Female Labor Force Participation in Turkey: A Synthetic Cohort Analysis, 1988-2013

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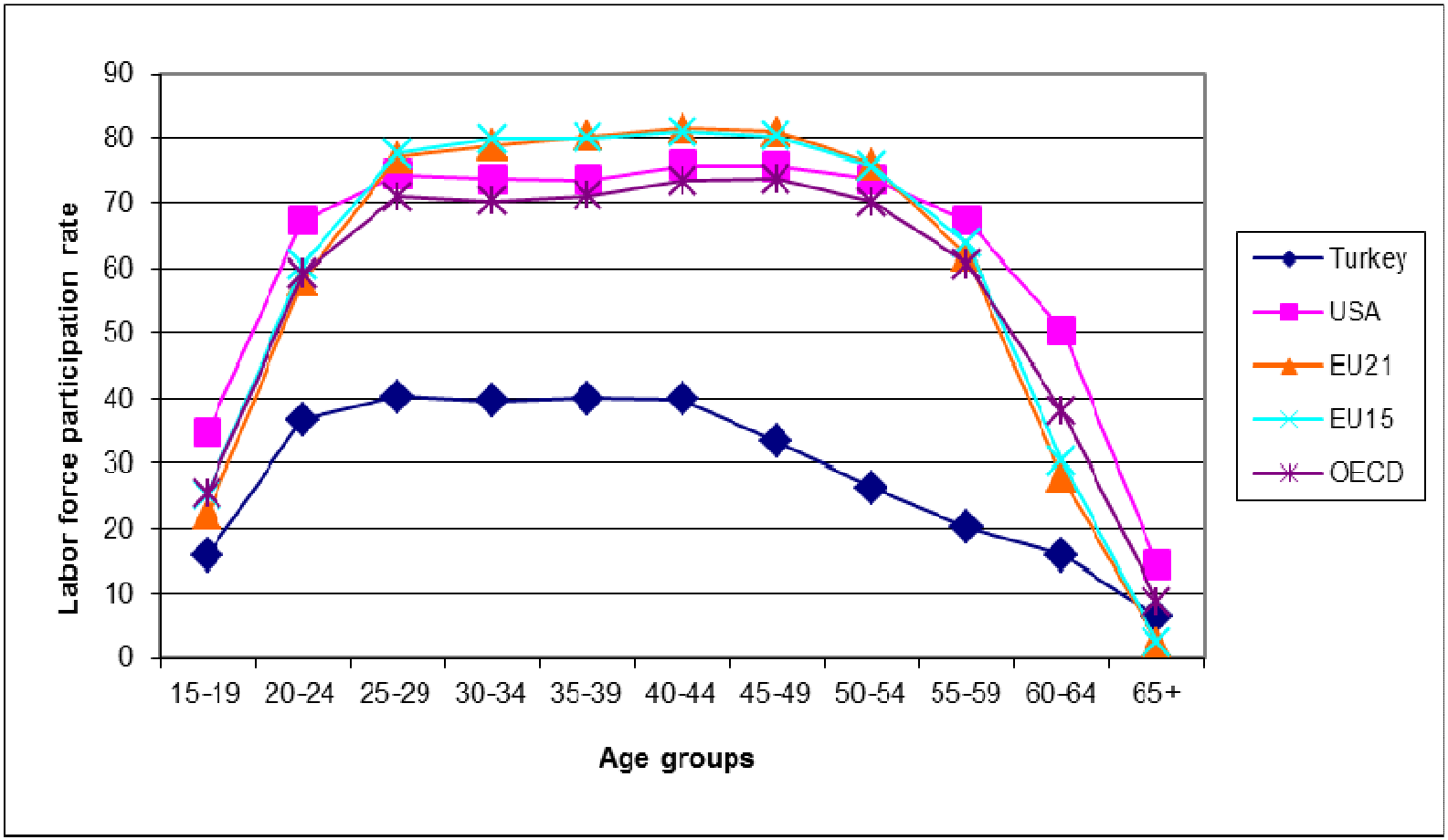
AIMS:

- Study the aggregate labor supply behavior of women over a 25-year period using a synthetic birth cohort analysis
- Decompose changes in labor force participation rates into age, time and cohort effects
- Construct true age-profiles that represent the behavior of a typical woman over her life-cycle
- Analyze how the behavior of younger cohorts differ from older cohorts
- Analyze how economic changes over time affect labor supply behavior

Female labor force participation rates by country/region, 2012



Motivation:

- Low participation rate of women

OECD average in 2012 (ages 15-64): 62.3% Turkey: 32.3%

For men:
OECD average in 2012 (ages 15-64): 79.9% Turkey: 75.8%

- Large participation gap between men and women

OECD average gap in favor of men: 17.6pp Turkey: 45pp

Contribution:

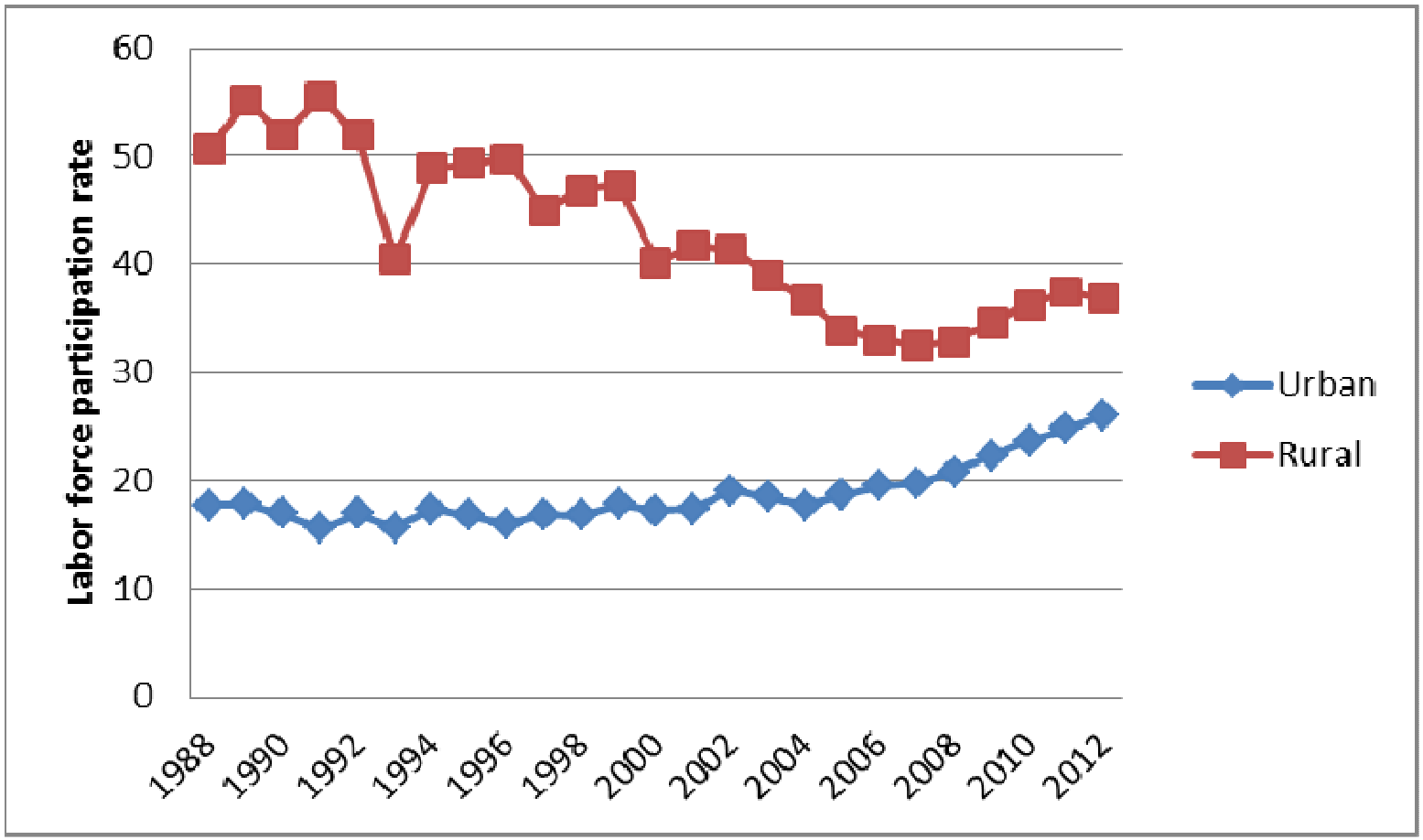
- A large literature exists on labor supply behavior of women

Tansel (1994, 1999), Tunalı (1997); Dayıoğlu ve Kasnakoğlu (1997), Ercan and Tunalı (1998), Dayıoğlu (2000), Tunalı ve Başlevent (2001), Dayıoğlu and Tunalı (2003), World Bank (2005), Buğra (2010), Buğra and Yakut-Çakar (2010), İlkkaracan (2012)

Factors that affect women's LFPR:

- Education, rural residence, marriage, number of children (indiv. factors)
- Social norms
- Social policy

Participation rates of women over years by urban/rural status



- Women's participation falling in rural areas until mid-2000s and rebounding afterwards. Why?

- Stagnant participation rates in urban areas until 2008 despite improvements in education, reduction in fertility, higher age at marriage and first birth. Why? But increasing participation rates after 2003.

- These could result from both changes in year effects (due to changes in economic conditions) and in cohort effects (later cohorts behaving differently than earlier cohorts)—assuming constant age-participation rate profiles over time and cohorts.

Data:

Household Labor Force Surveys of TurkStat: 1988-2013 (repeated cross-sections)

Use average values of labor force participation rates for ages 15 to 64.

Separate analyses by place of residence and schooling, for both men and women.

Methodology:

Synthetic cohort analysis – follow the same cohort over time

Decomposition analysis:

$$L = \beta + A\alpha + C\mu + T\gamma + e$$

L: LFPR in a given year for a given birth cohort,
A: age
C: birth cohort
T: year
α, μ, ve γ: relevant coefficients.

Simplified Identification Table:

Birth cohort	Birth year	Age 1988	Age 1993	Age 1998	Age 2003	Age 2008
1	1989-1993					15
2	1984-1988				15	20
3	1979-1983			15	20	25
4	1974-1978		15	20	25	30
5	1969-1973	15	20	25	30	35
6	1964-1968	20	25	30	35	40
7	1959-1963	25	30	35	40	45
8	1954-1958	30	35	40	45	50
9	1949-1953	35	40	45	50	55
10	1944-1948	40	45	50	55	60
11	1939-1943	45	50	55	60	65
12	1934-1938	50	55	60	65	
13	1929-1933	55	60	65		
14	1924-1928	60	65			
15	1919-1923	65				

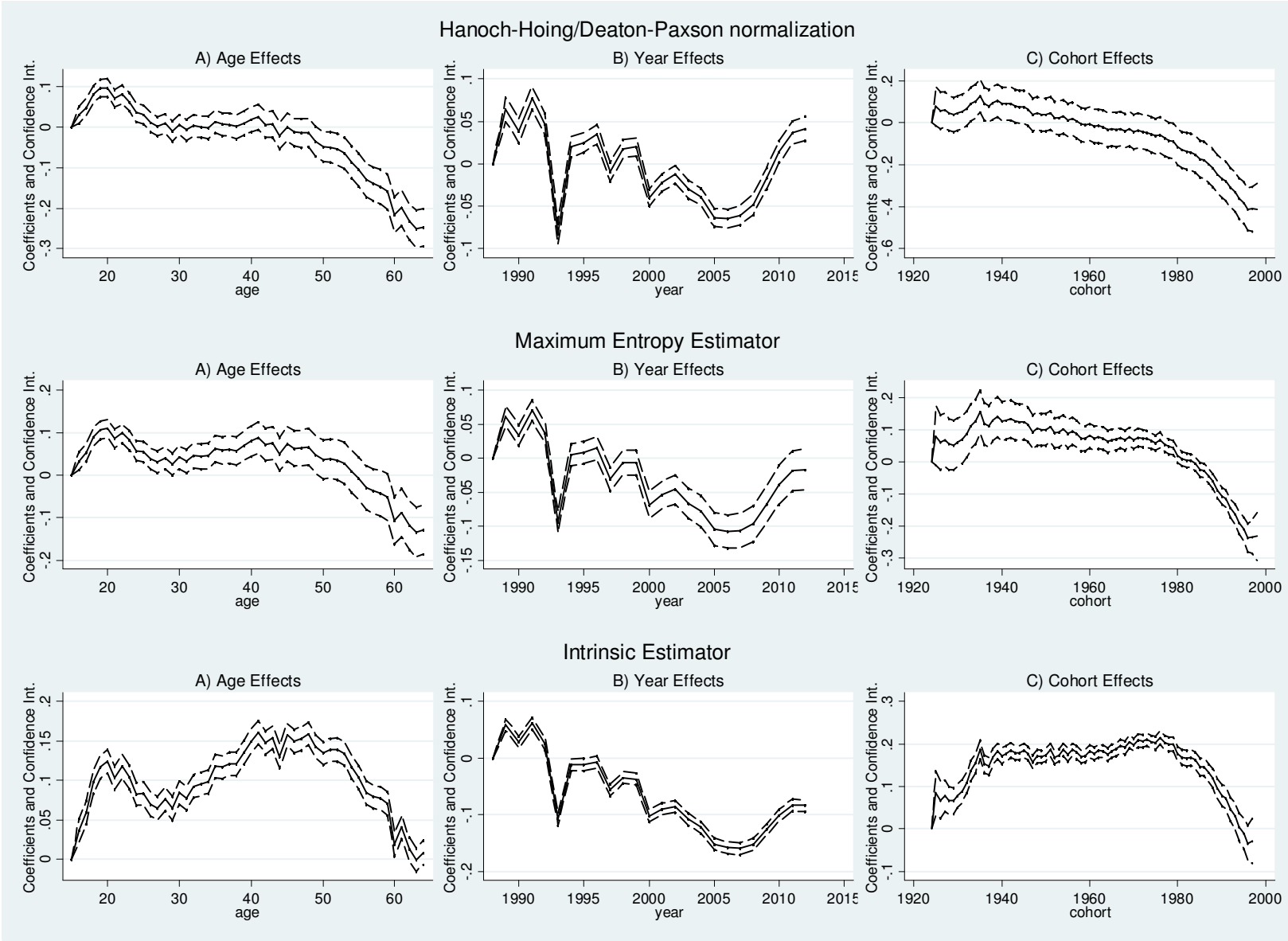
Methodology cont:

Try different decomposition techniques to test the robustness of the results.

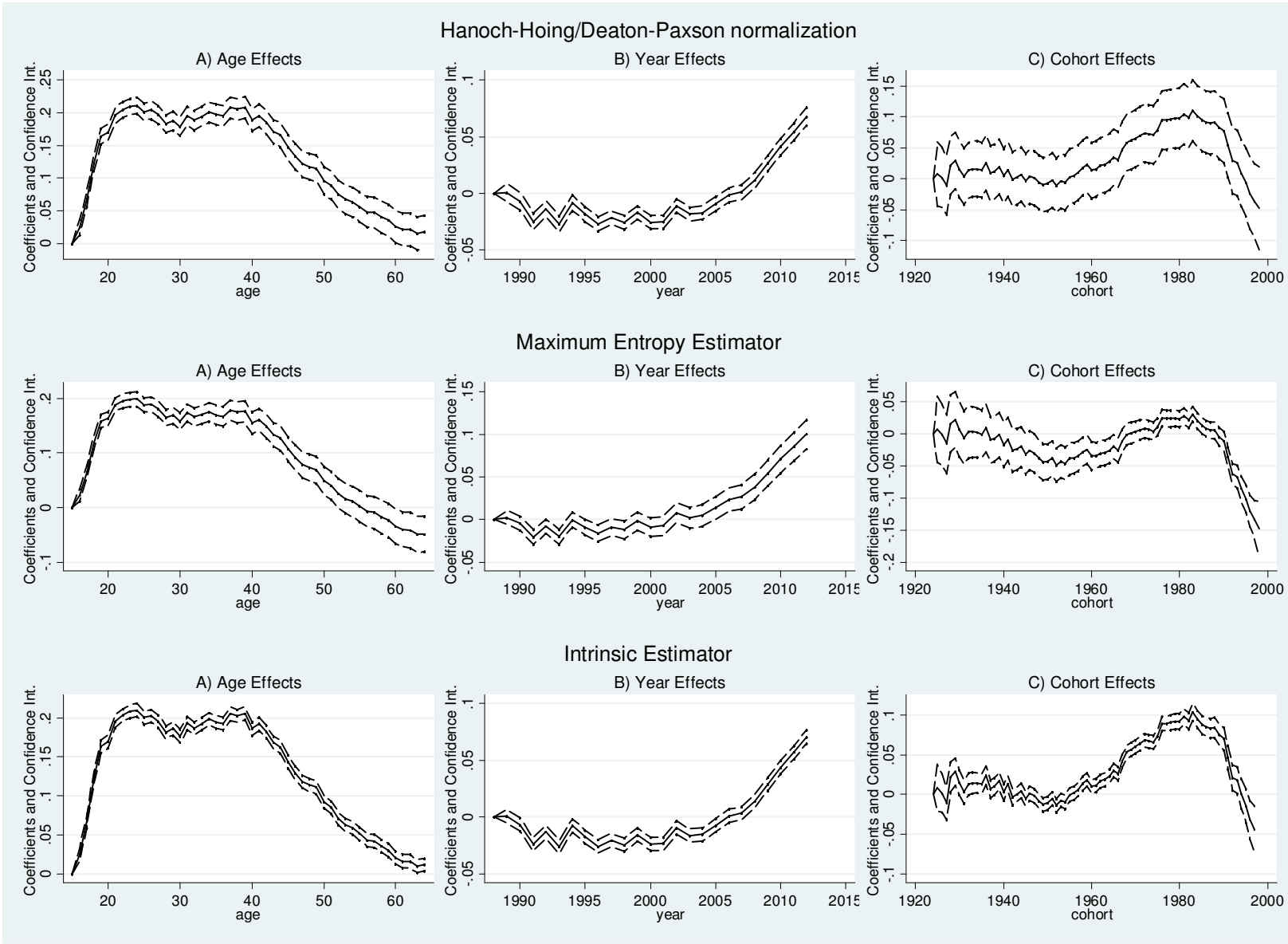
Techniques used:

- “Deaton method”: Hanoch and Honig (1985), Deaton ve Paxon (1994) and Deaton (1997)
- “Intrinsic Estimator” , Fu (2000), Yang et al. (2004, 2008)
- “Maximum Entropy”, Browning et al. (2011)

Rural areas, all women


Hanoch-Hoing/Deaton-Paxson normalization
A) Age Effects
B) Year Effects
C) Cohort Effects
Maximum Entropy Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Intrinsic Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Coefficients and Confidence Int.
age
year
cohort

Urban areas, all women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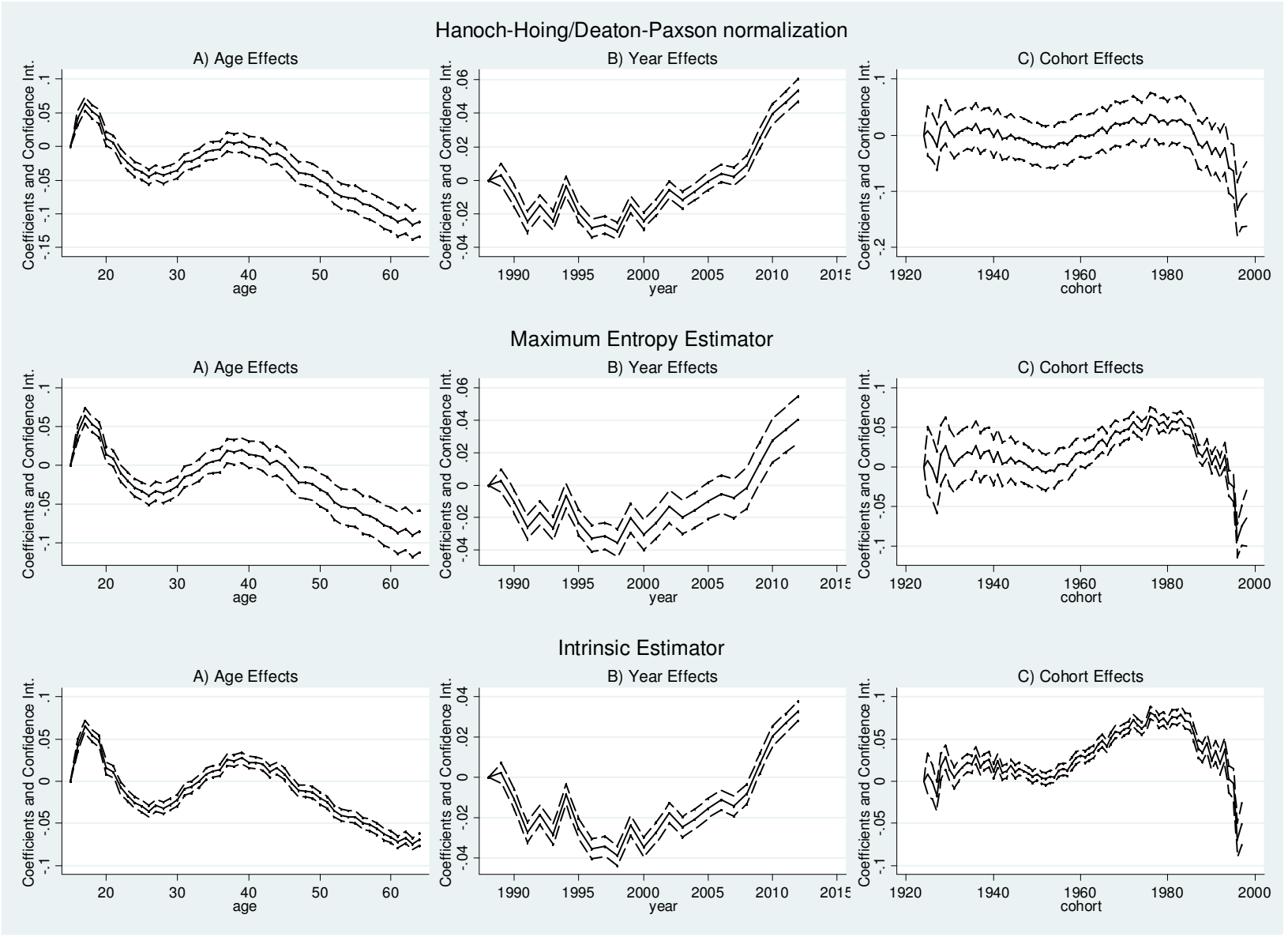
Intrinsic Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Coefficients and Confidence Int.
age
year
cohort

Urban areas,
primary school or lower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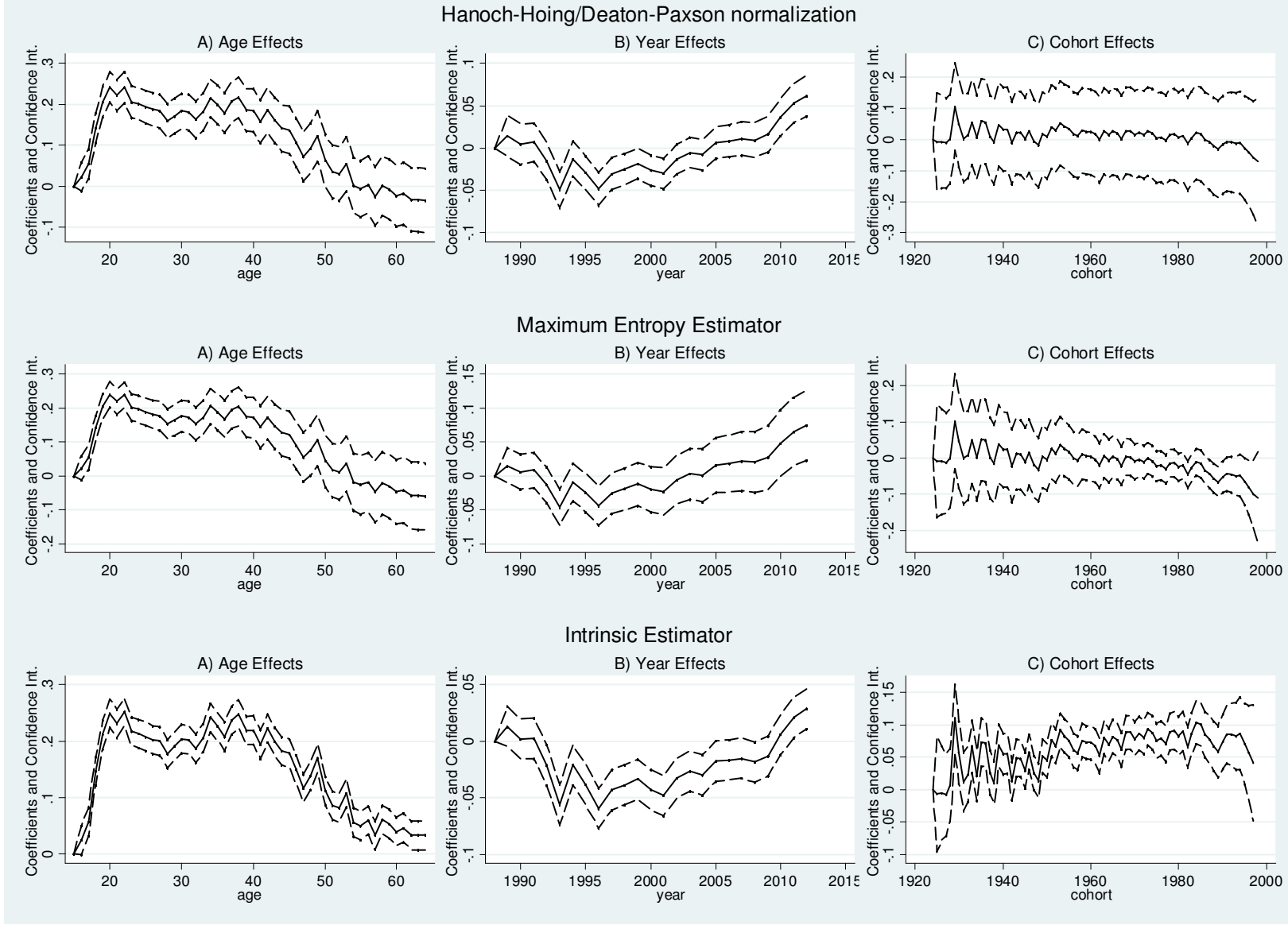
B) Year Effects
C) Cohort Effects
Intrinsic Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Coefficients and Confidence Int.
age
year
cohort

Urban areas,
secondary school graduates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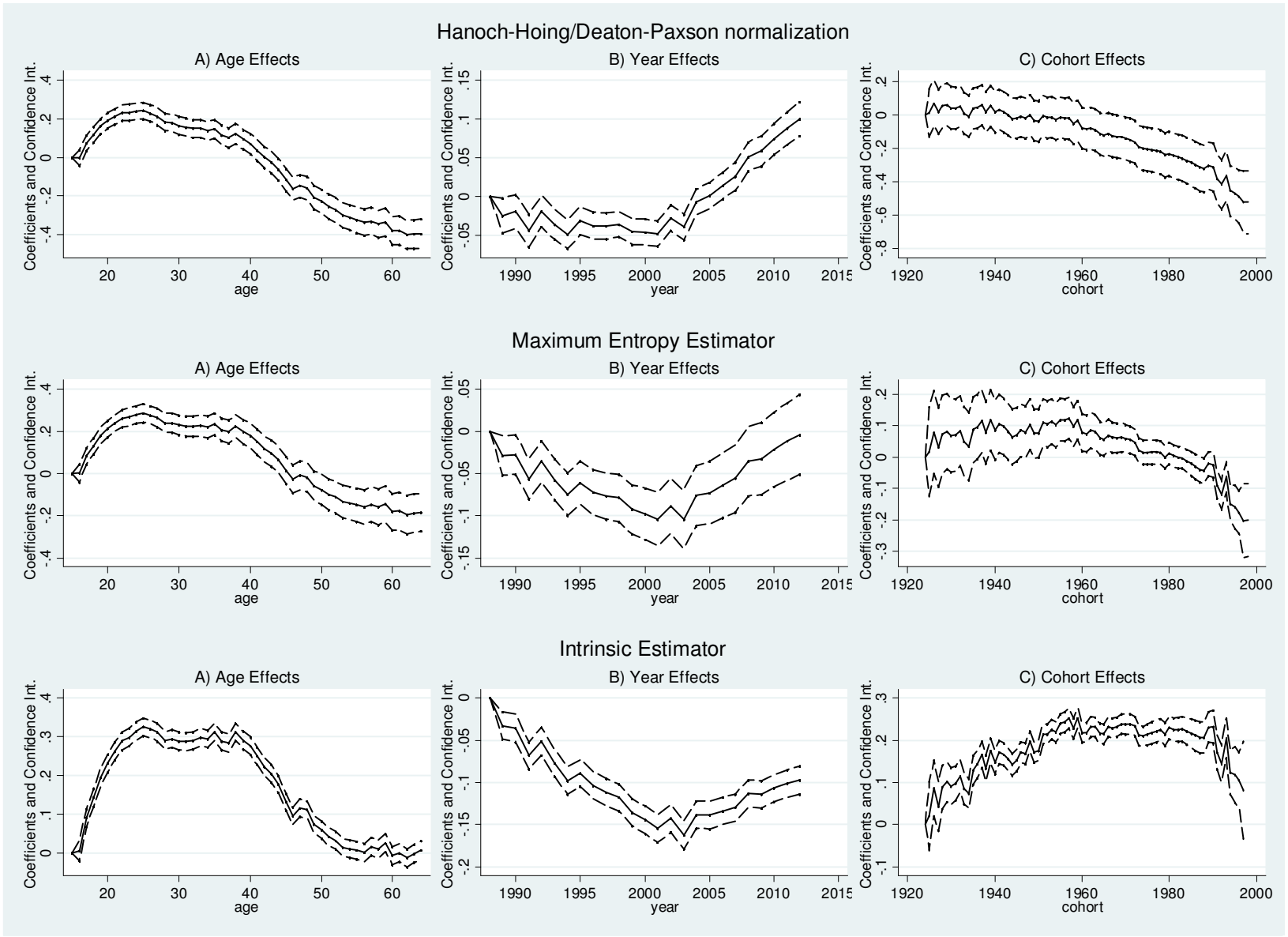
B) Year Effects
C) Cohort Effects
Maximum Entropy Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Intrinsic Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Coefficients and Confidence Int.
age
year
cohort

Urban areas,
high school graduates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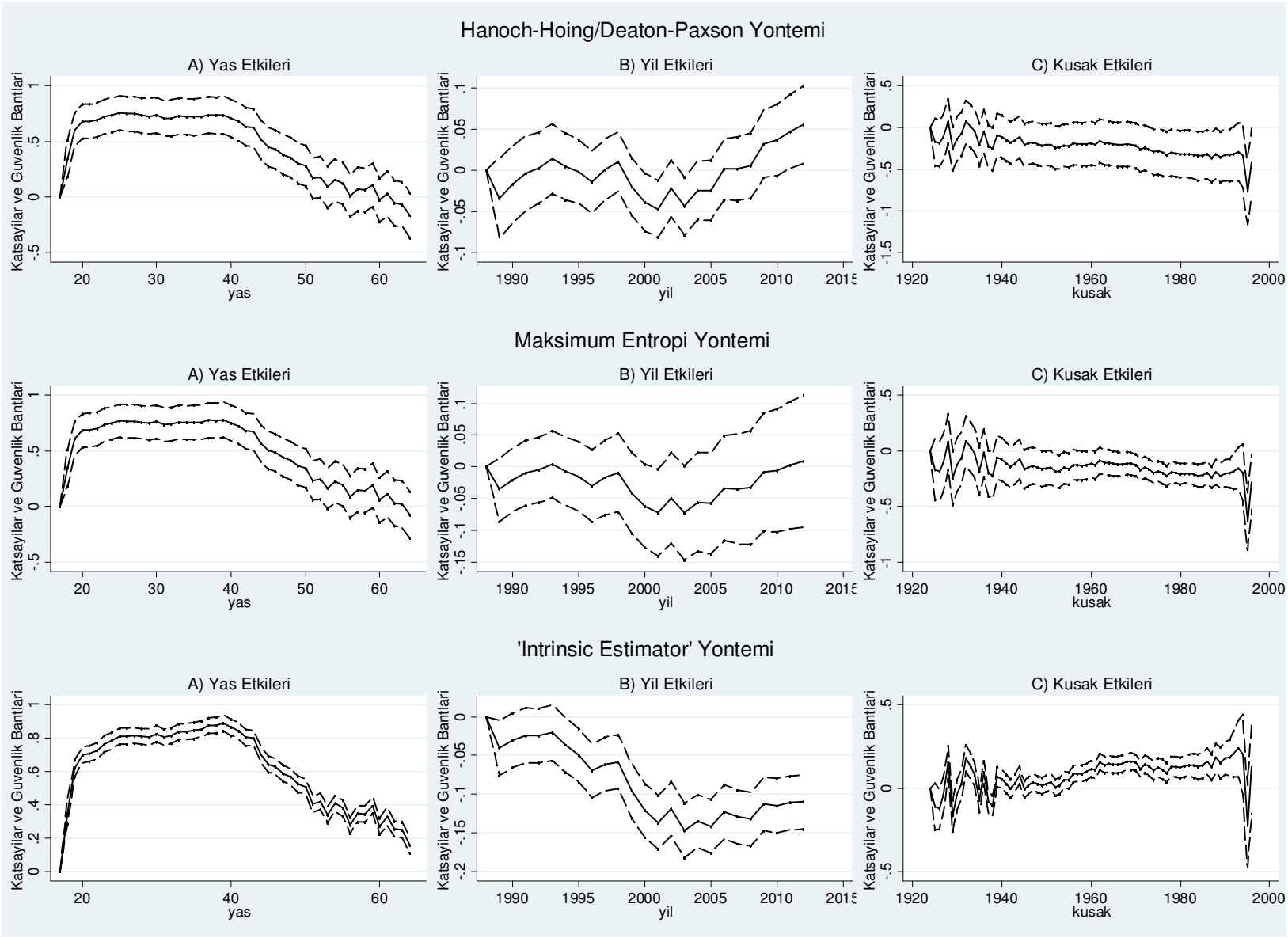
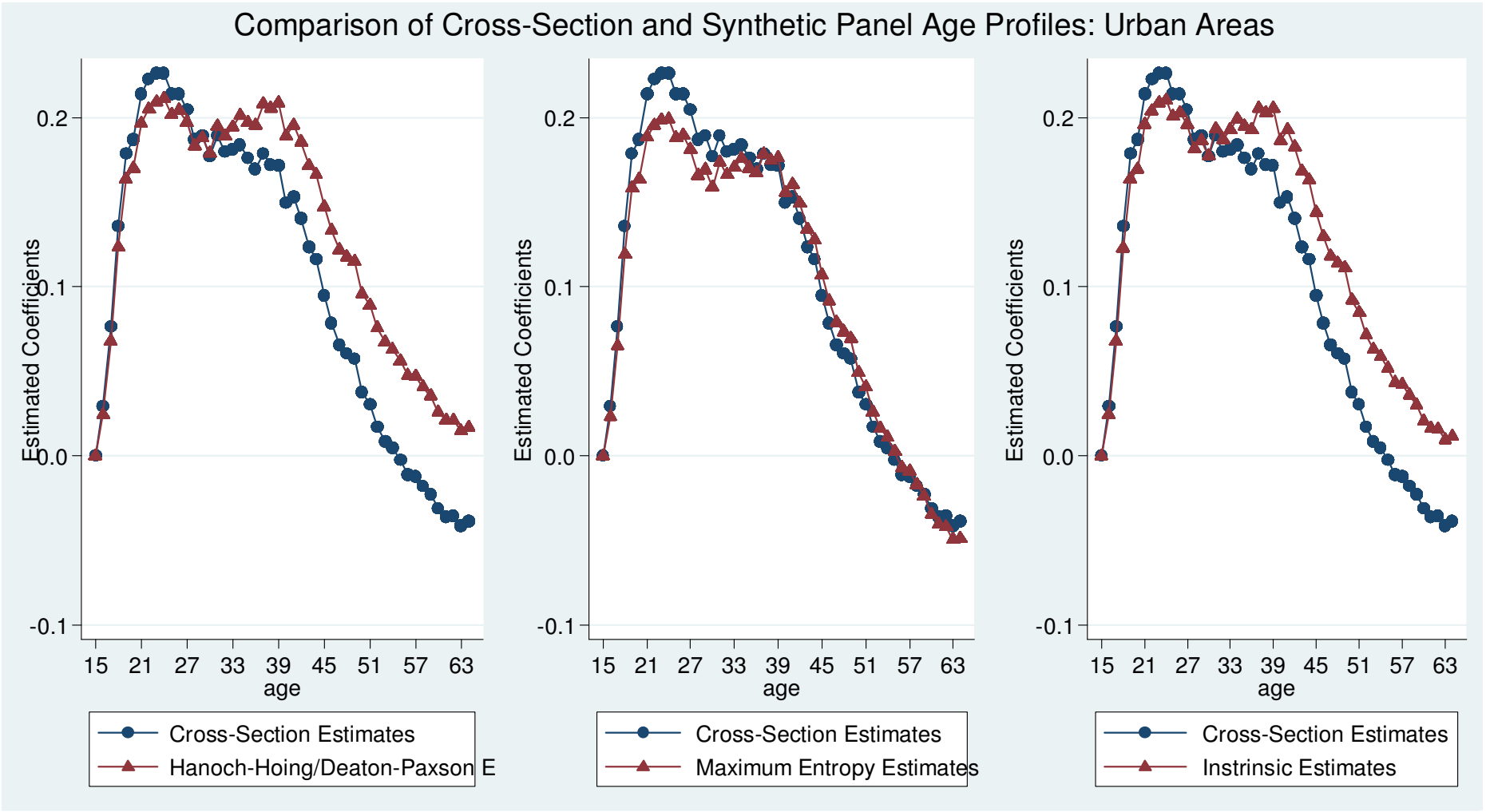
B) Year Effects
C) Cohort Effects
Intrinsic Estimator
A) Age Effects
B) Year Effects
C) Cohort Effects
Coefficients and Confidence Int.
age
year
cohort

Urban areas, university graduates


Hanoch-Hoing/Deaton-Paxson Yontemi
A) Yas Etkileri
B) Yil Etkileri
C) Kusak Etkileri
Maksimum Entropi Yontemi
A) Yas Etkileri
B) Yil Etkileri
C) Kusak Etkileri
'Intrinsic Estimator' Yontemi
A) Yas Etkileri
B) Yil Etkileri
C) Kusak Etkileri
Katsayilar ve Guvenlik Bantlari
yas
yil
kusak

Comparison of cross-section and pseudo-panel age-participation profiles

A) Urban, B) Rural


Comparison of Cross-Section and Synthetic Panel Age Profiles: Urban Areas
Estimated Coefficients
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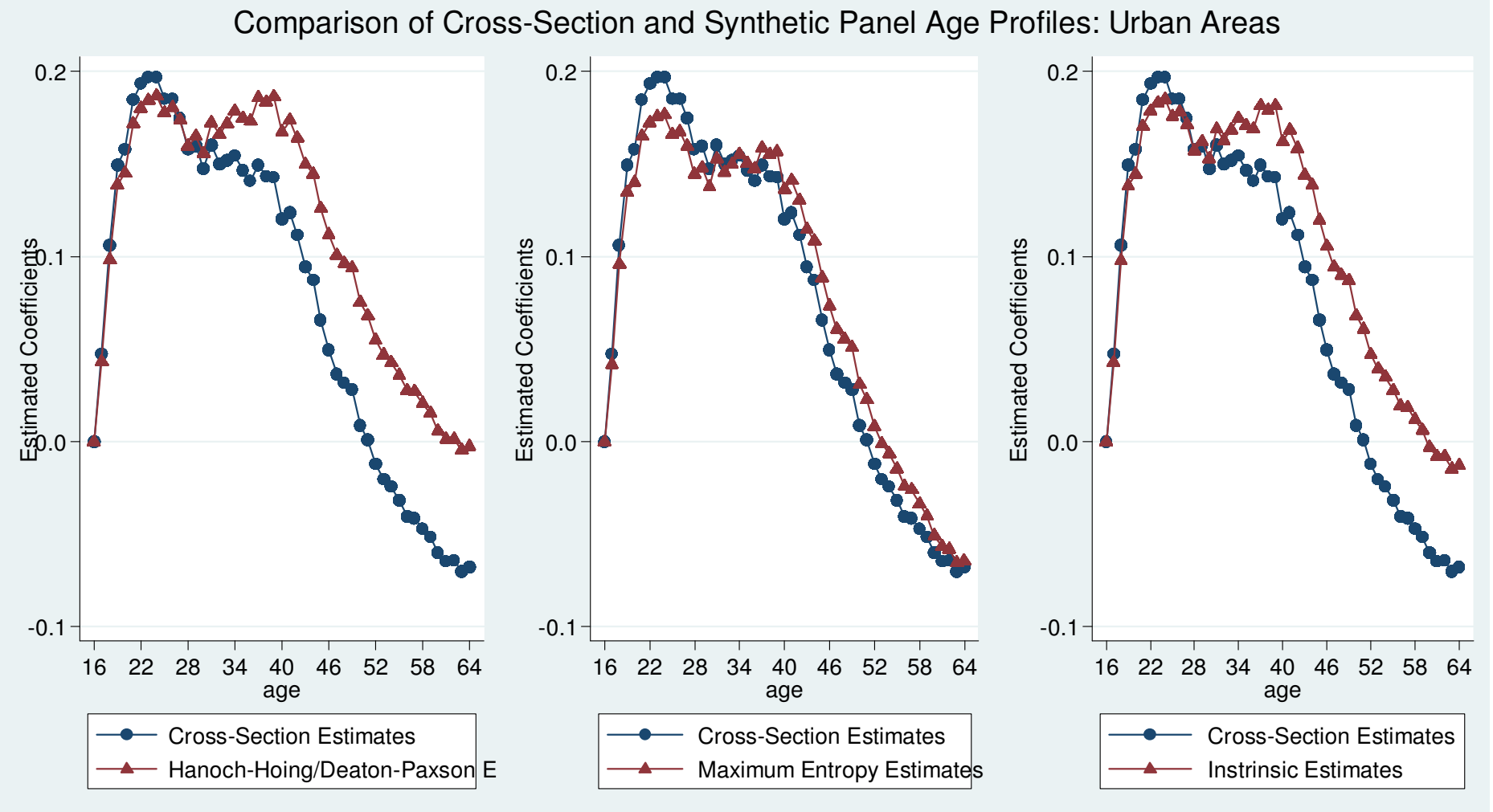
0.0
-0.1
15 21 27 33 39 45 51 57 63
age
Cross-Section Estimates
Hanoch-Hoing/Deaton-Paxson E
Cross-Section Estimates
Maximum Entropy Estimates
Cross-Section Estimates
Instrinsic Estimates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Estimated Coefficients
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0.1
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-0.1
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age
Cross-Section Estimates
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Cross-Section Estimates
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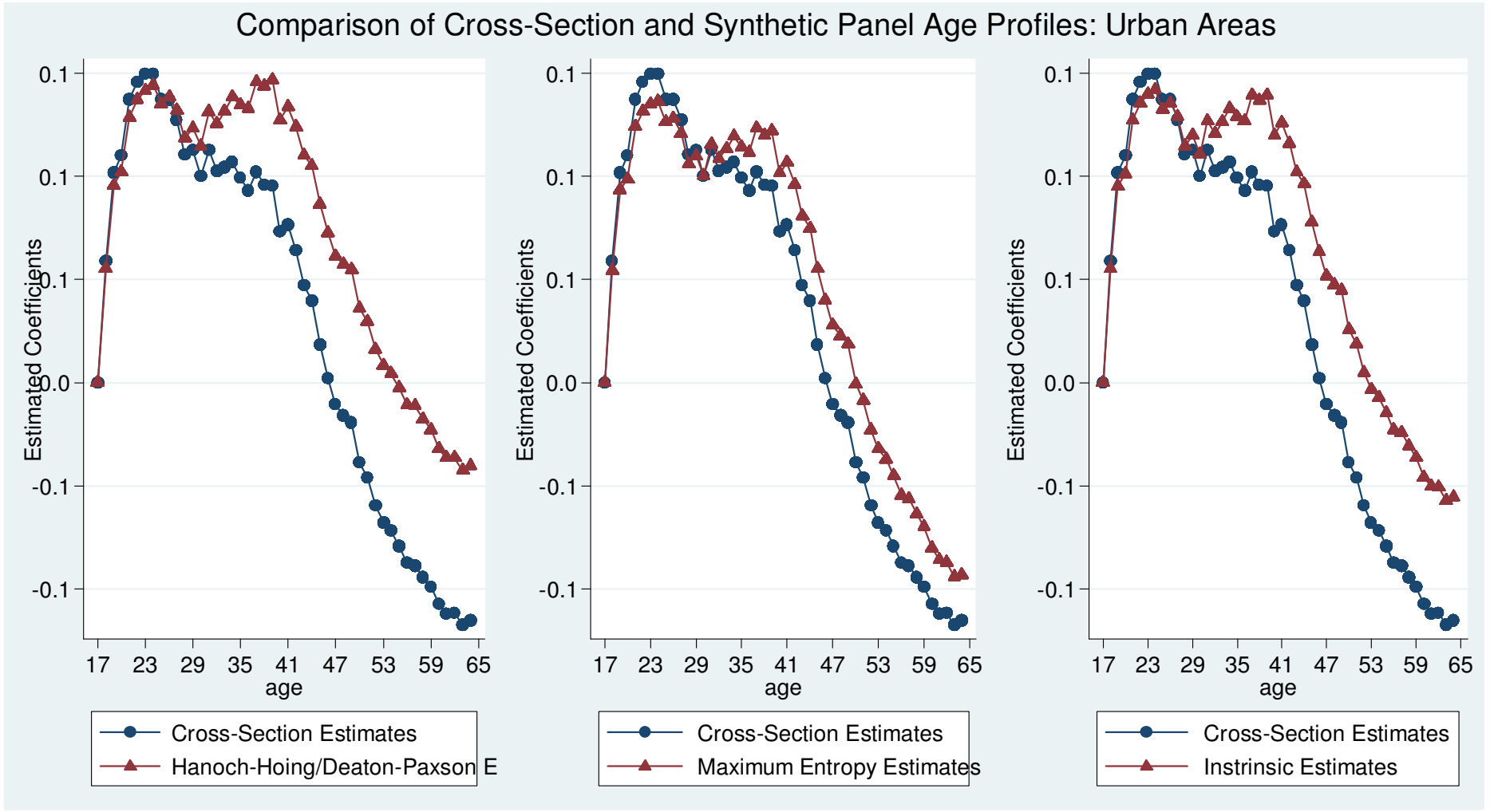
Cross-Section Estimates
Instrinsic Estimates


Comparison of Cross-Section and Synthetic Panel Age Profiles: Urban Areas
Estimated Coefficients
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0.1
0.1
0.0
-0.1
-0.1
17 23 29 35 41 47 53 59 65
age
Cross-Section Estimates
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Estimated Coefficients
0.1
0.1
0.1
0.0
-0.1
-0.1
17 23 29 35 41 47 53 59 65
age
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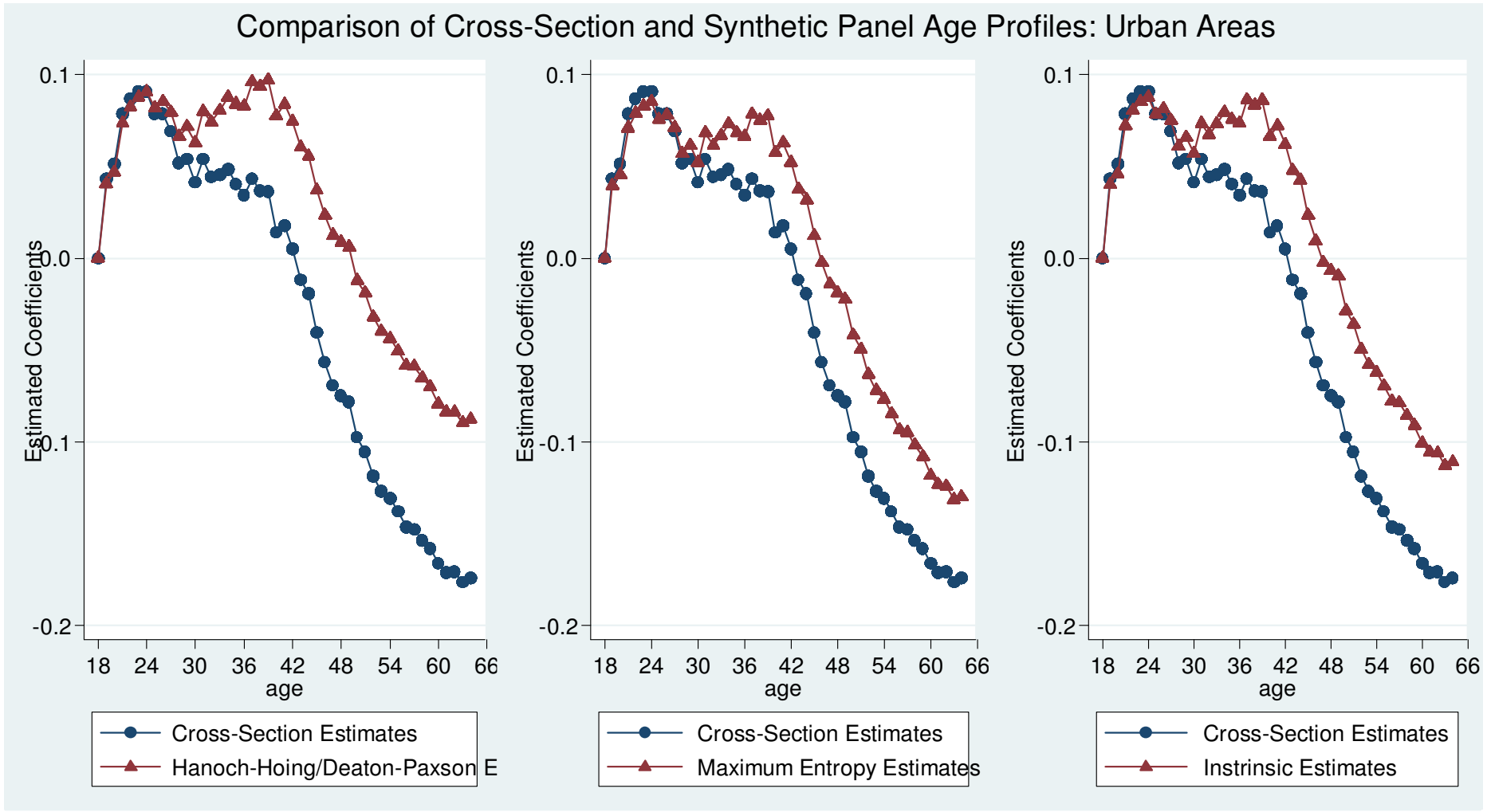
-0.1
-0.1
17 23 29 35 41 47 53 59 65
age
Cross-Section Estimates
Instrinsic Estimates


Comparison of Cross-Section and Synthetic Panel Age Profiles: Urban Areas
Estimated Coefficients
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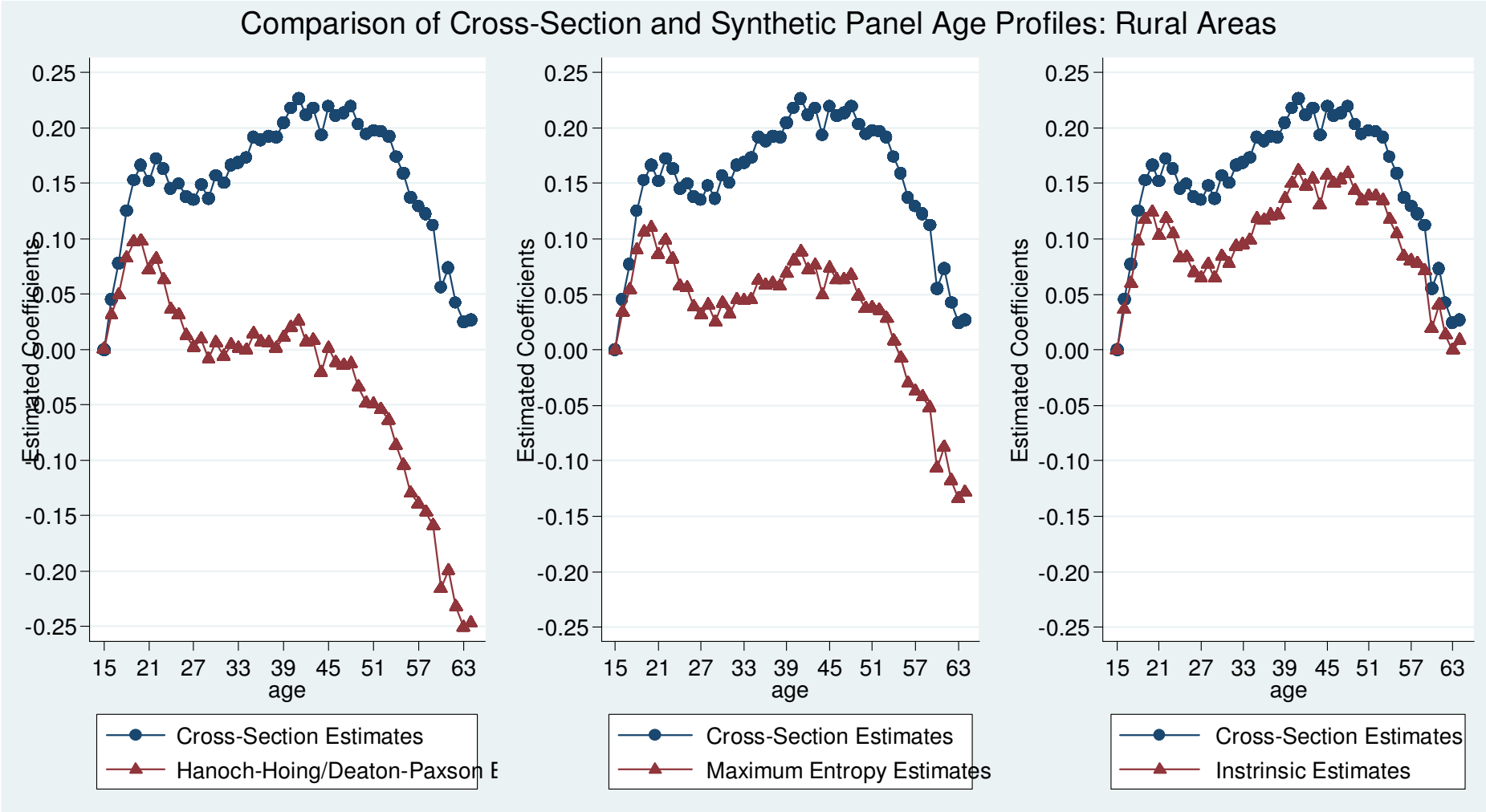
0.0
-0.1
-0.2
18 24 30 36 42 48 54 60 66
age
Cross-Section Estimates
Hanoch-Hoing/Deaton-Paxson E
Cross-Section Estimates
Maximum Entropy Estimates
Cross-Section Estimates
Instrinsic Estimates


Comparison of Cross-Section and Synthetic Panel Age Profiles: Rural Areas
Estimated Coefficients
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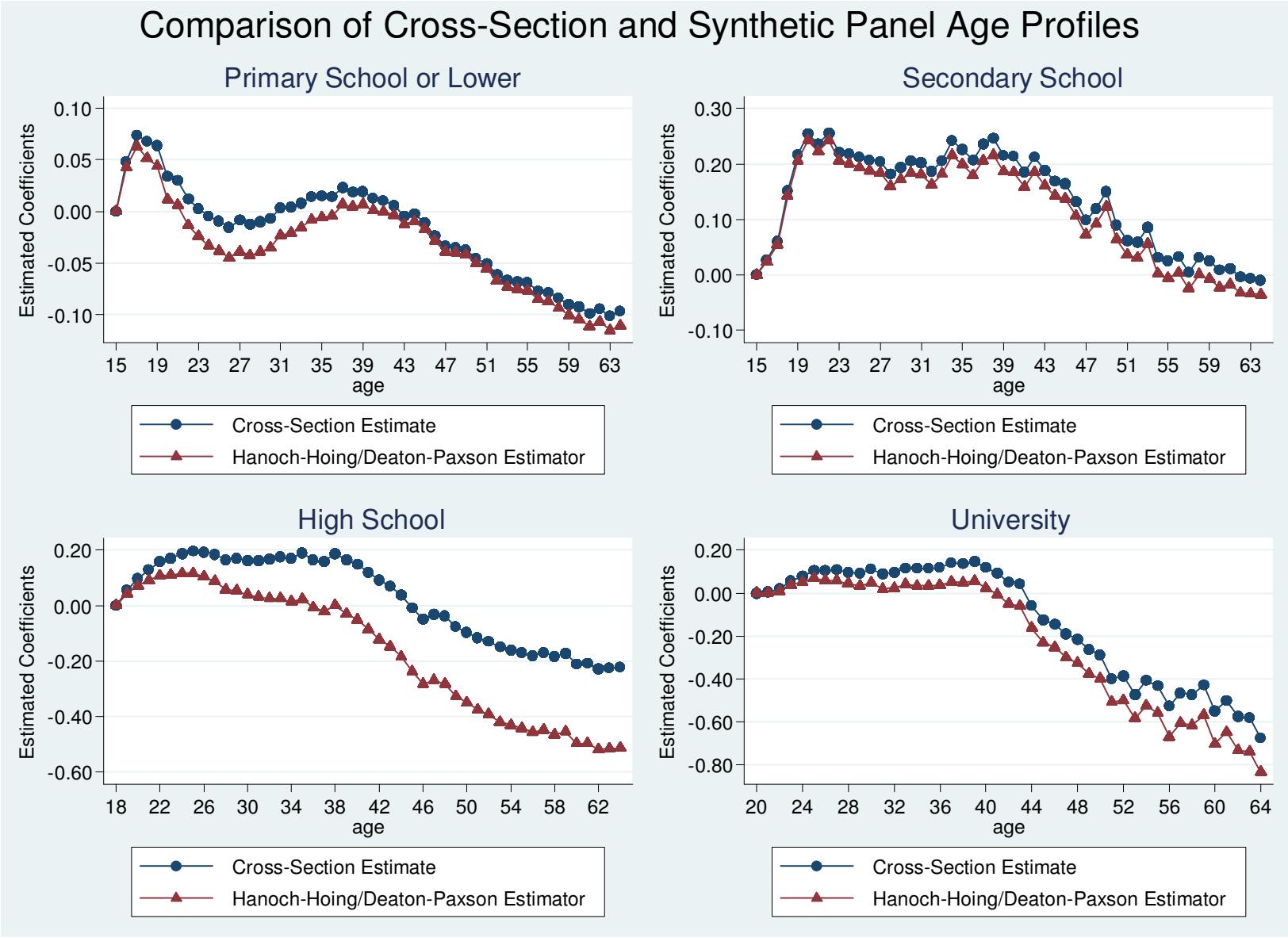
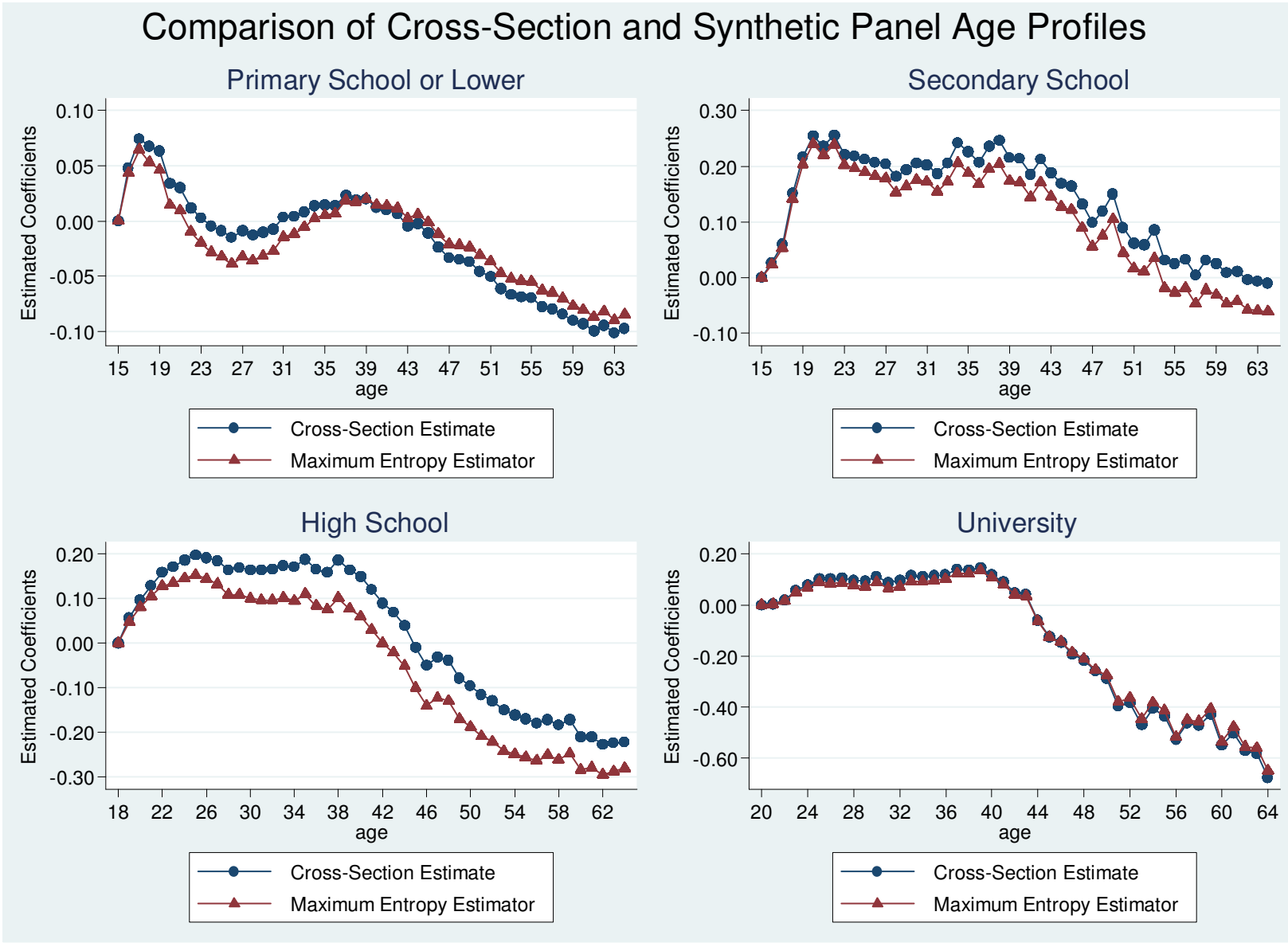
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
-0.20
-0.25
15 21 27 33 39 45 51 57 63
age
Cross-Section Estimates
Hanoch-Hoing/Deaton-Paxson E
Cross-Section Estimates
Maximum Entropy Estimates
Cross-Section Estimates
Instrinsic Estimates


Comparison of Cross-Section and Synthetic Panel Age Profiles
Primary School or Lower
Secondary School
High School
University
Estimated Coefficients
age
Cross-Section Estimate
Hanoch-Hoing/Deaton-Paxson Estimator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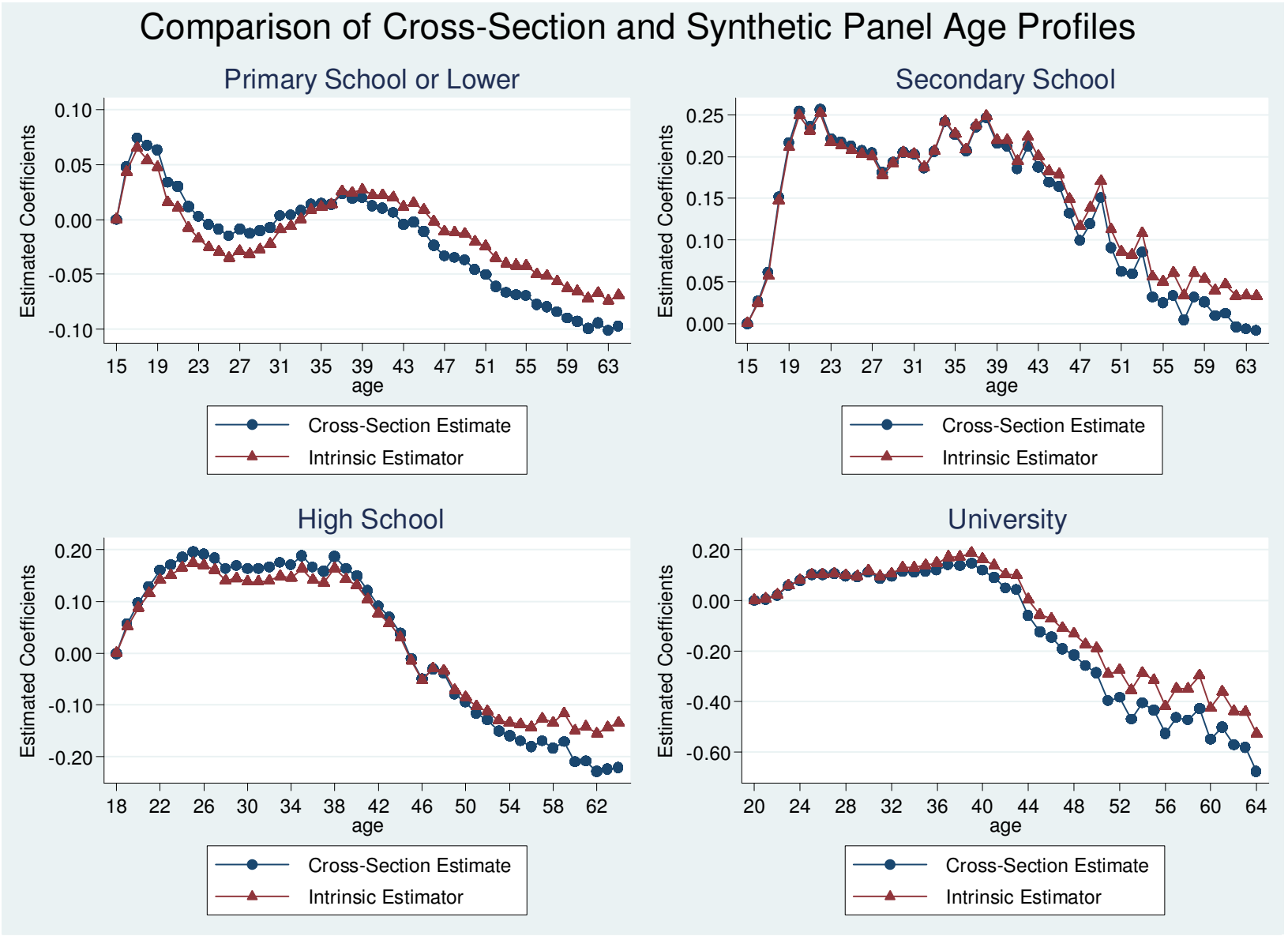
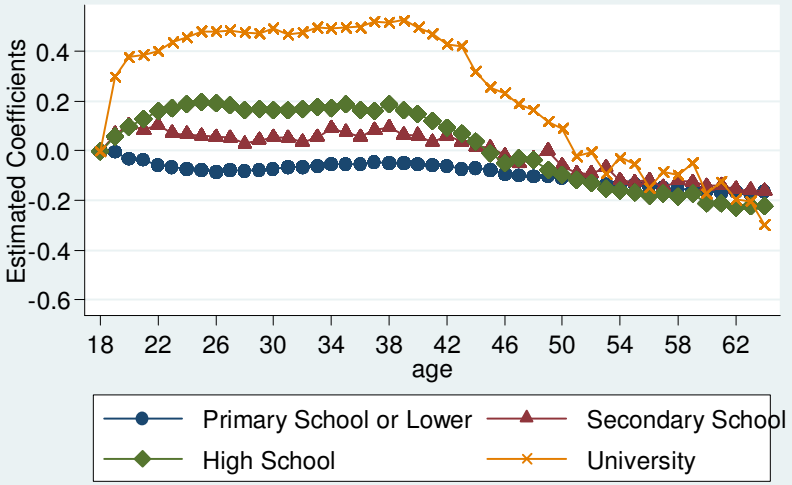
Primary School or Lower
Secondary School
High School
University
Estimated Coefficients
age
Cross-Section Estimate
Maximum Entropy Estimator


Comparison of Cross-Section and Synthetic Panel Age Profiles
Primary School or Lower
Secondary School
High School
University
Estimated Coefficients
age
Cross-Section Estimate
Intrinsic Estimator

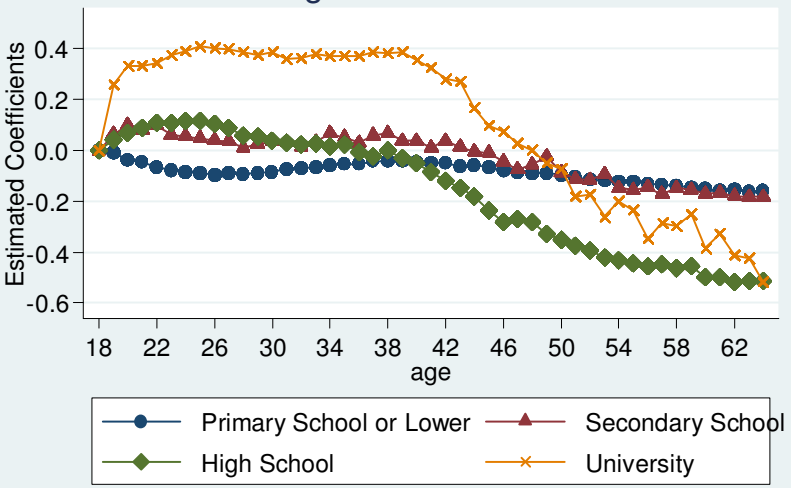
Age profiles by education

Age Profiles by Education

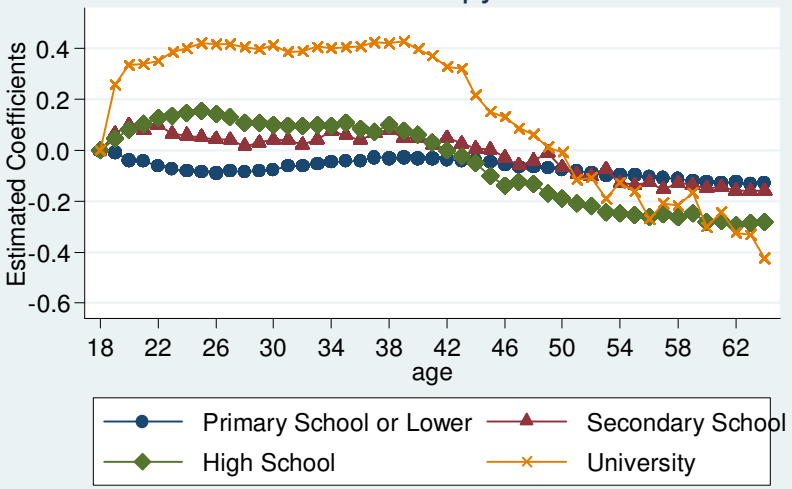
Cross-Section Profiles



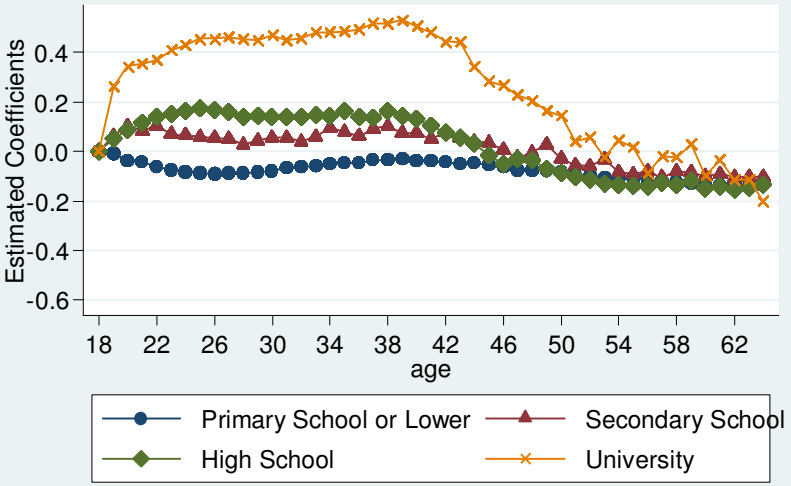
Hanoch-Hoing/Deaton-Paxson normalization

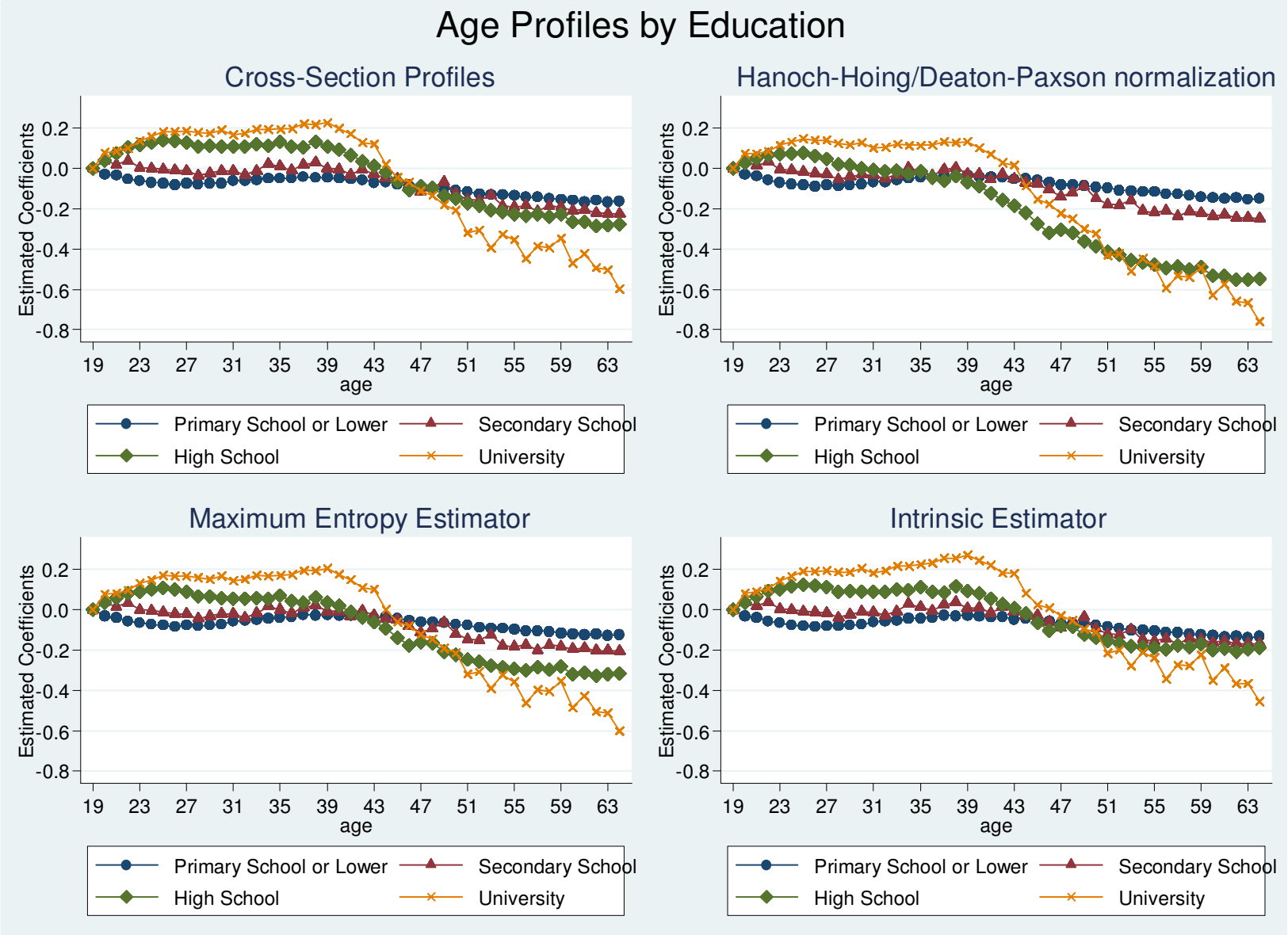


Maximum Entropy Estimator



Intrinsic Estimator




Age Profiles by Education
Cross-Section Profiles
Hanoch-Hoing/Deaton-Paxson normalization
Maximum Entropy Estimator
Intrinsic Estimator
Estimated Coefficients
0.2
0.0
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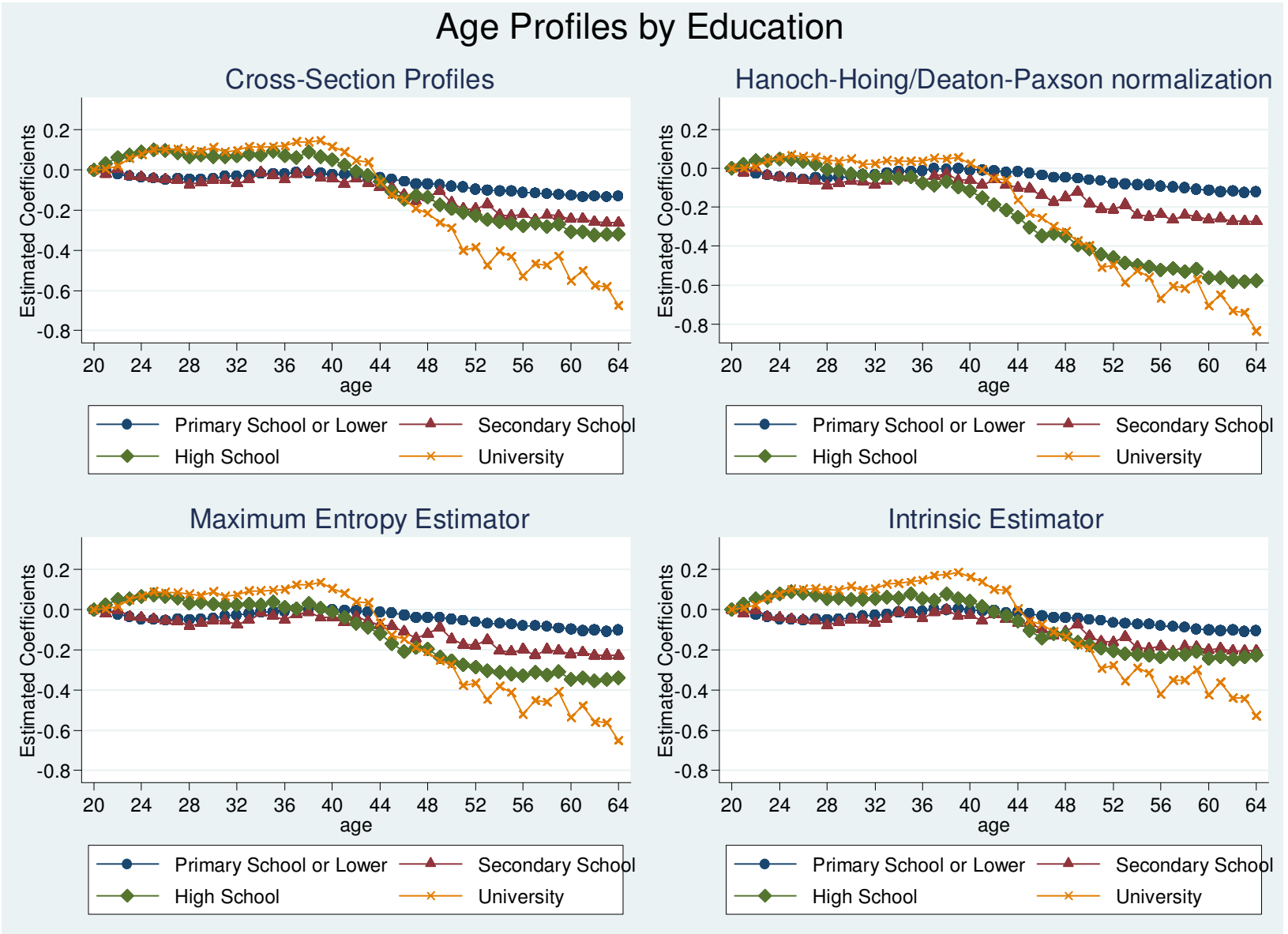
-0.6
-0.8
19 23 27 31 35 39 43 47 51 55 59 63
age
Primary School or Lower
Secondary School
High School
University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-0.4
-0.6
-0.8
20 24 28 32 36 40 44 48 52 56 60 64
age
Primary School or Lower
Secondary School
High School
University

Conclusions:

- In urban areas, later-born cohorts are more likely to participate. The participation propensity among different cohorts is the highest for those born in the early 1980s—who enter the labor market mostly in the early 2000s.

- An important reason for the higher participation rate of later-born cohorts is their higher educational attainment.

- Conditional on education, only for the group with the lowest level of education, later-born cohorts have a higher propensity to participate.

- M-shaped life-cycle profiles in rural areas and in urban areas for women with low education levels (secondary school or lower).

- The M-shape is very prominent for the group with the lowest educational attainment: the participation rate at mid-20s is about 10 pp lower that at age 18.

- These M-shapes do not appear in a cross-sectional analysis but only when cohort effects are accounted for (in addition to age and year effects).

- While M-shaped profile for the group with the lowest education is observable with a cross-sectional analysis, the M-shape becomes stronger with cohort analysis.

- In rural areas, later-born cohorts (particularly those born after 1980) have a lower propensity to participate. This causes substantial clockwise rotation of the life-cycle participation profiles.

- Negative year effects until late 2000s in rural areas after which participation increases with time (increasing world food prices).

- Constant year effects until late 2000s in urban areas after which participation increases very steeply over time (employment subsidy programs, change in TUIK classification of the employment of caregivers, change in the social security system—captured by year and cohort effects as the age-participation profile is taken to be constant)