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**Developing an Expert System for Establishing
Crop Insurance**

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Developing An Expert System for Establishing Crop Insurance

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(D/B) . D/B
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『 』 10a .

가 D/B 8
(1991 98) 가 .
D/B 가

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D/B .
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가 10 가 CD
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가 98
PULLDOWN

GUI (Graphic User Interface)

가 10
가

가

2001

SUMMARY

. Title

Developing An Expert System for Establishing Crop Insurance

. Objectives and Importance of the Study

Agricultural production is influenced considerably by natural environment and is subject to more uncertainty than any other industries. The uncertainty in agricultural production not only hampers the managerial stability in agriculture but also reduces the expected utility of risk-averse farmers.

Society needs an effective safety device to increase the stability of farm management and thus to increase society's economic welfare. Crop insurance is known as the most efficient device among social systems with such functions.

The most important task in designing crop insurance is to determine actuarially fair and sound premium rates. Excessively high premium rates will reduce the number of farmers to purchase an insurance plan, and very low premium will cause great losses to the insurer. In both cases

maintaining the insurance business will be impossible.

This study intends to develop an expert system which can calculate reasonable insurance premium for various crops by region in an easy and precise way.

. Scope and Contents of the Study

The scope and contents of the study are as follows.

o Construction of Data Base

- A sample survey was done for various crops on the distribution of cultivated area, average yield, distribution of crop loss, risk management attitude of farmers, an intention to buy insurance.
- Other basic materials needed for designing crop insurance model are searched.
- After sample survey and secondary data search, data base was constructed.

o Development of a Simulation Model

Based on the data base constructed, a simulation model was developed, which provides criteria for economic validity of introducing crop insurance, and calculates insurance premium by the scenarios of coverage level, liability type, and government's expense share.

o Development of an Expert System

Developed simulation model was extended to an expert system

. Results and Suggestions

The contents of the study proceeded for two years are as follows. First, a data base of crop yield per unit area (10a) was constructed for 10 major crops (rice, barley, naked barley, red pepper, garlic, onion, chinese cabbage, radish, apple, and pear) by the region, province and city/county. The data base covers 8 years (1991-1998) to meet enough time period required for the calculation of insurance premium DB is designed to allow updating of new data in an easy way.

Second, the probability distribution functions of crop yields were estimated for 10 major crops. The data base constructed at the first stage was used for the estimation. The estimated parameters of the yield distribution function were used to construct another DB, on which the information needed for the calculation of insurance premium such as average yield and liability are determined.

Third, a computer program to calculate premium rates was developed. The program is designed to enable simulation by the scenarios and the estimated parameters of probability density functions of crop yields. This program also shows the premium rates if the user inputs his/her own yield data on specific crop items.

Fourth, the developed computer program was extended to an expert

system. The expert system provides major statistical informations and graphs for 10 major crops on the essential informations on crop insurance.

The program and expert system were developed by the order of drawing flow chart, determining system development and usage environment, input-output screen design and development. Pull-down menu system is adopted and designed to meet the users and system demands. The menu system allocates the input-output screen according to the sectors, scopes, users, and the usages of the information. The GUI (Graphic User Interface) method is used to develop input-output screens for easy use.

A few suggestions are made to increase the usage and efficiency of the developed system. The expert system provides the various informations indispensable for the operation of crop insurance. These informations will enable for the government and insurers to design their own insurance programs and take necessary measures after the introduction of crop insurance. The informations will enable the farmers to make a decision to buy an insurance policy. The expert system and the informations therefrom will be valuable assets to prepare the model crop insurance programs. We sincerely hope this expert system to be used effectively for crop insurance programs for apple and pear to be in operation in 2001 as well as insurance programs to be designed for other crops in the near future.

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1

1

가 .
가 . 가
, (premi um)
가 , 가 가
, 가 ,
(optimal crop mix)
가 (Risk Management Agency; 4-5).
(diminishing marginal utility of income)
(risk-averse)
.
(uncertainty) (risk)
. 市場
(risk spreading) 가

(insurance) (Samuelson, pp. 185-188).

(risk aversion)

(Dillon & Scandizzo;

Binswanger).

(expected utility)

가

가

가

가

가

가

WTO

가

(risk aversion)

(risk premium)

가

(overhead cost)

가 가 .
가 .

2000 가

, ,

2001 3 가

.

, ,

가

.

(moral hazard)

(adverse selection)

가 가

.

가

.

, ,

가

()

가

가 (Expert System)

.

(1995), (1999)

가
(1975)

(1981)

(1981)

(1986),

(1987),

(1988),

(1989),

(1991)

(Poisson)

가
가

(1993),

(1996),

(1998)

(1993)

(1996)

가

가

가

3

가 . 가 , 가
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가

10 (, , ,) (道)

(D/B) D/B
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가 D/B 8
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10

가

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CD

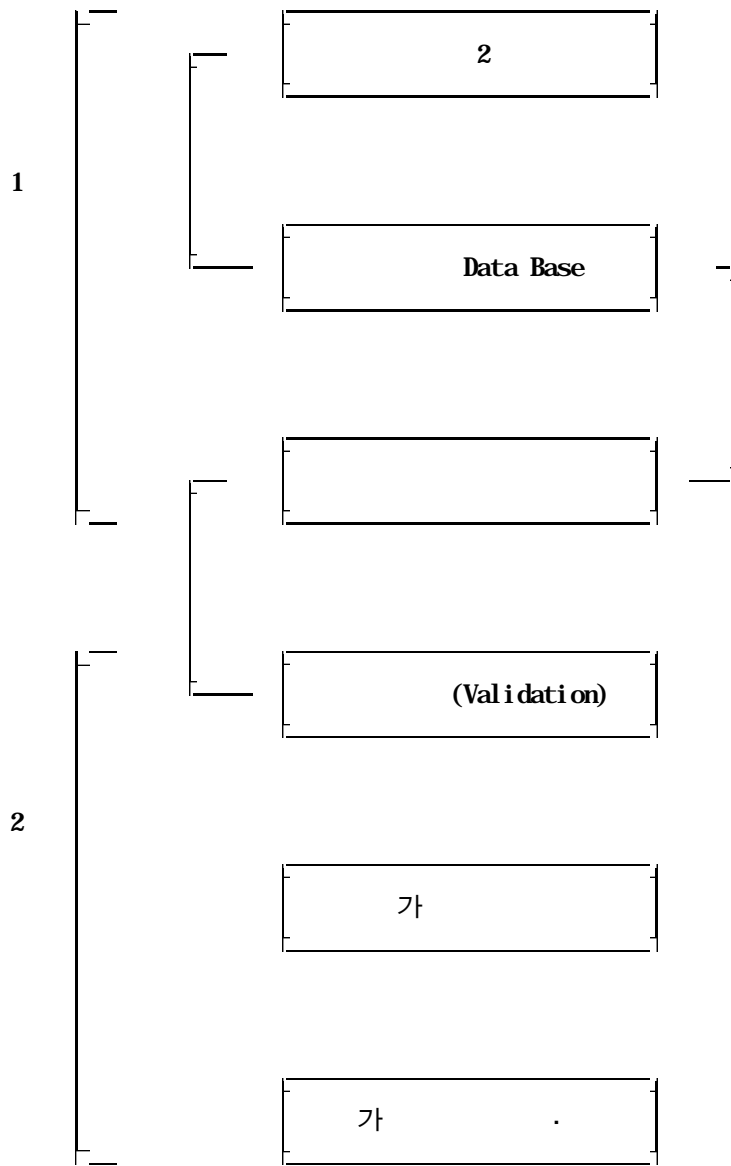
가

()

1-1.

1 (1998 1999)	Data Base	○ - - 2 ○ Data Base
2 (1999 2000)	가	○ ○ - 가, , , ○ 가

1-1.



2

1

, , ,
 .
 , 5 6 ha 가
 . 5 6 ,
 7 8 1 7 ha
 . , 5 6 9 10
 1 7 ha . 7 8
 (, 1996).
 , , ,
 , (潮害), (雪害), (凍害)
 , , 가 가 . 가
 가
 가

1 1.5ha 가 30% 가

가 (, 1993, pp. 26 30).

, 가 .

, , , , , , , , , .

, 가 가

. 가

, 가 가 .

가

가 .

가 가

가 .

가 가

가 가 (, 1996).

가

.

가 가

.

가

가

.

1998 99

가

.

.

, 1979 92

, 11 31

가

가

가

,

1993 94

가

가

가

.

1998 5

가

가

50%

가

가

가가

.

1999

9

가

가

가

50%

가

가

가가 60%

, 2001

,

(, 2000).

2

1.

가 , , , , .

가 1929 가 .

1938 .

1947 . 1967 ,

1968 . 1973

가 「

」 , 1979

(, 1993).

가

, , 가 , ,

,

.

가 .

2-1.

	,
	,
가	,
	,
	,
	,
	,
	,

: , 1996. p. 76

가 (, 1996).

,
 가 .
 , 가
 가가 .
 가 가
 가 .
 , 가
 가 가 가 , 가
 가 .
 , 가가

가 가 縣
 縣
 .
 .

潮水害 ().

(1993) (1996)

2.

1957

() 가

10a

.

가 47 (縣)

10a

(縣)

10a ()

10a 가

50%

$$I = 0.5(P \times Y_n)$$

I : 10a

P : 가

Yn : 10a

가 . 가
 , . 가
 . 가
1958 가
 50% 70% , 가 가
 가 70% 가
 . 가
 가 가 가
 가 가 가
 가 1963 가 가 90%
 .
 .
 = 0.7 × 10a × 가 × 0.9 × 가
1972 가
 가가 80%
 . 가
 70%

가

10a

20 25

(Ray, 1981).

가

(). , 「1 」

70% . , 「 가 」

가가

80%가 . , 「 가 」

가가 90%

3.

1964

(縣)

20

(Ray).

$$= \frac{\quad}{\quad} \times 100$$

「 」

縣

縣

6

18

縣 加

縣

. 1947 63

()

3

(

).

, 縣

(通常)

, (異常)

, (激甚)

加

20

(Poisson distribution function)

20
number)가 20

(observation

加

2

縣

(Ray).

加

3가

(goodness of fit test)

(degree of freedom) 2

가 「 」
가 (實地)
가 (檢見) 가
가 10 1
가
가 가
가
()
, 「1 」 가
30% 가
가 , 「 가
」 가 가가
가 가 20%
가
, 「 가 」
가가
10%
가

3

1.

(all-risk) (multiple-peril) 1899
가 가
5
가
1 . 1900 1920
가
가
(moral hazard) (adverse selection) 가 .
가
(specific-peril) 가
가 가 .
(monitoring cost) 가
(measuring cost)
가 1920

가 . 1920 2 가
(two-price system) (land allotment program)

1930

. 1936 가
,

가 5

가

. 1937

American Farm Bureau Federation

1938 (Agricultural Adjustment Act)

, (Federal Crop Insurance Company: FCIC)

가 .

(Federal multiple-peril crop insurance program MPCI

) “

(alleviation of

distress in rural areas arising out of factors beyond the control of individual producers)” .

가 MPCI 4

. 1938 1944

1944 MPCI

. MPCI 1945
 MPCI , 1973
 가 . 1973 「
 (Agricultural and Consumer Protection Act)」
 (Federal disaster relief program)
 1973 1980 MPCI
 가 1980 (Federal Crop Insurance Act)
 1981 . MPCI
 가 가 .
 (county) MPCI
 (Goodwin & Smith). 2000 FCIC가
 (underwriting) 60 .
 가 가 (selection) (classification)
 가 가
 가 ,
 .
 1994 (Federal Crop Insurance Reform Act:
 CIRA)」 가
 가 가 . (CIRA)
 가
 (catastrophe coverage: CAT coverage)가 .
 가 가 가
 (administrative fee) . 1998 1
 \$50 1999 \$60 . CAT

(가 50%)
가 가
60% 가 (Harwood et al.).
2000 FCIC 3가 (收
入) (pilot revenue crop insurance program) .
Redland 가 (Crop Revenue Coverage: CRC)
, FCIC가 (Income Protection: IP) , Farm
Bureau Mutual Insurance Company가 (Revenue Assurance: RA)
(USDA Risk Management Agency).

2. MPCI

MPCI (收量)
.
(Y)
(填補) (yield coverage: Y_0)
(insurance yield: Y_0) (r)
. (i. e.,
 Y_0) county
1980 (Federal Crop Insurance Act)
.
3
가 가 (Individual Yield

Calculation: IYC)

. IYC 10

Actual Production History(APH)

, 10 가

가 county

. APH CAT coverage 가가

CAT APH (Knight &

Coble).

MPCI 1980

50%, 65%, 75% 가 가 1994

(Federal Crop Insurance Reform Act)

50% 75% 5% 가

. 85%

가 ,

가(Po) 1994 3가

(Federal Crop Insurance Reform Act: CIRA) ↓

가 (estimated market price) 30% 100% 가

(Knight & Coble).

가 55% 100% . MPCI

$$Po \times \text{Max}(rYo - Y, 0)$$

MPCI (liability)

(maximum possible

indemnity), Po· rYo . 가
 30% MPCI
 가 .
 MPCI 가 가 .
 MPCI (語義) , MPCI가
 , ,
 , .
 가 가 (moral hazard) 가
 . 가 가 가 APH
 가 가

3. MPCI

가
 (liability) (indemnity) .
 (insurer)가 (exposure to loss) . MPCI
 가 가
 (Josephson et al.).

$$\begin{aligned}
 &= \text{(acres planted)} \\
 &\times \text{(APH yield)} \\
 &\times \text{填補 (coverage level)} \\
 &\times \text{가 (base price)} \\
 &\times \text{가 (price election percentage)}
 \end{aligned}$$

가 10
 , (填補) 50% 75%
 5% MPCI 가
 , 가 가 (estimated market price)
 , 가 MPCI 가 가 30% 100%

(value of production)

= (acres planted)
 × (actual yield)
 × 가 (base price)
 × 가 (price election percentage)

, MPCI 가

= (liability)
 × (rate)
 × (adjustment factor)

(exposure unit) 가

(expected value of loss)

(Loss

Cost Ratio: LCR)

()

(收支相等)

(pure premium)

(LCR)

$$(LCR) = \frac{\text{---}}{\text{---}}$$

가 가 가

가 (group)

. MPCI 10

APH(actual production history) 가

county . County

MPCI

가.

50% 75% 5% 가

(coverage level)

(common coverage level = 65%)

(liability) ()

(adjusted indemnity) 가

(adjusted liability)

(adjusted LCR) county .

1975 county

MPCI .

(excess loss adjustment)

()

(capping) .

(capping) 가

가

. 1975

80%

80% (the 80th percentile) . 1975

1999 가

가 20 (25 × 80%)

21

25 20

. (capped rate) county

(simple county LCR) . 80%

(catastrophe rate) .

. (unloaded base rate)

county (割増前) (County

unloaded base rate)

$$= \text{county} \times + \times (100\% -)$$

(credibility)

$$\sqrt{\frac{\text{Min}(P_i, 271)}{271}} \times 60\%$$

P_i county ,
 가 271 60%가 .
 271 가

county .
 (actuary) MPCI

(Josephson et al., p. 22-24).

(simple circle LCR) county
 county county county 가

$$\frac{\sum_{county} \text{county} \times \text{county}}{\sum_{county} \text{county}}$$

(案)
 county (案) (implied base rate)
 (unloaded base rate) 가 가 가 .
 (disaster reserve
 factor) $\frac{1}{0.88}$.

(下院)

가 . 가

(Josephson et al., p. 26).

가 (州)
 (state excess load) . county (capping)
 州
 0.05 0.01 0.05
 (capping) 0.01 (capping). 州

$$\text{州} = \text{Min}[\text{Max}(\frac{\text{county}}{\text{county}}, 0.01), 0.05]$$

가 0.05 county
 . 州
 county (capping)
 州 county

가 州 .

가 (非播種)

(prevented planting load) 가

가 .

가 案

(implied base rate) .

$$(案) = \frac{[\frac{\quad}{0.88} + 州 + \quad]}{0.9}$$

案 가

(案) .

(案) ()

() .

10% (capping), -5%

(capping). county

(base rate) . County

.

가

.

가

가 APH가 county APH county

(base rate) 가 .
 가 APH county APH 가
 가 .

$$\frac{\text{county} \times (\text{county})^x}{0.88} +$$

(yield span) $\frac{\text{county}}{\text{county}}$
 9 ,
 (catastrophe rate) 1975 80% (the
 80th percentile) . x -1
 -1.5 .
 (unit division factor) 가가
 MPCI 가 가
 . 가 가 가
 . 20ha
 70% (coverage rate) 가 6ha
 .
 20ha 10ha 70% 가
 6ha 가 3ha
 .
 가
 가

3

1

1.

가 .
가 .

,

(認知) (imperfect knowledge)

(危害)가

가

.

가 가

가

가

가

.

(objective risk)

(subjective risk),

(pure risk)

(speculative

risk) 가

(, pp. 6-11).

가 1.0%

가 1 100

100 90

110 100

90 (110) 10 가 10%

가

가

가

가 가

(production risk)

(price or market risk)

(institutional risk)

가 (人的)

(Hardaker et al. pp. 5-7).

가 , 가 ,
 . 2000
(收入) (Revenue
Crop Insurance) 가

2.

. Vaughan
 3 (, pp. 12-13).
(Don't risk more than
you can afford.).

, 가
 3 가
 .
(Consider the odds.).
 가

(Don't risk a lot for a little.) 가

3 가

3 가 가 .

3 ,

가

.

. 가

.

3.

.

.

,

, 가

가 .

(risk averse) 가

(risk premium) (certainty

equivalent) .

\mathcal{A} , $U(\mathcal{A})$

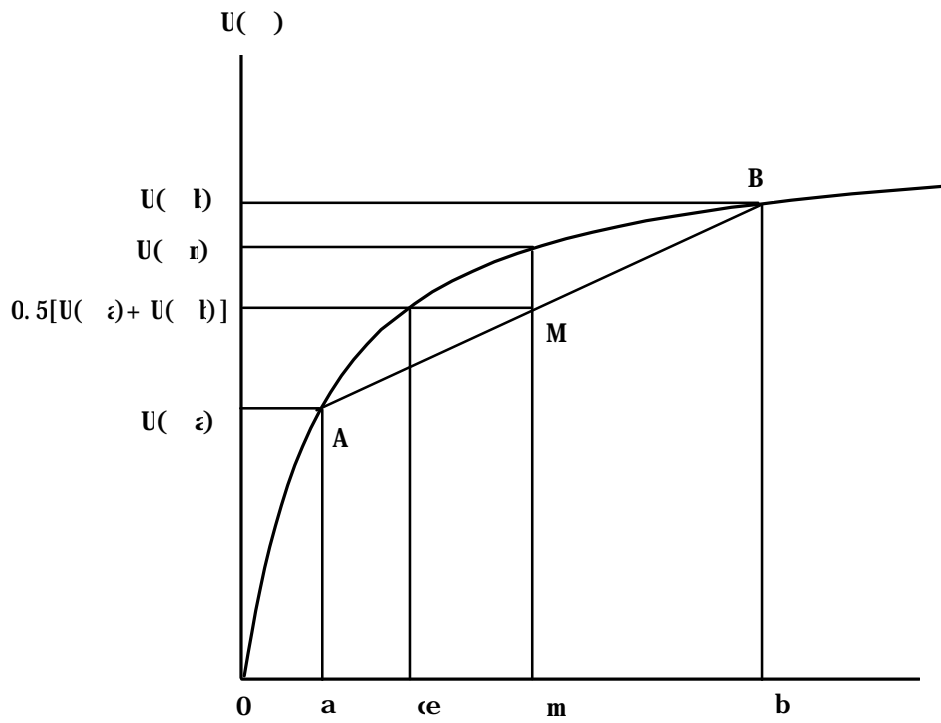
(Bernoulli's principle)

(expected utility theorem)

(decision maker)가 x
 (Anderson et al.), (strictly
 concave)

x_a x_b 50% 가

3-1.



가 ()

$$0.5 \times x_a + 0.5 \times x_b = x_m \qquad U(x_m)$$

가 A

B (弦) (M)

$0.5 \times U(\mathbb{Y}_a) + 0.5 \times U(\mathbb{Y}_b) = U(\mathbb{Y}_{ce})$

$U(\mathbb{Y}_m)$

$U(\mathbb{Y}_{ce})$ 100% \mathbb{Y}_{ce}

50% 가 \mathbb{Y}_a

\mathbb{Y}_b 가 \mathbb{Y}_a \mathbb{Y}_b

(100%) \mathbb{Y}_{ce} 가 가

(certainty equivalent) 50%

, $[\mathbb{Y}_m - \mathbb{Y}_{ce}]$

(risk premium)

가 (

H) 50% 50% 가

가 100% \mathbb{Y}_m $[\mathbb{Y}_m - \mathbb{Y}_{ce}]$

H가

K가 H “H \mathbb{Y}_a () K H

$(\mathbb{Y}_m - \mathbb{Y}_a)$,

H \mathbb{Y}_b $(\mathbb{Y}_b - \mathbb{Y}_m)$ K

” H

H가 H 가

$-\frac{1}{2} \times (\mathbb{Y}_m - \mathbb{Y}_a) = -\frac{1}{2} \times (\mathbb{Y}_b - \mathbb{Y}_m)$,

H (expected loss)

μ_m . H μ_m
 μ_b K
 $(\mu_b - \mu_m)$ (premium)
가 가
 $[\mu_m - \mu_{ce}]$ K
. 가 H
(certainty equivalent) μ_{ce} ,
H
K H μ_b
 $(\mu_b - \mu_m)$ 가 가
H가
가
. K
가 H (linear function)
(strictly convex function) 가 .
. (risk averse)
(the insured) H μ_b (2 1
) $(\mu_b - \mu_m)$ μ_r (,
 $\mu_r - \mu_m - \mu_{ce}$) K . H가 K
(insurance premium) 1
 $\frac{1}{2} \times (\mu_b - \mu_m) + \mu_r$. K H μ_a
(2 1) $(\mu_m - \mu_a)$
(indemnity) . μ_r (pure

premium) , (expected value)

. , K가

H v_r K

. K v_r

. K

가

가

2

1.

x가

C

(C - x)

(數理的)

(actuarially sound)

가

x가

f(x)

f(x)가

$f(x) = 0$, for all x

$$\int_{-\infty}^{\infty} f(x) dx = 1$$

가

가

1ha

1ha

30

가 < 3-1>

가 .

3-1.

ha ()	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10
	1	2	3	4	5	5	4	3	2	1

$E(X)$

30

$$(0.5 \times 1) + (1.5 \times 2) + (2.5 \times 3) + (3.5 \times 4) + (4.5 \times 5) + (5.5 \times 5) + (6.5 \times 4) + (7.5 \times 3) + (8.5 \times 2) + (9.5 \times 1) = 150$$

$$30 \times \frac{150}{30} = 5.0 \quad () \quad E(X) \quad .$$

$$V(X) = 5.09 \quad .$$

< 3-1>

< 3-2>

(triangle distribution

function)가

ha

x 가 .

$$f(x) = 0.04x, \quad 0 \leq x \leq 5$$

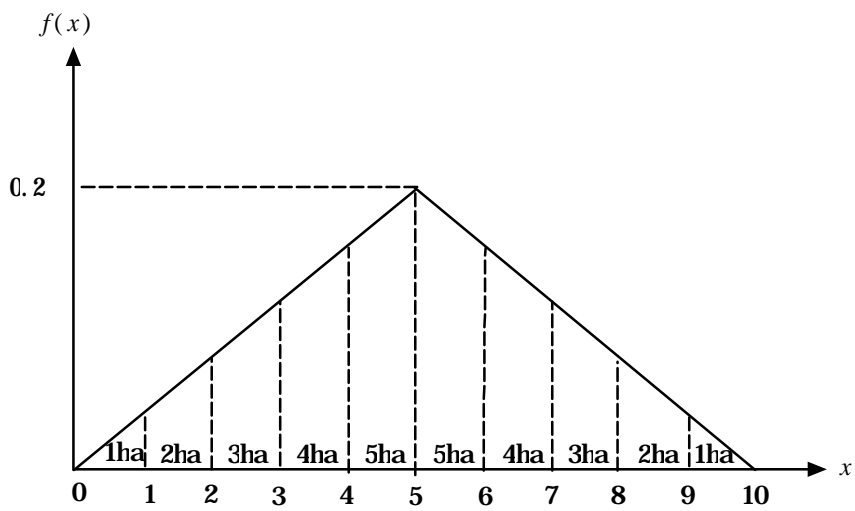
$$f(x) = 0.4 - 0.04x, \quad 5 \leq x \leq 10$$

x (domain) 0

$$\int_0^5 f(x)dx + \int_5^{10} f(x)dx = 1$$

3-2.

1



$$\begin{aligned}
E(X) &= \int_0^5 x \cdot f(x) dx + \int_5^{10} x \cdot f(x) dx \\
&= \int_0^5 0.04x^2 dx + \int_5^{10} (0.04x - 0.04^2) dx \\
&= \left. \frac{0.04x^3}{3} \right|_0^5 + \left. 0.2x^2 - \frac{0.04x^3}{3} \right|_5^{10} \\
&= \frac{5}{3} + \frac{10}{3} = 5.0
\end{aligned}$$

$$\begin{aligned}
V(X) &= \frac{a^2 + b^2 + c^2}{18} - \frac{ab}{9} - \frac{ac}{9} - \frac{bc}{9} \\
&= \frac{0^2 + 5^2 + 10^2}{18} - \frac{(0 \times 5)}{9} - \frac{(0 \times 10)}{9} - \frac{(5 \times 10)}{9} = 4.17
\end{aligned}$$

$a =$, $b =$ (most likely), $c =$

, < 3-3>

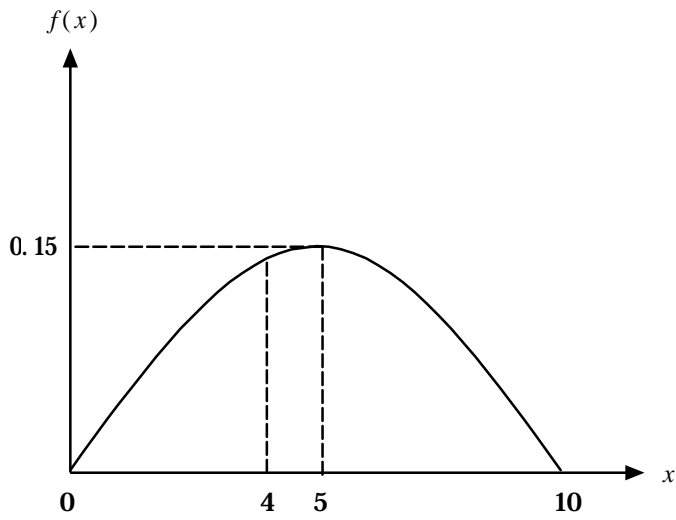
< 3-2>

$$f(x) = -0.006x^2 + 0.06x \text{ 가 } 2$$

< 3-2>

.

$$\begin{aligned}
E(X) &= \int_0^{10} x \cdot f(x) dx \\
&= \int_0^{10} x \cdot (-0.006x^2 - 0.06x) dx \\
&= \int_0^{10} (-0.006x^3 - 0.06x^2) dx \\
&= \left. -0.0015x^4 + 0.02x^3 \right|_0^{10} = 5.0
\end{aligned}$$



$$\begin{aligned}
 V(X) &= \int_0^{10} [x - E(X)]^2 \cdot f(x) dx \\
 &= \int_0^{10} (x - 5)^2 \cdot (-0.006x^2 - 0.06x) dx \\
 &= \int_0^{10} (-0.006x^4 + 0.12x^3 - 0.75x^2 + 1.5x) dx \\
 &= -0.0012x^5 + 0.03x^4 - 0.25x^3 + 0.75x^2 \Big|_0^{10} = 5.0
 \end{aligned}$$

		(coverage)	80%	4.0	
가	ha	(pure premium)			가
	1ha	4.0		4.0	
		가			
		가			ha
()		ha			()
		(expected loss)			.

1 (premiun) 가 (insurance premiun)
 가 . (pure premiun) . , <
 3-1> ha

$$\frac{(4-0.5) \times 1 + (4-1.5) \times 2 + (4-2.5) \times 3 + (4-3.5) \times 4}{30} = 0.50$$

ha

$$\int_0^4 f(x) \cdot (4-x) dx = \int_0^4 0.04x(4-x) dx$$

$$= 0.08x^2 - \frac{0.04}{3}x^3 \Big|_0^4 = 0.43$$

< 3-3> 4.0

$$\int_0^4 f(x) \cdot (4-x) dx = \int_0^4 (4-x) \cdot (-0.006x^2 + 0.06x) dx$$

$$= \int_0^4 (0.006x^3 - 0.084x^2 + 0.24x) dx$$

$$= 0.0015x^4 - 0.028x^3 + 0.12x^2 \Big|_0^4 = 0.51$$

< 3-2> . ,

, 2 .
 가 . 가 ,
 가 . , 가 ,

가 가 , 가
 가 가 , 가
 가 2 .

3-2.

			2
	5.0	5.0	5.0
	5.09	4.17	5.00
	0.50	0.43	0.51

가
 가 가 가
 2 가 2
 2 가

< 3-2>

(loss)

()

(probability density function)

2.

가 , 2
 $f(x)$ (cumulative distribution function:

cdf) $\int f(x) dx$ 가 (closed form)

$\int (C - x) \cdot f(x) dx$ (逆) (antiderivative)

cdf가 가
 , $\int (C - x) \cdot f(x) dx$ (逆) 가
 가 . 가
 cdf가 , 가

가 N ,
 \forall , C ,
 n , 가
 R , i x_i
) (3-1) (

$$= \sum_{i=1}^n (C - x_i) = nC - \sum_{i=1}^n x_i \quad (3-1)$$

(average loss cost) 가

(3-2)

$$(L) = \frac{1}{N} (nC - \sum_{i=1}^n x_i) \quad (3-2)$$

, $\sum_{i=1}^n x_i = nR$, 가

(i.e., $\frac{n}{N} = A$) (3-2) (3-3) .

$$L = \frac{n(C-R)}{N} = AC - AR \quad (3-3)$$

(3-3) L

‘ (收支相等) ’ (pure

premium)가 .

(3-3) C

. C 가

R

가 .

(numerical analysis)

A R .

가

A R . MPCI (

Sri Lanka)

(Botts & Boles; Ray).

x

$$E(X) = \mu, V(X) = \sigma^2$$

μ σ

$$\int_R^C f(x) dx = A \quad (3-3) \quad < \quad (3-4) \quad A$$

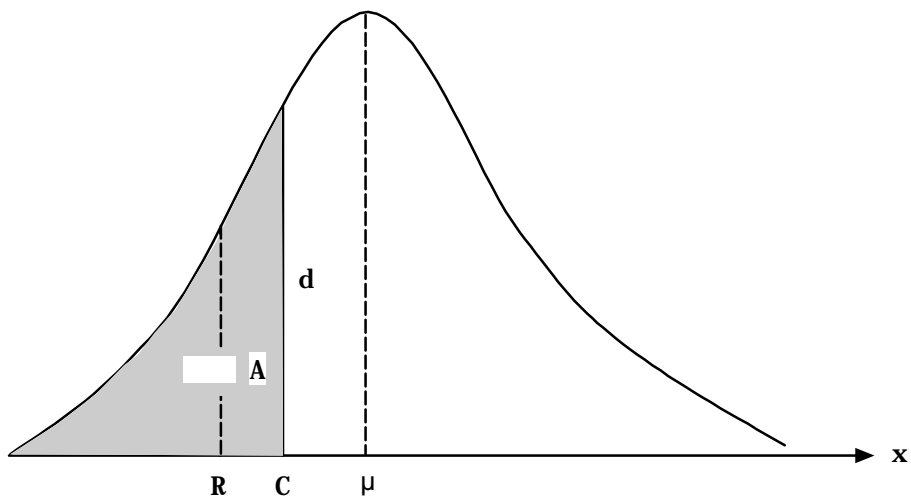
$$\int_{-\infty}^{\infty} f(x) dx = 1 \quad (3-4)$$

$$z = \frac{x - \mu}{\sigma}, \quad f(x) = g(z)$$

3-4.

$f(x) \sim N(\mu, \sigma^2)$

▲



$$A = \int_R^C f(x) dx = \int_{-\frac{C-\mu}{\sigma}}^{\frac{C-\mu}{\sigma}} g(z) dz \quad (3-4)$$

A (areas of standard normal distribution
table) subroutine

Microsoft Excel

. R (3-5) ,

$$R = \mu - \frac{\sigma^2 \cdot f(c)}{A} \quad (3-5)$$

[1]

pdf cdf $f(x)$ $F(x)$,
(domain) a b (, $a < b$) (truncated normal
distribution) pdf cdf $f^*(x)$ $F^*(x)$
 $f^*(x)$ $F^*(x)$.

$$f^*(x) = \frac{f(x)}{F(b) - F(a)} \quad \text{if } a < x < b$$

$$F^*(x) = \frac{F(x) - F(a)}{F(b) - F(a)} \quad \text{if } a < x < b$$

($a < x < b$) $E^*(x)$

(3-6) .

$$E^*(x) = \int_a^b x \cdot f^*(x) dx$$

$$= \frac{1}{F(b) - F(a)} \int_a^b x \cdot f(x) dx \quad (3-6)$$

, $X \sim N(\mu, \sigma^2)$ (standard normal distribution)
 $Z \sim SN(0, 1), z = \frac{x - \mu}{\sigma}$

$$f(x) = \frac{1}{\sqrt{2\pi}\sigma} \exp\left[-\frac{1}{2}\left(\frac{x - \mu}{\sigma}\right)^2\right]$$

$$g(z) = \frac{1}{\sqrt{2}} e^{-\frac{z^2}{2}} \quad (3-6)$$

(3-7)

$$\begin{aligned} E^*(x) &= \mu + \frac{1}{F(b) - F(a)} \int_{\frac{a - \mu}{\sigma}}^{\frac{b - \mu}{\sigma}} z \cdot g(z) dz \\ &= \mu + \frac{1}{F(b) - F(a)} \int_{\frac{a - \mu}{\sigma}}^{\frac{b - \mu}{\sigma}} z \cdot \frac{1}{\sqrt{2}} e^{-\frac{z^2}{2}} dz \\ &= \mu + \frac{1}{F(b) - F(a)} \left[-\frac{1}{\sqrt{2}} \int_{\frac{a - \mu}{\sigma}}^{\frac{b - \mu}{\sigma}} z \cdot e^{-\frac{z^2}{2}} dz \right] \\ &= \mu - \frac{1}{F(b) - F(a)} \left[\frac{1}{\sqrt{2}} e^{-\frac{z^2}{2}} \right]_{\frac{a - \mu}{\sigma}}^{\frac{b - \mu}{\sigma}} \\ &= \mu - \frac{1}{F(b) - F(a)} [g(z)]_{\frac{a - \mu}{\sigma}}^{\frac{b - \mu}{\sigma}} \\ &= \mu - \frac{1}{F(b) - F(a)} [g(\frac{b - \mu}{\sigma}) - g(\frac{a - \mu}{\sigma})] \\ &= \mu - \frac{1}{F(b) - F(a)} [f(b) - f(a)] \quad (3-7) \end{aligned}$$

(3-7) $a = -$, $b < 3-4 > C$ 가

$$F(a) = 0, f(a) = 0, F(b) = \text{Area } A \quad . \quad [- \quad x \quad C]$$

$$x \quad R$$

$$R = \mu - \frac{1}{A} \int_0^C [f(C) - 0] dx = \mu - \frac{f(C)}{A} \quad (\text{Q. E. D.})$$

[1] (3-5) (3-3)

가 가 . <

3-2 >

가 $\mu = 5.0, \sigma^2 = 5.09, C = 4,$

$$A = 0.3288, f(C) = \frac{1}{\sqrt{2\pi}\sigma} \exp\left[-\frac{1}{2}\left(\frac{C-\mu}{\sigma}\right)^2\right] = 0.1603$$

$$R = 2.518 \quad L = A(C - R)$$

$$= 0.3288 \times (4.0 - 2.518) = 0.49 \quad . \quad < \quad 3-2 >$$

10%

2

가

가

가

(statistical test)

가

가

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가

3.

가 가 .

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가

[2] .

가 ,
(r) r
. , 가 .

[2]

(i.e.,) μ , ,

$C, \frac{C}{\bar{w}}$ $r, \frac{Q}{\bar{w}}$

(coefficient of variation) v , ()

$$(3-3) \quad P = \frac{A}{C} \left(\frac{C}{r} - R \right) \quad (3-8)$$

$$C = r \lambda, \quad v = \frac{1}{\mu} \quad (3-8)$$

(3-9)가

$$\begin{aligned} P &= A - \frac{A}{C} R \\ &= A - \frac{A}{C} \left[\mu - \frac{f(c)}{A} \right] \\ &= A - \frac{A \mu}{C} + \frac{f(c)}{C} \\ &= A \left(1 - \frac{\mu}{C} \right) + \frac{f(c)}{C} \\ &= A \left(1 - \frac{1}{r} \right) + \frac{v \mu}{r \mu} f(c) \\ &= A \left(1 - \frac{1}{r} \right) + \frac{v}{r} f(c) \quad (3-9) \end{aligned}$$

, $f(x)$ $F(x)$ X $N(\lambda, \sigma^2)$ pdf cdf

, $z = \frac{(x-\lambda)}{\sigma}$, $g(z)$ $G(z)$ Z $SN(0, 1)$

pdf cdf

$$f(x) = \frac{1}{\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \quad g(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$$

$$f(x) = \frac{1}{\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right] = g(z) \quad .$$

가

$$f(c) = \frac{1}{\sqrt{2}} \exp\left[-\frac{1}{2}\left(\frac{c-\mu}{r}\right)^2\right],$$

$$f(c) = \frac{1}{\sqrt{2}} \exp\left[-\frac{1}{2}\left(\frac{c-\mu}{r}\right)^2\right] = g\left(\frac{c-\mu}{r}\right).$$

(3-9)

(3-10)

(3-10)

(3-11)

$$A \left(1 - \frac{1}{r}\right) + \frac{v}{r} \cdot g\left(\frac{c-\mu}{r}\right) \quad (3-10)$$

$$= A \left(1 - \frac{1}{r}\right) + \frac{v}{r} \cdot g\left[\frac{\mu(r-1)}{r}\right]$$

$$= A \left(1 - \frac{1}{r}\right) + \frac{v}{r} \cdot g\left(\frac{r-1}{v}\right) \quad (3-11)$$

(3-11)

A

(3-12)

$$A = \int_{-\infty}^c \frac{1}{\sqrt{2}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{r}\right)^2\right] dx$$

$$= \int_{-\infty}^{\frac{r\mu}{v}} \frac{1}{\sqrt{2}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{r}\right)^2\right] dx$$

$$= \int_{-\infty}^{\frac{r\mu-\mu}{v}} \frac{1}{\sqrt{2}} \exp\left(-\frac{1}{2}z^2\right) dz$$

$$= \int_{-\infty}^{\frac{r-1}{v}} g(z) dz$$

$$= G\left(\frac{r-1}{v}\right) \quad (3-12)$$

(3-11) (3-12) P (3-13) .

$$P = (1 - \frac{1}{r}) \cdot G(\frac{r-1}{v}) + \frac{v}{r} \cdot g(\frac{r-1}{v}) \quad (3-13)$$

(3-13) r v

.
.

, μ

. (Q. E. D.)

< 3-2 >

$$k = 5.0, \quad Q^2 = 5.09$$

80% (, $r = 0.8$)

(3-13)

$$v = \frac{Q}{k} = 0.4512,$$

$$(1 - \frac{1}{r}) = 0.25, \quad G(\frac{r-1}{v}) = 0.3288, \quad \frac{v}{r} = 0.5640, \quad g(\frac{r-1}{v}) = 0.3616$$

$$P = 0.25 \times 0.3288 + 0.5640 \times 0.3616 = 0.1217 \quad . \quad P$$

, (C)

$$= P \times C = 0.1217 \times 4.0 = 0.49 \quad .$$

(3-12)

(3-3)

.

2001

70%

가

< 3-3>

가

()

r

가

가

가

가

< 3-3>

(coefficient of variation) 0.2%

3-3.

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
10	0.00	0.00	0.00	0.00	0.01	0.03	0.11	0.34	0.93
11	0.00	0.00	0.00	0.00	0.02	0.06	0.19	0.51	1.21
12	0.00	0.00	0.00	0.01	0.03	0.11	0.30	0.71	1.51
13	0.00	0.00	0.01	0.02	0.07	0.18	0.44	0.94	1.83
14	0.00	0.00	0.01	0.04	0.11	0.28	0.60	1.20	2.17
15	0.00	0.01	0.03	0.08	0.18	0.40	0.79	1.47	2.52
16	0.01	0.02	0.05	0.12	0.27	0.54	1.01	1.76	2.88
17	0.02	0.04	0.09	0.19	0.38	0.71	1.25	2.07	3.25
18	0.03	0.07	0.14	0.27	0.51	0.90	1.51	2.40	3.62
19	0.05	0.10	0.20	0.38	0.66	1.12	1.79	2.74	4.01
20	0.08	0.15	0.28	0.50	0.84	1.35	2.08	3.09	4.40
21	0.12	0.22	0.38	0.64	1.03	1.60	2.39	3.45	4.79
22	0.17	0.30	0.50	0.80	1.25	1.87	2.72	3.81	5.19
23	0.24	0.40	0.64	0.99	1.48	2.16	3.05	4.19	5.59
24	0.33	0.51	0.79	1.19	1.73	2.46	3.40	4.57	5.99
25	0.42	0.65	0.97	1.41	2.00	2.78	3.76	4.96	6.40
26	0.54	0.80	1.16	1.65	2.29	3.11	4.12	5.36	6.81
27	0.68	0.97	1.38	1.91	2.59	3.45	4.50	5.76	7.22
28	0.83	1.16	1.61	2.18	2.90	3.80	4.88	6.16	7.64
29	1.00	1.37	1.85	2.47	3.23	4.16	5.27	6.57	8.06
30	1.19	1.60	2.12	2.77	3.57	4.53	5.67	6.98	8.47
31	1.40	1.84	2.40	3.09	3.92	4.91	6.07	7.40	8.89
32	1.62	2.10	2.70	3.42	4.28	5.30	6.48	7.82	9.32
33	1.87	2.38	3.01	3.76	4.66	5.70	6.89	8.24	9.74
34	2.13	2.68	3.34	4.12	5.04	6.10	7.31	8.66	10.16
35	2.41	2.99	3.68	4.49	5.43	6.51	7.73	9.09	10.59
36	2.71	3.31	4.03	4.86	5.83	6.92	8.15	9.52	11.01
37	3.02	3.65	4.39	5.25	6.23	7.34	8.58	9.95	11.44
38	3.35	4.00	4.77	5.65	6.65	7.77	9.02	10.38	11.87
39	3.69	4.37	5.16	6.05	7.07	8.20	9.45	10.82	12.30
40	4.05	4.75	5.55	6.47	7.50	8.64	9.89	11.25	12.73

3-3.

()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
41	4.42	5.14	5.96	6.89	7.93	9.08	10.33	11.69	13.16
42	4.81	5.54	6.38	7.32	8.37	9.52	10.78	12.13	13.59
43	5.20	5.96	6.81	7.76	8.81	9.97	11.22	12.57	14.02
44	5.62	6.38	7.24	8.20	9.26	10.42	11.67	13.02	14.45
45	6.04	6.82	7.69	8.65	9.71	10.87	12.12	13.46	14.88
46	6.48	7.26	8.14	9.11	10.17	11.33	12.57	13.90	15.31
47	6.93	7.72	8.60	9.57	10.64	11.79	13.03	14.35	15.75
48	7.38	8.18	9.06	10.04	11.10	12.25	13.48	14.80	16.18
49	7.85	8.65	9.54	10.51	11.57	12.72	13.94	15.24	16.62
50	8.33	9.13	10.02	10.99	12.05	13.19	14.40	15.69	17.05
51	8.82	9.62	10.50	11.47	12.53	13.66	14.86	16.14	17.48
52	9.32	10.11	10.99	11.96	13.01	14.13	15.33	16.59	17.92
53	9.83	10.62	11.49	12.45	13.49	14.60	15.79	17.04	18.35
54	10.34	11.12	12.00	12.95	13.98	15.08	16.25	17.49	18.79
55	10.86	11.64	12.50	13.45	14.47	15.56	16.72	17.94	19.23
56	11.40	12.16	13.02	13.95	14.96	16.04	17.19	18.40	19.66
57	11.94	12.69	13.53	14.46	15.46	16.52	17.66	18.85	20.10
58	12.48	13.22	14.06	14.97	15.95	17.01	18.13	19.30	20.54
59	13.04	13.76	14.58	15.48	16.45	17.49	18.60	19.76	20.97
60	13.60	14.31	15.11	16.00	16.95	17.98	19.07	20.21	21.41
61	14.16	14.86	15.65	16.52	17.46	18.47	19.54	20.67	21.85
62	14.74	15.41	16.18	17.04	17.96	18.96	20.01	21.12	22.28
63	15.32	15.97	16.73	17.56	18.47	19.45	20.49	21.58	22.72
64	15.90	16.54	17.27	18.09	18.98	19.94	20.96	22.04	23.16
65	16.49	17.11	17.82	18.62	19.49	20.43	21.44	22.49	23.60
66	17.09	17.68	18.37	19.15	20.01	20.93	21.91	22.95	24.04
67	17.69	18.26	18.93	19.69	20.52	21.42	22.39	23.41	24.47
68	18.30	18.84	19.48	20.22	21.04	21.92	22.87	23.87	24.91
69	18.91	19.42	20.05	20.76	21.56	22.42	23.34	24.32	25.35
70	19.52	20.01	20.61	21.30	22.07	22.92	23.82	24.78	25.79

3-3.

()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
71	20.14	20.60	21.17	21.84	22.59	23.42	24.30	25.24	26.23
72	20.77	21.20	21.74	22.39	23.12	23.92	24.78	25.70	26.67
73	21.40	21.80	22.31	22.93	23.64	24.42	25.26	26.16	27.11
74	22.03	22.40	22.89	23.48	24.16	24.92	25.74	26.62	27.55
75	22.67	23.00	23.46	24.03	24.69	25.42	26.22	27.08	27.98
76	23.31	23.61	24.04	24.58	25.22	25.93	26.70	27.54	28.42
77	23.95	24.22	24.62	25.14	25.74	26.43	27.19	28.00	28.86
78	24.60	24.83	25.20	25.69	26.27	26.94	27.67	28.46	29.30
79	25.25	25.45	25.79	26.25	26.80	27.44	28.15	28.92	29.74
80	25.91	26.06	26.37	26.80	27.33	27.95	28.63	29.38	30.18
81	26.57	26.68	26.96	27.36	27.87	28.46	29.12	29.84	30.62
82	27.23	27.31	27.55	27.92	28.40	28.96	29.60	30.30	31.06
83	27.89	27.93	28.14	28.48	28.93	29.47	30.09	30.77	31.50
84	28.56	28.56	28.73	29.04	29.47	29.98	30.57	31.23	31.94
85	29.23	29.19	29.33	29.61	30.00	30.49	31.06	31.69	32.38
86	29.90	29.82	29.92	30.17	30.54	31.00	31.54	32.15	32.82
87	30.57	30.45	30.52	30.74	31.07	31.51	32.03	32.61	33.26
88	31.25	31.09	31.12	31.30	31.61	32.02	32.51	33.08	33.70
89	31.93	31.73	31.72	31.87	32.15	32.53	33.00	33.54	34.14
90	32.61	32.37	32.32	32.44	32.69	33.04	33.48	34.00	34.58
91	33.30	33.01	32.93	33.01	33.23	33.55	33.97	34.47	35.03
92	33.99	33.65	33.53	33.58	33.77	34.07	34.46	34.93	35.47
93	34.68	34.29	34.14	34.15	34.31	34.58	34.95	35.39	35.91
94	35.37	34.94	34.74	34.72	34.85	35.09	35.43	35.86	36.35
95	36.06	35.59	35.35	35.30	35.39	35.61	35.92	36.32	36.79
96	36.76	36.24	35.96	35.87	35.93	36.12	36.41	36.78	37.23
97	37.46	36.89	36.57	36.45	36.48	36.63	36.90	37.25	37.67
98	38.15	37.54	37.18	37.02	37.02	37.15	37.38	37.71	38.11
99	38.86	38.19	37.79	37.60	37.56	37.66	37.87	38.17	38.55
100	39.56	38.85	38.41	38.17	38.11	38.18	38.36	38.64	38.99

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1.

가 가

가

(收支)

가

가

3

2001

2.

(Poisson)

(1987),

(1991) , (Beta) 가

(adverse selection) 가

(1999) ,

()

(, Babcock & Hennessy, Goodwin & Ker, Just & Weninger, Moss & Shonkwiler, Pease, Ramirez, Taylor, Wang et al., Zanini et al.)

가

(skewness)

(kurtosis)

Just & Veninger 가
가 가
. Just & Veninger
가

Goodwin & Ker
(nonparametric approach)

가
(parametric approach)

2

가 (4)

가 가 가

(continuous probability density function)

가

1 (10a) () (survey data) .

가 D/B

가 8 (1991 98) . < 4-1>

10가

4-1. .

	6,436	140	-	1,078	485	-	605	826	440	610
	3,321	240	-	918	325	20	290	365	270	210
	3,009	140	-	1,046	380	-	295	295	485	230
	6,073	234	99	982	785	250	530	650	585	550
	5,517	530	400	1,014	350	325	370	605	320	280
	6,969	-	1,040	1,208	945	800	580	900	190	465
	6,357	812	45	1,470	830	700	460	509	1,240	320
	5,779	695	440	728	685	830	505	525	370	435
	106	-	-	77	265	273	162	126	-	-
	43,567	2,791	2,024	8,521	5,050	3,198	3,797	4,801	3,900	3,100

2.

가. (BestFit)

가

가 . 가 가 가
 가
 가 가 가
P-P

(probability-probability plot) Q-Q (quantile-quantile plot)

가
 SAS SPSS

가 ,
 (goodness-of-fit test)

Palisade 가 BestFit

Beta, Binomial, Chi-Square, Error Function, Erlang,
 Exponential, Extreme Value, Gamma, Geometric, Hypergeometric, Inverse
 Gaussian, Logistic, Log-Logistic, Lognormal, Lognormal2, Negative
 Binomial, Normal, Pareto, Pearson Type , Pearson Type , Poisson,
 Rayleigh, Student's t, Triangular, Uniform, Weibull 5

21

(goodness-of-fit test)

Chi-square , Chi-square
 Kolmogorov-Smirnov , Anderson-Darling

가 가

(ranking)

BestFit

가 가

. BestFit

Kim & Leuthold Zanini

et al.

BestFit (maximum likelihood method)

가

Levenberg-Marquardt . Levenberg-Marquardt

(local minima)

(global minima)

(Palisade).

가 (Goodness-of-Fit Test)

가 Chi-square

X 가 $f(x)$ 가

가 $[H_0: X = f(x)]$ 가 n

c A_1, A_2, \dots, A_c 가 P_{jo}

가 (true) 가 c j

(, $P_{j0} = P[X \in A_j]$, where $X \sim f(x)$).

$$\chi^2 = \sum_{j=1}^c \frac{(o_j - e_j)^2}{e_j} \sim \chi^2_{c-1} \quad (4-1)$$

α (Bain & Engelhardt, pp. 417)

21).

$$\chi^2 = \sum_{j=1}^c \frac{(o_j - e_j)^2}{e_j} \sim \chi^2_{c-1} \quad (4-1)$$

, (4-1) χ^2 e_j 가 5

χ^2 가 .

가 가 .

가 . χ^2

가 가 가

가 가 가

가 , 가 가

(confidence level) . χ^2

(equi probable approach)

(Law & Kelton, pp. 382-387).

Chi-square

Kolmogorov

-Sni rnov . Kolmogorov-Sni rnov (4-2)

$$D_n = \sup [|F_n(x) - \check{F}(x)|] \quad (4-2)$$

(4-2) n , $F_n(x) = \frac{N_x}{n}$, N_x x ,
 $\check{F}(x)$ 가 가 x

(Law & Kelton, pp. 387-91).

Anderson-Darling

, (4-3) .

$$A_n^2 = n \int_{-\infty}^{\infty} [F_n(x) - \check{F}(x)]^2 \mathbb{I}(x) \check{f}(x) dx \quad (4-3)$$

(4-3) $F_n(x)$ $\check{F}(x)$ (4-2) , $\check{f}(x)$ 가
 가 x , $\mathbb{I}(x)$

가 (weight function) $\frac{1}{\check{F}(x)[1-\check{F}(x)]}$
 . 가 (tail)

가 가
 (discrepancy)

(Law & Kelton, pp. 392-393).

3

1.

가 가

. BestFit
가 . BestFit 21

가 1 2

가 BestFit 21
(best fit)

가 .

χ^2 .

χ^2 Kolmogorov-Smirnov

Anderson-Darling .

χ^2 ,

χ^2 가 ,

, Kolmogorov-Smirnov Anderson-Darling
(confidence level)가 15%

가 , ,

distributions)

2.

가. ()

가 가 가 가
 . (coefficient of variation) 가
 가 가 가 가 (4-2).

가 가 .

Logistic 가 . Logistic
 (symmetric) , (node)
 X (domain) - x 가

(kurtosis)가 , (fat tails), (closed form)

가 Weibull 가
 가 . Weibull
 0 , ,

가

가

4-2.

	(kg)							
					1	2	χ^2	
	459.0	82.5	0.180	Logistic	459.0	45.03	1130.0	0.99
	405.0	112.6	0.278	Logistic	405.0	61.76	1448.4	0.99
	454.8	70.1	0.154	Logistic	454.7	37.95	1191.5	0.99
	490.4	70.5	0.144	Logistic	490.6	37.94	1159.1	0.99
	508.9	70.2	0.138	Logistic	509.1	37.68	1263.5	0.99
	467.4	73.9	0.158	Logistic	467.4	40.28	1366.8	0.99
	443.6	88.7	0.200	Logistic	443.6	48.51	1312.8	0.99
	439.2	81.8	0.186	Logistic	439.3	44.47	2117.8	0.99
	389.7	64.7	0.166	Weibull	7.037	415.4	38.7	0.99

Logistic

가 가

(4-3).

가

가 가

가 가

가 가

가

가

가 가

4-3.

	(kg)							
					1	2	2	
	216.3	73.8	0.341	Logistic	214.9	40.6	13.6	0.99
	271.1	92.1	0.340	Logistic	270.0	50.8	18.8	0.99
	242.5	36.1	0.149	Logistic	241.4	20.7	9.5	0.99
	232.5	50.5	0.217	Logistic	231.7	28.1	10.1	0.99
	249.1	77.5	0.311	Logistic	248.7	42.7	11.4	0.99
	238.1	48.5	0.204	Logistic	237.9	26.3	8.2	0.99
	235.4	67.3	0.286	Logistic	235.2	36.8	7.7	0.99

Logistic

가

Gamma

Erlang

가 가

(4-4). Erlang

가

Gamma

(skewness)

가

가

가

4-4.

	(kg)							
					1	2	χ^2	
	213.2	60.5	0.284	Gamma	10.201	20.825	17.7	0.99
	315.5	92.7	0.294	Logistic	314.7	51.2	13.6	0.99
	273.3	66.1	0.242	Logistic	273.3	35.8	8.3	0.99
	295.5	43.1	0.146	Erlang	24.00	12.18	6.4	0.99
	277.7	73.4	0.264	Logistic	277.2	40.3	12.8	0.99

10

(4-5).

가 가 .

가 가

가

Logistic 가

가 Weibull

4-5.

	(kg)							
					1	2	χ^2	
	178.9	93.8	0.524	Normal	178.3	94.0	1.07	0.99
	204.7	107.9	0.527	Normal	204.1	108.1	3.53	0.99
	247.5	90.7	0.366	Logistic	246.7	49.7	0.40	0.99
	191.2	73.7	0.385	Logistic	190.4	40.0	0.79	0.99
	224.0	88.0	0.393	Logistic	223.3	48.1	0.28	0.99
	221.6	97.2	0.439	Logistic	220.7	52.5	0.31	0.99
	223.8	86.2	0.385	Logistic	223.2	47.0	0.47	0.99
	185.8	83.0	0.447	Logistic	185.0	45.3	0.48	0.99
	83.7	39.6	0.473	Weibull	2.234	93.76	0.52	0.99

가 가

(4-6). 가 .

가

가

, Weibull, Logistic, Erlang

3 , . Logistic

가

Weibull

Weibull

가

Weibull

가

4-6.

	(kg)							
					1	2	χ^2	
	716	292	0.408	Normal	713.1	292.4	0.795	0.99
	645	278	0.431	Weibull	2.491	723.7	0.698	0.99
	680	205	0.301	Logistic	678.1	112.2	0.774	0.99
	760	306	0.403	Erlang	6.00	126.5	0.659	0.99
	792	336	0.424	Normal	788.7	332.5	0.714	0.99
	1,186	330	0.278	Logistic	1183.8	178.9	1.174	0.99
	965	361	0.374	Logistic	963.6	196.6	0.721	0.99
	1,209	425	0.352	Normal	1206.8	424.5	0.685	0.99
	1,235	271	0.219	Weibull	5.023	1337.5	0.786	0.99

Weibull

(4-7).

Weibull

가

Weibull

가

Logistic

가

가

4-7.

	(kg)							
					1	2	χ^2	
	5,249	2,338	0.445	Weibull	2.295	5636	0.020	0.99
	4,138	1,514	0.366	Weibull	3.012	4611	1.156	0.99
	4,561	1,776	0.389	Logistic	4546	975	64.74	0.99
	5,605	1,286	0.229	Logistic	5603	688	15.67	0.99
	6,416	1,540	0.240	Weibull	4.763	6993	0.782	0.99
	5,602	1,654	0.295	Logistic	5591	895	1.663	0.99
	6,134	1,220	0.199	Normal	6121	1219	1.462	0.99

Logistic 가 가
 가
 Gamma 가 가 (

4-8).
 가

가 가

가

4-8.

	(kg)							
					1	2	χ^2	
	10, 277	3, 530	0. 343	Logistic	10249	1935	17. 88	0. 99
	8, 183	2, 948	0. 360	Gamma	6. 637	1228	0. 383	0. 99
	11, 165	3, 312	0. 297	Logistic	11119	1775	0. 914	0. 99
	11, 897	2, 921	0. 246	Logistic	11886	1595	10. 61	0. 99
	12, 259	3, 839	0. 313	Logistic	12219	2112	47. 20	0. 99
	11, 291	2, 855	0. 253	Logistic	11258	1580	93. 94	0. 99
	10, 058	3, 007	0. 299	Logistic	10027	1635	4. 29	0. 99
	11, 722	3, 384	0. 289	Logistic	11692	1860	194. 3	0. 99
	8, 845	1, 688	0. 191	Logistic	8797	942	0. 891	0. 99

Veibull, Rayleigh, Gamma

가 (4-9). Gamma ,
 , 4 . Gamma
 Rayleigh 가 Weibull
 가 가 , ,
 , Logistic

4-9.

	(kg)							
					1	2	σ2	
	5,017	2,150	0.429	Weibull	2.540	5647	1.082	0.99
	5,116	2,090	0.409	Rayleigh	3884	-	1.027	0.99
	4,726	1,674	0.354	Gamma	7.816	601	1.394	0.99
	5,647	1,884	0.334	Gamma	8.861	636	1.131	0.99
	5,606	1,703	0.304	Logistic	5592	916	1.007	0.99
	7,041	2,189	0.311	Logistic	7025	1183	1.411	0.99
	5,755	2,205	0.383	Gamma	6.792	845	0.960	0.99
	6,812	2,342	0.344	Logistic	6787	1269	16.54	0.99
	8,329	1,926	0.231	Gamma	15.63	529	0.125	0.99

10 가

(4-10).

가

가

Exponential , Extreme Value

가

Exponential

Extreme value

가

Logistic

4

4-10.

	(kg)							
					1	2	χ^2	
	1,456	831	0.571	Exponential	1449	-	5.35	0.99
	1,273	818	0.643	Exponential	1259	-	14.66	0.99
	2,102	622	0.296	Logistic	2089	343	2.63	0.99
	1,979	814	0.411	Logistic	1963	433	75.43	0.99
	1,898	1,071	0.564	Exponential	1873	-	0.336	0.99
	1,542	887	0.575	ExtremeValue	1122	684	0.672	0.99
	2,116	813	0.384	Logistic	2107	444	6.48	0.99
	2,267	1,092	0.482	Normal	2238	1052	0.302	0.99

Logistic

가

(4-11).

가

가 Weibull

가

가

가

가

가 가 .

4-11.

	(kg)							
					1	2	χ ²	
	2,448	1,011	0.413	Logistic	2435	543	21.50	0.99
	1,626	675	0.415	Normal	1604	675	10.60	0.99
	2,363	745	0.315	Logistic	2334	405	2.870	0.99
	2,150	829	0.386	Logistic	2136	454	0.947	0.99
	2,499	1,295	0.518	Weibull	1.677	2.273	0.017	0.99
	2,843	815	0.287	Logistic	2812	444	1.476	0.99
	2,117	699	0.330	Logistic	2105	384	1.864	0.99
	2,187	801	0.366	Logistic	2174	438	1.515	0.99

4

1.

< 4-12>

가

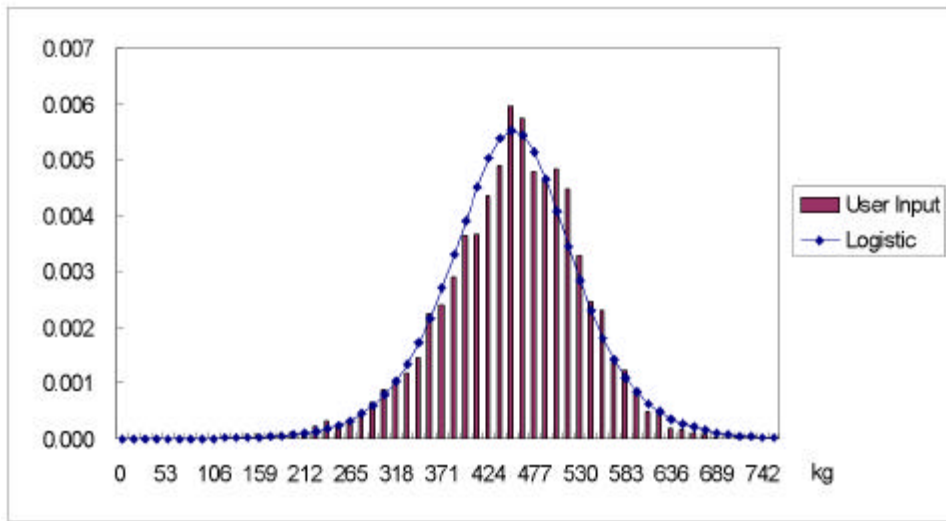
Logistic 가 . 10 . 9 80 (90 가 80)

Logistic **50**
 (best-fit) .
 < 4-1> **10a**
Logistic(459.0 , 82.0) .
Logistic 가 가
50 . **Logistic** 가
 (symmetric) , (node)
 가
 . (kurtosis)가
 (fat tails) **Logistic**

4-12.

Normal	-	-	-	2	3	1	-	-	1	1	8
Logistic	8	7	3	6	3	3	8	3	3	6	50
Weibull	1	-	-	1	2	3	-	1	-	1	9
Gama	-	-	1	-	-	-	1	4	-	-	6
Erlang	-	-	1	-	1	-	-	-	-	-	2
Rayleigh	-	-	-	-	-	-	-	1	-	-	1
Exponential	-	-	-	-	-	-	-	-	3	-	3
Extreme Value	-	-	-	-	-	-	-	-	1	-	1
	9	7	5	9	9	7	9	9	8	8	80

4-1. Logistic (,)



Logistic 가
 Weibull 80 9 .
 Weibull 가 (domain) 0 ,
 (skewness) 가 ,

Weibull 가

Zanini et al. .

12 (Counties)

28

(

A) 38

(B)

, A 26 22 B 14 12 ,

A 25 16 B 11 8

5% , , ,) 80 4 (.

Logistic

가 가 , Logistic

가 Weibull

(skewness) . 가

. Veibull Gamma, Rayleigh

가 가 가

가 가

80 5% 4 . ,

10 가 ,

가 ()

2.

(σ^2)가 가 ,

가 가 .

가

99%

가

(best fit)

99%

Logistic

99%

, < 4-3>

, <

4-4> Logistic

가 (99%))

Logistic

99%

가

< 4-5> < 4-6>

가

Weibull Weibull

가 5%

Logistic 80 50 가 (best fit)

30

30 85% 1 (

) 29 99%

가

4 (, ,)

Logistic 가 가 . 4

가

가

Logistic

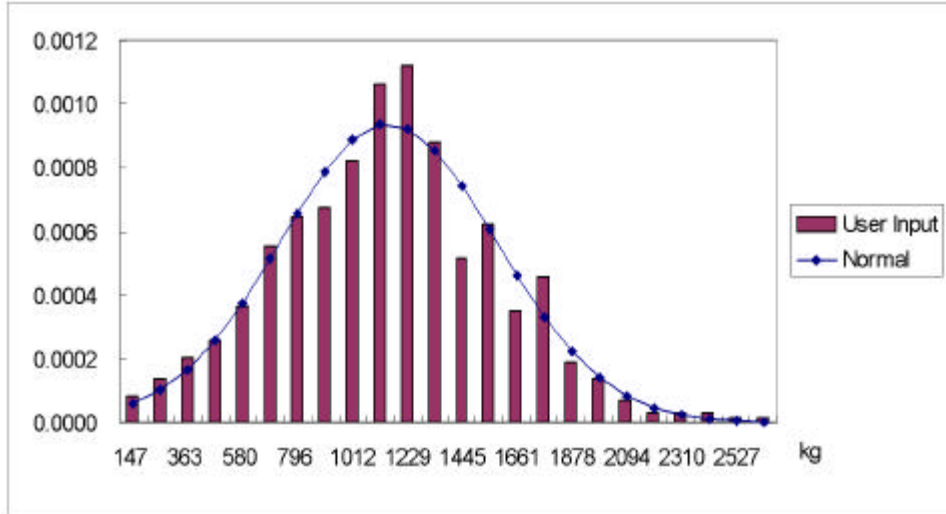
. Logistic

< 4-7> <

4-8>

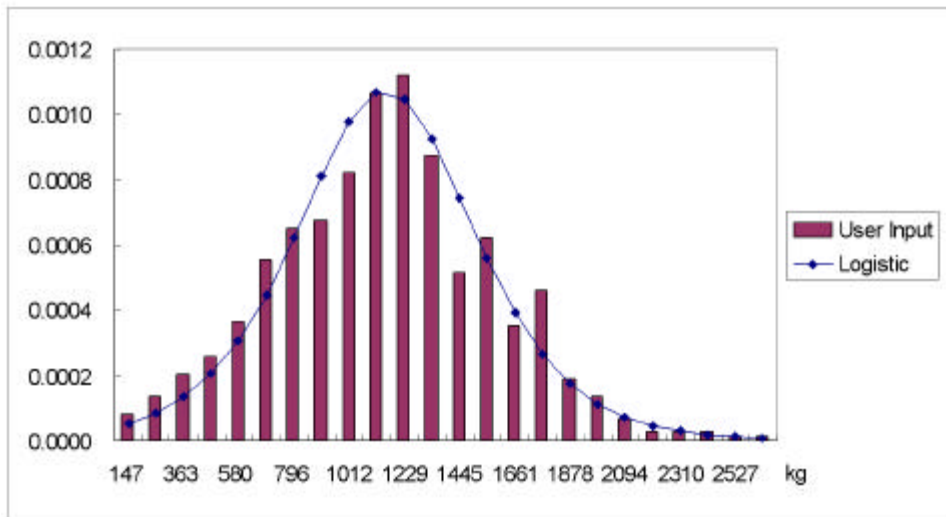
4-3.

(,)

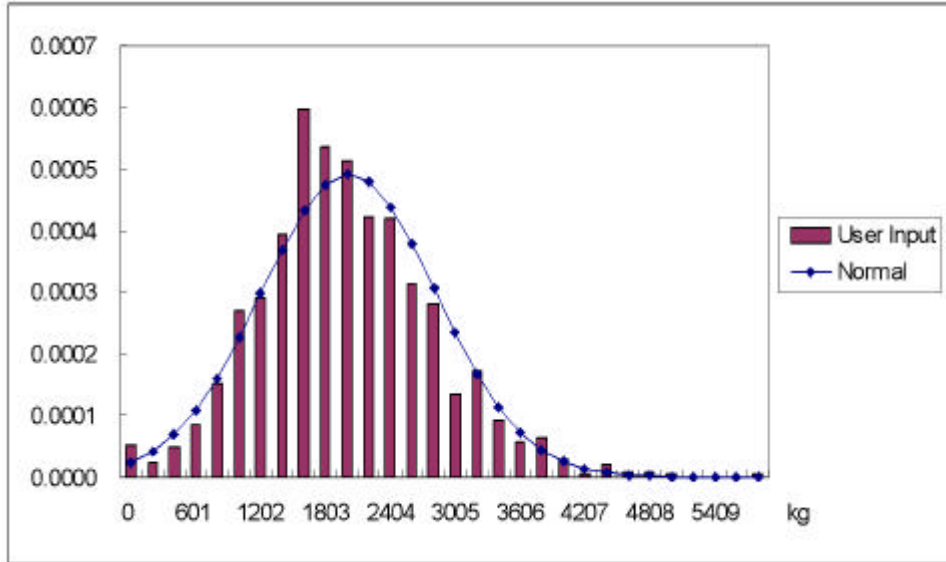


4-4.

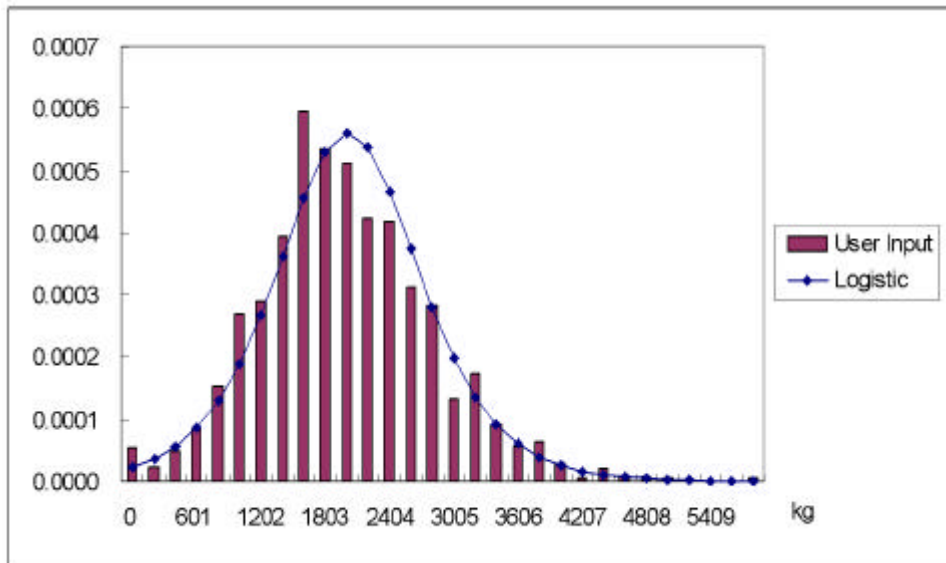
Logistic (,)



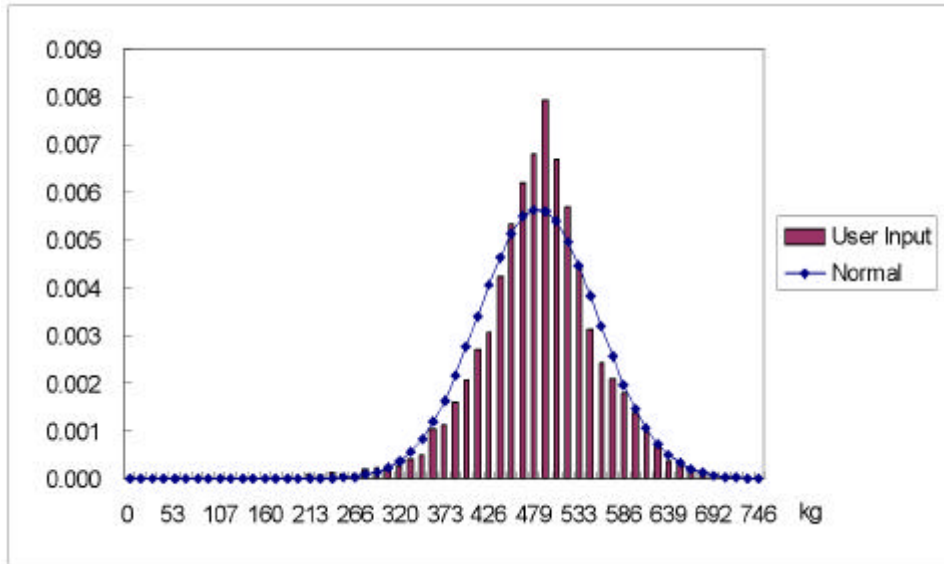
4-5. (,)



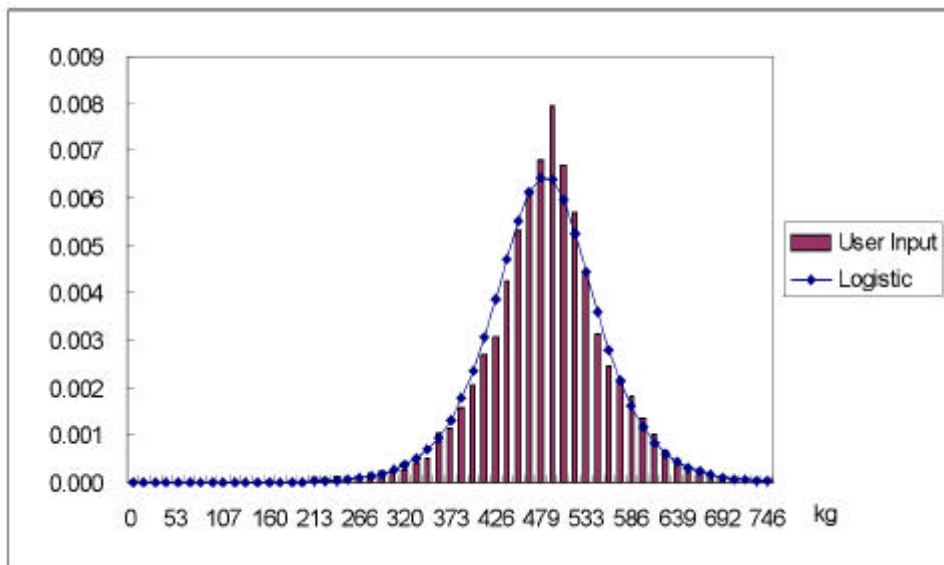
4-6. Logistic (,)



4-7. (,)



4-8. Logistic (,)



가 95%

가

Logistic

가

가

Logistic

가

Logistic

(closed form)

(continuous distribution function)

$\int (C - x) \cdot f(x) dx$ (逆) (antiderivative)

Logistic

가

Logistic

가

Kim & Leuthold(2000)가

. Logistic

가

가

(best

fit)

가

5%

Just & Veninger(1999)

(skewness test),

(kurtosis test),

(Lagrange

multiplier test)

가

가

, 가

. Just & Veninger

가

- (E-V analysis)

, -

(E-V efficient set) 2

(Second Degree Stochastic Dominance efficient set)

(Pope & Ziener) .

5

1 Logistic

1. Logistic

$X \sim \text{Logistic}(\alpha, \beta)$ (pdf) (cdf)
 (5-1), (5-2)

$$f(x) = \frac{\exp[-(\alpha-x)/\beta]}{[1 + \exp[(\alpha-x)/\beta]]^2}, \quad -\infty < x < \infty \quad (5-1)$$

$$F(x) = \frac{1}{1 + \exp[(\alpha-x)/\beta]}, \quad -\infty < x < \infty \quad (5-2)$$

$$E(X) = \alpha, \quad V(X) = \frac{\pi^2}{3} \beta^2$$

< 5-1> (=500) (=150)가

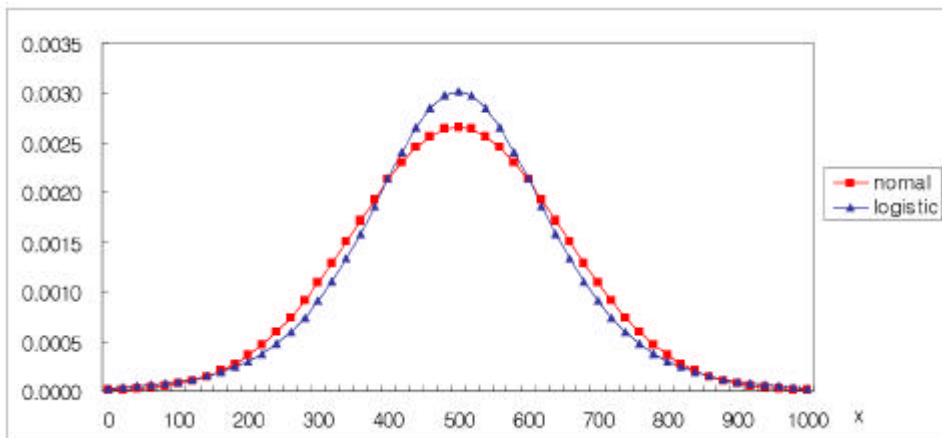
Logistic

Logistic

(symmetric), (mode), (median)

Logistic 가 ,
 (tails)
 가 Logistic .
 Logistic 가

5-1. Logistic



Logistic 가 ,
 (coefficient of variation)가 가
 가
 . (coefficient of
 variation)가
 . 70%
 가 0.30
 가 1.0 가

Logistic

5.7%

2. Logistic

Logistic 가

(=)

$$\int_1^C (C-x) \cdot \frac{\exp[(\alpha-x)/\beta]}{[1 + \exp[(\alpha-x)/\beta]]^2} dx \quad (\text{逆}) \quad \text{가}$$

. Mathematica[®] (Wolfram)

가

. Mathematica[®]

(5-3) . min -

overflow

- 10Q 가

$$\int_1^C (C-x) \cdot \frac{\exp[(\alpha-x)/\beta]}{[1 + \exp[(\alpha-x)/\beta]]^2} dx$$

$$= x - \frac{x - \frac{C}{\beta}}{1 + \exp[\frac{\alpha}{\beta} - \frac{x}{\beta}]} + b \ln[1 + \exp[\frac{\alpha}{\beta} - \frac{x}{\beta}]] \Big|_1^C \quad (5-3)$$

3 가

가 가

Logistic

(數

理的)

가 Logistic ,
 (r) r
 가

[3]

Logistic

L (5-3) (5-4)

$$L = C + \beta \ln [1 + \exp(-\frac{\alpha}{\beta} C)] - \min + \frac{\min - C}{1 + \exp(-\frac{\alpha}{\beta} \min)}$$

$$- \beta \ln [1 + \exp(-\frac{\alpha}{\beta} \min)] \quad (5-4)$$

$C =$, $\alpha = \kappa$, $\beta = \frac{\sqrt{3}Q}{\lambda}$, \min

(domain) $\min = k \cdot Q \ (k < 0)$

$\nu = \frac{Q}{\kappa}$, $\beta = \frac{\sqrt{3}Q}{\lambda} = \frac{\sqrt{3}Q}{\lambda_r}$, $\min = kQ = kQ_r$

$$\min C = \left(\frac{k}{r} - 1\right)C, \quad \frac{\alpha}{\beta} C = \frac{\mathbb{A}(1-r)}{\sqrt{3v}\mathbb{A}} = \frac{\mathbb{A}(1-r)}{\sqrt{3v}},$$

$$\frac{\alpha}{\beta} \min = \frac{\mathbb{A}k}{\beta} = \frac{\mathbb{A}kv}{\beta} = \frac{\mathbb{A}(1-kv)}{\sqrt{3v}\mathbb{A}} = \frac{\mathbb{A}(1-kv)}{\sqrt{3v}}$$

$$(5-4) \quad (5-5)$$

$$L = C + \frac{\sqrt{3}vC}{\mathbb{A}r} \ln[1 + \exp[-\frac{\mathbb{A}(1-r)}{\sqrt{3v}}]] - \frac{kvC}{r} + \frac{(\frac{kv}{r} - 1)C}{1 + \exp[-\frac{\mathbb{A}(1-kv)}{\sqrt{3v}}]} \quad (5-5)$$

$$P = \frac{L}{C} \quad (5-5) \quad C$$

$$(5-6)$$

$$P = 1 + \frac{\sqrt{3}v}{\mathbb{A}r} \ln[1 + \exp[-\frac{\mathbb{A}(1-r)}{\sqrt{3v}}]] - \frac{kv}{r} + \frac{\frac{kv}{r} - 1}{1 + \exp[-\frac{\mathbb{A}(1-kv)}{\sqrt{3v}}]} + \frac{\sqrt{3}v}{\mathbb{A}r} \ln[1 + \exp[-\frac{\mathbb{A}(1-kv)}{\sqrt{3v}}]] \quad (5-6)$$

$$(5-6) \quad k$$

, r v

Logistic

. (Q. E. D.)

5-1. Logistic

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
10	0.00	0.00	0.01	0.01	0.03	0.08	0.18	0.41	0.93
11	0.00	0.01	0.01	0.03	0.06	0.13	0.28	0.58	1.18
12	0.01	0.01	0.03	0.05	0.10	0.20	0.39	0.77	1.47
13	0.01	0.02	0.04	0.08	0.15	0.29	0.53	0.98	1.76
14	0.02	0.04	0.07	0.13	0.22	0.40	0.70	1.22	2.08
15	0.04	0.07	0.11	0.18	0.31	0.52	0.88	1.47	2.40
16	0.06	0.10	0.16	0.25	0.41	0.67	1.09	1.74	2.74
17	0.09	0.14	0.22	0.34	0.53	0.84	1.31	2.03	3.08
18	0.13	0.19	0.29	0.44	0.67	1.02	1.55	2.33	3.43
19	0.18	0.26	0.38	0.56	0.83	1.23	1.81	2.64	3.79
20	0.24	0.34	0.48	0.70	1.00	1.45	2.08	2.96	4.16
21	0.31	0.43	0.60	0.85	1.20	1.69	2.37	3.30	4.53
22	0.39	0.53	0.73	1.01	1.40	1.94	2.67	3.64	4.90
23	0.49	0.65	0.88	1.20	1.63	2.20	2.98	3.99	5.28
24	0.60	0.79	1.05	1.40	1.86	2.48	3.30	4.34	5.66
25	0.72	0.94	1.23	1.61	2.12	2.78	3.63	4.71	6.05
26	0.86	1.11	1.42	1.84	2.38	3.08	3.97	5.08	6.43
27	1.02	1.29	1.63	2.08	2.66	3.39	4.31	5.45	6.82
28	1.19	1.48	1.86	2.34	2.95	3.72	4.67	5.83	7.22
29	1.37	1.69	2.10	2.61	3.25	4.05	5.03	6.21	7.61
30	1.57	1.92	2.35	2.90	3.57	4.40	5.40	6.60	8.01
31	1.79	2.16	2.62	3.19	3.89	4.75	5.77	6.99	8.41
32	2.02	2.41	2.90	3.50	4.23	5.11	6.15	7.38	8.81
33	2.26	2.68	3.19	3.82	4.57	5.47	6.54	7.78	9.21
34	2.52	2.96	3.50	4.14	4.92	5.85	6.93	8.18	9.61
35	2.79	3.25	3.81	4.48	5.28	6.23	7.32	8.59	10.02
36	3.07	3.56	4.14	4.83	5.65	6.61	7.72	8.99	10.42
37	3.37	3.88	4.48	5.19	6.03	7.00	8.12	9.40	10.83
38	3.69	4.21	4.83	5.56	6.41	7.40	8.53	9.81	11.24
39	4.01	4.55	5.18	5.93	6.80	7.80	8.94	10.22	11.64
40	4.35	4.90	5.55	6.31	7.20	8.21	9.35	10.63	12.05

5-1. Logistic

()

: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
41	4.70	5.26	5.93	6.70	7.60	8.62	9.76	11.05	12.46
42	5.06	5.64	6.31	7.10	8.00	9.03	10.18	11.46	12.87
43	5.43	6.02	6.71	7.50	8.42	9.45	10.60	11.88	13.28
44	5.81	6.41	7.11	7.92	8.83	9.87	11.02	12.30	13.70
45	6.21	6.81	7.52	8.33	9.26	10.29	11.45	12.72	14.11
46	6.61	7.22	7.94	8.76	9.68	10.72	11.88	13.14	14.52
47	7.03	7.64	8.36	9.18	10.11	11.15	12.31	13.57	14.93
48	7.45	8.07	8.79	9.62	10.55	11.59	12.74	13.99	15.35
49	7.88	8.51	9.23	10.06	10.99	12.03	13.17	14.42	15.76
50	8.33	8.95	9.67	10.50	11.43	12.47	13.60	14.84	16.18
51	8.78	9.40	10.12	10.95	11.88	12.91	14.04	15.27	16.59
52	9.24	9.86	10.58	11.40	12.33	13.35	14.48	15.70	17.01
53	9.71	10.32	11.04	11.86	12.78	13.80	14.92	16.12	17.42
54	10.18	10.79	11.50	12.32	13.24	14.25	15.36	16.55	17.84
55	10.66	11.27	11.97	12.79	13.69	14.70	15.80	16.98	18.25
56	11.16	11.75	12.45	13.25	14.16	15.15	16.24	17.41	18.67
57	11.65	12.24	12.93	13.73	14.62	15.61	16.68	17.85	19.09
58	12.16	12.73	13.42	14.20	15.09	16.06	17.13	18.28	19.50
59	12.67	13.23	13.91	14.68	15.56	16.52	17.58	18.71	19.92
60	13.19	13.74	14.40	15.16	16.03	16.98	18.02	19.14	20.34
61	13.71	14.25	14.90	15.65	16.50	17.44	18.47	19.58	20.76
62	14.24	14.76	15.40	16.14	16.98	17.91	18.92	20.01	21.18
63	14.78	15.28	15.90	16.63	17.46	18.37	19.37	20.45	21.59
64	15.32	15.80	16.41	17.12	17.93	18.84	19.82	20.88	22.01
65	15.87	16.33	16.92	17.62	18.42	19.30	20.27	21.32	22.43
66	16.42	16.86	17.44	18.12	18.90	19.77	20.72	21.75	22.85
67	16.98	17.40	17.95	18.62	19.39	20.24	21.18	22.19	23.27
68	17.54	17.94	18.48	19.12	19.87	20.71	21.63	22.63	23.69
69	18.10	18.49	19.00	19.63	20.36	21.18	22.08	23.06	24.11
70	18.68	19.03	19.53	20.14	20.85	21.65	22.54	23.50	24.53

5-1. Logistic

()

: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
71	19.25	19.58	20.06	20.65	21.34	22.13	23.00	23.94	24.95
72	19.83	20.14	20.59	21.16	21.83	22.60	23.45	24.38	25.37
73	20.42	20.70	21.12	21.67	22.33	23.08	23.91	24.81	25.79
74	21.01	21.26	21.66	22.19	22.82	23.55	24.37	25.25	26.21
75	21.60	21.82	22.20	22.71	23.32	24.03	24.82	25.69	26.63
76	22.19	22.39	22.74	23.23	23.82	24.51	25.28	26.13	27.05
77	22.79	22.96	23.29	23.75	24.32	24.99	25.74	26.57	27.47
78	23.40	23.53	23.83	24.27	24.82	25.47	26.20	27.01	27.89
79	24.00	24.11	24.38	24.79	25.32	25.95	26.66	27.45	28.31
80	24.62	24.69	24.93	25.32	25.82	26.43	27.12	27.89	28.73
81	25.23	25.27	25.48	25.84	26.32	26.91	27.58	28.33	29.15
82	25.85	25.85	26.04	26.37	26.83	27.39	28.04	28.77	29.57
83	26.47	26.44	26.59	26.90	27.33	27.87	28.50	29.21	29.99
84	27.09	27.03	27.15	27.43	27.84	28.36	28.97	29.65	30.41
85	27.71	27.62	27.71	27.96	28.35	28.84	29.43	30.09	30.83
86	28.34	28.21	28.27	28.50	28.86	29.33	29.89	30.54	31.25
87	28.97	28.80	28.84	29.03	29.36	29.81	30.35	30.98	31.67
88	29.61	29.40	29.40	29.57	29.87	30.30	30.82	31.42	32.10
89	30.24	30.00	29.97	30.10	30.38	30.78	31.28	31.86	32.52
90	30.88	30.60	30.53	30.64	30.90	31.27	31.74	32.30	32.94
91	31.53	31.20	31.10	31.18	31.41	31.76	32.21	32.75	33.36
92	32.17	31.81	31.67	31.72	31.92	32.24	32.67	33.19	33.78
93	32.82	32.41	32.24	32.26	32.43	32.73	33.14	33.63	34.20
94	33.46	33.02	32.82	32.80	32.95	33.22	33.60	34.07	34.63
95	34.11	33.63	33.39	33.35	33.46	33.71	34.07	34.52	35.05
96	34.77	34.24	33.96	33.89	33.98	34.20	34.53	34.96	35.47
97	35.42	34.85	34.54	34.43	34.49	34.69	35.00	35.40	35.89
98	36.08	35.47	35.12	34.98	35.01	35.18	35.46	35.85	36.31
99	36.74	36.08	35.70	35.53	35.53	35.67	35.93	36.29	36.74
100	37.40	36.70	36.28	36.07	36.04	36.16	36.40	36.73	37.16

< 5-1> 3

가

가

가

_____ × 100% _

가

가

(coefficient of variation) 0.2%

.

가

()

,

Logistic

4

10

(goodness of fit test)

80

Logistic 가

.

.

Logistic

가

Logistic

가

가

가

가

2 .

1.

MPCI(Multiple Peril Crop Insurance)

50% 75% 5% 가

「 1 」

70% , 「 가 」

「 가 」 가가

80% 90%

2001

70% (

, 2000). < 5-2> < 5-11>

70% .

()

70%() 가

가 (liability exposure)

가 1991 98 가 가 (1998 가) .

() .

가.

() 10a

가 가

(

5-2).

9

70%

가 가

가

()

가

가 가

(coefficient of

variation)

(數理的)

가 가

10%

가 가

가

가 가

가 가

가

가

가

70%

가

가 ()

가 가

가

()

가 0.21%

2.89%

가

가 70%

가 가 .

가

가 .

70%

80% 가 .

5-2.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	459.0	82.5	2.16	3,736	0.67	556,838
	405.0	112.6	8.20	14,217	2.89	491,359
	454.8	70.1	1.12	1,934	0.35	551,691
	490.4	70.5	0.87	1,511	0.25	594,906
	508.9	70.2	0.74	1,288	0.21	617,345
	467.4	73.9	1.29	2,230	0.39	567,040
	443.6	88.7	3.12	5,399	1.00	538,158
	439.2	81.8	2.37	4,107	0.77	532,831
	389.7	64.7	1.32	2,293	0.48	472,805

* 70% , 가 : 1,733 /kg

가 , , ,
 가 4

5-3.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	216.3	73.8	7.51	8,238	4.96	166,121
	271.1	92.1	9.33	10,235	4.92	208,150
	242.5	36.1	0.51	557	0.30	186,211
	232.5	50.5	2.18	2,389	1.34	178,549
	249.1	77.5	6.85	7,518	3.93	191,256
	238.1	48.5	1.78	1,957	1.07	182,849
	235.4	67.3	5.15	5,646	3.12	180,798

* 70% , 가 : 1,097 /kg

가 .
 0.27%

가 .
 8 (1991 98)

45 .

가 .

5-4. .

	(kg)	(kg)	(, kg)	(,)	(%)	()
	213.2	60.5	4.57	5,484	3.07	178,934
	315.5	92.7	7.44	8,924	3.37	264,832
	273.3	66.1	3.65	4,380	1.91	229,413
	295.5	43.1	0.56	673	0.27	248,015
	277.7	73.4	4.85	5,820	2.50	233,115

* 70% , 가 : 1,199 /kg

가 5.9% .
 12% . 가

70%

(risk attitude)

() 50%

가 70% 가 ())

5-5.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	178.9	93.8	15.7	106,530	12.50	850,102
	204.7	107.9	18.1	122,974	12.60	972,813
	247.5	90.7	10.2	69,396	5.90	1,176,340
	191.2	73.7	8.9	60,250	6.63	908,672
	224.0	88.0	10.8	73,597	6.91	1,064,506
	221.6	97.2	13.6	92,476	8.78	1,053,319
	223.8	86.2	10.3	70,241	6.60	1,063,549
	185.8	83.0	11.9	80,447	9.11	882,753
	83.7	39.6	6.0	40,781	10.30	397,589

* 70% , 가 : 6,789 /kg

가 가 가 가

. < 5-6>

가 kg 2,025

가

가

5-6.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	715.7	292.9	37.9	76,775	7.57	1,014,457
	644.5	278.4	38.3	77,635	8.50	913,633
	679.8	205.0	17.2	34,862	3.62	963,628
	759.6	306.5	39.0	78,958	7.33	1,076,686
	792.4	336.3	45.4	91,925	8.18	1,123,247
	1,186.0	329.6	24.0	48,568	2.89	1,681,288
	965.4	360.9	41.7	84,455	6.17	1,368,444
	1,209.0	425.1	45.2	91,546	5.34	1,714,134
	1,235.0	270.9	12.0	24,310	1.39	1,750,388

* 70% , 가 : 2,025 /kg

가
가
가
가

5-7.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	5,249	2,338	333.0	78,586	9.06	867,127
	4,138	1,514	170.0	40,130	5.87	683,569
	4,561	1,776	216.4	51,069	6.78	753,515
	5,605	1,286	63.3	14,940	1.61	925,916
	6,416	1,540	83.7	19,763	1.86	1,059,991
	5,602	1,654	134.0	31,628	3.42	925,421
	6,134	1,220	42.3	9,977	0.98	1,013,383

* 70% , 가 : 236 /kg

가

가

(revenue insurance)

가

가

(凍害)

5-8.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	10,277	3,530	363.0	49,374	5.05	978,346
	8,183	2,948	324.2	44,091	5.66	779,051
	11,165	3,312	270.5	36,788	3.46	1,062,925
	11,897	2,921	166.7	22,673	2.00	1,132,573
	12,259	3,839	343.0	46,646	4.00	1,167,014
	11,291	2,855	173.1	23,538	2.19	1,074,879
	10,058	3,007	249.0	33,859	3.54	957,518
	11,722	3,384	263.8	35,879	3.22	1,115,962
	8,845	1,688	52.3	7,110	0.84	842,022

* 70% , 가 : 136 /kg

가

가

가

가

가

가

(支柱)

5-9.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	5,017	2,150	293.3	43,704	8.35	523,254
	5,116	2,090	270.0	40,231	7.54	533,556
	4,726	1,674	179.8	26,787	5.43	492,943
	5,647	1,884	185.8	27,684	4.70	588,975
	5,606	1,703	144.7	21,567	3.69	584,661
	7,041	2,189	193.2	28,790	3.92	734,378
	5,755	2,205	263.0	39,186	6.53	600,275
	6,812	2,342	241.2	35,936	5.06	710,445
	8,329	1,926	96.5	14,371	1.65	868,730

* 70% , 가 : 149 /kg

10 가
 가 3.44% ,
 6.58% , 10% .
 2001
 70% 70% 5%
 가 가 가 (risk
 attitude)
 70% 60%
 35% .
 가 가

5-10.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	1,456	830.9	149.3	187,271	14.70	1,277,845
	1,273	818.3	161.0	201,935	18.10	1,117,306
	2,102	622.1	50.6	63,483	3.44	1,845,264
	1,979	814.0	106.0	132,924	7.65	1,736,952
	1,898	1,071.0	190.7	239,097	14.30	1,666,202
	1,542	887.5	160.6	201,370	14.90	1,353,803
	2,116	813.4	97.5	122,211	6.58	1,857,539
	2,267	1,092.0	168.6	211,384	10.60	1,989,607

* 70% , 가 : 1,254 /kg

가 3.7% (, 2000)

가 (擔保損因)

(all-risk crop insurance)

가 2000 5 가 가

1,240 가 (6.58%)

가 3 3.16%

2 4.07%

가

5-11.

	(kg)	(kg)	(, kg)	(,)	(%)	()
	2,448	1,011.0	132.2	225,818	7.72	2,926,856
	1,626	675.1	88.9	151,775	7.81	1,944,256
	2,363	745.5	67.4	115,124	4.07	2,825,426
	2,150	829.1	99.8	170,396	6.63	2,570,388
	2,499	1,295.0	214.2	365,816	12.20	2,987,625
	2,843	815.4	62.8	107,288	3.16	3,399,147
	2,117	699.0	67.8	115,884	4.58	2,530,794
	2,187	801.5	90.3	154,171	5.90	2,614,376

* 70% , 가 : 1,708 /kg

2.

1,240
 6.58% 가
 3.7%
 가
 465
 3.16% 가

4.04%

(coefficient of variation)

(4-10 4-11).

가

가

(all-risk crop insurance)

()

가

가

가

가

가

300

가,

가 80%

가 600

가

(1996, p. 13).

가

가

, 가

[(皆無)

÷

× 100]

(proxy variable)

가

3. 가

10a 8 (1991 98) 『 』 가

(significant) 가 가 가 , 가 가 가

< 5-2> < 5-11>

가 가 가

가 1991 98 가

10

가 , 가 .

가 가 .

가 가 90% 가

MPCI 가 55 100%

가 (). 2001

가 가 90%

가 (2000).

가 1991 98 가

가 (1998 가) . 가 가 가

가 . 가

가 가 .

가 .

가

가

(versi on-up)

<http://al tai r. chonnam. ac. kr/~ae6460/j sseo/i ndex. htm>

3

1.

, ,
()

. 2001 . , ,

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,

(moral hazard)가 가
, 가 가 가

(, 2000).

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가 . . 가

가 .
가 가 가

.
가

가 .
 (observation number)가 .
 , 가 2 3 .

가
 (adverse selection)
 (moral hazard)가 가 .

(ex ante moral hazard) (ex
 post moral hazard) (Moral).

가
 (5 10) 가
 , 가 가 가
 (,)
 . MPCI가 10 가 가
 가 , 10 가

6

가

1

가 . 가
 . 가 . (sampling frame)
 21 . 250,721 가
 D/B . 가 (systematic random
 sampling)
 가 . 가
 2000 7 8 2 . . 가
 < 6-1> .

6-1. . 가

:

	3	11	-	-	-	14
	-	25	60	-	-	85

6-1. 가 ()

:

	2	4	-	-	-	6
	9	4	-	-	-	13
	-	1	-	-	-	1
	132	21	-	-	-	153
	-	-	-	1	-	1
	1	9	65	100	-	175
	8	12	1	-	18	39
	-	13	-	-	6	19
	9	15	35	20	12	91
	3	-	3	5	1	12
	-	10	-	-	30	40
	26	8	-	-	-	34
	-	4	-	-	-	4
	1	10	1	-	-	12
	3	10	9	-	3	25
	-	3	-	-	5	8
	1	5	-	18	-	24
	-	24	26	6	-	56
	2	11	-	-	-	13
	200	200	200	150	75	825

2

< 6-2 >

6-2.

1		
2		
3		
4	(, ,)	
5		
6		
7	,	
8	(가)	
9	,	
10		
11	, 가	
12	,	
13		
14	가 , 가	
15		
16		
17		
18		
19	,	
20		
21		

3 가

1. 가

가 , ,

가
 < 6-3> 가 66%(132 가)가
 가 . 51 60 가 29.0%(58 가), 41
 50 가 26.5%(53 가), 61 70 가 24.5%(49 가)
 11 20 37.5%(75 가), 21 30 27.5%(55 가)
 , 3000 4500 28.0%(56 가) 가
 69.5%(139 가)

2, 415kg
 2, 735kg, 1, 329kg

6-3. 가

: , %

	40	20	10.0		1500	33	16.5
	41 50	53	26.5		1500 3000	43	21.5
	51 60	58	29.0		3000 4500	56	28.0
	61 70	49	24.5		4500 6000	26	13.0
	70	20	10.0		6000	42	21.0
	10	42	21.0			19	9.5
	11 20	75	37.5			42	21.0
	21 30	55	27.5			55	27.5
	31 40	20	10.0			66	33.0
	41	8	4.0			18	9.0
	(kg)		: 2, 735. 1			: 1, 329. 1	: 2, 414. 5

2. 가

가 41 50 가 14.0%(28 가), 51 60 가 29.5%(59 가), 61 70 가 42.0%(84 가)

가 21 30 26.0%(52 가), 31 40 25.5%(51 가)

1500 33.5%(67 가) 가 57.5%(115 가)

가 424kg, 496kg, 330kg

6-4. 가

: , %

	40	10	5.0		1500	67	33.5
	41 50	28	14.0		1500 3000	44	22.0
	51 60	59	29.5		3000 4500	41	20.5
	61 70	84	42.0		4500 6000	16	8.0
	70	19	9.5		6000	32	16.0
	10	24	12.0			56	28.0
	11 20	42	21.0			59	29.5
	21 30	52	26.0			50	25.0
	31 40	51	25.5			25	12.5
	41	31	15.5			10	5.0
		(kg)	: 496.5		: 330.0		: 423.6

3. 가

가 41 50 가 15.0%(30 가), 51 60 가 28.0%(56 가), 61 70 가 40.0%(80 가)

가 11 20 28.0%(56 가), 21 30 23.0%(46 가), 500

1500 41.0%(82 가) 가 69.5%(139 가)

가 1, 111kg, 1, 327kg, 759kg

6-5. 가

: , %

	40	4	2.0		500	27	13.5
	41 50	30	15.0		500 1500	82	41.0
	51 60	56	28.0		1500 3000	58	29.0
	61 70	80	40.0		3000 4500	27	13.5
	70	30	15.0		4500	6	3.0
	10	29	14.5			45	22.5
	11 20	56	28.0			94	47.0
	21 30	46	23.0			31	15.5
	31 40	39	19.5			27	13.5
	41	30	15.0			3	1.5
	(kg)		: 1, 327. 1		: 759. 2		: 1, 110. 8

4. 가

가 41 50 가 16.0%(24 가), 51 60 가 32.0%(48 가), 61 70 가 36.7%(55 가) .
 11 20 36.0%(54 가), 21 30 28.0%(42 가)
 , 500 1500 36.0%(54 가) 가 .
 가 83.0%(84 가) .
 가 5,309kg ,
 6,661kg, 5,309kg .

6-6. 가

: , %

	40	6	4.0		500	14	9.3
	41 50	24	16.0		500 1500	54	36.0
	51 60	48	32.0		1500 3000	39	25.3
	61 70	55	36.7		3000 4500	33	22.0
	70	17	11.3		4500	11	7.3
	10	37	24.7			30	20.0
	11 20	54	36.0			54	63.0
	21 30	42	28.0			29	19.3
	31 40	11	7.3			35	23.3
	41	6	4.0			2	1.3
(kg)		: 6,660.7		: 3,722.9		: 5,308.6	

5. 가

가 41 50 가 14.7%(11 가), 51 60
 가 26.7%(20 가), 61 70 가 37.3%(28 가) . 1
 1 20 32.0%(24 가), 10 가 28.0%(21 가)
 , 1000 1500 37.3%(28 가) 가
 . 가 62.7%(47 가) 가 .
 가 261kg ,
 324kg, 181kg .

6-7. 가

: , %

	40	8	10.7		500	8	10.7
	41 50	11	14.7		500 1000	18	24.0
	51 60	20	26.7		1000 1500	28	37.3
	61 70	28	37.3		1500 2000	4	5.3
	70	8	10.7		2000	17	22.7
	10	21	28.0			12	16.0
	11 20	24	32.0			35	46.7
	21 30	15	20.0			20	26.7
	31 40	13	17.3			7	9.3
	41	2	2.7			1	1.3
(kg)		: 323.8		: 181.2		: 261.3	

4

1.

가 “ ”, “ , ”, “가 ” 가 87.3% . , “ ”가 가 “가 ” “ , ” 가 .

6-8.

: , %

		가							
				가					
		56	75	46	5	3	12	3	200
		28.0	37.5	23.0	2.5	1.5	6.0	1.5	100.0
		57	106	13	3	3	11	7	200
		28.5	53.0	6.5	1.5	1.5	5.5	3.5	100.0
		57	42	78	-	-	21	2	200
		28.5	21.0	39.0	-	-	10.5	1.0	100.0
		49	28	44	1	1	22	5	150
		32.7	18.7	29.3	0.7	0.7	14.7	3.3	100.0
		25	41	3	-	1	2	3	75
		33.3	54.7	4.0	-	1.3	2.7	4.0	100.0
		244	292	184	9	8	68	20	825
		29.6	35.4	22.3	1.1	1.0	8.2	2.4	100.0

2.

가 30%
 가 84.6% 698 가
 30% 가 (96.5%) . ()
 ,) (,) 가
 .
 3 27.3% 가

6-9.

: , %

		193	7	200
		96.5	3.5	100.0
		174	26	200
		87.0	13.0	100.0
		152	48	200
		76.0	24.0	100.0
		118	32	150
		78.7	21.3	100.0
		61	14	75
		81.3	18.7	100.0
		698	127	825
		84.6	15.4	100.0

6-10.

: , %

			2	3	4	5	6		
		7	25	48	30	36	54	200	
		3.5	12.5	24.0	15.0	18.0	27.0	100.0	
		27	16	44	36	35	42	200	
		13.5	8.0	22.0	18.0	17.5	21.0	100.0	
		48	30	58	19	33	12	200	
		24.0	15.0	29.0	9.5	16.5	6.0	100.0	
		34	32	47	11	10	16	150	
		22.7	21.3	31.3	7.3	6.7	10.7	100.0	
		14	15	28	4	10	4	75	
		18.7	20.0	37.3	5.3	13.3	5.3	100.0	
			130	118	225	100	124	128	825
			15.8	14.3	27.3	12.1	15.0	15.5	100.0

가 (33.6%), (25.1%), (17.2%), (15.4%), (6.3%) .

, , “ ” “ ”가

6-11.

: , %

			38	183	3	6	66	15	6	-	317
			12.0	52.7	0.9	1.9	20.8	4.7	1.9	-	100.0
			123	63	20	97	6	4	-	-	313
			39.3	20.1	6.4	31.0	1.9	1.3	-	-	100.0
			129	5	90	24	-	-	-	-	248
			50.0	2.0	36.3	9.7	-	-	-	-	100.0
			89	7	73	22	4	-	-	4	199
			44.7	3.5	36.7	11.1	2.0	-	-	2.0	100.0
			23	43	20	35	-	-	-	-	121
			19.1	35.5	16.5	28.9	-	-	-	-	100.0
			402	301	206	184	76	19	6	4	1,198
			33.6	25.1	17.2	15.4	6.3	1.6	0.5	0.3	100.0

: .

3.

가

. 85.5% 가가

. 가

가

11.3%, 13.0%

가

“ ”
 43%(153 가) 가 “ ”(22.5%), “ , , ”(20.2%)
 . “ ” “ ” “ , ” 30.9% 가
 .

6-12.

: , %

			171	29	200
			85.5	14.5	100.0
			50	150	200
			25.0	75.0	100.0
			26	174	200
			13.0	87.0	100.0
			17	133	150
			11.3	88.7	100.0
			22	53	75
			29.3	70.7	100.0
			286	539	825
			34.7	65.3	100.0

6-13.

: , %

		1	1	11	7	101	40	71	-	232
		0.4	0.4	4.7	3.0	43.5	17.2	30.6	-	100.0
		4	-	7	5	16	17	6	-	55
		7.3	-	12.7	9.1	29.1	30.9	10.9	-	100.0
		-	-	-	4	12	5	1	4	26
		-	-	-	15.4	46.2	19.2	3.8	15.4	100.0
		-	-	-	1	7	6	5	5	19
		-	-	-	5.3	36.8	31.6	26.3	26.3	100.0
		-	-	1	-	17	4	2	-	24
		-	-	4.2	-	70.8	16.7	8.3	-	100.0
		5	1	19	17	153	72	80	9	356
		1.4	0.3	5.3	4.8	43.0	20.2	22.5	2.5	100.0

: .

4.

가

(53.6%)

. 38.2% 가 “ ” “ ”

6-14.

: , %

		51	3	5	17	119	5	200	
		25.5	1.5	2.5	8.5	59.5	2.5	100.0	
		27	2	10	58	99	4	200	
		13.5	1.0	5.0	29.0	49.5	2.0	100.0	
		53	10	9	22	106	-	200	
		26.5	5.0	4.5	11.0	53.0	-	100.0	
		40	16	2	17	75	-	150	
		26.7	10.7	1.3	11.3	50.0	-	100.0	
		28	-	-	2	43	2	75	
		37.3	-	-	2.7	57.3	2.7	100.0	
			199	31	26	116	442	11	825
			24.1	3.8	3.2	14.1	53.6	1.3	100.0

5. 가

가

가

50.5%(417 가)가

가

6-15.

가

: , %

		가			
			125	75	200
			62.5	37.5	100.0
			89	111	200
			44.5	55.5	100.0
			91	109	200
			45.5	54.5	100.0
			83	67	150
			55.3	44.7	100.0
			20	55	75
			26.7	73.3	100.0
			408	417	825
			49.5	50.5	100.0

6.

2001

,

가

가

34.4%(284 가)

가

63.5%

가가

(

)

가

.

6-16.

: , %

			127	73	200	
			63.5	36.5	100.0	
			56	144	200	
			28.0	72.0	100.0	
			37	163	200	
			18.5	81.5	100.0	
			42	108	150	
			28.0	72.0	100.0	
			22	53	75	
			29.3	70.7	100.0	
			284	541	825	
			34.4	65.6	100.0	

6-17.

: , %

			78	6	26	3	15	128
			60.9	4.7	20.3	2.3	11.7	100.0
			44	2	5	2	2	55
			80.0	3.6	9.1	3.6	3.6	100.0
			32	-	4	-	1	37
			86.5	-	10.8	-	2.7	100.0
			33	2	4	3	-	42
			78.6	4.8	9.5	7.1	-	100.0
			20	-	2	-	-	22
			90.9	-	9.1	-	-	100.0
			207	10	41	8	18	284
			72.9	3.5	14.4	2.8	6.3	100.0

7.

가 가
 74.5%(615 가)가 가
 가 . 1998 , 1999 가
 가 가가 89.0% 가
 . 66.5%가 ,
 , , 70.0%, 71.5%, 74.7%가 .

6-18.

: , %

			18	178	4	200
			9.0	89.0	2.0	100.0
			49	133	18	200
			24.5	66.5	9.0	100.0
			47	143	10	200
			23.5	71.5	5.0	100.0
			35	105	10	150
			23.3	70.0	6.7	100.0
			16	56	3	75
			21.3	74.7	4.0	100.0
			165	615	45	825
			20.0	74.5	5.5	100.0

8.

가. 가

가 “ 가 가 ”(23.4%), “ 가”(70.3%), “ 가 가 ”(1.0%) .
 70.3%가 가 가
 가 가 가 가 가
 가 . 가가 가
 가

6-19. 가

: , %

			가				
			가	가 가	가	가 가	
			120	65	13	2	200
			60.0	32.5	6.5	1.0	100.0
			149	44	4	3	200
			74.5	22.0	2.0	1.5	100.0
			162	31	7	-	200
			81.0	15.5	3.5	-	100.0
			92	44	12	2	150
			61.3	29.3	8.0	1.3	100.0
			57	9	8	1	75
			76.0	12.0	10.7	1.3	100.0
			580	193	44	8	825
			70.3	23.4	5.3	1.0	100.0

가 가 1000

6-20. 가

: , %

	가						
	1,000	1,000	1500	2000	3000	5000	
	4	25	4	9	6	2	50
	8.0	50.0	8.0	18.0	12.0	4.0	100.0

가

(57.7%), (39.0%), (0.7%)

(2.5%)

6-21.

: , %

		108	82	6	4	200
		54.0	41.0	3.0	2.0	100.0
		142	53	-	5	200
		71.0	26.5	-	2.5	100.0
		111	88	-	1	200
		55.5	44.0	-	0.5	100.0
		76	66	-	8	150
		50.7	44.0	-	5.3	100.0
		39	33	-	3	75
		52.0	44.0	-	4.0	100.0
		476	322	6	21	825
		57.7	39.0	0.7	2.5	100.0

가
가
가
60.1%가 가 50%

6-22.

: , %

		30%	40%	50%	60%	70%	80%	90%	
		6	-	147	12	29	6	-	200
		3.0	-	73.5	6.0	14.5	3.0	-	100.0
		3	4	105	24	48	11	5	200
		1.5	2.0	52.5	12.0	24.0	5.5	2.5	100.0
		8	1	113	17	50	8	3	200
		4.0	0.5	56.5	8.5	25.0	4.0	1.5	100.0
		2	8	85	20	29	6	-	150
		1.4	5.3	56.7	13.3	19.3	4.0	-	100.0
		3	1	46	17	5	3	-	75
		4.0	1.3	61.3	22.7	6.7	4.0	-	100.0
		22	14	496	90	161	34	8	825
		2.6	1.7	60.1	10.9	19.5	4.1	1.0	100.0

가가

가
 . 가 가
 가 , 가
 .
 70%가 41.7%(344 가),
 50%, 60%가 30.5%(252 가), 19.2%(158 가)
 .
 , , 70%가
 62.0%, 41.0%, 40.0% 가
 . 70% 50%가 .

6-23.

: , %

			50%	60%	70%	80%	90%	
			41	29	124	6	-	200
			20.5	14.5	62.0	3.0	-	100.0
			69	29	82	19	1	200
			34.5	14.5	41.0	9.5	0.5	100.0
			65	45	57	23	10	200
			32.5	22.5	28.5	11.5	5.0	100.0
			56	34	51	6	3	150
			37.3	22.7	34.0	4.0	2.0	100.0
			21	21	30	3	-	75
			28.0	28.0	40.0	4.0	-	100.0
			252	158	344	57	14	825
			30.5	19.2	41.7	6.9	1.7	100.0

가) 2 4 77.4%(638
 “ ”(21.9%) 가
 “2 ”(42.7%) “4 ”(34.7%)
 4 2

6-25.

: , %

			2	4		
		68	55	73	4	200
		34.0	27.5	36.5	2.0	100.0
		40	85	74	1	200
		20.0	42.5	37.0	0.5	100.0
		33	98	69	-	200
		16.5	49.0	34.5	-	100.0
		24	77	48	1	150
		16.0	51.3	32.0	0.7	100.0
		16	37	22	-	75
		21.3	49.3	29.3	-	100.0
		181	352	286	6	825
		21.9	42.7	34.7	0.7	100.0

가 ,

가 , 9 11

6-26.

: , %

		1	2	3	5	6	7	8	9	10	11	12		
		1	2	1	-	-	-	1	10	42	9	2	68	
		1.5	2.9	1.5	-	-	-	1.5	14.7	61.8	13.2	2.9	100.0	
		-	-	-	1	-	-	1	2	14	9	13	40	
		-	-	-	2.5	-	-	2.5	5.0	35.0	22.5	32.5	100.0	
		1	-	-	-	22	-	1	-	2	3	4	33	
		3.0	-	-	-	66.7	-	3.0	-	6.1	9.1	12.1	100.0	
		-	-	-	2	5	3	3	1	6	-	2	22	
		-	-	-	9.1	22.7	13.6	13.6	4.5	27.3	-	9.1	100.0	
		-	-	3	1	5	1	-	1	-	1	3	15	
		-	-	20.0	6.7	33.3	6.7	-	6.7	-	6.7	20.0	100.0	
		2	2	4	4	32	4	6	14	64	22	24	178	
		1.1	1.1	2.2	2.2	18.0	2.2	3.4	7.9	36.0	12.4	13.5	100.0	

가 가 가
 “ ”가 43.6%(360 가), “ ”가 31.6%(261 가),
 “ ”가 23.6%(195 가), “ ”가 1.1%(9 가) 가
 가
 가

가

가가

6-27.

: , %

		56	85	57	2	200	
		28.0	42.5	28.5	1.0	100.0	
		43	92	59	6	200	
		21.5	46.0	29.5	3.0	100.0	
		43	88	69	-	200	
		21.5	44.0	34.5	-	100.0	
		40	63	47	-	150	
		26.7	42.0	31.3	-	100.0	
		13	32	29	1	75	
		17.3	42.7	38.7	1.3	100.0	
			195	360	261	9	825
			23.6	43.6	31.6	1.1	100.0

1996

가

가

70.4%(581

가)

가

7.0%(58 가) , 22.5%

6-28.

: , %

			39	133	28	200	
			19.5	66.5	14.0	100.0	
			50	136	14	200	
			25.0	68.0	7.0	100.0	
			38	155	7	200	
			19.0	77.5	3.5	100.0	
			39	104	7	150	
			26.0	69.3	4.7	100.0	
			20	53	2	75	
			26.7	70.7	2.7	100.0	
				186	581	58	825
				22.5	70.4	7.0	100.0

, 가 , ,

가

가

가 70%

6-29.

: , %

		19	11.7	61	21.5	89	48.1	89	55.6	26	76.5	284	34.4	$\chi^2=131.880$ $p=0.000$	
		143	88.3	223	78.5	96	51.9	71	44.4	8	23.5	541	65.6		
가		46	28.4	72	25.4	28	15.1	18	11.3	1	2.9	165	20.0	$\chi^2=30.183$ $p=0.000$	
		108	66.7	196	69.0	146	78.9	135	84.4	30	88.2	615	74.5		
		8	4.9	16	5.6	11	5.9	7	4.4	3	8.8	45	5.5		
	50%	60	37.0	85	29.9	51	27.6	41	25.6	15	44.1	252	30.5	$\chi^2=23.712$ $p=0.096$	
	60%	26	16.0	65	22.9	36	19.5	30	18.8	1	2.9	158	19.2		
	70%	58	35.8	110	38.7	81	43.8	80	50.0	15	44.1	344	41.7		
	80%	15	9.3	19	6.7	12	6.5	8	5.0	3	8.8	57	6.9		
	90%	3	1.9	5	1.8	5	2.7	1	0.6	-	-	14	1.7		
		49	30.2	67	23.6	40	21.6	28	17.5	2	5.9	186	22.5	$\chi^2=29.288$ $p=0.000$	
		108	66.7	199	70.1	133	71.9	117	73.1	24	70.6	581	70.4		
		5	3.1	18	6.3	12	6.5	15	9.4	8	23.5	58	7.0		

가 .

2 42.7%

가

2 .

4

6-30.

: , %

		30		31 40		41 50		51 60		61 70		70				
		6	75.0	19	47.5	72	49.3	78	32.4	86	29.1	23	24.5	284	34.4	$\chi^2=31.57$ $p=0.000$
		2	25.0	21	52.5	74	50.7	163	67.6	210	70.9	71	75.5	541	65.6	
		1	12.5	9	22.5	43	29.5	59	24.5	47	15.9	22	23.4	181	21.9	$\chi^2=38.93$ $p=0.001$
	2	5	62.5	20	50.0	67	45.9	105	43.6	131	44.3	24	6.8	352	42.7	
	4	2	25.0	11	27.5	35	24.0	73	30.3	117	39.5	48	16.8	286	34.7	
		-	-	-	-	1	0.7	4	1.7	1	0.3	-	-	6	0.7	

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 162, 1988.
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116, 1986.
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7. 가

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(Tool Bar),

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농작물 입력(I)	Ctrl+I
지역 입력(B)	Ctrl+B
생산량 입력(Q)	Ctrl+Q
농작물 가격 입력(P)	Ctrl+P
간단한 계산(S)	Ctrl+T

가

(Hot Key)

(ShortCut)가

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데이터 시트로 보기(D)	Ctrl+S
그래프로 보기(G)	Ctrl+G

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Crop Insurance에 [I]히여(△)
Crop Insurance 도움말(H) F1

[Crop Insurance]

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Insurance]

(2) (Tool Bar)



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시트로 보기

Ctrl + S



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그래프 보기

Ctrl + G





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농작물 입력

Ctrl + I

 [F4] [F4]
 . Ctrl + R .

 [F5] [F5]
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 [F6] [F6 가]
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(3) (Main Screen)

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 1,733 | 농작물 가격 선택 모드

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- 서울특별시
- 부산광역시
- 인천광역시
- 대구광역시
- 대전광역시
- 광주광역시
- 울산광역시
- 강원도
- 충청북도
- 충청남도
- 경기도
- 경상북도
- 경상남도
- 전라북도
- 전라남도
- 제주도
- 충청남도
- 충청북도

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기간 선택 : 1991년 부터 1998년 까지

:
가 가

보험 인수 비율 0% 100% 70

정당 보조 0% 100% 30

보험료 산출

:
0 100
70%

: 가 . 0 100

30% .

: 가

가 .

평균(Kg)		표준 편차(Kg)	
순보험료(Kg)		순보험료(원)	
보험요율(%)		최대 보상액(원)	

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기본값으로	순보험료 (원)	피해율에 따른 보상액 (원)		
		30 %	50 %	100 %
보험 인수 비율	50 %			
	60 %			
	80 %			
	90 %			

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간략한 계산

간략한 계산

농작물: 일반벼

수확년도: 2000년 가격(원/Kg): 0

수확면적(단보): 1 단보 수확량(Kg): 0

새로 작성 추 가 수 정 삭 제 말 기

수확년도	수확면적(단보)	수확량(Kg)	가격(원/Kg)

보험인수비율(%): 70 정부보조(%): 30 보험료 산출

농작물 가격 사용 형식

가장 최근 가격
 입력된 기간의 평균 가격
 입력된 기간중 최근 가격

평균(Kg): 표준 편차(Kg):
 순보험료(Kg): 보험요금(%):
 순보험료(원): 최대 보상액(원):

가.

농작물	일반벼	가격(원/Kg)	0
수확년도	2000년	수확량(Kg)	0
수확면적(단보)	1 단보		

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새로 작성	추가	수정	삭제	닫기
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수확 연도	수확 면적(단보)	수확 량(Kg)	가격(원/Kg)
2000	1	100	1000
2000	1	120	1050
2000	1	960	990

가 가가 .

보험인수비율(%)	<input type="text" value="70"/>	정부보조(%)	<input type="text" value="30"/>	보험료 산출
농작물 가격 사용 형식				
<input type="radio"/> 가장 최근 가격 <input checked="" type="radio"/> 입력된 기간의 평균 가격 <input type="radio"/> 입력된 기간중 최근 가격				

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평균(Kg)		표준 편차(Kg)	
순보험료(Kg)		보험료율(%)	
순보험료(원)		최대 보상액(원)	

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간략한 계산

간략한 계산

농작물: 일반벼

수확년도: 2000년 가격(원/Kg): 1000

수확면적(단보): 1 단보 수확량(Kg): 100

새로 작성 추 가 수 정 삭 제 달 기

수확년도	수확면적(단보)	수확량(Kg)	가격(원/Kg)
2000	1	100	1000
2000	1	120	1050
2000	1	950	990

보험인수비율(%) 70 정부보조(%) 30 보험료 산출

농작물 가격 사용 형식

가장 최근 가격 입력된 기간의 평균 가격 입력된 기간중 최근 가격

평균(Kg)	390	표준 편차(Kg)	198.0
순보험료(Kg)	32.2	보험요율(%)	11.78
순보험료(원)	40,902	최대 보상액(원)	496,137

3.

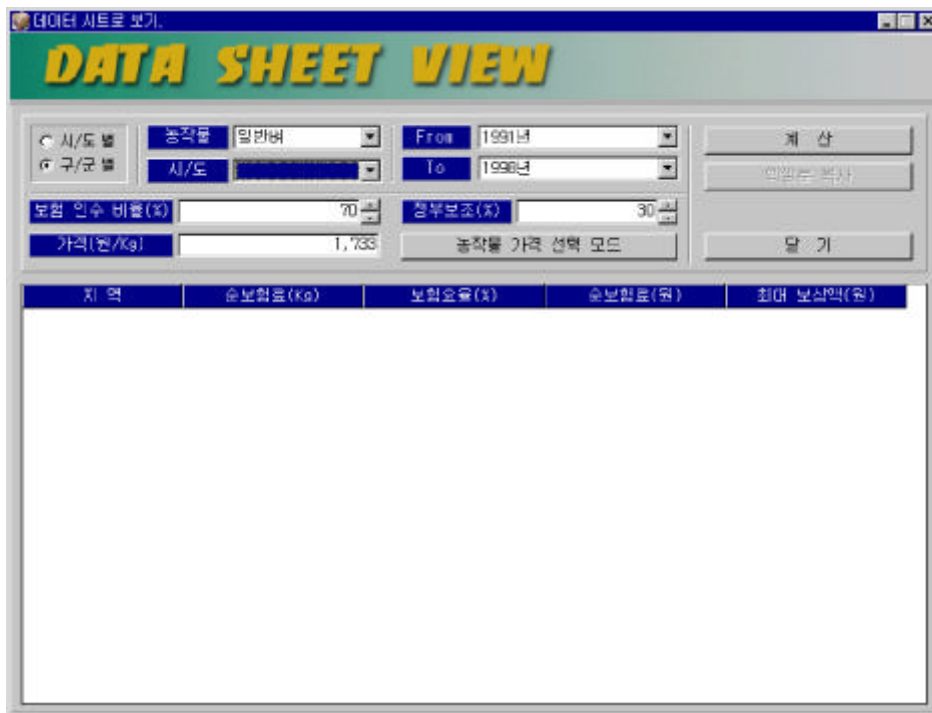
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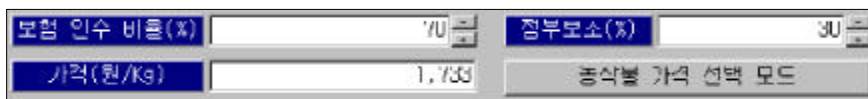
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인센티브 보사

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지 역	순보양료(Kg)	보양요율(%)	순보양료(원)	최대 보상액(원)
간성군	1.81	0.57	2,192	554,195
고령군	1.35	0.42	1,636	562,061
곡성군	0.78	0.24	943	572,402
광양시	1.39	0.43	1,686	555,003
구례군	0.58	0.18	708	561,584
나주시	0.89	0.26	1,075	596,618
담양군	0.11	0.03	133	620,755
북포시	1.72	0.51	2,092	581,454
무안군	0.57	0.17	693	579,420
보성군	2.86	0.89	3,468	554,417
순천시	1.01	0.31	1,223	572,509
신안군	1.90	0.60	2,307	552,262
여수시	1.10	0.35	1,440	567,112
영광군	1.22	0.36	1,481	582,174
영암군	1.13	0.35	1,373	560,929
완도군	1.37	0.44	1,664	536,658
장성군	0.66	0.20	799	575,690
장흥군	0.56	0.16	677	588,476
진도군	1.12	0.33	1,359	587,056
함평군	1.00	0.30	1,211	572,774
해남군	0.99	0.30	1,206	566,472

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데이터 시트로 보기.

DATA SHEET VIEW

시/도 별 농작물 일반벼 From 1991년
 구/군 별 시/도 전라남도 To 1996년

부원 인수 비율(%) 70
 장부보조(%) 30

가격(원/kg) 1,733 농작물 가격 선택 모드

계산
 번들로 복사
 닫기

지 역	순보합량(kg)	부원유율(%)	순보합량(원)	최대 보합액(원)
강진군	1.81	0.57	2,192	554,195
고흥군	1.35	0.42	1,636	562,051
곡성군	0.78	0.24	943	572,402
광양시	1.39	0.43	1,686	555,033
구례군	0.58	0.18	708	561,534
나주시	0.89	0.26	1,075	596,618
담양군	0.11	0.08	133	620,755
목포시	1.72	0.51	2,092	581,464
무안군	0.57	0.17	690	579,420
보성군	2.86	0.89	3,458	554,417
순천시	1.01	0.31	1,223	572,509
신안군	1.90	0.60	2,307	552,252
여수시	1.19	0.36	1,440	567,112
영광군	1.22	0.36	1,431	582,174
영암군	1.13	0.35	1,373	560,929
완도군	1.37	0.44	1,664	536,658
장성군	0.66	0.20	799	575,690
장흥군	0.56	0.16	677	588,476
진도군	1.12	0.38	1,350	587,056
함평군	1.00	0.30	1,211	572,774
해남군	0.89	0.30	1,206	555,672

4.

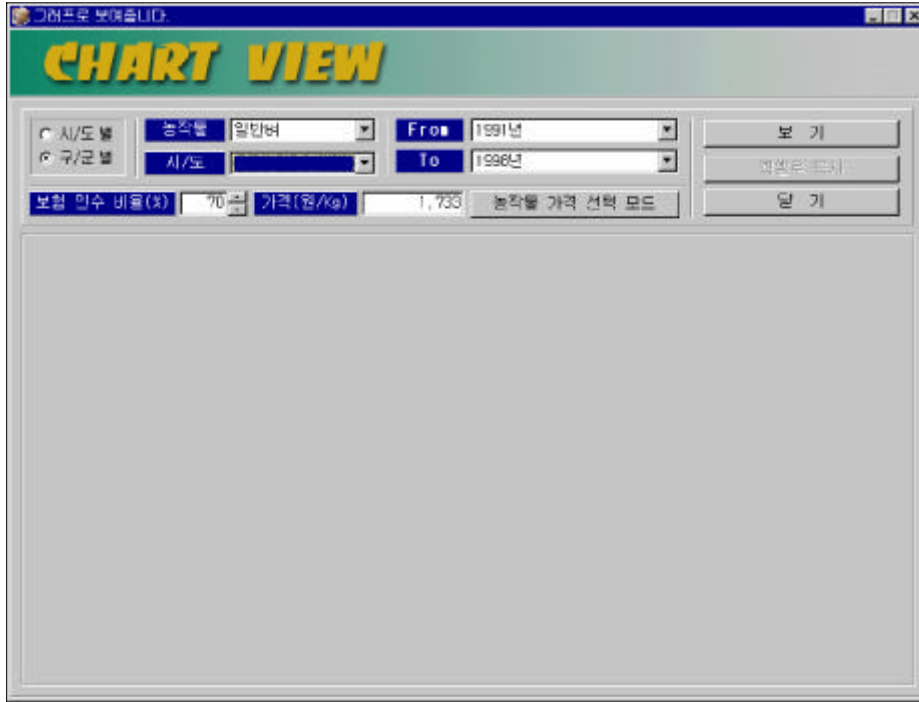
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보험 인수 비율(%) 70 가격(원/kg) 1,700 농작물 가격 선택 모드

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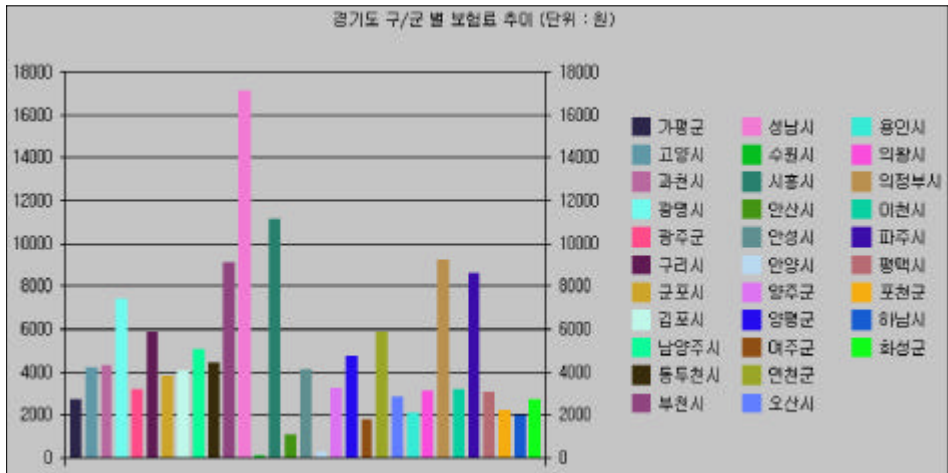
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인셀르 복사
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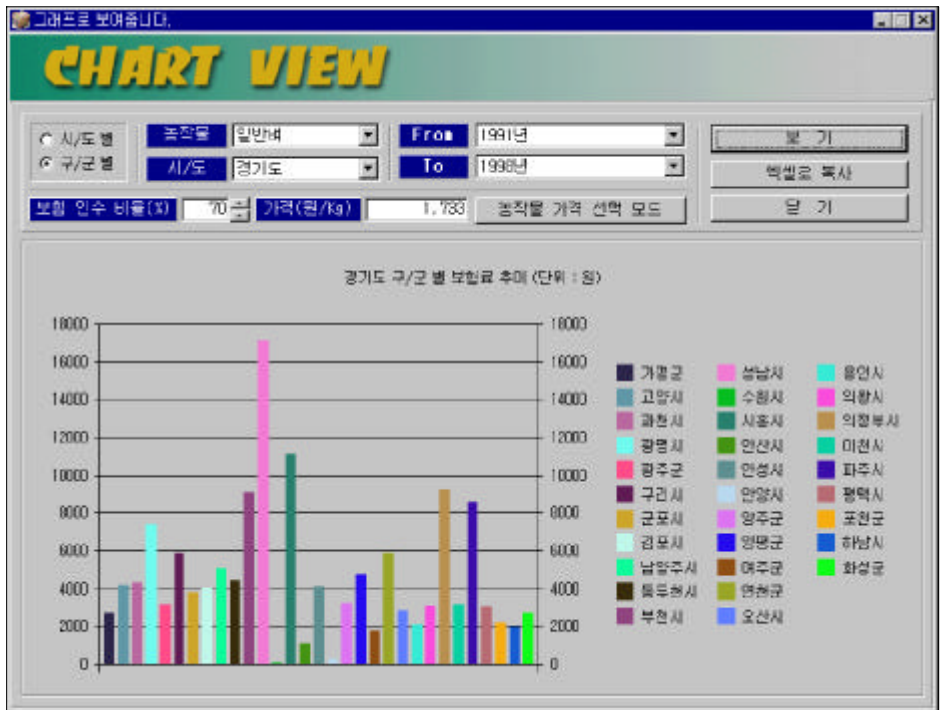
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새로운 농작물을 입력합니다.

농작물 입력

농작물 코드:

농작물 명:

농작물 코드 번호	농작물 명
11112	일반벼
12106	겉보리
12301	쌀보리
21130	김장배추
20132	김장무우
24100	고추
24200	마늘

가.

농작물 코드:

농작물 명:

5



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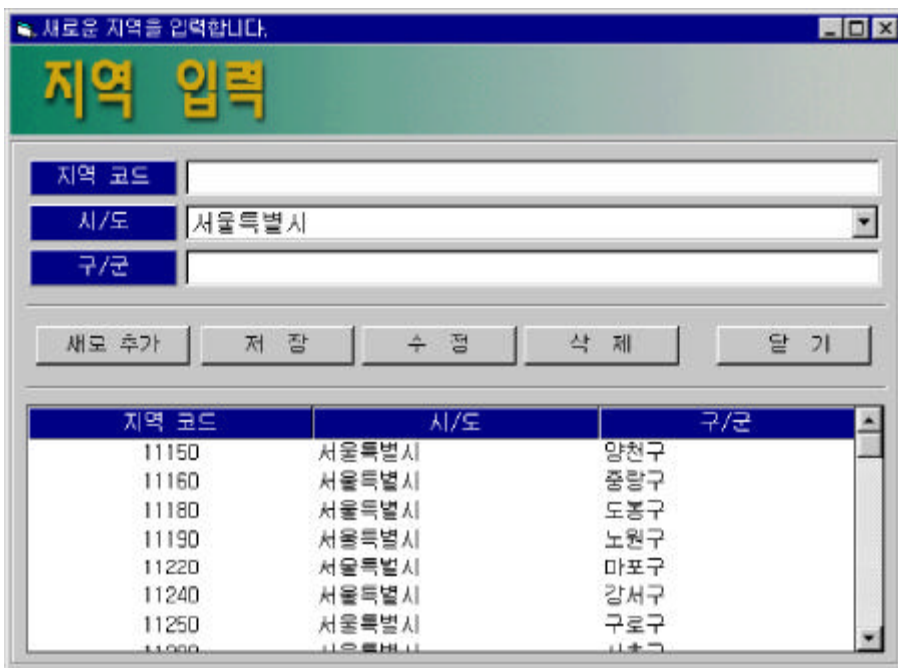
아이템 코드	아이템 명
11112	일반버
12106	겉보리
12301	쌀보리
21130	김장배추
23132	김장무우
24100	고추
24200	마늘

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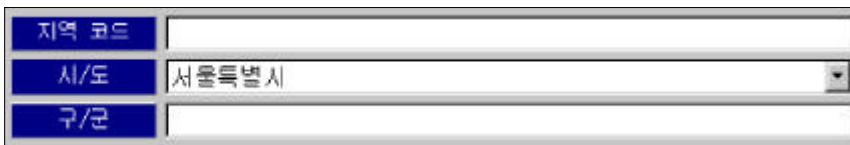
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새로 추가	저 장	수 정	삭 제	닫 기
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지역 코드	시/도	구/군
11150	서울특별시	양천구
11160	서울특별시	중랑구
11180	서울특별시	도봉구
11190	서울특별시	노원구
11220	서울특별시	마포구
11240	서울특별시	강서구
11250	서울특별시	구로구
11260	서울특별시	서초구

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- 가 .

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농작물	일반배
시/도	서울특별시
구/군	강남구
연 도	2000년
수확면적(단보)	1 단보
생산량(kg)	0

. , 0 .

지역별 생산량을 입력합니다.

지역별 생산량 입력

농작물	일반배
시/도	서울특별시
구/군	강남구
연 도	2000년
수확면적(단보)	<input type="text" value="1"/> 단보
생산량(Kg)	<input type="text" value="0"/>

연도	필지 구분	단보당 생산량(Kg)

가

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연도	종지 구분	단위량 생산량(Kg)

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농작물의 단위당 가격을 입력합니다.

농작물 가격 입력

농작물 명: 일반벼
 해당 년도: 2000년
 가격(원/Kg): 0

새로 추가 저장 수 전 사 제 단 기

연도	농작물 명	가격(원/Kg)
1964	일반벼	1,803
1965	일반벼	1,480
1966	일반벼	1,427
1967	일반벼	1,342
1968	일반벼	1,321
1969	일반벼	1,485
1970	일반벼	1,453
1971	일반벼	1,594

가.

농작물 명: 일반벼
 해당 년도: 2000년
 가격(원/Kg): 0

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새로 추가	저 장	수 정	삭 제	달 기
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연도	농작물 명	가격(원/Kg)
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1965	일반벼	1,480
1966	일반벼	1,427
1967	일반벼	1,342
1968	일반벼	1,321
1969	일반벼	1,485
1970	일반벼	1,453
1971	일반벼	1,594

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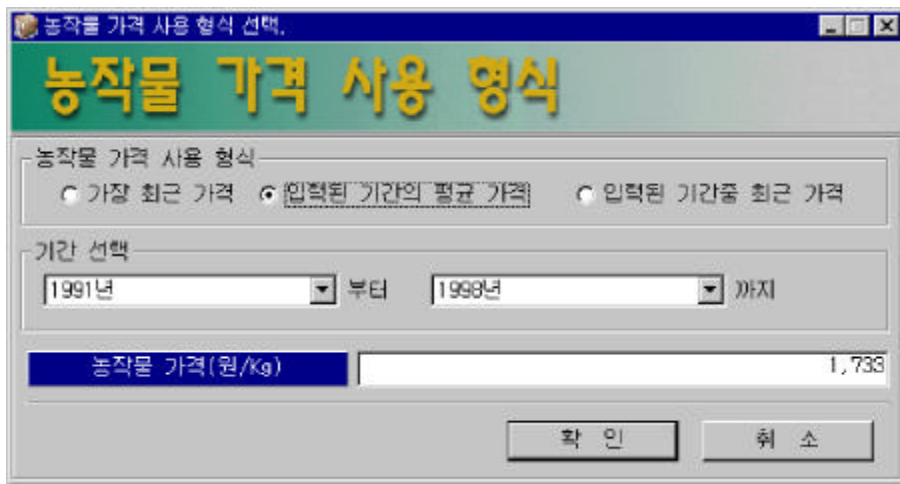
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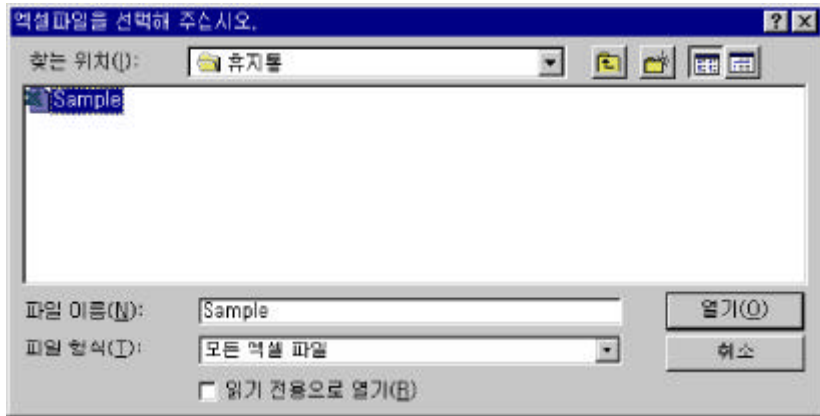
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Microsoft Excel - Sample

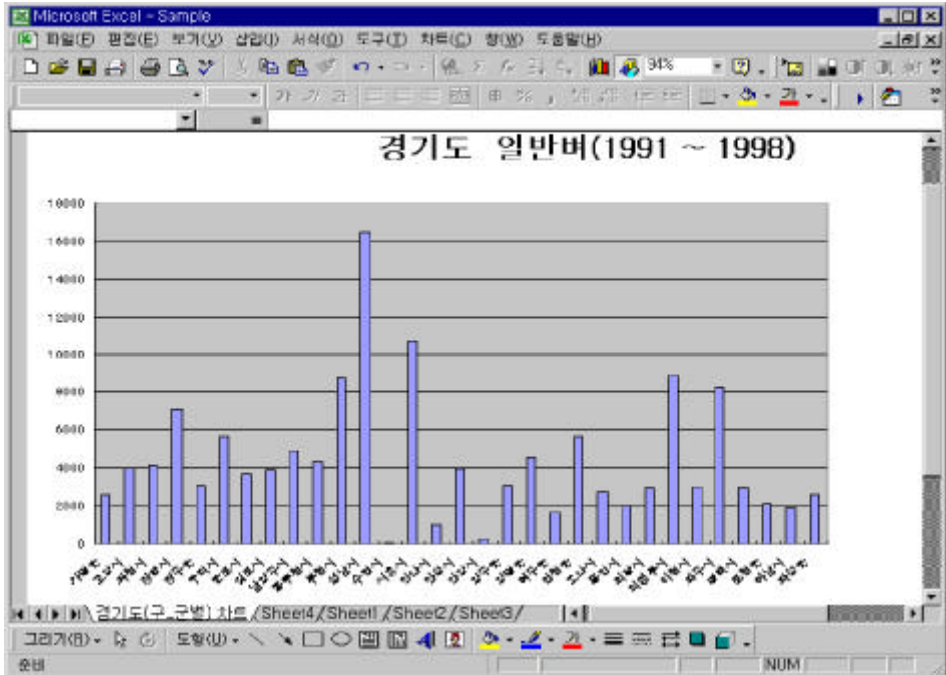
파일(F) 편집(E) 보기(V) 삽입(I) 서식(O) 도구(T) 데이터(D) 형식(W) 도움말(H)

100%

A1 = 지역

지역	순보험료(Kg)	보험요율(%)	순보험료(원)	최대 보상액(원)
가평군	1,56	0.52	1,826	505,188
고양시	2,41	0.8	2,811	504,476
과천시	2,48	0.81	2,892	507,020
광명시	4,25	1.29	4,969	556,313
광주군	1,83	0.59	2,138	518,010
구리시	3,4	1.1	3,978	516,718
군포시	2,19	0.7	2,559	525,952
김포시	2,34	0.75	2,735	518,002
남양주시	2,92	0.97	3,411	501,074
동두천시	2,56	0.75	2,996	572,071
부천시	5,24	1.6	6,125	546,941
성남시	9,87	2.84	11,528	579,589
수원시	0,04	0.01	45	563,397
시흥시	6,41	2.01	7,484	532,701
안산시	0,6	0.10	703	569,319

경기도(구.군별) 데이터 / Sheet1 / Sheet2 / Sheet3



< 2>

(1991 1998)

< 2-1>

: kg

1991		429.1	412.7	425.6	475.7	498.5	439.2	422.7	414.4	337.5
		75.6	91.5	56.2	52.9	59.5	61.8	71.5	70.0	61.9
1992		466.5	418.5	449.6	482.3	517.1	446.2	449.3	423.0	363.0
		72.7	88.4	60.0	58.1	68.5	67.8	65.2	66.3	41.2
1993		455.8	296.9	421.5	462.2	502.2	418.0	338.2	362.8	333.1
		91.6	173.5	76.8	79.3	89.7	79.4	112.3	92.6	49.3
1994		449.7	422.3	448.1	478.5	501.8	454.3	453.3	434.2	350.7
		70.2	79.6	62.2	53.6	72.9	63.8	84.1	92.6	69.4
1995		424.2	376.4	448.1	441.1	483.9	453.8	452.0	443.4	387.0
		71.9	77.7	58.2	70.3	66.2	61.2	65.9	63.0	56.0
1996		492.3	453.2	495.4	526.6	531.9	514.7	491.1	497.8	429.9
		82.3	82.5	76.9	62.0	63.6	60.0	70.1	70.3	33.9
1997		488.8	464.7	510.3	557.1	531.4	535.1	502.5	486.5	444.8
		86.0	81.8	63.4	57.4	66.6	54.9	67.6	63.3	27.0
1998		476.5	438.4	479.4	514.2	509.6	491.1	439.5	452.6	425.1
		85.1	90.9	62.0	65.8	58.3	52.5	75.7	58.2	61.3
		459.0	405.0	454.8	490.4	508.9	467.4	443.6	439.2	389.7
		82.5	112.6	70.1	70.5	70.2	73.9	88.7	81.8	64.7

< 2-2 >

: kg

1991		201.4	195.6	222.4	208.2	278.6	226.3	228.6
		81.8	71.9	44.9	53.1	43.0	51.1	63.1
1992		229.0	263.9	255.9	220.4	296.0	245.8	256.5
		66.8	66.1	28.3	52.2	52.0	48.8	65.8
1993		239.7	257.2	242.2	256.9	251.3	239.4	210.7
		95.9	113.6	44.5	38.5	57.7	39.3	64.0
1994		206.0	208.8	226.9	234.5	237.2	227.8	230.7
		82.0	79.8	22.5	44.7	67.0	47.7	55.6
1995		211.5	292.1	251.5	239.5	301.7	257.7	277.0
		86.8	72.8	39.1	47.7	57.5	46.0	49.3
1996		227.3	315.6	246.7	253.2	295.3	235.1	229.5
		62.4	89.9	31.9	33.9	63.7	47.6	66.7
1997		230.7	307.9	247.6	257.0	204.4	252.3	258.1
		29.7	89.8	29.1	32.7	59.8	35.2	62.1
1998		201.8	309.5	252.8	225.7	142.7	222.6	179.9
		54.7	78.6	21.3	63.4	37.1	55.0	63.6
		216.3	271.1	242.5	232.5	249.1	238.1	235.4
		73.8	92.1	36.1	50.5	77.5	48.5	67.3

< 2-3>

: kg

1991		-	-	-	-	-
		-	-	-	-	-
1992		208.3	358.1	291.4	301.2	299.8
		50.5	74.1	59.7	51.9	64.7
1993		218.5	295.1	263.4	299.0	272.3
		35.0	75.7	58.3	34.0	75.7
1994		-	327.8	256.3	263.1	250.7
		-	65.5	58.7	24.3	52.7
1995		274.8	396.8	307.8	315.9	314.5
		39.3	60.3	66.0	37.8	53.3
1996		168.5	372.1	308.1	-	304.5
		60.7	43.7	64.8	-	86.9
1997		189.2	242.9	265.6	-	255.1
		48.3	74.9	52.6	-	63.9
1998		183.7	195.2	208.4	-	198.2
		48.0	46.6	42.5	-	54.9
		213.2	315.5	273.3	295.5	277.7
		60.5	92.7	66.1	43.1	73.4

< 2-4>

: kg

1991		146.7	188.9	192.9	173.6	220.5	206.2	212.8	160.8	60.6
		87.0	94.9	73.9	66.3	80.8	80.0	85.5	88.4	30.9
1992		183.0	210.8	237.1	176.7	233.4	217.6	230.2	184.9	97.3
		83.3	102.5	77.1	59.4	81.2	73.2	77.8	64.0	35.3
1993		205.2	225.1	272.2	194.7	214.0	192.2	216.6	168.9	93.9
		89.6	107.6	84.1	59.0	102.7	82.2	85.4	85.1	37.7
1994		178.4	211.1	247.2	173.2	180.3	170.9	201.3	156.1	65.2
		73.7	90.2	62.4	67.8	83.8	69.9	70.9	71.7	41.3
1995		142.4	186.0	229.1	180.5	231.6	248.5	240.2	192.3	83.9
		67.5	93.7	77.5	57.4	68.9	100.9	82.6	81.2	31.7
1996		174.3	178.0	283.1	198.6	272.3	243.8	237.0	216.9	103.9
		106.2	127.9	102.6	77.1	76.9	111.4	73.6	62.0	43.5
1997		225.6	229.3	304.5	237.5	235.4	266.0	256.3	217.7	99.2
		103.8	118.9	80.5	82.2	90.7	119.2	99.9	91.4	49.7
1998		180.5	209.0	261.0	210.4	211.8	235.2	208.0	220.3	-
		104.7	123.8	118.2	96.6	94.2	105.8	100.1	92.8	-
		178.9	204.7	247.5	191.2	224.0	221.6	223.8	185.8	83.7
		93.8	107.9	90.7	73.7	88.0	97.2	86.2	83.0	39.6

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: kg

1991		561.1	536.1	641.7	651.6	706.2	1,144	846.0	1,237	961.2
		267.3	256.4	206.1	242.0	330.2	364.8	314.6	430.6	212.6
1992		959.8	661.6	708.5	796.3	753.2	1,191	928.0	1,287	1,141
		317.9	220.9	134.3	278.0	348.3	390.0	335.6	504.5	227.5
1993		794.0	660.6	691.3	855.7	769.9	1,218	954.4	1,215	1,131
		304.0	249.7	199.7	330.7	271.4	335.5	322.7	435.3	265.4
1994		665.2	535.2	669.4	671.2	750.5	1,178	863.5	1,119	1,285
		292.8	221.8	210.5	291.0	290.5	274.5	336.5	432.0	358.7
1995		749.5	659.2	722.5	810.9	732.9	1,313	1,065	1,395	1,335
		261.0	298.1	259.0	351.9	418.1	322.3	455.6	443.0	237.4
1996		663.2	569.9	691.5	771.8	880.0	1,193	1,066	1,125	1,321
		312.4	252.0	207.4	288.9	343.9	350.1	322.5	340.4	266.5
1997		657.2	731.8	677.6	788.6	898.6	1,167	1,055	1,185	1,350
		238.9	301.0	244.8	323.6	404.2	253.8	390.9	404.1	195.8
1998		734.2	854.9	640.4	732.0	864.3	1,111	1,006	1,124	1,280
		208.3	312.6	188.3	303.4	217.5	287.5	367.6	298.6	152.0
		715.7	644.5	679.8	759.6	792.4	1,186	965.4	1,209	1,235
		292.9	278.4	205.0	306.5	336.3	329.6	360.9	425.1	270.9

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: kg

1991		-	4,040	4,300	4,702	6,319	5,141	4,931
		-	1,213	1,619	1,161	1,566	1,556	659.7
1992		-	4,137	4,248	5,525	6,686	5,859	5,458
		-	1,749	2,184	1,226	1,547	1,513	781.1
1993		-	4,093	3,385	5,547	6,431	5,897	6,391
		-	1,248	1,930	1,194	1,393	1,942	1,469
1994		-	3,675	4,205	5,637	6,012	5,232	6,390
		-	1,542	1,494	906.4	1,817	1,650	1,494
1995		-	4,360	5,071	6,258	6,618	5,821	6,309
		-	1,855	1,720	1,621	1,502	1,582	951.3
1996		-	3,962	5,270	5,958	6,398	5,582	6,431
		-	1,028	1,449	1,066	1,473	1,417	1,360
1997		3,717	4,158	5,253	5,648	6,409	5,947	6,768
		1,485	1,638	1,569	1,322	1,551	1,757	1,069
1998		5,760	4,645	4,875	5,756	6,424	5,579	6,165
		2,381	1,587	1,442	989.7	1,439	1,672	551.7
		5,249	4,138	4,561	5,605	6,416	5,602	6,134
		2,338	1,514	1,776	1,286	1,540	1,654	1,220

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: kg

1991		9,600	7,493	10,407	11,549	11,483	11,311	10,106	11,928	7,582
		3,702	3,048	2,513	2,873	3,889	3,261	2,952	3,401	1,280
1992		10,398	8,782	11,173	12,130	12,546	11,821	10,720	11,952	8,238
		3,471	3,053	3,125	3,596	3,963	3,045	3,237	3,115	1,079
1993		10,738	8,278	12,119	11,928	13,486	11,939	10,367	12,593	8,641
		2,965	3,100	3,573	3,092	4,676	2,222	3,004	2,235	1,766
1994		10,692	8,790	11,881	12,517	11,918	10,467	9,265	11,955	9,156
		3,403	3,086	3,649	2,452	3,977	3,109	3,266	3,445	863.8
1995		9,555	7,779	11,272	11,904	11,941	10,127	10,745	10,978	9,679
		3,792	2,336	3,606	2,308	3,857	2,712	2,841	2,377	973.2
1996		11,403	8,954	12,435	12,441	13,033	12,124	10,114	12,452	10,160
		3,572	2,866	4,070	2,855	2,396	2,307	2,784	3,400	1,048
1997		10,701	7,581	10,415	11,932	12,877	11,167	9,688	11,703	10,650
		3,267	2,937	2,751	3,134	2,903	2,402	3,049	3,093	2,129
1998		9,431	7,922	9,823	10,586	10,883	11,031	8,814	9,769	9,590
		3,520	2,724	2,690	2,013	3,831	2,593	2,194	5,060	2,337
		10,277	8,183	11,165	11,897	12,259	11,291	10,058	11,722	8,845
		3,530	2,948	3,312	2,921	3,839	2,855	3,007	3,384	1,688

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: kg

1991		4,454	5,242	4,968	5,668	5,132	7,025	5,499	6,643	7,154
		2,076	2,424	1,373	1,686	1,665	2,007	2,086	2,339	1,243
1992		5,339	4,908	4,758	6,295	5,989	8,056	6,089	7,054	6,807
		2,144	1,714	1,285	1,695	1,642	1,749	2,442	2,080	987.0
1993		5,051	4,860	5,046	6,465	5,912	7,117	6,547	7,739	7,833
		2,281	2,067	1,365	2,389	2,094	2,128	3,091	2,383	2,543
1994		5,102	5,667	4,937	5,832	5,371	6,267	5,441	6,620	7,722
		2,154	2,120	1,444	1,871	1,658	2,337	2,463	2,396	834.3
1995		4,834	4,658	4,434	4,886	5,454	6,092	5,539	6,876	8,696
		1,662	1,937	1,755	1,617	1,433	2,294	2,024	2,474	838.6
1996		5,410	5,389	4,770	5,362	5,991	7,781	5,989	6,902	9,243
		2,274	2,192	1,970	1,847	2,027	1,973	2,023	2,258	1,428
1997		4,885	5,071	4,347	5,206	5,202	6,912	5,831	7,032	9,483
		2,183	2,079	2,178	1,579	1,593	2,418	1,607	2,141	2,177
1998		5,118	5,048	4,592	5,749	5,799	6,849	5,458	5,951	8,253
		2,344	2,066	1,832	2,033	1,310	1,926	1,813	2,365	2,455
		5,017	5,116	4,726	5,647	5,606	7,041	5,755	6,812	8,329
		2,150	2,090	1,674	1,884	1,703	2,189	2,205	2,342	1,926

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: kg

1991		1, 282	1, 345	1, 751	2, 056	1, 566	1, 187	2, 083	2, 005
		886. 2	891. 2	683. 4	949. 2	980. 3	949. 7	761. 8	953. 5
1992		1, 965	1, 321	2, 257	2, 232	1, 860	1, 801	2, 474	2, 529
		962. 9	966. 8	558. 5	916. 0	1, 247	759. 8	887. 6	1, 148
1993		1, 626	1, 378	2, 001	1, 918	1, 721	1, 746	2, 120	1, 869
		767. 2	1, 034	521. 8	856. 3	1, 167	1, 132	758. 9	1, 371
1994		1, 572	1, 359	2, 039	1, 816	1, 779	1, 557	1, 887	2, 370
		805. 2	654. 9	564. 2	948. 6	1, 084	887. 0	774. 1	1, 292
1995		1, 398	1, 298	2, 426	2, 270	1, 916	1, 729	2, 161	2, 317
		756. 7	792. 5	758. 5	558. 4	972. 5	894. 2	942. 7	998. 4
1996		1, 184	1, 290	2, 239	1, 844	2, 390	1, 478	2, 100	2, 431
		655. 7	745. 0	556. 8	404. 0	1, 030	848. 8	757. 9	927. 6
1997		1, 191	1, 218	2, 124	2, 034	2, 208	1, 652	2, 237	2, 375
		727. 8	769. 4	548. 4	554. 4	1, 019	816. 1	774. 5	939. 3
1998		1, 238	929. 8	2, 003	1, 593	1, 880	1, 120	1, 844	2, 091
		701. 3	706. 2	509. 3	592. 7	783. 4	614. 8	632. 9	897. 1
		1, 456	1, 273	2, 102	1, 979	1, 898	1, 542	2, 116	2, 267
		830. 9	818. 3	622. 1	814. 0	1, 071	887. 5	813. 4	1, 092

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: kg

1991		2, 244	1, 810	2, 345	1, 878	2, 323	2, 947	2, 158	2, 053
		1, 038	617. 2	825. 2	637. 0	1, 485	721. 1	729. 2	937. 6
1992		2, 408	1, 742	2, 804	1, 925	2, 161	2, 738	2, 027	2, 228
		920. 7	662. 2	1, 069	588. 0	1, 314	654. 3	559. 8	889. 4
1993		2, 198	1, 336	2, 312	2, 112	2, 468	2, 900	2, 141	1, 959
		827. 0	653. 8	901. 6	811. 0	1, 376	681. 9	759. 9	883. 0
1994		2, 349	1, 595	2, 252	1, 843	1, 942	2, 823	1, 792	1, 959
		804. 4	654. 1	683. 7	739. 7	1, 040	550. 1	717. 7	714. 9
1995		2, 438	1, 784	2, 352	2, 039	2, 103	2, 665	2, 112	2, 384
		966. 2	644. 2	563. 3	856. 9	1, 177	841. 7	630. 5	781. 3
1996		2, 653	1, 416	2, 352	2, 225	2, 797	2, 873	2, 295	2, 450
		924. 2	640. 4	387. 5	855. 6	985. 6	944. 2	727. 1	534. 4
1997		2, 837	1, 753	2, 213	2, 636	3, 201	3, 235	2, 194	2, 608
		1, 092	580. 0	742. 5	845. 7	1, 164	1, 051	571. 1	623. 7
1998		3, 051	1, 467	2, 504	2, 738	3, 398	2, 667	2, 230	2, 098
		1, 502	877. 1	865. 3	834. 0	1, 259	1, 081	785. 6	648. 5
		2, 448	1, 626	2, 363	2, 150	2, 499	2, 843	2, 117	2, 187
		1, 011	675. 1	745. 5	829. 1	1, 295	815. 4	699. 0	801. 5

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C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
10.0	0.00	0.00	0.00	0.00	0.01	0.03	0.11	0.34	0.93
10.2	0.00	0.00	0.00	0.00	0.01	0.03	0.12	0.38	0.98
10.4	0.00	0.00	0.00	0.00	0.01	0.04	0.14	0.41	1.04
10.6	0.00	0.00	0.00	0.00	0.01	0.04	0.15	0.44	1.09
10.8	0.00	0.00	0.00	0.00	0.01	0.05	0.17	0.48	1.15
11.0	0.00	0.00	0.00	0.00	0.02	0.06	0.19	0.51	1.21
11.2	0.00	0.00	0.00	0.00	0.02	0.07	0.21	0.55	1.27
11.4	0.00	0.00	0.00	0.01	0.02	0.08	0.23	0.59	1.33
11.6	0.00	0.00	0.00	0.01	0.03	0.09	0.25	0.63	1.39
11.8	0.00	0.00	0.00	0.01	0.03	0.10	0.27	0.67	1.45
12.0	0.00	0.00	0.00	0.01	0.03	0.11	0.30	0.71	1.51
12.2	0.00	0.00	0.00	0.01	0.04	0.12	0.32	0.76	1.57
12.4	0.00	0.00	0.00	0.01	0.05	0.13	0.35	0.80	1.64
12.6	0.00	0.00	0.00	0.02	0.05	0.15	0.38	0.85	1.70
12.8	0.00	0.00	0.01	0.02	0.06	0.16	0.41	0.89	1.77
13.0	0.00	0.00	0.01	0.02	0.07	0.18	0.44	0.94	1.83
13.2	0.00	0.00	0.01	0.03	0.07	0.20	0.47	0.99	1.90
13.4	0.00	0.00	0.01	0.03	0.08	0.22	0.50	1.04	1.97
13.6	0.00	0.00	0.01	0.03	0.09	0.23	0.53	1.09	2.03
13.8	0.00	0.00	0.01	0.04	0.10	0.26	0.57	1.14	2.10
14.0	0.00	0.00	0.01	0.04	0.11	0.28	0.60	1.20	2.17
14.2	0.00	0.01	0.02	0.05	0.13	0.30	0.64	1.25	2.24
14.4	0.00	0.01	0.02	0.05	0.14	0.32	0.68	1.30	2.31
14.6	0.00	0.01	0.02	0.06	0.15	0.35	0.71	1.36	2.38
14.8	0.00	0.01	0.03	0.07	0.17	0.37	0.75	1.41	2.45
15.0	0.00	0.01	0.03	0.08	0.18	0.40	0.79	1.47	2.52
15.2	0.00	0.01	0.03	0.08	0.20	0.42	0.84	1.53	2.59
15.4	0.00	0.01	0.04	0.09	0.21	0.45	0.88	1.59	2.66
15.6	0.01	0.02	0.04	0.10	0.23	0.48	0.92	1.64	2.73
15.8	0.01	0.02	0.05	0.11	0.25	0.51	0.97	1.70	2.81
16.0	0.01	0.02	0.05	0.12	0.27	0.54	1.01	1.76	2.88
16.2	0.01	0.02	0.06	0.14	0.29	0.57	1.06	1.82	2.95
16.4	0.01	0.03	0.07	0.15	0.31	0.61	1.10	1.89	3.03
16.6	0.01	0.03	0.07	0.16	0.33	0.64	1.15	1.95	3.10
16.8	0.01	0.03	0.08	0.18	0.36	0.67	1.20	2.01	3.17

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
17.0	0.02	0.04	0.09	0.19	0.38	0.71	1.25	2.07	3.25
17.2	0.02	0.04	0.10	0.20	0.40	0.75	1.30	2.14	3.32
17.4	0.02	0.05	0.11	0.22	0.43	0.78	1.35	2.20	3.40
17.6	0.02	0.05	0.12	0.24	0.45	0.82	1.40	2.27	3.47
17.8	0.03	0.06	0.13	0.25	0.48	0.86	1.46	2.33	3.55
18.0	0.03	0.07	0.14	0.27	0.51	0.90	1.51	2.40	3.62
18.2	0.03	0.07	0.15	0.29	0.54	0.94	1.56	2.47	3.70
18.4	0.04	0.08	0.16	0.31	0.57	0.98	1.62	2.53	3.78
18.6	0.04	0.09	0.17	0.33	0.60	1.03	1.67	2.60	3.85
18.8	0.05	0.09	0.19	0.35	0.63	1.07	1.73	2.67	3.93
19.0	0.05	0.10	0.20	0.38	0.66	1.12	1.79	2.74	4.01
19.2	0.06	0.11	0.22	0.40	0.70	1.16	1.85	2.81	4.08
19.4	0.06	0.12	0.23	0.42	0.73	1.21	1.90	2.88	4.16
19.6	0.07	0.13	0.25	0.45	0.76	1.25	1.96	2.95	4.24
19.8	0.07	0.14	0.27	0.47	0.80	1.30	2.02	3.02	4.32
20.0	0.08	0.15	0.28	0.50	0.84	1.35	2.08	3.09	4.40
20.2	0.09	0.17	0.30	0.52	0.87	1.40	2.14	3.16	4.47
20.4	0.10	0.18	0.32	0.55	0.91	1.45	2.21	3.23	4.55
20.6	0.10	0.19	0.34	0.58	0.95	1.50	2.27	3.30	4.63
20.8	0.11	0.20	0.36	0.61	0.99	1.55	2.33	3.37	4.71
21.0	0.12	0.22	0.38	0.64	1.03	1.60	2.39	3.45	4.79
21.2	0.13	0.23	0.40	0.67	1.07	1.65	2.46	3.52	4.87
21.4	0.14	0.25	0.43	0.70	1.12	1.71	2.52	3.59	4.95
21.6	0.15	0.27	0.45	0.74	1.16	1.76	2.59	3.67	5.03
21.8	0.16	0.28	0.47	0.77	1.20	1.82	2.65	3.74	5.11
22.0	0.17	0.30	0.50	0.80	1.25	1.87	2.72	3.81	5.19
22.2	0.19	0.32	0.53	0.84	1.29	1.93	2.78	3.89	5.27
22.4	0.20	0.34	0.55	0.87	1.34	1.99	2.85	3.96	5.35
22.6	0.21	0.36	0.58	0.91	1.39	2.04	2.92	4.04	5.43
22.8	0.23	0.38	0.61	0.95	1.43	2.10	2.98	4.11	5.51
23.0	0.24	0.40	0.64	0.99	1.48	2.16	3.05	4.19	5.59
23.2	0.26	0.42	0.67	1.03	1.53	2.22	3.12	4.27	5.67
23.4	0.27	0.44	0.70	1.07	1.58	2.28	3.19	4.34	5.75
23.6	0.29	0.47	0.73	1.11	1.63	2.34	3.26	4.42	5.83
23.8	0.31	0.49	0.76	1.15	1.68	2.40	3.33	4.49	5.91

: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
24.0	0.33	0.51	0.79	1.19	1.73	2.46	3.40	4.57	5.99
24.2	0.34	0.54	0.83	1.23	1.79	2.52	3.47	4.65	6.07
24.4	0.36	0.57	0.86	1.28	1.84	2.59	3.54	4.73	6.16
24.6	0.38	0.59	0.90	1.32	1.89	2.65	3.61	4.80	6.24
24.8	0.40	0.62	0.93	1.36	1.95	2.71	3.68	4.88	6.32
25.0	0.42	0.65	0.97	1.41	2.00	2.78	3.76	4.96	6.40
25.2	0.45	0.68	1.01	1.46	2.06	2.84	3.83	5.04	6.48
25.4	0.47	0.71	1.04	1.50	2.12	2.91	3.90	5.12	6.56
25.6	0.49	0.74	1.08	1.55	2.17	2.97	3.98	5.20	6.65
25.8	0.52	0.77	1.12	1.60	2.23	3.04	4.05	5.28	6.73
26.0	0.54	0.80	1.16	1.65	2.29	3.11	4.12	5.36	6.81
26.2	0.57	0.83	1.20	1.70	2.35	3.17	4.20	5.44	6.89
26.4	0.59	0.87	1.25	1.75	2.41	3.24	4.27	5.52	6.98
26.6	0.62	0.90	1.29	1.80	2.47	3.31	4.35	5.60	7.06
26.8	0.65	0.94	1.33	1.85	2.53	3.38	4.42	5.68	7.14
27.0	0.68	0.97	1.38	1.91	2.59	3.45	4.50	5.76	7.22
27.2	0.70	1.01	1.42	1.96	2.65	3.52	4.57	5.84	7.31
27.4	0.73	1.05	1.47	2.01	2.71	3.59	4.65	5.92	7.39
27.6	0.77	1.09	1.51	2.07	2.78	3.66	4.73	6.00	7.47
27.8	0.80	1.12	1.56	2.12	2.84	3.73	4.80	6.08	7.56
28.0	0.83	1.16	1.61	2.18	2.90	3.80	4.88	6.16	7.64
28.2	0.86	1.20	1.65	2.24	2.97	3.87	4.96	6.24	7.72
28.4	0.89	1.24	1.70	2.29	3.03	3.94	5.04	6.32	7.81
28.6	0.93	1.29	1.75	2.35	3.10	4.01	5.11	6.40	7.89
28.8	0.96	1.33	1.80	2.41	3.16	4.09	5.19	6.49	7.97
29.0	1.00	1.37	1.85	2.47	3.23	4.16	5.27	6.57	8.06
29.2	1.04	1.42	1.91	2.53	3.30	4.23	5.35	6.65	8.14
29.4	1.07	1.46	1.96	2.59	3.37	4.31	5.43	6.73	8.22
29.6	1.11	1.51	2.01	2.65	3.43	4.38	5.51	6.82	8.31
29.8	1.15	1.55	2.07	2.71	3.50	4.46	5.59	6.90	8.39
30.0	1.19	1.60	2.12	2.77	3.57	4.53	5.67	6.98	8.47
30.2	1.23	1.65	2.17	2.83	3.64	4.61	5.75	7.06	8.56
30.4	1.27	1.69	2.23	2.90	3.71	4.68	5.83	7.15	8.64
30.6	1.31	1.74	2.29	2.96	3.78	4.76	5.91	7.23	8.73
30.8	1.35	1.79	2.34	3.02	3.85	4.84	5.99	7.31	8.81

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C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
31.0	1.40	1.84	2.40	3.09	3.92	4.91	6.07	7.40	8.89
31.2	1.44	1.89	2.46	3.15	3.99	4.99	6.15	7.48	8.98
31.4	1.49	1.95	2.52	3.22	4.07	5.07	6.23	7.56	9.06
31.6	1.53	2.00	2.58	3.29	4.14	5.14	6.31	7.65	9.15
31.8	1.58	2.05	2.64	3.35	4.21	5.22	6.39	7.73	9.23
32.0	1.62	2.10	2.70	3.42	4.28	5.30	6.48	7.82	9.32
32.2	1.67	2.16	2.76	3.49	4.36	5.38	6.56	7.90	9.40
32.4	1.72	2.21	2.82	3.56	4.43	5.46	6.64	7.98	9.49
32.6	1.77	2.27	2.88	3.62	4.51	5.54	6.72	8.07	9.57
32.8	1.82	2.33	2.95	3.69	4.58	5.62	6.81	8.15	9.65
33.0	1.87	2.38	3.01	3.76	4.66	5.70	6.89	8.24	9.74
33.2	1.92	2.44	3.07	3.83	4.73	5.78	6.97	8.32	9.82
33.4	1.97	2.50	3.14	3.90	4.81	5.86	7.06	8.41	9.91
33.6	2.02	2.56	3.20	3.98	4.88	5.94	7.14	8.49	9.99
33.8	2.08	2.62	3.27	4.05	4.96	6.02	7.22	8.58	10.08
34.0	2.13	2.68	3.34	4.12	5.04	6.10	7.31	8.66	10.16
34.2	2.18	2.74	3.40	4.19	5.12	6.18	7.39	8.75	10.25
34.4	2.24	2.80	3.47	4.26	5.19	6.26	7.47	8.83	10.33
34.6	2.30	2.86	3.54	4.34	5.27	6.34	7.56	8.92	10.42
34.8	2.35	2.92	3.61	4.41	5.35	6.43	7.64	9.00	10.50
35.0	2.41	2.99	3.68	4.49	5.43	6.51	7.73	9.09	10.59
35.2	2.47	3.05	3.74	4.56	5.51	6.59	7.81	9.18	10.67
35.4	2.53	3.11	3.81	4.64	5.59	6.67	7.90	9.26	10.76
35.6	2.59	3.18	3.89	4.71	5.67	6.76	7.98	9.35	10.84
35.8	2.64	3.25	3.96	4.79	5.75	6.84	8.07	9.43	10.93
36.0	2.71	3.31	4.03	4.86	5.83	6.92	8.15	9.52	11.01
36.2	2.77	3.38	4.10	4.94	5.91	7.01	8.24	9.60	11.10
36.4	2.83	3.45	4.17	5.02	5.99	7.09	8.32	9.69	11.18
36.6	2.89	3.51	4.24	5.10	6.07	7.17	8.41	9.78	11.27
36.8	2.95	3.58	4.32	5.17	6.15	7.26	8.50	9.86	11.36
37.0	3.02	3.65	4.39	5.25	6.23	7.34	8.58	9.95	11.44
37.2	3.08	3.72	4.47	5.33	6.32	7.43	8.67	10.04	11.53
37.4	3.15	3.79	4.54	5.41	6.40	7.51	8.76	10.12	11.61
37.6	3.21	3.86	4.62	5.49	6.48	7.60	8.84	10.21	11.70
37.8	3.28	3.93	4.69	5.57	6.56	7.68	8.93	10.30	11.78

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
38.0	3.35	4.00	4.77	5.65	6.65	7.77	9.02	10.38	11.87
38.2	3.41	4.08	4.85	5.73	6.73	7.86	9.10	10.47	11.95
38.4	3.48	4.15	4.92	5.81	6.81	7.94	9.19	10.56	12.04
38.6	3.55	4.22	5.00	5.89	6.90	8.03	9.28	10.64	12.13
38.8	3.62	4.30	5.08	5.97	6.98	8.11	9.36	10.73	12.21
39.0	3.69	4.37	5.16	6.05	7.07	8.20	9.45	10.82	12.30
39.2	3.76	4.44	5.24	6.14	7.15	8.29	9.54	10.91	12.38
39.4	3.83	4.52	5.31	6.22	7.24	8.37	9.63	10.99	12.47
39.6	3.90	4.60	5.39	6.30	7.32	8.46	9.71	11.08	12.55
39.8	3.97	4.67	5.47	6.39	7.41	8.55	9.80	11.17	12.64
40.0	4.05	4.75	5.55	6.47	7.50	8.64	9.89	11.25	12.73
40.2	4.12	4.83	5.64	6.55	7.58	8.72	9.98	11.34	12.81
40.4	4.19	4.90	5.72	6.64	7.67	8.81	10.07	11.43	12.90
40.6	4.27	4.98	5.80	6.72	7.75	8.90	10.15	11.52	12.98
40.8	4.34	5.06	5.88	6.81	7.84	8.99	10.24	11.61	13.07
41.0	4.42	5.14	5.96	6.89	7.93	9.08	10.33	11.69	13.16
41.2	4.50	5.22	6.05	6.98	8.02	9.16	10.42	11.78	13.24
41.4	4.57	5.30	6.13	7.06	8.10	9.25	10.51	11.87	13.33
41.6	4.65	5.38	6.21	7.15	8.19	9.34	10.60	11.96	13.41
41.8	4.73	5.46	6.30	7.23	8.28	9.43	10.69	12.04	13.50
42.0	4.81	5.54	6.38	7.32	8.37	9.52	10.78	12.13	13.59
42.2	4.88	5.62	6.47	7.41	8.46	9.61	10.86	12.22	13.67
42.4	4.96	5.71	6.55	7.50	8.54	9.70	10.95	12.31	13.76
42.6	5.04	5.79	6.64	7.58	8.63	9.79	11.04	12.40	13.85
42.8	5.12	5.87	6.72	7.67	8.72	9.88	11.13	12.49	13.93
43.0	5.20	5.96	6.81	7.76	8.81	9.97	11.22	12.57	14.02
43.2	5.29	6.04	6.89	7.85	8.90	10.06	11.31	12.66	14.10
43.4	5.37	6.13	6.98	7.94	8.99	10.15	11.40	12.75	14.19
43.6	5.45	6.21	7.07	8.02	9.08	10.24	11.49	12.84	14.28
43.8	5.53	6.30	7.16	8.11	9.17	10.33	11.58	12.93	14.36
44.0	5.62	6.38	7.24	8.20	9.26	10.42	11.67	13.02	14.45
44.2	5.70	6.47	7.33	8.29	9.35	10.51	11.76	13.10	14.54
44.4	5.79	6.55	7.42	8.38	9.44	10.60	11.85	13.19	14.62
44.6	5.87	6.64	7.51	8.47	9.53	10.69	11.94	13.28	14.71
44.8	5.96	6.73	7.60	8.56	9.62	10.78	12.03	13.37	14.80

: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
45.0	6.04	6.82	7.69	8.65	9.71	10.87	12.12	13.46	14.88
45.2	6.13	6.90	7.78	8.74	9.81	10.96	12.21	13.55	14.97
45.4	6.21	6.99	7.87	8.83	9.90	11.05	12.30	13.64	15.06
45.6	6.30	7.08	7.96	8.93	9.99	11.15	12.39	13.73	15.14
45.8	6.39	7.17	8.05	9.02	10.08	11.24	12.48	13.82	15.23
46.0	6.48	7.26	8.14	9.11	10.17	11.33	12.57	13.90	15.31
46.2	6.57	7.35	8.23	9.20	10.27	11.42	12.66	13.99	15.40
46.4	6.66	7.44	8.32	9.29	10.36	11.51	12.76	14.08	15.49
46.6	6.74	7.53	8.41	9.39	10.45	11.60	12.85	14.17	15.57
46.8	6.83	7.62	8.51	9.48	10.54	11.70	12.94	14.26	15.66
47.0	6.93	7.72	8.60	9.57	10.64	11.79	13.03	14.35	15.75
47.2	7.02	7.81	8.69	9.66	10.73	11.88	13.12	14.44	15.83
47.4	7.11	7.90	8.78	9.76	10.82	11.97	13.21	14.53	15.92
47.6	7.20	7.99	8.88	9.85	10.92	12.07	13.30	14.62	16.01
47.8	7.29	8.09	8.97	9.95	11.01	12.16	13.39	14.71	16.09
48.0	7.38	8.18	9.06	10.04	11.10	12.25	13.48	14.80	16.18
48.2	7.48	8.27	9.16	10.13	11.20	12.35	13.58	14.89	16.27
48.4	7.57	8.37	9.25	10.23	11.29	12.44	13.67	14.97	16.35
48.6	7.66	8.46	9.35	10.32	11.39	12.53	13.76	15.06	16.44
48.8	7.76	8.56	9.44	10.42	11.48	12.62	13.85	15.15	16.53
49.0	7.85	8.65	9.54	10.51	11.57	12.72	13.94	15.24	16.62
49.2	7.95	8.75	9.63	10.61	11.67	12.81	14.03	15.33	16.70
49.4	8.04	8.84	9.73	10.70	11.76	12.91	14.13	15.42	16.79
49.6	8.14	8.94	9.82	10.80	11.86	13.00	14.22	15.51	16.88
49.8	8.23	9.03	9.92	10.89	11.95	13.09	14.31	15.60	16.96
50.0	8.33	9.13	10.02	10.99	12.05	13.19	14.40	15.69	17.05
50.2	8.43	9.23	10.11	11.09	12.14	13.28	14.49	15.78	17.14
50.4	8.53	9.32	10.21	11.18	12.24	13.37	14.59	15.87	17.22
50.6	8.62	9.42	10.31	11.28	12.33	13.47	14.68	15.96	17.31
50.8	8.72	9.52	10.41	11.38	12.43	13.56	14.77	16.05	17.40
51.0	8.82	9.62	10.50	11.47	12.53	13.66	14.86	16.14	17.48
51.2	8.92	9.72	10.60	11.57	12.62	13.75	14.96	16.23	17.57
51.4	9.02	9.81	10.70	11.67	12.72	13.85	15.05	16.32	17.66
51.6	9.12	9.91	10.80	11.77	12.81	13.94	15.14	16.41	17.75
51.8	9.22	10.01	10.90	11.86	12.91	14.04	15.23	16.50	17.83

: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
52.0	9.32	10.11	10.99	11.96	13.01	14.13	15.33	16.59	17.92
52.2	9.42	10.21	11.09	12.06	13.10	14.22	15.42	16.68	18.01
52.4	9.52	10.31	11.19	12.16	13.20	14.32	15.51	16.77	18.09
52.6	9.62	10.41	11.29	12.25	13.30	14.41	15.60	16.86	18.18
52.8	9.72	10.51	11.39	12.35	13.39	14.51	15.70	16.95	18.27
53.0	9.83	10.62	11.49	12.45	13.49	14.60	15.79	17.04	18.35
53.2	9.93	10.72	11.59	12.55	13.59	14.70	15.88	17.13	18.44
53.4	10.03	10.82	11.69	12.65	13.69	14.80	15.98	17.22	18.53
53.6	10.13	10.92	11.79	12.75	13.78	14.89	16.07	17.31	18.62
53.8	10.24	11.02	11.89	12.85	13.88	14.99	16.16	17.40	18.70
54.0	10.34	11.12	12.00	12.95	13.98	15.08	16.25	17.49	18.79
54.2	10.44	11.23	12.10	13.05	14.08	15.18	16.35	17.58	18.88
54.4	10.55	11.33	12.20	13.15	14.17	15.27	16.44	17.67	18.96
54.6	10.65	11.43	12.30	13.25	14.27	15.37	16.53	17.76	19.05
54.8	10.77	11.55	12.42	13.36	14.38	15.48	16.64	17.87	19.15
55.0	10.86	11.64	12.50	13.45	14.47	15.56	16.72	17.94	19.23
55.2	10.97	11.74	12.61	13.55	14.57	15.66	16.81	18.03	19.31
55.4	11.08	11.85	12.71	13.65	14.66	15.75	16.91	18.13	19.40
55.6	11.18	11.95	12.81	13.75	14.76	15.85	17.00	18.22	19.49
55.8	11.29	12.06	12.91	13.85	14.86	15.94	17.09	18.31	19.58
56.0	11.40	12.16	13.02	13.95	14.96	16.04	17.19	18.40	19.66
56.2	11.50	12.27	13.12	14.05	15.06	16.14	17.28	18.49	19.75
56.4	11.61	12.37	13.22	14.15	15.16	16.23	17.38	18.58	19.84
56.6	11.72	12.48	13.33	14.25	15.26	16.33	17.47	18.67	19.92
56.8	11.83	12.58	13.43	14.36	15.36	16.43	17.56	18.76	20.01
57.0	11.94	12.69	13.53	14.46	15.46	16.52	17.66	18.85	20.10
57.2	12.04	12.80	13.64	14.56	15.55	16.62	17.75	18.94	20.19
57.4	12.15	12.90	13.74	14.66	15.65	16.72	17.84	19.03	20.27
57.6	12.26	13.01	13.85	14.76	15.75	16.81	17.94	19.12	20.36
57.8	12.37	13.12	13.95	14.86	15.85	16.91	18.03	19.21	20.45
58.0	12.48	13.22	14.06	14.97	15.95	17.01	18.13	19.30	20.54
58.2	12.59	13.33	14.16	15.07	16.05	17.10	18.22	19.39	20.62
58.4	12.70	13.44	14.27	15.17	16.15	17.20	18.31	19.49	20.71
58.6	12.81	13.55	14.37	15.27	16.25	17.30	18.41	19.58	20.80
58.8	12.92	13.66	14.48	15.38	16.35	17.40	18.50	19.67	20.88

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
59.0	13.04	13.76	14.58	15.48	16.45	17.49	18.60	19.76	20.97
59.2	13.15	13.87	14.69	15.58	16.55	17.59	18.69	19.85	21.06
59.4	13.26	13.98	14.79	15.69	16.65	17.69	18.78	19.94	21.15
59.6	13.37	14.09	14.90	15.79	16.75	17.78	18.88	20.03	21.23
59.8	13.48	14.20	15.01	15.89	16.85	17.88	18.97	20.12	21.32
60.0	13.60	14.31	15.11	16.00	16.95	17.98	19.07	20.21	21.41
60.2	13.71	14.42	15.22	16.10	17.05	18.08	19.16	20.30	21.50
60.4	13.82	14.53	15.33	16.20	17.16	18.17	19.26	20.39	21.58
60.6	13.94	14.64	15.43	16.31	17.26	18.27	19.35	20.49	21.67
60.8	14.05	14.75	15.54	16.41	17.36	18.37	19.45	20.58	21.76
61.0	14.16	14.86	15.65	16.52	17.46	18.47	19.54	20.67	21.85
61.2	14.28	14.97	15.75	16.62	17.56	18.57	19.63	20.76	21.93
61.4	14.39	15.08	15.86	16.72	17.66	18.66	19.73	20.85	22.02
61.6	14.51	15.19	15.97	16.83	17.76	18.76	19.82	20.94	22.11
61.8	14.62	15.30	16.08	16.93	17.86	18.86	19.92	21.03	22.20
62.0	14.74	15.41	16.18	17.04	17.96	18.96	20.01	21.12	22.28
62.2	14.85	15.53	16.29	17.14	18.07	19.06	20.11	21.21	22.37
62.4	14.97	15.64	16.40	17.25	18.17	19.15	20.20	21.31	22.46
62.6	15.08	15.75	16.51	17.35	18.27	19.25	20.30	21.40	22.55
62.8	15.20	15.86	16.62	17.46	18.37	19.35	20.39	21.49	22.63
63.0	15.32	15.97	16.73	17.56	18.47	19.45	20.49	21.58	22.72
63.2	15.43	16.09	16.84	17.67	18.57	19.55	20.58	21.67	22.81
63.4	15.55	16.20	16.94	17.77	18.68	19.65	20.68	21.76	22.90
63.6	15.67	16.31	17.05	17.88	18.78	19.74	20.77	21.85	22.98
63.8	15.78	16.42	17.16	17.98	18.88	19.84	20.87	21.94	23.07
64.0	15.90	16.54	17.27	18.09	18.98	19.94	20.96	22.04	23.16
64.2	16.02	16.65	17.38	18.19	19.08	20.04	21.06	22.13	23.25
64.4	16.14	16.77	17.49	18.30	19.19	20.14	21.15	22.22	23.33
64.6	16.26	16.88	17.60	18.41	19.29	20.24	21.25	22.31	23.42
64.8	16.37	16.99	17.71	18.51	19.39	20.34	21.34	22.40	23.51
65.0	16.49	17.11	17.82	18.62	19.49	20.43	21.44	22.49	23.60
65.2	16.61	17.22	17.93	18.73	19.60	20.53	21.53	22.58	23.68
65.4	16.73	17.34	18.04	18.83	19.70	20.63	21.63	22.68	23.77
65.6	16.85	17.45	18.15	18.94	19.80	20.73	21.72	22.77	23.86
65.8	16.97	17.56	18.26	19.04	19.90	20.83	21.82	22.86	23.95

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
66.0	17.09	17.68	18.37	19.15	20.01	20.93	21.91	22.95	24.04
66.2	17.21	17.79	18.48	19.26	20.11	21.03	22.01	23.04	24.12
66.4	17.33	17.91	18.59	19.36	20.21	21.13	22.10	23.13	24.21
66.6	17.45	18.03	18.70	19.47	20.31	21.23	22.20	23.22	24.30
66.8	17.57	18.14	18.82	19.58	20.42	21.33	22.29	23.32	24.39
67.0	17.69	18.26	18.93	19.69	20.52	21.42	22.39	23.41	24.47
67.2	17.81	18.37	19.04	19.79	20.62	21.52	22.48	23.50	24.56
67.4	17.93	18.49	19.15	19.90	20.73	21.62	22.58	23.59	24.65
67.6	18.05	18.60	19.26	20.01	20.83	21.72	22.68	23.68	24.74
67.8	18.17	18.72	19.37	20.11	20.93	21.82	22.77	23.77	24.82
68.0	18.30	18.84	19.48	20.22	21.04	21.92	22.87	23.87	24.91
68.2	18.42	18.95	19.60	20.33	21.14	22.02	22.96	23.96	25.00
68.4	18.54	19.07	19.71	20.44	21.24	22.12	23.06	24.05	25.09
68.6	18.66	19.19	19.82	20.54	21.35	22.22	23.15	24.14	25.18
68.8	18.79	19.30	19.93	20.65	21.45	22.32	23.25	24.23	25.26
69.0	18.91	19.42	20.05	20.76	21.56	22.42	23.34	24.32	25.35
69.2	19.03	19.54	20.16	20.87	21.66	22.52	23.44	24.42	25.44
69.4	19.15	19.66	20.27	20.98	21.76	22.62	23.54	24.51	25.53
69.6	19.28	19.77	20.38	21.08	21.87	22.72	23.63	24.60	25.61
69.8	19.40	19.89	20.50	21.19	21.97	22.82	23.73	24.69	25.70
70.0	19.52	20.01	20.61	21.30	22.07	22.92	23.82	24.78	25.79
70.2	19.65	20.13	20.72	21.41	22.18	23.02	23.92	24.87	25.88
70.4	19.77	20.25	20.83	21.52	22.28	23.12	24.01	24.97	25.96
70.6	19.90	20.36	20.95	21.63	22.39	23.22	24.11	25.06	26.05
70.8	20.02	20.48	21.06	21.74	22.49	23.32	24.21	25.15	26.14
71.0	20.14	20.60	21.17	21.84	22.59	23.42	24.30	25.24	26.23
71.2	20.27	20.72	21.29	21.95	22.70	23.52	24.40	25.33	26.32
71.4	20.39	20.84	21.40	22.06	22.80	23.62	24.49	25.42	26.40
71.6	20.52	20.96	21.52	22.17	22.91	23.72	24.59	25.52	26.49
71.8	20.64	21.08	21.63	22.28	23.01	23.82	24.69	25.61	26.58
72.0	20.77	21.20	21.74	22.39	23.12	23.92	24.78	25.70	26.67
72.2	20.89	21.32	21.86	22.50	23.22	24.02	24.88	25.79	26.75
72.4	21.02	21.44	21.97	22.61	23.33	24.12	24.97	25.88	26.84
72.6	21.15	21.56	22.09	22.72	23.43	24.22	25.07	25.98	26.93
72.8	21.27	21.68	22.20	22.83	23.54	24.32	25.17	26.07	27.02

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: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
73.0	21.40	21.80	22.31	22.93	23.64	24.42	25.26	26.16	27.11
73.2	21.52	21.92	22.43	23.04	23.74	24.52	25.36	26.25	27.19
73.4	21.65	22.04	22.54	23.15	23.85	24.62	25.45	26.34	27.28
73.6	21.78	22.16	22.66	23.26	23.95	24.72	25.55	26.44	27.37
73.8	21.90	22.28	22.77	23.37	24.06	24.82	25.65	26.53	27.46
74.0	22.03	22.40	22.89	23.48	24.16	24.92	25.74	26.62	27.55
74.2	22.16	22.52	23.00	23.59	24.27	25.02	25.84	26.71	27.63
74.4	22.29	22.64	23.12	23.70	24.37	25.12	25.93	26.80	27.72
74.6	22.41	22.76	23.23	23.81	24.48	25.22	26.03	26.89	27.81
74.8	22.54	22.88	23.35	23.92	24.58	25.32	26.13	26.99	27.90
75.0	22.67	23.00	23.46	24.03	24.69	25.42	26.22	27.08	27.98
75.2	22.80	23.12	23.58	24.14	24.80	25.52	26.32	27.17	28.07
75.4	22.92	23.24	23.69	24.25	24.90	25.62	26.42	27.26	28.16
75.6	23.05	23.36	23.81	24.36	25.01	25.73	26.51	27.36	28.25
75.8	23.18	23.49	23.93	24.47	25.11	25.83	26.61	27.45	28.34
76.0	23.31	23.61	24.04	24.58	25.22	25.93	26.70	27.54	28.42
76.2	23.44	23.73	24.16	24.69	25.32	26.03	26.80	27.63	28.51
76.4	23.57	23.85	24.27	24.80	25.43	26.13	26.90	27.72	28.60
76.6	23.69	23.97	24.39	24.91	25.53	26.23	26.99	27.82	28.69
76.8	23.82	24.10	24.50	25.03	25.64	26.33	27.09	27.91	28.78
77.0	23.95	24.22	24.62	25.14	25.74	26.43	27.19	28.00	28.86
77.2	24.08	24.34	24.74	25.25	25.85	26.53	27.28	28.09	28.95
77.4	24.21	24.46	24.85	25.36	25.96	26.63	27.38	28.18	29.04
77.6	24.34	24.59	24.97	25.47	26.06	26.73	27.48	28.28	29.13
77.8	24.47	24.71	25.09	25.58	26.17	26.84	27.57	28.37	29.22
78.0	24.60	24.83	25.20	25.69	26.27	26.94	27.67	28.46	29.30
78.2	24.73	24.95	25.32	25.80	26.38	27.04	27.77	28.55	29.39
78.4	24.86	25.08	25.44	25.91	26.48	27.14	27.86	28.64	29.48
78.6	24.99	25.20	25.55	26.02	26.59	27.24	27.96	28.74	29.57
78.8	25.12	25.32	25.67	26.13	26.70	27.34	28.05	28.83	29.65
79.0	25.25	25.45	25.79	26.25	26.80	27.44	28.15	28.92	29.74
79.2	25.38	25.57	25.90	26.36	26.91	27.54	28.25	29.01	29.83
79.4	25.51	25.69	26.02	26.47	27.02	27.64	28.34	29.11	29.92
79.6	25.64	25.82	26.14	26.58	27.12	27.75	28.44	29.20	30.01
79.8	25.78	25.94	26.26	26.69	27.23	27.85	28.54	29.29	30.09

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
80.0	25.91	26.06	26.37	26.80	27.33	27.95	28.63	29.38	30.18
80.2	26.04	26.19	26.49	26.91	27.44	28.05	28.73	29.47	30.27
80.4	26.17	26.31	26.61	27.03	27.55	28.15	28.83	29.57	30.36
80.6	26.30	26.44	26.73	27.14	27.65	28.25	28.92	29.66	30.45
80.8	26.43	26.56	26.84	27.25	27.76	28.35	29.02	29.75	30.53
81.0	26.57	26.68	26.96	27.36	27.87	28.46	29.12	29.84	30.62
81.2	26.70	26.81	27.08	27.47	27.97	28.56	29.21	29.94	30.71
81.4	26.83	26.93	27.20	27.59	28.08	28.66	29.31	30.03	30.80
81.6	26.96	27.06	27.31	27.70	28.18	28.76	29.41	30.12	30.89
81.8	27.09	27.18	27.43	27.81	28.29	28.86	29.51	30.21	30.97
82.0	27.23	27.31	27.55	27.92	28.40	28.96	29.60	30.30	31.06
82.2	27.36	27.43	27.67	28.03	28.50	29.06	29.70	30.40	31.15
82.4	27.49	27.56	27.79	28.15	28.61	29.17	29.80	30.49	31.24
82.6	27.62	27.68	27.90	28.26	28.72	29.27	29.89	30.58	31.33
82.8	27.76	27.81	28.02	28.37	28.82	29.37	29.99	30.67	31.41
83.0	27.89	27.93	28.14	28.48	28.93	29.47	30.09	30.77	31.50
83.2	28.02	28.06	28.26	28.59	29.04	29.57	30.18	30.86	31.59
83.4	28.16	28.18	28.38	28.71	29.14	29.67	30.28	30.95	31.68
83.6	28.29	28.31	28.50	28.82	29.25	29.78	30.38	31.04	31.77
83.8	28.42	28.43	28.62	28.93	29.36	29.88	30.47	31.14	31.85
84.0	28.56	28.56	28.73	29.04	29.47	29.98	30.57	31.23	31.94
84.2	28.69	28.69	28.85	29.16	29.57	30.08	30.67	31.32	32.03
84.4	28.82	28.81	28.97	29.27	29.68	30.18	30.76	31.41	32.12
84.6	28.96	28.94	29.09	29.38	29.79	30.28	30.86	31.51	32.21
84.8	29.09	29.06	29.21	29.49	29.89	30.39	30.96	31.60	32.29
85.0	29.23	29.19	29.33	29.61	30.00	30.49	31.06	31.69	32.38
85.2	29.36	29.32	29.45	29.72	30.11	30.59	31.15	31.78	32.47
85.4	29.50	29.44	29.57	29.83	30.21	30.69	31.25	31.88	32.56
85.6	29.63	29.57	29.69	29.95	30.32	30.79	31.35	31.97	32.65
85.8	29.76	29.69	29.81	30.06	30.43	30.90	31.44	32.06	32.73
86.0	29.90	29.82	29.92	30.17	30.54	31.00	31.54	32.15	32.82
86.2	30.03	29.95	30.04	30.28	30.64	31.10	31.64	32.24	32.91
86.4	30.17	30.07	30.16	30.40	30.75	31.20	31.73	32.34	33.00
86.6	30.30	30.20	30.28	30.51	30.86	31.30	31.83	32.43	33.09
86.8	30.44	30.33	30.40	30.62	30.97	31.41	31.93	32.52	33.18

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
87.0	30.57	30.45	30.52	30.74	31.07	31.51	32.03	32.61	33.26
87.2	30.71	30.58	30.64	30.85	31.18	31.61	32.12	32.71	33.35
87.4	30.85	30.71	30.76	30.96	31.29	31.71	32.22	32.80	33.44
87.6	30.98	30.84	30.88	31.08	31.40	31.81	32.32	32.89	33.53
87.8	31.12	30.96	31.00	31.19	31.50	31.92	32.41	32.98	33.62
88.0	31.25	31.09	31.12	31.30	31.61	32.02	32.51	33.08	33.70
88.2	31.39	31.22	31.24	31.42	31.72	32.12	32.61	33.17	33.79
88.4	31.52	31.34	31.36	31.53	31.83	32.22	32.71	33.26	33.88
88.6	31.66	31.47	31.48	31.64	31.93	32.33	32.80	33.35	33.97
88.8	31.80	31.60	31.60	31.76	32.04	32.43	32.90	33.45	34.06
89.0	31.93	31.73	31.72	31.87	32.15	32.53	33.00	33.54	34.14
89.2	32.07	31.86	31.84	31.99	32.26	32.63	33.10	33.63	34.23
89.4	32.21	31.98	31.96	32.10	32.36	32.73	33.19	33.73	34.32
89.6	32.34	32.11	32.08	32.21	32.47	32.84	33.29	33.82	34.41
89.8	32.48	32.24	32.20	32.33	32.58	32.94	33.39	33.91	34.50
90.0	32.61	32.37	32.32	32.44	32.69	33.04	33.48	34.00	34.58
90.2	32.75	32.49	32.44	32.55	32.80	33.14	33.58	34.10	34.67
90.4	32.89	32.62	32.56	32.67	32.90	33.25	33.68	34.19	34.76
90.6	33.03	32.75	32.68	32.78	33.01	33.35	33.78	34.28	34.85
90.8	33.16	32.88	32.81	32.90	33.12	33.45	33.87	34.37	34.94
91.0	33.30	33.01	32.93	33.01	33.23	33.55	33.97	34.47	35.03
91.2	33.44	33.14	33.05	33.12	33.33	33.66	34.07	34.56	35.11
91.4	33.57	33.26	33.17	33.24	33.44	33.76	34.17	34.65	35.20
91.6	33.71	33.39	33.29	33.35	33.55	33.86	34.26	34.74	35.29
91.8	33.85	33.52	33.41	33.47	33.66	33.96	34.36	34.84	35.38
92.0	33.99	33.65	33.53	33.58	33.77	34.07	34.46	34.93	35.47
92.2	34.12	33.78	33.65	33.69	33.88	34.17	34.56	35.02	35.55
92.4	34.26	33.91	33.77	33.81	33.98	34.27	34.65	35.11	35.64
92.6	34.40	34.04	33.89	33.92	34.09	34.37	34.75	35.21	35.73
92.8	34.54	34.17	34.01	34.04	34.20	34.48	34.85	35.30	35.82
93.0	34.68	34.29	34.14	34.15	34.31	34.58	34.95	35.39	35.91
93.2	34.81	34.42	34.26	34.27	34.42	34.68	35.04	35.48	35.99
93.4	34.95	34.55	34.38	34.38	34.52	34.78	35.14	35.58	36.08
93.6	35.09	34.68	34.50	34.49	34.63	34.89	35.24	35.67	36.17
93.8	35.23	34.81	34.62	34.61	34.74	34.99	35.34	35.76	36.26

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
94.0	35.37	34.94	34.74	34.72	34.85	35.09	35.43	35.86	36.35
94.2	35.51	35.07	34.86	34.84	34.96	35.19	35.53	35.95	36.44
94.4	35.65	35.20	34.99	34.95	35.07	35.30	35.63	36.04	36.52
94.6	35.78	35.33	35.11	35.07	35.17	35.40	35.73	36.13	36.61
94.8	35.92	35.46	35.23	35.18	35.28	35.50	35.82	36.23	36.70
95.0	36.06	35.59	35.35	35.30	35.39	35.61	35.92	36.32	36.79
95.2	36.20	35.72	35.47	35.41	35.50	35.71	36.02	36.41	36.88
95.4	36.34	35.85	35.59	35.53	35.61	35.81	36.12	36.50	36.96
95.6	36.48	35.98	35.72	35.64	35.72	35.91	36.21	36.60	37.05
95.8	36.62	36.11	35.84	35.76	35.82	36.02	36.31	36.69	37.14
96.0	36.76	36.24	35.96	35.87	35.93	36.12	36.41	36.78	37.23
96.2	36.90	36.37	36.08	35.99	36.04	36.22	36.51	36.88	37.32
96.4	37.04	36.50	36.20	36.10	36.15	36.33	36.60	36.97	37.41
96.6	37.18	36.63	36.33	36.22	36.26	36.43	36.70	37.06	37.49
96.8	37.32	36.76	36.45	36.33	36.37	36.53	36.80	37.15	37.58
97.0	37.46	36.89	36.57	36.45	36.48	36.63	36.90	37.25	37.67
97.2	37.59	37.02	36.69	36.56	36.59	36.74	36.99	37.34	37.76
97.4	37.73	37.15	36.81	36.68	36.69	36.84	37.09	37.43	37.85
97.6	37.87	37.28	36.94	36.79	36.80	36.94	37.19	37.52	37.93
97.8	38.01	37.41	37.06	36.91	36.91	37.05	37.29	37.62	38.02
98.0	38.15	37.54	37.18	37.02	37.02	37.15	37.38	37.71	38.11
98.2	38.29	37.67	37.30	37.14	37.13	37.25	37.48	37.80	38.20
98.4	38.43	37.80	37.43	37.25	37.24	37.35	37.58	37.90	38.29
98.6	38.58	37.93	37.55	37.37	37.35	37.46	37.68	37.99	38.38
98.8	38.72	38.06	37.67	37.48	37.46	37.56	37.78	38.08	38.46
99.0	38.86	38.19	37.79	37.60	37.56	37.66	37.87	38.17	38.55
99.2	39.00	38.32	37.92	37.71	37.67	37.77	37.97	38.27	38.64
99.4	39.14	38.46	38.04	37.83	37.78	37.87	38.07	38.36	38.73
99.6	39.28	38.59	38.16	37.94	37.89	37.97	38.17	38.45	38.82
99.8	39.42	38.72	38.28	38.06	38.00	38.08	38.26	38.55	38.90
100.0	39.56	38.85	38.41	38.17	38.11	38.18	38.36	38.64	38.99

< 4> Logistic

< 4> Logistic

: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
10.0	0.00	0.00	0.01	0.01	0.03	0.08	0.18	0.41	0.93
10.2	0.00	0.00	0.01	0.02	0.04	0.09	0.20	0.44	0.98
10.4	0.00	0.00	0.01	0.02	0.04	0.10	0.22	0.48	1.03
10.6	0.00	0.00	0.01	0.02	0.05	0.11	0.23	0.51	1.08
10.8	0.00	0.01	0.01	0.03	0.05	0.12	0.25	0.54	1.13
11.0	0.00	0.01	0.01	0.03	0.06	0.13	0.28	0.58	1.18
11.2	0.00	0.01	0.02	0.03	0.07	0.14	0.30	0.61	1.24
11.4	0.00	0.01	0.02	0.04	0.08	0.16	0.32	0.65	1.29
11.6	0.01	0.01	0.02	0.04	0.08	0.17	0.34	0.69	1.35
11.8	0.01	0.01	0.02	0.05	0.09	0.18	0.37	0.73	1.41
12.0	0.01	0.01	0.03	0.05	0.10	0.20	0.39	0.77	1.47
12.2	0.01	0.02	0.03	0.06	0.11	0.22	0.42	0.81	1.52
12.4	0.01	0.02	0.03	0.06	0.12	0.23	0.45	0.85	1.58
12.6	0.01	0.02	0.04	0.07	0.13	0.25	0.47	0.89	1.64
12.8	0.01	0.02	0.04	0.08	0.14	0.27	0.50	0.94	1.70
13.0	0.01	0.02	0.04	0.08	0.15	0.29	0.53	0.98	1.76
13.2	0.02	0.03	0.05	0.09	0.17	0.31	0.56	1.03	1.82
13.4	0.02	0.03	0.05	0.10	0.18	0.33	0.60	1.07	1.89
13.6	0.02	0.03	0.06	0.11	0.19	0.35	0.63	1.12	1.95
13.8	0.02	0.04	0.07	0.12	0.21	0.37	0.66	1.17	2.01
14.0	0.02	0.04	0.07	0.13	0.22	0.40	0.70	1.22	2.08
14.2	0.03	0.05	0.08	0.14	0.24	0.42	0.73	1.26	2.14
14.4	0.03	0.05	0.09	0.15	0.26	0.44	0.77	1.31	2.20
14.6	0.03	0.05	0.09	0.16	0.27	0.47	0.81	1.37	2.27
14.8	0.04	0.06	0.10	0.17	0.29	0.50	0.84	1.42	2.33
15.0	0.04	0.07	0.11	0.18	0.31	0.52	0.88	1.47	2.40
15.2	0.04	0.07	0.12	0.20	0.33	0.55	0.92	1.52	2.47
15.4	0.05	0.08	0.13	0.21	0.35	0.58	0.96	1.58	2.53
15.6	0.05	0.08	0.14	0.22	0.37	0.61	1.00	1.63	2.60
15.8	0.06	0.09	0.15	0.24	0.39	0.64	1.04	1.69	2.67
16.0	0.06	0.10	0.16	0.25	0.41	0.67	1.09	1.74	2.74
16.2	0.07	0.10	0.17	0.27	0.44	0.70	1.13	1.80	2.80
16.4	0.07	0.11	0.18	0.29	0.46	0.74	1.17	1.85	2.87
16.6	0.08	0.12	0.19	0.30	0.48	0.77	1.22	1.91	2.94
16.8	0.08	0.13	0.20	0.32	0.51	0.80	1.26	1.97	3.01

< 4> Logistic

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: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
17.0	0.09	0.14	0.22	0.34	0.53	0.84	1.31	2.03	3.08
17.2	0.10	0.15	0.23	0.36	0.56	0.87	1.36	2.09	3.15
17.4	0.10	0.16	0.25	0.38	0.59	0.91	1.41	2.15	3.22
17.6	0.11	0.17	0.26	0.40	0.62	0.95	1.45	2.21	3.29
17.8	0.12	0.18	0.28	0.42	0.64	0.99	1.50	2.27	3.36
18.0	0.13	0.19	0.29	0.44	0.67	1.02	1.55	2.33	3.43
18.2	0.14	0.20	0.31	0.46	0.70	1.06	1.60	2.39	3.50
18.4	0.15	0.22	0.32	0.49	0.73	1.10	1.65	2.45	3.57
18.6	0.16	0.23	0.34	0.51	0.77	1.14	1.70	2.51	3.65
18.8	0.17	0.24	0.36	0.54	0.80	1.19	1.76	2.58	3.72
19.0	0.18	0.26	0.38	0.56	0.83	1.23	1.81	2.64	3.79
19.2	0.19	0.27	0.40	0.59	0.86	1.27	1.86	2.70	3.86
19.4	0.20	0.29	0.42	0.61	0.90	1.31	1.92	2.77	3.94
19.6	0.21	0.30	0.44	0.64	0.93	1.36	1.97	2.83	4.01
19.8	0.22	0.32	0.46	0.67	0.97	1.40	2.03	2.90	4.08
20.0	0.24	0.34	0.48	0.70	1.00	1.45	2.08	2.96	4.16
20.2	0.25	0.35	0.50	0.72	1.04	1.50	2.14	3.03	4.23
20.4	0.26	0.37	0.53	0.75	1.08	1.54	2.19	3.09	4.30
20.6	0.28	0.39	0.55	0.78	1.12	1.59	2.25	3.16	4.38
20.8	0.29	0.41	0.58	0.81	1.16	1.64	2.31	3.23	4.45
21.0	0.31	0.43	0.60	0.85	1.20	1.69	2.37	3.30	4.53
21.2	0.32	0.45	0.63	0.88	1.24	1.74	2.43	3.36	4.60
21.4	0.34	0.47	0.65	0.91	1.28	1.79	2.49	3.43	4.67
21.6	0.35	0.49	0.68	0.94	1.32	1.84	2.55	3.50	4.75
21.8	0.37	0.51	0.71	0.98	1.36	1.89	2.61	3.57	4.82
22.0	0.39	0.53	0.73	1.01	1.40	1.94	2.67	3.64	4.90
22.2	0.41	0.56	0.76	1.05	1.45	1.99	2.73	3.71	4.98
22.4	0.43	0.58	0.79	1.09	1.49	2.04	2.79	3.78	5.05
22.6	0.45	0.60	0.82	1.12	1.53	2.10	2.85	3.85	5.13
22.8	0.47	0.63	0.85	1.16	1.58	2.15	2.91	3.92	5.20
23.0	0.49	0.65	0.88	1.20	1.63	2.20	2.98	3.99	5.28
23.2	0.51	0.68	0.91	1.24	1.67	2.26	3.04	4.06	5.35
23.4	0.53	0.71	0.95	1.27	1.72	2.31	3.10	4.13	5.43
23.6	0.55	0.73	0.98	1.31	1.77	2.37	3.17	4.20	5.51
23.8	0.57	0.76	1.01	1.36	1.81	2.43	3.23	4.27	5.58

< 4> Logistic

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: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
24.0	0.60	0.79	1.05	1.40	1.86	2.48	3.30	4.34	5.66
24.2	0.62	0.82	1.08	1.44	1.91	2.54	3.36	4.42	5.74
24.4	0.65	0.85	1.12	1.48	1.96	2.60	3.43	4.49	5.81
24.6	0.67	0.88	1.15	1.52	2.01	2.66	3.49	4.56	5.89
24.8	0.70	0.91	1.19	1.57	2.06	2.72	3.56	4.63	5.97
25.0	0.72	0.94	1.23	1.61	2.12	2.78	3.63	4.71	6.05
25.2	0.75	0.97	1.27	1.66	2.17	2.84	3.69	4.78	6.12
25.4	0.78	1.00	1.30	1.70	2.22	2.90	3.76	4.85	6.20
25.6	0.81	1.04	1.34	1.75	2.27	2.96	3.83	4.93	6.28
25.8	0.83	1.07	1.38	1.79	2.33	3.02	3.90	5.00	6.36
26.0	0.86	1.11	1.42	1.84	2.38	3.08	3.97	5.08	6.43
26.2	0.89	1.14	1.46	1.89	2.44	3.14	4.04	5.15	6.51
26.4	0.92	1.18	1.51	1.94	2.49	3.20	4.10	5.22	6.59
26.6	0.95	1.21	1.55	1.98	2.55	3.27	4.17	5.30	6.67
26.8	0.99	1.25	1.59	2.03	2.60	3.33	4.24	5.37	6.75
27.0	1.02	1.29	1.63	2.08	2.66	3.39	4.31	5.45	6.82
27.2	1.05	1.32	1.68	2.13	2.72	3.46	4.38	5.53	6.90
27.4	1.08	1.36	1.72	2.19	2.78	3.52	4.46	5.60	6.98
27.6	1.12	1.40	1.77	2.24	2.83	3.59	4.53	5.68	7.06
27.8	1.15	1.44	1.81	2.29	2.89	3.65	4.60	5.75	7.14
28.0	1.19	1.48	1.86	2.34	2.95	3.72	4.67	5.83	7.22
28.2	1.22	1.52	1.91	2.39	3.01	3.78	4.74	5.91	7.30
28.4	1.26	1.56	1.95	2.45	3.07	3.85	4.81	5.98	7.38
28.6	1.30	1.61	2.00	2.50	3.13	3.92	4.89	6.06	7.45
28.8	1.33	1.65	2.05	2.56	3.19	3.99	4.96	6.14	7.53
29.0	1.37	1.69	2.10	2.61	3.25	4.05	5.03	6.21	7.61
29.2	1.41	1.74	2.15	2.67	3.32	4.12	5.10	6.29	7.69
29.4	1.45	1.78	2.20	2.72	3.38	4.19	5.18	6.37	7.77
29.6	1.49	1.83	2.25	2.78	3.44	4.26	5.25	6.44	7.85
29.8	1.53	1.87	2.30	2.84	3.51	4.33	5.33	6.52	7.93
30.0	1.57	1.92	2.35	2.90	3.57	4.40	5.40	6.60	8.01
30.2	1.61	1.96	2.40	2.95	3.63	4.47	5.47	6.68	8.09
30.4	1.66	2.01	2.46	3.01	3.70	4.54	5.55	6.76	8.17
30.6	1.70	2.06	2.51	3.07	3.76	4.61	5.62	6.83	8.25
30.8	1.74	2.11	2.56	3.13	3.83	4.68	5.70	6.91	8.33

< 4> Logistic

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: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
31.0	1.79	2.16	2.62	3.19	3.89	4.75	5.77	6.99	8.41
31.2	1.83	2.21	2.67	3.25	3.96	4.82	5.85	7.07	8.49
31.4	1.88	2.26	2.73	3.31	4.03	4.89	5.93	7.15	8.57
31.6	1.92	2.31	2.79	3.37	4.09	4.96	6.00	7.23	8.65
31.8	1.97	2.36	2.84	3.44	4.16	5.03	6.08	7.31	8.73
32.0	2.02	2.41	2.90	3.50	4.23	5.11	6.15	7.38	8.81
32.2	2.06	2.46	2.96	3.56	4.30	5.18	6.23	7.46	8.89
32.4	2.11	2.52	3.01	3.62	4.36	5.25	6.31	7.54	8.97
32.6	2.16	2.57	3.07	3.69	4.43	5.33	6.38	7.62	9.05
32.8	2.21	2.62	3.13	3.75	4.50	5.40	6.46	7.70	9.13
33.0	2.26	2.68	3.19	3.82	4.57	5.47	6.54	7.78	9.21
33.2	2.31	2.73	3.25	3.88	4.64	5.55	6.62	7.86	9.29
33.4	2.36	2.79	3.31	3.95	4.71	5.62	6.69	7.94	9.37
33.6	2.41	2.84	3.37	4.01	4.78	5.70	6.77	8.02	9.45
33.8	2.46	2.90	3.43	4.08	4.85	5.77	6.85	8.10	9.53
34.0	2.52	2.96	3.50	4.14	4.92	5.85	6.93	8.18	9.61
34.2	2.57	3.02	3.56	4.21	4.99	5.92	7.01	8.26	9.69
34.4	2.62	3.07	3.62	4.28	5.07	6.00	7.09	8.34	9.78
34.6	2.68	3.13	3.68	4.35	5.14	6.07	7.16	8.42	9.86
34.8	2.73	3.19	3.75	4.42	5.21	6.15	7.24	8.50	9.94
35.0	2.79	3.25	3.81	4.48	5.28	6.23	7.32	8.59	10.02
35.2	2.84	3.31	3.88	4.55	5.36	6.30	7.40	8.67	10.10
35.4	2.90	3.37	3.94	4.62	5.43	6.38	7.48	8.75	10.18
35.6	2.96	3.43	4.01	4.69	5.50	6.46	7.56	8.83	10.26
35.8	3.02	3.50	4.07	4.76	5.58	6.53	7.64	8.91	10.34
36.0	3.07	3.56	4.14	4.83	5.65	6.61	7.72	8.99	10.42
36.2	3.13	3.62	4.21	4.90	5.73	6.69	7.80	9.07	10.50
36.4	3.19	3.68	4.27	4.97	5.80	6.77	7.88	9.15	10.59
36.6	3.25	3.75	4.34	5.05	5.88	6.84	7.96	9.23	10.67
36.8	3.31	3.81	4.41	5.12	5.95	6.92	8.04	9.32	10.75
37.0	3.37	3.88	4.48	5.19	6.03	7.00	8.12	9.40	10.83
37.2	3.43	3.94	4.55	5.26	6.10	7.08	8.20	9.48	10.91
37.4	3.50	4.01	4.61	5.34	6.18	7.16	8.28	9.56	10.99
37.6	3.56	4.07	4.68	5.41	6.26	7.24	8.37	9.64	11.07
37.8	3.62	4.14	4.75	5.48	6.33	7.32	8.45	9.73	11.15

< 4> Logistic

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: %

C. V (%)	C. V (%)								
	50	55	60	65	70	75	80	85	90
38.0	3.69	4.21	4.83	5.56	6.41	7.40	8.53	9.81	11.24
38.2	3.75	4.27	4.90	5.63	6.49	7.48	8.61	9.89	11.32
38.4	3.81	4.34	4.97	5.71	6.57	7.56	8.69	9.97	11.40
38.6	3.88	4.41	5.04	5.78	6.64	7.64	8.77	10.05	11.48
38.8	3.94	4.48	5.11	5.86	6.72	7.72	8.86	10.14	11.56
39.0	4.01	4.55	5.18	5.93	6.80	7.80	8.94	10.22	11.64
39.2	4.08	4.62	5.26	6.01	6.88	7.88	9.02	10.30	11.73
39.4	4.14	4.69	5.33	6.08	6.96	7.96	9.10	10.38	11.81
39.6	4.21	4.76	5.40	6.16	7.04	8.04	9.18	10.47	11.89
39.8	4.28	4.83	5.48	6.24	7.12	8.12	9.27	10.55	11.97
40.0	4.35	4.90	5.55	6.31	7.20	8.21	9.35	10.63	12.05
40.2	4.42	4.97	5.63	6.39	7.28	8.29	9.43	10.72	12.14
40.4	4.49	5.04	5.70	6.47	7.36	8.37	9.52	10.80	12.22
40.6	4.56	5.12	5.78	6.55	7.44	8.45	9.60	10.88	12.30
40.8	4.63	5.19	5.85	6.62	7.52	8.53	9.68	10.96	12.38
41.0	4.70	5.26	5.93	6.70	7.60	8.62	9.76	11.05	12.46
41.2	4.77	5.34	6.00	6.78	7.68	8.70	9.85	11.13	12.55
41.4	4.84	5.41	6.08	6.86	7.76	8.78	9.93	11.21	12.63
41.6	4.91	5.48	6.16	6.94	7.84	8.86	10.01	11.30	12.71
41.8	4.99	5.56	6.24	7.02	7.92	8.95	10.10	11.38	12.79
42.0	5.06	5.64	6.31	7.10	8.00	9.03	10.18	11.46	12.87
42.2	5.13	5.71	6.39	7.18	8.09	9.11	10.27	11.55	12.96
42.4	5.21	5.79	6.47	7.26	8.17	9.20	10.35	11.63	13.04
42.6	5.28	5.86	6.55	7.34	8.25	9.28	10.43	11.71	13.12
42.8	5.36	5.94	6.63	7.42	8.33	9.36	10.52	11.80	13.20
43.0	5.43	6.02	6.71	7.50	8.42	9.45	10.60	11.88	13.28
43.2	5.51	6.10	6.79	7.59	8.50	9.53	10.69	11.97	13.37
43.4	5.58	6.17	6.87	7.67	8.58	9.62	10.77	12.05	13.45
43.6	5.66	6.25	6.95	7.75	8.67	9.70	10.86	12.13	13.53
43.8	5.74	6.33	7.03	7.83	8.75	9.78	10.94	12.22	13.61
44.0	5.81	6.41	7.11	7.92	8.83	9.87	11.02	12.30	13.70
44.2	5.89	6.49	7.19	8.00	8.92	9.95	11.11	12.39	13.78
44.4	5.97	6.57	7.27	8.08	9.00	10.04	11.19	12.47	13.86
44.6	6.05	6.65	7.35	8.16	9.09	10.12	11.28	12.55	13.94
44.8	6.13	6.73	7.44	8.25	9.17	10.21	11.36	12.64	14.03

< 4> Logistic

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: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
45.0	6.21	6.81	7.52	8.33	9.26	10.29	11.45	12.72	14.11
45.2	6.29	6.89	7.60	8.42	9.34	10.38	11.54	12.81	14.19
45.4	6.37	6.98	7.69	8.50	9.43	10.47	11.62	12.89	14.27
45.6	6.45	7.06	7.77	8.59	9.51	10.55	11.71	12.97	14.36
45.8	6.53	7.14	7.85	8.67	9.60	10.64	11.79	13.06	14.44
46.0	6.61	7.22	7.94	8.76	9.68	10.72	11.88	13.14	14.52
46.2	6.69	7.31	8.02	8.84	9.77	10.81	11.96	13.23	14.60
46.4	6.78	7.39	8.11	8.93	9.85	10.90	12.05	13.31	14.69
46.6	6.86	7.47	8.19	9.01	9.94	10.98	12.13	13.40	14.77
46.8	6.94	7.56	8.28	9.10	10.03	11.07	12.22	13.48	14.85
47.0	7.03	7.64	8.36	9.18	10.11	11.15	12.31	13.57	14.93
47.2	7.11	7.73	8.45	9.27	10.20	11.24	12.39	13.65	15.02
47.4	7.20	7.81	8.53	9.36	10.29	11.33	12.48	13.74	15.10
47.6	7.28	7.90	8.62	9.44	10.37	11.41	12.56	13.82	15.18
47.8	7.37	7.98	8.70	9.53	10.46	11.50	12.65	13.91	15.26
48.0	7.45	8.07	8.79	9.62	10.55	11.59	12.74	13.99	15.35
48.2	7.54	8.16	8.88	9.70	10.64	11.68	12.82	14.08	15.43
48.4	7.62	8.24	8.97	9.79	10.72	11.76	12.91	14.16	15.51
48.6	7.71	8.33	9.05	9.88	10.81	11.85	13.00	14.25	15.60
48.8	7.80	8.42	9.14	9.97	10.90	11.94	13.08	14.33	15.68
49.0	7.88	8.51	9.23	10.06	10.99	12.03	13.17	14.42	15.76
49.2	7.97	8.59	9.32	10.14	11.08	12.11	13.26	14.50	15.84
49.4	8.06	8.68	9.41	10.23	11.17	12.20	13.34	14.59	15.93
49.6	8.15	8.77	9.49	10.32	11.25	12.29	13.43	14.67	16.01
49.8	8.24	8.86	9.58	10.41	11.34	12.38	13.52	14.76	16.09
50.0	8.33	8.95	9.67	10.50	11.43	12.47	13.60	14.84	16.18
50.2	8.42	9.04	9.76	10.59	11.52	12.55	13.69	14.93	16.26
50.4	8.51	9.13	9.85	10.68	11.61	12.64	13.78	15.01	16.34
50.6	8.60	9.22	9.94	10.77	11.70	12.73	13.87	15.10	16.43
50.8	8.69	9.31	10.03	10.86	11.79	12.82	13.95	15.18	16.51
51.0	8.78	9.40	10.12	10.95	11.88	12.91	14.04	15.27	16.59
51.2	8.87	9.49	10.21	11.04	11.97	13.00	14.13	15.35	16.67
51.4	8.96	9.58	10.30	11.13	12.06	13.09	14.21	15.44	16.76
51.6	9.05	9.67	10.39	11.22	12.15	13.17	14.30	15.53	16.84
51.8	9.15	9.76	10.49	11.31	12.24	13.26	14.39	15.61	16.92

< 4> Logistic

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: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
52.0	9.24	9.86	10.58	11.40	12.33	13.35	14.48	15.70	17.01
52.2	9.33	9.95	10.67	11.49	12.42	13.44	14.56	15.78	17.09
52.4	9.42	10.04	10.76	11.58	12.51	13.53	14.65	15.87	17.17
52.6	9.52	10.13	10.85	11.68	12.60	13.62	14.74	15.95	17.26
52.8	9.61	10.23	10.95	11.77	12.69	13.71	14.83	16.04	17.34
53.0	9.71	10.32	11.04	11.86	12.78	13.80	14.92	16.12	17.42
53.2	9.80	10.41	11.13	11.95	12.87	13.89	15.00	16.21	17.51
53.4	9.89	10.51	11.22	12.04	12.96	13.98	15.09	16.30	17.59
53.6	9.99	10.60	11.32	12.14	13.05	14.07	15.18	16.38	17.67
53.8	10.09	10.69	11.41	12.23	13.14	14.16	15.27	16.47	17.75
54.0	10.18	10.79	11.50	12.32	13.24	14.25	15.36	16.55	17.84
54.2	10.28	10.88	11.60	12.41	13.33	14.34	15.44	16.64	17.92
54.4	10.37	10.98	11.69	12.51	13.42	14.43	15.53	16.73	18.00
54.6	10.47	11.07	11.79	12.60	13.51	14.52	15.62	16.81	18.09
54.8	10.58	11.18	11.89	12.71	13.62	14.62	15.72	16.91	18.18
55.0	10.66	11.27	11.97	12.79	13.69	14.70	15.80	16.98	18.25
55.2	10.76	11.36	12.07	12.88	13.79	14.79	15.89	17.07	18.34
55.4	10.86	11.46	12.16	12.97	13.88	14.88	15.97	17.16	18.42
55.6	10.96	11.56	12.26	13.07	13.97	14.97	16.06	17.24	18.50
55.8	11.06	11.65	12.36	13.16	14.06	15.06	16.15	17.33	18.59
56.0	11.16	11.75	12.45	13.25	14.16	15.15	16.24	17.41	18.67
56.2	11.25	11.85	12.55	13.35	14.25	15.24	16.33	17.50	18.75
56.4	11.35	11.94	12.64	13.44	14.34	15.33	16.42	17.59	18.84
56.6	11.45	12.04	12.74	13.54	14.43	15.43	16.51	17.67	18.92
56.8	11.55	12.14	12.83	13.63	14.53	15.52	16.60	17.76	19.00
57.0	11.65	12.24	12.93	13.73	14.62	15.61	16.68	17.85	19.09
57.2	11.75	12.34	13.03	13.82	14.71	15.70	16.77	17.93	19.17
57.4	11.85	12.43	13.12	13.92	14.81	15.79	16.86	18.02	19.25
57.6	11.96	12.53	13.22	14.01	14.90	15.88	16.95	18.11	19.34
57.8	12.06	12.63	13.32	14.11	14.99	15.97	17.04	18.19	19.42
58.0	12.16	12.73	13.42	14.20	15.09	16.06	17.13	18.28	19.50
58.2	12.26	12.83	13.51	14.30	15.18	16.16	17.22	18.36	19.59
58.4	12.36	12.93	13.61	14.39	15.27	16.25	17.31	18.45	19.67
58.6	12.46	13.03	13.71	14.49	15.37	16.34	17.40	18.54	19.75
58.8	12.57	13.13	13.81	14.59	15.46	16.43	17.49	18.62	19.84

< 4> Logistic

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: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
59.0	12.67	13.23	13.91	14.68	15.56	16.52	17.58	18.71	19.92
59.2	12.77	13.33	14.00	14.78	15.65	16.61	17.66	18.80	20.01
59.4	12.88	13.43	14.10	14.87	15.74	16.71	17.75	18.88	20.09
59.6	12.98	13.53	14.20	14.97	15.84	16.80	17.84	18.97	20.17
59.8	13.08	13.63	14.30	15.07	15.93	16.89	17.93	19.06	20.26
60.0	13.19	13.74	14.40	15.16	16.03	16.98	18.02	19.14	20.34
60.2	13.29	13.84	14.50	15.26	16.12	17.07	18.11	19.23	20.42
60.4	13.40	13.94	14.60	15.36	16.22	17.17	18.20	19.32	20.51
60.6	13.50	14.04	14.70	15.46	16.31	17.26	18.29	19.40	20.59
60.8	13.61	14.14	14.80	15.55	16.41	17.35	18.38	19.49	20.67
61.0	13.71	14.25	14.90	15.65	16.50	17.44	18.47	19.58	20.76
61.2	13.82	14.35	15.00	15.75	16.60	17.54	18.56	19.66	20.84
61.4	13.92	14.45	15.10	15.85	16.69	17.63	18.65	19.75	20.92
61.6	14.03	14.55	15.20	15.94	16.79	17.72	18.74	19.84	21.01
61.8	14.13	14.66	15.30	16.04	16.88	17.81	18.83	19.92	21.09
62.0	14.24	14.76	15.40	16.14	16.98	17.91	18.92	20.01	21.18
62.2	14.35	14.86	15.50	16.24	17.07	18.00	19.01	20.10	21.26
62.4	14.46	14.97	15.60	16.33	17.17	18.09	19.10	20.19	21.34
62.6	14.56	15.07	15.70	16.43	17.26	18.18	19.19	20.27	21.43
62.8	14.67	15.18	15.80	16.53	17.36	18.28	19.28	20.36	21.51
63.0	14.78	15.28	15.90	16.63	17.46	18.37	19.37	20.45	21.59
63.2	14.89	15.38	16.00	16.73	17.55	18.46	19.46	20.53	21.68
63.4	14.99	15.49	16.10	16.83	17.65	18.56	19.55	20.62	21.76
63.6	15.10	15.59	16.21	16.93	17.74	18.65	19.64	20.71	21.84
63.8	15.21	15.70	16.31	17.02	17.84	18.74	19.73	20.79	21.93
64.0	15.32	15.80	16.41	17.12	17.93	18.84	19.82	20.88	22.01
64.2	15.43	15.91	16.51	17.22	18.03	18.93	19.91	20.97	22.10
64.4	15.54	16.01	16.61	17.32	18.13	19.02	20.00	21.06	22.18
64.6	15.65	16.12	16.72	17.42	18.22	19.12	20.09	21.14	22.26
64.8	15.76	16.23	16.82	17.52	18.32	19.21	20.18	21.23	22.35
65.0	15.87	16.33	16.92	17.62	18.42	19.30	20.27	21.32	22.43
65.2	15.98	16.44	17.02	17.72	18.51	19.40	20.36	21.40	22.51
65.4	16.09	16.54	17.13	17.82	18.61	19.49	20.45	21.49	22.60
65.6	16.20	16.65	17.23	17.92	18.71	19.58	20.54	21.58	22.68
65.8	16.31	16.76	17.33	18.02	18.80	19.68	20.63	21.67	22.77

< 4> Logistic ()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
66.0	16.42	16.86	17.44	18.12	18.90	19.77	20.72	21.75	22.85
66.2	16.53	16.97	17.54	18.22	19.00	19.86	20.81	21.84	22.93
66.4	16.64	17.08	17.64	18.32	19.09	19.96	20.91	21.93	23.02
66.6	16.75	17.19	17.75	18.42	19.19	20.05	21.00	22.01	23.10
66.8	16.86	17.29	17.85	18.52	19.29	20.15	21.09	22.10	23.18
67.0	16.98	17.40	17.95	18.62	19.39	20.24	21.18	22.19	23.27
67.2	17.09	17.51	18.06	18.72	19.48	20.33	21.27	22.28	23.35
67.4	17.20	17.62	18.16	18.82	19.58	20.43	21.36	22.36	23.44
67.6	17.31	17.72	18.27	18.92	19.68	20.52	21.45	22.45	23.52
67.8	17.42	17.83	18.37	19.02	19.77	20.62	21.54	22.54	23.60
68.0	17.54	17.94	18.48	19.12	19.87	20.71	21.63	22.63	23.69
68.2	17.65	18.05	18.58	19.22	19.97	20.80	21.72	22.71	23.77
68.4	17.76	18.16	18.69	19.33	20.07	20.90	21.81	22.80	23.86
68.6	17.88	18.27	18.79	19.43	20.16	20.99	21.90	22.89	23.94
68.8	17.99	18.38	18.90	19.53	20.26	21.09	21.99	22.97	24.02
69.0	18.10	18.49	19.00	19.63	20.36	21.18	22.08	23.06	24.11
69.2	18.22	18.60	19.11	19.73	20.46	21.28	22.18	23.15	24.19
69.4	18.33	18.70	19.21	19.83	20.56	21.37	22.27	23.24	24.27
69.6	18.45	18.81	19.32	19.93	20.65	21.46	22.36	23.32	24.36
69.8	18.56	18.92	19.42	20.04	20.75	21.56	22.45	23.41	24.44
70.0	18.68	19.03	19.53	20.14	20.85	21.65	22.54	23.50	24.53
70.2	18.79	19.14	19.63	20.24	20.95	21.75	22.63	23.59	24.61
70.4	18.91	19.25	19.74	20.34	21.05	21.84	22.72	23.67	24.69
70.6	19.02	19.36	19.84	20.44	21.14	21.94	22.81	23.76	24.78
70.8	19.14	19.47	19.95	20.55	21.24	22.03	22.90	23.85	24.86
71.0	19.25	19.58	20.06	20.65	21.34	22.13	23.00	23.94	24.95
71.2	19.37	19.70	20.16	20.75	21.44	22.22	23.09	24.03	25.03
71.4	19.48	19.81	20.27	20.85	21.54	22.32	23.18	24.11	25.11
71.6	19.60	19.92	20.38	20.95	21.64	22.41	23.27	24.20	25.20
71.8	19.72	20.03	20.48	21.06	21.74	22.51	23.36	24.29	25.28
72.0	19.83	20.14	20.59	21.16	21.83	22.60	23.45	24.38	25.37
72.2	19.95	20.25	20.70	21.26	21.93	22.70	23.54	24.46	25.45
72.4	20.07	20.36	20.80	21.36	22.03	22.79	23.63	24.55	25.53
72.6	20.18	20.47	20.91	21.47	22.13	22.89	23.73	24.64	25.62
72.8	20.30	20.59	21.02	21.57	22.23	22.98	23.82	24.73	25.70

< 4> Logistic ()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
73.0	20.42	20.70	21.12	21.67	22.33	23.08	23.91	24.81	25.79
73.2	20.53	20.81	21.23	21.78	22.43	23.17	24.00	24.90	25.87
73.4	20.65	20.92	21.34	21.88	22.53	23.27	24.09	24.99	25.95
73.6	20.77	21.03	21.45	21.98	22.63	23.36	24.18	25.08	26.04
73.8	20.89	21.15	21.55	22.09	22.72	23.46	24.27	25.16	26.12
74.0	21.01	21.26	21.66	22.19	22.82	23.55	24.37	25.25	26.21
74.2	21.12	21.37	21.77	22.29	22.92	23.65	24.46	25.34	26.29
74.4	21.24	21.48	21.88	22.40	23.02	23.74	24.55	25.43	26.37
74.6	21.36	21.60	21.98	22.50	23.12	23.84	24.64	25.52	26.46
74.8	21.48	21.71	22.09	22.60	23.22	23.93	24.73	25.60	26.54
75.0	21.60	21.82	22.20	22.71	23.32	24.03	24.82	25.69	26.63
75.2	21.72	21.94	22.31	22.81	23.42	24.13	24.92	25.78	26.71
75.4	21.84	22.05	22.42	22.91	23.52	24.22	25.01	25.87	26.79
75.6	21.96	22.16	22.53	23.02	23.62	24.32	25.10	25.96	26.88
75.8	22.07	22.28	22.63	23.12	23.72	24.41	25.19	26.04	26.96
76.0	22.19	22.39	22.74	23.23	23.82	24.51	25.28	26.13	27.05
76.2	22.31	22.50	22.85	23.33	23.92	24.60	25.37	26.22	27.13
76.4	22.43	22.62	22.96	23.43	24.02	24.70	25.47	26.31	27.21
76.6	22.55	22.73	23.07	23.54	24.12	24.80	25.56	26.39	27.30
76.8	22.67	22.85	23.18	23.64	24.22	24.89	25.65	26.48	27.38
77.0	22.79	22.96	23.29	23.75	24.32	24.99	25.74	26.57	27.47
77.2	22.91	23.08	23.40	23.85	24.42	25.08	25.83	26.66	27.55
77.4	23.04	23.19	23.51	23.95	24.52	25.18	25.92	26.75	27.63
77.6	23.16	23.30	23.61	24.06	24.62	25.27	26.02	26.83	27.72
77.8	23.28	23.42	23.72	24.16	24.72	25.37	26.11	26.92	27.80
78.0	23.40	23.53	23.83	24.27	24.82	25.47	26.20	27.01	27.89
78.2	23.52	23.65	23.94	24.37	24.92	25.56	26.29	27.10	27.97
78.4	23.64	23.76	24.05	24.48	25.02	25.66	26.38	27.19	28.05
78.6	23.76	23.88	24.16	24.58	25.12	25.75	26.48	27.27	28.14
78.8	23.88	23.99	24.27	24.69	25.22	25.85	26.57	27.36	28.22
79.0	24.00	24.11	24.38	24.79	25.32	25.95	26.66	27.45	28.31
79.2	24.13	24.22	24.49	24.90	25.42	26.04	26.75	27.54	28.39
79.4	24.25	24.34	24.60	25.00	25.52	26.14	26.84	27.63	28.48
79.6	24.37	24.46	24.71	25.11	25.62	26.23	26.94	27.71	28.56
79.8	24.49	24.57	24.82	25.21	25.72	26.33	27.03	27.80	28.64

< 4> Logistic ()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
80.0	24.62	24.69	24.93	25.32	25.82	26.43	27.12	27.89	28.73
80.2	24.74	24.80	25.04	25.42	25.92	26.52	27.21	27.98	28.81
80.4	24.86	24.92	25.15	25.53	26.02	26.62	27.30	28.07	28.90
80.6	24.98	25.04	25.26	25.63	26.12	26.72	27.40	28.15	28.98
80.8	25.11	25.15	25.37	25.74	26.22	26.81	27.49	28.24	29.06
81.0	25.23	25.27	25.48	25.84	26.32	26.91	27.58	28.33	29.15
81.2	25.35	25.39	25.60	25.95	26.43	27.00	27.67	28.42	29.23
81.4	25.48	25.50	25.71	26.06	26.53	27.10	27.77	28.51	29.32
81.6	25.60	25.62	25.82	26.16	26.63	27.20	27.86	28.60	29.40
81.8	25.72	25.74	25.93	26.27	26.73	27.29	27.95	28.68	29.49
82.0	25.85	25.85	26.04	26.37	26.83	27.39	28.04	28.77	29.57
82.2	25.97	25.97	26.15	26.48	26.93	27.49	28.13	28.86	29.65
82.4	26.09	26.09	26.26	26.58	27.03	27.58	28.23	28.95	29.74
82.6	26.22	26.20	26.37	26.69	27.13	27.68	28.32	29.04	29.82
82.8	26.34	26.32	26.48	26.80	27.23	27.78	28.41	29.12	29.91
83.0	26.47	26.44	26.59	26.90	27.33	27.87	28.50	29.21	29.99
83.2	26.59	26.55	26.71	27.01	27.44	27.97	28.60	29.30	30.07
83.4	26.71	26.67	26.82	27.11	27.54	28.07	28.69	29.39	30.16
83.6	26.84	26.79	26.93	27.22	27.64	28.16	28.78	29.48	30.24
83.8	26.96	26.91	27.04	27.33	27.74	28.26	28.87	29.57	30.33
84.0	27.09	27.03	27.15	27.43	27.84	28.36	28.97	29.65	30.41
84.2	27.21	27.14	27.26	27.54	27.94	28.45	29.06	29.74	30.50
84.4	27.34	27.26	27.38	27.65	28.04	28.55	29.15	29.83	30.58
84.6	27.46	27.38	27.49	27.75	28.15	28.65	29.24	29.92	30.66
84.8	27.59	27.50	27.60	27.86	28.25	28.74	29.33	30.01	30.75
85.0	27.71	27.62	27.71	27.96	28.35	28.84	29.43	30.09	30.83
85.2	27.84	27.73	27.82	28.07	28.45	28.94	29.52	30.18	30.92
85.4	27.97	27.85	27.94	28.18	28.55	29.03	29.61	30.27	31.00
85.6	28.09	27.97	28.05	28.28	28.65	29.13	29.70	30.36	31.09
85.8	28.22	28.09	28.16	28.39	28.75	29.23	29.80	30.45	31.17
86.0	28.34	28.21	28.27	28.50	28.86	29.33	29.89	30.54	31.25
86.2	28.47	28.33	28.39	28.60	28.96	29.42	29.98	30.62	31.34
86.4	28.60	28.45	28.50	28.71	29.06	29.52	30.07	30.71	31.42
86.6	28.72	28.56	28.61	28.82	29.16	29.62	30.17	30.80	31.51
86.8	28.85	28.68	28.72	28.93	29.26	29.71	30.26	30.89	31.59

< 4> Logistic

()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
87.0	28.97	28.80	28.84	29.03	29.36	29.81	30.35	30.98	31.67
87.2	29.10	28.92	28.95	29.14	29.47	29.91	30.45	31.07	31.76
87.4	29.23	29.04	29.06	29.25	29.57	30.00	30.54	31.15	31.84
87.6	29.35	29.16	29.17	29.35	29.67	30.10	30.63	31.24	31.93
87.8	29.48	29.28	29.29	29.46	29.77	30.20	30.72	31.33	32.01
88.0	29.61	29.40	29.40	29.57	29.87	30.30	30.82	31.42	32.10
88.2	29.74	29.52	29.51	29.68	29.98	30.39	30.91	31.51	32.18
88.4	29.86	29.64	29.63	29.78	30.08	30.49	31.00	31.60	32.26
88.6	29.99	29.76	29.74	29.89	30.18	30.59	31.09	31.68	32.35
88.8	30.12	29.88	29.85	30.00	30.28	30.69	31.19	31.77	32.43
89.0	30.24	30.00	29.97	30.10	30.38	30.78	31.28	31.86	32.52
89.2	30.37	30.12	30.08	30.21	30.49	30.88	31.37	31.95	32.60
89.4	30.50	30.24	30.19	30.32	30.59	30.98	31.46	32.04	32.69
89.6	30.63	30.36	30.31	30.43	30.69	31.07	31.56	32.13	32.77
89.8	30.76	30.48	30.42	30.54	30.79	31.17	31.65	32.22	32.85
90.0	30.88	30.60	30.53	30.64	30.90	31.27	31.74	32.30	32.94
90.2	31.01	30.72	30.65	30.75	31.00	31.37	31.84	32.39	33.02
90.4	31.14	30.84	30.76	30.86	31.10	31.46	31.93	32.48	33.11
90.6	31.27	30.96	30.87	30.97	31.20	31.56	32.02	32.57	33.19
90.8	31.40	31.08	30.99	31.07	31.31	31.66	32.11	32.66	33.28
91.0	31.53	31.20	31.10	31.18	31.41	31.76	32.21	32.75	33.36
91.2	31.65	31.32	31.22	31.29	31.51	31.85	32.30	32.83	33.44
91.4	31.78	31.44	31.33	31.40	31.61	31.95	32.39	32.92	33.53
91.6	31.91	31.56	31.44	31.51	31.72	32.05	32.49	33.01	33.61
91.8	32.04	31.68	31.56	31.61	31.82	32.15	32.58	33.10	33.70
92.0	32.17	31.81	31.67	31.72	31.92	32.24	32.67	33.19	33.78
92.2	32.30	31.93	31.79	31.83	32.02	32.34	32.76	33.28	33.87
92.4	32.43	32.05	31.90	31.94	32.13	32.44	32.86	33.37	33.95
92.6	32.56	32.17	32.01	32.05	32.23	32.54	32.95	33.45	34.04
92.8	32.69	32.29	32.13	32.15	32.33	32.63	33.04	33.54	34.12
93.0	32.82	32.41	32.24	32.26	32.43	32.73	33.14	33.63	34.20
93.2	32.94	32.53	32.36	32.37	32.54	32.83	33.23	33.72	34.29
93.4	33.07	32.65	32.47	32.48	32.64	32.93	33.32	33.81	34.37
93.6	33.20	32.78	32.59	32.59	32.74	33.03	33.42	33.90	34.46
93.8	33.33	32.90	32.70	32.70	32.84	33.12	33.51	33.99	34.54

< 4> Logistic

()

: %

C. V (%)	(%)								
	50	55	60	65	70	75	80	85	90
94.0	33.46	33.02	32.82	32.80	32.95	33.22	33.60	34.07	34.63
94.2	33.59	33.14	32.93	32.91	33.05	33.32	33.69	34.16	34.71
94.4	33.72	33.26	33.04	33.02	33.15	33.42	33.79	34.25	34.79
94.6	33.85	33.38	33.16	33.13	33.26	33.51	33.88	34.34	34.88
94.8	33.98	33.51	33.27	33.24	33.36	33.61	33.97	34.43	34.96
95.0	34.11	33.63	33.39	33.35	33.46	33.71	34.07	34.52	35.05
95.2	34.24	33.75	33.50	33.46	33.57	33.81	34.16	34.61	35.13
95.4	34.38	33.87	33.62	33.56	33.67	33.91	34.25	34.69	35.22
95.6	34.51	33.99	33.73	33.67	33.77	34.00	34.35	34.78	35.30
95.8	34.64	34.12	33.85	33.78	33.87	34.10	34.44	34.87	35.38
96.0	34.77	34.24	33.96	33.89	33.98	34.20	34.53	34.96	35.47
96.2	34.90	34.36	34.08	34.00	34.08	34.30	34.63	35.05	35.55
96.4	35.03	34.48	34.19	34.11	34.18	34.39	34.72	35.14	35.64
96.6	35.16	34.61	34.31	34.22	34.29	34.49	34.81	35.23	35.72
96.8	35.29	34.73	34.43	34.33	34.39	34.59	34.90	35.31	35.81
97.0	35.42	34.85	34.54	34.43	34.49	34.69	35.00	35.40	35.89
97.2	35.55	34.97	34.66	34.54	34.60	34.79	35.09	35.49	35.98
97.4	35.68	35.10	34.77	34.65	34.70	34.88	35.18	35.58	36.06
97.6	35.82	35.22	34.89	34.76	34.80	34.98	35.28	35.67	36.14
97.8	35.95	35.34	35.00	34.87	34.91	35.08	35.37	35.76	36.23
98.0	36.08	35.47	35.12	34.98	35.01	35.18	35.46	35.85	36.31
98.2	36.21	35.59	35.23	35.09	35.11	35.28	35.56	35.94	36.40
98.4	36.34	35.71	35.35	35.20	35.22	35.38	35.65	36.02	36.48
98.6	36.47	35.84	35.47	35.31	35.32	35.47	35.74	36.11	36.57
98.8	36.61	35.96	35.58	35.42	35.42	35.57	35.84	36.20	36.65
99.0	36.74	36.08	35.70	35.53	35.53	35.67	35.93	36.29	36.74
99.2	36.87	36.20	35.81	35.64	35.63	35.77	36.02	36.38	36.82
99.4	37.00	36.33	35.93	35.74	35.73	35.87	36.12	36.47	36.90
99.6	37.13	36.45	36.04	35.85	35.84	35.96	36.21	36.56	36.99
99.8	37.27	36.58	36.16	35.96	35.94	36.06	36.30	36.65	37.07
100.0	37.40	36.70	36.28	36.07	36.04	36.16	36.40	36.73	37.16

< 5> . ()

< 5-1> ()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
	459.0	82.5	0.29	0.48	0.80	1.31	2.16	3.52	5.68	9.06	14.2
	405.0	112.6	2.33	3.21	4.41	6.03	8.20	11.1	14.9	19.8	26.0
	454.8	70.1	0.11	0.19	0.35	0.62	1.12	1.99	3.51	6.11	10.4
	490.4	70.5	0.07	0.13	0.25	0.47	0.87	1.62	3.00	5.45	9.69
	508.9	70.2	0.05	0.10	0.20	0.39	0.74	1.42	2.70	5.05	9.21
	467.4	73.9	0.13	0.23	0.41	0.73	1.29	2.26	3.92	6.72	11.2
	443.6	88.7	0.52	0.82	1.28	2.00	3.12	4.82	7.38	11.2	16.6
	439.2	81.8	0.35	0.56	0.91	1.47	2.37	3.80	6.02	9.42	14.5
	389.7	64.7	0.15	0.26	0.45	0.77	1.32	2.25	3.81	6.34	10.3

< 5-2> ()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
	216.3	73.8	2.75	3.55	4.58	5.88	7.51	9.55	12.1	15.1	18.8
	271.1	92.1	3.41	4.40	5.68	7.29	9.33	11.9	15.0	18.8	23.4
	242.5	36.1	0.05	0.08	0.15	0.28	0.51	0.92	1.67	2.97	5.16
	232.5	50.5	0.42	0.64	0.97	1.45	2.18	3.25	4.79	6.98	10.0
	249.1	77.5	2.26	2.99	3.96	5.22	6.85	8.94	11.6	14.9	19.0
	238.1	48.5	0.31	0.48	0.75	1.16	1.78	2.74	4.16	6.23	9.19
	235.4	67.3	1.52	2.07	2.82	3.82	5.15	6.90	9.18	12.1	15.8

< 5-3> ()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
	213.2	60.5	1.34	1.83	2.49	3.38	4.57	6.15	8.20	10.8	14.1
	315.5	92.7	2.28	3.08	4.15	5.57	7.44	9.89	13.0	17.0	22.0
	273.3	66.1	0.85	1.23	1.77	2.55	3.65	5.20	7.34	10.2	14.1
	295.5	43.1	0.05	0.09	0.16	0.30	0.56	1.04	1.89	3.42	6.01
	277.7	73.4	1.29	1.80	2.52	3.50	4.85	6.69	9.13	12.4	16.5

< 5-4> ()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
	178.9	93.8	8.45	9.90	11.6	13.5	15.7	18.2	21.0	24.2	27.7
	204.7	107.9	9.79	11.5	13.4	15.6	18.1	21.0	24.2	27.8	31.9
	247.5	90.7	4.05	5.13	6.48	8.15	10.2	12.8	15.8	19.5	23.8
	191.2	73.7	3.70	4.63	5.77	7.17	8.88	10.9	13.4	16.3	19.7
	224.0	88.0	4.60	5.73	7.11	8.80	10.8	13.3	16.2	19.7	23.7
	221.6	97.2	6.39	7.75	9.39	11.3	13.6	16.3	19.5	23.1	27.2
	223.8	86.2	4.30	5.39	6.72	8.35	10.3	12.8	15.6	19.0	23.0
	185.8	83.0	5.64	6.82	8.23	9.89	11.9	14.1	16.8	19.9	23.4
	83.7	39.6	3.00	3.58	4.27	5.07	6.01	7.09	8.33	9.75	11.3

< 5-5> ()

: kg

			%								
			50	55	60	65	70	75	80	85	90
	715.7	292.9	16.7	20.6	25.3	31.1	37.9	46.1	55.7	67.0	80.1
	644.5	278.4	17.7	21.6	26.2	31.8	38.3	46.1	55.1	65.5	77.5
	679.8	205.0	5.45	7.30	9.76	13.0	17.2	22.7	29.7	38.5	49.4
	759.6	306.5	17.0	21.0	25.9	31.8	39.0	47.5	57.7	69.6	83.4
	792.4	336.3	20.7	25.3	30.8	37.5	45.4	54.7	65.7	78.4	93.1
	1,186	329.6	6.82	9.38	12.9	17.6	24.0	32.5	43.6	57.9	76.2
	965.4	360.9	16.8	21.2	26.7	33.4	41.7	51.8	63.9	78.4	95.4
	1,209	425.1	17.1	21.9	28.0	35.7	45.2	57.0	71.4	88.9	109.7
	1,235	270.9	2.37	3.57	5.37	8.05	12.0	17.8	26.1	38.0	54.2

< 5-6> ()

: kg

			%								
			50	55	60	65	70	75	80	85	90
	5,249	2,338	158.2	191.3	230.9	277.8	333.0	397.6	472.6	559.0	657.6
	4,138	1,514	67.2	85.2	107.6	135.6	170.0	212.2	263.4	324.6	397.0
	4,561	1,776	91.0	113.6	141.3	175.2	216.4	266.0	325.3	395.3	477.1
	5,605	1,286	13.5	20.0	29.4	43.3	63.3	92.1	132.7	189.1	265.3
	6,416	1,540	19.2	27.9	40.4	58.3	83.7	119.6	169.3	237.0	327.0
	5,602	1,654	41.3	55.7	74.9	100.4	134.0	177.8	234.1	305.4	394.3
	6,134	1,220	7.01	11.0	17.3	27.1	42.3	65.5	100.7	152.6	227.2

< 5-7>

()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
10, 277	3, 530	134. 1	172. 8	222. 2	284. 6	363. 0	460. 6	580. 8	726. 9	902. 1	
8, 183	2, 948	126. 0	160. 4	203. 6	257. 4	324. 2	406. 2	506. 0	626. 0	768. 3	
11, 165	3, 312	83. 9	112. 9	151. 7	203. 0	270. 5	358. 3	471. 1	613. 8	791. 4	
11, 897	2, 921	39. 6	57. 0	81. 8	117. 0	166. 7	236. 0	331. 1	459. 6	629. 0	
12, 259	3, 839	113. 8	150. 7	199. 0	261. 8	343. 0	446. 8	577. 9	741. 3	941. 6	
11, 291	2, 855	43. 0	61. 2	86. 8	122. 9	173. 1	242. 2	336. 2	461. 7	625. 6	
10, 058	3, 007	78. 0	104. 8	140. 3	187. 4	249. 0	328. 9	431. 4	560. 8	721. 4	
11, 722	3, 384	79. 0	107. 3	145. 4	196. 3	263. 8	352. 5	467. 4	614. 1	797. 8	
8, 845	1, 688	8. 00	12. 8	20. 6	32. 9	52. 3	82. 7	129. 6	200. 5	304. 2	

< 5-8>

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: kg

			(%)								
			50	55	60	65	70	75	80	85	90
5, 017	2, 150	134. 8	164. 4	200. 1	242. 7	293. 3	353. 0	422. 9	503. 9	596. 9	
5, 116	2, 090	118. 9	146. 6	180. 3	221. 1	270. 0	328. 3	397. 2	477. 8	571. 2	
4, 726	1, 674	68. 6	87. 8	111. 9	142. 1	179. 8	226. 3	283. 1	351. 6	433. 2	
5, 647	1, 884	66. 4	86. 3	111. 9	144. 5	185. 8	237. 6	301. 9	380. 7	475. 7	
5, 606	1, 703	46. 2	61. 8	82. 4	109. 5	144. 7	190. 3	248. 4	321. 4	411. 6	
7, 041	2, 189	63. 5	84. 3	111. 6	147. 2	193. 2	252. 2	327. 0	420. 3	535. 0	
5, 755	2, 205	108. 9	136. 4	170. 3	212. 1	263. 0	324. 6	398. 4	485. 9	588. 4	
6, 812	2, 342	89. 2	114. 9	147. 7	189. 1	241. 2	305. 9	385. 7	482. 6	598. 7	
8, 329	1, 926	20. 8	30. 7	45. 1	66. 1	96. 5	139. 8	200. 9	285. 4	399. 3	

< 5-9> ()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
	1,456	830.9	85.1	98.3	113.3	130.2	149.3	170.8	194.7	221.2	250.5
	1,273	818.3	98.5	111.7	126.4	142.9	161.0	181.1	203.1	227.3	253.5
	2,102	622.1	15.7	21.1	28.4	38.0	50.6	67.1	88.3	115.1	148.5
	1,979	814.0	47.0	57.8	71.0	86.9	106.0	128.7	155.5	186.8	223.0
	1,898	1,071	107.8	124.8	144.1	166.0	190.7	218.4	249.4	283.9	321.9
	1,542	887.5	92.0	106.1	122.1	140.2	160.6	183.4	208.8	237.0	268.1
	2,116	813.4	40.5	50.7	63.2	78.7	97.5	120.2	147.4	179.6	217.4
	2,267	1,092	85.3	101.5	120.6	142.8	168.6	198.3	232.3	271.0	314.5

< 5-10> ()

: kg

			(%)								
			50	55	60	65	70	75	80	85	90
	2,448	1,011	58.8	72.3	88.7	108.5	132.2	160.4	193.6	232.4	277.2
	1,626	675.1	39.7	48.8	59.8	73.0	88.9	107.7	129.8	155.7	185.5
	2,363	745.5	22.6	29.8	39.3	51.6	67.4	87.6	113.1	144.7	183.5
	2,150	829.1	41.6	52.0	64.8	80.6	99.8	122.9	150.6	183.5	221.9
	2,499	1,295	114.4	134.3	157.3	183.8	214.2	248.7	287.8	331.7	380.8
	2,843	815.4	18.6	25.4	34.5	46.6	62.8	84.1	111.8	147.1	191.6
	2,117	699.0	24.0	31.2	40.6	52.6	67.8	87.0	110.9	140.2	175.7
	2,187	801.5	35.7	45.3	57.2	72.0	90.3	112.6	139.7	172.1	210.4

< 6 >

< 6-1 >

		(kg)	(kg)	(, kg)	(,)	(%)	()
	248	431.2	80.8	2.37	4,113	0.79	523,074
	350	429.5	67.6	1.16	2,002	0.38	521,012
	449	414.8	79.6	2.51	4,344	0.86	503,248
	920	469.5	74.1	1.28	2,221	0.39	569,605
	397	451.8	71.4	1.24	2,146	0.39	548,107
	340	457.4	67.6	0.93	1,611	0.29	554,832
	252	417.0	74.7	1.93	3,343	0.66	505,910
가	190	432.4	72.9	1.56	2,708	0.52	524,560
	352	431.8	81.1	2.41	4,169	0.80	523,820
	32	434.0	82.1	2.48	4,290	0.81	526,462
	140	443.4	77.2	1.83	3,171	0.59	537,874
	30	442.3	90.7	3.41	5,901	1.10	536,532
	36	450.2	81.7	2.19	3,796	0.70	546,120
	398	443.4	82.2	2.34	4,057	0.75	537,865
	80	428.9	85.0	2.92	5,060	0.97	520,289
	42	468.2	107.2	5.24	9,086	1.60	567,914
	32	456.0	112.1	6.41	11,102	2.01	553,128
	48	487.3	65.0	0.60	1,043	0.18	591,150
	348	454.6	84.1	2.38	4,130	0.75	551,488
	130	436.4	76.5	1.85	3,201	0.60	529,432
	176	448.2	86.1	2.71	4,704	0.87	543,722
	428	465.1	69.7	1.00	1,736	0.31	564,245
	122	449.8	91.7	3.39	5,881	1.08	545,667
	64	481.8	80.1	1.64	2,847	0.49	584,496
	368	453.0	71.2	1.21	2,094	0.38	549,583
	78	434.8	102.2	5.31	9,205	1.75	527,506
	296	443.8	77.2	1.82	3,156	0.59	538,433
	136	440.0	100.8	4.95	8,572	1.61	533,756
	604	510.2	85.1	1.77	3,059	0.49	618,874
	216	461.7	73.1	1.28	2,210	0.39	560,143
	48	452.0	70.1	1.14	1,976	0.36	548,270
	692	466.6	77.1	1.55	2,689	0.48	566,018
	6,436	459.0	82.5	2.16	3,736	0.67	556,838

* 70% , 가 : 1,733 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	230	351.3	123.8	13.20	22,904	5.37	426,165
	214	384.6	101.2	6.64	11,505	2.47	466,544
	132	368.7	125.0	12.60	21,865	4.89	447,226
	102	377.9	136.0	14.90	25,872	5.64	458,490
	42	422.1	67.4	1.21	2,092	0.41	512,048
	150	446.6	90.5	3.30	5,711	1.05	541,770
	192	376.9	104.2	7.51	13,012	2.85	457,210
	112	427.1	93.2	4.08	7,075	1.37	518,138
	378	404.3	93.4	4.66	8,080	1.65	490,502
	102	412.8	135.1	12.90	22,409	4.47	500,788
	58	397.0	143.5	15.90	27,500	5.71	481,627
	388	507.7	82.7	1.59	2,749	0.45	615,929
	239	416.3	93.6	4.40	7,626	1.51	505,016
	30	365.0	95.5	6.20	10,743	2.43	442,785
	100	383.2	140.1	15.70	27,258	5.86	464,910
	396	379.4	92.5	5.20	9,005	1.96	460,210
	134	427.2	115.1	7.92	13,717	2.65	518,236
	322	368.6	99.9	6.94	12,020	2.69	447,178
	3321	405.0	112.6	8.20	14,217	2.89	491,359
	290	456.2	69.5	1.06	1,840	0.33	553,470
	76	439.8	75.8	1.74	3,019	0.57	533,501
	273	461.9	76.3	1.54	2,660	0.47	560,318
	204	449.2	68.8	1.07	1,853	0.34	544,869
	188	459.2	64.2	0.72	1,240	0.22	557,040
	360	443.3	73.0	1.45	2,520	0.47	537,779
	230	440.9	65.0	0.89	1,533	0.29	534,859
	317	471.4	76.8	1.47	2,549	0.45	571,840
	549	458.4	62.9	0.65	1,128	0.20	556,086
	56	504.1	45.5	0.06	104	0.02	611,539
	398	447.2	65.5	0.87	1,506	0.28	542,445
	3009	454.8	70.1	1.12	1,934	0.35	551,691

* 70% , 가 : 1,733 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	326	492.7	73.4	1.04	1,797	0.30	597,701
	158	463.3	91.7	3.14	5,435	0.97	562,045
	377	489.0	78.7	1.45	2,517	0.42	593,203
	602	521.1	47.4	0.07	115	0.02	632,181
	433	502.3	82.0	1.58	2,741	0.45	609,373
	544	498.7	67.7	0.67	1,166	0.19	604,948
	502	476.7	53.6	0.23	405	0.07	578,255
	474	490.6	88.9	2.37	4,109	0.69	595,108
	491	506.9	63.2	0.44	764	0.12	614,911
	112	526.6	66.5	0.49	850	0.13	638,849
	335	492.7	61.9	0.45	771	0.13	597,635
	353	496.3	48.7	0.11	181	0.03	602,010
	266	479.3	62.6	0.53	918	0.16	581,456
	311	482.0	59.6	0.40	696	0.12	584,723
	252	470.3	63.6	0.62	1,079	0.19	570,468
	6,073	490.4	70.5	0.87	1,511	0.25	594,906
	557	502.9	53.7	0.18	315	0.05	610,052
	436	519.4	53.2	0.15	251	0.04	630,094
	677	531.4	59.4	0.25	433	0.07	644,686
	482	478.6	94.9	3.26	5,651	0.97	580,620
	134	464.2	112.3	6.21	10,764	1.91	563,108
	541	533.0	70.7	0.64	1,109	0.17	646,546
	274	491.2	61.3	0.43	742	0.12	595,857
	298	475.7	67.6	0.80	1,385	0.24	577,065
	722	522.3	63.9	0.41	709	0.11	633,543
	254	490.7	58.4	0.33	574	0.10	595,268
	164	479.9	73.5	1.15	1,985	0.34	582,193
	52	520.3	53.1	0.14	245	0.04	631,152
	594	523.7	59.5	0.27	469	0.07	635,348
	167	477.6	77.7	1.49	2,575	0.44	579,366
	5,517	508.9	70.2	0.74	1,288	0.21	617,345
	340	456.8	78.7	1.81	3,132	0.57	554,195
	281	463.3	74.2	1.35	2,338	0.42	562,061

* 70% , 가 : 1,733 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	273	471.9	66.8	0.78	1,348	0.24	572,402
	184	457.5	74.0	1.39	2,409	0.43	555,003
	181	462.9	62.0	0.58	1,012	0.18	561,584
	449	491.8	70.9	0.89	1,535	0.26	596,618
	80	511.7	50.3	0.11	190	0.03	620,755
	37	479.3	80.7	1.72	2,989	0.51	581,464
	458	477.6	63.3	0.57	989	0.17	579,420
	430	457.0	88.6	2.86	4,955	0.89	554,417
	230	471.9	70.6	1.01	1,747	0.31	572,509
	275	455.2	79.5	1.90	3,296	0.60	552,262
	210	467.5	72.6	1.19	2,058	0.36	567,112
	374	479.9	74.6	1.22	2,116	0.36	582,174
	610	462.4	71.2	1.13	1,961	0.35	560,929
	244	442.4	71.9	1.37	2,377	0.44	536,658
	339	474.6	64.8	0.66	1,142	0.20	575,690
	306	485.1	63.8	0.56	966	0.16	588,476
	105	483.9	73.6	1.12	1,942	0.33	587,056
	329	472.2	70.4	1.00	1,730	0.30	572,774
	396	466.1	69.7	0.99	1,723	0.30	565,472
	343	456.2	90.9	3.17	5,490	0.99	553,460
	6,969	467.4	73.9	1.29	2,230	0.39	567,040
	176	445.4	90.1	3.26	5,653	1.05	540,344
	289	439.8	95.1	4.08	7,069	1.33	533,473
	332	445.6	75.1	1.61	2,793	0.52	540,564
	300	447.6	75.1	1.59	2,751	0.51	543,019
	181	444.6	79.9	2.08	3,600	0.67	539,386
	68	493.0	65.0	0.57	994	0.17	598,004
	322	428.3	70.5	1.40	2,426	0.47	519,576
	267	434.5	90.8	3.57	6,191	1.17	527,078
	290	436.8	79.8	2.19	3,791	0.72	529,826
	178	431.5	83.5	2.69	4,666	0.89	523,437
	209	424.4	89.9	3.65	6,329	1.23	514,896
	375	432.4	86.7	3.07	5,318	1.01	524,502

* 70% , 가 : 1,733 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	104	462.6	72.2	1.20	2,075	0.37	561,128
	325	435.8	89.4	3.35	5,810	1.10	528,640
	225	442.8	70.6	1.26	2,183	0.41	537,208
	86	473.9	78.2	1.56	2,710	0.47	574,888
	310	436.8	89.6	3.37	5,834	1.10	529,923
	305	438.6	73.2	1.52	2,627	0.49	532,006
	268	465.3	104.2	4.85	8,400	1.49	564,399
	399	427.3	69.3	1.31	2,266	0.44	518,368
	5,779	439.2	81.8	2.37	4,107	0.77	532,831
	152	437.2	74.7	1.67	2,897	0.55	530,387
	610	429.7	79.1	2.21	3,827	0.73	521,227
	173	441.0	80.8	2.23	3,863	0.72	534,975
	380	462.6	88.5	2.76	4,777	0.85	561,210
	149	439.1	99.9	4.83	8,368	1.57	532,666
	349	455.2	94.5	3.66	6,346	1.15	552,249
	261	461.1	99.5	4.24	7,343	1.31	559,387
	156	447.6	66.0	0.90	1,560	0.29	542,988
	661	464.0	95.8	3.65	6,331	1.12	562,906
	206	403.9	99.2	5.66	9,807	2.00	490,026
	307	466.1	83.6	2.17	3,756	0.66	565,375
	144	426.0	93.4	4.14	7,176	1.39	516,807
	68	433.2	106.4	6.08	10,539	2.01	525,538
	237	445.4	76.0	1.69	2,936	0.54	540,373
	253	432.3	71.6	1.45	2,512	0.48	524,398
	389	466.8	78.3	1.65	2,860	0.51	566,218
	168	422.3	105.8	6.29	10,902	2.13	512,246
	435	462.0	83.6	2.23	3,861	0.69	560,495
	180	424.6	75.9	1.94	3,367	0.65	515,103
	74	445.8	73.1	1.43	2,484	0.46	540,791
	162	430.6	79.3	2.22	3,852	0.74	522,340
	394	424.6	97.3	4.78	8,281	1.61	515,088
	6,357	443.6	88.7	3.12	5,399	1.00	538,158
	31	409.6	68.5	1.44	2,487	0.50	496,889
	62	372.8	61.1	1.19	2,070	0.46	452,273
	106	389.7	64.7	1.32	2,293	0.48	472,805

* 70% , 가 : 1,733 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	179	227.0	56.1	3.25	3,564	2.04	174,313
	41	240.5	82.7	8.53	9,352	5.06	184,656
	140	216.3	73.8	7.51	8,238	4.96	166,121
	197	270.7	95.4	10.20	11,174	5.38	207,844
	240	271.1	92.1	9.33	10,235	4.92	208,150
	52	248.2	32.2	0.27	294	0.15	190,568
	140	242.5	36.1	0.51	557	0.30	186,211
	234	232.5	50.5	2.18	2,389	1.34	178,549
	30	252.5	97.4	11.70	12,873	6.64	193,885
	178	249.0	78.7	7.15	7,838	4.10	191,236
	38	239.2	63.6	4.26	4,677	2.55	183,666
	72	236.1	69.3	5.57	6,105	3.37	181,285
	32	235.2	58.4	3.42	3,752	2.08	180,610
	52	254.6	81.9	7.64	8,385	4.29	195,512
	66	240.6	73.9	6.40	7,016	3.80	184,756
	530	249.1	77.5	6.85	7,518	3.93	191,256
	230	233.5	33.9	0.43	475	0.26	179,291
	43	217.7	70.3	6.59	7,226	4.32	167,206
	35	259.4	58.8	2.82	3,093	1.55	199,215
	147	249.1	38.7	0.63	692	0.36	191,321
	45	245.7	34.7	0.40	443	0.23	188,642
	812	238.1	48.5	1.78	1,957	1.07	182,849
	252	236.1	66.5	4.97	5,449	3.01	181,289
	32	202.3	84.0	11.10	12,135	7.81	155,339
	86	224.8	64.8	5.04	5,525	3.20	172,596
	57	250.9	73.8	5.93	6,506	3.38	192,694
	128	238.0	61.6	3.91	4,289	2.35	182,758
	695	235.4	67.3	5.15	5,646	3.12	180,798

* 70% , 가 : 1,097 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	195	267.0	72.1	4.98	5,970	2.66	224,132
	99	213.2	60.5	4.57	5,484	3.07	178,934
	86	297.9	98.0	9.47	11,354	4.54	249,991
	62	294.1	95.3	8.99	10,774	4.36	246,850
	82	324.3	86.0	5.73	6,868	2.52	272,213
	75	352.5	105.2	8.69	10,417	3.52	295,851
	400	315.5	92.7	7.44	8,924	3.37	264,832
	75	252.0	50.9	1.84	2,208	1.04	211,519
	31	255.1	40.1	0.69	822	0.38	214,081
	42	271.9	48.9	1.28	1,531	0.67	228,220
	46	278.7	70.9	4.35	5,216	2.23	233,904
	47	246.5	51.6	2.04	2,451	1.18	206,927
	33	273.9	57.8	2.33	2,791	1.21	229,920
	43	271.4	41.4	0.63	760	0.33	227,759
	77	301.9	74.4	4.28	5,126	2.02	253,359
	36	280.0	46.4	0.95	1,134	0.48	235,011
	63	344.5	82.1	4.40	5,274	1.82	289,127
	73	241.8	43.9	1.18	1,413	0.70	202,947
	58	277.0	82.7	6.84	8,200	3.53	232,464
	47	277.8	60.7	2.66	3,190	1.37	233,124
	1,040	273.3	66.1	3.65	4,380	1.91	229,413
	45	295.5	43.1	0.56	673	0.27	248,015
	147	284.2	70.5	4.11	4,922	2.06	238,511
	42	284.0	59.5	2.36	2,824	1.18	238,355
	32	272.6	76.2	5.61	6,723	2.94	228,770
	39	235.4	83.6	9.01	10,800	5.47	197,576
	52	269.6	81.7	6.93	8,309	3.67	226,235
	440	277.7	73.4	4.85	5,820	2.50	233,115

* 70% , 가 : 1,199 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	154	139.1	93.5	19.0	128,870	19.50	660,878
	250	189.9	93.5	14.7	100,021	11.10	902,595
	180	173.5	79.5	11.7	79,137	9.60	824,471
	145	181.6	88.2	13.7	93,196	10.80	863,252
가	38	194.8	95.7	15.1	102,316	11.10	925,823
	47	167.7	79.7	12.1	82,469	10.40	796,769
	76	159.9	79.4	12.6	85,661	11.30	760,118
	58	176.5	87.9	14.0	95,116	11.30	838,863
	36	179.1	125.0	26.0	176,569	20.70	851,058
	66	164.9	89.5	15.4	104,667	13.40	783,841
	39	150.6	107.2	22.6	153,459	21.40	715,648
	68	176.6	97.2	16.9	115,023	13.70	839,340
	60	174.2	100.3	18.2	123,330	14.90	827,771
	58	200.2	75.1	8.7	59,196	6.22	951,279
	30	225.6	112.7	18.0	122,387	11.40	1,072,119
	108	188.1	80.5	11.0	74,546	8.34	893,828
	1,078	178.9	93.8	15.7	106,530	12.50	850,102
	40	218.6	60.2	4.3	29,200	2.81	1,038,853
	198	208.8	96.3	14.2	96,480	9.72	992,487
	72	201.1	109.8	19.0	129,119	13.50	955,674
	140	246.5	95.7	11.6	78,853	6.73	1,171,510
	56	162.2	119.4	25.7	174,402	22.60	770,721
	98	227.3	113.9	18.3	123,975	11.50	1,080,130
	92	167.6	116.3	24.1	163,616	20.50	796,578
	94	175.4	120.2	24.7	167,783	20.10	833,321
	918	204.7	107.9	18.1	122,974	12.60	972,813
	198	258.1	95.8	11.0	74,505	6.08	1,226,405
	104	251.7	106.9	14.4	98,066	8.20	1,196,300
	72	241.3	68.2	5.1	34,707	3.03	1,146,822
	44	211.4	54.1	3.4	22,847	2.27	1,004,571
	44	229.4	62.7	4.4	29,979	2.75	1,090,329
	110	266.4	93.4	9.9	67,102	5.30	1,266,186

* 70% , 가 : 6,789 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	172	252.8	98.3	11.9	81,123	6.75	1,201,614
	42	211.9	87.1	11.3	77,024	7.65	1,006,809
	86	254.4	73.6	5.8	39,153	3.24	1,209,074
	134	244.9	93.7	11.2	75,797	6.51	1,163,604
	1,046	247.5	90.7	10.2	69,396	5.90	1,176,340
	78	202.9	67.4	6.6	44,752	4.64	964,473
	30	223.2	53.0	2.8	19,117	1.80	1,060,555
	56	185.2	49.7	3.4	23,032	2.62	880,024
	62	197.9	47.3	2.6	17,321	1.84	940,649
	32	194.1	90.8	13.6	92,395	10.00	922,392
	64	168.4	107.8	21.1	143,583	17.90	800,466
	64	179.9	82.1	12.0	81,403	9.52	854,968
	36	179.4	89.1	14.2	96,280	11.30	852,378
	54	181.6	39.4	1.7	11,541	1.34	862,894
	58	199.3	48.7	2.8	18,641	1.97	947,264
	64	194.4	67.3	7.00	47,464	5.14	923,728
	46	222.5	74.4	7.4	49,995	4.73	1,057,490
	46	194.1	98.7	16.1	108,972	11.80	922,463
	80	202.6	60.6	5.0	34,134	3.54	963,054
	982	191.2	73.7	8.9	60,250	6.63	908,672
	200	240.9	90.2	10.4	70,840	6.19	1,144,900
	50	213.8	81.5	9.7	65,622	6.46	1,016,042
	72	198.6	84.8	11.5	78,186	8.28	943,860
	58	256.4	89.5	9.4	63,958	5.25	1,218,555
	76	208.8	79.0	9.3	62,920	6.34	992,355
	60	234.1	101.7	14.1	95,620	8.59	1,112,593
	58	259.6	78.6	6.6	45,071	3.65	1,233,550
	46	229.0	97.6	13.3	89,967	8.27	1,088,277
	92	214.3	88.2	11.5	78,056	7.66	1,018,387
	36	230.5	85.5	9.8	66,428	6.06	1,095,537
	174	192.7	73.6	8.8	59,417	6.49	915,883
	58	245.5	86.5	9.2	62,584	5.36	1,166,854
	1,014	224.0	88.0	10.8	73,597	6.91	1,064,506

* 70% , 가 : 6,789 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	36	214.4	63.2	5.1	34,738	3.41	1,018,708
	34	224.5	86.6	10.4	70,847	6.64	1,066,752
	40	207.2	87.3	11.7	79,314	8.05	984,677
	76	201.6	57.9	4.5	30,332	3.17	958,214
	44	175.1	80.2	11.8	79,842	9.60	831,977
	30	270.3	106.7	13.2	89,692	6.98	1,284,705
	46	260.9	98.7	11.6	78,666	6.34	1,240,040
	98	276.1	130.7	19.8	134,699	10.30	1,311,926
	104	215.6	86.1	10.8	73,381	7.16	1,024,532
	30	210.9	54.6	3.5	23,512	2.35	1,002,102
	138	248.7	115.3	17.1	116,254	9.84	1,181,704
	42	215.1	63.6	5.2	35,090	3.43	1,022,310
	32	231.9	107.9	16.1	109,185	9.91	1,102,088
	58	197.4	68.6	7.2	48,789	5.20	938,252
	72	248.9	115.3	17.1	116,202	9.82	1,182,729
	36	253.1	80.8	7.4	50,484	4.20	1,202,860
	1,208	221.6	97.2	13.6	92,476	8.78	1,053,319
	38	211.6	93.3	13.1	89,252	8.88	1,005,487
	36	221.2	87.9	11.0	74,507	7.09	1,051,050
	136	265.3	82.3	7.3	49,190	3.90	1,260,932
	74	228.2	74.6	7.1	48,329	4.46	1,084,552
	172	232.3	56.8	3.2	21,848	1.98	1,104,164
	30	168.9	89.8	15.2	103,205	12.90	802,505
	156	238.7	97.3	12.5	84,994	7.49	1,134,368
	42	246.0	37.0	0.5	3,669	0.31	1,168,840
	30	221.4	87.7	10.9	74,054	7.04	1,052,001
	94	232.8	88.5	10.5	71,040	6.42	1,106,224
	178	255.2	81.9	7.6	51,642	4.26	1,212,557
	154	213.8	51.7	2.9	19,336	1.90	1,015,881
	40	244.0	88.7	9.9	67,056	5.78	1,159,680
	1,470	223.8	86.2	10.3	70,241	6.60	1,063,549

* 70% , 가 : 6,789 /kg, 30

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		(kg)	(kg)	(, kg)	(,)	(%)	()
	52	210.8	57.0	3.9	26,729	2.67	1,001,913
	32	159.2	49.4	4.4	29,511	3.90	756,804
	36	204.8	69.5	7.0	47,748	4.91	973,429
	30	207.0	70.5	7.2	48,555	4.94	983,885
	58	185.2	96.2	16.0	108,365	12.30	879,913
	30	167.1	95.1	17.1	115,809	14.60	794,268
	148	183.7	75.8	9.9	67,198	7.70	873,075
	34	195.5	107.3	18.7	126,749	13.60	928,935
	58	197.6	81.3	10.6	71,800	7.65	938,989
	36	190.3	60.3	5.5	37,362	4.13	904,153
	728	185.8	83.0	11.9	80,447	9.11	882,753
	41	88.0	39.6	5.7	38,767	9.27	418,202
	30	86.7	33.9	4.2	28,235	6.86	411,866
	77	83.7	39.6	6.0	40,781	10.30	397,589

* 70% , 가 : 6,789 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	30	798.4	255.6	23.7	47,894	4.23	1,131,779
	164	1,074.0	471.2	66.0	133,646	8.78	1,522,637
	138	678.6	271.9	34.3	69,444	7.22	961,948
	85	805.3	268.2	26.4	53,414	4.68	1,141,454
	110	721.2	252.3	26.6	53,952	5.28	1,022,365
	32	857.0	341.3	42.8	86,571	7.13	1,214,798
	35	735.9	269.6	30.3	61,411	5.89	1,043,118
	39	788.1	288.3	32.4	65,579	5.87	1,117,063
	54	703.4	250.5	27.1	54,926	5.51	997,106
	38	738.1	312.3	42.0	85,061	8.13	1,046,190
	485	715.7	292.9	37.9	76,775	7.57	1,014,457
	99	758.2	328.3	45.3	91,815	8.54	1,074,780
	39	671.8	227.4	22.9	46,376	4.87	952,306
	30	623.5	285.8	41.9	84,947	9.61	883,764
	325	644.5	278.4	38.3	77,635	8.50	913,633
	30	591.3	149.7	9.1	18,423	2.20	838,120
	93	698.5	260.4	30.0	60,722	6.13	990,131
	32	713.1	130.9	3.6	7,352	0.73	1,010,855
	57	659.1	208.6	19.0	38,404	4.11	934,282
	47	711.0	193.4	13.5	27,388	2.72	1,007,903
	32	717.7	211.8	17.2	34,737	3.41	1,017,278
	380	679.8	205.0	17.2	34,862	3.62	963,628
	71	706.6	205.1	16.1	32,698	3.26	1,001,633
	34	670.4	316.6	47.9	97,042	10.20	950,350
	111	680.1	228.4	22.7	46,019	4.77	964,028
	34	696.2	262.6	30.7	62,194	6.30	986,872
	141	799.0	356.3	50.8	102,909	9.09	1,132,562
	785	759.6	306.5	39.0	78,958	7.33	1,076,686

* 70% , 가 : 2,025 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	32	678.1	284.2	37.8	76,558	7.96	961,242
	33	811.3	274.4	27.6	55,877	4.86	1,149,979
	45	986.4	335.1	33.9	68,700	4.91	1,398,222
	71	850.3	416.5	65.4	132,343	11.00	1,205,294
	350	792.4	336.3	45.4	91,925	8.18	1,123,247
	68	1,210.0	299.0	17.3	34,991	2.04	1,715,821
	175	1,372.0	251.1	6.9	13,988	0.72	1,944,907
	97	1,269.0	221.6	5.3	10,739	0.60	1,798,369
	108	1,289.0	323.5	19.3	39,104	2.14	1,827,223
	44	1,124.0	234.6	9.2	18,640	1.17	1,593,270
	111	1,144.0	297.8	19.2	38,781	2.39	1,621,250
	75	1,176.0	318.6	22.1	44,768	2.68	1,667,547
	945	1,186.0	329.6	24.0	48,568	2.89	1,681,288
	83	869.8	209.0	11.4	23,072	1.87	1,232,952
	40	798.8	155.0	5.0	10,179	0.90	1,132,334
	112	1,238.0	448.8	49.8	100,892	5.75	1,754,245
	227	947.1	208.6	9.3	18,889	1.41	1,342,522
	830	965.4	360.9	41.7	84,455	6.17	1,368,444
	296	1,289.0	379.4	30.6	61,922	3.39	1,826,976
	107	1,314.0	389.5	31.8	64,320	3.45	1,863,151
	38	1,364.0	550.0	69.9	141,598	7.32	1,933,657
	57	1,156.0	420.4	46.8	94,815	5.78	1,639,326
	685	1,209.0	425.1	45.2	91,546	5.34	1,714,134
	69	1,370.0	283.2	10.8	21,968	1.13	1,941,893
	174	1,200.0	236.5	8.0	16,179	0.95	1,701,358
	265	1,235.0	270.9	12.0	24,310	1.39	1,750,388

* 70% , 가 : 2,025 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	135	5,100	1,566	135.6	32,012	3.80	842,488
	86	6,004	1,418	74.4	17,556	1.77	991,794
	20	5,249	2,338	333.0	78,586	9.06	867,127
	32	4,127	1,349	129.0	30,435	4.46	681,796
	39	3,910	1,479	173.6	40,967	6.34	645,979
	34	4,320	1,735	219.5	51,793	7.26	713,698
	32	4,020	1,336	131.0	30,918	4.66	664,161
	250	4,138	1,514	170.0	40,130	5.87	683,569
	119	5,114	1,419	103.0	24,319	2.88	844,873
	76	4,451	1,654	189.8	44,795	6.09	735,227
	59	3,870	2,082	356.1	84,041	13.10	639,394
	325	4,561	1,776	216.4	51,069	6.78	753,515
	284	5,545	1,202	51.8	12,219	1.33	916,101
	126	5,636	954	20.7	4,879	0.52	931,051
	35	3,948	881	40.7	9,601	1.47	652,243
	96	5,638	1,235	54.5	12,867	1.38	931,374
	40	5,017	1,086	46.6	10,987	1.33	828,742
	51	6,226	938	13.8	3,247	0.32	1,028,470
	800	5,605	1,286	63.3	14,940	1.61	925,916
	41	6,778	1,149	25.1	5,919	0.53	1,119,657
	85	6,578	1,784	124.2	29,301	2.70	1,086,724
	118	7,124	1,664	85.3	20,122	1.71	1,176,874
	150	5,997	1,339	61.8	14,591	1.47	990,741
	71	6,267	1,337	55.3	13,056	1.26	1,035,371
	36	6,604	837	6.27	1,480	0.14	1,091,031
	700	6,416	1,540	83.7	19,763	1.86	1,059,991
	55	6,607	1,810	128.2	30,265	2.77	1,091,521
	389	5,486	1,215	55.1	12,992	1.43	906,215
	91	6,384	2,072	195.8	46,212	4.38	1,054,657
	55	6,288	1,612	100.4	23,701	2.28	1,038,712
	830	5,602	1,654	134.0	31,628	3.42	925,421
	247	6,138	1,253	46.5	10,968	1.08	1,013,963
	273	6,134	1,220	42.3	9,977	0.98	1,013,383

* 70% , 가 : 236 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	65	9,942	2,144	91.2	12,408	1.31	946,458
	130	11,613	2,418	94.3	12,825	1.16	1,105,555
	107	10,737	2,484	124.5	16,933	1.66	1,022,156
	114	10,831	3,447	316.0	42,975	4.17	1,031,102
	160	11,976	3,070	191.4	26,035	2.28	1,140,132
	100	11,760	3,772	349.9	47,593	4.25	1,119,545
	38	11,142	2,987	203.3	27,655	2.61	1,060,753
	60	13,066	4,077	362.1	49,251	3.96	1,243,929
	56	10,228	2,978	235.7	32,055	3.29	973,672
	605	10,277	3,530	363.0	49,374	5.05	978,346
	35	7,728	2,994	362.5	49,298	6.70	735,714
	34	7,638	2,983	364.7	49,599	6.82	727,166
	36	8,003	2,511	225.0	30,596	4.02	761,857
	30	8,912	3,770	507.0	68,957	8.13	848,378
	290	8,183	2,948	324.2	44,091	5.66	779,051
	35	10,408	2,857	203.2	27,641	2.79	990,872
	37	10,217	3,621	389.4	52,963	5.45	972,661
	57	13,452	3,764	277.4	37,732	2.95	1,280,590
	47	11,669	2,833	157.7	21,453	1.93	1,110,909
	295	11,165	3,312	270.5	36,788	3.46	1,062,925
	109	10,282	1,674	32.0	4,357	0.45	978,871
	34	13,227	2,436	68.3	9,283	0.74	1,259,219
	65	12,354	1,987	36.6	4,972	0.42	1,176,107
	56	13,812	2,716	91.3	12,413	0.94	1,314,901
	530	11,897	2,921	166.7	22,673	2.00	1,132,573
	99	12,767	2,498	82.7	11,254	0.93	1,215,461
	31	13,503	4,757	507.3	68,993	5.37	1,285,532
	39	11,453	4,158	462.1	62,847	5.76	1,090,338
	44	13,378	3,694	265.7	36,136	2.84	1,273,542
	370	12,259	3,839	343.0	46,646	4.00	1,167,014

* 70% , 가 : 136 /kg, 30

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		(kg)	(kg)	(, kg)	(,)	(%)	()
	59	10,582	3,016	229.8	31,258	3.10	1,007,434
	91	10,462	2,352	110.4	15,009	1.51	995,952
	31	11,175	4,360	532.4	72,400	6.81	1,063,878
	96	11,749	2,471	98.7	13,428	1.20	1,118,535
	580	11,291	2,855	173.1	23,538	2.19	1,074,879
	36	13,842	1,796	14.8	2,016	0.15	1,317,775
	30	11,400	2,741	149.6	20,341	1.87	1,085,283
	460	10,058	3,007	249.0	33,859	3.54	957,518
	87	13,599	3,719	262.8	35,738	2.76	1,294,661
	39	13,551	2,186	40.6	5,528	0.43	1,290,082
	39	11,788	4,010	406.9	55,333	4.93	1,122,188
	505	11,722	3,384	263.8	35,879	3.22	1,115,962
	35	8,693	1,587	43.3	5,894	0.71	827,593
	93	9,061	1,858	69.7	9,479	1.10	862,632
	33	8,432	1,163	12.3	1,670	0.21	802,692
	162	8,845	1,688	52.3	7,110	0.84	842,022

* 70% , 가 : 136 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	89	5,177	1,863	204.7	30,496	5.65	539,939
	100	5,812	1,554	105.2	15,675	2.59	606,151
	116	5,494	2,110	252.7	37,648	6.57	573,013
	162	5,280	2,194	289.1	43,078	7.82	550,689
	270	7,225	1,932	130.8	19,487	2.59	753,584
	115	5,809	2,138	242.0	36,056	5.95	605,914
	44	5,396	1,686	150.0	22,348	3.97	562,843
	32	4,596	2,082	302.0	44,996	9.39	479,366
	87	4,445	1,762	219.5	32,713	7.06	463,568
	88	4,384	2,391	413.8	61,654	13.50	457,217
	826	5,017	2,150	293.3	43,704	8.35	523,254
	35	4,031	1,413	149.7	22,306	5.31	420,442
	40	4,599	1,624	173.8	25,901	5.40	479,704
	61	5,365	2,770	456.6	68,028	12.20	559,614
	40	5,303	2,543	390.8	58,232	10.50	553,095
	365	5,116	2,090	270.0	40,231	7.54	533,556
	31	3,939	1,275	120.0	17,878	4.35	410,878
	30	4,795	1,008	40.3	6,004	1.20	500,101
	85	5,218	2,060	255.2	38,031	6.99	544,224
	30	4,630	1,233	82.9	12,347	2.56	482,947
	295	4,726	1,674	179.8	26,787	5.43	492,943
	162	5,711	1,265	57.4	8,556	1.44	595,622
	32	6,779	2,002	162.4	24,193	3.42	707,040
	64	5,000	1,648	159.4	23,754	4.56	521,476
	53	7,111	2,313	219.4	32,696	4.41	741,697
	32	4,556	840	23.6	3,520	0.74	475,175
	32	5,428	1,515	111.2	16,573	2.93	566,137
	31	4,956	1,394	103.7	15,452	2.99	516,907
	650	5,647	1,884	185.8	27,684	4.70	588,975
	377	5,468	1,330	74.4	11,089	1.94	570,275
	51	6,250	2,510	317.5	47,302	7.26	651,881
	68	5,335	1,763	171.2	25,514	4.59	556,405
	605	5,606	1,703	144.7	21,567	3.69	584,661

* 70% , 가 : 149 /kg, 30

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		(kg)	(kg)	(, kg)	(,)	(%)	()
	109	6,795	2,130	190.7	28,415	4.01	708,684
	172	7,002	2,039	161.4	24,050	3.29	730,336
	38	7,267	2,300	208.9	31,132	4.11	757,956
	118	6,664	2,783	368.9	54,962	7.91	695,049
	36	6,329	3,432	590.8	88,033	13.30	660,164
	84	7,854	1,586	57.2	8,516	1.04	819,187
	900	7,041	2,189	193.2	28,790	3.92	734,378
	40	7,644	2,041	137.8	20,535	2.58	797,227
	39	4,208	2,150	350.9	52,287	11.90	438,926
	509	5,755	2,205	263.0	39,186	6.53	600,275
	36	7,911	2,711	278.0	41,415	5.02	825,094
	30	7,759	2,092	143.9	21,437	2.65	809,225
	40	6,471	2,765	376.1	56,043	8.30	674,886
	87	8,021	1,596	55.4	8,252	0.99	836,615
	525	6,812	2,342	241.2	35,936	5.06	710,445
	31	6,996	1,369	45.3	6,755	0.93	729,686
	35	8,797	2,079	109.2	16,270	1.77	917,575
	60	8,745	1,783	65.9	9,814	1.08	912,077
	126	8,329	1,926	96.5	14,371	1.65	868,730

* 70% , 가 : 149 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	190	1,682	798.8	121.6	152,433	10.30	1,476,737
	115	1,461	1,103.0	241.1	302,350	23.60	1,282,199
가	42	886	419.1	63.6	79,704	10.30	777,564
	53	1,442	968.9	196.6	246,582	19.50	1,265,523
	61	1,195	695.8	127.1	159,354	15.20	1,048,913
	92	1,747	885.2	143.5	179,893	11.70	1,533,202
	45	1,509	655.9	90.9	114,049	8.61	1,324,503
	35	1,482	886.2	165.3	207,273	15.90	1,300,649
	41	1,717	654.7	77.7	97,383	6.46	1,506,969
	440	1,456	830.9	149.3	187,271	14.70	1,277,845
	50	1,530	701.8	103.1	129,325	9.63	1,342,683
	105	1,293	855.2	171.7	215,311	19.00	1,134,678
	270	1,273	818.3	161.0	201,935	18.10	1,117,306
	31	2,492	394.0	6.9	8,589	0.39	2,187,223
	50	2,231	460.4	17.6	22,017	1.12	1,958,196
	45	2,699	941.0	98.9	124,002	5.23	2,369,397
	113	1,971	507.8	32.0	40,073	2.32	1,730,431
	116	1,905	514.3	35.5	44,474	2.66	1,672,360
	485	2,102	622.1	50.6	63,483	3.44	1,845,264
	35	2,442	1,027.0	137.3	172,128	8.03	2,143,964
	182	2,296	399.3	9.4	11,820	0.59	2,015,726
	43	1,800	399.1	18.2	22,764	1.44	1,579,754
	97	1,761	527.0	43.7	54,835	3.55	1,545,444
	585	1,979	814.0	106.0	132,924	7.65	1,736,952
	30	2,417	734.1	62.4	78,252	3.69	2,121,643
	56	1,155	695.3	130.3	163,389	16.10	1,014,172
	32	2,635	1,464.0	257.3	322,660	13.90	2,313,277
	52	2,366	981.9	129.2	161,990	7.80	2,076,672
	62	2,053	835.8	107.5	134,811	7.48	1,802,038
	320	1,898	1,071.0	190.7	239,097	14.30	1,666,202

* 70% , 가 : 1,254 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	35	2,023	946.8	142.0	178,107	10.00	1,775,664
	34	1,853	1,077.0	196.6	246,549	15.20	1,626,254
	190	1,542	887.5	160.6	201,370	14.90	1,353,803
	53	2,276	546.6	29.7	37,286	1.87	1,998,072
	66	2,439	910.5	105.0	131,722	6.15	2,141,340
	35	2,229	557.8	33.1	41,545	2.12	1,956,240
	36	1,546	715.9	106.2	133,224	9.82	1,356,786
	64	1,905	413.3	17.8	22,360	1.34	1,672,620
	84	2,208	712.6	66.7	83,696	4.32	1,938,579
	103	2,737	836.4	71.8	90,086	3.75	2,402,351
	143	1,927	557.1	43.5	54,571	3.23	1,691,821
	87	2,311	723.9	64.7	81,142	4.00	2,028,727
	36	2,324	840.0	92.8	116,353	5.70	2,040,397
	111	2,615	946.5	104.8	131,408	5.72	2,295,384
	44	1,719	638.5	73.2	91,803	6.09	1,508,619
	58	2,242	708.5	64.2	80,539	4.09	1,968,239
	43	2,187	800.4	89.9	112,751	5.87	1,920,136
	1240	2,116	813.4	97.5	122,211	6.58	1,857,539
	203	2,624	1,072.0	138.4	173,574	7.54	2,303,468
	40	1,270	512.7	65.3	81,875	7.35	1,114,521
	78	2,174	972.2	139.0	174,322	9.13	1,908,765
	370	2,267	1,092.0	168.6	211,384	10.60	1,989,607

* 70% , 가 : 1,254 /kg, 30

		(kg)	(kg)	(, kg)	(,)	(%)	()
	65	1,821	438.5	24.0	41,000	1.88	2,177,316
	45	1,434	516.5	56.8	96,950	5.65	1,715,022
	46	1,935	614.0	56.0	95,650	4.13	2,314,058
	65	3,038	574.9	17.4	29,689	0.82	3,632,785
	180	2,500	1,150.0	169.5	289,429	9.68	2,989,365
	93	1,954	614.6	55.3	94,446	4.04	2,336,305
	32	2,690	558.7	21.7	36,991	1.15	3,215,604
	61	2,775	875.2	79.1	135,062	4.07	3,318,084
	83	2,683	988.3	112.0	191,329	5.96	3,207,809
	37	3,095	818.9	54.3	92,801	2.51	3,700,317
	53	2,654	1,001.0	117.0	199,809	6.30	3,173,574
	83	2,819	1,254.0	178.2	304,330	9.03	3,370,915
	610	2,448	1,011.0	132.2	225,818	7.72	2,926,856
	53	1,878	599.5	55.2	94,294	4.20	2,245,495
	45	1,904	470.4	27.2	46,443	2.04	2,276,157
	33	1,665	717.5	98.6	168,359	8.46	1,990,131
	41	1,319	665.4	107.4	183,396	11.60	1,577,201
	210	1,626	675.1	88.9	151,775	7.81	1,944,256
	60	2,361	351.0	4.9	8,403	0.30	2,822,612
	43	2,216	1,101.0	175.1	298,995	11.30	2,649,867
	40	2,413	516.9	21.6	36,961	1.28	2,884,564
	230	2,363	745.5	67.4	115,124	4.07	2,825,426
	96	2,191	542.7	31.5	53,843	2.06	2,619,858
	179	1,818	318.7	7.7	13,184	0.61	2,173,120
	550	2,150	829.1	99.8	170,396	6.63	2,570,388
	82	1,616	934.5	169.7	289,908	15.00	1,932,206
	40	2,877	830.8	64.8	110,669	3.22	3,439,442
	80	3,318	1,338.0	170.1	290,608	7.33	3,966,403
	33	2,450	1,468.0	274.3	468,476	16.00	2,929,582
	280	2,499	1,295.0	214.2	365,816	12.20	2,987,625
	195	2,898	814.3	60.5	103,304	2.98	3,464,867
	109	2,803	586.0	23.1	39,417	1.18	3,351,629
	465	2,843	815.4	62.8	107,288	3.16	3,399,147

* 70% , 가 : 1,708 /kg, 30

< 6-10> . ()

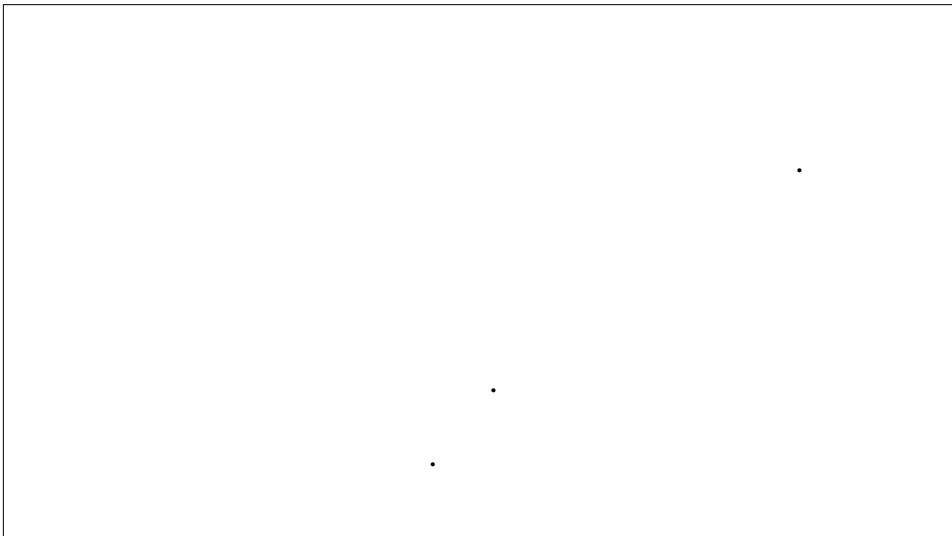
		(kg)	(kg)	(, kg)	(,)	(%)	()
	44	1,595	257.2	4.8	8,150	0.43	1,906,982
	55	1,926	630.6	60.4	103,231	4.48	2,302,269
	91	2,446	630.7	39.8	67,952	2.32	2,924,096
	37	2,070	619.7	51.4	87,871	3.55	2,474,310
	32	2,360	777.5	75.2	128,430	4.55	2,821,242
	320	2,117	699.0	67.8	115,884	4.58	2,530,794
	139	2,412	813.0	81.4	138,969	4.82	2,883,374
	41	2,549	744.4	59.2	101,132	3.32	3,047,030
	435	2,187	801.5	90.3	154,171	5.90	2,614,376

* 70% , 가 : 1,708 /kg, 30

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가

가 ()



: 2000

: / / /

:

:

1. ?

2. ?

3. ? ()

4. , , ?

	kg
	kg
	kg

5. ? ()

6. 가 ?

,

가

()

7. , , , ?
30%

7-1. ? () ()

8. ?

9. ?

9-1. ?

, '
()

10. ?

()

11. 가 ?
(, , ,)

12. .
?

12-1. ?
(, TV,) ()
()
()

13. ?
(:)

14. 가
?
가 가 가
가 가

14-1. 가 가
? ()

15. ?
()

16. 가 가
? ()%

17. 가
?
50% 60% 70% 80% 90%

	가 ()	50% ()	100% ()
50%	13	1, 217	2, 434
60%	26	1, 460	2, 920
70%	49	1, 704	3, 407
80%	90	1, 947	3, 894
90%	158	2, 191	4, 381

50%, 1 (2, 843kg, 1, 712 /kg)

18. () 가
? / 가 /

19. 가 ?
2 4

19-1. ? ()

20. 가 ?
()

21. ?
(:)