??

$r_{it} - r_{ft} = f_1(r_{mt} - r_f) + f_2(\beta_{ij} f_{jt}) + \epsilon_{it}$

$i =$
$1, 2, \ldots, n$
$t =$
$1, 2, \ldots, T$
$j =$
$1, 2, \ldots, k$
$f_1(\cdot)$
$f_2(\cdot)$
$(r_{mt} -$
$r_f)$
r_{mt}
r_{ft}
r_{it}
f_{jt}
β_{ij}
ϵ_{it}
β_{ij}
α_j
0
??
$k \times$
k
Σ
Σ
k
$f_1(a)$
$f_2(a)$
$_1(r_{mt} - r_f) =$
$a_i +$
$\beta_{im}(r_{mt} -$
$r_{ft})$
$f_2(\beta_{ij} f_{jt}) =$
$\sum_{j=1}^{k} \beta_{ij} f_{ij}$

$$r_{it} = a_i + \sum_{j=1}^{k+1} \beta_{ij} f_{ij} + \epsilon_{it}$$

a_i
$U[-0.5, 0.5]$
β_{ij}
f_{ij}
α_j
r_{mi-r_f}
f_{i1}
$\beta_{\mathbf{i}} =$
$(\beta_{i1}, \beta_{i2} \cdots, \beta_{ik+1})$
$IIDU(\mu_\beta -$
$0.2, \mu_\beta +$
$0.2)$
μ_β
$[n^{\alpha_j}]$
$\beta_{\mathbf{i}}$

$$r_{it} = a_i + \beta_{im}(r_{mt} - r_{ft}) + \sum_{j=1}^{k} \beta_{ij} f_{jt} + \epsilon_{it}$$

$r_{mt} -$
r_{ft}
$\alpha_m =$
1
β_m
$T =$
$\{120, 240, 360\}$
$n =$
$\{100, 300, 500\}$
$\alpha_m =$
1
$\alpha_x =$
$\{0.5, 0.7, 0.9, 1\}$
a_i
β_i
α
α
$bias =$
$|\alpha -$
$\hat{\alpha}|$
$MSE =$
$\frac{1}{n} \sum_{i=1}^{n} (bias_i)^2$