**SAPM calculations assignment 2**

**Single index model based on 10 years weekly data:**

**E(R)= a+bRm**

**Rm=0.18%**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **BHEL** | **BIOCON** | **BOSCH** | **SENSEX** |
| **Weekly expected return** | 0.29% | 0.52% | 0.03% | 0.18% |
| **variance** | 0.00115 | 0.00177 | 0.00658 | 0.00045 |
| **Alpha =a** | -.0026% | .0039% | .0019% | N.A. |
| **beta=b** | 1.528 | 0.75 | .62 | 1 |
| **Systematic risk** | 15.76% | 14.18% | 14.84% | N.A. |
| **Firm specific risk** | 84.24% | 85.82% | 85.16% | N.A. |

**Multifactor model based on 9 years data:**

**Yearly expected return:**

**Risk free rate Rf=5.65%**

|  |  |
| --- | --- |
| **Market return(Rm)** | 10.96% |
| **Return inflation(Rinfl.)** | 14.87% |
| **Return GDP(RGDP)** | 16.05% |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **bhel** | **biocon** | **bosch** |  | **total weight** |
| **beta inflation** | -0.916548797 | -2.226952004 | 3.067942451 |  |  |
| **beta gdp** | -1.170509195 | 21.43351934 | 2.158060573 |  |  |
| **Beta market** |  |  |  |  |  |
|  |  |  |  |  |  |
| **weights inflation** | 0.2965087342 | 0.1674270761 | 0.5360650717 |  | 1.000000882 |
| **weights gdp** | 0.1493790653 | -0.03428410914 | 0.8849050438 |  | 1 |
|  |  |  |  |  |  |
| **portfolio beta inflation** | 1.000000004 |  |  |  |  |
| **portfolio beta gdp** | 1 |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **return inflation** | 14.87% |  |  |  |  |
| **return gdp** | 16.05% |  |  |  |  |
|  |  |  |  |  |  |
| **risk free rate** | 5.65% |  |  |  |  |
|  |  |  |  |  |  |
| **yearly expected returns:** | -11.22% | 39.61% | 21.57% |  |  |

**E(R) portfolio=Rf+b(portfolio)(Rm-Rf)+b(GDP(portfolio))(RGDP-Rf)+b(infl.(portfolio))(Rinfl-Rf)**

**Source: yahoo finance for stock prices and index values**

**Stat bureau and world bank for inflation and gdp growth**

**rates, respectively**