CANNEX

INCOME VALUE

Technical Document

Updated December 2019

Contained herein are the basic specifications and requirements for an insurance carrier to accommodate the calculation of INCOME VALUE on their administrative systems and be able to transmit that data to distributors or other users.

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I. Summary & Objectives

a. What is INCOME VALUE ('What")

There has been demand for the fair market valuation of income annuity contracts for a variety of reasons. Until recently, each product manufacturer had a proprietary methodology to derive this value. The industry has since come together to define a standard methodology and approach to calculate this market value and has agreed to identify it as INCOME VALUE.

b. This Document

Contained herein are the basic specifications and requirements for an insurance carrier to accommodate the calculation of INCOME VALUE on their administrative systems and be able to transmit that data to distributors or other users. It is assumed that Broker Dealers or other receivers of INCOME VALUE will leverage existing processes consistent with central clearing organizations like the DTCC.   Ultimately, the timing and expectations about what is communicated with regard to INCOME VALUE will be determined and managed directly between the product manufacturer and the distributor.

For more information about INCOME VALUE and related technical requirements, contact the following:

Income Annuity Yield Curve & Valuation Methodology
CANNEX Financial Exchanges
> Phone: 416-926-0882 / 800-387-1269
> Email: cannex@cannex.com
> Contact: Actuarial Support

Data & File Requirements
Depository Trust & Clearing Corporation (DTCC)
> Phone: 888-382-2721
> Email: insurancesupport@dtcc.com
> Contact: Insurance & Retirement Services

II. Calculating INCOME VALUE ("How")

a. Overview

    i. INCOME VALUE is defined as the actuarial present value of remaining benefits from an annuitized contract.
- The Discount Rate used for the present valuation is called the <u>Income Annuity Yield Curve</u>. This is a spot rate curve that is derived on a daily basis from the average payout results of the top income annuity providers in the industry.
- Standard Mortality Tables and Improvement Scales are also used to derive the probability of survival and death.

    ii. INCOME VALUE can be used for the following products:
- Immediate Income Annuities. Also known as Single Premium Immediate Annuities (SPIA); including Immediate Variable Annuities.
- Deferred Income Annuities (DIAs). Also known as Longevity Insurance; including QLAC.
- Any Deferred Savings Annuity contract that has been Annuitized. These would include Variable Annuities (VAs), Indexed Annuities (FIA or RILA), and Fixed Rate Annuities including MYGAs.

b. Inputs / Variables

    i. **Policy Data**

The following data elements of an annuity contract would be needed to derive INCOME Value (a complete description is provided in Appendix A of this document):

Data	Example(s)
Payout Type	Fixed, Variable
Current Payment Amount	$1000.00
Payment Frequency	Per Month
Income Start Date	mm/dd/yyyy
Annuity Type	Single, Joint, Period Certain Only
Guarantee Type / Death Benefit	Life Only, Life with PC, Cash Refund
Resident State	CT
Date of Birth – Primary	mm/dd/yyyy
Gender – Primary	Female
Date of Birth – Secondary (for Joint)	mm/dd/yyyy
Gender – Secondary (for Joint)	Male
Primary Survivor Reduction (for Joint)	100%, Two Thirds
Secondary Survivor Reduction (for Joint)	100%, Two Thirds
Certain Period Qualifier	Annual
Certain Period	10 Years
Payment End Date (Certain Period Duration)	mm/dd/yyyy
Payment Increase Type (for Fixed)	Fixed Percentage (COLA), CPI
Payment Increase Amount	3.0%
Assumed Interest Rate (for Variable)	1.5%
Payment Levelization (for Variable)	Annual
Payout Change Date	mm/dd/yyyy
Payout Change Qualifier	$ vs. %
Payout Change Amount	2.0%
Payout Change Direction	Increase vs. Decrease

Appendix A provides a more detailed description of policy data in DTCC POV format.

ii. **Discount Rate**

- A specific set of rates are used to derive the present value of benefits as part of the calculation. Rather than use the U.S. Treasury curve as the standard measure, the industry wanted to use a set of rates that calibrate more specifically to the pricing and credit experience of insurance companies that support annuitized guarantees in the marketplace.

- The INCOME ANNUITY YIELD CURVE was created to provide a set of rates used for the INCOME VALUE calculation. Like the U.S. Treasury, the Income Annuity Yield Curve will provide a set of rates that stretch out at 30 years.   These rates will be updated on a daily basis and will be interpolated down to the monthly level (i.e., a series of 360 rates).   However, there are a couple of differences from the U.S. Treasury Curve:
    - The minimum duration in the Income Annuity Yield Curve will be 1 Year. Any benefit that (e.g., payment) that falls between months 1 to 11 months will apply the 1 Year rate.
    - The maximum duration in the Income Annuity Yield Curve will be 30 Years. Any benefit that falls beyond 30 Years will apply the 30 Year rate.

- The Income Annuity Yield Curve can be supported and made available by CANNEX Financial Exchanges (www.cannex.com), a service provider to the fixed annuity market in the U.S. A table of rates will be updated on a daily basis and loaded onto the CANNEX web site for download. Users of this data will be provided with a security credentials to access this data manually or have a process set up with CANNEX automatically have the data feed to the appropriate administrative system. This data will be made available in Excel format. CANNEX would be able to accommodate other file formats under special accommodation.

- *Appendix B provides a summary of the methodology used to derive the Income Annuity Yield Curve*

- *Appendix C provides an example of the Income Annuity Yield Curve table*

iii. **Mortality**

- The data used for the actuarial portion of the INCOME VALUE calculation is standard across the insurance industry and is made available by the Society of Actuaries (SOA). Chances are that each insurance company has processes in place to obtain and manage this data. If not, processes and procedures are available through the SOA web site or other actuarial sources.

    - Gender:
      Sex distinct tables will be used for in all cases including situations where unisex mortality rates may be used in pricing for certain states (e.g., Montana, Massachusetts) or fund types (e.g., qualified).

- Mortality Table:
  At this time, the A2000 is the commonly recognized and used table in the industry and will be applied to the INCOME VALUE calculation.

- Improvement Scale:
  Scale G will be applied for Male and G/2 for female

- Mortality Projection:
  Projections of mortality will be limited to a static basis only. In other words, a static projection of 12 years (= 2012 – 2000) is used to update the mortality table to the current year of valuation from the base year of 2000. In 2013, it will be projected 13 years and then 14 years in 2014 and so on. Dynamic projections are not used for income valuation.

c. **Calculation / Methodology**

i. **Immediate Fixed Annuities (IFA or SPIA) / Fixed Annuitization (Level Payments)**

- This is considered the baseline methodology for the INCOME VALUE calculation since a large majority of annuitized contracts are on a fixed basis and provided in the form of an immediate income annuity product.

- Many contracts provide for the ability to modify the benefits at a future date. INCOME VALUE is calculated for the current level of benefits in place at the time of valuation and does not consider optional or conditional adjustments. However, scheduled adjustments are considered such as a fixed rate adjustment to a payment as defined and guaranteed by a contract.

- Summary of Calculation
  (1) Depending upon the mode of payment (e.g., monthly), income payments and any death benefits are discounted back to the valuation date using a common industry benchmark for **economic value**.   This benchmark is the Income Annuity Yield Curve.
  (2) Then, the **probability of survival and death** is calculated for each payment period based upon common mortality tables and improvement scales.
  (3) Finally, the economic values are **combined** with the survival and death probabilities to derive the INCOME VALUE.

- Details of Calculation
  x is the age of the annuitant(s) at the valuation date
  t is the time (e.g., months) between the valuation date and the income payment
  i is the discount rate for each income payment
  (1) Economic Value of Income Payment = Income Payment(t) ·
      Economic Value of Death Benefit = Death Benefit(t) $\cdot (1+i)^{-t}$

  (2) Probability of receiving income payment at time t = Survivorship Factor(t)

- If the payment is not life-contingent, the survivorship factor is 1
- If the payment is life-contingent, the survivorship factor is the probability of the annuitant surviving from the valuation date until time t
  - For joint annuitants, the survivorship factor is the probability of either annuitant surviving until time t

Probability of receiving death benefit at time t = Mortality Factor(t)
- The mortality factor is the probability of surviving from the valuation date until time t-1 but dying before time t
  - For joint annuitants, the mortality factor is the probability of at least one annuitant surviving until time t-1 but both having died before time t

(3) Income Value for each payment period =
Income Payment $\cdot$ $(1+i)^{-t}$ $\cdot$ Survivorship Factor(t)
+ Death Benefit(t) $\cdot$ $(1+i)^{-t}$ $\cdot$ Mortality Factor(t)

- Total Income Value (for all payment periods) =

$$\sum_t \left[\begin{array}{l} \text{Income Payment} \cdot (1+i)^{-t} \cdot \text{Survivorship Factor}(t) \\ + \ \text{Death Benefit}(t) \cdot (1+i)^{-t} \cdot \text{Mortality Factor}(t) \end{array} \right]$$

Note: Consistent with current practices, the time period for life contingent payments will stop at age 115.

- Other Information and Assumptions:

  (1) ***Appendix D*** provides an example of how the calculation is performed.

  (2) The following elements are excluded from the calculation:
      a. State Premium Taxes
      b. Other Taxes (i.e., Qualified vs. Non-Qualified Funding)
      c. Compensation, Loads and other expenses specific to a carrier

  (3) Variance in calculation between carriers:
      It is recognized that there will be some minor differences in programming and assumptions used by insurance carriers in calculating INCOME VALUE. Since valuation is essentially different from annuitant to annuitant based on the specific profile of consumer and the type of contract they hold, this variance would be minor. Examples of these differences include:
      a. Different rounding rules
      b. Age definition as of the Valuation Date
      c. Pivotal Date for the income value calculation
      d. Different methods to calculate Cash Refund and Installment Refund
      e. Monthly vs. Annual cash flow models

ii.   Fixed Annuitization with Payment Adjustments

- COLA / fixed percentage Adjustments
  Merely apply the anticipate increase in payments in calculation as dictated by the terms of the contract.

- CPI Adjustment
  Apply the current CPIu rate for changes in payments, again as dictated by the terms of the contract.

iii.   Deferred Fixed Income Annuity Contracts (e.g., DIA or Longevity Insurance)

- Income Payments
  Match the discount rates to the point in time in the future when income payments begin. For example, if payments a deferred for 10 years, apply the 10 year discount rate from the Income Annuity Yield Curve on forward.

- Death Benefits
  Death Benefits available during the deferral and income period should align with the discount rates for that same time period.

iv.   Immediate Variable Annuities (IVA) / Variable Annuitization

- Substitute the current AIR (Adjusted Interest Rate) currently in force instead of the full set of rates provided from the Income Annuity Yield Curve.
  Note: By using each carrier's AIR, there will be a variance of INCOME VALUE for similar products across the market

d. Outputs

i. Transmitting INCOME VALUE through DTCC

- INCOME VALUE can be accommodated on the Full Positions and Values file (POV) as defined and managed by the DTCC.

- Each distributor or user of this value will dictate what contract information should be passed on from the insurance carrier. Elements specific for INCOME VALUE should be:
  - (1) Value: A field already exists in the POV file for a value for the contract.
  - (2) Contract Value Qualifier: A new code called "INV" should be placed in this POV field.
  - (3) As of Date: Since there may be some variation in the frequency of updating INCOME VALUE, it is important to provide the date for which the current value has been updated.

- If necessary, contact the DTCC for additional information on transmittal processes and specifications.

e. Summary

i. Future Modifications to Methodology

- It is anticipated that over the course of time there may be some changes necessary to certain inputs or processes used to support the calculation of INCOME VALUE. Insurance carriers who are accommodating this calculation on their administrative systems should take this into account. Some examples of potential changes include:

  - Industry update of mortality tables used (e.g, from A2000 to "A2012").
  - Common adoption of enhanced improvement scales (e.g., G2 for valuations being discussed by SOA).
  -

- It is assumed that there would be ongoing monitoring and a periodic review of the methodology by an industry committee to discuss best practices as well as propose and agree to any necessary modifications.

III. Other Requirements for INCOME VALUE

a. Frequency ("When")

- Ultimately, it would be up to the user of INCOME VALUE (I.e., distributor) and the insurance carrier to agree as to the timing and frequency of updating the value.

- However, it has been agreed that a general practice would be for the valuation to change on a **Monthly Basis** for an in-force contract. The timing of this valuation would also as part of the standard practice for the insurer for other types of products that are updated on a monthly basis (e.g., **End of Month** valuation).

b. Users of INCOME VALUE ("Who")

- INCOME VALUE can be applied in a number of scenarios both external to the client or internally for the advisor or distribution firm. Ultimately, INCOME VALUE can be transmitted to any party. Since the usage of INCOME VALUE would be predominately external to the insurance carrier, common standards for transmitting this data were defined leveraging DTCC processes.

c. Auditing & Validation

- CANNEX will provide an updated table of sample valuations along with the Income Annuity Yield Curve on its web site. Each carrier can calibrate the results of their INCOME VALUE calculation against this table. The scenarios initially included in this table include the following:
    - Single Life 10 years, Male   55
    - Single Life 10 years, Male   70
    - Single Life 10 years, Male   85
    - Single Life 10 years, Female 55
    - Single Life 10 years, Female 70
    - Single Life 10 years, Female 85
    - Single Life 0 year, Male   55
    - Single Life 0 year, Male   70
    - Single Life 0 year, Male   85
    - Single Life 0 year, Female 55
    - Single Life 0 year, Female 70
    - Single Life 0 year, Female 85

d. Outsourcing of INCOME VALUE Calculation?

- If the carrier chooses to outsource the process for deriving the INCOME VALUE calculation, it is assumed that the exchange of data between the two parties would be similar to the DTCC POV format. The DTCC is able to make an accommodation for "Gender" in one of its records (the only data element necessary for INCOME VALUE that has historically been absent from the POV file. Contact DTCC for more information on this accommodation.

e. Disclosures & Communication of INCOME VALUE

- If INCOME VALUE is to be made available on external reports to the client, it is assumed that the appropriate disclosures would be provided by each party that communicates this data. Naturally, such disclosures would have to be review and approved by each party before making it available.

- A sample disclosure statement has been drafted by the industry working committee that helped defined the standards for INCOME VALUE and is available either through RIIA or the CANNEX web site along with other marketing and communications material.

- Other material available for training and education of advisors and other distributors about INCOME VALUE include:

    o FAQ Document
    o PowerPoint presentation describing INCOME VALUE
    o Other advisor tools

Appendix A –In-Force Policy Data Necessary for INCOME VALUE

Field Name	POV Record	POV Field	Opt/Cond/Mand	Description	Options
Payment Start Date	13/11	3722	Mandatory	Date	
Payout Type	13/11	3706	Mandatory	Code List	F - Fixed V - Variable
Annuity Payout Amount	13/11	3701	Mandatory	Amount	
Annuity Payment Amount Qualifier	13/11	3702	Mandatory	Code List	KN - Gross Amount/Payout WH - Withheld Amount HP - Hypothetical Payout Amount LA - Liquidated Amount PL - Partial Liquidation Amount
Annuity Payment Frequency Code	13/11	3703	Mandatory	Code List	BD - Yearly BM - Bi-Monthly BW - Bi-Weekly CC - Cycles EL - Single Lump Sum ID - Inception to Date MO Monthly SA - Semi-Annual SP - Quarterly YD - Calendar Year to Date CD - Contract Year to Date
Payment Start Date	13/11	3722	Mandatory	Date	
Payment End Date	13/11	3723	Optional	Date	
Lives Type (i.e., Annuity Type)	13/11	3705	Conditional	Code List	S - Single J - Joint
Payout Option (i.e., Guarantee Type)	13/11	3704	Mandatory	Code List	PC - Period Certain Only LO - Life Only LC - Life with Certain Period IR - Life with Installment Refund CR - Life with Cash Refund Tl - Lessor of Period Certain or Life LR - Life with Return of Premium
Residence State		3852			
Date of Birth - Primary Annuitant	13/09	3811	Optional	Date	

Gender - Primary					Contract Party Record (13/09): 109 bytes of filler;
Date of Birth - Secondary Annuitant	13/09	3808	Mandatory	Code List	G2 - Annuitant/Insured HC - Joint Annuitant/Insured HD - Contingent Annuitant/Insured
Gender - Secondary					Contract Party Record (13/09): 109 bytes of filler;
Primary Survivor Reduction Type	13/11	3711	Conditional	Code List	P - Percentage Specified H - Two Thirds R - One Third
Primary Survivor Reduction %	13/11	3712	Conditional	Percentage	
Joint Survivor Reduction Type	13/11	3713	Conditional	Code List	P - Percentage Specified H - Two Thirds R - One Third
Joint Survivor Reduction %	13/11	3714	Conditional	Percentage	
Certain Period Qualifier	13/11	3717	Conditional	Code List	BD - Yearly BM - Bi-Monthly BW - Bi-Weekly EL - Single Lump Sum MO Monthly SA - Semi-Annual SP - Quarterly
Certain Period	13/11	3707	Conditional	Number	
Certain Period Qualifier	13/11	3717	Conditional	Code List	BD - Yearly BM - Bi-Monthly BW - Bi-Weekly EL - Single Lump Sum MO Monthly SA - Semi-Annual SP - Quarterly
Payment Increase Percentage	13/11	3708	Optional	Percentage	
Assumed Interest Rate	13/11	3709	Optional	Percentage	

Levelization Indicator	13/11	3710	Optional	Code List	Y - Yearly Levelization M - Monthly Levelization S - Semi-Annual Levelization Q - Quarterly Levelization N - No Levelization
Payout Change Date	13/11	3860	Opt/Cond	Date	
Payout Change Amount	13/11	3861	Opt/Cond	Amount	
Payout Change Qualifier	13/11	3862	Opt/Cond	Code List	DO - Dollars P1 - Percent
Payout Change Direction	13/11	3863	Opt/Cond	Code List	D - Decrease I - Increase

Appendix B – Income Annuity Yield Curve Methodology (Adjusted Yield Curve)

- An Adjusted Yield Curve (i.e., Income Annuity Yield Curve) will be updated on a daily basis.

- A premium amount for $1,000 benefit per month is generated from 10 representative carriers in the market for the following scenarios:
    - Life only
    - Male and Female
    - Ages: 55-70
    - Deferral period: 0, 2, 3, 4, 5, 6 years

  These premiums are obtained from CANNEX's Income Annuity Exchange service. An average premium is calculated for each of these 192 scenarios.

- The Treasury Rates for 1-year, 5-year, 10-year, and 30-year tenors (currently pulled from the US Treasuries website) are used as the base yield curve (these are spot rates based on semi-annual compounding frequency). The objective is to derive four (4) spreads which when added to the base yield curve will derive the Income Annuity Yield Curve.

- For each of the 32 age and gender combinations in the scenarios above, 4 spreads to the base yield curve (treasuries) are determined (via an optimization algorithm) so as to minimize the error between the calculated INCOME VALUEs and the corresponding premium averages. This process creates 32 yield curves, one for each of the 32 age and gender combinations. As a result, for each gender there is an Income Annuity Yield Surface. The two surfaces can be averaged across gender to create a single Income Annuity Yield Surface. This surface is further averaged across ages in order to get the Income Annuity Yield Curve.

- The Income Annuity Yield Curve is specified by the four Treasury Rates plus the spreads for the 1-year, 5-year, 10-year, and 30-year tenors. These spot rates are then interpolated for Years 1 through 30. Rates beyond 30 years will apply the year 30 rate. These interpolated spot rates (based on semi-annual compounding frequency) are then converted to effective annual spot rates, which are further converted to annual forward rates which represent a format most conducive for generating the discount factors used in the APV calculations. The annual forward rates are converted to monthly forward rates which would align most closely with a monthly payout amount when income valuation is calculated. Forward rates beyond 360 months will apply the month 360 rate.

Appendix C – Sample table of rates from the Income Annuity Yield Curve

/********************* Income Annuity Yield Curve *********************\

Date [yyyy mm dd] : 2012 2 14

	Treasury			=	Income Annuity
Year	Rate	+	Spread		Yield Curve
----	-----------		-----------		-------------
1	0.170000		0.33442509		0.50442509
5	0.820000		0.50894315		1.32894315
10	1.940000		1.31684217		3.25684217
30	3.080000		0.83565272		3.91565272

The above percentages are based on Semi-Annual compounding frequency.
Linear interpolation will be used to derive the entire yield curve.

/************************** Annual Rates ***************************\

Rates beyond 31 years will apply the 31 year rate.

	Interpolated	Annual	Annual
Year	Spot Rates	Spot Rates	Forward Rates
----	------------	-----------	-------------
1	0.00504425	0.00505061	0.00505061
2	0.00710555	0.00711817	0.00918998
3	0.00916684	0.00918785	0.01333998
4	0.01122814	0.01125965	0.01750062
5	0.01328943	0.01333358	0.02167192
6	0.01714523	0.01721872	0.03686898
7	0.02100103	0.02111129	0.04478151
8	0.02485683	0.02501129	0.05273159
9	0.02871262	0.02891873	0.06071925
10	0.03256842	0.03283360	0.06874457
11	0.03289783	0.03316839	0.03652233
12	0.03322723	0.03350324	0.03719377
13	0.03355664	0.03383815	0.03786548
14	0.03388604	0.03417311	0.03853747
15	0.03421545	0.03450812	0.03920972
16	0.03454485	0.03484319	0.03988225
17	0.03487426	0.03517831	0.04055505
18	0.03520366	0.03551349	0.04122812
19	0.03553307	0.03584872	0.04190146
20	0.03586247	0.03618400	0.04257507
21	0.03619188	0.03651934	0.04324896
22	0.03652128	0.03685474	0.04392312
23	0.03685069	0.03719018	0.04459755
24	0.03718010	0.03752569	0.04527225
25	0.03750950	0.03786124	0.04594723
26	0.03783891	0.03819685	0.04662247
27	0.03816831	0.03853252	0.04729799
28	0.03849772	0.03886824	0.04797378
29	0.03882712	0.03920401	0.04864984
30	0.03915653	0.03953984	0.04932618
31	0.03915653	0.03953984	0.03953984

The Annual Forward Rates are converted to Monthly Forward Rates.

/*********************** 361 Monthly Forward Rates ***********************\

Forward rates beyond 361 months will apply the 361 month rate.

	Monthly			Monthly			Monthly			Monthly	
i	Forward Rates		i	Forward Rates		i	Forward Rates		i	Forward Rates	
---	-------------		---	-------------		---	-------------		---	-------------	
1	0.00041991		92	0.00429154		183	0.00326427		274	0.00364259	
2	0.00041991		93	0.00429154		184	0.00326427		275	0.00364259	
3	0.00041991		94	0.00429154		185	0.00326427		276	0.00364259	
4	0.00041991		95	0.00429154		186	0.00326427		277	0.00369660	
5	0.00041991		96	0.00429154		187	0.00326427		278	0.00369660	
6	0.00041991		97	0.00492435		188	0.00326427		279	0.00369660	
7	0.00041991		98	0.00492435		189	0.00326427		280	0.00369660	
8	0.00041991		99	0.00492435		190	0.00326427		281	0.00369660	
9	0.00041991		100	0.00492435		191	0.00326427		282	0.00369660	
10	0.00041991		101	0.00492435		192	0.00326427		283	0.00369660	
11	0.00041991		102	0.00492435		193	0.00331835		284	0.00369660	
12	0.00041991		103	0.00492435		194	0.00331835		285	0.00369660	
13	0.00076262		104	0.00492435		195	0.00331835		286	0.00369660	
14	0.00076262		105	0.00492435		196	0.00331835		287	0.00369660	
15	0.00076262		106	0.00492435		197	0.00331835		288	0.00369660	
16	0.00076262		107	0.00492435		198	0.00331835		289	0.00375059	
17	0.00076262		108	0.00492435		199	0.00331835		290	0.00375059	
18	0.00076262		109	0.00555576		200	0.00331835		291	0.00375059	
19	0.00076262		110	0.00555576		201	0.00331835		292	0.00375059	
20	0.00076262		111	0.00555576		202	0.00331835		293	0.00375059	
21	0.00076262		112	0.00555576		203	0.00331835		294	0.00375059	
22	0.00076262		113	0.00555576		204	0.00331835		295	0.00375059	
23	0.00076262		114	0.00555576		205	0.00337242		296	0.00375059	
24	0.00076262		115	0.00555576		206	0.00337242		297	0.00375059	
25	0.00110493		116	0.00555576		207	0.00337242		298	0.00375059	
26	0.00110493		117	0.00555576		208	0.00337242		299	0.00375059	
27	0.00110493		118	0.00555576		209	0.00337242		300	0.00375059	
28	0.00110493		119	0.00555576		210	0.00337242		301	0.00380458	
29	0.00110493		120	0.00555576		211	0.00337242		302	0.00380458	
30	0.00110493		121	0.00299374		212	0.00337242		303	0.00380458	
31	0.00110493		122	0.00299374		213	0.00337242		304	0.00380458	
32	0.00110493		123	0.00299374		214	0.00337242		305	0.00380458	
33	0.00110493		124	0.00299374		215	0.00337242		306	0.00380458	
34	0.00110493		125	0.00299374		216	0.00337242		307	0.00380458	
35	0.00110493		126	0.00299374		217	0.00342647		308	0.00380458	
36	0.00110493		127	0.00299374		218	0.00342647		309	0.00380458	

85	0.00429154		176	0.00321019		267	0.00364259		358	0.00402041	
86	0.00429154		177	0.00321019		268	0.00364259		359	0.00402041	
87	0.00429154		178	0.00321019		269	0.00364259		360	0.00402041	
88	0.00429154		179	0.00321019		270	0.00364259		361	0.00323674	
89	0.00429154		180	0.00321019		271	0.00364259				
90	0.00429154		181	0.00326427		272	0.00364259				
91	0.00429154		182	0.00326427		273	0.00364259				

Appendix D – Sample of the INCOME VALUE Calculation

/****************** Mortality Table & Projection Scale ******************\

The entire projected mortality table is shown below.

	|----------- MALE ---------------|	
Age	Annual Mortality Rates	Annual Projection Scale	Annual Projected Mortality
-----	-----------	-----------	-----------
0	0.00208000	0.01500000	0.00173499
1	0.00081500	0.01500000	0.00067982
2	0.00045400	0.01500000	0.00037870
3	0.00036700	0.01500000	0.00030613
4	0.00032100	0.01500000	0.00026776
5	0.00029100	0.01500000	0.00024273
6	0.00027000	0.01500000	0.00022522
7	0.00025700	0.01500000	0.00021437
8	0.00029400	0.01250000	0.00025281
9	0.00032500	0.01000000	0.00028808
10	0.00035000	0.00750000	0.00031977
11	0.00037100	0.00500000	0.00034934
12	0.00038800	0.00250000	0.00037652
13	0.00040200	0.00240000	0.00039057
14	0.00041400	0.00230000	0.00040272
15	0.00042500	0.00220000	0.00041391
16	0.00043700	0.00210000	0.00042611
17	0.00044900	0.00200000	0.00043834
18	0.00046300	0.00180000	0.00045310
19	0.00048000	0.00160000	0.00047086
20	0.00049900	0.00140000	0.00049068
21	0.00051900	0.00120000	0.00051158
22	0.00054200	0.00100000	0.00053553
23	0.00056600	0.00100000	0.00055925
24	0.00059200	0.00100000	0.00058493
25	0.00061600	0.00100000	0.00060865
26	0.00063900	0.00100000	0.00063137
27	0.00065900	0.00100000	0.00065114
28	0.00067500	0.00230000	0.00065660
29	0.00068700	0.00360000	0.00065790
30	0.00069400	0.00490000	0.00065427
31	0.00069900	0.00620000	0.00064873

110	0.58400400	0.00000000	0.58400400
111	0.65100700	0.00000000	0.65100700
112	0.72562200	0.00000000	0.72562200
113	0.80833600	0.00000000	0.80833600
114	0.89963300	0.00000000	0.89963300
115	1.00000000	0.00000000	1.00000000

DISCOUNT & SURVIVAL FACTORS

Note: PA = age of Primary Annuitant @ Beginning Of Month
        tPx is for PA:
        Contract & Gender: Male, Single Life with 10 Year Certain
        Age: 85 years and   0 months

Mth	PA	Discount	tPx	Pay Index	PV
0	85	1.00000000	1.00000000	1.00000000	1.00000000
1	85	0.99958026	1.00000000	1.00000000	1.99958026
2	85	0.99916070	1.00000000	1.00000000	2.99874097
3	85	0.99874132	1.00000000	1.00000000	3.99748228
4	85	0.99832211	1.00000000	1.00000000	4.99580439
5	85	0.99790308	1.00000000	1.00000000	5.99370747
6	85	0.99748422	1.00000000	1.00000000	6.99119169
7	85	0.99706554	1.00000000	1.00000000	7.98825723
8	85	0.99664703	1.00000000	1.00000000	8.98490426
9	85	0.99622870	1.00000000	1.00000000	9.98113296
10	85	0.99581055	1.00000000	1.00000000	10.97694351
11	85	0.99539257	1.00000000	1.00000000	11.97233609
12	85	0.99497477	1.00000000	1.00000000	12.96731085
13	86	0.99421655	1.00000000	1.00000000	13.96152741
14	86	0.99345892	1.00000000	1.00000000	14.95498633
15	86	0.99270186	1.00000000	1.00000000	15.94768819
16	86	0.99194538	1.00000000	1.00000000	16.93963356
17	86	0.99118947	1.00000000	1.00000000	17.93082304
18	86	0.99043414	1.00000000	1.00000000	18.92125718
19	86	0.98967939	1.00000000	1.00000000	19.91093657
20	86	0.98892521	1.00000000	1.00000000	20.89986178
21	86	0.98817161	1.00000000	1.00000000	21.88803339
22	86	0.98741858	1.00000000	1.00000000	22.87545196
23	86	0.98666612	1.00000000	1.00000000	23.86211808
24	86	0.98591424	1.00000000	1.00000000	24.84803232
25	87	0.98482608	1.00000000	1.00000000	25.83285840

Mth	PA	Discount	tPx	Pay Index	PV
360	114	0.31243948	0.00000140	1.00000000	121.99864192
361	115	0.31143146	0.00000129	1.00000000	121.99864232
362	115	0.31042669	0.00000117	1.00000000	121.99864268
363	115	0.30942516	0.00000105	1.00000000	121.99864301
364	115	0.30842686	0.00000094	1.00000000	121.99864330
365	115	0.30743179	0.00000082	1.00000000	121.99864355
366	115	0.30643992	0.00000070	1.00000000	121.99864377
367	115	0.30545125	0.00000059	1.00000000	121.99864394
368	115	0.30446578	0.00000047	1.00000000	121.99864409
369	115	0.30348348	0.00000035	1.00000000	121.99864419
370	115	0.30250435	0.00000023	1.00000000	121.99864426
371	115	0.30152839	0.00000012	1.00000000	121.99864430
372	115	0.30055557	0.00000000	1.00000000	121.99864430

Actuarial Present Value (APV) = 121.998644300

For Monthly Income $1000.00, calculated Income Value = $ 121998.644300   [= $ 121998.64 (rounded)]

Appendix E – Sample of INCOME VALUE Audit Tables

```
/*********************** Income Value Audit Table  ***********************\

Date [yyyy mm dd] :  2012  2 14

                                        Income
                                         Value
                                      ------------
Single Life 10 years, Male   55 :        222102.30
Single Life 10 years, Male   70 :        166728.08
Single Life 10 years, Male   85 :        121998.64

Single Life 10 years, Female 55 :        231947.17
Single Life 10 years, Female 70 :        175492.65
Single Life 10 years, Female 85 :        122794.18

Single Life  0 year,  Male   55 :        219752.92
Single Life  0 year,  Male   70 :        157148.04
Single Life  0 year,  Male   85 :         88773.32

Single Life  0 year,  Female 55 :        230475.42
Single Life  0 year,  Female 70 :        169214.13
Single Life  0 year,  Female 85 :         92044.20
```