

M-shaped Female Labor Force Participation Curve- Reality and Prediction in South Korea

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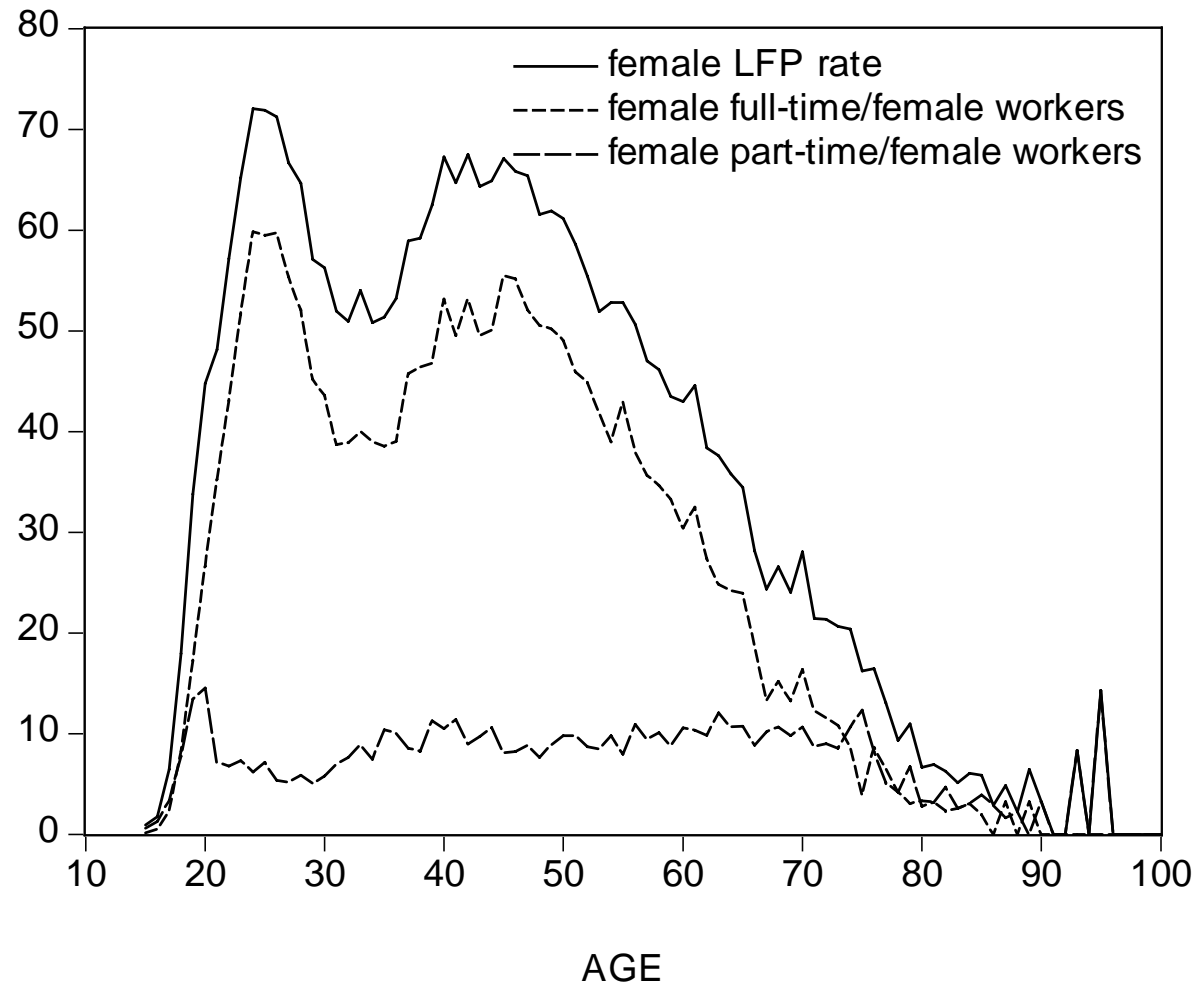
- Both genders in Korea have started to enjoy similar levels of higher and planned education
- And consequently women's ability to obtain the highly-paid white-collar jobs has been enhanced.
- Coupled with the better access to overall job market, a higher education allows female workers to consider their life-time employment plans more realistically than ever before.

- The marriage bars, however, still exist as a major obstacle in this trend and Korean female workers often remained at the bottleneck in employment because of women's domestic and childcare responsibilities.
- This paper identifies the turning ages of leaving and rejoining the labor force of female workers due to marriage, child birth and caring,
- Also examines the female participation trends over time, which are heavily influenced by Korean government labor policies toward the female workers.

literature on how industrialization changes
the female labor force participation

- emancipation hypothesis – a direct relationship between industrialization and employment,
- reverse U-hypothesis – a curvilinear relationship between industrialization and female labor force participation which increases when white-collar service jobs appear and family structures changes (Goldin 1983), and
- constancy hypothesis – woman always worked and the curvilinear patterns is a statistical artifact.

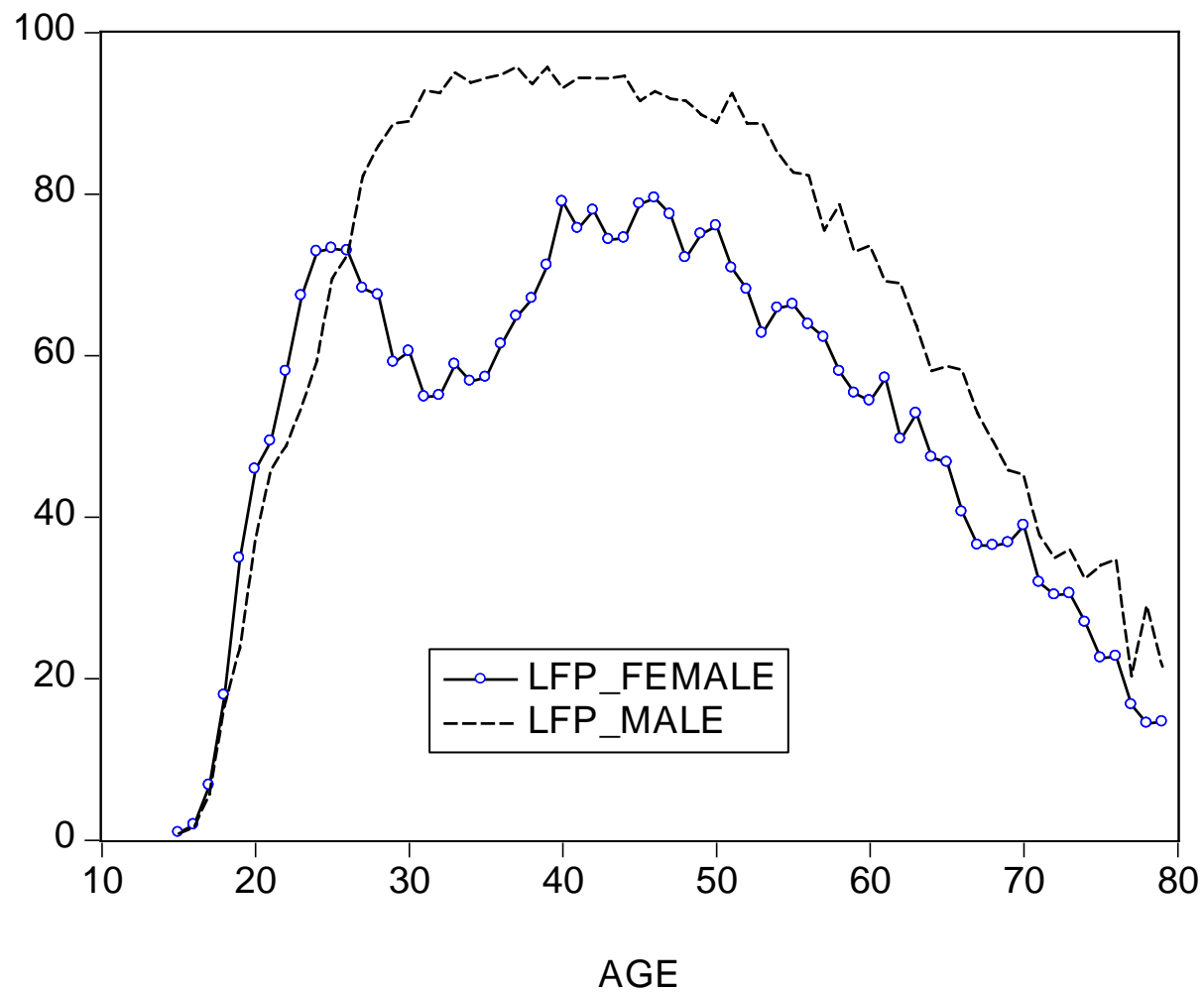
**Figure: Full-time versus part-time female LFP rate
– EAP January 2007**



The female labor-force-participation rate is

- highest at the age of 24 (72% of labor-force-participation rate)
- lower at the ages of 32 (50.91%) and 34 (50.79%),
- the second highest peak occurs at the age of 42 (67.50%),
- After that age, the ratio keeps decreasing.

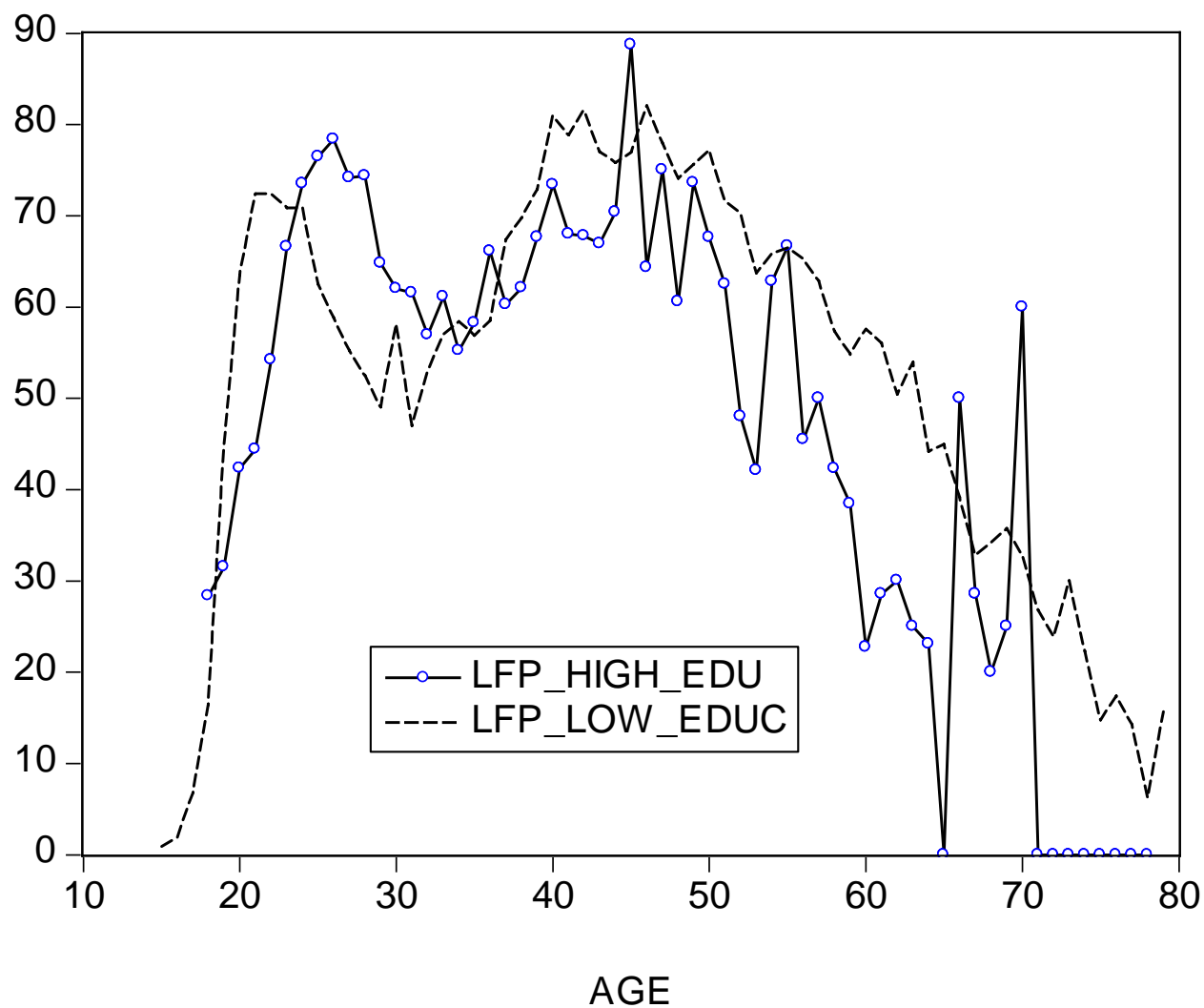
Figure: Female versus Male LFP rates– EAP January 2007



Education level and female M-shaped curve

- The education level is classified into two groups, the lower education level and the higher level.
- The first group includes the graduates of elementary, middle and high schools,
- The latter group encompasses the graduates of two-year colleges, four-year universities and graduate schools.

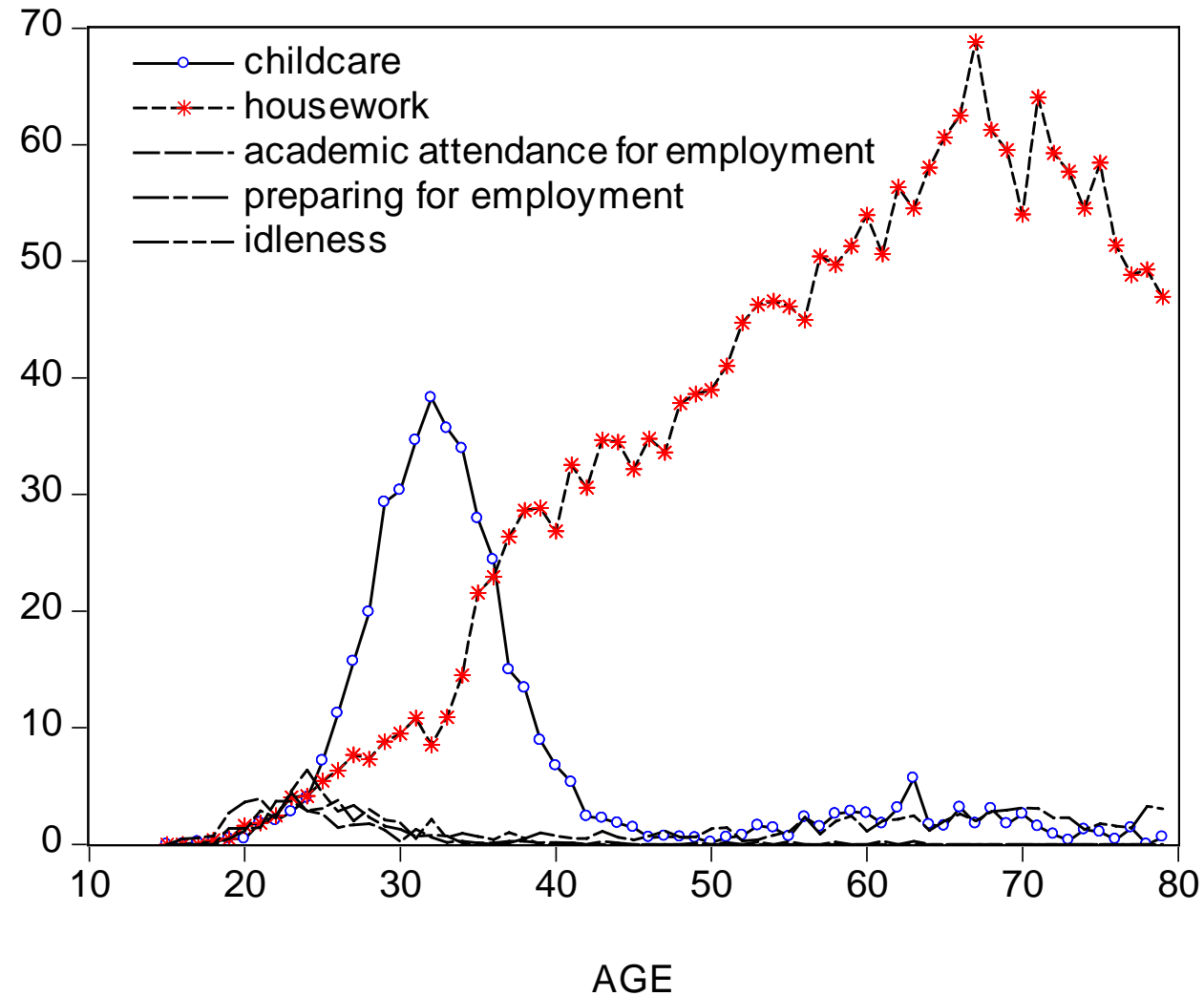
**Figure: Female LFP rates by education levels
– EAP January 2007**



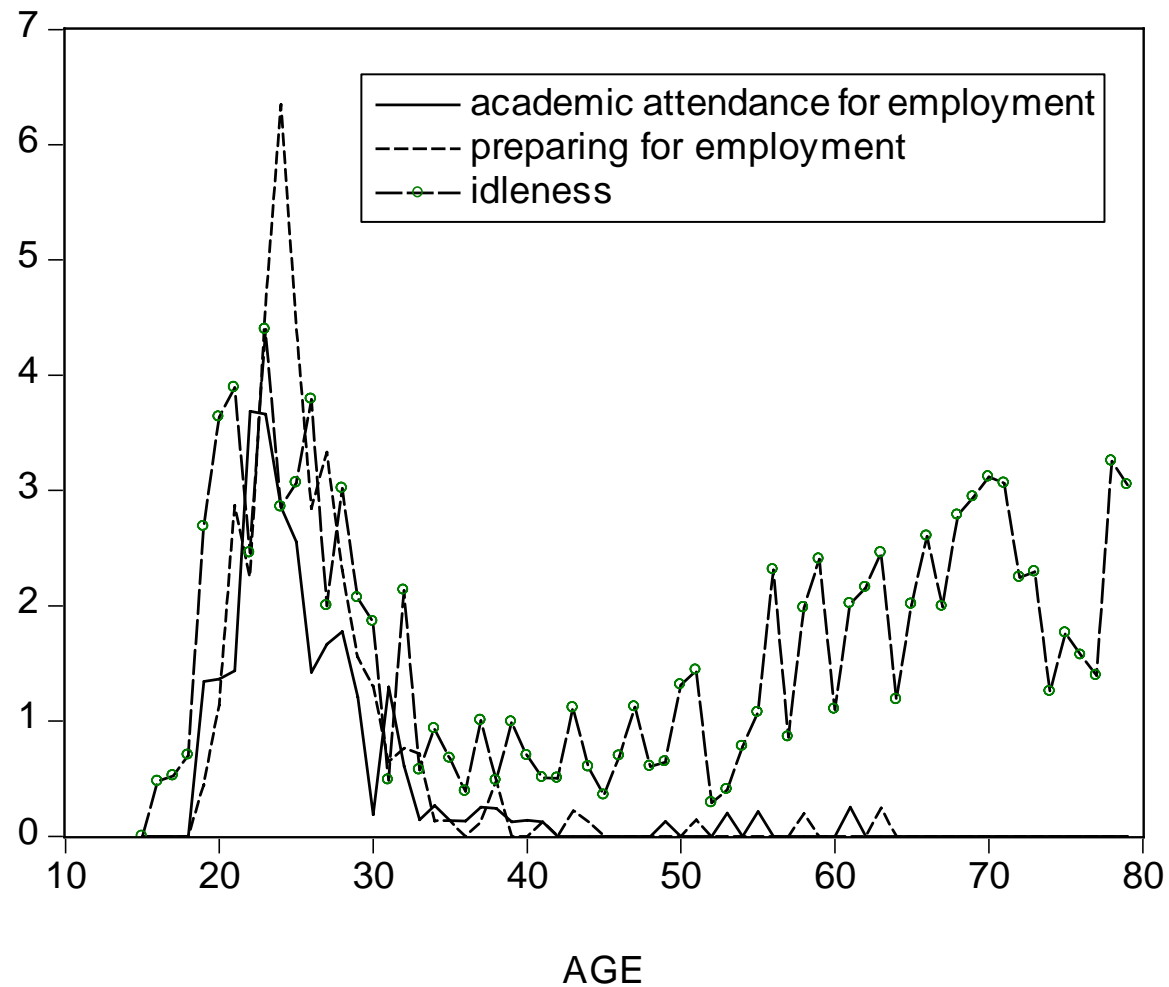
Female Workers and Bottleneck in Employment

$$\frac{LF}{LF + NonLF} = 1 - \frac{NonLF}{LF + NonLF}$$

Figure: Female Workers' Bottleneck in Employment

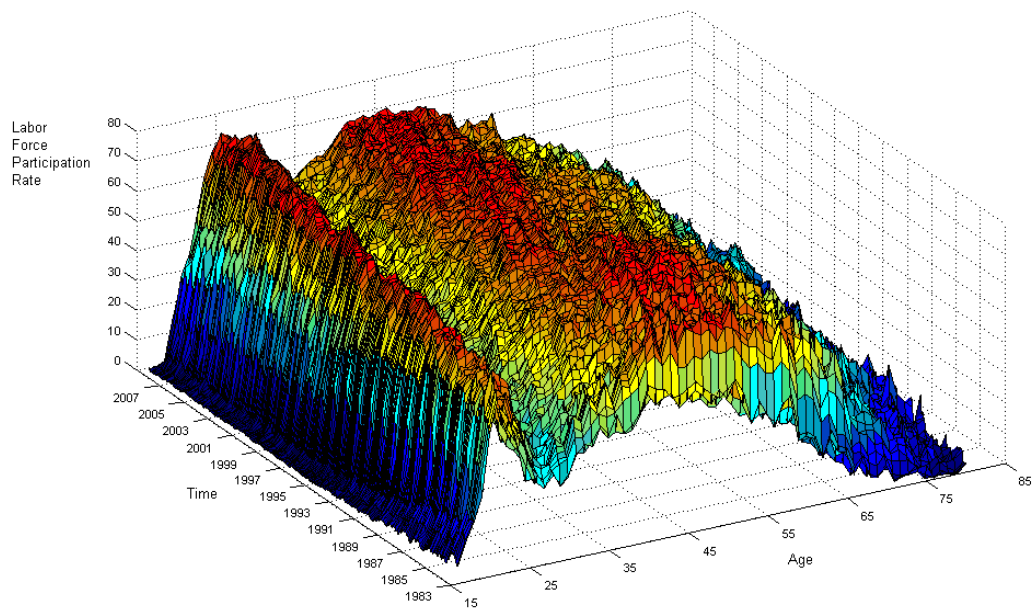
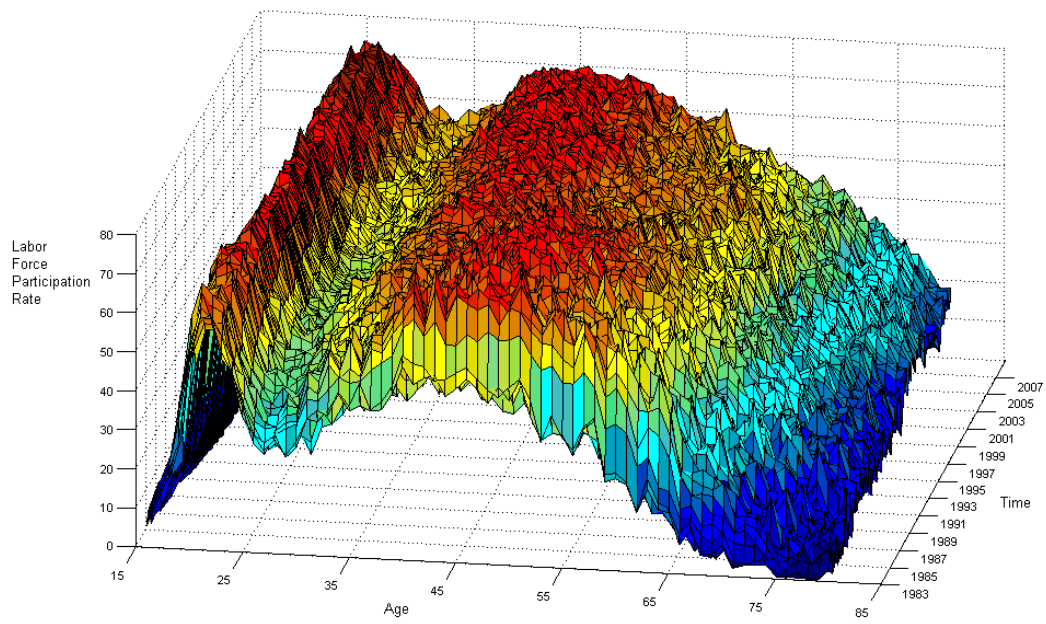


**Figure: Employment Effort
and Idleness of Female Workers**



Time trends of M-shaped curve

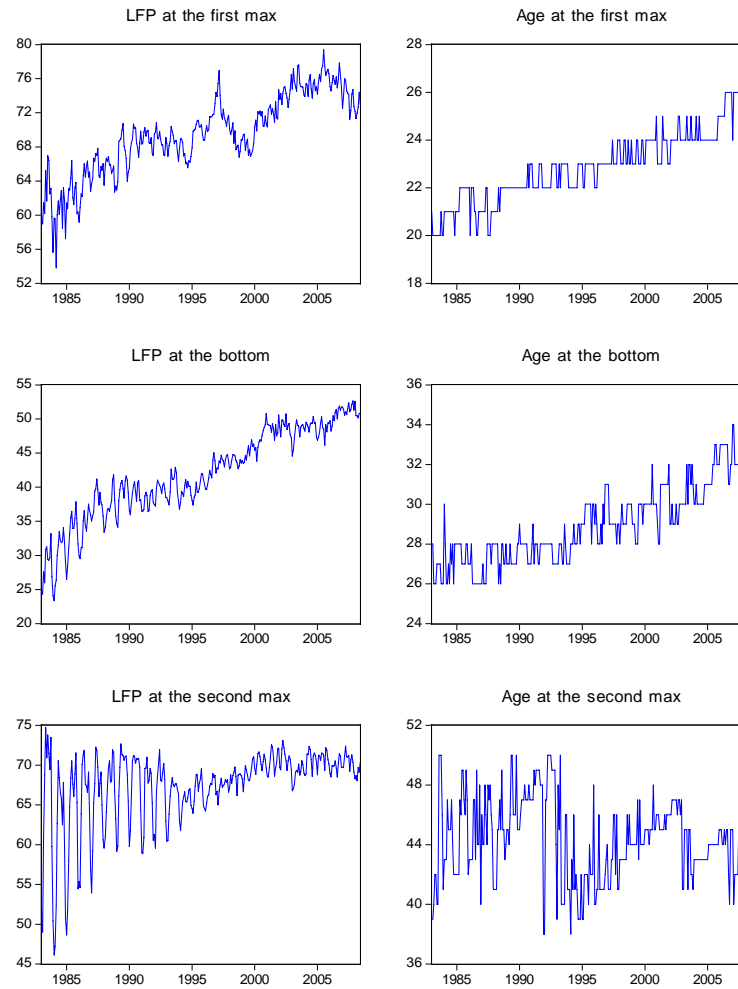
- The M-shaped curve indicates the two peak ages and one trough age.
- The ages of three points are obtained over time.
- The corresponding labor force participation rates (the first peak, the trough, the second peak) are collected and analyzed as well.



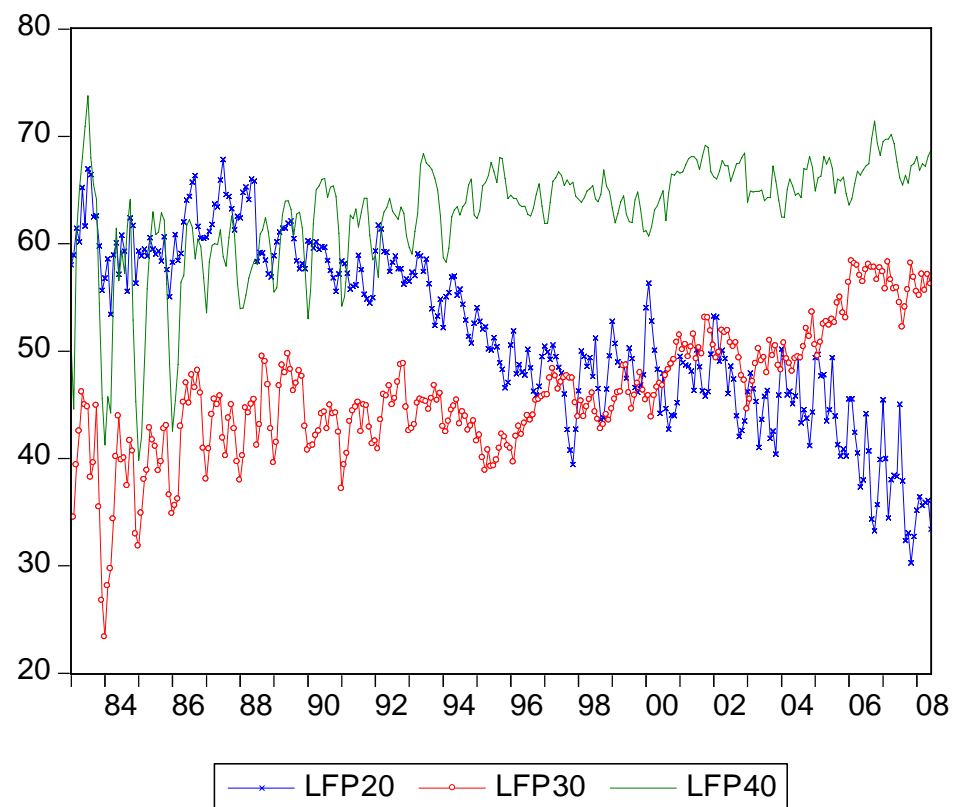
Identify *locally* three turning points

- $$first_{age,t} = \max (f_{15,t}, f_{16,t}, f_{17,t}, \dots f_{33,t})$$
$$age_{first,t} = \arg \max_k (f_{15,t}, f_{16,t}, f_{17,t}, \dots f_{33,t})$$
- where f is the female labor force participation rate at the age k in the surveyed period of t . Equivalently, the bottom and the second maximum points are identified.

Figure: Identifying turning ages and their percentages



Labor force participation at ages of 20, 30 and 40



The changes in the first peak points are associated with

- (i) the increase of younger female workers in the class of non-labor-force, for example, the NEET young group,
- (ii) the postponed graduation from the college mainly due to job preparations through extended foreign language exercise and extensive job internships,
- (iii) the increase in the job search duration period after graduation.

Up-trend of the bottoms

- is related to the changes of personnel policies managed by private companies,
- the adaptation of the affirmative actions in the Korean female labor market,
- the attempt of protecting the legal rights of female workers once female workers are able to take the regular full-time jobs.
- the marriage bar is lower toward the favor of younger female workers and the effective policies have been imposed on the younger female labor market.

Regression

- Sample periods: Monthly between January 1983 and June 2008
- Dependent variable:
 - LPF at the first peak
 - LPF at the bottom
 - LPF at the second peak
 - LPF at the age of 20
 - LPF at the age of 30
 - LPF at the age of 40
 - LPF at the age of 50
- Independent variables
 - trends (either deterministic or stochastic)
 - seasonality (monthly)
 - monthly macroeconomic variables
 - monthly labor-related variables

| | age 20 | First Peak | age 30 | Bottom | age 40 | Second peak | age 50 |
|------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Constant | 12.873 (4.79) | 19.493 (7.19) | 5.358 (2.93) | 12.280 (4.47) | 9.993 (4.10) | 2.987 (2.73) | 7.507 (2.69) |
| unemployment | 0.145 (1.27) | -0.322 (-3.51) | -0.118 (-1.1) | -0.020 (-0.16) | -0.219 (-1.74) | -0.038 (-0.55) | -0.093 (-0.59) |
| education | -0.104 (-4.28) | 0.099 (5.44) | 0.032 (1.91) | 0.038 (2.02) | 0.060 (2.90) | 0.084 (4.59) | 0.018 (0.78) |
| inflation | 0.175 (2.05) | 0.017 (0.28) | 0.008 (0.11) | 0.034 (0.38) | 0.005 (0.06) | -0.044 (-0.88) | 0.102 (0.9) |
| coincident comp. Index | 0.055 (1.39) | -0.023 (-0.78) | -0.018 (-0.51) | 0.017 (0.40) | -0.046 (-1.09) | 0.008 (0.35) | 0.044 (0.82) |
| interest | -0.015 (-0.28) | -0.056 (-1.39) | -0.093 (-1.82) | -0.028 (-0.48) | -0.014 (-0.24) | -0.014 (-0.42) | -0.048 (-0.65) |
| first lag of dependent | 0.830 (25.48) | 0.674 (15.65) | 0.843 (27.16) | 0.749 (19.33) | 0.776 (21.08) | 0.825 (25.30) | 0.792 (21.85) |
| dummy for January | 1.758 (3.12) | 0.165 (0.4) | 0.391 (0.76) | 0.730 (1.19) | 0.043 (0.07) | -0.102 (-0.30) | 0.750 (0.96) |
| dummy for February | 0.108 (0.19) | 0.948 (2.29) | 2.275 (4.32) | 2.076 (3.26) | 2.049 (3.30) | 0.524 (1.50) | 3.803 (4.67) |
| dummy for March | -1.649 (-2.84) | 0.911 (2.23) | 2.907 (5.62) | 5.033 (8.02) | 4.021 (6.55) | 1.472 (4.24) | 7.929 (9.90) |
| dummy for April | -0.176 (-0.31) | 0.338 (0.83) | 2.943 (5.78) | 5.466 (9.18) | 4.340 (7.31) | 1.597 (4.74) | 7.713 (10.16) |
| dummy for May | -0.592 (-1.04) | 0.691 (1.7) | 2.787 (5.51) | 4.765 (8.06) | 3.321 (5.65) | 1.619 (4.87) | 6.062 (8.06) |
| dummy for June | -1.102 (-1.95) | 0.554 (1.36) | 2.356 (4.66) | 3.719 (6.24) | 3.130 (5.33) | 1.275 (3.85) | 5.990 (7.94) |
| dummy for July | 1.620 (2.85) | 0.347 (0.84) | 1.038 (2.04) | 2.593 (4.31) | 2.328 (3.92) | 0.528 (1.58) | 4.488 (5.87) |
| dummy for August | -2.027 (-3.47) | -0.432 (-1.05) | 1.313 (2.57) | 2.549 (4.27) | 2.017 (3.40) | 0.130 (0.39) | 4.565 (6.00) |
| dummy for September | -2.669 (-4.69) | -0.107 (-0.26) | 2.833 (5.52) | 4.205 (7.04) | 3.555 (5.99) | 2.228 (6.63) | 5.651 (7.43) |
| dummy for October | -1.129 (-2.01) | 0.286 (0.70) | 2.964 (5.79) | 4.442 (7.41) | 3.460 (5.82) | 1.537 (4.59) | 6.294 (8.25) |
| dummy for November | -1.501 (-2.68) | -0.419 (-1.02) | 1.324 (2.59) | 1.519 (2.52) | 1.249 (2.09) | 0.167 (0.50) | 2.339 (3.05) |
| R ² | 0.944 | 0.911 | 0.907 | 0.970 | 0.852 | 0.804 | 0.814 |
| adj. R ² | 0.941 | 0.905 | 0.901 | 0.968 | 0.843 | 0.793 | 0.803 |
| DW stat | 2.04 | 2.22 | 1.81 | 2.07 | 1.54 | 1.50 | 1.46 |

Conclusion

- Although the M-shaped curve is dominant in the Korean female labor force participation, it is expected that its shape will be transformed to a reverse U-shaped curve in the near future.
- Our study characterizes the stylized facts during this transition, which guides to propose the future balanced policy directions on childcare support, re-training program and active part-timer markets.