TIME-VARYING RETURNS

KERRY BACK

RICE | BUSINESS
Jones Graduate School of Business

RETIREMENT PLANNING AGAIN

PREVIOUS EXAMPLE

ACCOUNT BALANCE IN A LOOP

ACCOUNT BALANCE WITH FUTURE VALUE FACTORS

```
r = np.random.normal(loc=mn, scale=sd, size=T)
D = D1 * (1+g)**np.arange(R)
W = W1 * (1+h)**np.arange(T-R)

fvFactors = np.flip(np.cumprod(np.flip(1+r)))
fvFactors = np.concatenate((fvFactors, [1]))

B0 = np.concatenate(([B0], np.zeros(T)))
D = np.concatenate(([0], D, np.zeros(T-R)))
W = np.concatenate((np.zeros(R), W, [0]))
CF = B0 + D - W
BT = np.sum(CF*fvFactors)
```