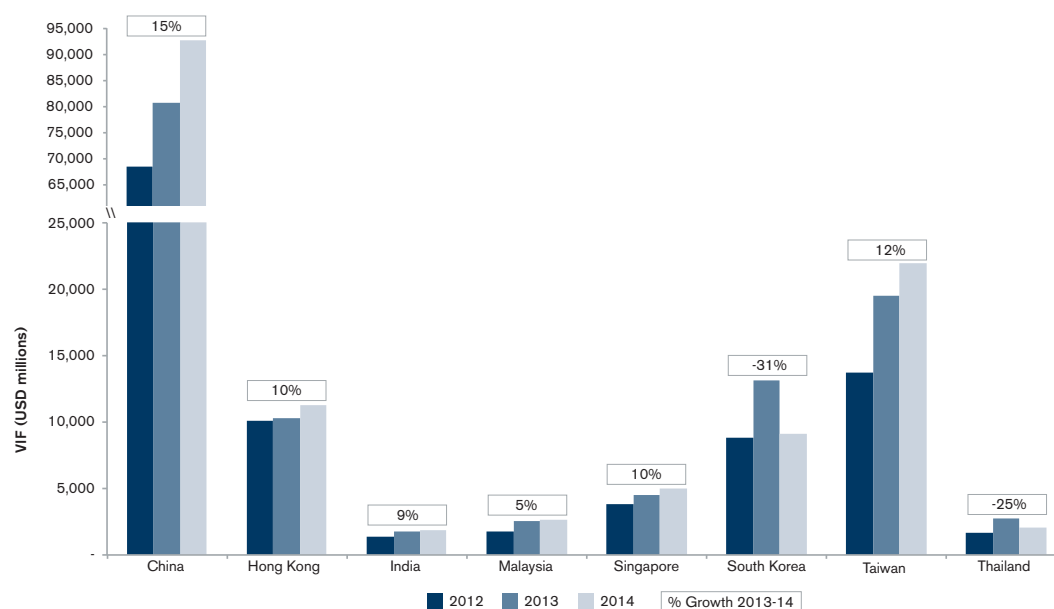


FIGURE 20: COMPARABLE ASIAN LIFE INSURANCE COVERED VIF, 2012 TO 2014

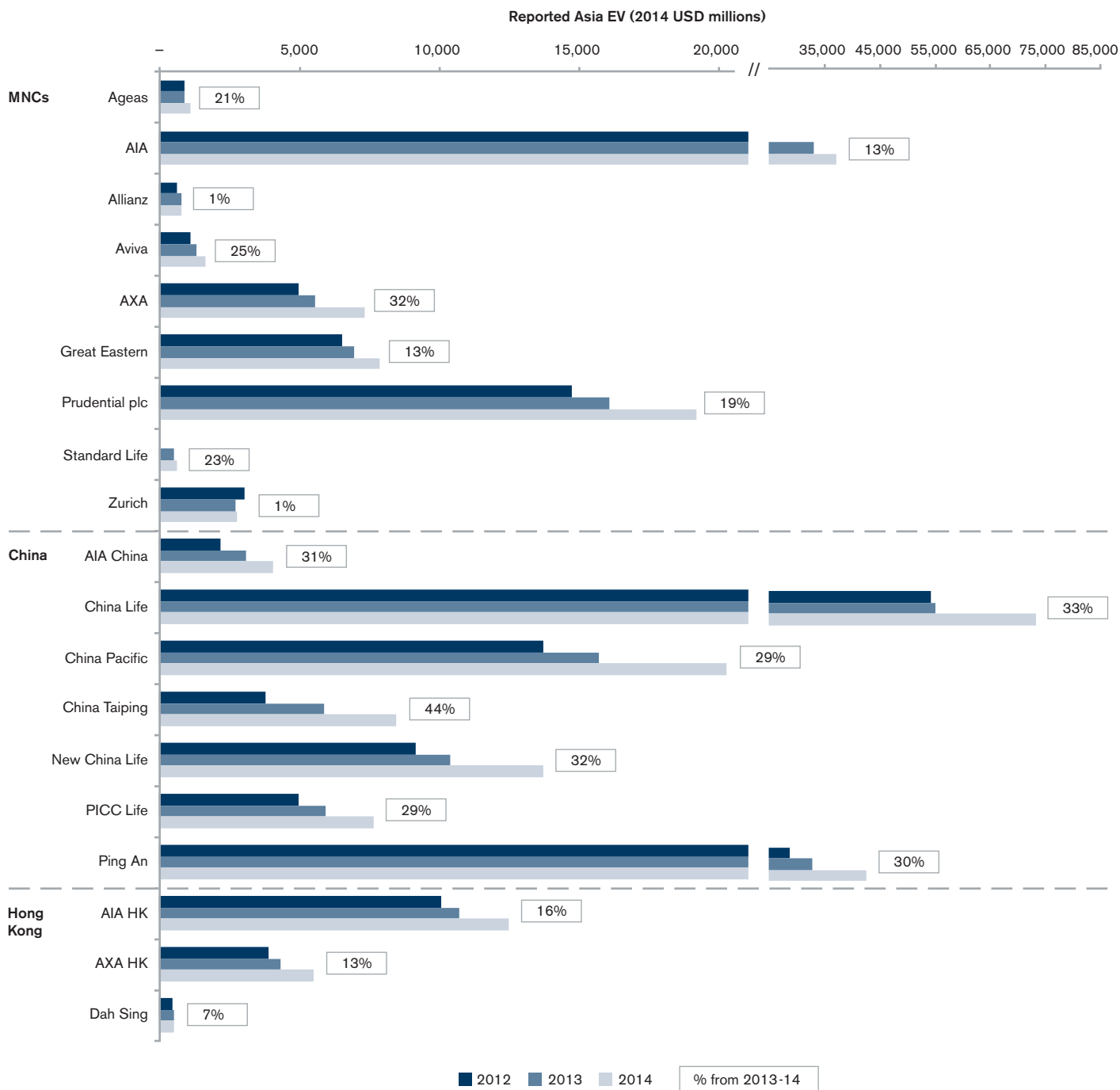


The countries with the largest reported annual growth in EV were China (32%), Hong Kong (19.4%), and Singapore (12%). This is largely a reflection of ANW growth from lower interest rates not being offset by corresponding VIF reductions (in China in particular), coupled with strong VNB results during the year, with some positive impact from operating and/or investment variances. It is also no coincidence that the countries reporting the highest EV growth were also the same countries that had strong equity markets and growth in GWP in 2014.

The smallest increases in EV in 2014 came from Malaysia and South Korea. In South Korea new tax laws rendering long-term savings products less attractive and further reductions in interest rates have hampered EV growth. Limited GWP growth was also a factor in 2014, as the new business environment was challenging and discontinuances increased for many companies.

EV by company

FIGURE 21: ASIAN LIFE INSURANCE COVERED BUSINESS EV BY COMPANY, <sup>33, 34, 35</sup> 2012 TO 2014



33 The EV figures for each company have been converted to USD at the mid exchange rate prevailing as at their FY 2014 reporting dates, to remove the effect of currency fluctuations.

34 There is no entry for Standard Life in 2012 as Asian EV figures were not separated out until 2013.

35 Please note that some companies have not yet disclosed their 2014 EV results. The 2014 results for these companies have been left blank as a consequence.



**FIGURE 21: ASIAN LIFE INSURANCE COVERED BUSINESS EV BY COMPANY, 2012 TO 2014 CONTINUED**

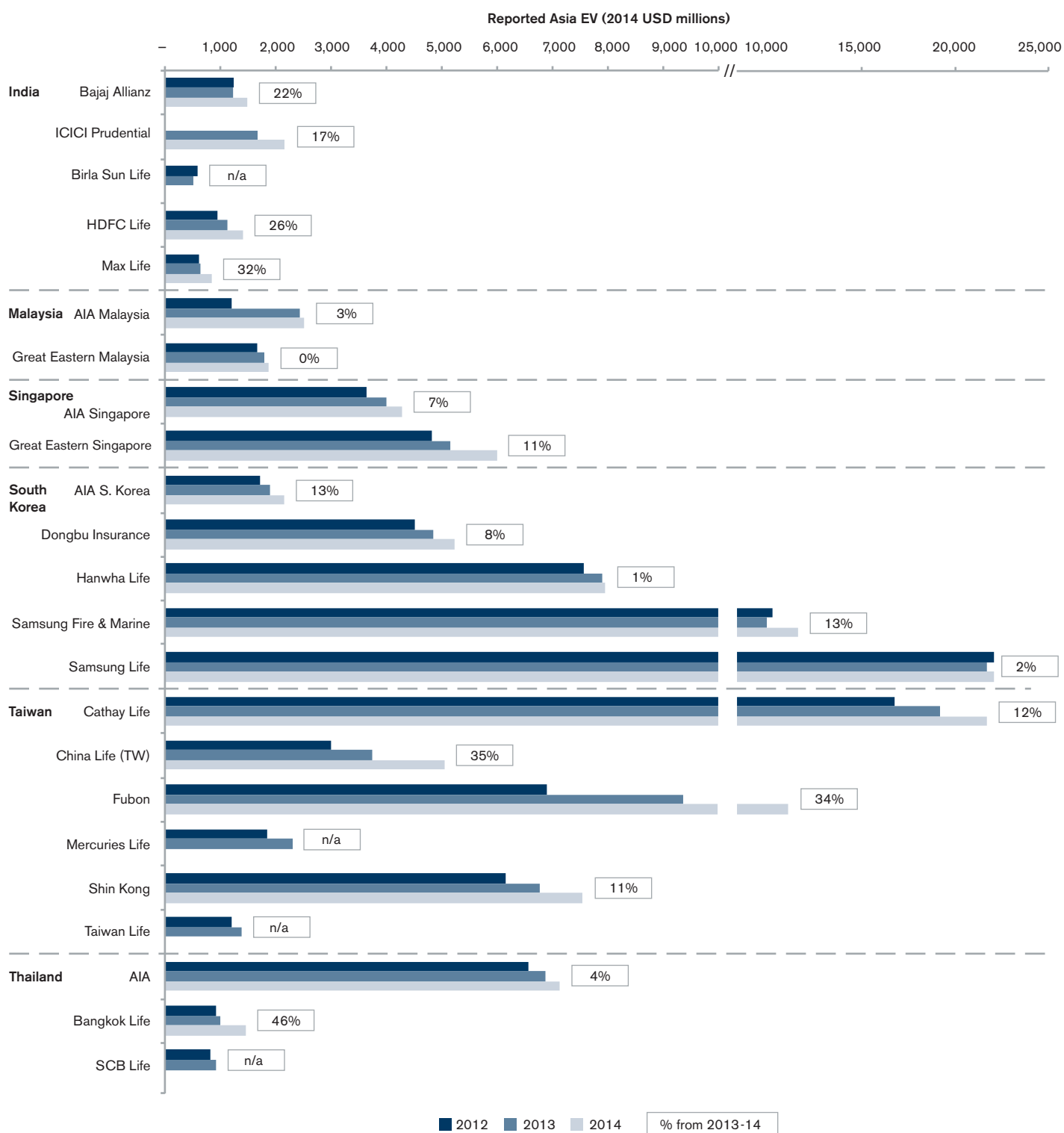


FIGURE 22: SPLIT OF 2014 ASIAN LIFE INSURANCE EV INTO VIF AND ANW BY COMPANY

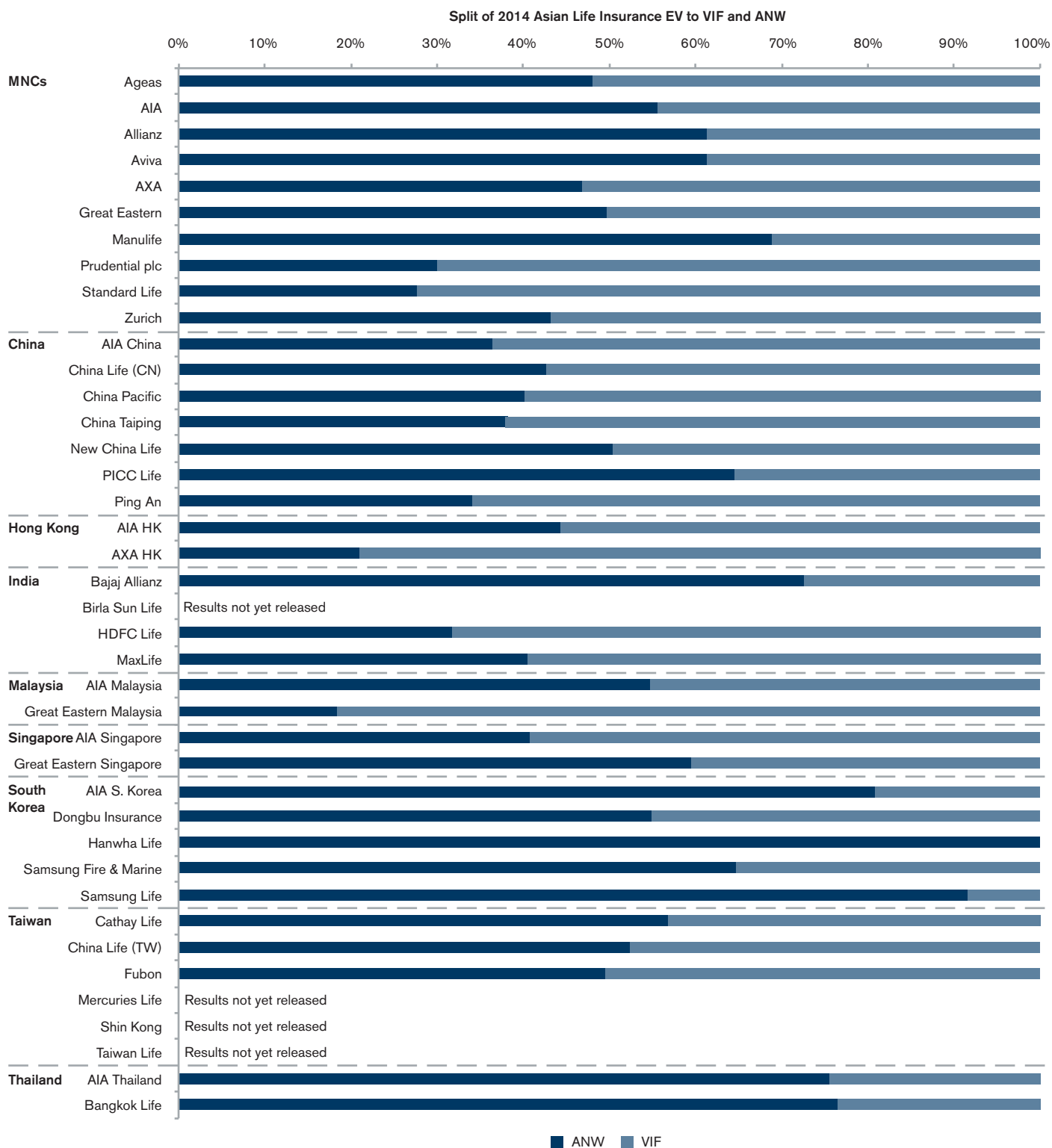


Figure 21 shows the growth in EV by individual company. Amongst the companies included in this report, Bangkok Life reported the greatest annual increase in EV (44%), followed by China Taiping (44%) and China Life of Taiwan (35%). The increase in Bangkok Life's EV is largely attributable to a rise in the market value of the insurer's fixed income portfolio from falling bond yields, leading to a 63% rise in ANW. This is discussed further in the Thailand section of the detailed country analysis.

In China, falling yields increased ANW's but offsetting VIF reductions did not come through as investment returns were generally assumed to grade up to similar levels as prior years. Strong VNB results and investment related gains also contributed to 2014 EV growth across the market.

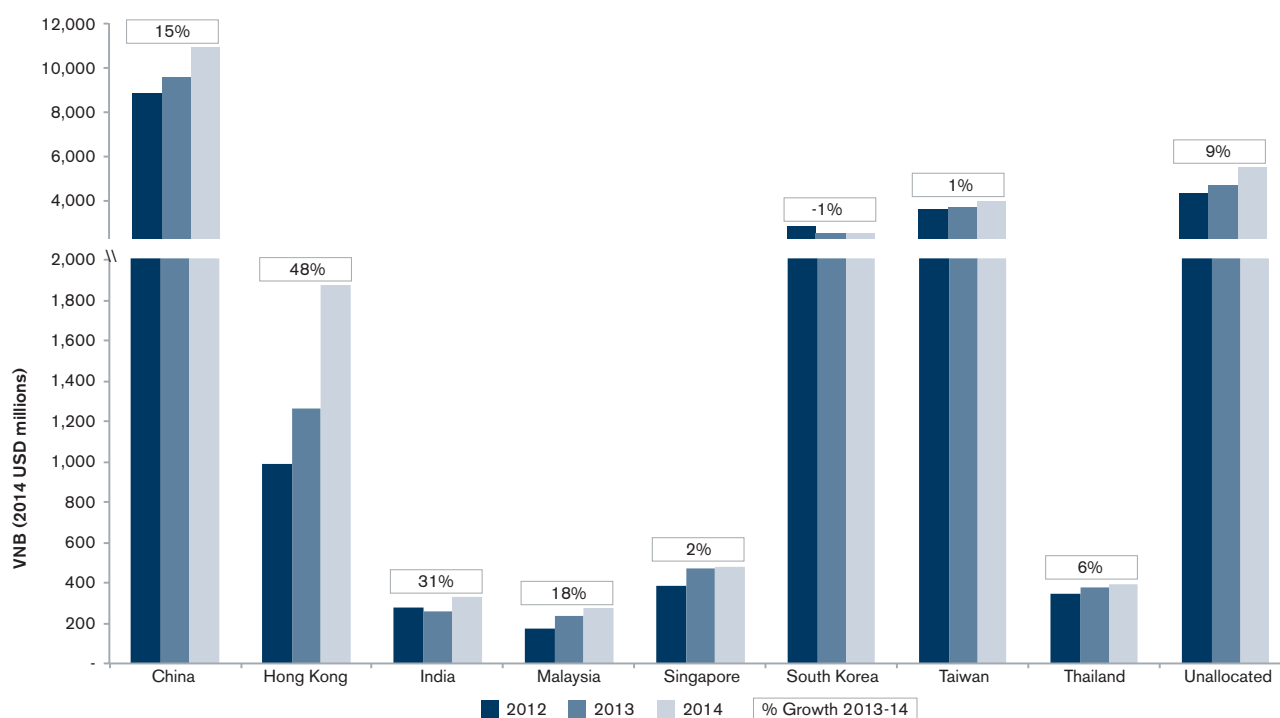
Figure 22 breaks down the reported EV for 2014 into its VIF and ANW components. Interestingly, Chinese insurers generally show a higher proportion of their EV coming from VIF compared with the South Korean insurers, which typically have a higher proportion of ANW.

The key factor for those markets more weighted to ANW is the persistent low interest rate environment. All other things being equal, a declining interest rate environment will increase the value of fixed income assets held on the balance sheets, thereby increasing the value of the ANW. In theory, this should be offset by a reduction in VIF, as the investment return assumptions are in turn adjusted to account for the low interest rates. If insurers have asset durations shorter than liability durations, then the VIF reductions should more than offset the ANW increases. This is not always the case, however, as we discuss in greater detail in the Hot Topics section.

### VNB in Asia

Reported Asian VNB grew by 9%<sup>36</sup> in 2014 on a comparable basis. Figure 23 provides a country-by-country comparison of growth in VNB through the disclosures made.

**FIGURE 23: REPORTED VNB OF ASIAN OPERATIONS ON A COMPARABLE BASIS,<sup>37</sup> 2012 TO 2014**



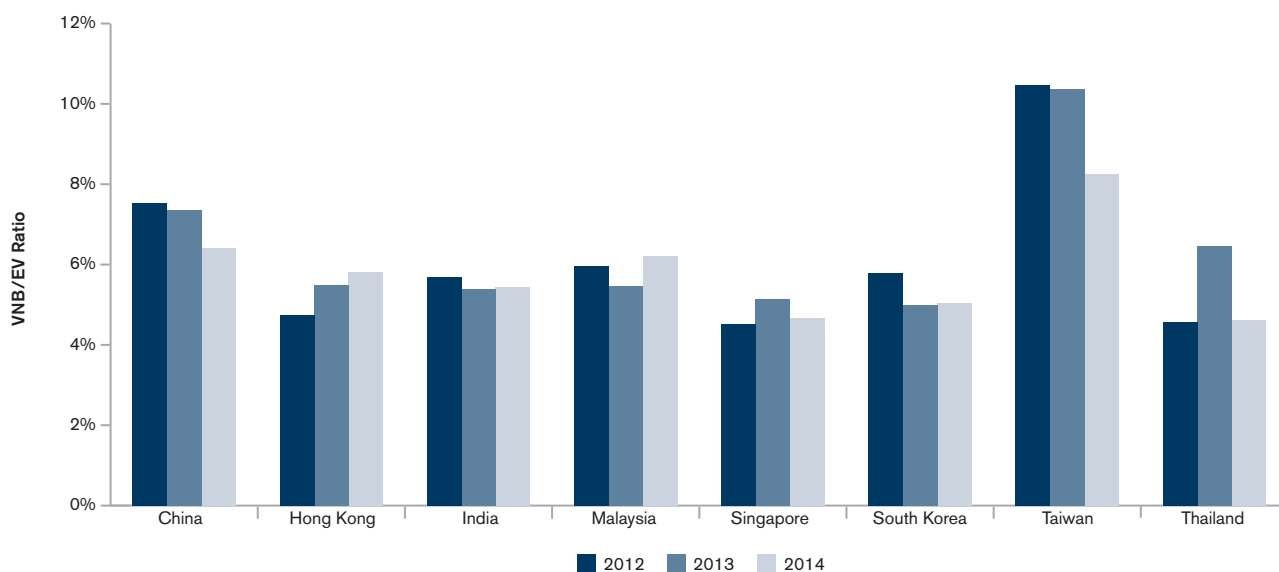
<sup>36</sup> This percentage has been calculated on a comparable basis, i.e., only companies that have disclosed a full set of FY 2013 and FY 2014 numbers have been included here.

<sup>37</sup> As at the date of publication of this report, some insurers have not yet disclosed their FY 2014 EV figures. Hence, this chart and subsequent commentary only includes insurers that have a complete set of FY 2013 and FY 2014 EV figures. The performance of the remaining companies will be included in our midyear EV update report. The missing companies include Birla Sun Life, Mercuries Life, and Taiwan Life.

Based on the public disclosures of VNB, Hong Kong and Indian operations reported the largest growth in VNB in 2014. Major insurers in Hong Kong such as AIA and Prudential reported significant increases in VNB.

When analysing VNB, it is sometimes instructive to examine the ratio of VNB/EV over time—this gives an indication of the market growth rate, and the relative maturity of the market.

**FIGURE 24: VNB/EV RATIO,<sup>38</sup> 2012 TO 2014**

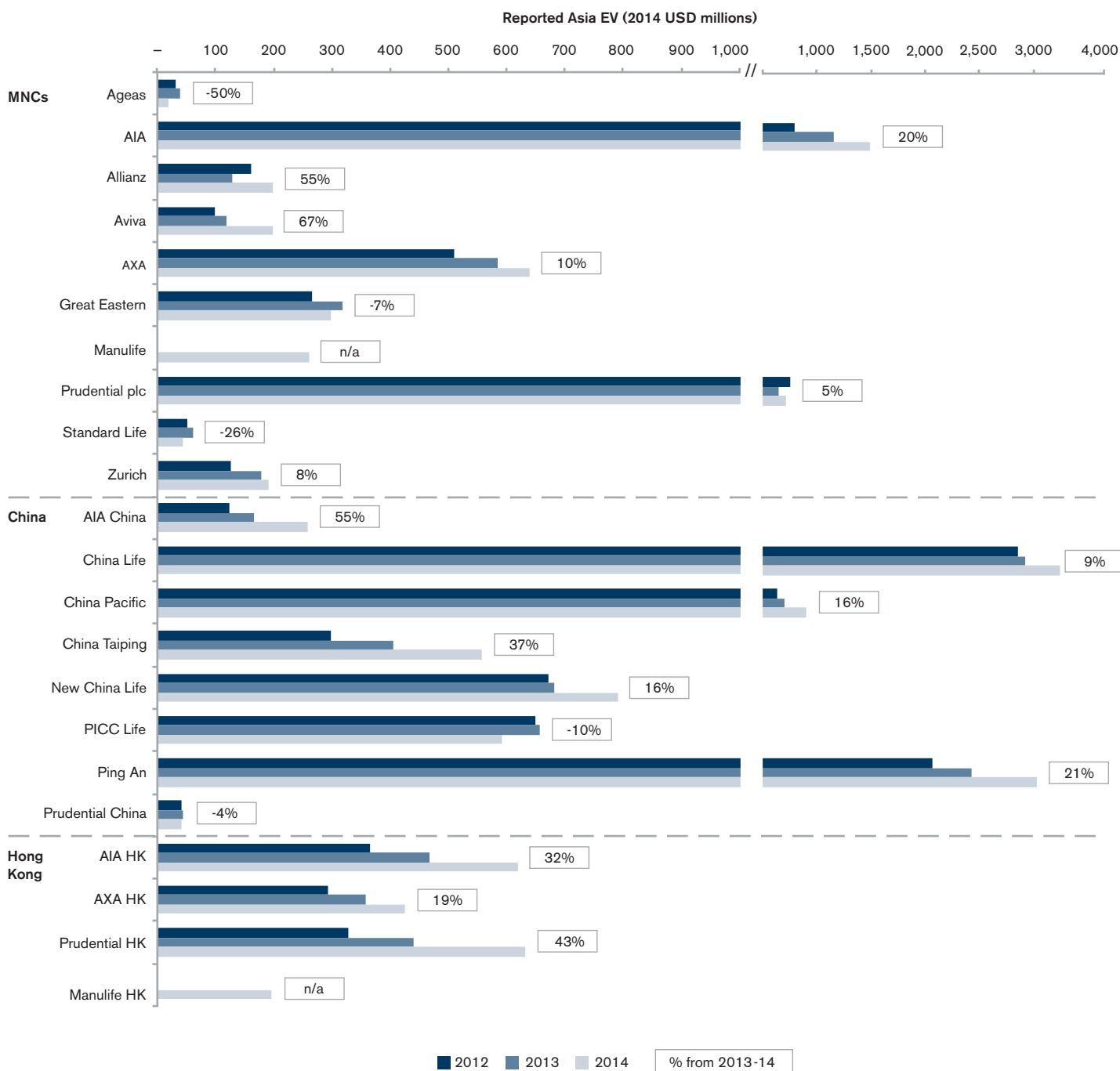


The majority of markets exhibit a relatively stable ratio over the last three years, with Taiwan, India, and Thailand the notable outliers. As discussed more extensively in our Taiwan section, Taiwan is currently experiencing a low interest rate environment (which is limiting the profitability of its linked products) coupled with some insurers reporting lower new business volumes. The Thailand results are dependent on two insurers—AIA and Bangkok Life, and are further discussed in the Thailand section.

<sup>38</sup> This ratio has been calculated on a constant currency basis, using the EV and VNB figures of insurers that have reported both EV and VNB during those periods. Companies that only report EV or VNB have been excluded from this analysis.

VNB by company

FIGURE 25: ASIAN VNB BY COMPANY,<sup>39</sup> 2012 TO 2014



<sup>39</sup> Manulife only began reporting VNB for its Asian operations in 2014.

FIGURE 25: ASIAN VNB BY COMPANY, 2012 TO 2014 CONTINUED

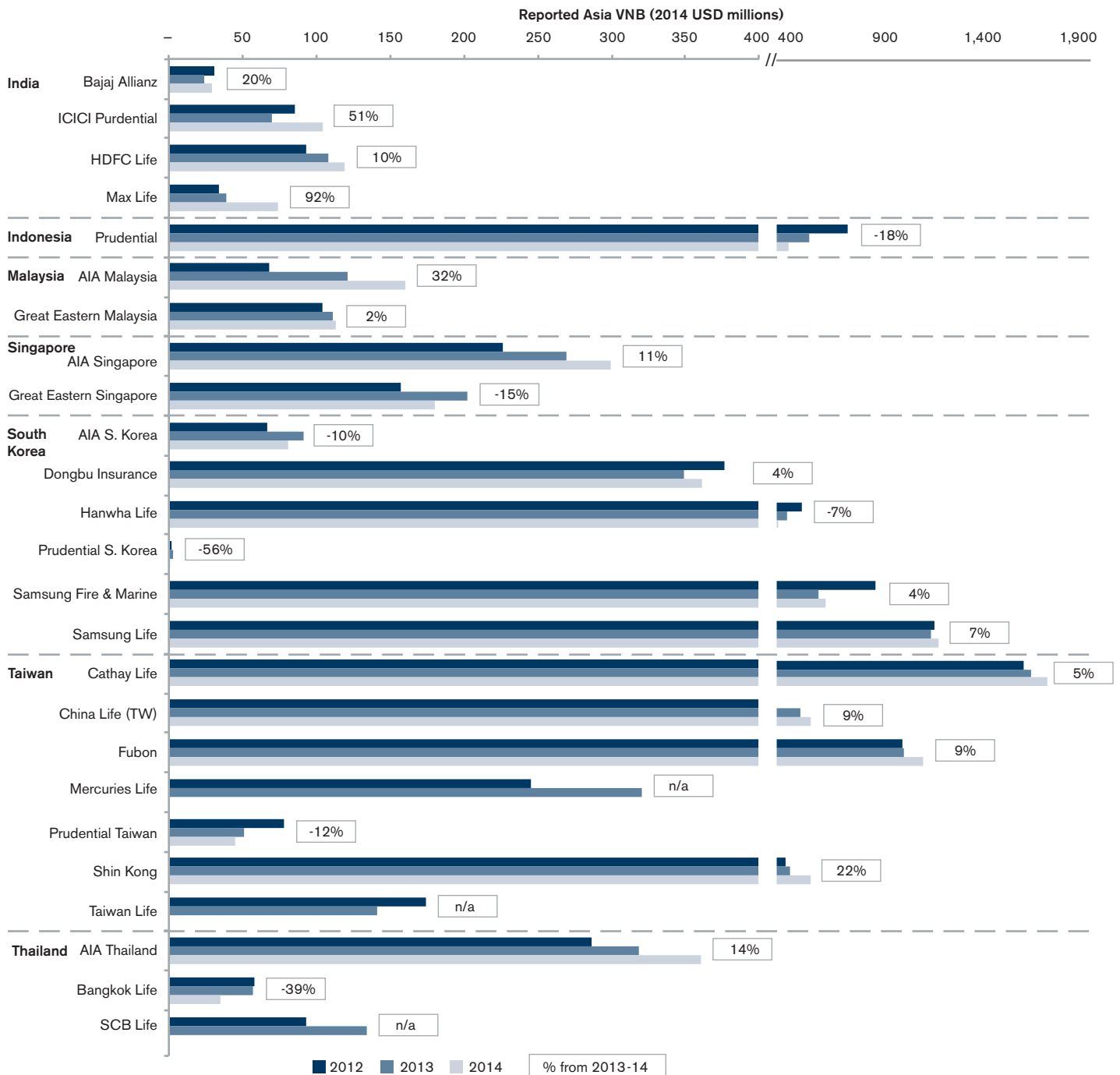


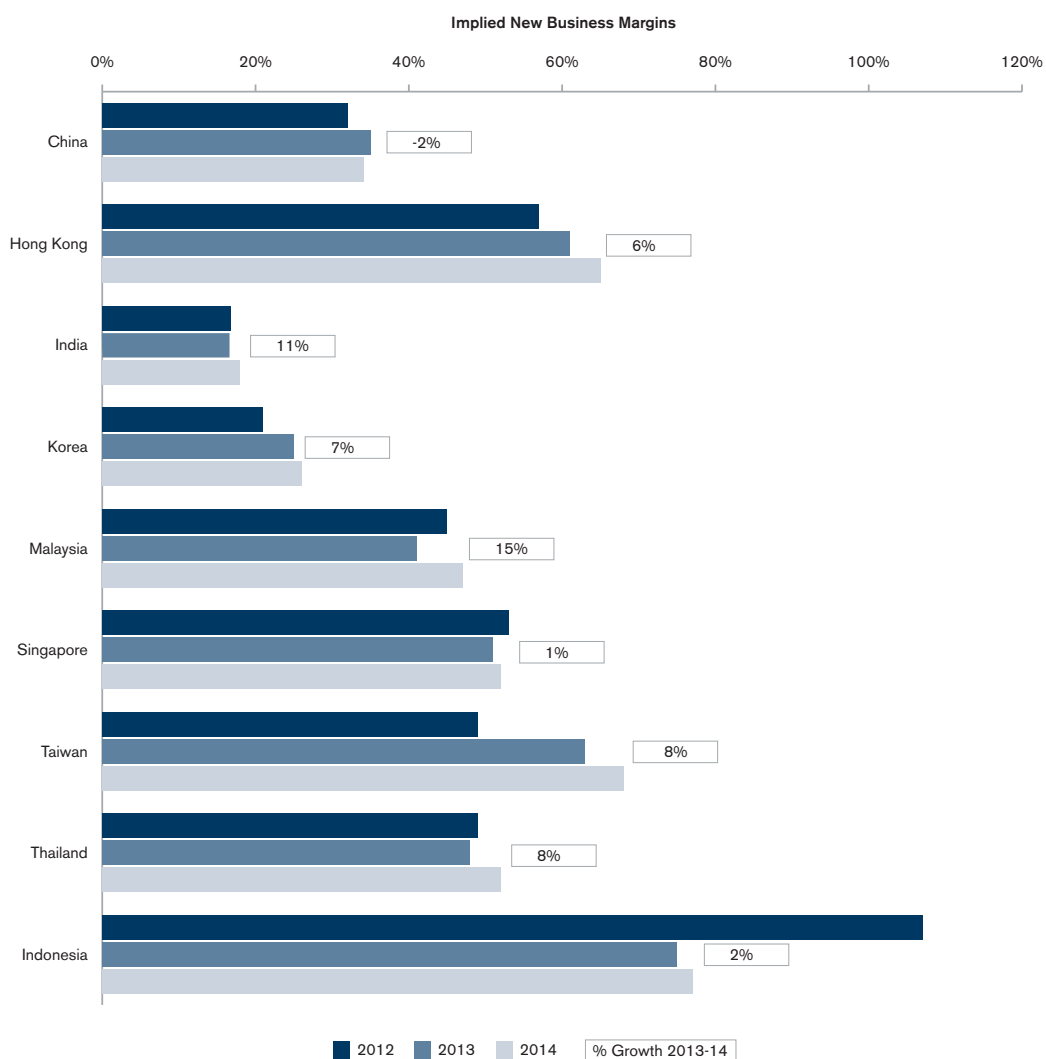
Figure 25 presents each individual company's VNB from 2012 to 2014.

Max Life (92%) and Aviva (67%) reported the largest increases in Asian VNB in 2014:

- Max Life's growth in VNB was driven by a combination of experience improvements, volume growth, and a shift in EV reporting methodology from 2013
- Aviva saw growth in all of its key Asian markets, Singapore in particular benefiting from its bancassurance partnership with DBS Bank

## New business margins<sup>40</sup> in Asia

FIGURE 26: IMPLIED NEW BUSINESS MARGINS<sup>41</sup> BY COUNTRY, 2012 TO 2014



The chart in Figure 26 compares the total disclosed new business margins for each market. The reliability of this analysis is inherently linked to the amount of disclosures available. Indonesia, Hong Kong and, somewhat surprisingly, Taiwan report that highest margins in Asia, but the former is based on one data point, namely Prudential's reported margin for Indonesia. For Hong Kong, the four insurers disclosing VNB in 2014 (AIA, Prudential, AXA, and Manulife) are reporting similar new business margins levels of around 60%.

40 New business margin has been defined as the ratio of VNB and APE as commonly used in Asia, as opposed to the ratio of VNB to the present value of new business premiums as defined by the MCEV principles.

41 This chart has been calculated by taking the sum of all disclosed VNB in each market, divided by the commensurate APE figure sold by the company in the country. As such, the reliability of this chart will increase depending on the actual number of companies (and their collective market share) disclosing information by geography. This means that for markets with very few disclosures, such as Taiwan, India, Malaysia, Singapore, and Thailand, this analysis may not reflect profitability across the whole market.

Detailed country analysis

CHINA

FIGURE 27: REPORTED EV OF CHINESE INSURANCE OPERATIONS, 2012-2014

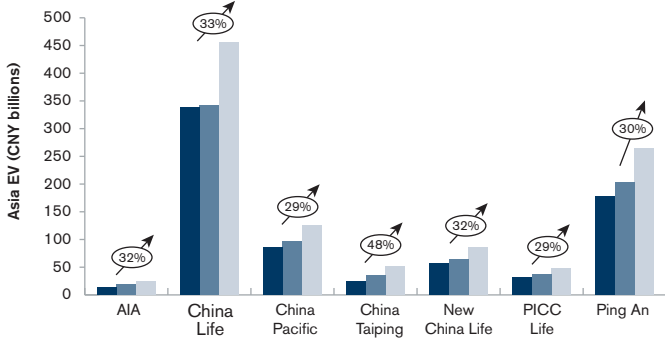


FIGURE 28: REPORTED ANW OF CHINESE INSURANCE OPERATIONS, 2012-2014

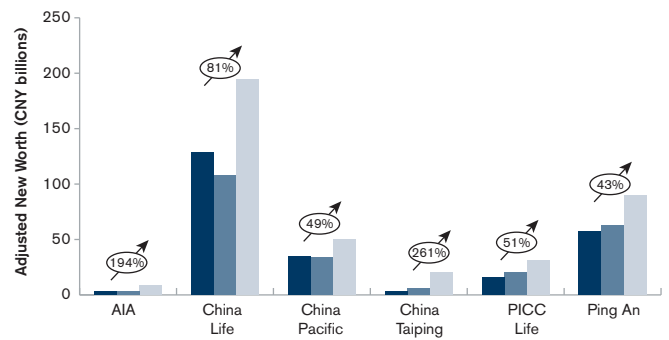


FIGURE 29: REPORTED VIF OF CHINESE INSURANCE OPERATIONS, 2012-2014

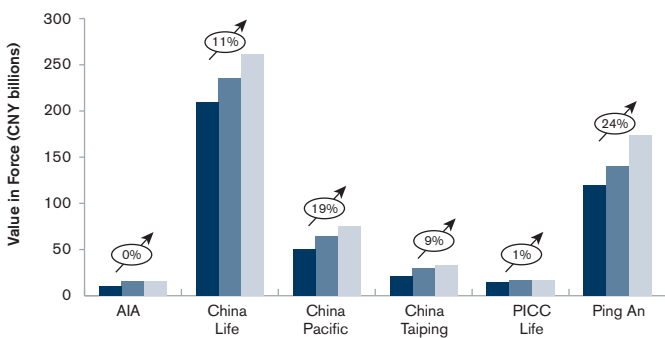


FIGURE 30: REPORTED VIF/ANW SPLIT OF CHINESE INSURANCE OPERATIONS, 2014

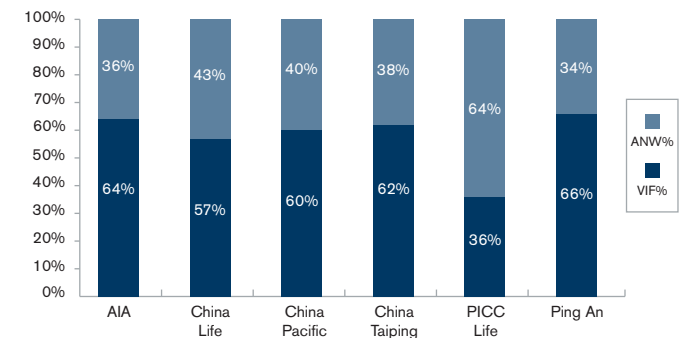


FIGURE 31: REPORTED VNB OF CHINESE INSURANCE OPERATIONS, 2012-2014

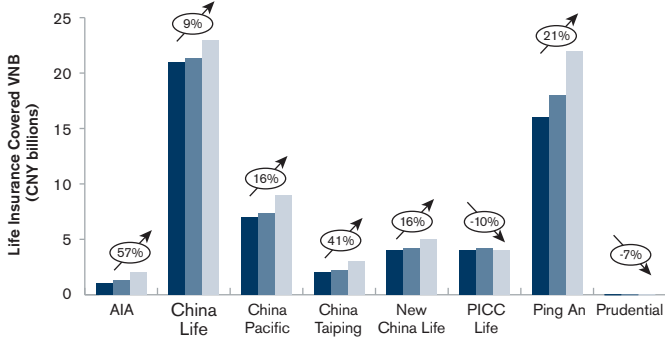


FIGURE 32: REPORTED APE OF CHINESE INSURANCE OPERATIONS, 2012-2014

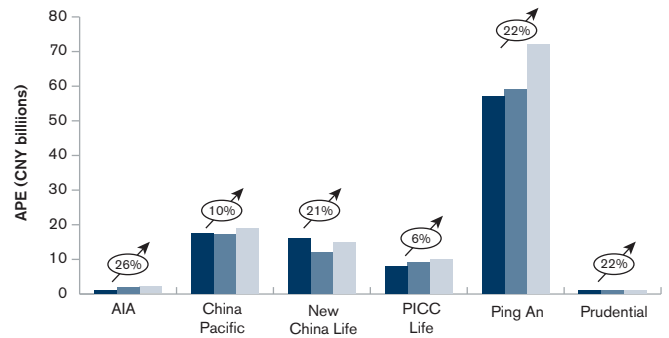
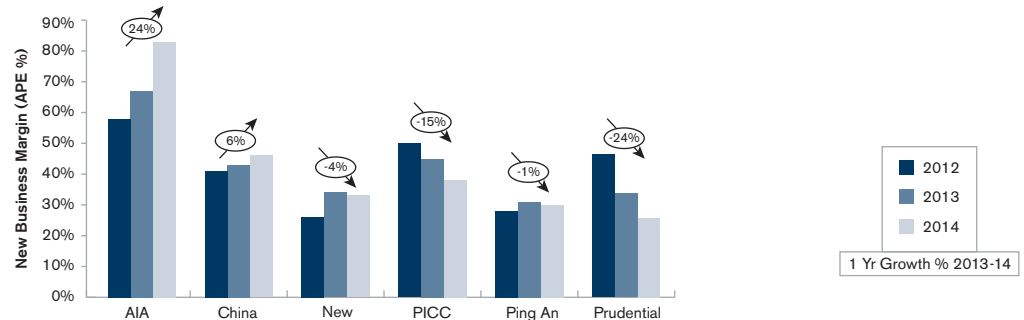


FIGURE 33: REPORTED NEW BUSINESS MARGINS OF CHINESE INSURANCE OPERATIONS, 2012-2014





Six companies reported 2014 EV results in China, all of which managed double-digit growth for the year. China Taiping reported the largest growth at 48%, followed by China Life at 33%, and New China Life at 32%. Prudential only discloses VNB results for its China joint venture, which have also been included in the analysis.

A key driver of the improved EV results has been the low interest rate environment—decreasing interest rates, all else being equal, will increase the value of the fixed income assets on the balance sheet, thereby increasing the ANW. For example, approximately 77% of the increase in EV for China Life is attributable to increases in ANW, driven primarily by declining interest rates and increased equity markets. This is further highlighted in Figures 17 and 18 above, showing the predominant growth in ANW in comparison with VIF. While interest rates decreased by around 100 bps in a near parallel shift from year-end 2013 to 2014, most insurers made little or no adjustments to their investment return assumptions (most of the domestics assumed a grading up of returns to a similar ultimate level). Given that there was little reduction in investment returns assumed, there was generally little negative impact on VIF.

A further important factor in the increase of EV is the growth in VNB, which has been driven largely by increased volumes of business and increased new business margins associated with an industry shift away from bancassurance and toward agency. Excluding PICC Life and Prudential, insurers reported significant growth in VNB for 2014. AIA recorded the largest growth in VNB for 2014, which was predominantly due to its product and distribution strategies (it has less exposure to the bancassurance channel and has instead focused more on agency). PICC Life's decrease in VNB is primarily driven by a reduction in regular premium new business, which was down 7.9%<sup>42</sup> year-on-year, and also by deterioration in its persistency experience.

A particular characteristic of the Chinese life insurance market is the low profitability of the bancassurance channel. In February 2014 the China Insurance Regulatory Commission (CIRC), the insurance regulator, introduced a new circular for bancassurance practices, which included requirements for further consumer protection and increased sales of protection and long-term savings products instead of pure investment products. Depending on the success of the shift to protection, this could potentially increase bancassurance margins. Included in the same circular is a cap on the number of insurance partners that each bank outlet or business office may select of three. This move has limited bancassurance channel access for foreign insurers, as domestic banks have generally shown a preference for domestic insurance partners.

In distribution, of particular interest is the online direct channel, which saw premiums grow by 549%<sup>43</sup> in 2014. Although online currently only makes up less than 2% of total life insurance premiums, this proportion is likely to grow, which is due to government encouragement of Internet commerce. For example, in 2014 CIRC issued an Internet-only license to Zhong An Insurance, a cooperation between Ping An, Tencent, and Alibaba.

The most important regulatory change in China in recent times is the introduction of the new risk-based capital solvency regime, China Risk Oriented Solvency System (C-ROSS), in 2016. Similar to Solvency II, it is built on a three-pillar framework encompassing quantitative capital requirement, qualitative supervisory requirement, and market discipline mechanism. Though conceptually similar to Solvency II, C-ROSS has avoided mandatory complicated modelling requirements on risks, emphasising instead the risk management aspects of solvency regulation.

The introduction of C-ROSS is likely to result in:

- Increased solvency ratio volatility, which is due to increased emphasis on managing market and interest rate risks.
- Given the lack of long-term fixed income assets in China, traditional savings products will become more capital-intensive, which is due to asset/liability mismatches. This could potentially shift the market toward more protection and linked products.
- Changing new business margins, although the precise impact on each insurer will depend on its product mix, asset mix, and capital management strategy.

For more in-depth information and analysis on C-ROSS, please refer to our detailed analysis located at <http://www.milliman.com/insight/Periodicals/asia-ealrt/Quantitative-Capital-Requirement-for-Life-Insurers-under-C-ROSS/>.

42 Source: PICC Life Investor Presentation.

43 Source: CIRC

HONG KONG

FIGURE 34: REPORTED EV OF HONG KONG INSURANCE OPERATIONS, 2012-2014

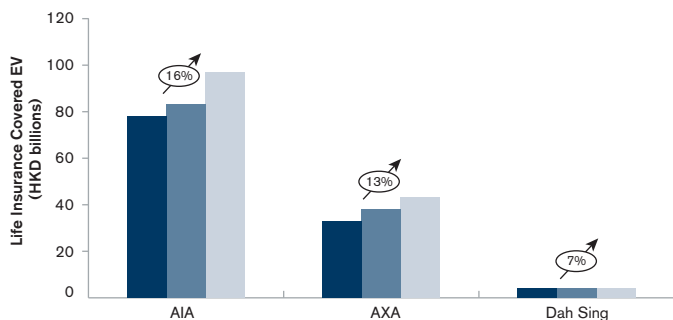


FIGURE 35: REPORTED ANW OF HONG KONG INSURANCE OPERATIONS, 2012-2014

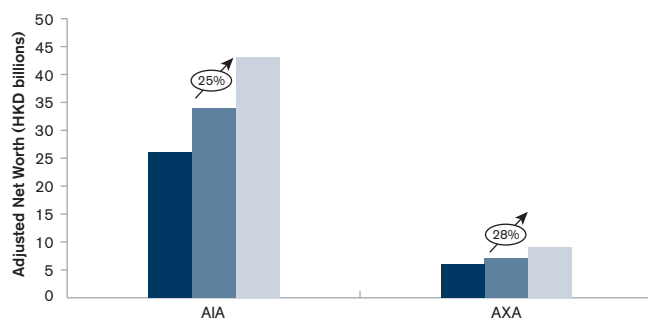


FIGURE 36: REPORTED VIF OF HONG KONG INSURANCE OPERATIONS, 2012-2014

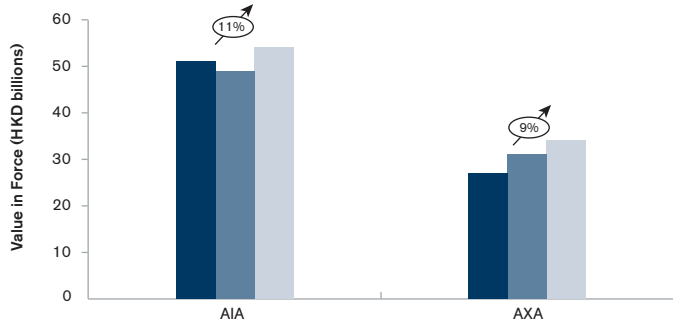


FIGURE 37: REPORTED VIF/ANW SPLIT OF HONG KONG INSURANCE OPERATIONS, 2014

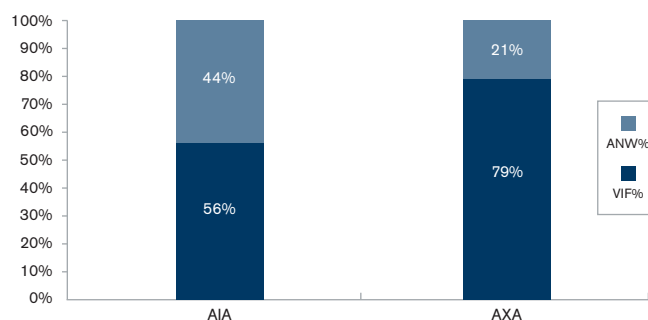


FIGURE 38: REPORTED VNB OF HONG KONG INSURANCE OPERATIONS,<sup>44</sup> 2012-2014

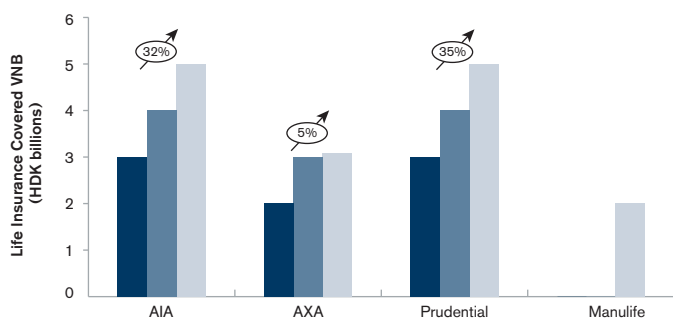


FIGURE 39: REPORTED APE OF HONG KONG INSURANCE OPERATIONS, 2012-2014

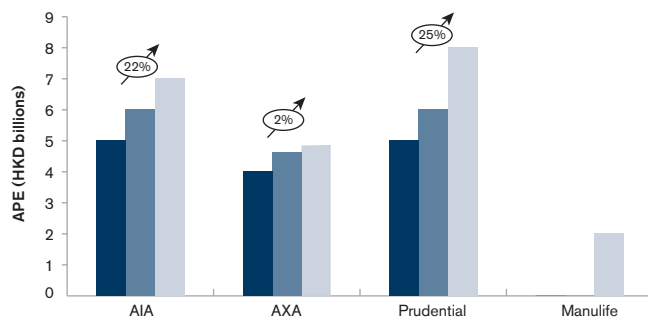
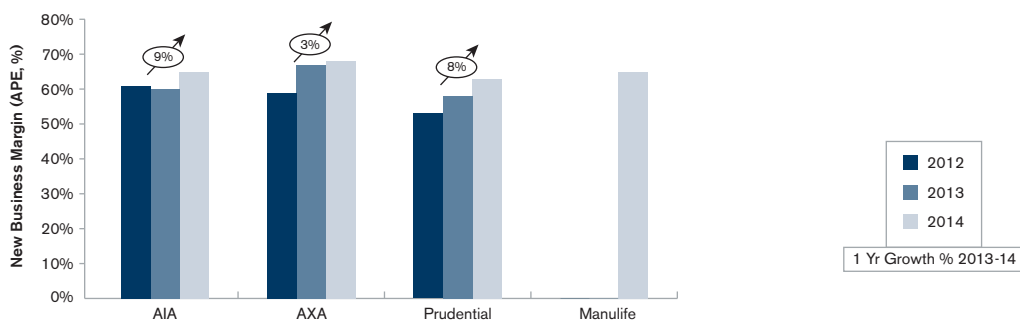


FIGURE 40: REPORTED NEW BUSINESS MARGIN OF HONG KONG INSURANCE OPERATIONS, 2012-2014



44 Manulife began disclosing VNB for its Asian operations in 2014.

---

Only three insurers currently disclose EV results for their Hong Kong operations separately, namely AIA, AXA, and Dah Sing, although Prudential and Manulife (the latter from 2014 onwards) disclose VNB and new business margins.

Both AIA and AXA have seen a steady increase in EV over the past three years, with ANW rising faster than VIF in 2014. The increase in ANW is driven mainly by a decrease in the long-term yield curve (thereby increasing the market value of fixed income assets). Meanwhile, the increase in VIF has been partly due to positive experience variances and the ability of companies to adjust bonus/dividend levels to protect in-force profit streams and to continue to write profitable new business despite various market challenges. For insurers with sufficient scale or those operating successfully in profitable niches, new business margins in Hong Kong continue to be amongst the highest in Asia (as can be seen by Figure 15 above).

Prudential and AIA saw strong growth in VNB in Hong Kong in 2014. Manulife separately disclosed VNB and new business margins for its Hong Kong operations for the first time this year as part of its enhanced EV disclosures for Asia.

The Hong Kong life insurance market benefitted in general from increased domestic demand and also from continued robust sales to mainland Chinese consumers visiting Hong Kong. According to the Office of the Commissioner of Insurance (OCI), the percentage of Hong Kong life insurance new business represented by mainland Chinese sales increased from 25% in 2013 to 28% in 2014.

Despite an overall rise in new business APE for many life insurers in Hong Kong during 2014, the market conditions were challenging for most players. There was increased regulatory scrutiny of the sale of investment-linked assurance scheme (ILAS) products, with stricter point of sales regulations and enhanced consumer disclosures. This led to a significant reduction in ILAS sales in 2014—a 10% reduction in individual-linked APE from 2013, according to data from the OCI.

Other factors driving VNB growth were:

- Increasing prevalence of protection type products
- A resurgence in participating product sales
- Increased productivity of tied agents
- Continued growth in bancassurance

It is somewhat surprising to see new business margins so similar between the four life insurers reporting results separately for Hong Kong. Although all four companies certainly have scale and sizeable agency forces, they report on a range of different TEV/EEV/MCEV bases across some different product lines and distribution strategies.

On the regulatory front, Hong Kong's new Independent Insurance Authority will be established in 2016, with the relevant bill currently being considered by Bills Committee in the Legislative Council. The proposed body will take over from the current government regulator, the OCI, and from the three self-regulatory bodies currently overseeing insurance intermediaries.

An important ongoing regulatory development is the establishment of a new risk-based capital (RBC) solvency regime in Hong Kong. A consultation paper was published by the OCI in September 2014 setting out the proposed framework, in broad terms, and the process for the development of the new rules. Implementation is not expected before 2017, as a second round of consultation is expected in 2015 and 2016. After the second round of consultation, the OCI has estimated it will take another two to three years before the appropriate legislation is passed. Whilst it is premature to speculate on the impact of the new RBC framework on EV reporting, the new rules will undoubtedly affect both the EV and VNB of all life insurers operating in Hong Kong.

For more information on the new RBC framework in Hong Kong, please refer to the Milliman e-Alert published in October 2014 at <http://www.milliman.com/insight/Periodicals/asia-ealert/Risk-based-capital-framework-for-the-insurance-industry-of-Hong-Kong/>.

INDIA

FIGURE 41: REPORTED EV OF INDIAN INSURANCE OPERATIONS, 2012-2014

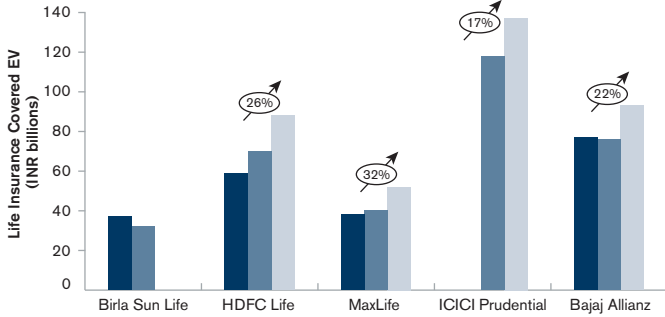


FIGURE 42: REPORTED ANW OF INDIAN INSURANCE OPERATIONS, 2012-2014

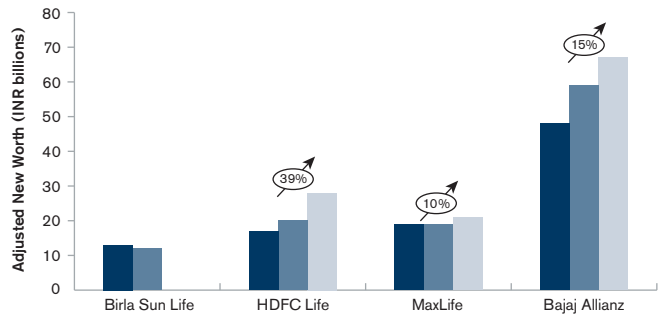


FIGURE 43: REPORTED VIF OF INDIAN INSURANCE OPERATIONS, 2012-2014

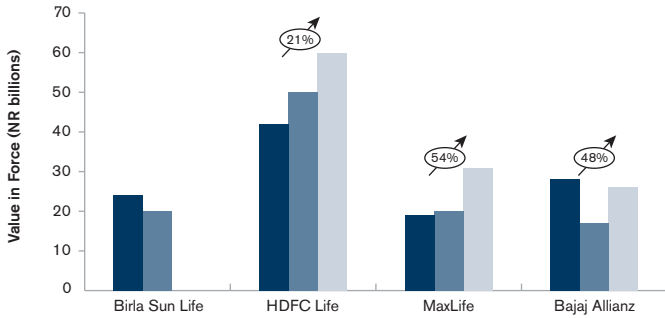


FIGURE 44: REPORTED VIF/ANW SPLIT OF INDIAN INSURANCE OPERATIONS, 2014

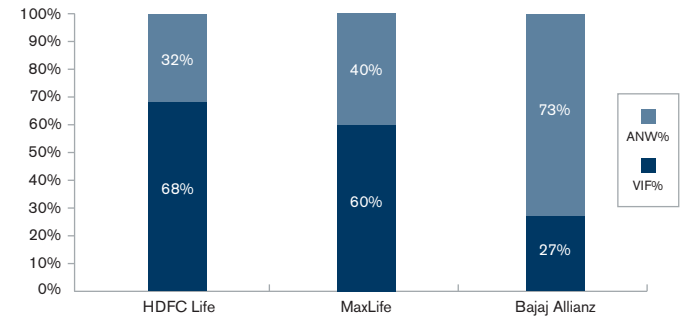


FIGURE 45: REPORTED VNB OF INDIAN INSURANCE OPERATIONS, 2012-2014

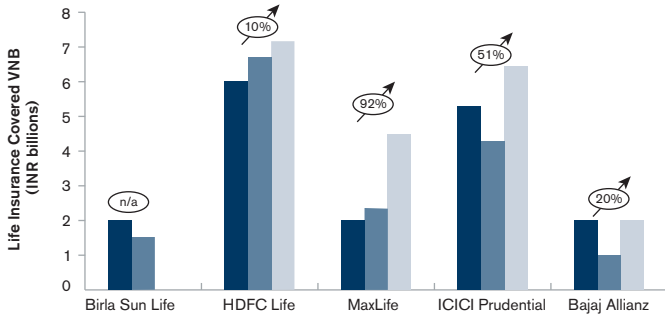


FIGURE 46: REPORTED APE OF INDIAN INSURANCE OPERATIONS, 2012-2014

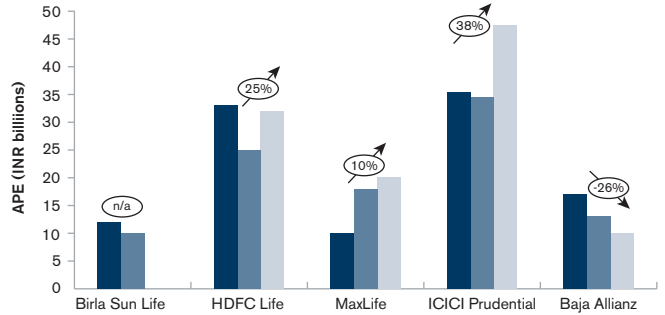
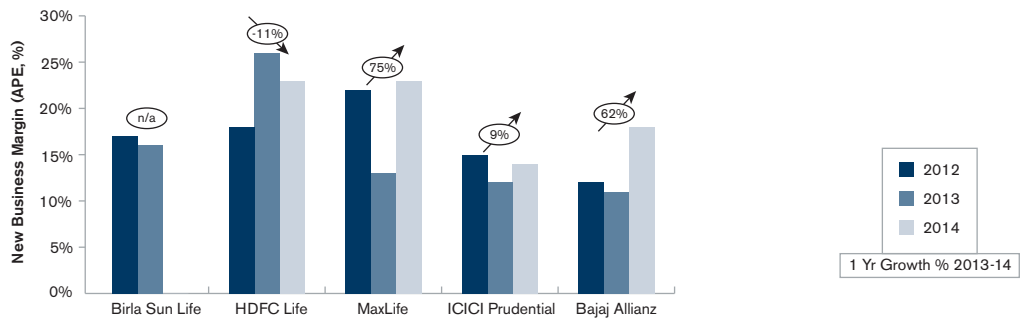


FIGURE 47: REPORTED NEW BUSINESS MARGIN<sup>45</sup> OF INDIAN INSURANCE OPERATIONS, 2012-2014



45 The VNB used to calculate the new business margins are before expense overruns.

---

Several companies disclose EV and/or VNB results in India. Our analysis focuses on disclosures by the domestic life insurance companies or their domestic promoters. Some companies such as Birla Sun Life have chosen to prepare disclosures using TEV methodology. Others such as HDFC Standard Life and Bajaj Allianz Life use market-consistent approaches. Although in the past ICICI Prudential Life has disclosed results using a TEV methodology, its latest disclosures are in accordance with APS10 using IEV methodology, an approach which is market-consistent.

Similarly, Max Life has, in the past, disclosed results based on an EEV basis. However, the company's latest disclosure was based on a market-consistent approach akin to MCEV, but with a clear statement that it was 'not intended to be compliant with the MCEV Principles...or the APS10 (IEV)...' Max Life has not provided a comparison of VNB between its EEV and MCEV results, but has provided a comparison of its VIF and ANW as at 31 March 2014 (FY 2013 by the definition in this report). The transition to MCEV resulted in an increase in VIF of 22%.

The 2014 disclosures (as at 31 March 2015) were the first to highlight expected new business margins in the industry, taking into account the impact of recent product-related regulatory changes. New business margins have typically been reported in the range of 13% to 23% depending on methodology and before the impact of acquisition expense overruns. It is important to note, however, that expense overruns are significant for most companies. Only the large companies have eliminated maintenance expense overruns, although acquisition expense overruns continue. Disclosures under APS10 are expected to be performed using current levels of expenses and hence disclosed new business margins are not expected to factor in the impact of future expense improvements.

The impact of acquisition overruns on disclosed VNB and new business margins are as follows:

- HDFC Life's VNB decreased from INR 7.4 billion to INR 5.9 billion, leading its new business margins to decrease from 23.4% to 18.5%.
- ICICI Prudential's VNB<sup>46</sup> decreased from INR 6.42 billion to INR 2.7 billion, which caused its new business margin to drop from 13.6% to 5.7%.
- Max Life's VNB reduced from INR 4.6 billion to INR 4.23 billion, causing its new business margin to decrease from 23.4% to 21.5%.
- Bajaj Allianz disclosed the impact of expense overruns on its overall EV, but did not separately disclose its impact on the VNB. The stated impact on their EV was INR 2.6 billion.

Insurance company valuation is attracting a lot of interest currently following the passing of the Insurance Laws (Amendment) Act, 2015, permitting foreign companies to increase their levels of equity from 26% to 49%. This is likely to see the realignment of shareholding in many of the 23 private life insurance companies. We may also see some IPOs from the larger companies, which would significantly enhance the level and quality of disclosures in the market (which would need to strictly follow the requirements of APS10).

One draft proposal for possible regulatory change sitting with the Insurance Regulatory and Development Authority of India (IRDAI) that could impact significantly on future valuations is the proposal for companies to limit expenses allocated to insurance funds, especially participating funds. An earlier proposal for banks to adopt an open architecture model of distribution has recently been amended to allow the continuation of the current corporate agency model, with no limits on the business to be sourced through insurance partners.

For more in-depth information and analysis on the Insurance Laws (Amendment) Bill of 2014, please refer to our analysis, available at <http://in.milliman.com/insight/Periodicals/asia-ealert/The-Insurance-Laws-Amendment-Bill--2014/>.

---

<sup>46</sup> Based on IEV.

INDONESIA

FIGURE 48: REPORTED VNB OF INDOONESIAN INSURANCE OPERATIONS, 2012-2014

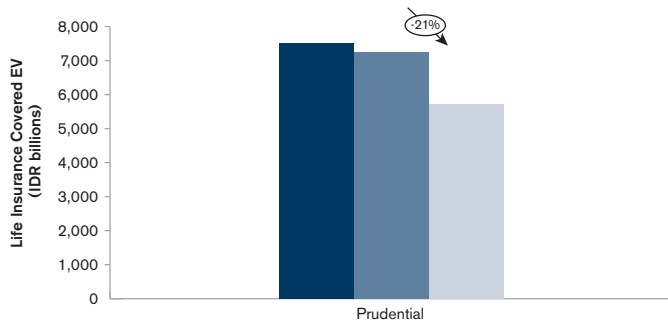


FIGURE 49: REPORTED APE OF INDOONESIAN INSURANCE OPERATIONS, 2012-2014

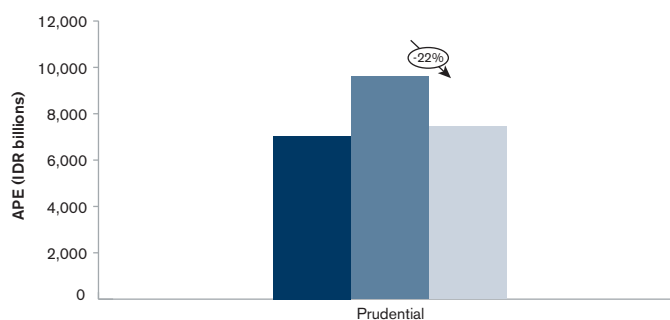
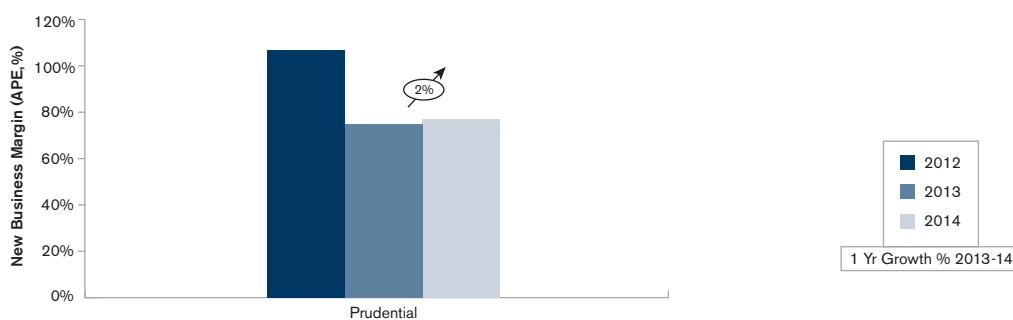


FIGURE 50: REPORTED NEW BUSINESS MARGIN OF INDOONESIAN INSURANCE OPERATIONS, 2012-2014



Unfortunately, no insurance company publicly discloses EV for Indonesia. Prudential discloses its VNB and new business margins, and, while Bank Mandiri has made some disclosures for AXA Mandiri in the past, there have been no disclosures since 2012.

Prudential Indonesia boasts one of its highest new business margins in the region. We understand this is also the situation for other MNCs that have achieved economies of scale in Indonesia, although results are not disclosed. Prudential reported a new business margin of over 100% for 2012, declining to 77% in 2014. Prudential's decline of VNB in 2014 is explained almost entirely by a commensurate decline in APE, with new business margins relative to 2013 remaining stable.

The most significant regulatory development in 2014 for Indonesia was the passing of the new Insurance Law in September 2014. Among its key provisions are:

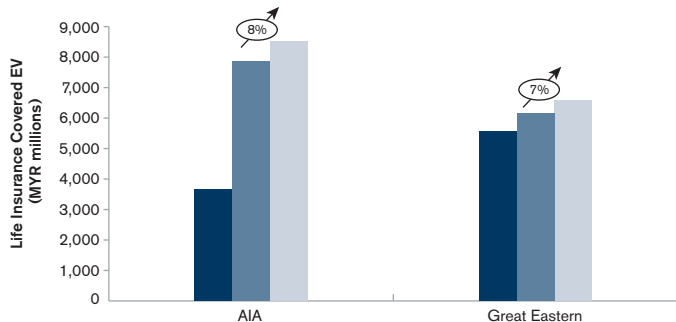
- The requirement for a single presence—each person or legal entity can only be a controlling shareholder in one life/general/reinsurance/Shariah insurance company, with a requirement for this to be effected within a three-year period.
- The mandatory spin-off of Shariah businesses within 10 years.
- The introduction of a policyholder protection mechanism in the case of an insurer being liquidated or otherwise unable to operate (e.g., license revoked).
- Clarity on legal structures and ownership of insurance companies, where Indonesian shareholders must hold at least 20% of the issued capital of insurers.

The new Insurance Law is unlikely to impact on EV and new business margins significantly. Of greater significance at the moment is the ongoing scarcity of human capital in the market, driving up the costs of recruitment and replacing key personnel. Increased competition within bancassurance channels in particular, with insurers looking to recruit and increase the number of in-branch sales consultants, is increasing expenses and adversely affecting new business margins for some companies.

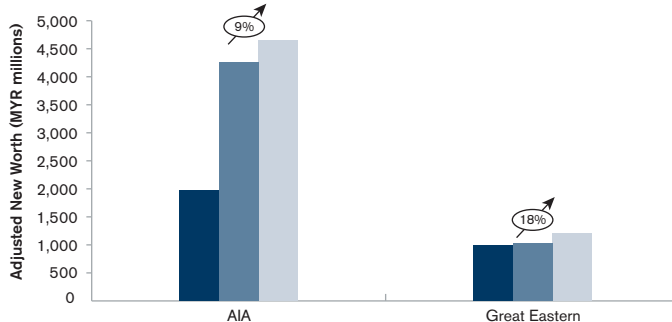
For more information and analysis on the new Insurance Law of 2014, please refer to our e-Alert at <http://www.milliman.com/insight/Periodicals/asia-ealert/Indonesia-New-insurance-bill-passed-in-September-2014/>.

**MALAYSIA<sup>47</sup>**

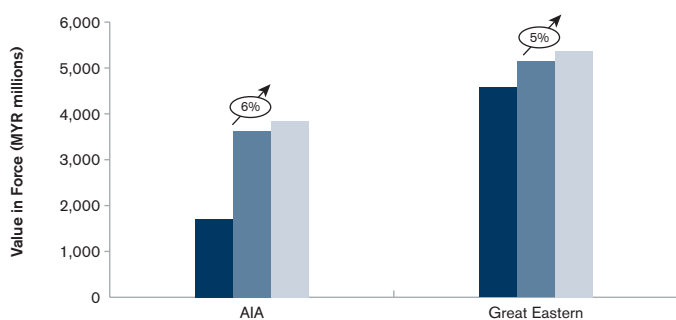
**FIGURE 51: REPORTED EV OF MALAYSIAN INSURANCE OPERATIONS, 2012-2014**



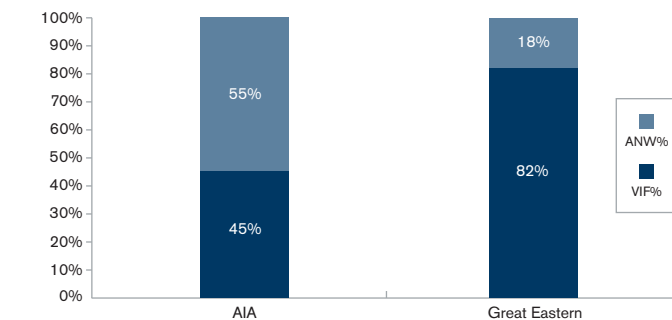
**FIGURE 52: REPORTED ANW OF MALAYSIAN INSURANCE OPERATIONS, 2012-2014**



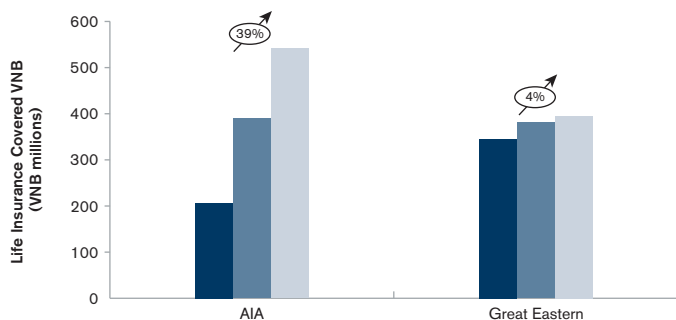
**FIGURE 53: REPORTED VIF OF MALAYSIAN INSURANCE OPERATIONS, 2012-2014**



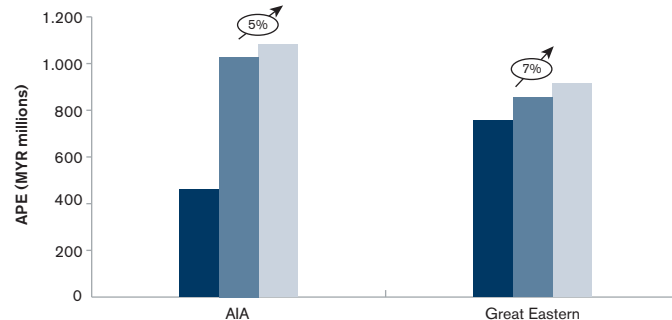
**FIGURE 54: REPORTED VIF/ANW SPLIT OF MALAYSIAN INSURANCE OPERATIONS, 2014**



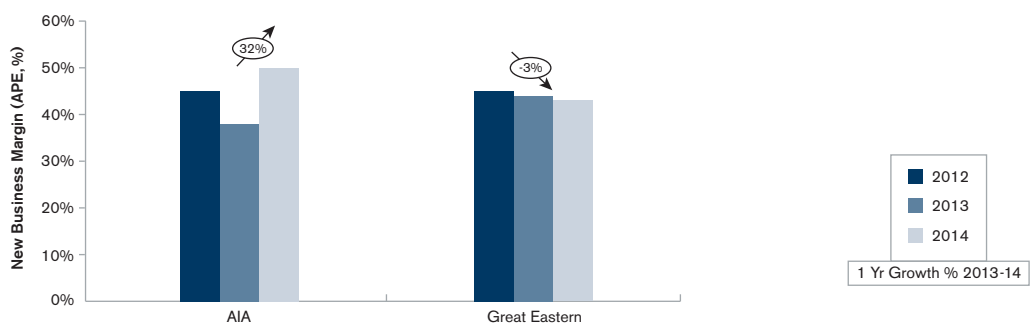
**FIGURE 55: REPORTED VNB OF MALAYSIAN INSURANCE OPERATIONS, 2012-2014**



**FIGURE 56: REPORTED APE OF MALAYSIAN INSURANCE OPERATIONS, 2012-2014**



**FIGURE 57: REPORTED NEW BUSINESS MARGIN OF MALAYSIAN INSURANCE OPERATIONS, 2012-2014**



47 Note that the discussion in Malaysia is as per the disclosures.

---

Only Great Eastern and AIA disclose EV and VNB results in Malaysia. Prudential Malaysia's results are not disclosed (it is part of an aggregated classification), but there is some disclosure of the underlying EV assumptions. The investment assumptions and RDRs for Great Eastern and AIA were unchanged between 2013 and 2014 disclosures.

The new business margins for both AIA and Great Eastern are similar, primarily driven by linked business, which accounts for 55% and 73% of their 2014 new business portfolios by APE, respectively. Linked business in Malaysia is typically packaged with protection riders. For AIA, much of the increase in new business APE for 2013 and 2014 has been attributed to the acquisition of ING's Malaysian operation, with AIA effecting changes in product mix through distribution previously managed by ING, primarily from switching to a greater proportion of protection and linked businesses.

In response to the lower interest rate environment, some insurers have been able to revise bonus rates downwards for their participating business, a practice that historically has proven to be difficult. The claims experience of medical riders has, however, been less favourable.

On the regulatory front, with the stated aims of achieving higher levels of insurance and Takaful penetration in Malaysia, increasing the professionalism of intermediaries, and enhancing the transparency around the provision of products and services to consumers, in November 2013 Bank Negara Malaysia (BNM) issued a concept paper, 'Life Insurance and Family Takaful Framework (Framework)', for public consultation.

For further in-depth information and analysis on the BNM concept paper, please refer to our discussion paper at <http://www.milliman.com/insight/Periodicals/asia-ealert/Malaysia-Life-Insurance-Family-Takaful-Framework-concept-paper/>.



SINGAPORE

FIGURE 58: REPORTED EV OF SINGAPOREAN INSURANCE OPERATIONS, 2012-2014

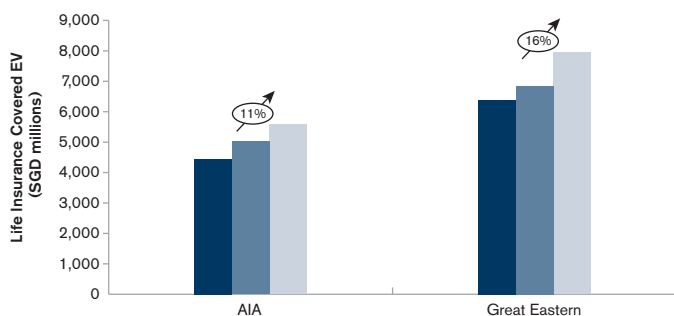


FIGURE 59: REPORTED ANW OF SINGAPOREAN INSURANCE OPERATIONS, 2012-2014

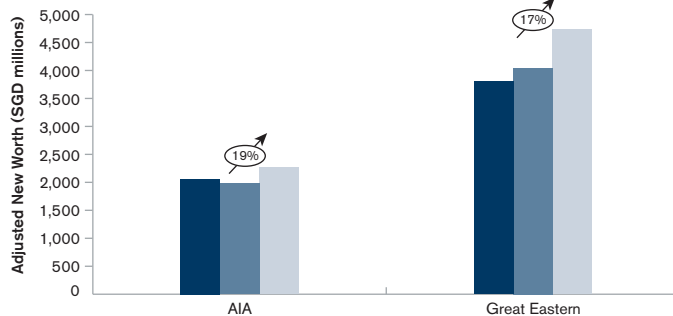


FIGURE 60: REPORTED VIF OF SINGAPOREAN INSURANCE OPERATIONS, 2012-2014

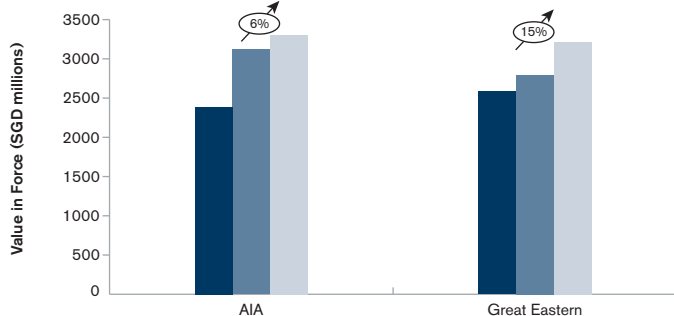


FIGURE 61: REPORTED VIF/ANW SPLIT OF SINGAPOREAN INSURANCE OPERATIONS, 2014

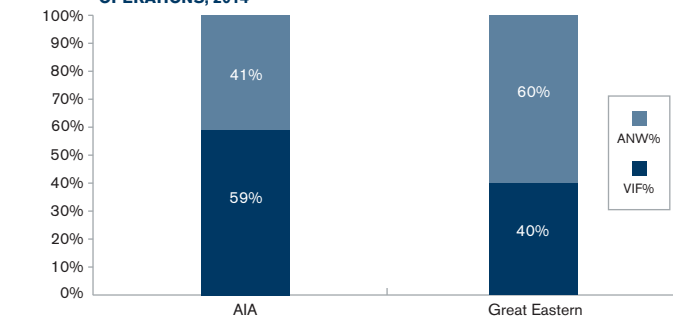


FIGURE 62: REPORTED VNB OF SINGAPOREAN INSURANCE OPERATIONS, 2012-2014

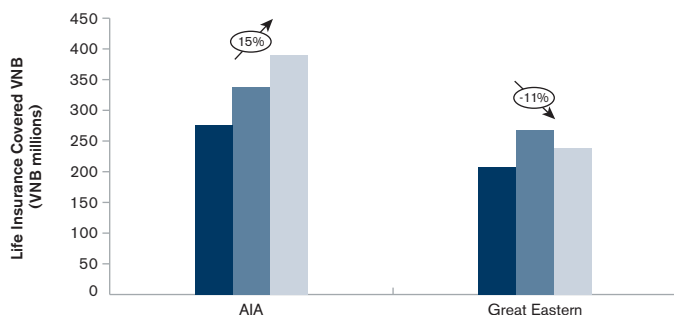


FIGURE 63: REPORTED APE OF SINGAPOREAN INSURANCE OPERATIONS, 2012-2014

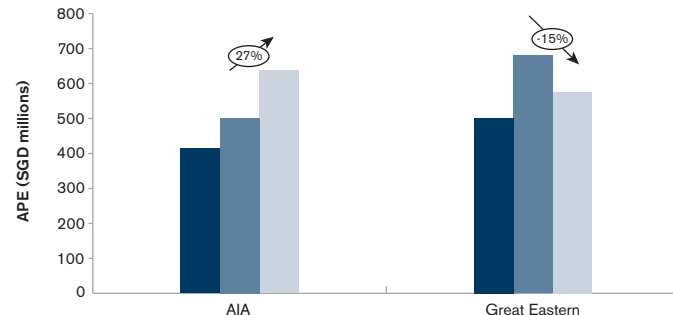
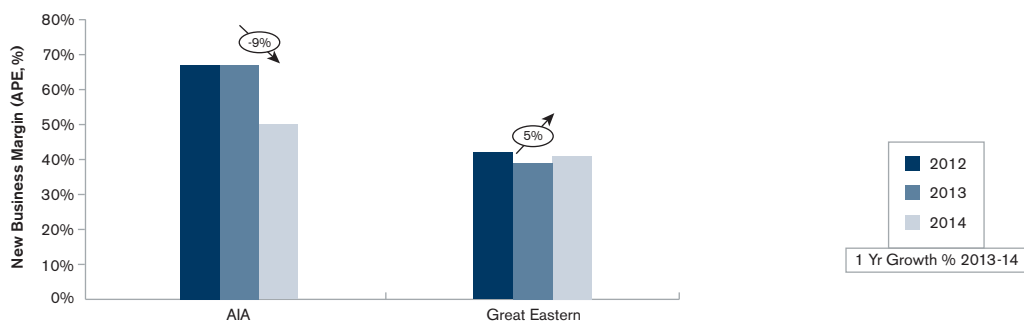


FIGURE 64: REPORTED NEW BUSINESS MARGIN OF SINGAPOREAN INSURANCE OPERATIONS, 2012-2014



---

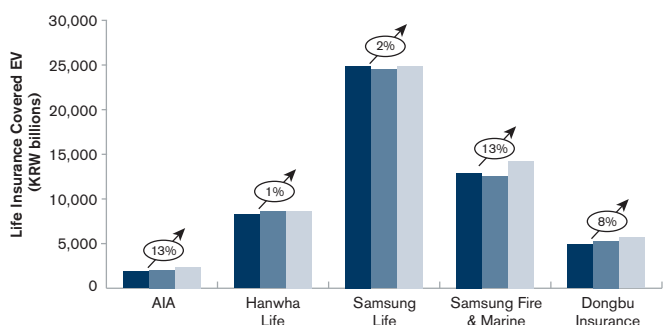
Great Eastern and AIA are the two companies that disclose EV and VNB results for Singapore. Prudential's results are not disclosed (it is part of an aggregated classification), but there is some disclosure of the underlying EV assumptions. The investment assumptions and RDRs for both Great Eastern and AIA were unchanged for 2013 and 2014 disclosures. Prudential reduced its risk discount rates from 5.3% (in-force) and 4.6% (new business) to 5% and 4.3% respectively, reflecting a similar 0.3% reduction in the Singaporean 10-year government bond yield.

Looking ahead, it will be interesting to see the impact that compulsory direct sales may have on margins (although volumes from direct sales for AIA and Great Eastern are likely to be insignificant as a proportion of total sales). The industry also awaits the latest consultation regarding RBC2, with a prospect that capital requirements in the future may be more onerous, particularly for participating and universal life business.

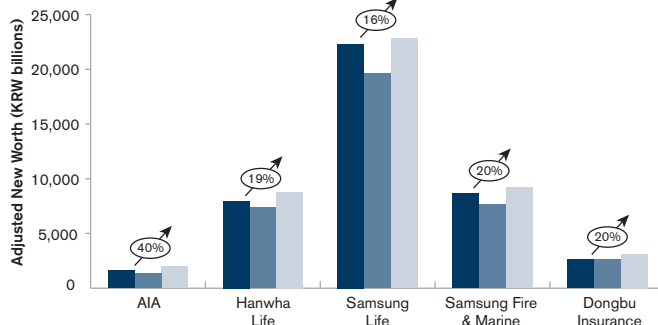
For more information on the recent RBC2 consultation, please see our e-Alert at <http://sg.milliman.com/uploadedFiles/insight/Periodicals/asia-ealert/singapore-rbc-2.pdf>.

**SOUTH KOREA**

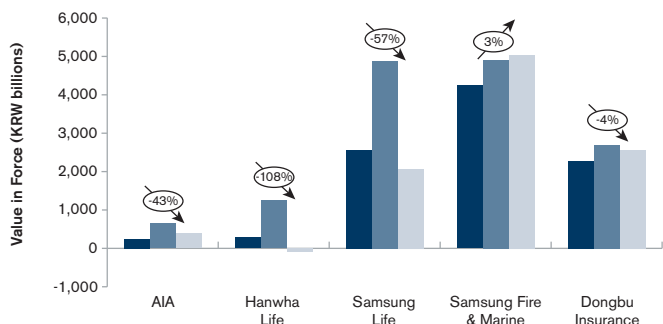
**FIGURE 65: REPORTED EV OF SOUTH KOREAN INSURANCE OPERATIONS, 2012-2014<sup>48</sup>**



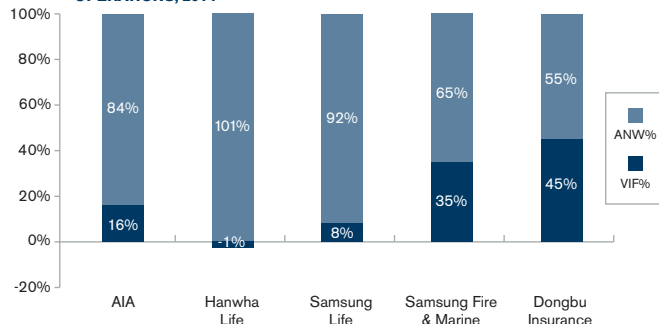
**FIGURE 66: REPORTED ANW OF SOUTH KOREAN INSURANCE OPERATIONS, 2012-2014**



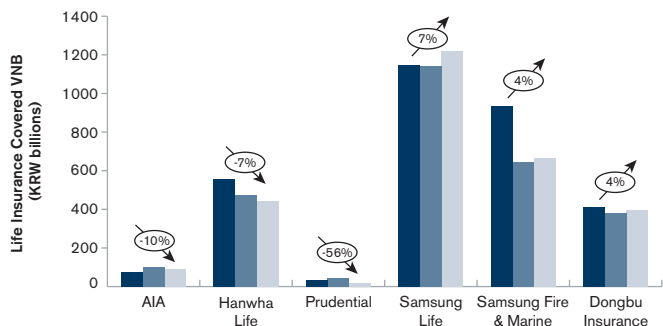
**FIGURE 67: REPORTED VIF OF SOUTH KOREAN INSURANCE OPERATIONS, 2012-2014**



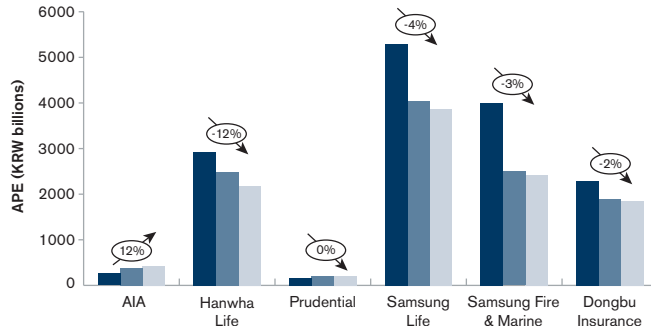
**FIGURE 68: REPORTED VIF/ANW SPLIT OF SOUTH KOREAN INSURANCE OPERATIONS, 2014**



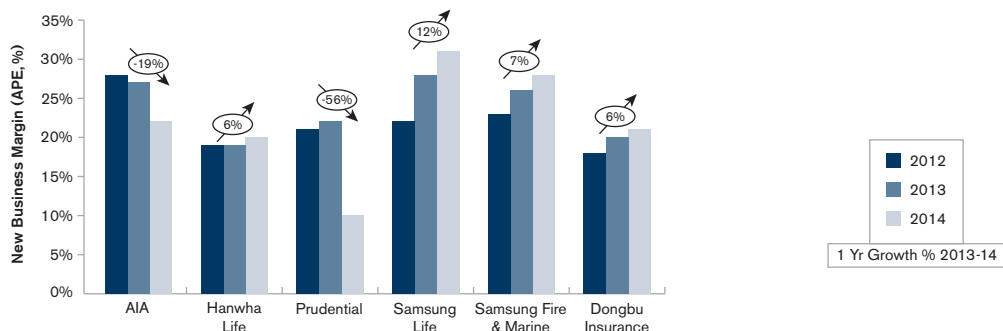
**FIGURE 69: REPORTED VNB OF SOUTH KOREAN INSURANCE OPERATIONS, 2012-2014**



**FIGURE 70: REPORTED APE OF SOUTH KOREAN INSURANCE OPERATIONS, 2012-2014**



**FIGURE 71: REPORTED NEW BUSINESS MARGIN OF SOUTH KOREAN INSURANCE OPERATIONS, 2012-2014**



48 Hanwha Life did not disclose the EV following dividends and share repurchases in 2014. As such, the values in Hanwha Life's EV are all prior to dividends and share repurchases in order to provide comparability year on year.

South Korean insurers, similar to those in other more developed economies around the world, are finding the sustained low interest rate environment particularly challenging. Declining interest rates have resulted in an uplift in fixed income asset values, with all Korean insurers reporting double-digit increases in their ANW (AIA reporting the largest gain of 47%). On the other hand, insurers have suffered material declines in VIF. Domestic insurers, which typically have large portfolios of savings and investment type products (such as Samsung Life and Hanwha Life), have been the hardest hit. These products are particularly sensitive to low interest rates, with 2014 representing another year where the interest margins (the difference between investment returns and the assumed interest rate (for pricing purposes) were negative.

Another primary driver of the decline in VNB during 2014 was reduced volumes in the first quarter, when the insurance regulator suspended direct marketing of insurance products in response to a consumer data privacy breach in an unrelated industry. Even after the three-month ban was lifted, the regulator increased its scrutiny of selling practices in the industry, including imposing new restrictions on direct marketing. This resulted in cost increases related to data security and compliance, as well as new business reductions, affecting the MNCs more than the domestics. This stifled the nascent recovery in life insurance premiums in 2014, following the decline of premiums in 2013 caused by changes in the tax laws rendering savings type products less attractive for the consumer.

As the MNCs saw their new business margins decrease, domestic insurers increased their margins, primarily from selling protection products rather than lower-margin investment-linked and savings products.

The South Korean regulator recently modified its RBC standards, which were first introduced in 2011. The key changes included:

- Requiring companies to calculate capital using a higher confidence level
- Introducing a longevity risk component
- Introducing the option for insurers to use an internal model

In addition to solvency requirements, the regulator has increased its focus on the risk management and corporate governance practices of South Korean insurers. This is partially in response to the aforementioned data security breach.

TAIWAN

FIGURE 72: REPORTED EV OF TAIWANESE INSURANCE OPERATIONS, 2012-2014

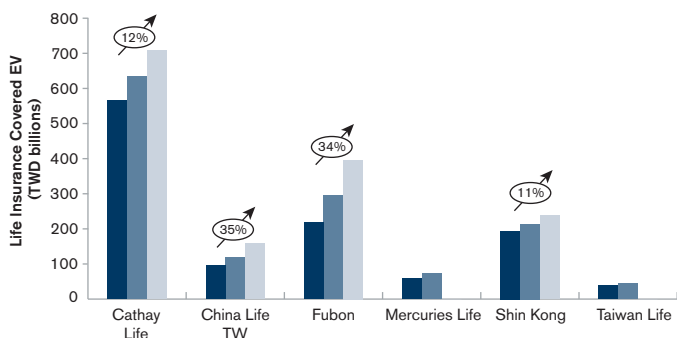


FIGURE 73: REPORTED ANW OF TAIWANESE INSURANCE OPERATIONS, 2012-2014

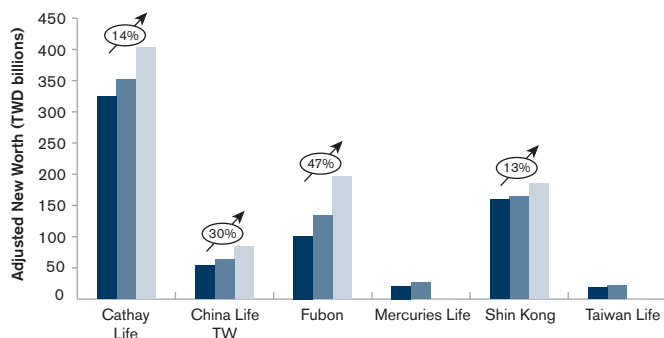


FIGURE 74: REPORTED VIF OF TAIWANESE INSURANCE OPERATIONS, 2012-2014

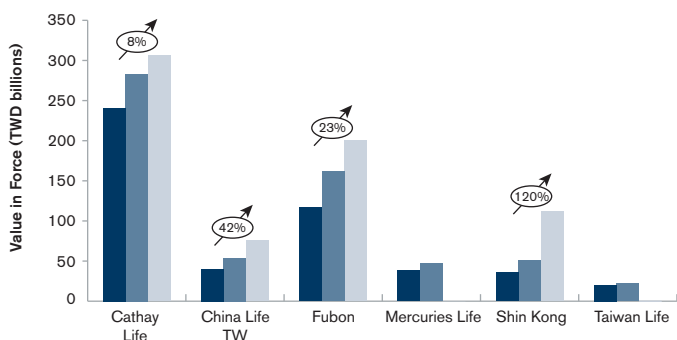


FIGURE 75: REPORTED VIF/ANW SPLIT OF TAIWANESE INSURANCE OPERATIONS, 2014

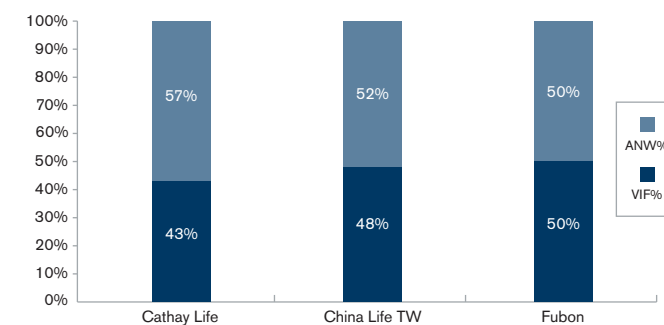


FIGURE 76: REPORTED VNB OF TAIWANESE INSURANCE OPERATIONS, 2012-2014

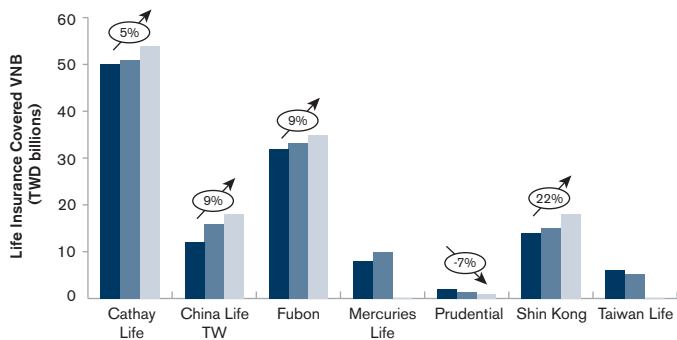


FIGURE 77: REPORTED APE OF TAIWANESE INSURANCE OPERATIONS, 2012-2014

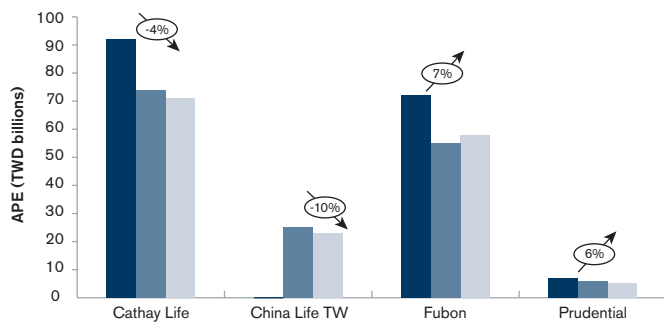
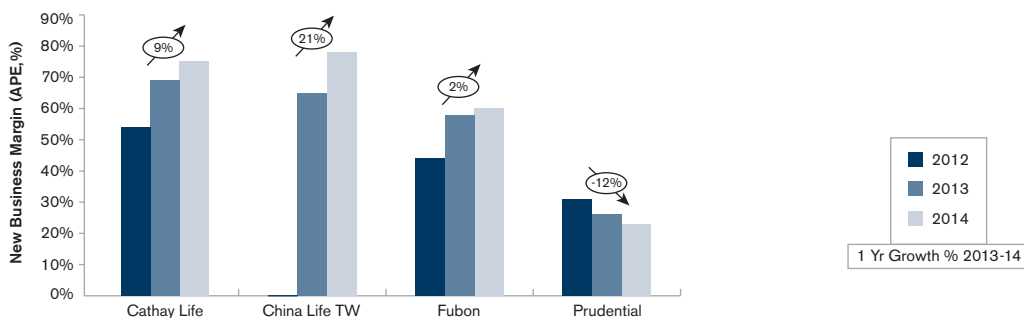


FIGURE 78: REPORTED NEW BUSINESS MARGIN OF TAIWANESE INSURANCE OPERATIONS, 2012-2014



---

Taiwan's life insurance market for years has been characterised by in-force blocks of business with high investment guarantees and low domestic fixed interest yields. Most life insurers have large foreign investment holdings, e.g., Cathay Life and Fubon Life have more than 50% of general account assets invested in higher-yielding US dollar and other foreign currency assets. Insurers also tend to have significant exposure to the domestic equity and real estate markets.

Taiwanese life insurance has been oriented to savings deposit products in the past. However, the regulator has taken very active measures to redirect sales away from single premium savings deposit replacement products in the past two years, in particular by making them either capital-punitive or prohibited by regulations. As a result, insurers have been gradually moving to regular premium products.

The top firms Cathay Life, Fubon Life, and China Life (Taiwan) have seen 2014 EV growth largely driven by increases in net asset values resulting from 2014 profits, unrealised capital gains (e.g., Cathay Life and Fubon Life), or by valuation gains in real estate holdings (e.g., China Life and Shinkong Life).

The large growth in VIF reported by Fubon Life (23%) and China Life (42%) in 2014 has been mainly due to the addition of profitable new business. Both companies have also reported significant contribution to VNB growth from a change in product mix.

The industry is hoping for a positive impact from the establishment of 'Overseas Insurance Units.' In June 2015, 12<sup>49</sup> insurance companies were approved to set up such businesses, which are provided tax and other regulatory incentives to start selling business to foreigners either visiting Taiwan or residing in Taiwan. This initiative is primarily aimed at sales to mainland Chinese tourists visiting Taiwan.

---

<sup>49</sup> Source: Financial Supervisory Commission.

THAILAND

FIGURE 79: REPORTED EV OF THAI INSURANCE OPERATIONS, 2012-2014

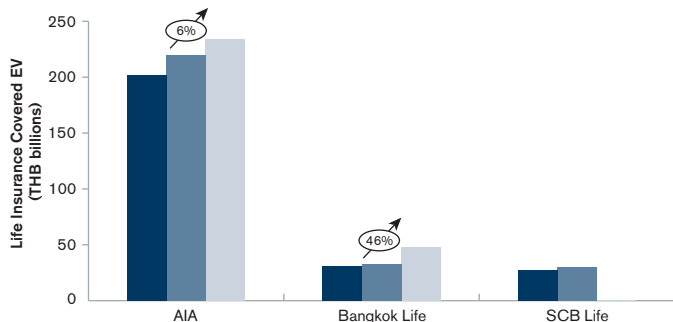


FIGURE 80: REPORTED ANW OF THAI INSURANCE OPERATIONS, 2012-2014

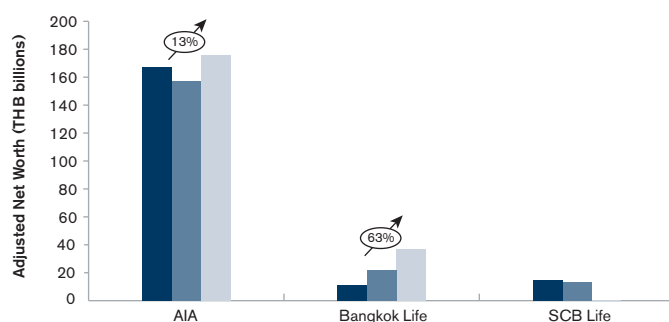


FIGURE 81: REPORTED VIF OF THAI INSURANCE OPERATIONS, 2012-2014

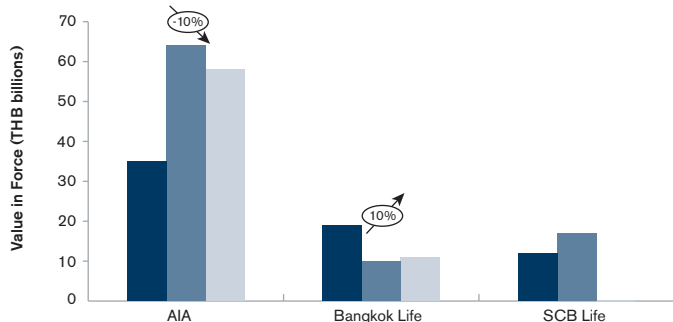


FIGURE 82: REPORTED VIF/ANW SPLIT OF THAI INSURANCE OPERATIONS, 2014

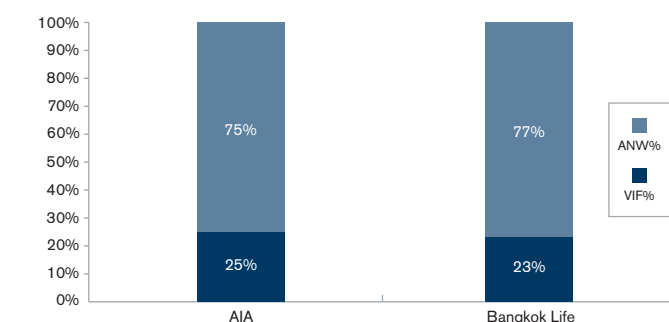


FIGURE 83: REPORTED VNB OF THAI INSURANCE OPERATIONS, 2012-2014

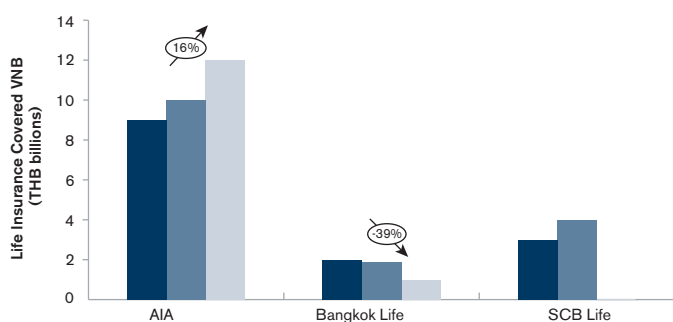


FIGURE 84: REPORTED APE OF THAI INSURANCE OPERATIONS, 2012-2014

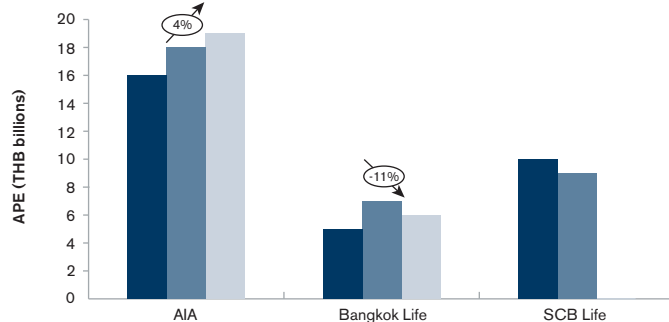
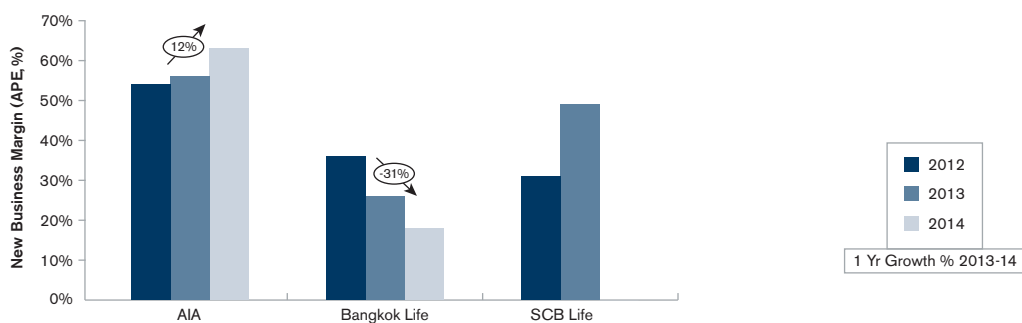


FIGURE 85: REPORTED NEW BUSINESS MARGIN OF THAI INSURANCE OPERATIONS, 2012-2014



Three life insurance companies have disclosed their EV and VNB results in recent years in Thailand, namely AIA, Bangkok Life, and SCB Life. SCB Life delisted from the Stock Exchange of Thailand in May 2015 and has not disclosed its 2014 EV and VNB results, although the company's 2012 to 2013 results have been included in this section for reference. The EV and VNB disclosures highlight some important developments impacting the Thai life insurance industry.

Fixed interest yields have been on a downward trend, as evidenced by the chart in Figure 75 showing Thailand 10-year government bond yield since the start of 2014.

**FIGURE 86: HISTORICAL 10 YEAR THAILAND GOVERNMENT BOND YIELDS**



Source: Thai Bond Market Association.

The depressed investment climate has led to some market players reducing investment return assumptions in their 2014 EV disclosures. AIA reduced long-term 10-year government bond yield and long-term equity return assumptions by 25 bps to 3.62% p.a. and 9.37% p.a. respectively, along with a 25 bps reduction in risk discount rates to 9.00%. Bangkok Life cut its investment return assumption from 5.00% p.a. to 4.75% p.a. in its 2014 EV reporting.

It is interesting to note the different impact of lower interest rates on the 2014 year-end EV results for AIA and Bangkok Life. AIA's ANW rose by 13% in 2014, whilst its VIF fell by 10%, which was largely due to the lower fixed interest rate environment. Bangkok Life saw a much larger rise in ANW, 63%, but also showed an increase in VIF of 10%.

For some companies, the low interest rate environment has resulted in rises in gross premium valuation (GPV) reserves and increases in market risk charges within their RBC calculations, leading to increasing cost of capital in their EV and VNB reporting.

Another important market development in Thailand over recent years has been the explosive growth of bancassurance, with insurers such as Muang Thai Life, Bangkok Life, SCB Life, and Krungthai-AXA Life showing strong sales. However, there are signs of increasing margin compression in the bancassurance channel, including instances of some banks carrying out 'tactical' campaigns to sell large volumes of short-term endowment products in order to boost fee income, often with low or no margin for the insurer.

AIA has seen steady growth in VNB despite relatively flat new business APE. Its new business margins have been boosted by increases in agency productivity and by changes in the product mix toward greater focus on higher-margin protection products. Agency-focused players such as AIA have benefited from margin enhancement from successful attachment of profitable protection riders, which has been more difficult to achieve for many of the bancassurance-focused insurers.

For more detailed analysis on riders in Asia, please refer to the 'Milliman Asia Rider Survey 2015' at <http://www.milliman.com/insight/Periodicals/asia-ealert/Milliman-Asia-Rider-Survey/>.

The Thai insurance regulator is currently undergoing consultation around proposed changes to its RBC regime. Under the Thai 'RBC 2' proposals, various changes to the prevailing RBC bases have been recommended, including recalibrating risk charges and moving over time from a 95% to a 99.5% confidence level for the determination of risk charges and minimum capital requirements. A transitional period of one to two years has been proposed for Thai RBC 2 implementation, during which time insurers will be required to carry out parallel runs on both the old and new bases. Based on industry test results, the proposed shift to a 99.5% confidence interval would lead to a reduction in overall capital adequacy ratios for the Thai life insurance industry.

The life insurance landscape in Thailand has been historically dominated by products offering investment guarantees, with much lower penetration of linked, universal life, or participating business with meaningful levels of non-guaranteed benefits than seen in most other markets in Asia. If the depressed interest rate climate continues, there is likely to be increasing attention given to expanding product portfolios to reduce market risk.



---

## METHODOLOGY HOT TOPICS

Within Asia, there are two tiers of companies publicly reporting EV: those reporting TEV and the remaining reporting EEV, IEV, or MCEV. The latter tend to be subsidiaries or joint ventures of European and Japanese insurers.

For all types of EV reporting, common hot topics in Asia include:

- The selection and construction of the appropriate RDR
- The selection of appropriate investment rate assumptions
- Allowance for the impact of cost/expense overruns
- How to explicitly or implicitly allow for the cost of capital
- Calculation of TVOG

### Construction of RDR

The selection of risk discount rate (RDR) is one of the most important considerations for EV calculations. Broadly, there are three main methodologies behind discount rate derivation:

1. A single discount rate applied to all periods, calculated using a benchmark risk-free rate plus risk margin or adjusting an assumed investment return.
2. A 'top-down' approach whereby a discount rate or curve is constructed by adjusting the expected portfolio returns by considering the risks that the company is exposed to, and applying this discount rate/curve to every cash flow.
3. A 'bottom-up' approach whereby a risk-free rate plus risk margin curve is constructed for each cash flow or group of cash flows, with due consideration to the risk exposure of each cash flow. Where cash flows have an equivalent liquid and listed asset, the discount rate will be set to the implied yield of the asset. In IEV and MCEV, the risk margin typically only includes the liquidity premium.

These three methods roughly correspond to the TEV, EEV, and IEV/MCEV approaches, although the majority of companies that report using EEV also now adopt a 'bottom-up' approach.

In addition to the derivation methodology, there are three further major considerations:

1. The *underlying basis* for the RDR.
2. The inclusion of any *illiquidity premium*.
3. The *interpolation/extrapolation* method used to construct a discount curve (typically applicable only to EEV and MCEV companies).

The three considerations described above generally only apply to firms using EEV, IEV, and MCEV reporting. For TEV-reporting firms, the generally accepted approach is to use an underlying risk-free rate (such as a long-dated government bond), and apply an additional risk margin—a popular subset of this approach includes the capital asset pricing model (CAPM). The main consideration for TEV firms is the calculation of the risk margin, meant to encompass factors which are explicitly accounted for in EEV, IEV, and MCEV; that is, the cost of capital and TVOG.

Figure 76 summarises the RDR and investment return assumptions by the MNCs (both foreign and Asian MNCs). Figure 77 summarises the assumptions by market.

**FIGURE 87: RDR AND INVESTMENT RETURN ASSUMPTIONS OF MNCs**

TYPE	COMPANY	EV PRINCIPLE	RDR	INVESTMENT RETURNS
MNC	Ageas	EEV	Swap rates + volatility adjustment	Equity: +300 bps above reference rate. Real estate: +200 bps above reference rate. Debt securities: Based on actual cash flows
	AIA	TEV	China: 9.8% Hong Kong: 7.0% Indonesia: 13.0% Korea: 9.5% Malaysia: 8.8% Philippines (Philam Life): 10.5% Singapore: 6.8% Sri Lanka: 18% Taiwan: 7.8% Thailand: 9.0 % Vietnam: 13.8%	China: Equities 9.49%, 10-Year Gov't Bonds 3.74% Hong Kong: Equities 7.55%, 10-Year Gov't Bonds 2.5% Indonesia: Equities 12.25%, 10-Year Gov't Bonds 7.5% Korea: Equities 6.94%, 10-Year Gov't Bonds 3.6% Malaysia: Equities 8.75%, 10-Year Gov't Bonds 3.99% Philippines: Equities 9.16%, 10-Year Gov't Bonds 4% Singapore: Equities 7%, 10-Year Gov't Bonds 2.23% Sri Lanka: Equities 14%, 10-Year Gov't Bonds 12.33% Taiwan: Equities 6.62%, 10-Year Gov't Bonds 1.48% Thailand: Equities 9.37%, 10-Year Gov't Bonds 3.62% Vietnam: Equities 13.8%, 10-Year Gov't Bonds 8.0%
	Allianz	MCEV	Swap rates – credit risk adjustment + volatility adjustment	Equity: +500 bps above reference rate. Real estate: +200 bps x reference rate.
	Aviva	MCEV	Swap rates + liquidity premium	Equity: +350 bps above reference rate. Real estate: +200 bps above reference rate.
	AXA	EEV	Swap rates + liquidity premium	n/a: Risk-neutral projection in line with MCEV principles.
	Great Eastern	TEV	Singapore: 7.5% Malaysia: 9.0%	Singapore: 5.25% (participating), 4.0% (nonparticipating), 6.0% (linked). Malaysia: 6.0% (participating), 5.0% (nonparticipating), 7.0% (linked).
	Manulife	TEV	Hong Kong: 10%	Hong Kong: 11.5% Equity, 1.85% Gov't Bonds Asia excl. Hong Kong and Japan: 9.0%-11.0% Equity
	Prudential	EEV	China: 10.2% Hong Kong: 3.7% India: 13.0% Indonesia: 12.0% Korea: 6.7% (NB), 6.5% (IF) Malaysia: 6.6% Philippines: 10.8% Singapore: 4.3% (NB), 5.0% (IF) Taiwan: 4.2% (NB), 4.1% (IF) Thailand: 9.5% Vietnam: 14.0%	China: 3.7% Gov't Bonds Hong Kong: 2.2% Gov't Bonds, 6.2% Equities India: 8.0% Gov't Bonds Indonesia: 7.9% Gov't Bonds Korea: 2.6% Gov't Bonds Malaysia: 4.1% Gov't Bonds, 10.1% Equities Philippines: 4.0% Gov't Bonds Singapore: 2.3% Gov't Bonds, 8.3% Equities Taiwan: 1.6% Gov't Bonds Thailand: 2.7% Gov't Bonds Vietnam: 7.2% Gov't Bonds
	Standard Life	EEV	Hong Kong: 4.82% (NB), 4.89% (IF)	Risk-free rate: 1.99% (Hong Kong), 7.55% (India), 3.93% (China). Corporate bond returns: 2.77% (Hong Kong IF), 2.73% (Hong Kong NB) Equity returns: Risk-free rate +3% Property returns: Risk-free rate +2%
	Zurich	MCEV	Swap rates + liquidity premium	n/a: Risk-neutral projection in line with MCEV principles.

There is a clear divide between the MNCs and domestic insurers when it comes to disclosing long-term investment return assumptions. MNCs typically disclose investment return assumptions on an asset class basis. In contrast, domestic insurers disclose mostly on a portfolio basis, without much information on the assumed asset mix (although this can often be inferred from their regulatory returns).

Another interesting comparison can be made between AIA and Prudential. Despite their contrasting methodologies (TEV vs. EEV), their investment assumptions are quite similar for the emerging markets (e.g., China, Indonesia, Thailand, Philippines) but diverge sharply for the more mature markets (e.g., Hong Kong, Singapore, South Korea).

**FIGURE 88: RDR AND INVESTMENT ASSUMPTIONS OF INSURERS BY MARKET**

COUNTRY	COMPANY	EV PRINCIPLE	RDR	INVESTMENT RETURNS
<b>China</b>	<b>Chinese 10-year government bond yield at 31 Dec 2014: 3.62%</b>			
	AIA	TEV	9.8%	China: Equities 9.49%, Gov't Bonds 3.74%
	China Life	TEV	11.0%	Year 1: 5.1%; Year 2: 5.2%; Year 3: 5.3%; Year 4: 5.4%; Year 5+: 5.5%
	China Pacific	TEV	11.0%	Year 1: 5.1%; Year 2+: 5.2%
	China Taiping	TEV	11.0%	Year 1: 5.3%; Year 2+: 5.5%
	New China Life	TEV	11.5%	Year 1: 5.0% (non-linked), 7.60% (linked) Year 2: 5.1% (non-linked), 5.2% (universal life), 7.60% (linked) Year 3: 5.2% (nonparticipating), 5.3% (participating), 5.5% (universal life), 7.80% (linked) Year 4+: 5.2% (nonparticipating), 5.5% (participating), 5.6% (universal life), 7.90% (linked)
	PICC Life	TEV	10.0%	5.75%
	Ping An	TEV	11.0%	Year 1: 4.75%; Year 2: 5.0%; Year 3: 5.25%; Year 4+: 5.5%
	Prudential	EEV	10.2%	Gov't Bonds: 3.7%
<b>Hong Kong</b>	<b>Hong Kong 10-year government bond yield at 31 December 2014: 2.05%</b>			
	AIA	TEV	7.0%	Equities 7.55%, Gov't Bonds 2.5%
	Dah Sing	TEV	Not disclosed	Not disclosed
	Manulife	TEV	10.0%	Equities 11.5%, Gov't Bonds 1.85%
	Prudential	EEV	3.7%	Equities 6.2%, Gov't Bonds 2.2%
	Standard Life	EEV	4.82% (NB), 4.89% (IF)	Risk-free rate: 1.99% Corporate bond returns: 2.77% IF, 2.73% NB
<b>India</b>	<b>Indian 10-year government bond yield at 31 December 2014: 8.88%</b>			
	Bajaj Allianz	IEV	Risk-free yield curve	n/a: Risk-neutral projection in line with IEV principles
	Birla Sun Life	TEV	Not disclosed	Not disclosed
	HDFC Life	MCEV	Risk-free gov't bond yield curve	Risk-free gov't bond yield curve
	ICICI Prudential	IEV <sup>50</sup>	Risk-free yield curve	n/a: Risk-neutral projection in line with IEV principles
	MaxLife	MCEV <sup>51</sup>	Risk-free gov't bond yield curve	n/a: Risk-neutral projection in line with MCEV principles
	Prudential	EEV	13.0%	Gov't Bonds: 8%
<b>Indonesia</b>	<b>Indonesian 10-year government bond yield at 31 December 2014: 7.79%</b>			
	AIA	TEV	13.0%	Equities 12.25%, Gov't Bonds 7.5%
	Prudential	EEV	12.0%	Gov't Bonds: 7.9%
<b>Korea</b>	<b>Korean 10-year government bond yield at 31 December 2014: 2.6%</b>			
	AIA	TEV	9.5%	Equities 6.94%, Gov't Bonds 3.6%
	Dongbu Insurance	TEV	9.5%	3.90%
	Hanwha Life	TEV	9.5%	3.80%
	Prudential	EEV	6.7% (NB), 6.5% (IF)	Gov't Bonds: 2.6%
	Samsung Life	TEV	9.5%	3.90%
	Samsung Fire & Marine	TEV	9.5%	3.60%

50 ICICI Prudential changed to reporting on an IEV basis for the year ending 31 March 2015, after previously reporting on a TEV basis.

51 Max Life changed to reporting on an MCEV basis for the year ending 31 March 2015, after previously reporting on an EEV basis.

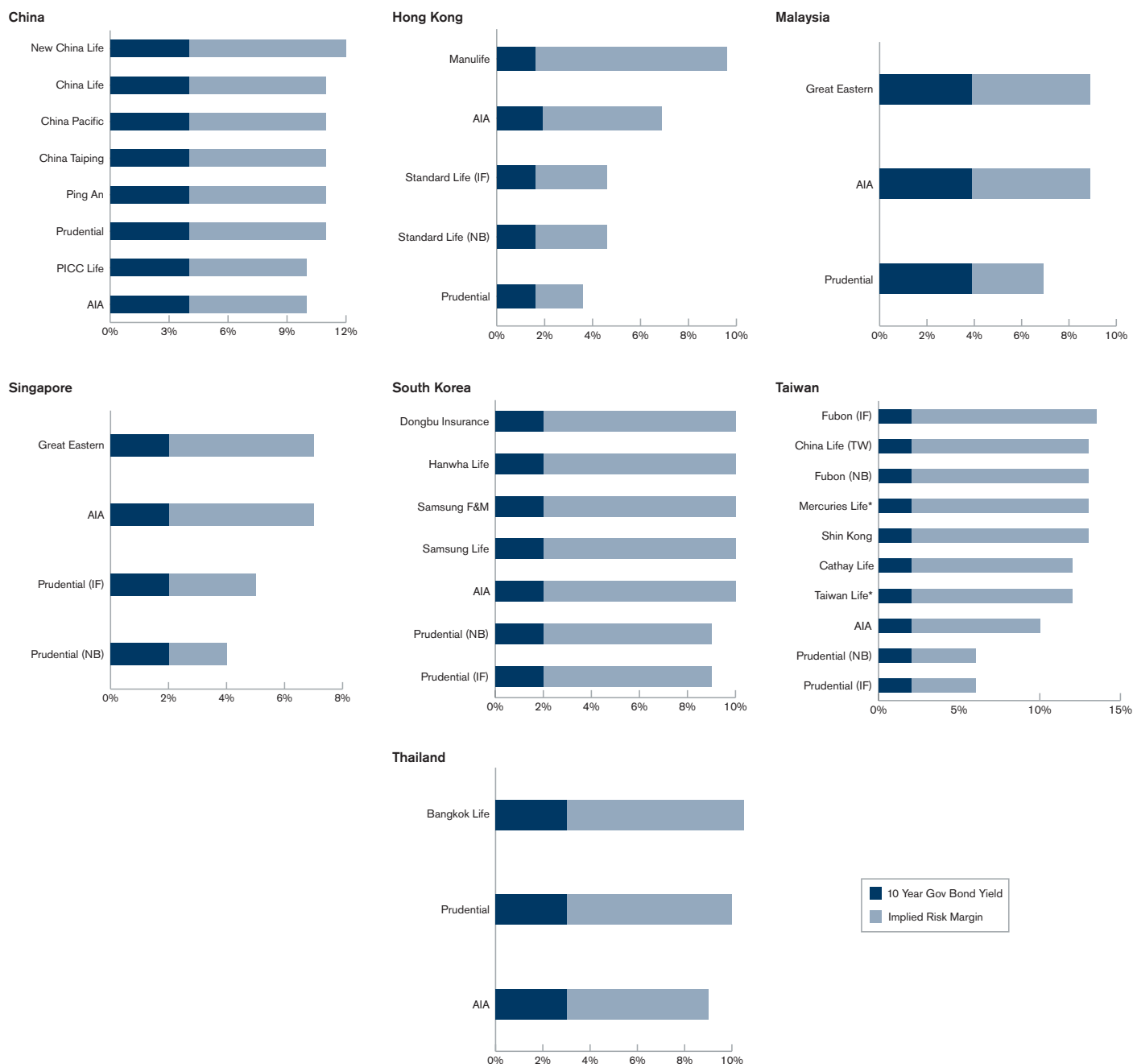
**FIGURE 88: RDR AND INVESTMENT ASSUMPTIONS OF INSURERS BY MARKET CONTINUED**

COUNTRY	COMPANY	EV PRINCIPLE	RDR	INVESTMENT RETURNS
<b>Malaysia</b>	<b>Malaysian 10-year government bond yield at 31 December 2014: 4.15%</b>			
	AIA	TEV	8.8%	Equities 8.75%, Gov't Bonds 3.99%
	Great Eastern	TEV	9.0%	6.0% (participating), 5.0% (nonparticipating), 7.0% (linked)
	Prudential	EEV	6.6%	Equities 10.1%, Gov't Bonds 4.1%
<b>Philippines</b>	<b>Philippines 10-year government bond yield at 31 December 2014: 4.37%</b>			
	AIA	TEV	10.5%	Equities 9.16%, Gov't Bonds 4%
	Prudential	EEV	10.8%	Gov't Bonds: 4%
<b>Singapore</b>	<b>Singaporean 10-year government bond yield at 31 December 2014: 2.28%</b>			
	AIA	TEV	6.8%	Equities 7%, Gov't Bonds 2.23%
	Great Eastern	TEV	7.5%	Singapore: 5.25% (participating), 4.0% (nonparticipating), 6.0% (linked)
	Prudential	EEV	4.3% (NB), 5.0% (IF)	Equities: 8.3%, Gov't Bonds: 2.3%
<b>Taiwan</b>	<b>Taiwan 10-year government bond yield at 31 December 2014: 1.6%</b>			
	AIA	TEV	7.8%	Equities 6.62%, Gov't Bonds 1.48%
	Cathay Life	TEV	10.0%	NTD: 4.01%-5.05% (IF), 2.54%-5.03% (NB) USD: 4.40%-6.07% (IF), 4.47%-6.07% (NB) IS products: 2.75%-3.02% (IF), 2.19%-2.62% (NB)
	China Life TW	TEV	10.5%	Years 1-10: 3.75%-5.36% (traditional), 2.75%-4.48% (interest sensitive) Years 11+: 5.43% (traditional), 4.59% (interest sensitive)
	Fubon	TEV	11% (VIF), 10.5% (VNB)	NTD: 3.94%-5.43% (IF), 3.89%-5.43% (NB) USD: 5.16%-5.96% (IF), 5.14%-5.96% (NB) ISA: Average retained spread of around 100 bps
	Mercuries Life	TEV	10.50%	NTD: 3.35%-5% USD: 4.05%-6% (IF), 3.75%-6% (NB)
	Prudential	EEV	4.2% (NB), 4.1% (IF)	Gov't Bonds: 1.6%
	Shin Kong	TEV	10.50%	TWD: 4.08%-5.10% (IF), 4.13%-5.10% (NB) USD: 4.64%-6.09% (IF), 4.63%-6.02% (NB) IS products: 2.95%-5.23% (IF), 2.95%-5.23% (NB)
	Taiwan Life	TEV	10%	NTD: 3.94%-4.77% USD: 4.98%-5.91%
<b>Thailand</b>	<b>Thailand 10-year government bond yield at 31 December 2014: 2.83%</b>			
	AIA	TEV	9%	Equities 9.37%, Gov't Bonds 3.62%
	Bangkok Life	TEV	10%	4.75%
	Prudential	EEV	10%	Gov't Bonds: 2.7%
	SCB Life	TEV	10%	5%
<b>Vietnam</b>	<b>Vietnamese 10-year government bond yield at 31 December 2014: 7.15%</b>			
	AIA	TEV	13.8%	Equities 13.8%, Gov't Bonds 8.0%
	Prudential	EEV	14.0%	Gov't Bonds: 7.2%

Note: Blue shaded entries indicate that the FY 2014 EV results have not yet been disclosed, and that the assessment has been based on FY 2013 disclosures instead.

The charts in Figure 89 compare 10-year government bond yields and the RDRs assumed by different companies for each market. The implied risk margin is also stated for each company.

**FIGURE 89: FY 2014 PROXY RISK-FREE RATES AND IMPLIED RISK MARGINS,<sup>52, 53, 54</sup> BY COMPANY<sup>55</sup> FOR EACH MARKET**



52 In this case, the risk margin has been defined as the difference between the assumed RDR and the yield on a 10-year government bond as at each insurer's FY 2014 reporting date.

53 The 10-year government bond yields have been extracted from the following sources, in alphabetical order: China: China Bond Association; Hong Kong: Hong Kong Monetary Authority; India: Reserve Bank of India; Malaysia: Bank Negara Malaysia; Singapore: Monetary Authority of Singapore; South Korea: Ministry of Strategy and Finance; Taiwan: The Central Bank of the Republic of China; Thailand: The Thai Bond Market Association.

54 As at the publication of this report, Mercuries Life, Shin Kong, and Taiwan Life have not yet disclosed their FY 2014 EV results. The values in this chart are hence based on the FY 2013 disclosures. As the other Taiwanese companies have not significantly changed their RDR assumptions this year, the analysis is unlikely to change significantly.

55 Note that only TEV- and EEV-reporting companies using RDRs have been included in this analysis. Companies reporting on MCEV, IEV, or market-consistent EEV (i.e., using a discount curve similar to MCEV) bases have not been included.

## Investment return assumptions

Unlike insurers reporting under MCEV, companies reporting under TEV and EEV need to make assumptions about future investment returns earned on reserves and required capital. In the MCEV framework, assets are assumed to earn returns that are, on average, equal to the risk-free reference rate (typically swaps plus adjustments). The major investment assumptions for MCEV are embedded in the stochastic asset model and the calibration of those models, including correlation assumptions.

Insurers reporting under TEV and EEV tend to specify investment returns at the asset class level. However, some insurers choose to disclose (and potentially use) investment assumptions at a fund or company<sup>56</sup> level instead.

In general the investment return assumptions used by insurers tend to be in a tight band in most markets. This is illustrated in the tables in Figure 87 and Figure 88. There can be greater variation in equity return assumptions than government bond yield assumptions.

Chinese and Taiwanese insurers have assumed increasing investment returns for future years. There is limited disclosure as to how these increasing yield scenarios are reflected in the VIF calculations, in particular whether corresponding capital losses are incorporated as interest rates are projected to rise. This is in contrast to AIA, where disclosures indicate that when long-term fixed interest yields are assumed to rise from the current level, allowance is made for the resulting bond portfolio capital losses.

## Expense overruns

This item is reported by some insurers, particularly for new operations or those in an expansion phase. The EV expense assumptions are usually based on 'fully allocated' historical experience, but this can cause insurers with fledgling operations that have yet to scale to show seemingly unprofitable business. As a result, some EV results are presented as 'pre-overrun,' where the EV figures will be calculated based on long-term target expense levels, and as 'post-overrun,' which reflects current actual expense experience. The difference between actual current expense level and the targeted long-term level is commonly referred to as an expense overrun.

Overruns can come from acquisition expenses (including distribution-related costs), maintenance expenses, or one-off costs. Figure 90 summarises the reported overruns in Asia.

**FIGURE 90: SUMMARY OF EXPENSE OVERRUNS BY COMPANY**

COMPANY CATEGORY	COMPANY	EV METHODOLOGY	TYPE OF OVERRUN	IMPACT ON EV/VNB
India	Bajaj Allianz	IEV	Unspecified	EV: Rs 2.6 bn
India	HDFC Life	MCEV	Acquisition expenses	VNB: Rs 1.5 bn
India	ICICI Prudential	IEV	Acquisition expenses	VNB: Rs 3.7 bn
India	MaxLife	MCEV	Acquisition expenses	VNB: Rs 0.4 bn

As Figure 90 shows, the primary type of overruns relate to acquisition expenses.

## Cost of capital

Cost of capital (CoC) is typically calculated as a deduction from the PVFP to reflect the fact that assets backing the required capital are held within an insurance company and, therefore, cannot be distributed to shareholders immediately. Additional costs, frictional costs, may arise from investing in assets via an insurance company, such as additional taxation, investment expenses, or the fact that investors do not have direct control over their capital (known as agency costs). Cost of capital may also arise in respect of asymmetric non-hedgeable risks that may not have been reflected in the PVFP, and reflects the potential additional cost and risk on shareholders. The split into FCoC and the CRNHR is a requirement of the MCEV and IEV reporting principles.

Under TEV, CoC reflects the cost to shareholders of having to hold the required capital which will earn the after-tax investment rate of return instead of the RDR. The CRNHR is generally implicit in the choice of the RDR assumption, hence it is not disclosed separately. Asian insurers reporting TEV usually include the impact of the CoC as part of the EV report, although a few companies do not.

Companies reporting under MCEV principles typically allow for the frictional costs of capital within the investment income on assets backing the required capital by:

- Projecting investment returns using the reference rate net of tax and investment management expenses
- Discounting using the reference rate gross of tax and investment management expenses

<sup>56</sup> E.g., Bangkok Life cites an investment assumption of 4.75% for its entire business instead of specifying the exact asset class assumptions.

Companies may also adopt such an approach under the EEV principles, especially if they use a market-consistent basis. Alternatively, the CoC may be calculated based on the difference between the real-world investment return assumptions and the risk discount rate, similar to the approach for TEV.

The majority of companies reporting MCEV calculate the CoC using the frictional cost approach, which is the approach required under MCEV principles. However, the definition of required capital differs between companies. As at year-end 2014, almost all companies disclosed that they set their required capital by reference to domestic regulatory requirements, with a few MNCs such as Allianz, Prudential, and Standard Life also taking into consideration the result from an internal model.

An important assumption behind EV calculations is the level of solvency margin assumed to be held in the future. Given the nature of EV calculations, the primary impact of capital assumptions is the effect of the timing of cash flows. Capital is provided by shareholders to support the writing of new business and is eventually returned to shareholders as profit emerges.

Figure 91 summarises the required solvency margin assumed by insurers for their Asian operations (excluding Japan).

**FIGURE 91: SUMMARY OF SOLVENCY MARGIN REQUIREMENTS BY COMPANY**

CATEGORY	COMPANY	EV METHODOLOGY	REQUIRED CAPITAL
MNC	Ageas	EEV	Internal target capital (excludes non-shareholder funding sources)
MNC	AIA <sup>57</sup>	TEV	Hong Kong: 150% minimum SM China: 100% minimum SM Indonesia: 120% RBC Malaysia: 170% RBC New Zealand: 100% regulatory requirement Philippines: 100% RBC Singapore: 180% RBC South Korea: 150% minimum SM Sri Lanka: 120% RBC Taiwan: 250% RBC Thailand: 140% RBC Vietnam: 100% minimum SM
MNC	Allianz	MCEV	Higher of local regulatory requirements and internal model
MNC	Aviva	MCEV	Highest of regulatory requirements, group economic capital requirements, and target capital level of business unit
MNC	AXA	EEV	>= 75% local regulatory requirements (after deducting allowable non-shareholder funding sources from 150% local regulatory requirements)
MNC	Great Eastern	TEV	Malaysia: 130% RBC Singapore: 120% RBC
MNC	Manulife	TEV	China: 100% minimum SM Hong Kong: 150% minimum SM Indonesia: 120% RBC Malaysia: 160% RBC Philippines: 125% RBC Singapore: 200% RBC Vietnam: 100% minimum SM
MNC	Prudential	EEV	Higher of local regulatory requirements and internal target
MNC	Standard Life	EEV	Higher of local regulatory requirements and internal model
MNC	Zurich	MCEV	>= 100% local regulatory requirement
China	AIA China	TEV	100% minimum SM
China	China Life	TEV	100% minimum SM
China	China Pacific	TEV	100% minimum SM
China	China Taiping	TEV	100% minimum SM
China	Manulife China	TEV	100% minimum SM

<sup>57</sup> AIA operates in a number of its territories as branches of entities regulated in Hong Kong. As such, these branches are subject to both local and Hong Kong regulatory requirements. The materially impacted territories are South Korea and Thailand, where the Hong Kong regulations are more onerous. The EV and VNB results disclosed by AIA for these territories are based on the local regulatory requirements. Adjustments are made at the group EV disclosure to include this additional capital requirement, which was USD 4.1 billion as of 30 November 2014.

**FIGURE 91: SUMMARY OF SOLVENCY MARGIN REQUIREMENTS BY COMPANY *CONTINUED***

CATEGORY	COMPANY	EV METHODOLOGY	REQUIRED CAPITAL
China	New China Life	TEV	100% minimum SM
China	PICC Life	TEV	China: Higher of minimum SM and internal target
China	Ping An	TEV	Not disclosed
Hong Kong	AIA Hong Kong	TEV	150% minimum SM
Hong Kong	Dah Sing	TEV	Not disclosed
Hong Kong	Manulife Hong Kong	TEV	150% minimum SM
India	Bajaj Allianz	IEV	Not disclosed
India	Birla Sun Life	TEV	Not disclosed
India	HDFC Life	MCEV	Not disclosed
India	ICICI Prudential	IEV	Not disclosed
India	Max Life	MCEV	Higher of internal required solvency margin (170% minimum required solvency capital) and internal economic capital requirement
Indonesia	AIA Indonesia	TEV	120% RBC
Indonesia	Manulife Indonesia	TEV	120% RBC
Malaysia	AIA Malaysia	TEV	170% RBC
Malaysia	Great Eastern Malaysia	TEV	130% RBC
Malaysia	Manulife Malaysia	TEV	160% RBC
Singapore	AIA Singapore	TEV	180% RBC
Singapore	Great Eastern Singapore	TEV	120% RBC
Singapore	Manulife Singapore	TEV	200% RBC
South Korea	AIA South Korea	TEV	150% RBC
South Korea	Hanwha Life	TEV	150% RBC
South Korea	Samsung Life	TEV	150% RBC
South Korea	Samsung Fire & Marine	TEV	Not disclosed
South Korea	Dongbu Insurance	TEV	150% RBC
Taiwan	AIA Taiwan	TEV	250% RBC
Taiwan	Cathay Life	TEV	Not disclosed
Taiwan	China Life TW	TEV	200% RBC
Taiwan	Fubon	TEV	200% RBC
Taiwan	Mercuries Life	TEV	200% RBC
Taiwan	Shin Kong	TEV	200% RBC
Taiwan	Taiwan Life	TEV	200% RBC
Thailand	AIA Thailand	TEV	140% RBC
Thailand	Bangkok Life	TEV	140% RBC
Thailand	SCB Life	TEV	140% RBC

EV reporting insurers generally use similar assumptions, opting to use the level of solvency margin at which they believe regulatory intervention will occur. The exceptions to this are as follows:

- In Singapore, where there is a wide spectrum starting from Great Eastern's 120%, AIA's 180%, and Manulife's 200%
- In Taiwan, where AIA uses 250% compared with the 200% used by China Life, Fubon Life, Mercuries Life, Shin Kong, and Taiwan Life
- In Malaysia, where Great Eastern uses 130% compared with AIA's and Manulife's 160%.

Some Chinese and Indian companies notably do not disclose their required solvency margin assumptions.



## Time value of options and guarantees

The impact of financial options and guarantees can be split into two components. The first is the effect on the PVFP with respect to the intrinsic value<sup>58</sup> of such financial options and guarantees. The second is the time value of options and guarantees (TVOG)—which is the difference between the total value of the options/guarantees and the intrinsic value. It represents the value of the ‘optionality’ bestowed on the policyholder for the duration of the insurance contract.

The TVOG primarily corresponds to the asymmetry of the impact over a range of scenarios on the distributable earnings to shareholders. For example, for the case of participating contracts, profits are shared between shareholders and policyholders. Losses, however, are only shared up to a certain point, after which shareholders bear all the subsequent losses. This can be further exacerbated by the actions of policyholders (dynamic policyholder behaviour).

The reporting of TVOG is mandatory for insurers reporting on EEV, MCEV, and IEV bases. Although not required for TEV, Asian insurers can still utilise TVOG for risk management purposes, in order to make up for the limitations of TEV.

The features of products that generally give rise to an assessment of TVOG can include interest rate guarantees on traditional products, profit-sharing features such as bonuses or levels of credited rates, and guaranteed benefits on linked and guaranteed annuity options. Other features such as return of premiums are also a form of a guarantee.

As noted, EEV/MCEV/IEV-reporting insurers are required to assess the TVOG using stochastic techniques. Closed-form solutions can also be used where they lead to sufficiently accurate results but may not be suitable in valuing certain guarantees. The stochastic models must be appropriately calibrated and internally consistent with the rest of the modelling methodologies and approaches. Management actions can be allowed, which may include those relating to crediting rates, bonus rates, charges to asset shares, and investment strategies. These management actions can be reflected, provided that such actions are consistent with the insurer’s normal governance and approval processes, are consistent with the operating environment, and take into account the market reaction to discretion.

Dynamic policyholder behaviour is included in many companies’ assessments of TVOG. In particular, a number of companies recognise the impact of dynamic policyholder behaviour under certain economic scenarios.

Figure 92 shows that, of those companies that disclosed the number of scenarios used, the majority applied 1,000 economic scenarios on a market-consistent basis.

**FIGURE 92: SUMMARY OF TVOG APPROACHES**

COMPANY TYPE	COMPANY	OPTIONS AND GUARANTEES	SCENARIOS	USE OF DYNAMIC POLICYHOLDER BEHAVIOUR	CALCULATED FOR ASIAN OPERATIONS? (ASIA VALUE)
MNC	Ageas	Market-consistent, stochastic	1,000	No	Yes (not disclosed)
MNC	Allianz	Market-consistent, stochastic	1,000 (5,000 in Germany)	Yes	Yes (EUR 444 million)
MNC	Aviva	Market-consistent, stochastic	At least 1,000	Not for Asia	Yes (GBP 23 million)
MNC	AXA	Market-consistent, stochastic	At least 1,000	Yes	Yes (Japan: EUR 163 million; Hong Kong: EUR 549 million; SE Asia, India, China: 98 million)
MNC	Prudential	Market-consistent, stochastic	Not disclosed	Yes	Yes (GBP 113 million)
MNC	Standard Life	Market-consistent, stochastic	Not disclosed	Yes	Yes (GBP 15 million)
MNC	ZIG	Market-consistent, stochastic	1,000	Yes	Yes (EUR 11 million <sup>59</sup> )
India	Bajaj Allianz	Not disclosed	Not disclosed	Not disclosed	Yes
India	HDFC Life	Market-consistent, stochastic	Not disclosed	Not disclosed	Yes
India	ICICI Prudential	Market-consistent, stochastic	Not disclosed	Not disclosed	Yes
India	MaxLife	Not disclosed	1,000	Not disclosed	Yes (INR 20 million)

<sup>58</sup> In the example of a financial call option, the intrinsic value is the positive difference between the current underlying asset price and the strike price.

<sup>59</sup> Includes Middle East.

---

Figure 92 discloses the TVOG approaches at a group level. While details on specific countries are not usually disclosed, it is likely that the calculations focus on products such as participating, linked, and universal life, which often embed some form of implicit or explicit policyholder guarantee.

For example, Prudential explicitly identifies its participating portfolios in Hong Kong, Singapore, and Malaysia in its TVOG calculations, in addition to increasing sum-assured whole of life contracts. Its other key markets, such as Indonesia, are unlikely to be a material source of TVOG for Prudential, given the predominance of linked and protection business.

Of the companies that separately disclosed Asia TVOG figures, Allianz, AXA, and Prudential report the highest levels of TVOG, in contrast with the rest of the MNCs and Max Life, whose figures are relatively immaterial when compared with their EV levels. This is likely to be a reflection of their long history in the region, which has resulted in legacy portfolios of participating and other guarantee-bearing products.

## DISCLOSURES

Analysts have frequently commented that the drive toward greater consistency, through improved guidance and developments in EV reporting, has helped to improve their understanding of the inherent values and strengths within companies. The richness of disclosures has been particularly helpful as they allow analysts to compare and contrast the performances across insurers.

Similarly, EV reporting continues to provide rating agencies with valuable information in their credit assessments. For example, Standard & Poor's states that return on embedded value (RoEV) is one of the factors considered in determining life insurers' ratings. Additional disclosures and the component nature with which the analysis is presented assist rating agencies in drilling down into the underlying key risk drivers and the areas of the company that are most important and/or where the ability to generate value is most at risk.

The most developed EV disclosure requirements are set out in the EEV and MCEV principles by the European Insurance CFO Forum, which call for minimum disclosures around methodology, assumptions, sensitivities, and analyses. APS10 standard disclosures for IEV in India require similar levels of detail. However, the prevalence of TEV in Asia, with the associated lack of any disclosure standards or requirements, makes it more difficult to use EV results for comparison and evaluation purposes.

The quality of EV disclosures tends to be closely correlated with the nature of the insurance operations. MNCs (be they Asian, European, or North American) tend to provide more disclosure than insurers focusing on one or two core markets. For the single market operations, typically only group EV and VNB are disclosed and some companies do not disclose the key assumptions behind the result, providing the RDR and nothing more.

The table in Figure 93 summarises the available disclosures of insurers operating in Asia. While the level of disclosures in Asia lags behind Europe at the moment, the key components are typically provided, i.e., analysis of movement, sensitivities, and key assumptions.

Another key differentiator between Europe and Asia is that it is normal practice for European insurers to include a detailed EV report, almost to the same level of detail as their statutory IFRS statements, in their annual reports. At this time, only AIA amongst the Asian insurers has a comparable level of disclosure.

We anticipate that more detailed reporting will follow over the next few years as Asian insurers increase in scale, complexity, and sophistication, not only in EV methodology but in investor relations as well.

**Note:** The table should not and cannot be taken as endorsement or verification of any kind by the part of Milliman that the disclosures of specific sections by specific companies meet in part or in full the requirements laid out by the EEV or MCEV principles.

FIGURE 93: SUMMARY OF DISCLOSURES IN 2014

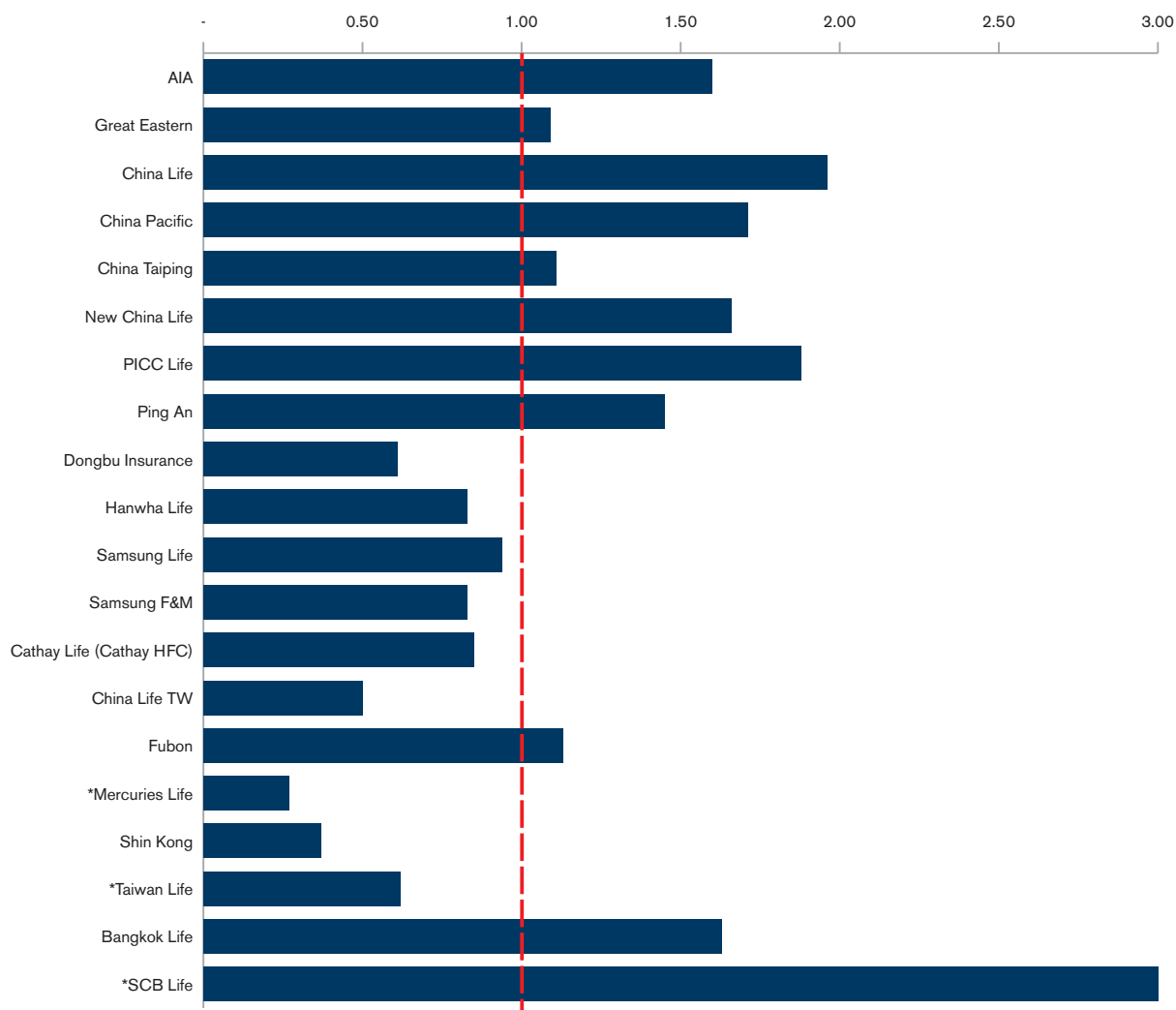
TYPE	COMPANY	EV PRINCIPLE	EVIDENCE OF INDEPENDENT REVIEW OF EV RESULTS	ANALYSIS OF EV MOVEMENT	RECONCILIATION OF ANW TO IFRS NET ASSETS	COST OF CAPITAL & REQUIRED CAPITAL	RISK DISCOUNT RATE ASSUMPTIONS	INVESTMENT RETURN ASSUMPTIONS	EXPENSE INFLATION ASSUMPTIONS	NEW BUSINESS MARGIN INFORMATION	EV AND VNB SENSITIVITIES	NEW BUSINESS IMPLIED DISCOUNT RATE AND IRR
MNC	Ageas	EEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	AIA	TEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Allianz	MCEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Aviva	MCEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	AXA	EEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Great Eastern	TEV	✓	✓			✓	✓		✓	✓	
	Manulife	TEV	✓	✓	✓	✓	✓	✓		✓	✓	
	Prudential plc	EEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Standard Life	EEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ZIG	MCEV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
China	China Life	TEV	✓	✓		✓	✓	✓			✓	
	China Pacific	TEV	✓	✓		✓	✓	✓	✓	✓	✓	
	China Taiping	TEV	✓	✓		✓	✓	✓			✓	
	New China Life	TEV	✓	✓		✓	✓	✓	✓		✓	
	PICC Life	TEV	✓			✓	✓	✓	✓		✓	
	Ping An	TEV	✓	✓		✓	✓	✓	✓	✓	✓	
Hong Kong	Dah Sing	TEV										
India	Bajaj Allianz	IEV		✓						✓		
	Birla Sun Life	TEV					✓	✓		✓		
	HDFC Life	MCEV		✓		✓	✓	✓	✓	✓		
	ICICI Prudential	IEV		✓			✓	✓	✓	✓	✓	
	MaxLife	MCEV		✓		✓	✓	✓		✓	✓	
Korea	Hanwha Life	TEV	✓	✓		✓	✓	✓	✓	✓	✓	
	Samsung Life	TEV	✓	✓		✓	✓	✓	✓	✓	✓	
	Samsung Fire & Marine	TEV	✓	✓		✓	✓	✓	✓	✓	✓	
	Dongbu Insurance	TEV		✓		✓	✓	✓		✓	✓	
Taiwan	Cathay Life	TEV				✓	✓	✓		✓	✓	
	China Life TW	TEV	✓	✓	✓	✓	✓	✓			✓	
	Fubon Life	TEV	✓	✓	✓	✓	✓	✓	✓		✓	
	Mercuries Life	TEV	✓	✓	✓	✓	✓	✓			✓	
	Shin Kong	TEV	✓	✓	✓	✓	✓	✓	✓		✓	
	Taiwan Life	TEV	✓	✓		✓	✓	✓			✓	
Thailand	Bangkok Life	TEV	✓	✓		✓	✓	✓			✓	
	SCB Life	TEV	✓	✓		✓	✓	✓			✓	

Note: Blue shaded entries indicate that the FY 2014 EV results have not yet been disclosed, and that the assessment has been based on FY 2013 disclosures instead.

## OTHER MEASURES OF VALUE

### Market Capitalisation

FIGURE 94: PRICE TO EMBEDDED VALUE RATIOS AS AT FY 2014 REPORTING DATES



\* P/EV ratio calculated using 2013 EV figures. All P/EV ratios have been calculated using the market capitalisation as at the reporting date of EV results.

Figure 94 gives the price/EV (P/EV) ratios for listed insurers.

The standard treatment for including non-covered business is to add the net assets (analogous to ANW in our EV world), thereby excluding what would have been their equivalent of the VIF. As a result there is a tendency for composites and insurers with large pure investment businesses to seem 'overvalued' by the P/EV metric.

## IFRS 4 Phase 2

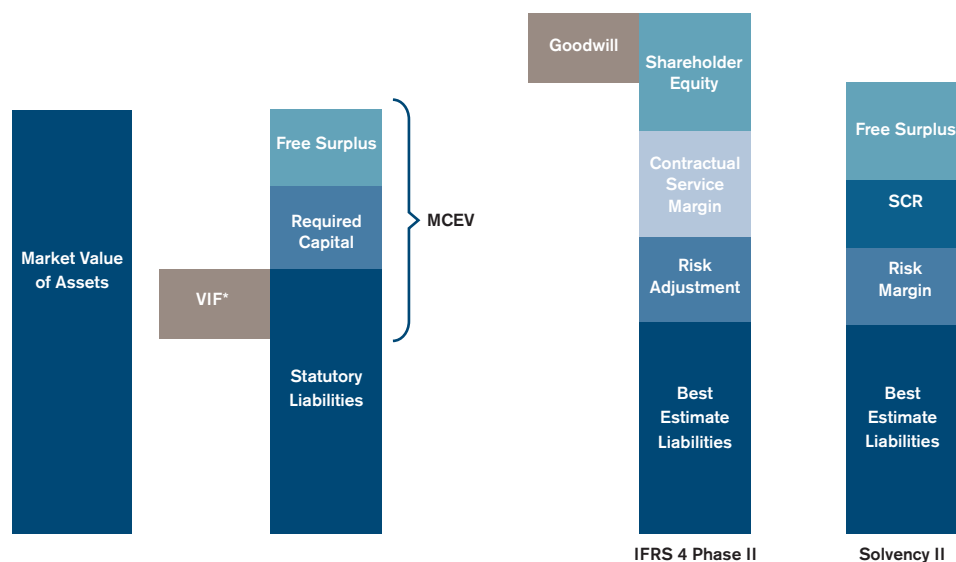
The preparation of accounts on an IFRS basis gives rise to a different interpretation and timing of profit and loss compared to an EV basis. This is fundamentally due to current IFRS 4 standards (called 'Phase 1,' implemented in 2004) focusing on a current view of assets and liabilities together with current profit generation compared to embedded value, which makes allowances for future earnings and the shareholder value created.

Reconciliation of these different measures helps to reveal different features of insurers' underlying performances. The IFRS 4 Phase 2 project aims at further standardising international accounting requirements for insurance contracts. The publication (in June 2013) of the second exposure draft on reporting for insurance contracts by the International Accounting Standards Board (IASB) meant 2013 was a significant year for IFRS reporting. The Financial Accounting Standards Board (FASB) separately published a proposed Accounting Standards Update, Insurance Contracts (Topic 834), also in June 2013.

The IASB Exposure Draft attracted a number of comment letters, with 194 respondents in total. The Exposure Draft is now closed for comments and similarly the FASB consultation period has ended. In 2014, the IASB was in the process of considering the feedback received to date and made a number of tentative decisions, which demonstrate that it is treating the feedback seriously. There are still a number of areas awaiting IASB discussion before publication of a final standard, expected to be in mid- to late 2015. European companies will then have three years before mandatory adoption of the standard—Asian insurers will generally have a bit longer as IFRS will need to be adopted by their national accounting standard boards before such a requirement exists.

In contrast, in light of the feedback received on the 2013 proposed update, the FASB decided to limit the scope to insurance entities as described in existing US GAAP. The FASB also decided that the project should focus on making targeted improvements to existing US GAAP. For short-duration contracts, the FASB decided to limit the targeted improvements to enhancing disclosures. The proposed IFRS 4 Phase 2 balance sheet, based on the IASB Exposure Draft, is compared with MCEV and Solvency II in Figure 95.

FIGURE 95: MCEV VS. SOLVENCY II VS. IFRS 4 PHASE 2



---

The IASB Exposure Draft highlighted a number of areas for consultation:

- **Treatment of participating contracts.** For contracts with contractual pass-through of investment experience, including linked, a mirroring approach was proposed to measure the participation feature and use the accounting value of the underlying asset to value the liability. There were many comments in response to this proposal, including the complexity resulting from the need to bifurcate cash flows.
- **Presentation of premium and claims in the statement of comprehensive income.** The IASB has attempted to align the definition of revenue with other industries and, as such, revenue will no longer be directly aligned with premium information. The investment component is to be excluded from premiums and claims. The feedback on this proposal has been mixed. The IASB has tentatively decided to maintain the presentation proposed in the Exposure Draft, with additional disclosures.
- **Treatment of unearned profit in an insurance contract.** The contractual service margin (CSM) will be 'unlocked' and changes to the expected underlying cash flows can be reflected in changes in the residual customer service margin in the other comprehensive income (OCI) component. The IASB has tentatively decided to confirm the proposed Exposure Draft approach and, additionally, changes in the risk adjustment related to future service are recognised in the periods the service is provided.
- **Approach to transition.** A full retrospective application of the building blocks is encouraged, including both the risk margin and the contractual service margin. However, simplified approaches are available to insurers where the data is not available to do a full building block approach, or when it is otherwise impractical to do so. The IASB will reconsider the approach to transition when the standard is near-final.
- **Changes in discount rate.** The Exposure Draft required presentation of the effect of changes in the discount rate used to measure the insurance contract liability in OCI rather than in profit and loss (P&L). This generated a significant number of comments, with many insurers commenting that this approach created a potential accounting mismatch. The IASB has taken these concerns into account and has made the tentative decision to allow insurers the option of presenting the impact of change in discount rate in the P&L.

Based on the feedback, the IASB has identified a number of additional areas it wishes to reconsider. These include the treatment of reinsurance—the proposed approach in the Exposure Draft considered the CSM on the direct written policies and the reinsurance contracts separately. This potentially created an accounting mismatch if the overall business was profitable, but the direct written contract was loss-making.

## APPENDIX A: TOTAL ASIAN EV BY COMPANY BY TERRITORY

FIGURE 96: TOTAL ASIAN EV BY COMPANY (USD MILLIONS<sup>60</sup>)

TYPE	COMPANY	EV PRINCIPLE	CHINA	HONG KONG	INDIA	MALAYSIA	SINGAPORE	SOUTH KOREA	TAIWAN	THAILAND	OTHER ASIA
MNC	Ageas	EEV	-	-	-	-	-	-	-	-	1,085
	AIA	TEV	4,065	12,472	-	2,513	4,275	2,152	-	7,122	4,553
	Allianz	MCEV	-	-	-	-	-	-	-	-	797
	Aviva	MCEV	-	-	-	-	-	-	-	-	1,654
	AXA	EEV	-	5,504	-	-	-	-	-	-	1,810
	Great Eastern	TEV	-	-	-	1,881	5,996	-	-	-	-
	Manulife	TEV	-	-	-	-	-	-	-	-	-
	Prudential plc	EEV	-	-	-	-	-	-	-	-	19,178
	Standard Life	EEV	-	-	-	-	-	-	-	-	639
	Zurich	MCEV	-	-	-	-	-	-	-	-	2,750
China	China Life	TEV	73,292	-	-	-	-	-	-	-	-
	China Pacific	TEV	20,258	-	-	-	-	-	-	-	-
	China Taiping	TEV	8,454	-	-	-	-	-	-	-	-
	New China Life	TEV	13,737	-	-	-	-	-	-	-	-
	PICC Life	TEV	7,639	-	-	-	-	-	-	-	-
	Ping An	TEV	42,570	-	-	-	-	-	-	-	-
Hong Kong	Dah Sing	TEV	-	526	-	-	-	-	-	-	-
India	Bajaj Allianz	IEV	-	-	1,494	-	-	-	-	-	-
	ICICI Prudential	IEV	-	-	2,203	-	-	-	-	-	-
	Birla Sun Life	TEV	-	-	-	-	-	-	-	-	-
	HDFC Life	MCEV	-	-	1,415	-	-	-	-	-	-
	MaxLife	MCEV	-	-	840	-	-	-	-	-	-
South Korea	Hanwha Life	TEV	-	-	-	-	-	7,943	-	-	-
	Samsung Life	TEV	-	-	-	-	-	22,795	-	-	-
	Samsung Fire & Marine	TEV	-	-	-	-	-	13,028	-	-	-
	Dongbu Insurance	TEV	-	-	-	-	-	5,219	-	-	-
Taiwan	Cathay Life	TEV	-	-	-	-	-	-	22,430	-	-
	China Life TW	TEV	-	-	-	-	-	-	5,045	-	-
	Fubon	TEV	-	-	-	-	-	-	12,525	-	-
	Mercuries Life	TEV	-	-	-	-	-	-	-	-	-
	Shin Kong	TEV	-	-	-	-	-	-	7,542	-	-
	Taiwan Life	TEV	-	-	-	-	-	-	-	-	-
Thailand	Bangkok Life	TEV	-	-	-	-	-	-	-	1,452	-
	SCB Life	TEV	-	-	-	-	-	-	-	-	-

60 EV results have been converted at the prevailing USD mid-FX rate as at the reporting date.

**CONTACT**

If you have any questions or comments on this briefing paper or any other aspect of embedded value reporting, please contact any of the consultants below or speak to your usual Milliman consultant.

**Amsterdam**

Dennis de Vries  
dennis.devries@milliman.com  
+31 6 10152187

Henny Verheugen  
henny.verheugen@milliman.com  
+31 6 10149938

**Beijing**

Sharon Huang  
sharon.huang@milliman.com  
+86 10 8523 3189

**Belgium**

Kurt Lambrechts  
kurt.lambrechts@milliman.com  
+32 499 22 16 36

**Boston**

William Hines  
william.hines@milliman.com  
+1 781 213 6228

**Bucharest**

Cosmin Gherghisan  
cosmin.gherghisan@milliman.com  
+40 314 326 524

**Chicago**

Anna Berezovskaya  
anna.berezovskaya@milliman.com  
+1 312 499 5679

Ted Schlude  
ted.schlude@milliman.com  
+1 312 499 5622

Bruce Winterhof  
bruce.winterhof@milliman.com  
+1 312 499 5624

Laird Zacheis  
laird.zacheis@milliman.com  
+1 312 499 5623

**Dublin**

Mike Claffey  
mike.claffey@milliman.com  
+35 31 647 5902

Dermot Corry  
dermot.corry@milliman.com  
+35 31 647 5910

**Dusseldorf**

Lars Hoffmann  
lars.hoffmann@milliman.com  
+49 211 9388 6620

Mario Hörig  
mario.hoerig@milliman.com  
+49 211 938866 13

**Hong Kong**

Paul Sinnott  
paul.sinnott@milliman.com  
+852 2152 3838

Michael Daly  
michael.daly@milliman.com  
+852 2152 3138

Sam Morgan  
sam.morgan@milliman.com  
+852 2147 9678

**Jakarta**

Halim Gunawan  
halim.gunawan@milliman.com  
+62 21 2553 2599

Catherine Liu  
catherine.liu@milliman.com  
+62 21 2553 2599

**London**

Nick Dumbreck  
nick.dumbreck@milliman.com  
+44 20 7847 1538

Chris Lewis  
christopher.lewis@milliman.com  
+44 20 7847 1536

Eoin O'Byrne  
eoin.o'byrne@milliman.com  
+44 20 7847 1517

Stuart Reynolds  
stuart.reynolds@milliman.com  
+44 20 7847 1535

Richard See Toh  
richard.seetoh@milliman.com  
+44 20 7847 1529

Phil Simpson  
philip.simpson@milliman.com  
+44 20 7847 1543

Scott Mitchell  
scott.mitchell@milliman.com  
+44 20 7847 1604

Tatyana Egoshina  
tatyana.egoshina@milliman.com  
+44 20 7847 1527

**Madrid**

Luca Inserra  
luca.inserra@milliman.com  
+34 91 598 4077

**Milan**

Aldo Balestreri  
aldo.balestreri@milliman.com  
+39 335 8296 917

Dominic Clark  
dominic.clark@milliman.com  
+34 609 026 561

Jeremy Kent  
jeremy.kent@milliman.com  
+39 02 76 26 05 1

Ed Morgan  
ed.morgan@milliman.com  
+39 02 76 26 05 1

**Mumbai**

Sanket Kawatkar  
sanket.kawatkar@milliman.com  
+91 22 6784 8410

**Munich**

Marcus Looft  
marcus.looft@milliman.com  
+49 89 12 71 08 711

**New York**

Steve Schreiber  
steven.schreiber@milliman.com  
+1 646 473 3104

Stuart Silverman  
stuart.silverman@milliman.com  
+1 646 473 3108

Marc Slutzky  
marc.slutzky@milliman.com  
+1 646 473 3102

**Paris**

Jerome Nebout  
jerome.nebout@milliman.com  
+33 1 42 99 15 80

Eric Serant  
eric.serant@milliman.com  
+33 1 42 99 15 90

**Seattle**

Novian Junus  
novian.junus@milliman.com  
+1 206 504 5624

Craig Likkel  
craig.likkel@milliman.com  
+1 206 504 5540

David Wang  
david.wang@milliman.com  
+1 206 504 5524

**Seoul**

Chihong An  
chihong.an@milliman.com  
+82 2 3276 2501

Sung Hoon Kim  
sunghoon.kim@milliman.com  
+82 2 3276 2502

**Shanghai**

Wilson Tian  
wilson.tian@milliman.com  
+86 21 61590253

**Singapore**

Richard Holloway  
richard.holloway@milliman.com  
+65 6327 2301

Iwan Juwono  
iwan.juwono@milliman.com  
+65 6327 2315

Wen Yee Lee  
wenyee.lee@milliman.com  
+65 6327 2302

**Stockholm**

Steve Hardwick  
steve.hardwick@milliman.com  
+46 709 50 80 51

**Sydney**

Wade Matterson  
wade.matterson@milliman.com  
+61 2 8090 9103

**Taipei**

Wing Wong  
wing.wong@milliman.com  
+88 62 8780 0701

**Tokyo**

Steve Conwill  
stephen.conwill@milliman.com  
+81 3 5211 7031

Masaaki Yoshimura  
masaaki.yoshimura@milliman.com  
+81 3 5211 7174

**Warsaw**

Marcin Krzykowski  
marcin.krzykowski@milliman.com  
+48 22 630 6200

**Zurich**

Sandra Haas  
sandra.haas@milliman.com  
+41 44 287 9078

Tigran Kalberer  
tigran.kalberer@milliman.com  
+41 44 28790 77