(5) $n = 10$

LOW

$-43,06$; $-17,75$; $-9,53$; $-6,18$; $8,04$; $20,32$; $22,87$; $41,20$; $45,90$; $46,21$

RANGE $46,21 - (-43,06) = 89,27$

WIDTH $= \frac{89,27}{5} = 17,86$

	ABS. FREQUENCY		RELATIVE	CUMULATIVE
$\langle -43,06 ; -25,2)$	1	1	10%	10%
$\langle -25,2 ; -7,34)$	2	3	20%	30%
$\langle -7,34 ; 10,52)$	2	5	20%	50%
$\langle 10,52 ; 28,38)$	2	7	20%	70%
$\langle 28,38 ; 46,24)$	3	10	30%	100%

(6)

MEAN $= \frac{108,02}{10} = 10,802$

MEDIAN $= \frac{8,04 + 20,32}{2} = \frac{28,36}{2} = 14,18$

MODAL INTERVAL → UNIMODAL $\Rightarrow \langle 28,38 ; 46,24 \rangle$

(7)

$GM = \sqrt[10]{(1+(-0,4306)) \cdot (1-0,1745) \cdot (1-0,0953) \cdot (1-0,0618) \cdot 1,0804 \cdot 1,2032 \cdot 1,2287 \cdot 1,4120 \cdot 1,4590 \cdot 1,4621} - 1 = \sqrt[10]{1,91244393} - 1 = 0,06699 \rightarrow 6,699\%$

(9)

RANGE $= 89,27$

$MAD = \frac{|-43,06 - 10,802| + |-17,75 - 10,802| \dots}{10} = \frac{244,98}{10} =$

$= 24,498$

$$\sigma^2 = \frac{8.071,60236}{10-1} = 896,844$$

$$\sigma = 29,947\ \%$$

$$\text{SEMIVALIANCE} = \frac{4.425,74}{5-1} = 1.106,44$$

$$\text{SEMIDEVIATION} = 33,26\ \%$$

(12)

1993 → $0,6 \cdot 46,21 + 0,4 \cdot 15,74 = 34,022$

1994 → $0,6 \cdot (-9,18) + 0,4 \cdot (-3,4) = -5,068$

1995 → $0,6 \cdot 8,04 + 0,4 \cdot 18,3 = 12,144$

1996 → $0,6 \cdot 22,87 + 0,4 \cdot 8,35 = 17,062$

1997 → $0,6 \cdot 45,9 + 0,4 \cdot 6,65 = 30,2$

1998 → $0,6 \cdot 20,32 + 0,4 \cdot 12,45 = 17,172$

1999 → $0,6 \cdot 41,2 + 0,4 \cdot (-2,19) = 23,844$

2000 → $0,6 \cdot (-9,53) + 0,4 \cdot 7,44 = -2,742$

2001 → $0,6 \cdot (-17,74) + 0,4 \cdot 5,55 = -8,424$

2002 → $0,6 \cdot (-43,06) + 0,4 \cdot 10,27 = -21,728$

$$\text{MEAN} = \frac{96,48}{10} = 9,648\ \%$$

$\sigma_{\text{PORTFOLIO}} = 18,31\ \%$

$\sigma_{\text{MSCI}} = 29,95$ $\quad \text{MEAN} = \frac{108}{10} = 10,8\ \%$

$\sigma_{\text{JPM}} = 6,94$ $\quad \text{MEAN} = \frac{79,16}{10} = 7,916\ \%$

→ $CV = \frac{\text{MEAN}}{\sigma}$

$CV_{\text{PORTFOLIO}} = \frac{9,646}{18,31} = 0,53$

$CV_{\text{MSCI}} = \frac{10,8}{29,95} = 0,36$

$CV_{\text{JPM}} = \frac{7,916}{6,94} = 1,14$ ✓

(14) $SR = \frac{r - r_F}{2}$ $\qquad r_F = 4{,}33\%$

$$SR_{PORTFOLIO} = \frac{9{,}648 - 4{,}33}{13{,}31} = 0{,}29$$

$$SR_{MSCI} = \frac{10{,}8 - 4{,}33}{29{,}95} = 0{,}216$$

$$SR_{JPM} = \frac{4{,}916 - 4{,}33}{6{,}94} = 0{,}5167$$

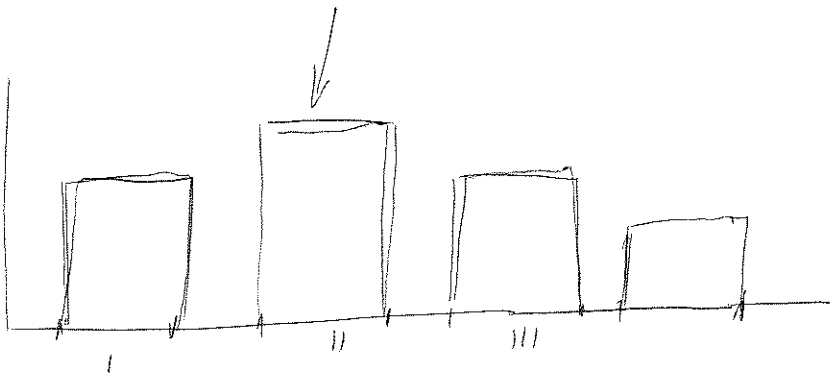
(15) $\phi\ P/E = \frac{123{,}01}{8} = 15{,}38$ $\qquad$ MEDIAN $= \frac{14{,}43 + 14{,}34}{2} = 14{,}39$

$\phi\ P/S = \frac{10{,}48}{8} = 1{,}31$ $\qquad$ MEDIAN $= \frac{1{,}13 + 1{,}34}{2} = 1{,}234$

$\phi\ P/B = \frac{436{,}2}{8} = 54{,}524$ $\qquad$ MEDIAN $= \frac{1{,}96 + 2{,}13}{2} = 2{,}045$

(3)

MODAL INTERVAL



(4) $MEAN = \frac{-2{,}61}{12} = -0{,}2175\%$

$\sigma^2 = \frac{312{,}62\,1825}{11} = 29{,}23$

$\sigma = 5{,}41\%$