

# Matlab Graph Scatter and Line Spectrum with Three Variables

back to [Fan's Intro Math for Econ](#), [Matlab Examples](#), or [Dynamic Asset Repositories](#)

Generate  $k + b = w$ , color for each  $w$ , vectors of  $k$  and  $b$  such that  $k + b = w$  for each  $w$

There are two  $N$  by  $M$  matrix,  $A$  and  $B$ .

Values in Matrix  $A$  correspond to the  $x$ -axis, values in Matrix  $B$  correspond to the  $y$ -axis.

The rows and columns in matrix  $A$  and  $B$  have some other meanings. In this case, we will give color to the columns.

The columns is represented by vector  $C$ , which is another variable.

1. Each line a different color representing variable 3
2. Legend labeling a subset of colors
3.  $X$  and  $Y$  could be asset choices, color could be utility, consumption etc.

## Setting Up Data

```
close all
clear all

% Bounds
fl_b_bd = -10;
% Max and Mins
fl_w_max = 50;
fl_w_min = fl_b_bd;
fl_kp_max = fl_w_max - fl_b_bd;
fl_kp_min = 0;

% Grid Point Counts
it_w_i = 30;
it_kb_j = 30;

% Grids
ar_w = linspace(fl_w_min, fl_w_max, it_w_i);
ar_kp = linspace(fl_kp_min, fl_kp_max, it_kb_j);
mt_bp = ar_w - ar_kp';
mt_kp = ar_w - mt_bp;
mt_bl_constrained = (mt_bp < fl_b_bd);
mt_bp_wth_na = mt_bp;
mt_kp_wth_na = mt_kp;
mt_bp_wth_na(mt_bl_constrained) = nan;
mt_kp_wth_na(mt_bl_constrained) = nan;

% Flatten
ar_bp_mw_wth_na = mt_bp_wth_na(:);
ar_kp_mw_wth_na = mt_kp_wth_na(:);
ar_bp_mw = ar_bp_mw_wth_na(~isnan(ar_bp_mw_wth_na));
```

```
ar_kp_mw = ar_kp_mw_wth_na(~isnan(ar_kp_mw_wth_na));
```

## Graphing

```
figure('PaperPosition', [0 0 7 4]);
hold on;

chart = plot(mt_bp_wth_na, mt_kp_wth_na, 'blue');

clr = jet(numel(chart));
for m = 1:numel(chart)
    set(chart(m), 'Color', clr(m,:))
end
if (length(ar_w) <= 50)
    scatter(ar_bp_mw, ar_kp_mw, 5, 'filled');
end
xline(0);
yline(0);

title('Choice Grids Conditional on kp+bp=w')
ylabel('Capital Choice')
xlabel({'Borrowing or Saving'})
legend2plot = fliplr([1 round(numel(chart))/3 round((2*numel(chart))/4) numel(chart)]);
legendCell = cellstr(num2str(ar_w, 'kp+bp=%3.2f'));
legend(chart(legend2plot), legendCell(legend2plot), 'Location', 'northeast');

grid on;
```

