```
function result = pricing(factor,port,num_fac,zero_cost)
[T,N] = size(port);
t = length(factor);
result.beta = zeros(num_fac+1,N); % betas of pricing model (alpha in
 the first row)
result.tstat = zeros(num_fac+1,N); % t-stat of estimated betas
result.residual = zeros(t,N); % residuals of regression
result.sig2eps = zeros(1,N); % error variance in regression
result.Sharpe_excess = zeros(1,N); % doubt: alternative way of excess
 Sharpe ratio?
    if num_fac == 1
        for n = 1:N
        % CAPM model: number of factor (num_fac) equals to 1
        rmrf = factor(:,1); rf = factor(:,2);
        regression = NWtest(port(:,n)-rf*(1-zero_cost),...
            rmrf,12); % use maxlag of 12
        % use 'hac' to adjust for the standard errors
        result.beta(:,n) = regression.beta;
        result.tstat(:,n) = regression.tstat;
        result.residual(:,n) = regression.residual;
        % to exclude the NaN value in residuals
        index_nan = find(isnan(result.residual(:,n)));
        index = setdiff(1:t,index_nan);
        result.sig2eps(n) = sum(result.residual(index,n).^2)/
(length(index)-1-num_fac);
        end
        result.Sharpe_excess = result.beta(1,:)./sqrt(result.sig2eps);
    elseif num_fac == 3
        % Fama-French 3 factor
        for n = 1:N
        rmrf = factor(:,1); smb = factor(:,2);
        hml = factor(:,3); rf = factor(:,4);
        regression = NWtest(port(:,n)-rf*(1-zero_cost),...
            [rmrf,smb,hml],12);
        result.beta(:,n) = regression.beta;
        result.tstat(:,n) = regression.tstat;
        result.residual(:,n) = regression.residual;
        % to exclude the NaN value in residuals
        index_nan = find(isnan(result.residual(:,n)));
        index = setdiff(1:t,index_nan);
        result.sig2eps(n) = sum(result.residual(index,n).^2)/
(length(index)-1-num_fac);
        end
        result.Sharpe_excess = result.beta(1,:)./sqrt(result.sig2eps);
    elseif num_fac == 5
        % Fama-French 5 factor
        for n = 1:N
        rmrf = factor(:,1); smb = factor(:,2);
        hml = factor(:,3); rmw = factor(:,4);
        cma = factor(:,5); rf = factor(:,6);
        regression = NWtest(port(T-t+1:T,n)-rf(T-t+1,:)*(1-
zero_cost),...
```

```
            [rmrf,smb,hml,rmw,cma],12);
        result.beta(:,n) = regression.beta;
        result.tstat(:,n) = regression.tstat;
        result.residual(:,n) = regression.residual;
        % to exclude the NaN value in residuals
        index_nan = find(isnan(result.residual(:,n)));
        index = setdiff(1:t,index_nan);
        result.sig2eps(n) = sum(result.residual(index,n).^2)/
(length(index)-1-num_fac);
        end
        result.Sharpe_excess = result.beta(1,:)./sqrt(result.sig2eps);
    end
```

```
Not enough input arguments.

Error in pricing (line 2)
[T,N] = size(port);
```

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