Equilibrium W to Q to W Contraction By Skill Group

This is the example vignette for function: bfw_solveequi_w2q2w from the **PrjLabEquiBFW Package**.

Default

```
[mp_fl_labor_occprbty,mp_fl_labor_supplied] = bfw_solveequi_w2q2w();
```

```
ITER:;it_speed_shifter_ctr=1;it_equi_wage_ctr=1;bl_continue=1;fl_ds_gap_mse=1.0294;fl_total_wage_change_mse=2.4494
    2.9507    2.8632    5.2962
    1.7458    2.4472    3.9586

    4.2925    3.7644    1.5416
    2.2735    1.6222    1.3410

    3.9933    2.9733    1.8551
    2.1150    1.2813    1.6136

ITER:;it_speed_shifter_ctr=1;it_equi_wage_ctr=2;bl_continue=1;fl_ds_gap_mse=0.62115;fl_total_wage_change_mse=1.2697
    2.0535    2.6792    5.8550
    1.4375    2.3313    4.0597

    4.9024    3.0389    1.6928
    2.1150    1.2813    1.6136

    4.1907    2.9908    1.7891
    1.8080    1.2610    1.7054

ITER:;it_speed_shifter_ctr=1;it_equi_wage_ctr=10;bl_continue=1;fl_ds_gap_mse=0.0075186;fl_total_wage_change_mse=0.0
    1.5739    1.8511    3.9011
    1.2165    1.8810    3.2705

    4.3801    3.1280    1.9299
    1.6748    1.0915    1.4595

    4.3088    3.1446    1.9595
    1.6475    1.0973    1.4818

ITER:;it_speed_shifter_ctr=1;it_equi_wage_ctr=20;bl_continue=1;fl_ds_gap_mse=6.4007e-05;fl_total_wage_change_mse=0.0
    1.5762    1.8205    3.8023
    1.2159    1.8637    3.2298

    4.3126    3.1498    1.9685
    1.6528    1.0893    1.4649

    4.3065    3.1520    1.9717
    1.6505    1.0900    1.4673

ITER:;it_speed_shifter_ctr=1;it_equi_wage_ctr=30;bl_continue=1;fl_ds_gap_mse=6.0214e-07;fl_total_wage_change_mse=2.8
    1.5778    1.8191    3.7958
    1.2164    1.8629    3.2273

    4.3064    3.1522    1.9722
    1.6515    1.0896    1.4660

    4.3058    3.1524    1.9726
    1.6513    1.0897    1.4663

ITER:;it_speed_shifter_ctr=1;it_equi_wage_ctr=39;bl_continue=0;fl_ds_gap_mse=9.1058e-09;fl_total_wage_change_mse=4.3
    1.5780    1.8190    3.7950
    1.2165    1.8628    3.2270
```

```
    4.3057    3.1524    1.9727
    1.6514    1.0896    1.4662

    4.3057    3.1524    1.9727
    1.6514    1.0896    1.4662

----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_wages Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.2165
    C002    2     2     1.8628
    C003    3     3      3.227
    C101    4     4      1.578
    C102    5     5      1.819
    C103    6     6      3.795

----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_supplied Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.6514
    C002    2     2     1.0896
    C003    3     3     1.4662
    C101    4     4     4.3057
    C102    5     5     3.1524
    C103    6     6     1.9727

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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_demanded Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.6514
    C002    2     2     1.0896
    C003    3     3     1.4662
    C101    4     4     4.3057
    C102    5     5     3.1524
    C103    6     6     1.9727
```

Vary Parameters, Solve Equilibrium Quantities Wages, W to Q to W Contraction

```
% 2. Get Parameters and data
bl_log_wage = true;
bl_verbose_nest = false;

% Get Parameters
mp_params = bfw_mp_param_esti(bl_log_wage);
mp_param_aux = bfw_mp_param_aux(bl_verbose_nest);
mp_params = [mp_params ; mp_param_aux];

% Get Data
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mp_data = bfw_mp_data(bl_verbose_nest);

% Get Functions
mp_func_demand = bfw_mp_func_demand(bl_verbose_nest);
mp_func_supply = bfw_mp_func_supply(bl_log_wage, bl_verbose_nest);
mp_func_equi = bfw_mp_func_equi(bl_verbose_nest);
mp_func = [mp_func_equi; mp_func_supply; mp_func_demand];

% Get Controls
mp_controls = bfw_mp_control();
mp_controls('bl_bfw_solveequi_w2q2w_display') = false;
mp_controls('bl_bfw_solveequi_w2q2w_display_verbose') = false;

st_exa_common_str = 'bfw_solveequi_w2q2w()';
for it_example_inputs = [1,2,3,4]

    % Different testing scenariors
    if (it_example_inputs == 1)
        fl_rho_manual = 0.18;
        fl_rho_routine = 0.18;
        fl_rho_analytical = 0.18;

        fl_beta_1_manual = 1 - 0.26;
        fl_beta_1_routine = 1 - 0.30;
        fl_beta_1_analytical = 1 - 0.40;

        fl_Y_manual = 3.4084;
        fl_Y_routine = 2.3402;
        fl_Y_analytical = 1.7552;

        fl_w1o1_init = 2.315707;
        fl_w1o2_init = 3.217799;
        fl_w1o3_init = 4.329016;

        fl_w2o1_init = 1.942;
        fl_w2o2_init = 3.2247;
        fl_w2o3_init = 3.3738;

        it_data_year = 1989;
        fl_potwrker_1 = 9.9687;
        fl_potwrker_2 = 12.5164;
        bl_skilled = false;

        st_exa_string = "homogeneous rho at 0.18, unskilled";

    elseif (it_example_inputs == 2)
        fl_rho_manual = 0.64678;
        fl_rho_routine = 0.64678;
        fl_rho_analytical = 0.64678;

        fl_beta_1_manual = 0.63427;
        fl_beta_1_routine = 0.58738;
        fl_beta_1_analytical = 0.5784;
```

```
        fl_Y_manual = 3.2291;
        fl_Y_routine = 2.2223;
        fl_Y_analytical = 1.7487;

        fl_w1o1_init = 2.3157;
        fl_w1o2_init = 3.2178;
        fl_w1o3_init = 4.329;

        fl_w2o1_init = 1.942;
        fl_w2o2_init = 3.2247;
        fl_w2o3_init = 3.3738;

        it_data_year = 1989;
        fl_potwrker_1 = 9.9687;
        fl_potwrker_2 = 12.5164;

        bl_skilled = false;

        st_exa_string = "homogeneous rho at 0.64, unskilled";

    elseif (it_example_inputs == 3)
        fl_rho_manual = 0.34186;
        fl_rho_routine = 0.34186;
        fl_rho_analytical = 0.34186;

        fl_beta_1_manual = 0.63075;
        fl_beta_1_routine = 0.6326;
        fl_beta_1_analytical = 0.53894;

        fl_Y_manual = 5.5703;
        fl_Y_routine = 4.6673;
        fl_Y_analytical = 2.5644;

        fl_w1o1_init = 2.263;
        fl_w1o2_init = 2.5991;
        fl_w1o3_init = 3.6533;

        fl_w2o1_init = 1.7636;
        fl_w2o2_init = 2.4062;
        fl_w2o3_init = 2.8429;

        it_data_year = 2010;
        fl_potwrker_1 = 16.4952;
        fl_potwrker_2 = 19.4271;

        bl_skilled = false;

        st_exa_string = "homogeneous rho at 0.34, unskilled";

    elseif (it_example_inputs == 4)
        fl_rho_manual = 0.75002424;
        fl_rho_routine = 0.244249613;
        fl_rho_analytical = 0.244249613;
```

```
        fl_beta_1_manual = 0.703785173;
        fl_beta_1_routine = 0.687107264;
        fl_beta_1_analytical = 0.706254232;

        fl_Y_manual = 0.124479951;
        fl_Y_routine = 0.39857586;
        fl_Y_analytical = 1.388880655;

        fl_w1o1_init = 5.758649;
        fl_w1o2_init = 6.221019;
        fl_w1o3_init = 7.977073;

        fl_w2o1_init = 2.376239;
        fl_w2o2_init = 4.863073;
        fl_w2o3_init = 5.881686;

        it_data_year = 1996;
        fl_potwrker_1 = 16.4952;
        fl_potwrker_2 = 19.4271;

        bl_skilled = true;

        st_exa_string = "heter rho (0.75, 0.24, 0.24), skilled";

    end

    mp_params('fl_rho_manual') = fl_rho_manual;
    mp_params('fl_rho_routine') = fl_rho_routine;
    mp_params('fl_rho_analytical') = fl_rho_analytical;

    mp_params('fl_beta_1_manual') = fl_beta_1_manual;
    mp_params('fl_beta_1_routine') = fl_beta_1_routine;
    mp_params('fl_beta_1_analytical') = fl_beta_1_analytical;

    mp_params('fl_Y_manual') = fl_Y_manual;
    mp_params('fl_Y_routine') = fl_Y_routine;
    mp_params('fl_Y_analytical') = fl_Y_analytical;

    mp_data('fl_w1o1_init') = fl_w1o1_init;
    mp_data('fl_w1o2_init') = fl_w1o2_init;
    mp_data('fl_w1o3_init') = fl_w1o3_init;

    mp_data('fl_w2o1_init') = fl_w2o1_init;
    mp_data('fl_w2o2_init') = fl_w2o2_init;
    mp_data('fl_w2o3_init') = fl_w2o3_init;

    mp_data('fl_potwrker_1') = fl_potwrker_1;
    mp_data('fl_potwrker_2') = fl_potwrker_2;

    it_data_year = it_data_year - 1989;
    bl_checkminmax = true;
    it_solve_n1n2n3 = 3;
    [~, ~, ~, ~, ~, ~, ~, ~, ~, ...
        mp_wages, mp_fl_labor_demanded, mp_fl_labor_supplied, ...
```

```
        mp_fl_labor_occprbty] = ...
        bfw_solveequi_w2q2w(mp_params, mp_data, mp_func, mp_controls, ...
        it_solve_n1n2n3, it_data_year, bl_skilled, bl_checkminmax);

    disp('');
    disp('');
    disp('XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX');
    disp(['EXAMPLE ' num2str(it_example_inputs) ', ' st_exa_common_str ', ' char(st_exa_string)
    disp('XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX');
    ff_container_map_display(mp_wages);
    ff_container_map_display(mp_fl_labor_demanded);
    ff_container_map_display(mp_fl_labor_supplied);
    ff_container_map_display(mp_fl_labor_occprbty);

end
```

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
EXAMPLE 1, bfw_solveequi_w2q2w(), homogeneous rho at 0.18, unskilled
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_wages Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.2165
    C002    2     2     1.8628
    C003    3     3      3.227
    C101    4     4      1.578
    C102    5     5      1.819
    C103    6     6      3.795
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_demanded Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.6514
    C002    2     2     1.0896
    C003    3     3     1.4662
    C101    4     4     4.3057
    C102    5     5     3.1524
    C103    6     6     1.9727
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_supplied Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.6514
    C002    2     2     1.0896
    C003    3     3     1.4662
    C101    4     4     4.3057
    C102    5     5     3.1524
    C103    6     6     1.9727
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_occprbty Scalars
```

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xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx     value
            _    ___    ________

    C001    1     1      0.13194
    C002    2     2     0.087055
    C003    3     3      0.11714
    C101    4     4      0.43193
    C102    5     5      0.31623
    C103    6     6      0.19788
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
EXAMPLE 2, bfw_solveequi_w2q2w(), homogeneous rho at 0.64, unskilled
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_wages Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.2482
    C002    2     2     1.8713
    C003    3     3     3.1469
    C101    4     4     1.5614
    C102    5     5     1.8289
    C103    6     6     3.8378
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_demanded Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.6914
    C002    2     2     1.0934
    C003    3     3     1.4297
    C101    4     4     4.2646
    C102    5     5     3.1708
    C103    6     6     1.9952
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_supplied Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.6914
    C002    2     2     1.0934
    C003    3     3     1.4297
    C101    4     4     4.2645
    C102    5     5     3.1707
    C103    6     6     1.9952
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_occprbty Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx     value
            _    ___    ________

    C001    1     1      0.13514
    C002    2     2     0.087359
    C003    3     3      0.11423
    C101    4     4      0.42779
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    C102    5     5      0.31807
    C103    6     6      0.20014
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
EXAMPLE 3, bfw_solveequi_w2q2w(), homogeneous rho at 0.34, unskilled
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_wages Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     1.5675
    C002    2     2     2.5998
    C003    3     3     3.0763
    C101    4     4     1.9027
    C102    5     5     2.7234
    C103    6     6       3.72
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_demanded Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     3.9729
    C002    2     2     2.8316
    C003    3     3     2.6364
    C101    4     4     6.6763
    C102    5     5     6.0249
    C103    6     6     2.5039
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_supplied Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx    value
            _    ___    ______

    C001    1     1     3.9729
    C002    2     2     2.8316
    C003    3     3     2.6363
    C101    4     4     6.6763
    C102    5     5     6.0249
    C103    6     6     2.5039
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_fl_labor_occprbty Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
            i    idx     value
            _    ___    _______

    C001    1     1      0.2045
    C002    2     2     0.14576
    C003    3     3      0.1357
    C101    4     4     0.40474
    C102    5     5     0.36525
    C103    6     6      0.1518
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
EXAMPLE 4, bfw_solveequi_w2q2w(), heter rho (0.75, 0.24, 0.24), skilled
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_wages Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

	i	idx	value
C011	1	1	2.2661
C012	2	2	5.3851
C013	3	3	6.7078
C111	4	4	3.5562
C112	5	5	6.8374
C113	6	6	9.4358

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CONTAINER NAME: mp_fl_labor_demanded Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

	i	idx	value
C011	1	1	0.032483
C012	2	2	0.23899
C013	3	3	0.8312
C111	4	4	0.1707
C112	5	5	0.49341
C113	6	6	1.6894

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CONTAINER NAME: mp_fl_labor_supplied Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

	i	idx	value
C011	1	1	0.032483
C012	2	2	0.23897
C013	3	3	0.83122
C111	4	4	0.1707
C112	5	5	0.49336
C113	6	6	1.6895

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CONTAINER NAME: mp_fl_labor_occprbty Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

	i	idx	value
C011	1	1	0.018322
C012	2	2	0.13479
C013	3	3	0.46886
C111	4	4	0.068174
C112	5	5	0.19704
C113	6	6	0.67473