

$$r_c = (\frac{1}{3}, 0, 0, \frac{1}{3}, \frac{1}{3})^T \quad r_D = (1, 0, 0, 0, 0)^T$$

$$V_A = \beta M V_A + (1-\beta) \begin{pmatrix} \frac{1}{3} \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \Rightarrow V_A(1-\beta M) = (1-\beta) V_A$$

$$\Delta V_E = 3V_A + 3V_C - 3V_B - 2V_D \quad \therefore V_E = 3V_A$$

1.2. 741b

$$1.3. V_A = 0.6 V_A + 0.3 V_B + 0.3 V_C - 0.2 V_D$$

1.4 所有可以用 V_A, V_B, V_C 线性表示的向量组成的集合

$$1.5 \quad r = Ar + \beta M r + \frac{1-\beta}{N} \mathbf{1}^T r$$

$$\frac{1-\beta}{N} \mathbf{1}^T r = \frac{1-\beta}{N} \begin{pmatrix} 1 & 1 & \dots & 1 \\ \vdots & \vdots & \ddots & \vdots \\ 1 & 1 & \dots & 1 \end{pmatrix} \begin{pmatrix} r_1 \\ r_2 \\ \vdots \\ r_n \end{pmatrix} = \frac{1-\beta}{N} \begin{pmatrix} r_1 + r_2 + \dots + r_n \\ r_H r_L + \dots + r_M \\ r_1 + r_2 + \dots + r_3 \end{pmatrix}$$

$$\Rightarrow \frac{1-\beta}{N} \mathbf{1}^T r = \frac{1-\beta}{N} \begin{pmatrix} 1 \\ \vdots \\ 1 \end{pmatrix} = \frac{1-\beta}{N} \mathbf{1}$$

$$\Rightarrow r = Ar + \beta M r + \frac{1-\beta}{N} \mathbf{1}$$