Compute Nested CES MPL Given Demand (CRS)

Testing the **bfw_crs_nested_ces_mpl** function from the **PrjLabEquiBFW Package.** Given labor quantity demanded, using first-order relative optimality conditions, find the marginal product of labor given CES production function. Results match up with correct relative wages, but not wage levels. Takes as inputs share and elasticity parameters across layers of sub-nests, as well as quantity demanded at each bottom-most CES nest layer. Works with Constant Elasticity of Substitution problems with constant returns, up to four nest layers, and two inputs in each sub-nest. Allows for uneven branches, so that some branches go up to four layers, but others have less layers, works with BFW (2022) nested labor input problem.

Key Inputs and Outputs for bfw_crs_nested_ces_mpl

Here are the key inputs for the CES demand solver function:

- **CL_MN_PRHO** cell array of rho (elasticity) parameter between negative infinity and 1. For example, suppose there are four nest layers, and there are two branches at each layer, then we have 1, 2, 4, and 8 ρ parameter values at the 1st, 2nd, 3rd, and 4th nest layers: size(CL_MN_PRHO{1})= $[1,1]$, size(CL_MN_PRHO{2}) = $[1,2]$, size(CL_MN_PRHO{3}) = $[2,2]$, size(CL_MN_PRHO{4}) = $[2,2,2]$. Note that if the model has 4 nest layers, not all cells need to be specified, some branches could be deeper than others.
- **CL_MN_PSHARE** cell array of share (between 0 and 1) for the first input of the two inputs for each nest. The structure for this is similar to CL_MN_PRHO.
- **CL_MN_YZ_CHOICES** cell array of quantity demanded for the first and second inputs of the bottom-most layer of sub-nests. The last index in each element of the cell array indicates first (1) or second (2) quantities. For example, suppose we have four layers, with 2 branches at each layer, as in the example for CL_MN_PRHO, then we have 2, 4, 8, and 16 quantity values at the 1st, 2nd, 3rd, and 4th nest layers: size(CL_MN_YZ_CHOICES{1})= $[1,2]$, size(CL_MN_YZ_CHOICES{2})= $[2,2]$, size(CL_MN_YZ_CHOICES{3})= $[2,2,2]$, size(CL_MN_YZ_CHOICES{4})= $[2,2,2,2]$. Note that only the last layer of quantities needs to be specified, in this case, the 16 quantities at the 4th layer. Given first order conditions, we solve for the 2, 4, and 8 aggregate quantities at the higher nest layers. If some branches are deeper than other branches, then can specific NA for non-reached layers along some branches.
- **BL_BFW_MODEL** boolean true by default if true then will output outcomes specific to the BFW 2022 problem.

Here are the key outputs for the CES demand solver function:

- **CL_MN_MPL_PRICE** has the same dimension as CL_MN_YZ_CHOICES, suppose there are four layers, the CL_MN_MPL_PRICE{4} results at the lowest layer includes wages that might be observed in the data. CL_MN_MPL_PRICE cell values at non-bottom layers include aggregate wages.
- **CL_MN_YZ_CHOICES** includes at the lowest layer observed wages, however, also includes higher layer aggregate solved quantities. CL_MN_PRHO and CL_MN_PSHARE are identical to inputs.

Single Nest Layer Two Inputs CES Problem (MPL)

In this first example, we solve a constant returns to scale problem with a single nest, meaning just two inputs and a single output.

```
clc;
close all;
clear all;

% rho = 0.5, 1/(1-0.5)=2, elasticity of substitution of 2
cl_mn_prho = {[0.1]};
% equal share, similar "productivity"
cl_mn_pshare = {[0.5]};
% levels of the two inputs, Values picked from demand problem parallel
% example.
cl_mn_yz_choices = {[0.67537, 1.4589]};
% print option
bl_verbose = true;
mp_func = bfw_mp_func_demand();
bl_bfw_model = false;
[cl_mn_yz_choices, cl_mn_mpl_price] = ...
    bfw_crs_nested_ces_mpl(cl_mn_prho, cl_mn_pshare, cl_mn_yz_choices, ...
    mp_func, bl_verbose, bl_bfw_model);
```

```
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                    i    idx    ndim    numel    rowN    colN     sum       mean        std       coefvari      min
                    _    ___    ____    _____    ____    ____    ______    _______    _______    ________    ______

    mpl_price_c1    1     1      2        2       1       2      1.0678    0.53388    0.25168    0.47141     0.3559
    yz_c1           2     4      2        2       1       2      2.1343     1.0671    0.55404    0.51918     0.6753

xxx TABLE:mpl_price_c1 xxxxxxxxxxxxxxxxxx
            c1         c2   
          _______    _______

    r1    0.71184    0.35592

xxx TABLE:yz_c1 xxxxxxxxxxxxxxxxxx
            c1         c2  
          _______    ______

    r1    0.67537    1.4589

----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                 i    idx    value
                 _    ___    _____

    prho_c1      1     2      0.1 
    pshare_c1    2     3      0.5 
```

Single Nest Layer Two Inputs CES Problem, Vary Share and Elasticity (MPL)

In this second example, we test over different rho values, explore optimal relative choices, as share and elasticity change. In this exercise, we also check, at every combination of rho and share parameter, whether the

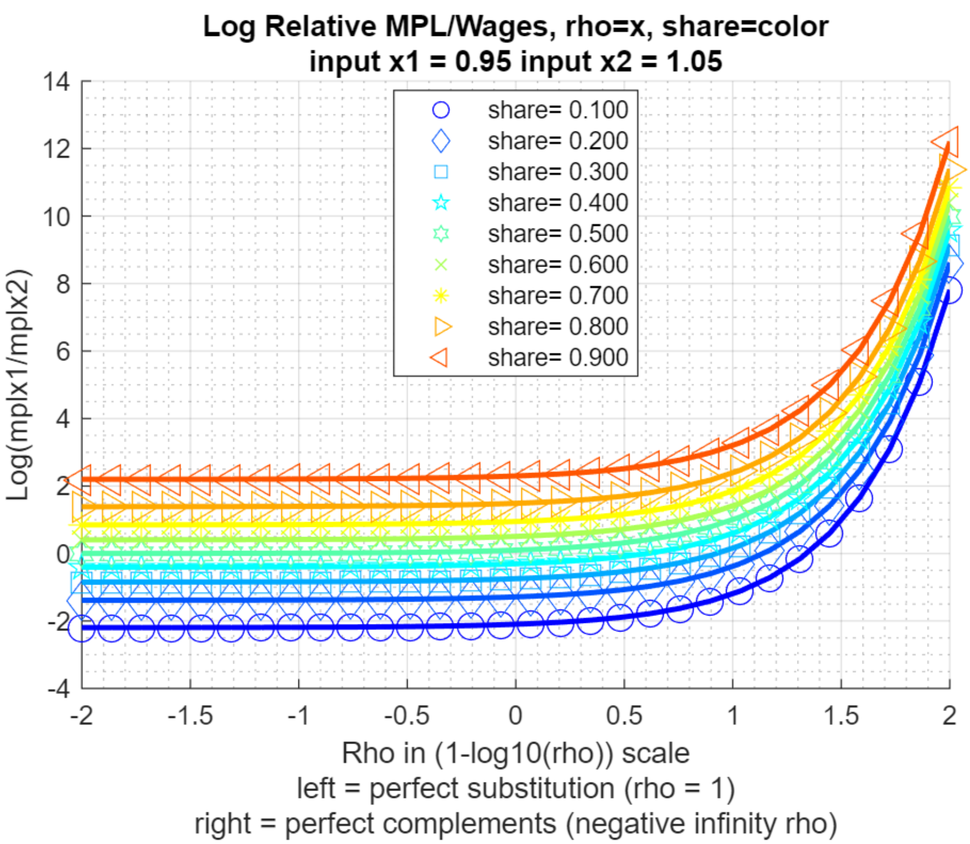
FOC condition is satisfied by the optimal choices. Also check if at the optimal choices, the minimization output requirement is met.

```
% Approximately close function
rel_tol=1e-09;
abs_tol=0.0;
if_is_close = @(a,b) (abs(a-b) <= max(rel_tol * max(abs(a), abs(b)), abs_tol));

% Input 1 and 2 fixed
fl_x_1 = 0.95;
fl_x_2 = 1.05;

% Define share and rho arrays
ar_pshare = linspace(0.1, 0.9, 9);
ar_prho = 1 - 10.^(linspace(-2, 2, 30));
% Loop over share and rho values
mt_rela_opti = NaN([length(ar_pshare), length(ar_prho)]);
mt_rela_wage = NaN([length(ar_pshare), length(ar_prho)]);
for it_pshare_ctr = 1:length(ar_pshare)
    for it_prho_ctr = 1:length(ar_prho)

        % A. Parameters
        % rho
        fl_prho = ar_prho(it_prho_ctr);
        cl_mn_prho = {[fl_prho]};
        % share
        fl_pshare = ar_pshare(it_pshare_ctr);
        cl_mn_pshare = {[fl_pshare]};
        % wages for the two inputs, identical wage
        % Note that if chosee {[1,1]} below, log(1/1) = log(1) = 0,
        % elasticity does not matter.
        cl_mn_yz_choices = {[fl_x_1, fl_x_2]};
        % print option
        bl_verbose = false;

        % B. Call function
        [cl_mn_yz_choices, cl_mn_mpl_price] = ...
            bfw_crs_nested_ces_mpl(cl_mn_prho, cl_mn_pshare, cl_mn_yz_choices, ...
            mp_func, bl_verbose, bl_bfw_model);
        % Store results for mpl given input choices
        fl_mpl_x1 = cl_mn_mpl_price{1}(1);
        fl_mpl_x2 = cl_mn_mpl_price{1}(2);
        mt_rela_wage(it_pshare_ctr, it_prho_ctr) = log(fl_mpl_x1/fl_mpl_x2);
    end
end
```

Key results: (1) As share parameter of input 1 goes to zero, input 1 is less productive, and the log(mplx1/mplx2) ratio is lower. (2) Becaus x2 input in this example is larger than x1 input, so as two inputs become more inelastic (more leontief), relative MPL for the lower level input is now larger. At the Leontief extreme, the MPL of the input provided at lower level is infinity.

```
% Visualize
% Generate some Data
```

```
rng(456);
ar_row_grid = ar_pshare;
ar_col_grid = log(1-ar_prho)/log(10);
rng(123);
mt_value = mt_rela_wage;
% container map settings
mp_support_graph = containers.Map('KeyType', 'char', 'ValueType', 'any');
mp_support_graph('cl_st_graph_title') = {...
    ['Log Relative MPL/Wages, rho=x, share=color'] ...
    ['input x1 = ' num2str(fl_x_1) ' input x2 = ' num2str(fl_x_2)]
    };
mp_support_graph('cl_st_ytitle') = {'Log(mplx1/mplx2)'};
mp_support_graph('cl_st_xtitle') = {'Rho in (1-log10(rho)) scale', ...
    'left = perfect substitution (rho = 1)', ...
    'right = perfect complements (negative infinity rho)'};
mp_support_graph('st_legend_loc') = 'best';
mp_support_graph('bl_graph_logy') = false; % do not log
mp_support_graph('st_rowvar_name') = 'share=';
mp_support_graph('it_legend_select') = 5; % how many shock legends to show
mp_support_graph('st_rounding') = '6.3f'; % format shock legend
mp_support_graph('cl_colors') = 'jet'; % any predefined matlab colormap
% Call function
ff_graph_grid(mt_value, ar_row_grid, ar_col_grid, mp_support_graph);
```



Doubly Nest Layer Two Inputs Each Sub-nest CES Problem

In this third example, solve for optimal choices for a doubly nested problem. Below, we first solve for the optimal choices, then we do a number of checks, to make sure that the solutions are correct, as expected.

```
% output requirement
fl_yz = 2.1;
% upper nest 0.1, lower nests 0.35 and -1 separately for rho values
cl_mn_prho = {[0.1], [0.35, -1]};
% unequal shares of share values
cl_mn_pshare = {[0.4], [0.3, 0.88]};
% differential wages
% in lower-left nest, not productive and very expensive, not very elastic
% last index for left or right. Values picked from demand problem parallel
% example.
cl_mn_yz_choices = {[nan, nan], [0.04789, 6.0934; 2.2044, 0.70496]};
% print option
bl_verbose = true;
[cl_mn_yz_choices, cl_mn_mpl_price] = ...
    bfw_crs_nested_ces_mpl(cl_mn_prho, cl_mn_pshare, cl_mn_yz_choices, ...
    mp_func, bl_verbose, bl_bfw_model);
```

```
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

	i	idx	ndim	numel	rowN	colN	sum	mean	std	coefvari	min
mpl_price_c1	1	1	2	2	1	2	1.0206	0.51032	0.27499	0.53886	0.31587
mpl_price_c2	2	2	2	4	2	2	2.3618	0.59045	0.5082	0.86069	0.13121
prho_c2	3	4	2	2	1	2	-0.65	-0.325	0.95459	-2.9372	-1
pshare_c2	4	6	2	2	1	2	1.18	0.59	0.41012	0.69512	0.3
yz_c1	5	7	2	2	1	2	4.4862	2.2431	0.68863	0.307	1.7562
yz_c2	6	8	2	4	2	2	9.0507	2.2627	2.7086	1.1971	0.04789

xxx TABLE:mpl_price_c1 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	0.31587	0.70476

xxx TABLE:mpl_price_c2 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	1.3121	0.13121
r2	0.39362	0.52484

xxx TABLE:prho_c2 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	0.35	-1

xxx TABLE:pshare_c2 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	0.3	0.88

xxx TABLE:yz_c1 xxxxxxxxxxxxxxxxxx

```
          c1       c2
         ____     ______

    r1    2.73    1.7562

xxx TABLE:yz_c2 xxxxxxxxxxxxxxxxxx
           c1          c2
         _______     _______

    r1    0.04789     6.0934
    r2     2.2044    0.70496

----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map Scalars
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                 i    idx    value
                 _    ___    _____

    prho_c1      1     3      0.1
    pshare_c1    2     5      0.4
```

```
% there are four optimal choices, they are
fl_mpl_x11 = cl_mn_mpl_price{2}(1,1);
fl_mpl_x12 = cl_mn_mpl_price{2}(1,2);
fl_mpl_x21 = cl_mn_mpl_price{2}(2,1);
fl_mpl_x22 = cl_mn_mpl_price{2}(2,2);
% display
st_print = strjoin(...
    ["completed double nest test:", ...
    ['nest 1 input 1, fl_mpl_x11=' num2str(fl_mpl_x11)], ...
    ['nest 1 input 2, fl_mpl_x12=' num2str(fl_mpl_x12)], ...
    ['nest 2 input 1, fl_mpl_x21=' num2str(fl_mpl_x21)], ...
    ['nest 2 input 2, fl_mpl_x22=' num2str(fl_mpl_x22)], ...
    ['nest 1 input 1, fl_mpl_x11/fl_mpl_x11=' num2str(fl_mpl_x11/fl_mpl_x11)], ...
    ['nest 1 input 2, fl_mpl_x12/fl_mpl_x11=' num2str(fl_mpl_x12/fl_mpl_x11)], ...
    ['nest 2 input 1, fl_mpl_x21/fl_mpl_x11=' num2str(fl_mpl_x21/fl_mpl_x11)], ...
    ['nest 2 input 2, fl_mpl_x22/fl_mpl_x11=' num2str(fl_mpl_x22/fl_mpl_x11)], ...
    ], ";");
st_out = st_print;
ar_ch_out = char(strsplit(st_print,";")');
disp(ar_ch_out);
```

```
completed double nest test:
nest 1 input 1, fl_mpl_x11=1.3121
nest 1 input 2, fl_mpl_x12=0.13121
nest 2 input 1, fl_mpl_x21=0.39362
nest 2 input 2, fl_mpl_x22=0.52484
nest 1 input 1, fl_mpl_x11/fl_mpl_x11=1
nest 1 input 2, fl_mpl_x12/fl_mpl_x11=0.099995
nest 2 input 1, fl_mpl_x21/fl_mpl_x11=0.29998
nest 2 input 2, fl_mpl_x22/fl_mpl_x11=0.39999
```

BFW (2022) Nested Three Branch (Four Layer) Problem (MPL)

The model BFW 2022 has three branches and four layers. one of the branches go down only three layers, the other two branches go down four layers.

First, we prepare the various inputs:

```
% Controls
bl_verbose = true;
bl_bfw_model = true;

% Given rho and beta, solve for equilibrium quantities
mp_func = bfw_mp_func_demand();

% Following instructions in: PrjFLFPMexicoBFW\solvedemand\README.md

% Nests/layers
it_nests = 4;

% Input cell of mn matrixes
it_prho_cl = 1;
it_pshare_cl = 2;
it_yz_share_cl = 3;
for it_cl_ctr = [1,2,3]

    cl_mn_cur = cell(it_nests,1);

    % Fill each cell element with NaN mn array
    for it_cl_mn = 1:it_nests

        bl_yz_share = (it_cl_ctr == it_yz_share_cl);

        if (~bl_yz_share && it_cl_mn == 1)
            mn_nan = NaN;
        elseif (~bl_yz_share && it_cl_mn == 2) || (bl_yz_share && it_cl_mn == 1)
            mn_nan = [NaN, NaN];
        elseif (~bl_yz_share && it_cl_mn == 3) || (bl_yz_share && it_cl_mn == 2)
            mn_nan = NaN(2,2);
        elseif (~bl_yz_share && it_cl_mn == 4) || (bl_yz_share && it_cl_mn == 3)
            mn_nan = NaN(2,2,2);
        elseif (~bl_yz_share && it_cl_mn == 5) || (bl_yz_share && it_cl_mn == 4)
            mn_nan = NaN(2,2,2,2);
        elseif (~bl_yz_share && it_cl_mn == 6) || (bl_yz_share && it_cl_mn == 5)
            mn_nan = NaN(2,2,2,2,2);
        end
        cl_mn_cur{it_cl_mn} = mn_nan;
    end

    % Name cell arrays
    if (it_cl_ctr == it_prho_cl)
        cl_mn_prho = cl_mn_cur;
    elseif (it_cl_ctr == it_pshare_cl)
        cl_mn_pshare = cl_mn_cur;
    elseif (it_cl_ctr == it_yz_share_cl)
        cl_mn_yz_choices = cl_mn_cur;
    end
end

% Initialize share matrix
```

```
rng(123);
for it_cl_mn = 1:it_nests
    mn_pshare = cl_mn_pshare{it_cl_mn};
    if it_cl_mn == 4
        mn_pshare(2,:,:) = rand(2,2);
    else
        mn_pshare = rand(size(mn_pshare));
    end
    cl_mn_pshare{it_cl_mn} = mn_pshare;
end

% Initialize rho matrix
rng(456);
for it_cl_mn = 1:it_nests
    mn_prho = cl_mn_prho{it_cl_mn};
    if it_cl_mn == 4
        mn_prho(2,:,:) = rand(2,2);
    else
        mn_prho = rand(size(mn_prho));
    end
    % Scalling rho between 0.7500 and -3.0000
    % 1 - 2.^(linspace(-2,2,5))
    mn_prho = 1 - 2.^(mn_prho*(4) - 2);
    cl_mn_prho{it_cl_mn} = mn_prho;
end

% Initialize quantities matrix
rng(789);
for it_cl_mn = 1:it_nests
    mn_yz_choices = cl_mn_yz_choices{it_cl_mn};
    if it_cl_mn == 3
        mn_yz_choices(1,:,:) = rand(2,2);
    elseif it_cl_mn == 4
        mn_yz_choices(2,:,:,:) = rand(2,2,2);
    end
    % Scalling quantities between 3 amd 5
    mn_yz_choices = mn_yz_choices*(2) + 3;
    cl_mn_yz_choices{it_cl_mn} = mn_yz_choices;
end

% Initialize yz matrix
rng(101112);
```

Second, display created inputs:

```
celldisp(cl_mn_prho);
```

```
cl_mn_prho{1} =

    0.5017



cl_mn_prho{2} =
```

```
    0.6071   -1.1955



cl_mn_prho{3} =

   -1.3523   -0.3346
   -0.4167   -1.9136



cl_mn_prho{4} =


(:,:,1) =

       NaN       NaN
   -1.0512    0.5869


(:,:,2) =

       NaN       NaN
    0.6209    0.1633
```

```
celldisp(cl_mn_pshare);
```

```
cl_mn_pshare{1} =

    0.6965



cl_mn_pshare{2} =

    0.2861    0.2269



cl_mn_pshare{3} =

    0.5513    0.4231
    0.7195    0.9808



cl_mn_pshare{4} =


(:,:,1) =

       NaN       NaN
    0.6848    0.4809


(:,:,2) =

       NaN       NaN
    0.3921    0.3432
```

```
celldisp(cl_mn_yz_choices);
```

```
cl_mn_yz_choices{1} =

   NaN   NaN



cl_mn_yz_choices{2} =

   NaN   NaN
   NaN   NaN



cl_mn_yz_choices{3} =


(:,:,1) =

    3.6467    3.4605
       NaN       NaN


(:,:,2) =

    4.5876    4.2488
       NaN       NaN



cl_mn_yz_choices{4} =


(:,:,1,1) =

       NaN       NaN
    4.9508    4.5178


(:,:,2,1) =

       NaN       NaN
    3.0212    3.0495


(:,:,1,2) =

       NaN       NaN
    3.2221    4.0763


(:,:,2,2) =

       NaN       NaN
    3.0909    4.1031
```

Third, call function and solve for optimal demand:

```
% Call function
[cl_mn_yz_choices, cl_mn_mpl_price] = ...
    bfw_crs_nested_ces_mpl(cl_mn_prho, cl_mn_pshare, cl_mn_yz_choices, ...
    mp_func, bl_verbose, bl_bfw_model);
```

```
----------------------------------------
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map ND Array (Matrix etc)
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
                    i     idx    ndim    numel    rowN    colN      sum        mean        std       coefvari
                    _     ___    ____    _____    ____    ____    ________    ________    ________    ________    _

    mpl_price_c1    1      1      2        2       1       2       1.0002      0.5001     0.28686     0.57362
    mpl_price_c2    2      2      2        4       2       2       1.0009     0.25022     0.17949     0.71731     0
    mpl_price_c3    3      3      3        8       2       4       1.0088      0.1261     0.10191     0.80822    0.
    mpl_price_c4    4      4      4       16       2       8          NaN         NaN         NaN         NaN    0.
    prho_c2         5      6      2        2       1       2     -0.58844    -0.29422      1.2746     -4.3323
    prho_c3         6      7      2        4       2       2      -4.0173     -1.0043     0.76195    -0.75868
    prho_c4         7      8      3        8       2       4          NaN         NaN         NaN         NaN
    pshare_c2       8     10      2        2       1       2      0.51299      0.2565    0.041923     0.16344
    pshare_c3       9     11      2        4       2       2       2.6747     0.66866     0.24087     0.36023
    pshare_c4      10     12      3        8       2       4          NaN         NaN         NaN         NaN
    yz_c1          11     13      2        2       1       2       8.0897      4.0448       0.173     0.04277
    yz_c2          12     14      2        4       2       2       16.015      4.0039     0.19166     0.04787
    yz_c3          13     15      3        8       2       4       31.235      3.9044     0.51337     0.13149
    yz_c4          14     16      4       16       2       8          NaN         NaN         NaN         NaN

xxx TABLE:mpl_price_c1 xxxxxxxxxxxxxxxxxx
            c1         c2   
          _______    _______

    r1    0.70294    0.29725

xxx TABLE:mpl_price_c2 xxxxxxxxxxxxxxxxxx
             c1         c2   
          ________    _______

    r1     0.19946    0.50351
    r2    0.080381    0.21754

xxx TABLE:mpl_price_c3 xxxxxxxxxxxxxxxxxx
             c1          c2          c3           c4    
          ________    _______    ________    _________

    r1     0.13727    0.24893    0.065108      0.25809
    r2    0.050551    0.21139    0.031132    0.0063057

xxx TABLE:mpl_price_c4 xxxxxxxxxxxxxxxxxx
            c1          c2          c3           c4           c5          c6          c7           c8    
          _______    ________    ________    _________    ________    _______    ________    _________

    r1        NaN         NaN         NaN          NaN         NaN        NaN         NaN          NaN
    r2    0.02507    0.099481    0.012272    0.0025507    0.027845    0.11203    0.018861    0.0038085

xxx TABLE:prho_c2 xxxxxxxxxxxxxxxxxx
            c1         c2   
          _______    _______

    r1    0.60709    -1.1955
```

xxx TABLE:prho_c3 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	-1.3523	-0.33464
r2	-0.41668	-1.9136

xxx TABLE:prho_c4 xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4
r1	NaN	NaN	NaN	NaN
r2	-1.0512	0.58694	0.62089	0.16334

xxx TABLE:pshare_c2 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	0.28614	0.22685

xxx TABLE:pshare_c3 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	0.55131	0.42311
r2	0.71947	0.98076

xxx TABLE:pshare_c4 xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4
r1	NaN	NaN	NaN	NaN
r2	0.68483	0.48093	0.39212	0.34318

xxx TABLE:yz_c1 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	3.9225	4.1672

xxx TABLE:yz_c2 xxxxxxxxxxxxxxxxxx

	c1	c2
r1	4.0073	3.8887
r2	3.8468	4.2727

xxx TABLE:yz_c3 xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4
r1	3.6467	3.4605	4.5876	4.2488
r2	4.23	4.2863	3.0635	3.7118

xxx TABLE:yz_c4 xxxxxxxxxxxxxxxxxx

	c1	c2	c3	c4	c5	c6	c7	c8
r1	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
r2	4.9508	4.5178	3.0212	3.0495	3.2221	4.0763	3.0909	4.1031

----
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
CONTAINER NAME: mp_container_map Scalars

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

	i	idx	value
prho_c1	1	5	0.50172
pshare_c1	2	9	0.69647