Revisiting Once Again the Value of Net Migration Estimates

Paul R. Voss
Odum Institute for Research in Social Science
and Carolina Population Center
UNC at Chapel Hill

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I say “once again” because…

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Andrei Rogers

Requiem for the Net

Despite recent research that ha
perspective in measuring and
many scholars continue to adc
on net *migrants, a nonexister*
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Journal of Economic and Social Measurement 24 (1998) 249–264
IOS Press

In defense of the net migrant*

Stanley K Smith
Bureau of Economic and Business Research, 221 Matherly Hall, University of Florida, Gainesville, FL 32611-7145. Tel 352 392 0171, Ext 210, Fax 352 392 4739, E-mail sksmith@ufl.edu

David A. Swanson
Science Applications International Corporation, 1271 Town Center Drive, Building 2, Las Vegas, NV 89134 and Helsinki School of Economics and Business Administration, Lönnrotinkatu 5, Mikkeli, Finland, FIN-50100

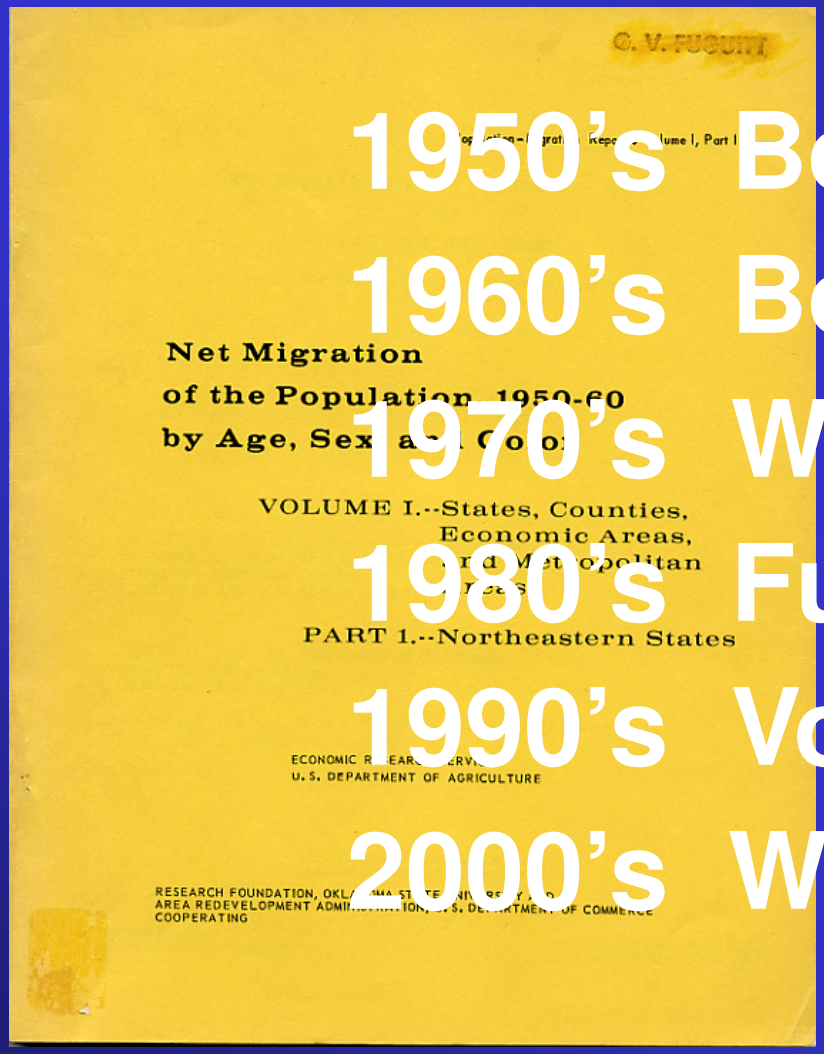
Net migration has been widely criticized as a theoretical concept and as a measure of population movement Many of these criticisms are valid net migration reflects a residual rather than a true migration process, it often masks large gross migration flows, it cannot account for differences in the characteristics of origin and destination populations, it cannot be used for rates in a probabilistic sense, and it can lead to misspecified causal models and unrealistic population projections However, we believe there are purposes for which net migration is very useful, especially for analyses of small areas 1) It provides a summary measure of one component of population change, 2) It can be used when gross

Migration… what do we know?

- Not a registered event in U.S.
- Retrospective accounts of migration flows from censuses & surveys
  - 5-year (census long form)
    - Information on in-flows at all levels BG and above
    - Special county-county flows files (since 1970 Census)
  - 1-year (CPS March supplement)
    - Rich content; best for inter-regional flow summaries
  - 1-year (ACS)
    - Too early to evaluate?
- Administrative records
  - IRS data for state-state & county-county flows
- SIPP
  - Characteristics of migrants; no flows; somewhat dated (2004)
- Estimates & Projections (net components of change)
- Intercensal net migration estimates (residual method)

Why net migration?

- Important
  - Understanding the demographic dynamics of all counties; net migration role in components of growth
  - Valuable for population projection models
- Conceptually easy to understand & generate
- Very accurate (if properly estimated)
- Long comparable historical series available



1950's Bowles, *et al.*

1960's Bowles, *et al.*

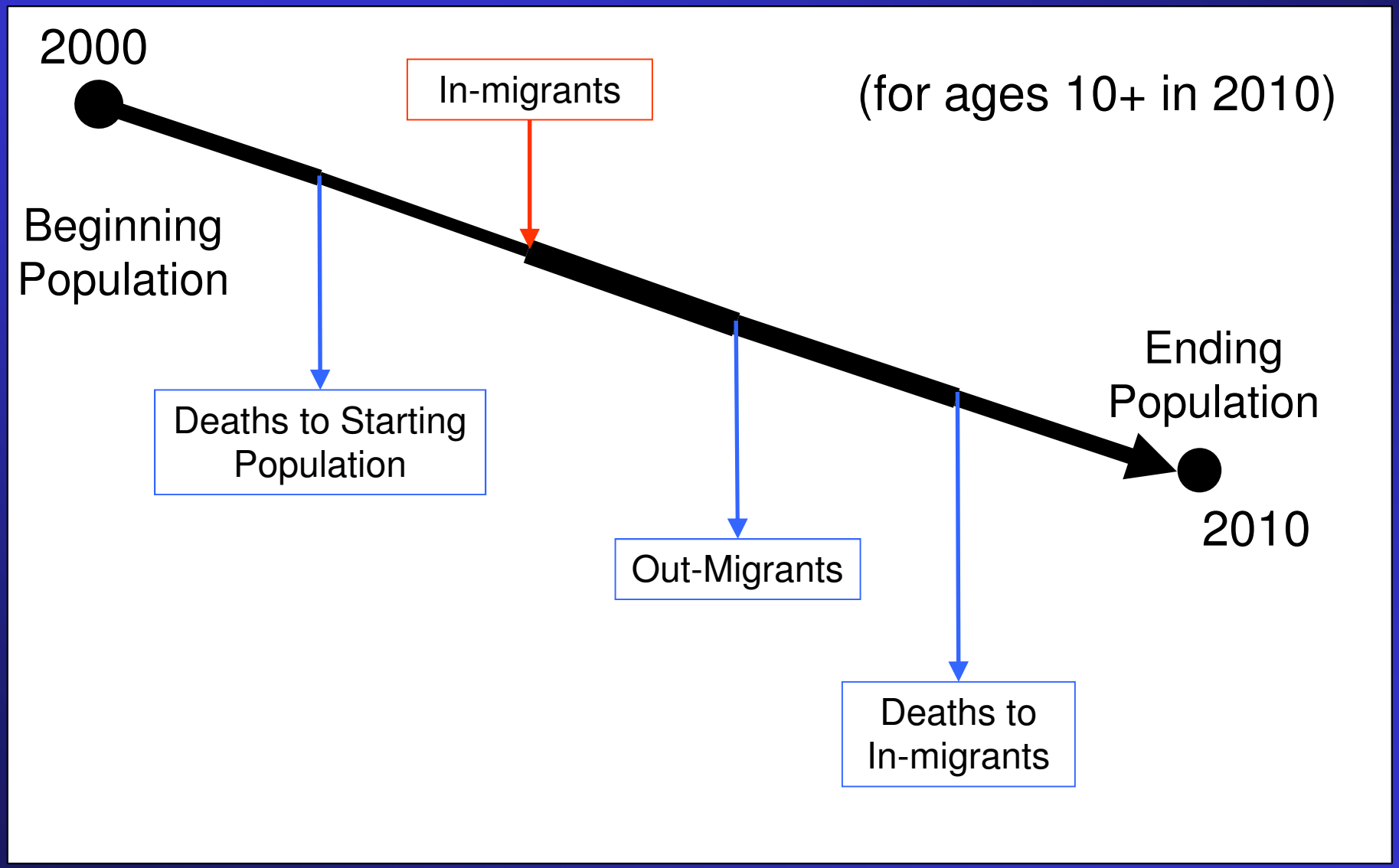
1970's White, *et al.*

1980's Fuguitt, *et al.*

1990's Voss, *et al.*

2000's Winkler, *et al.*

Components of Population Change



The Balancing Equation of Population Change

$$P_2 = P_1 - D_{P_1} + M_I - M_O - D_{M_I}$$

Where,

P_2 = Ending population

P_1 = Beginning population

D_{P_1} = Deaths to beginning population

M_I = In-migrants

M_O = Out-migrants

D_{M_I} = Deaths to in-migrants

2000 Census Population

B & D

Survived 2000 Population "Expected 2010 Population"

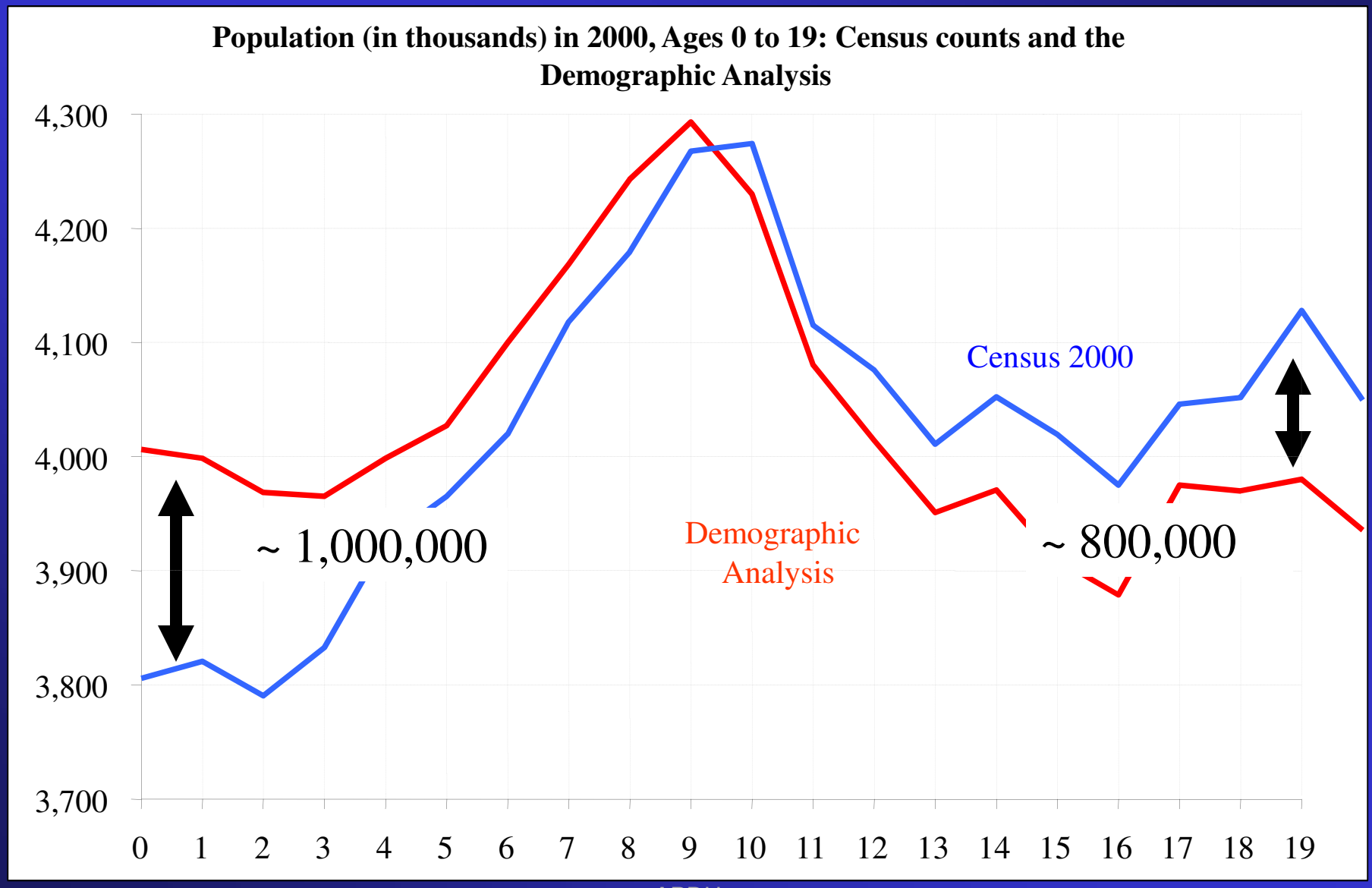
Net Migration 2000 - 2010 = 2000 Census Population − Expected 2010 Population

- Not rocket science!
- Mostly a (huge) data management task
- May require some adjustments to the census data
- May require imputation of some births & deaths
- Young ages in terminal year require birth information
- Estimates are strong & robust
- The devil's in the details

e.g., problems peculiar to the 1990-2000 decade

- Endless uncertainty about the final (adjusted) 2000 Census counts.
- Which led to uncertainty about the final (adjusted)1990 Census counts.
- Lack of agreement between vital data and census data (mostly problem with Hispanic deaths).
- 1990-2000 race comparability.
- Huge problems with age in the 2000 Census.

Census' undercount of children



e.g., problems peculiar to the 1990-2000 decade

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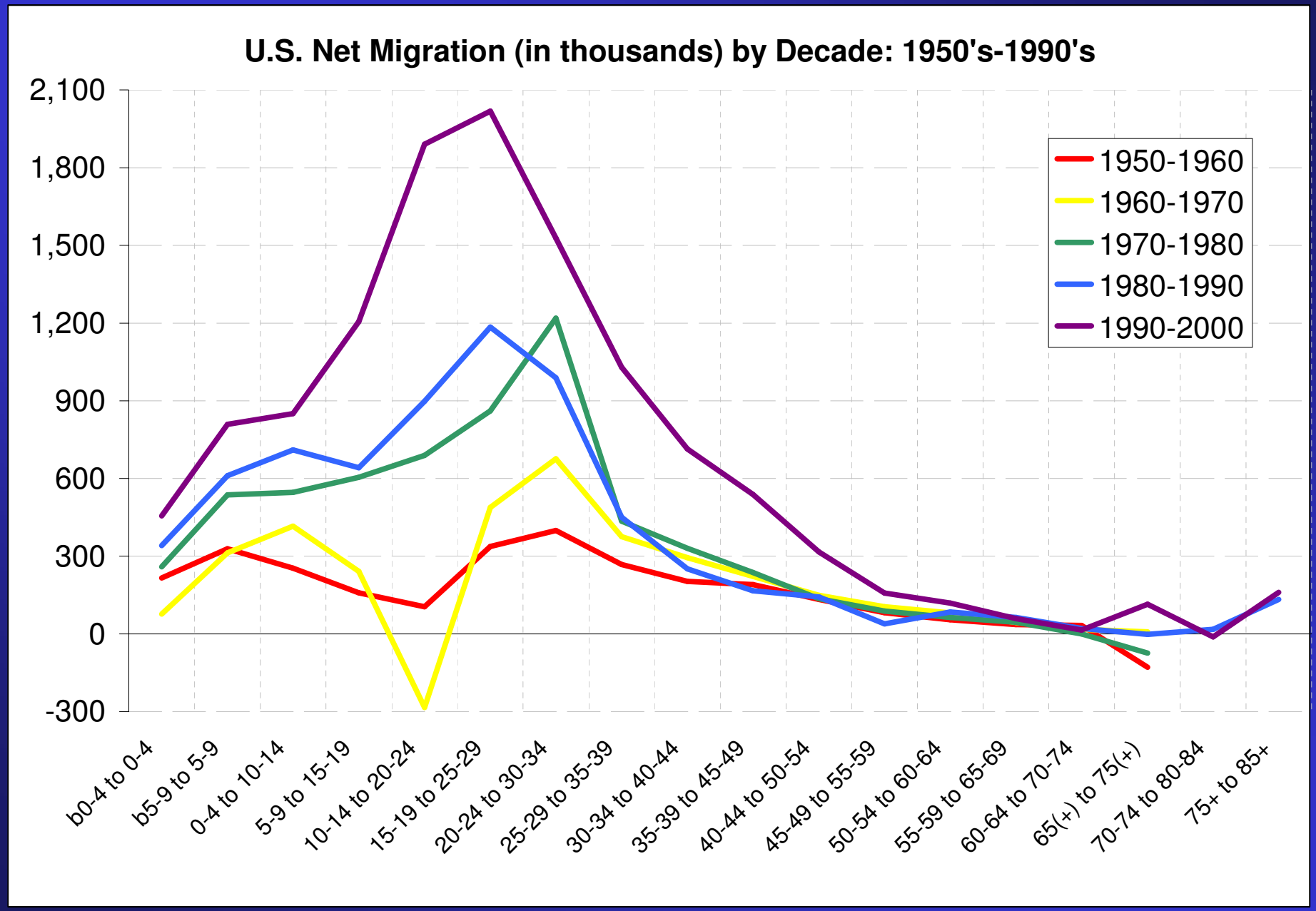
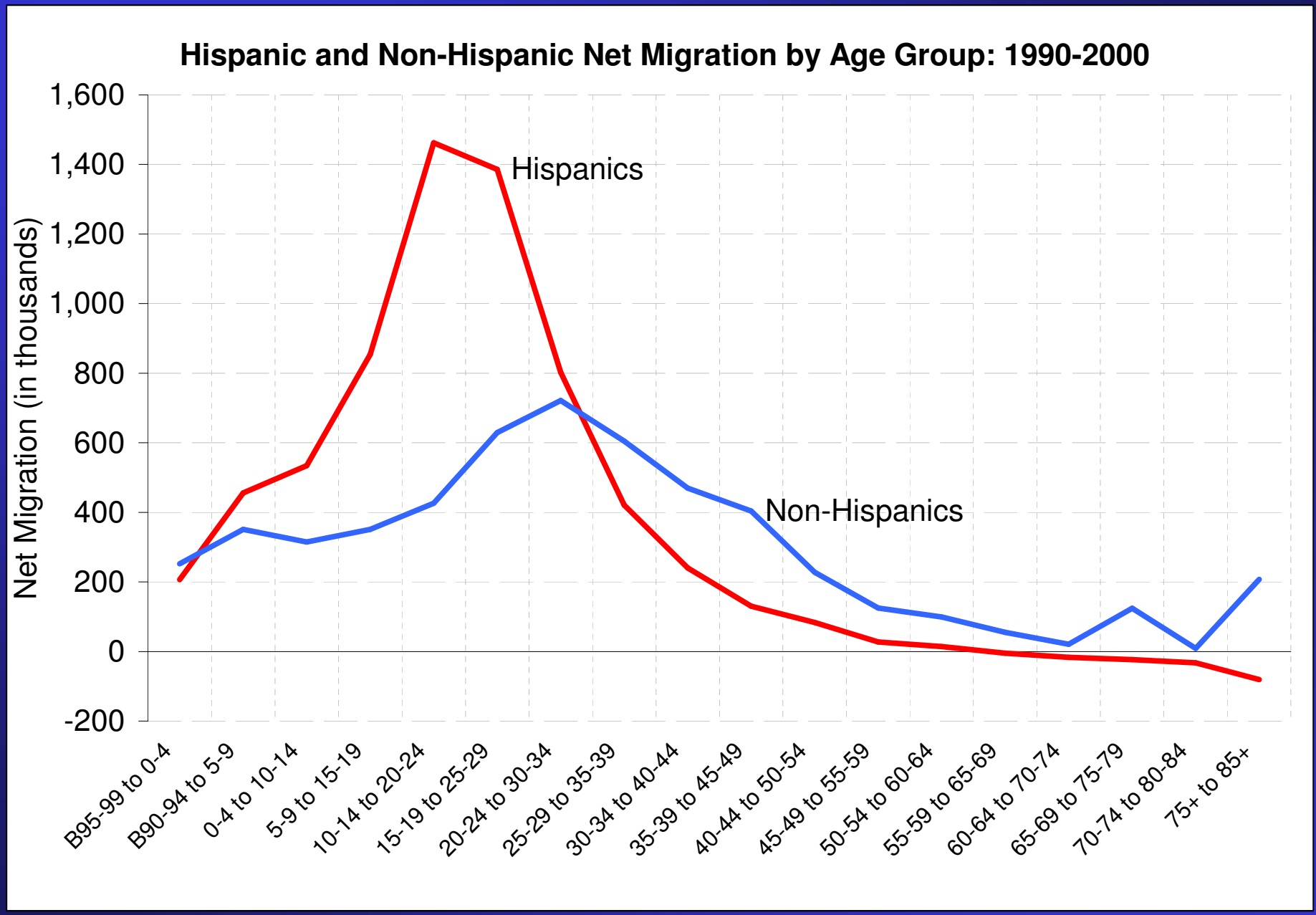
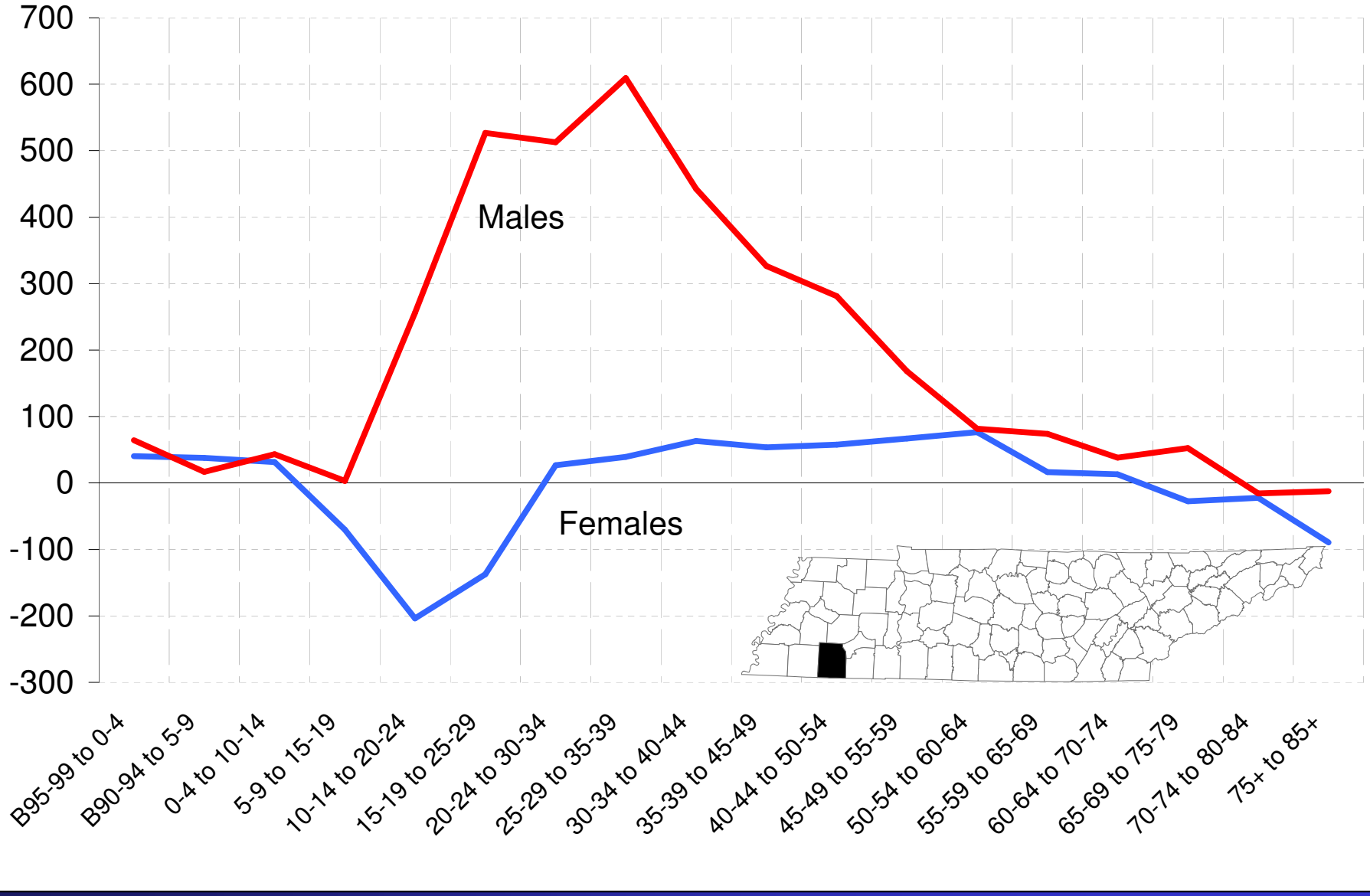
- Which led to uncertainty about the final (adjusted)1990 Census counts.
- Lack of agreement between vital data and census data (mostly problem with Hispanic deaths).
- 1990-2000 race comparability.
- Huge problems with age in the 2000 Census.
- Geographic misallocation of prisons
- But in the end, the numbers seemed solid

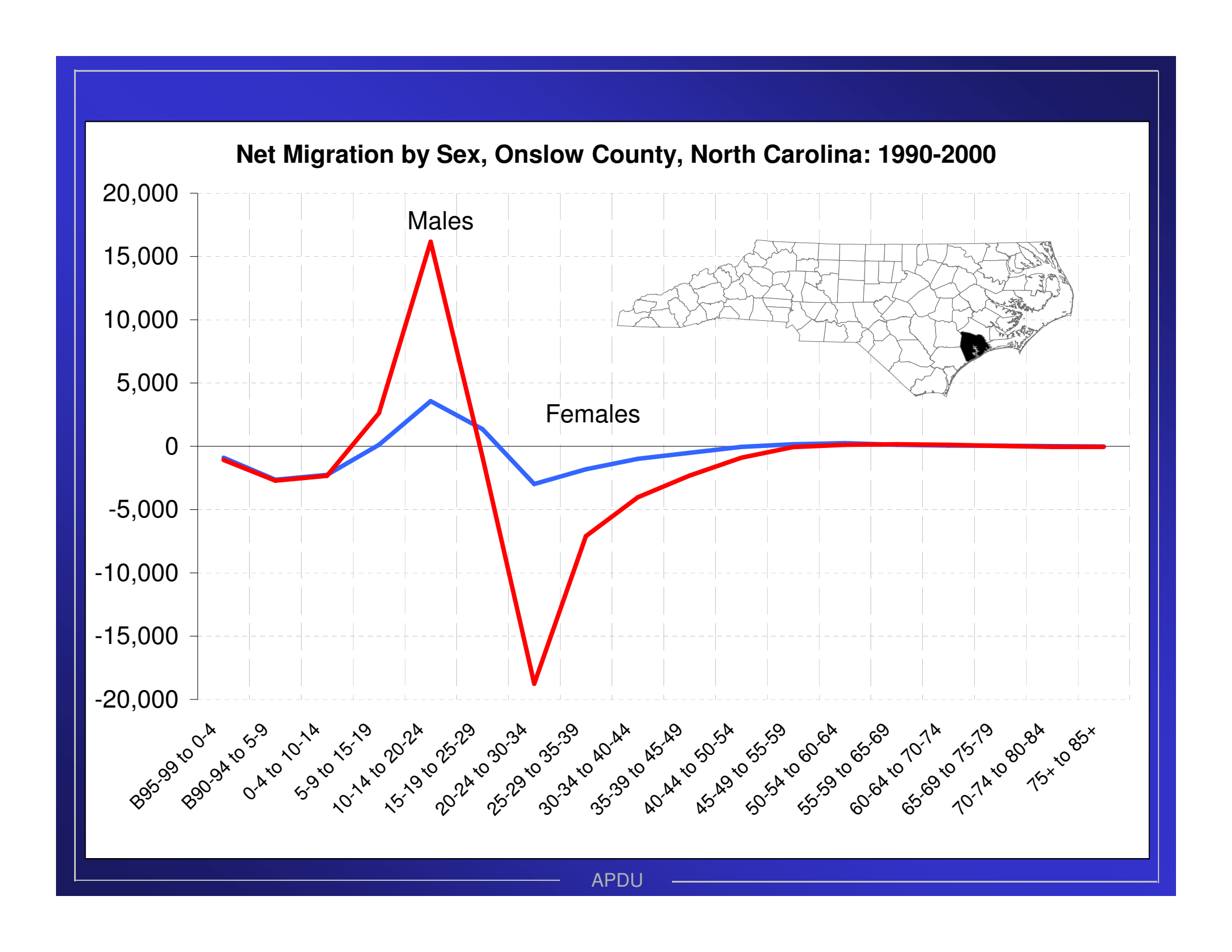

U.S. Net Migration (in thousands) by Decade: 1950's-1990's
2,100
1,800
1,500
1,200
900
600
300
0
-300
1950-1960
1960-1970
1970-1980
1980-1990
1990-2000
b0-4 to 0-4
b5-9 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65(+) to 75(+)
70-74 to 80-84
75+ to 85+


Hispanic and Non-Hispanic Net Migration by Age Group: 1990-2000
Net Migration (in thousands)
1,600
1,400
1,200
1,000
800
600
400
200
0
-200
Hispanics
Non-Hispanics
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65-69 to 75-79
70-74 to 80-84
75+ to 85+

Net Migration by Sex, Hardeman County, Tennessee: 1990-2000



Net Migration by Sex, Onslow County, North Carolina: 1990-2000

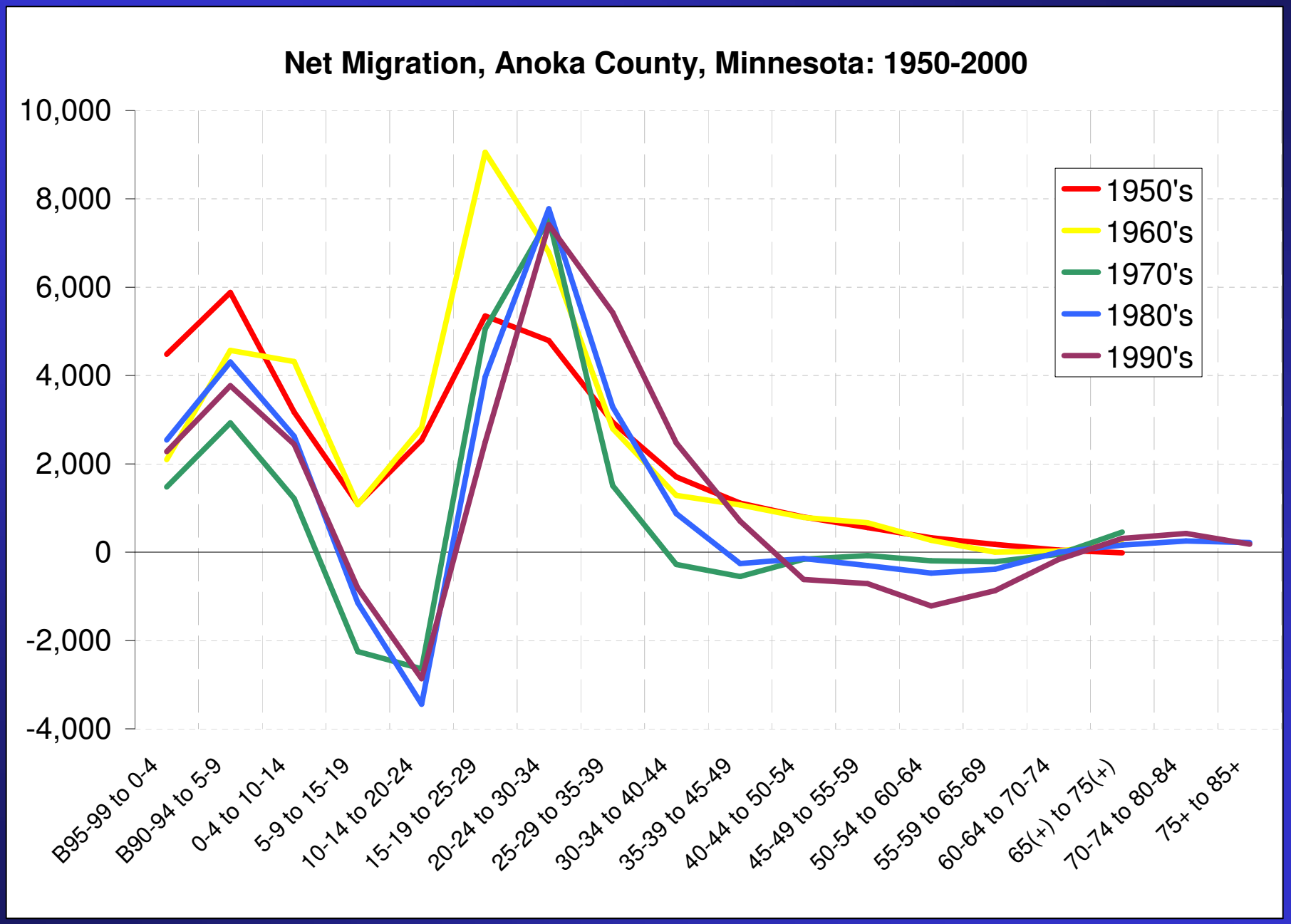


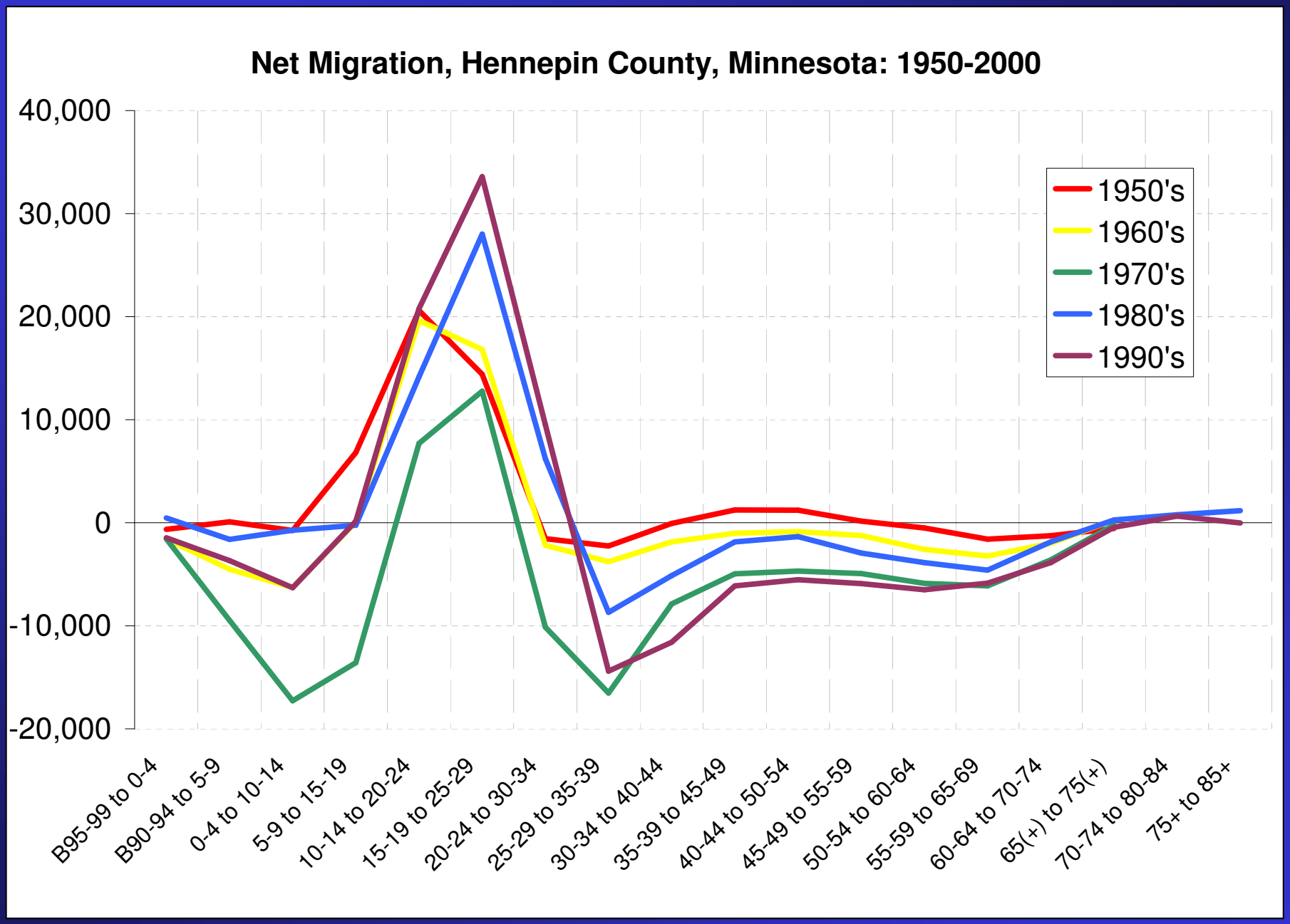
Why are estimates of net migration be useful?

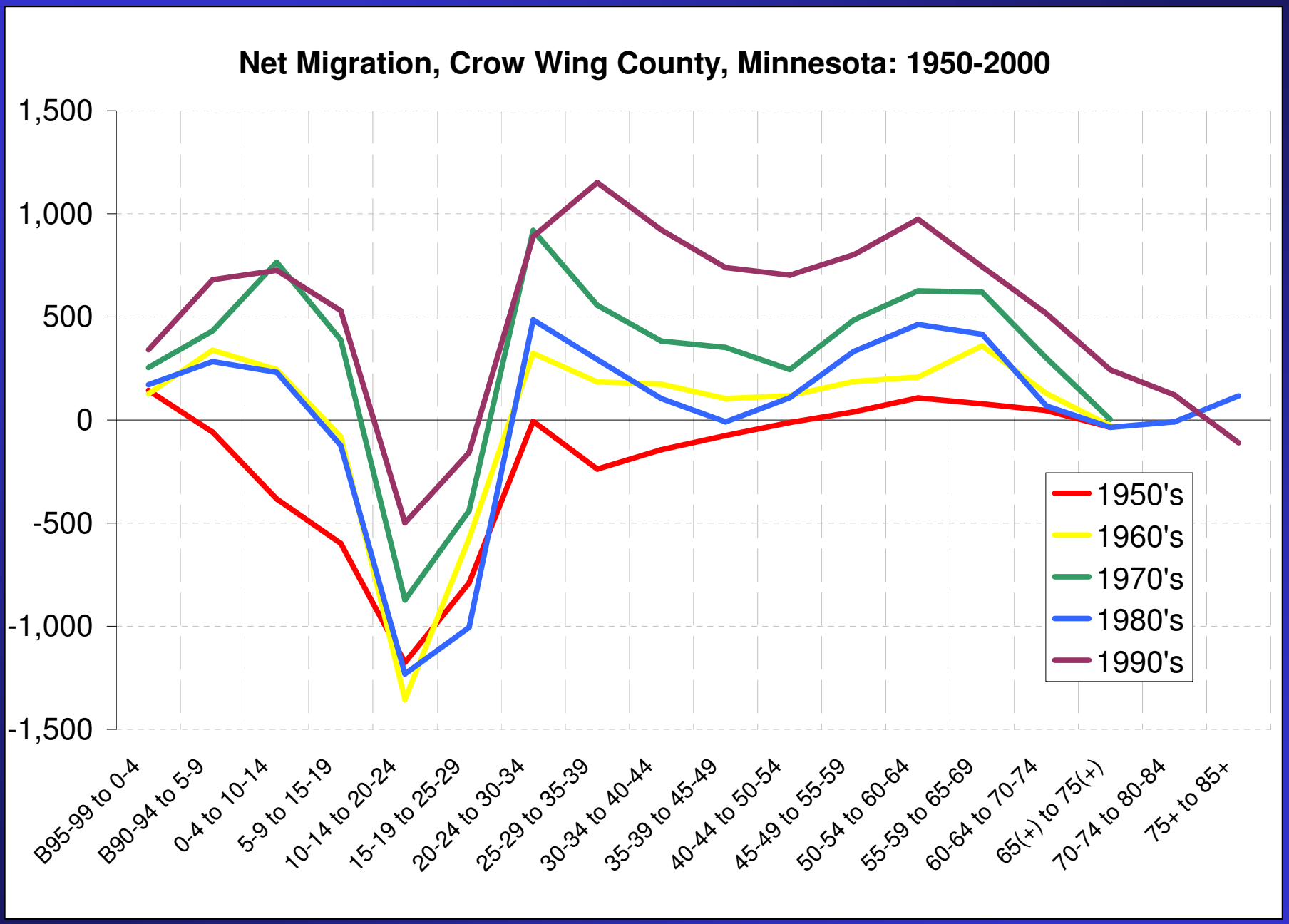
- Cohort Component Population Projections
  - Births estimated from historical trends and the number of women in their child-bearing years.
  - Deaths estimated from historical trends and population's age, sex, and race distributions.
  - Migration is harder to account for. But, each county tends to have a "signature" pattern that makes net migration easier to forecast.

Role of net migration in population projections

- Externally set target net migration level
  - Account for expected local economic conditions, housing growth, etc.
  - Then some assumptions must be made about the *overall* magnitude of net migration.
  - Net migration "signature" helps to distribute overall net migration by age, sex (and race/ethnicity).
- Signatures are remarkably constant across decades.
- When not constant, they reveal breaks in trends that can be incorporated into the projections.

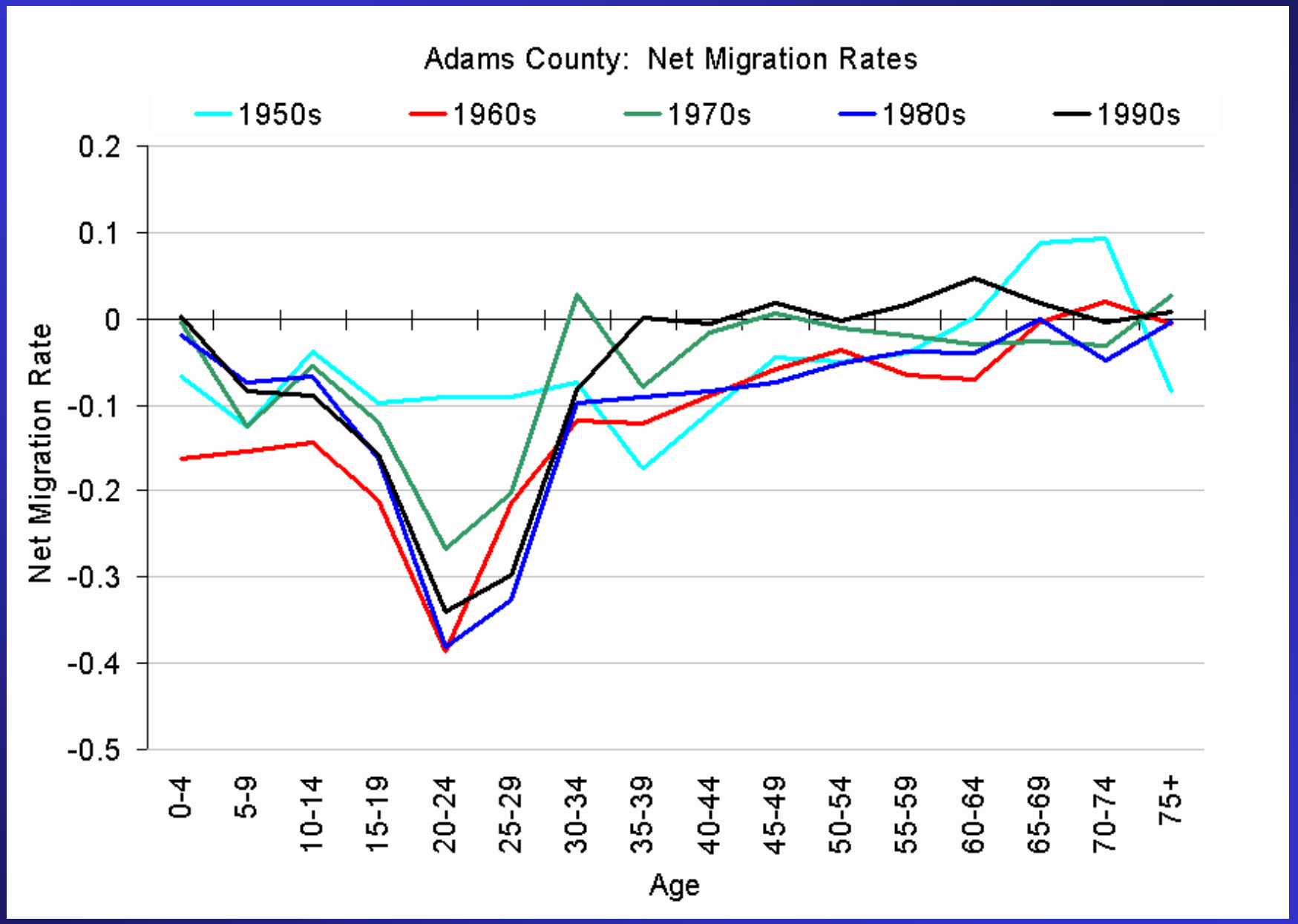

Net Migration, Anoka County, Minnesota: 1950-2000
10,000
8,000
6,000
4,000
2,000
0
-2,000
-4,000
1950's
1960's
1970's
1980's
1990's
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65(+) to 75(+)
70-74 to 80-84
75+ to 85+

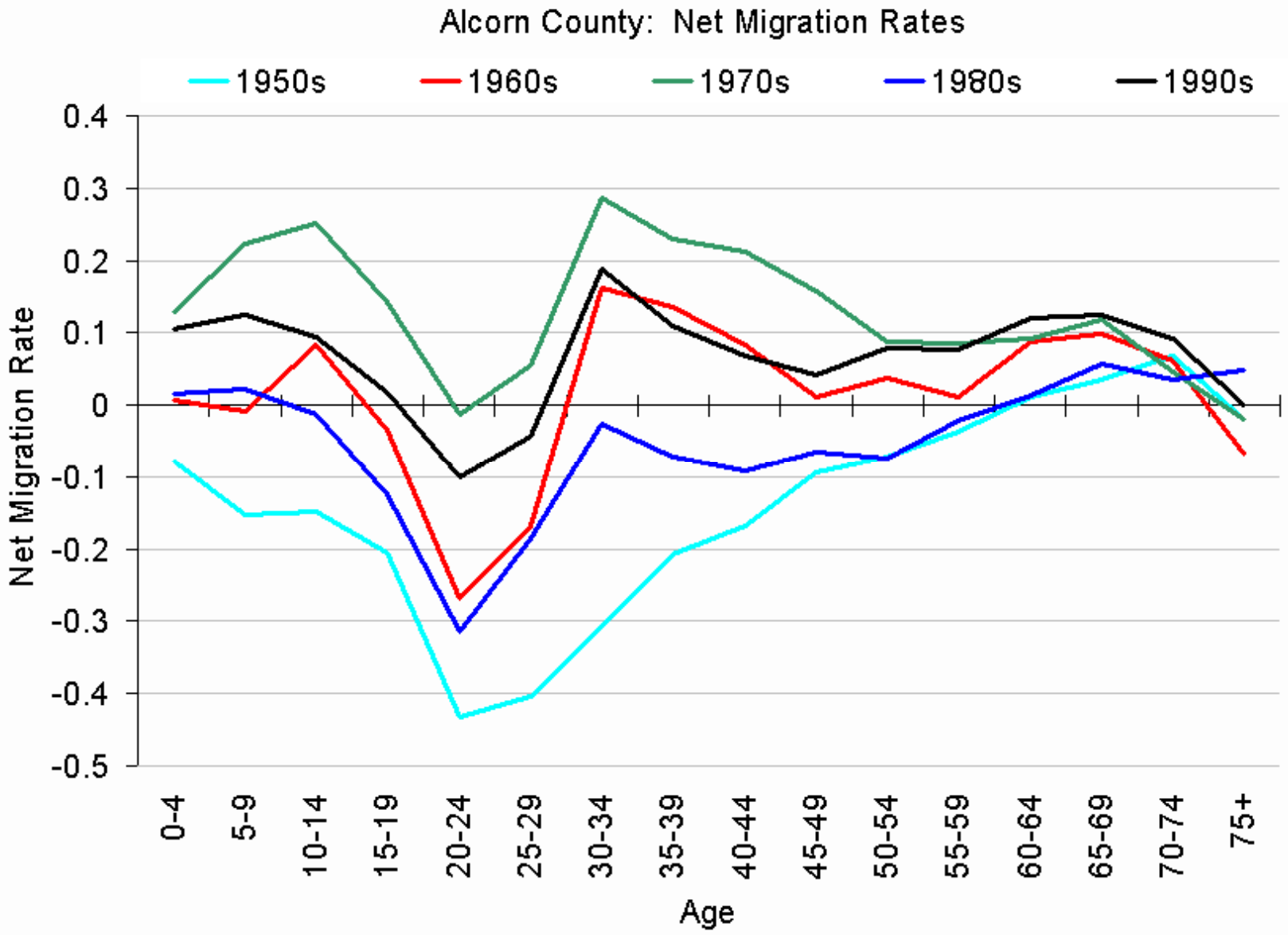

Net Migration, Hennepin County, Minnesota: 1950-2000
40,000
30,000
20,000
10,000
0
-10,000
-20,000
1950's
1960's
1970's
1980's
1990's
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65(+) to 75(+)
70-74 to 80-84
75+ to 85+

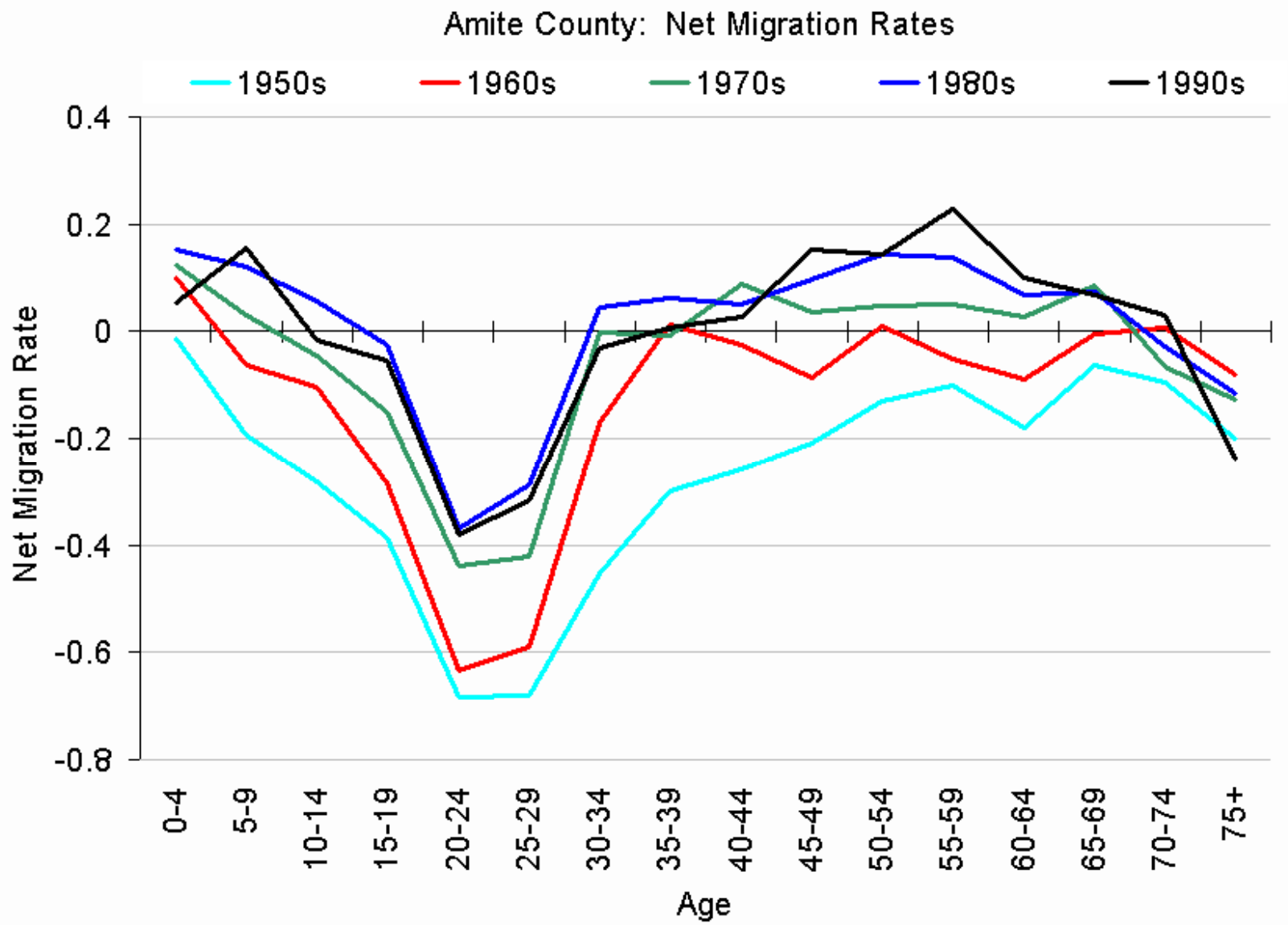

Net Migration, Crow Wing County, Minnesota: 1950-2000
1,500
1,000
500
0
-500
-1,000
-1,500
1950's
1960's
1970's
1980's
1990's
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65(+) to 75(+)
70-74 to 80-84
75+ to 85+

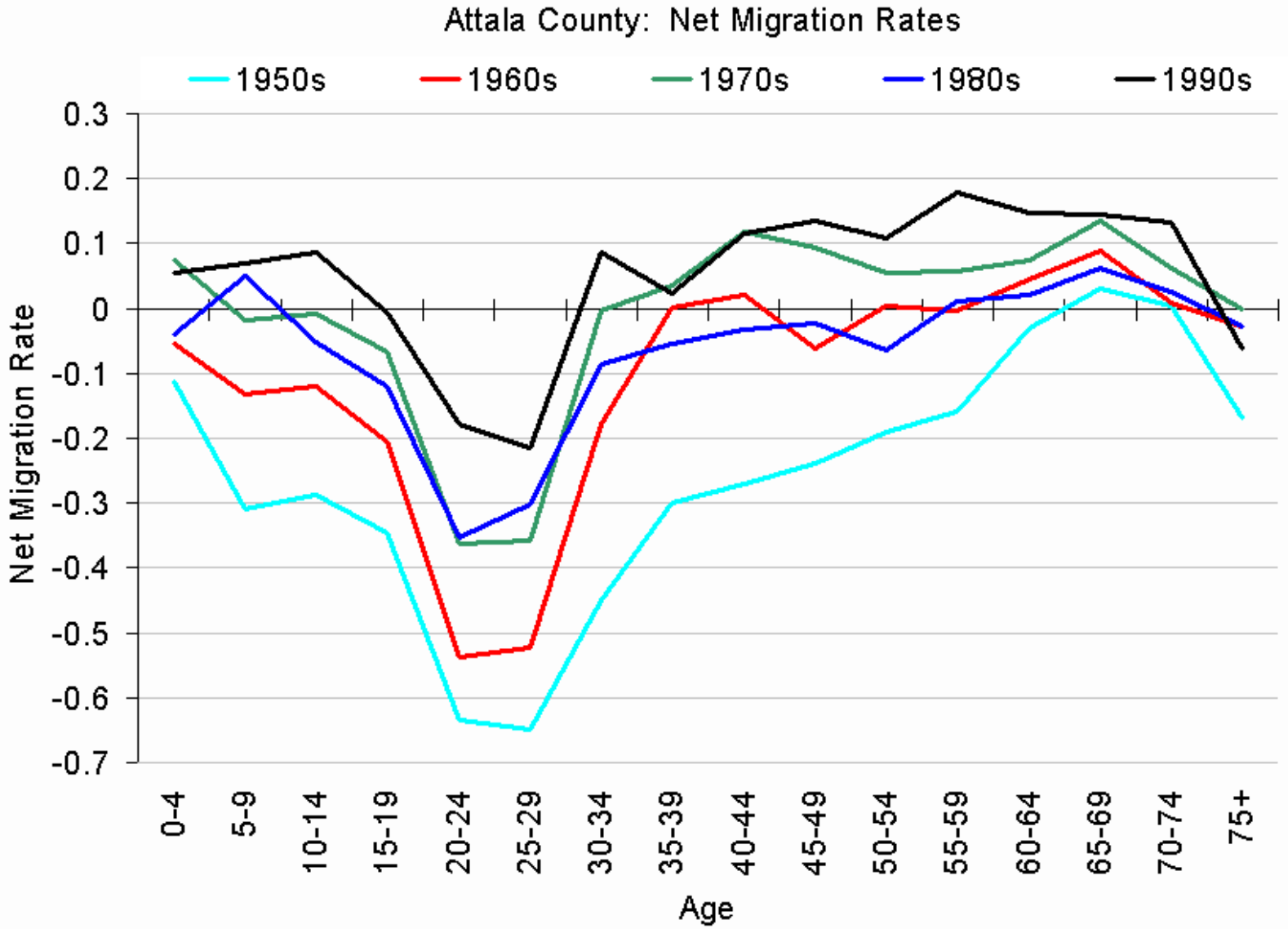
Net migration “signatures”

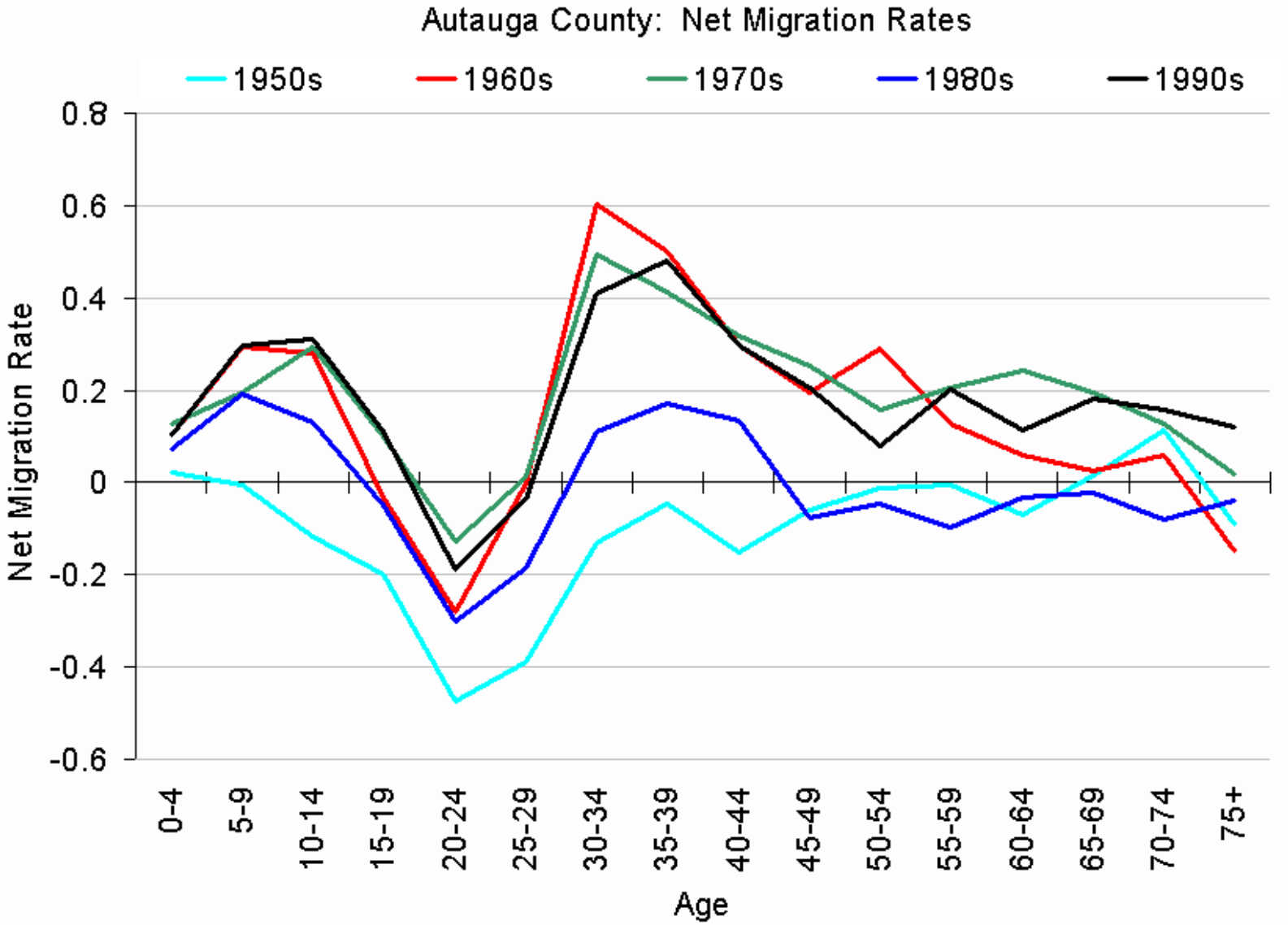
- Very useful for understanding “type” of county
- Can be “read” much the same as a population pyramid
- Important role in population projection models for counties
- A 6th set will join the suite of data sets in a couple years
- Some examples using Mississippi…

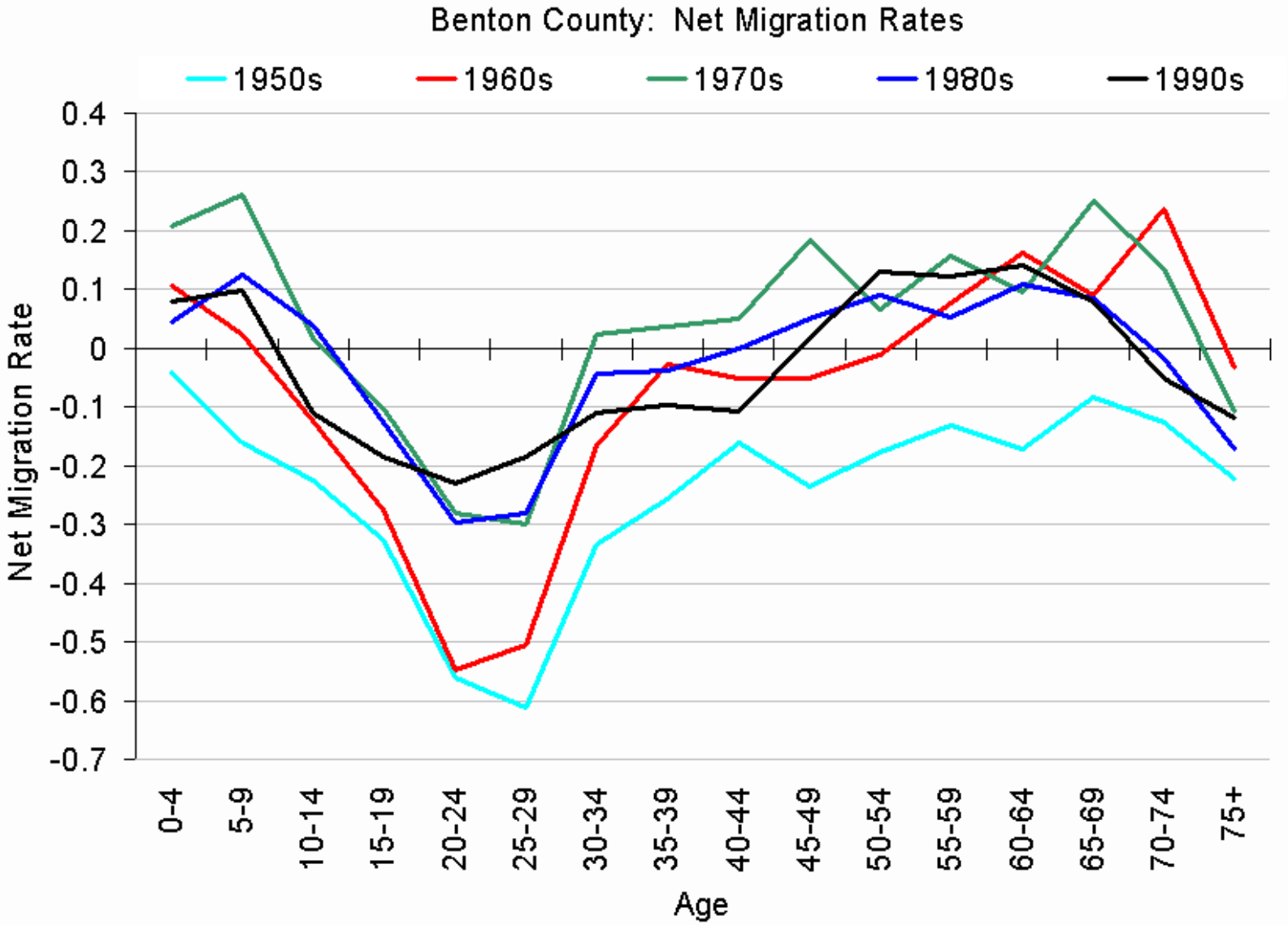

Adams County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

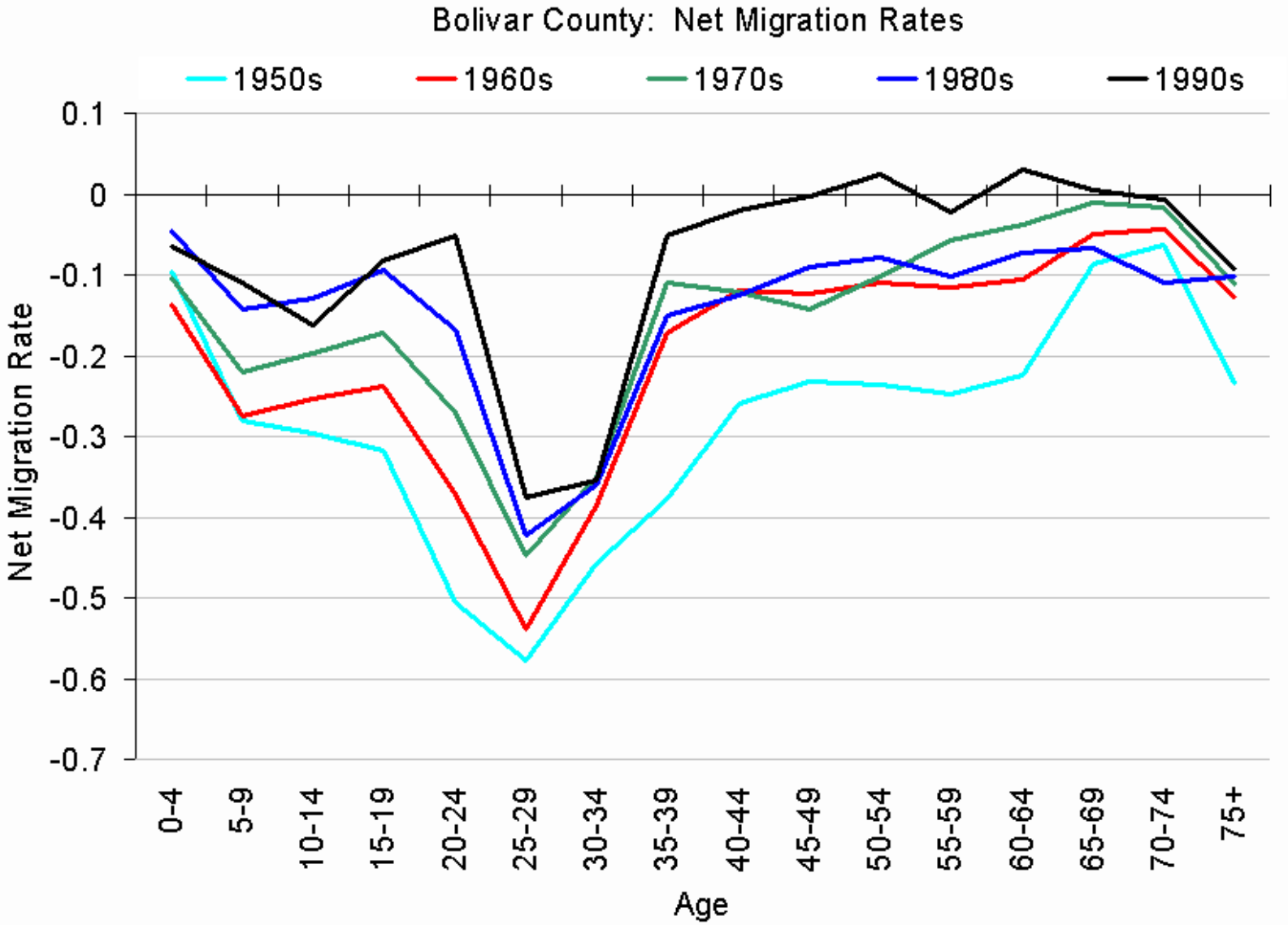

Alcorn County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

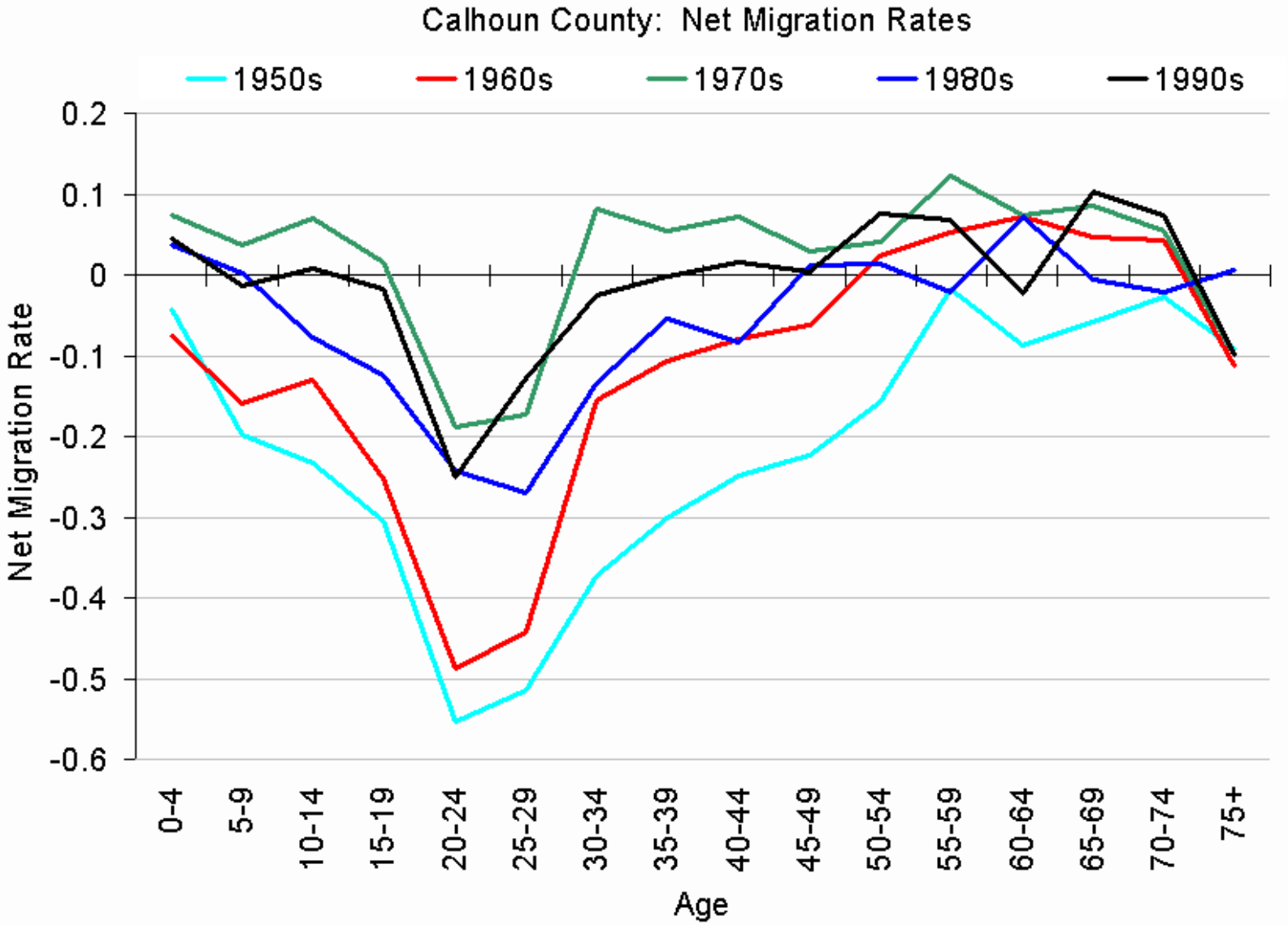

Amite County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

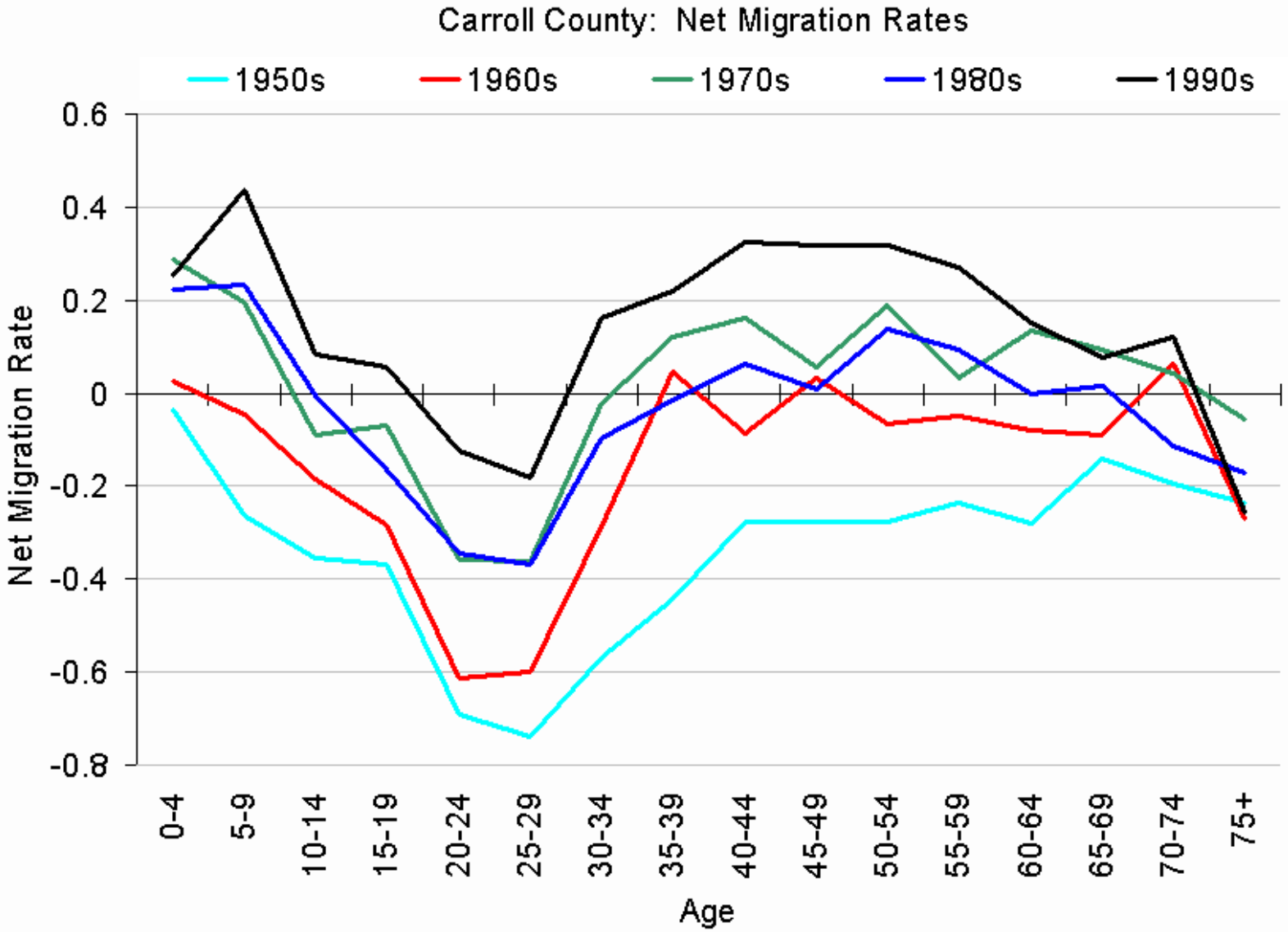

Attala County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

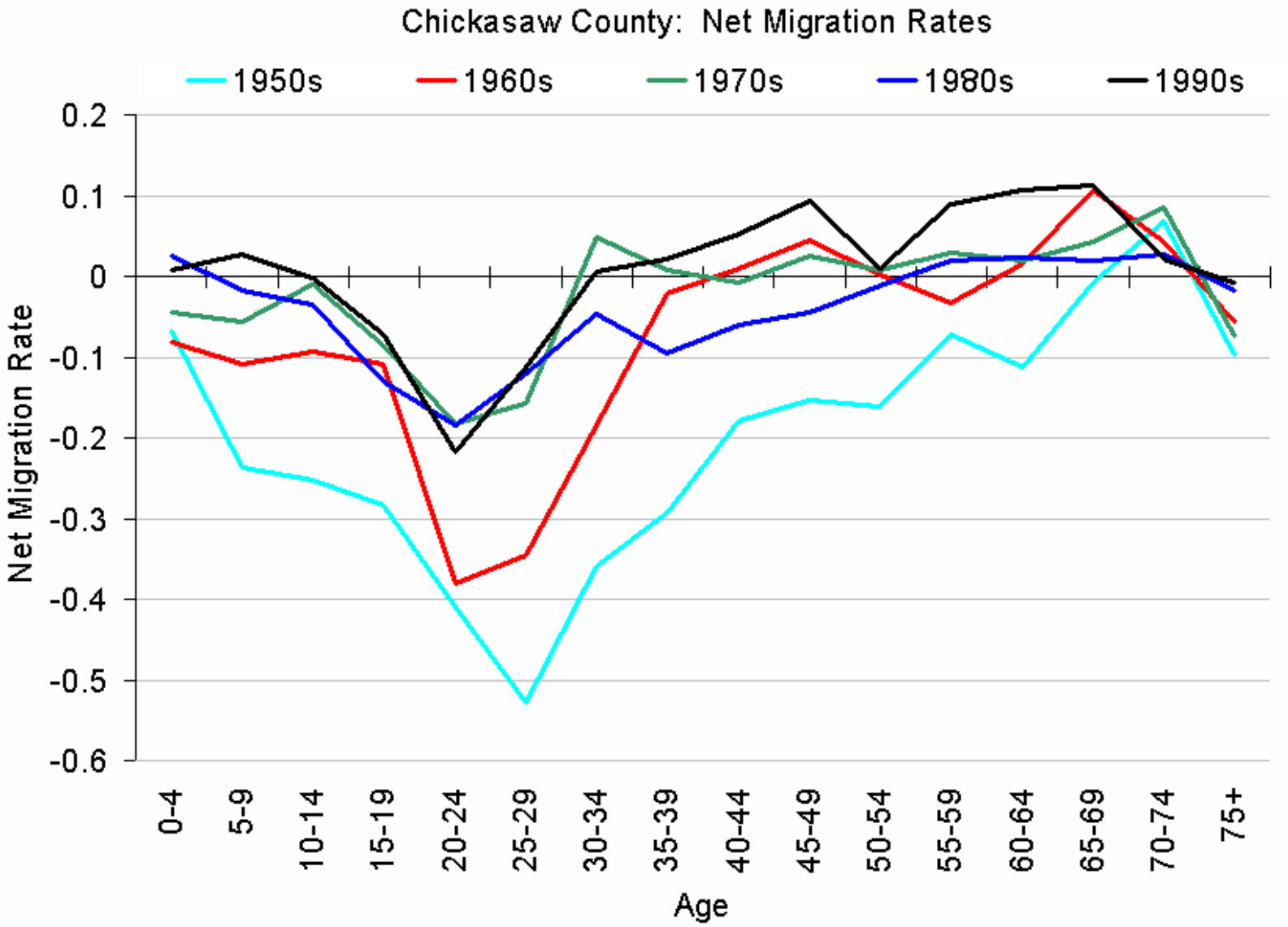

Autauga County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

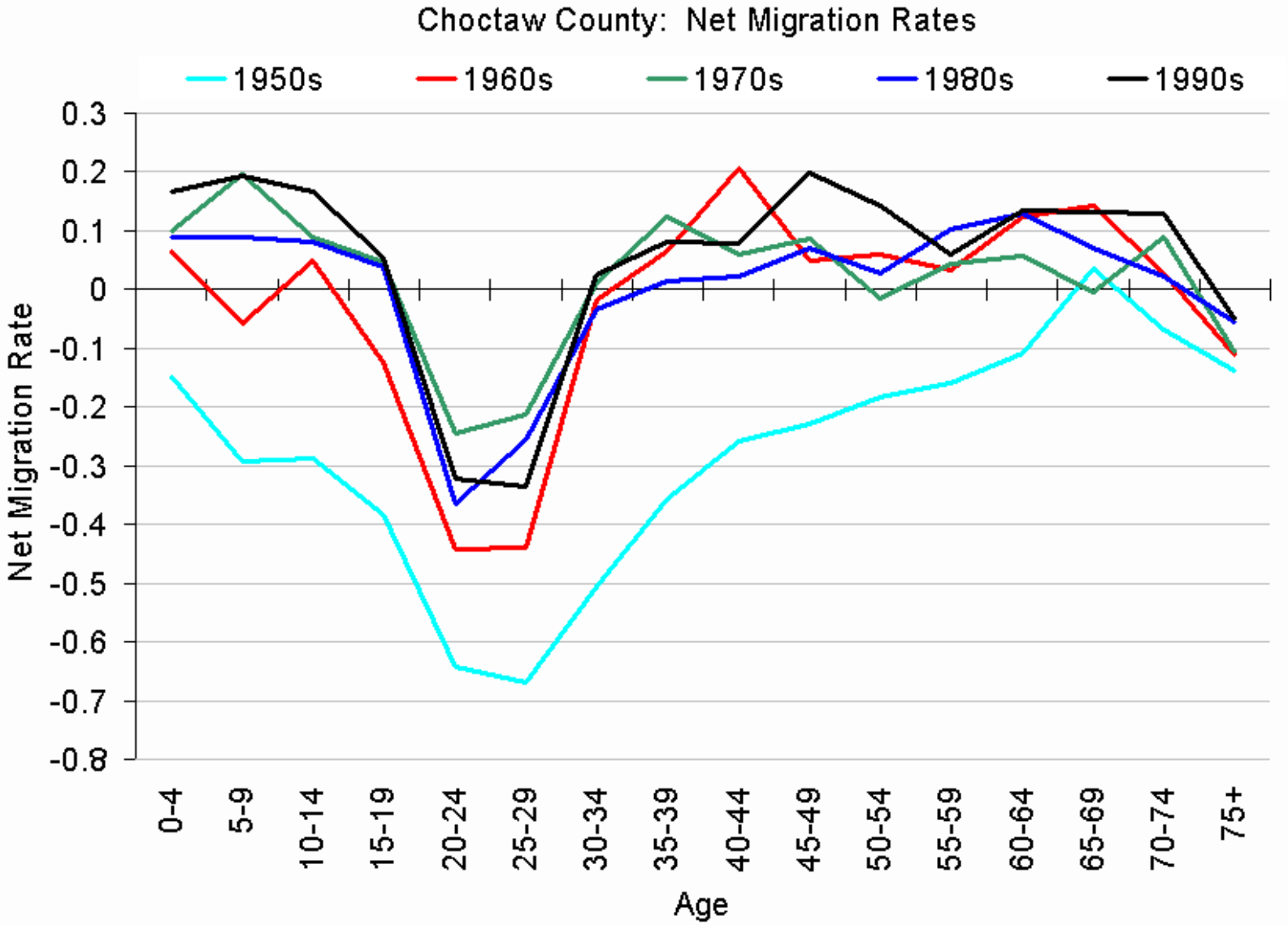

Benton County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

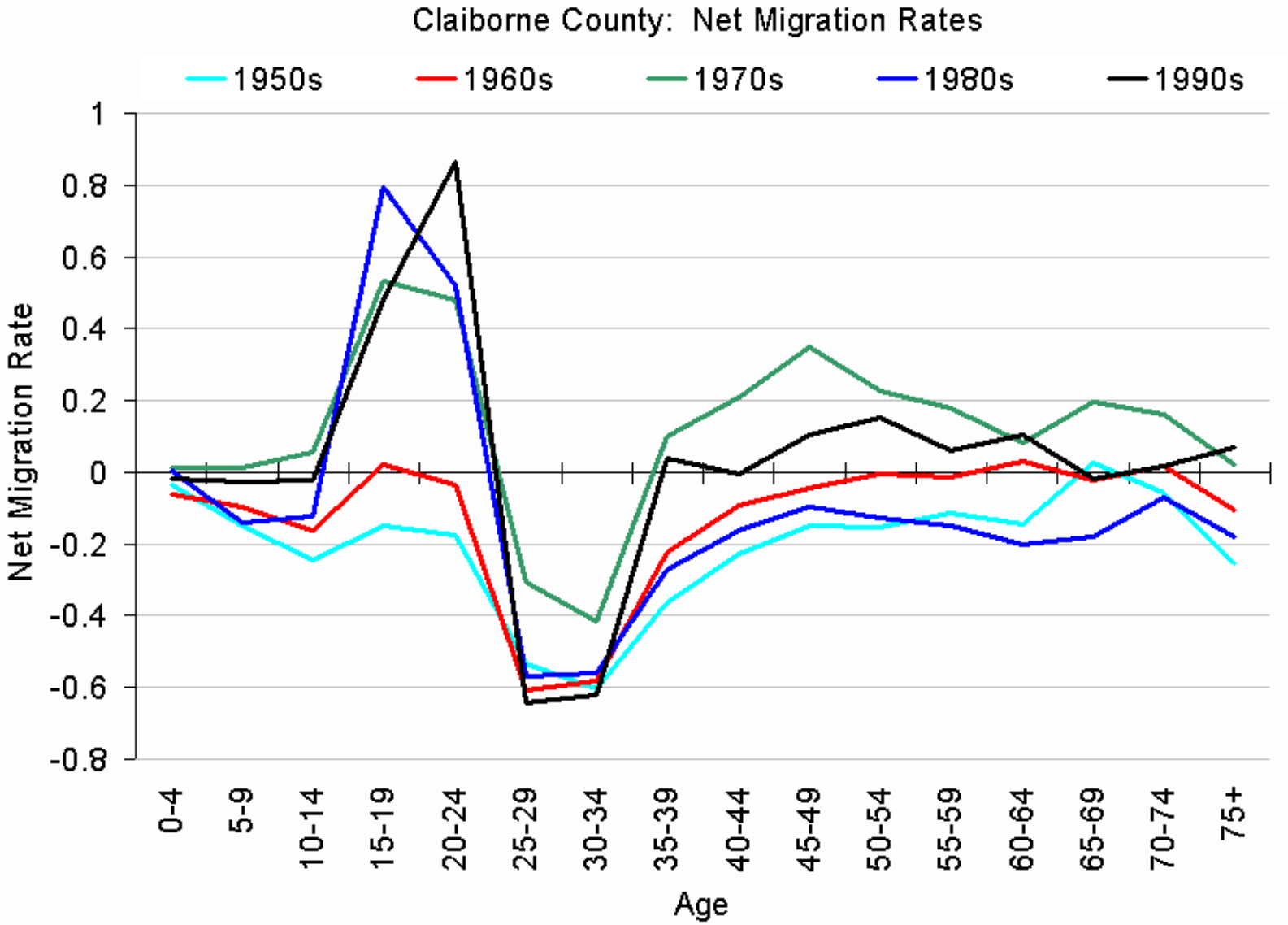

Bolivar County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

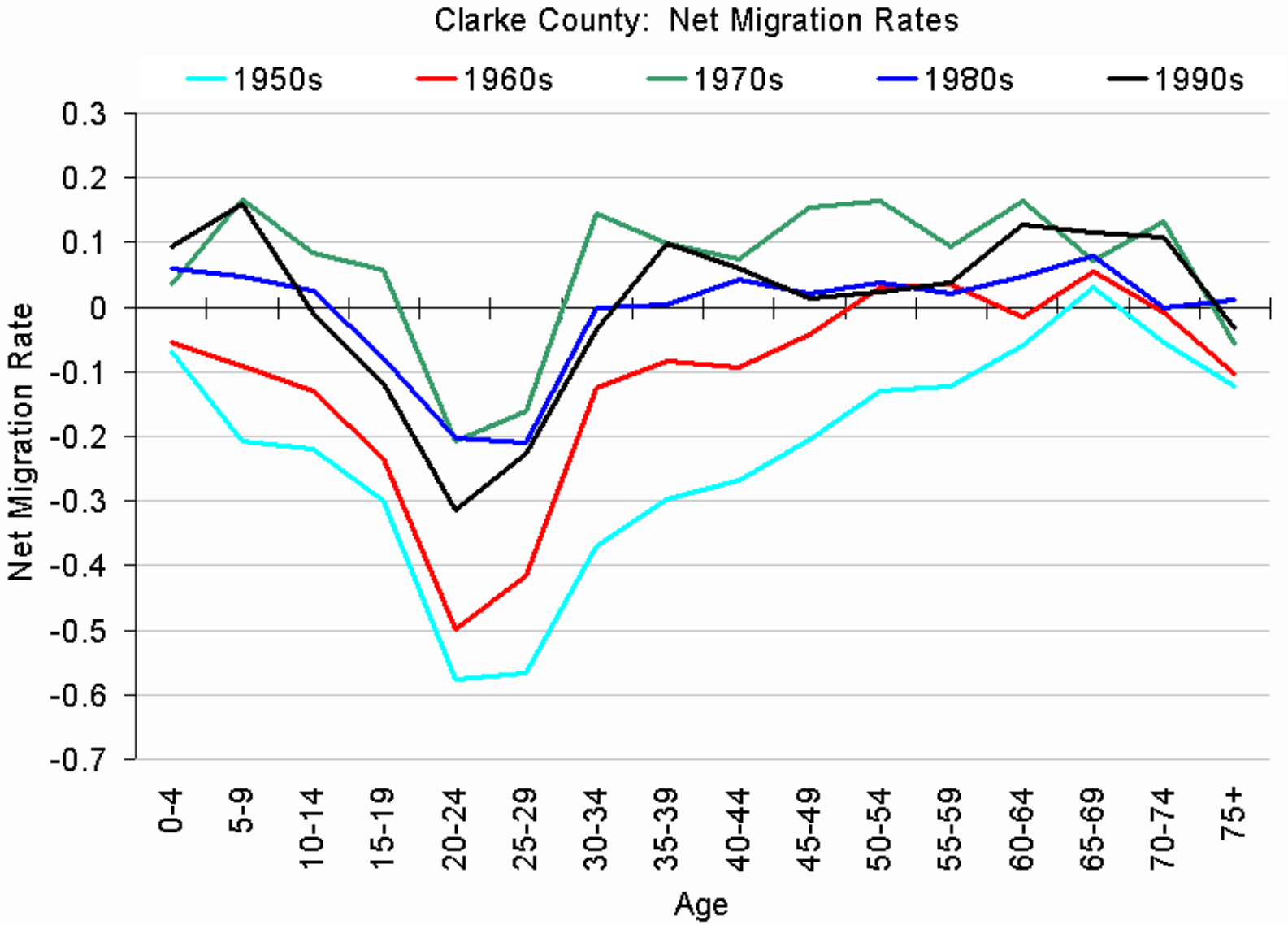

Calhoun County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Carroll County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Chickasaw County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Choctaw County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Claiborne County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Clarke County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
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45-49
50-54
55-59
60-64
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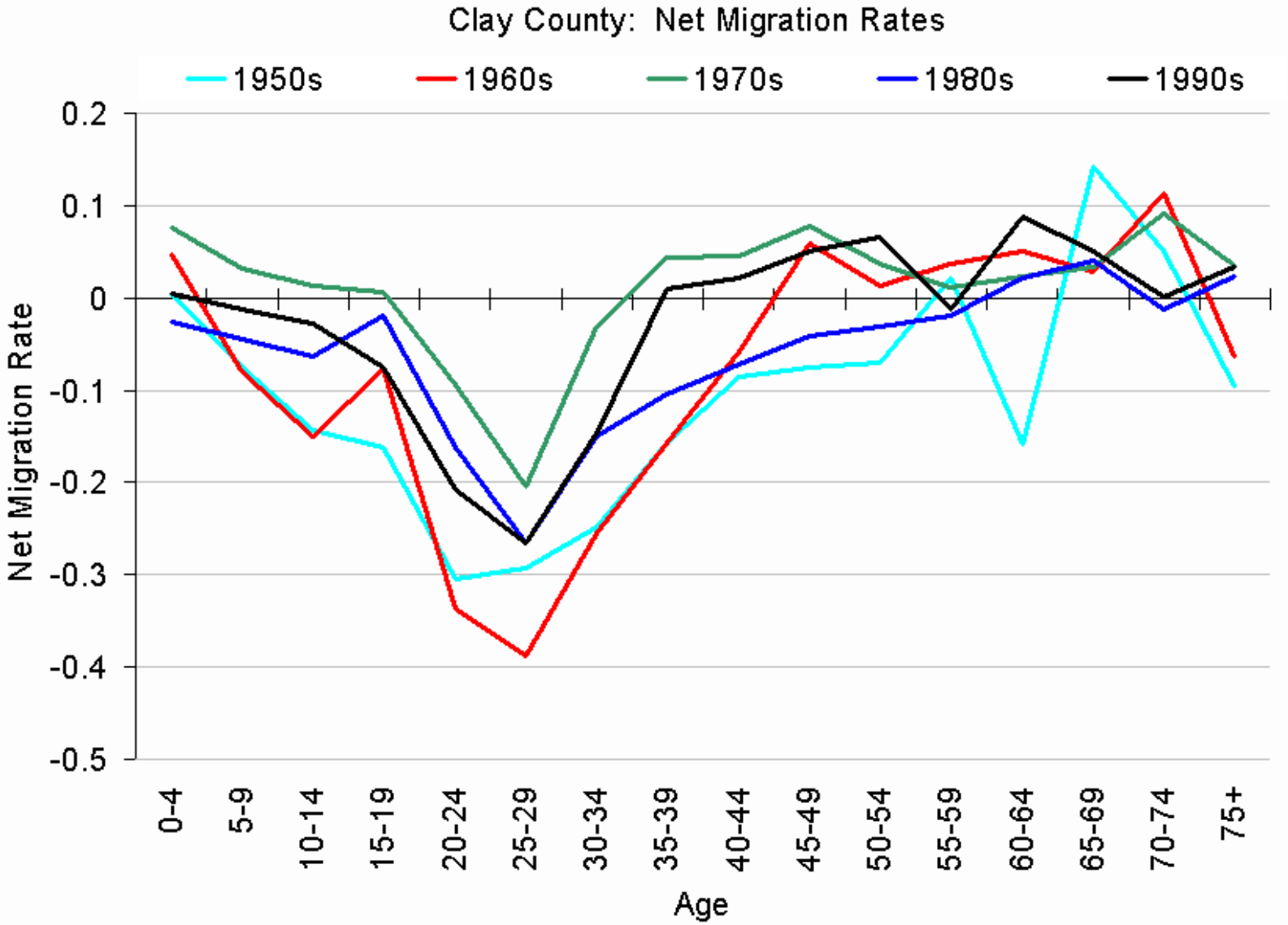
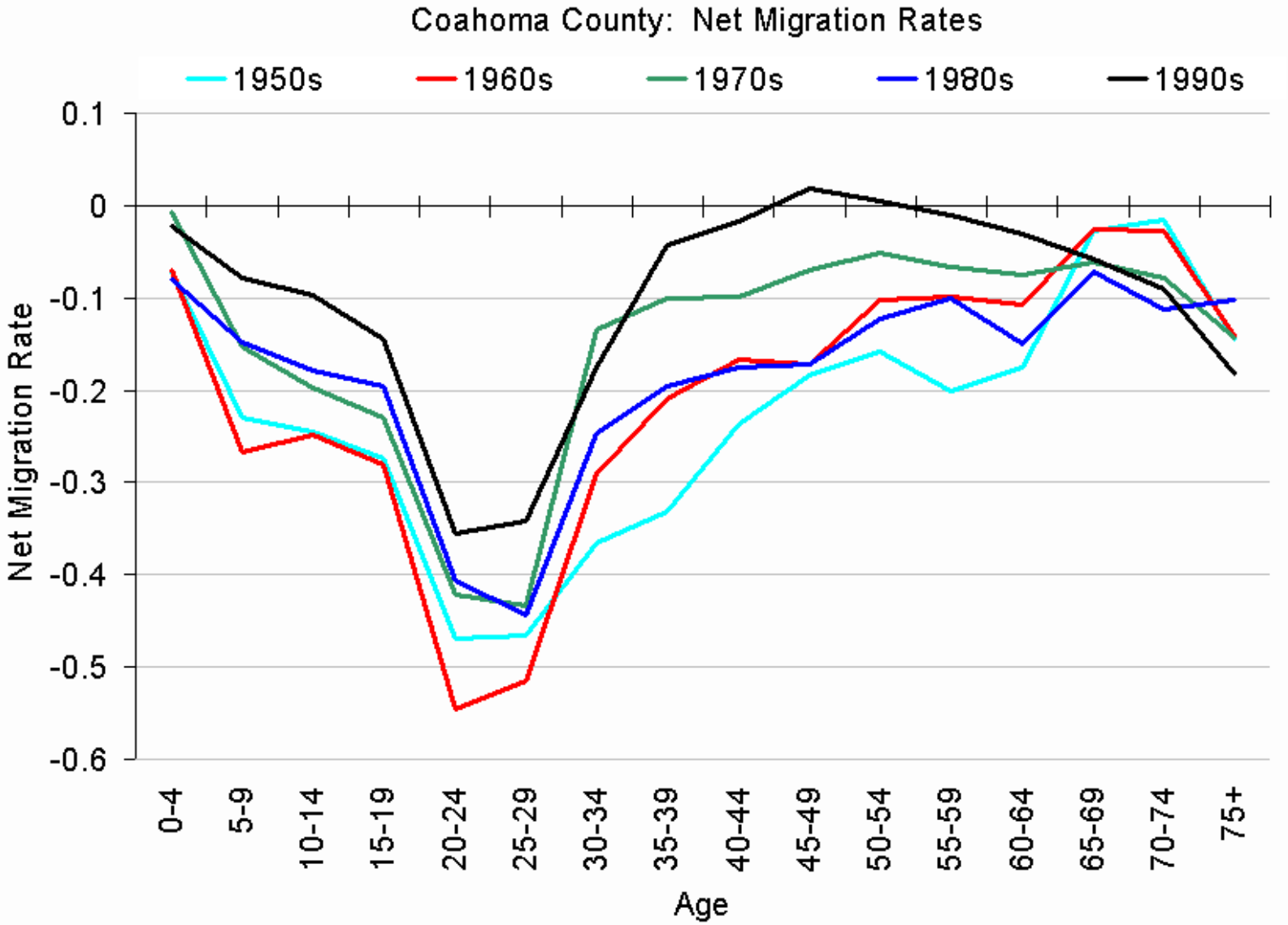
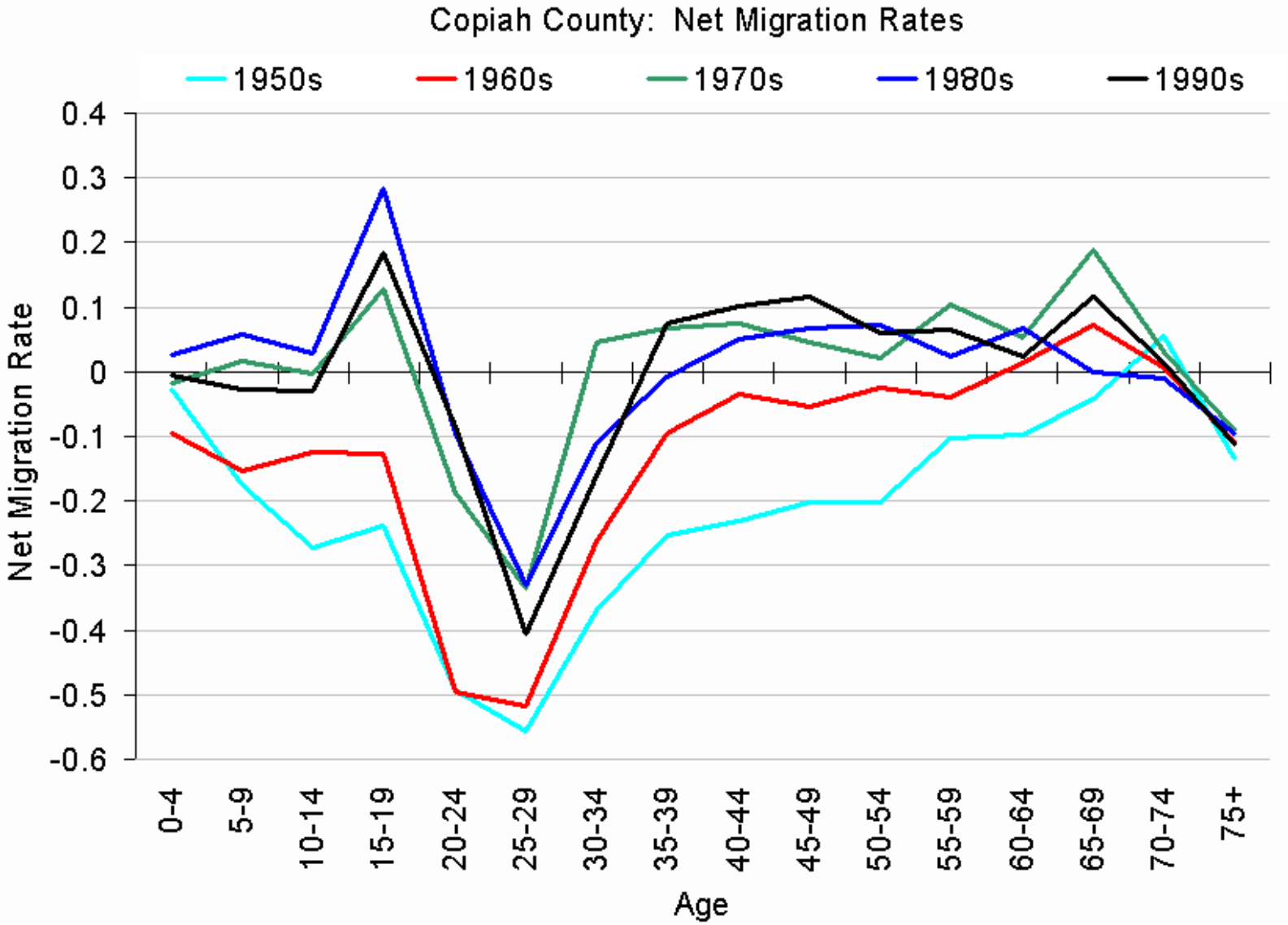
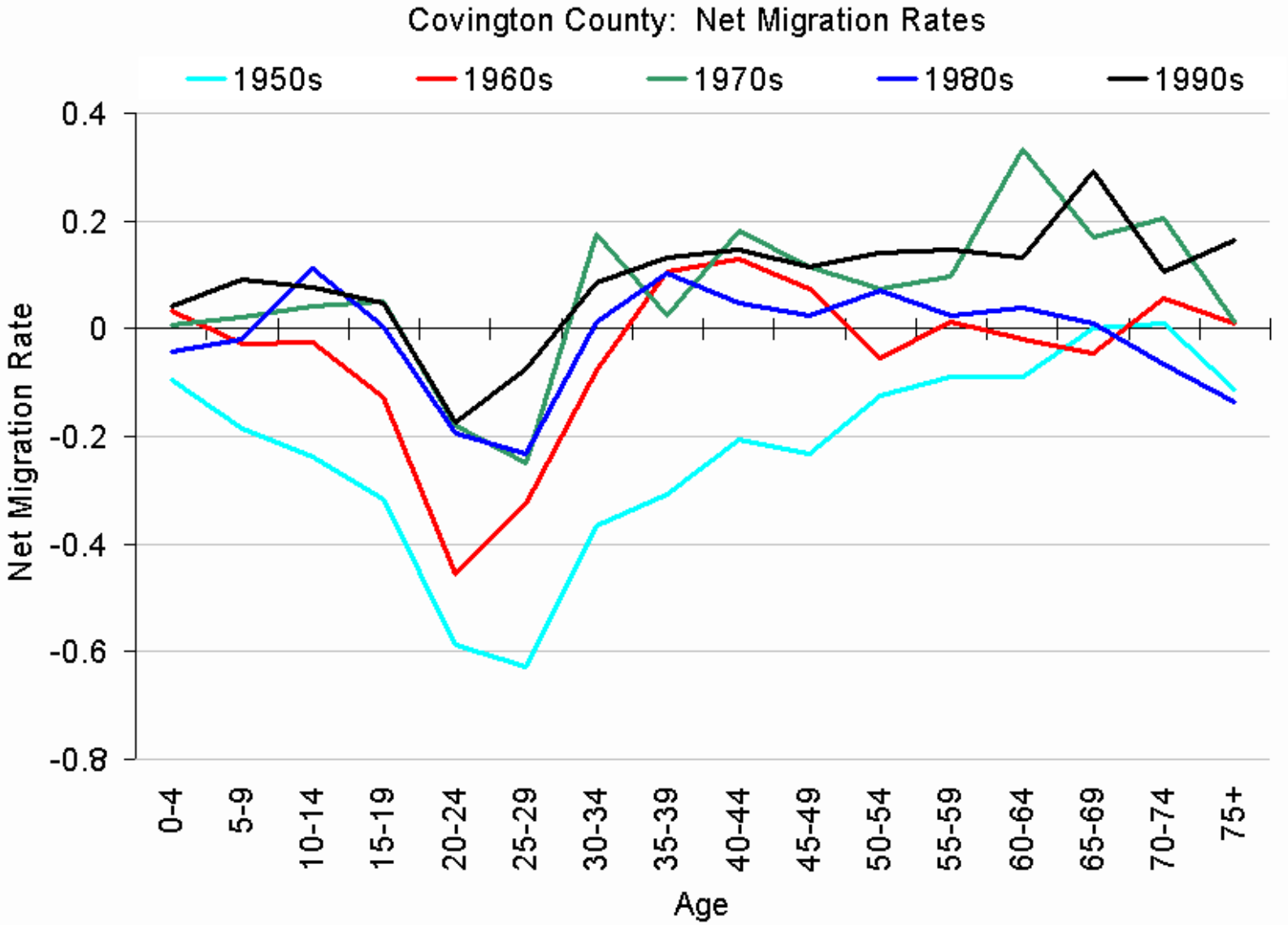
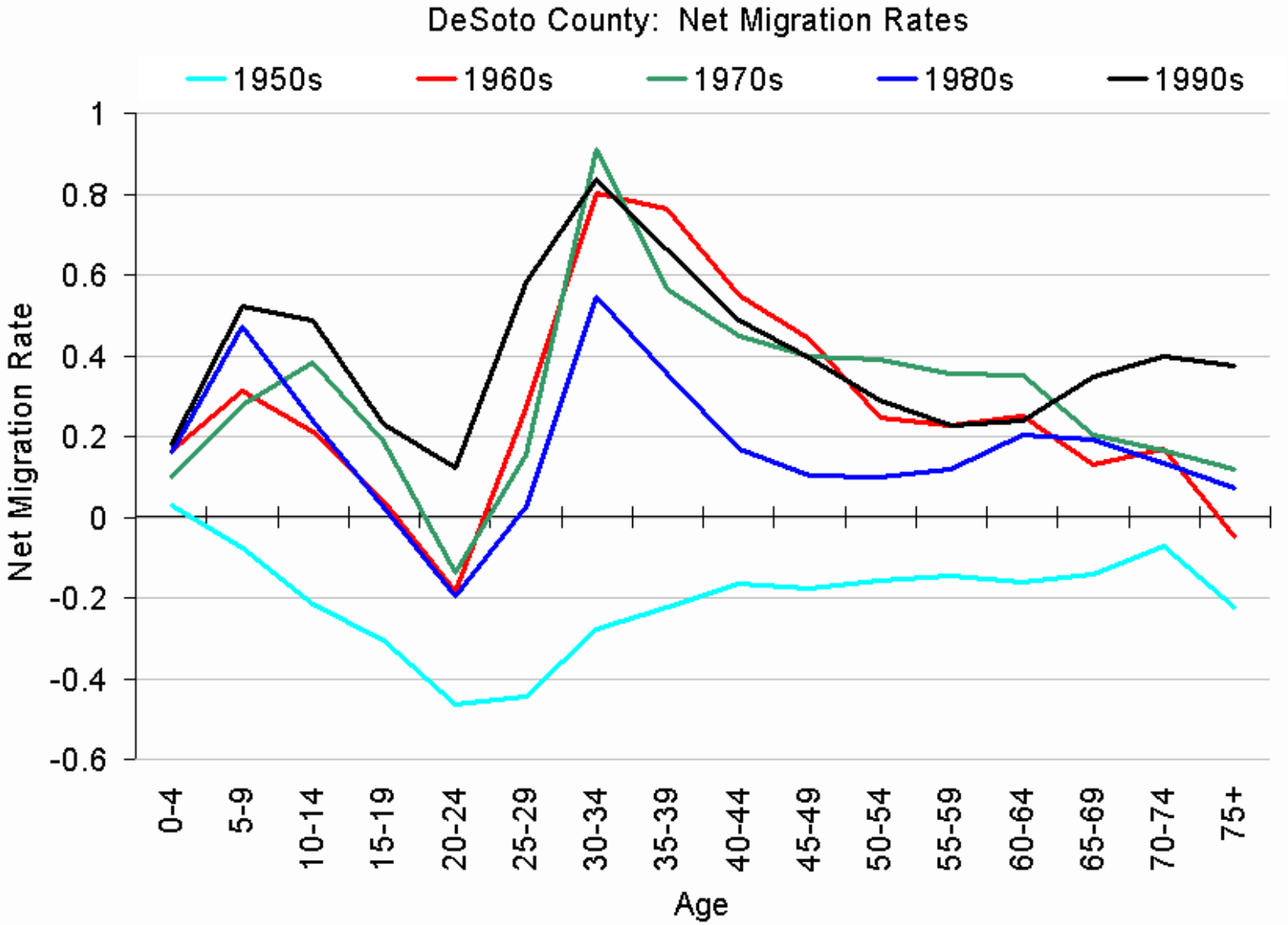
75+
Age

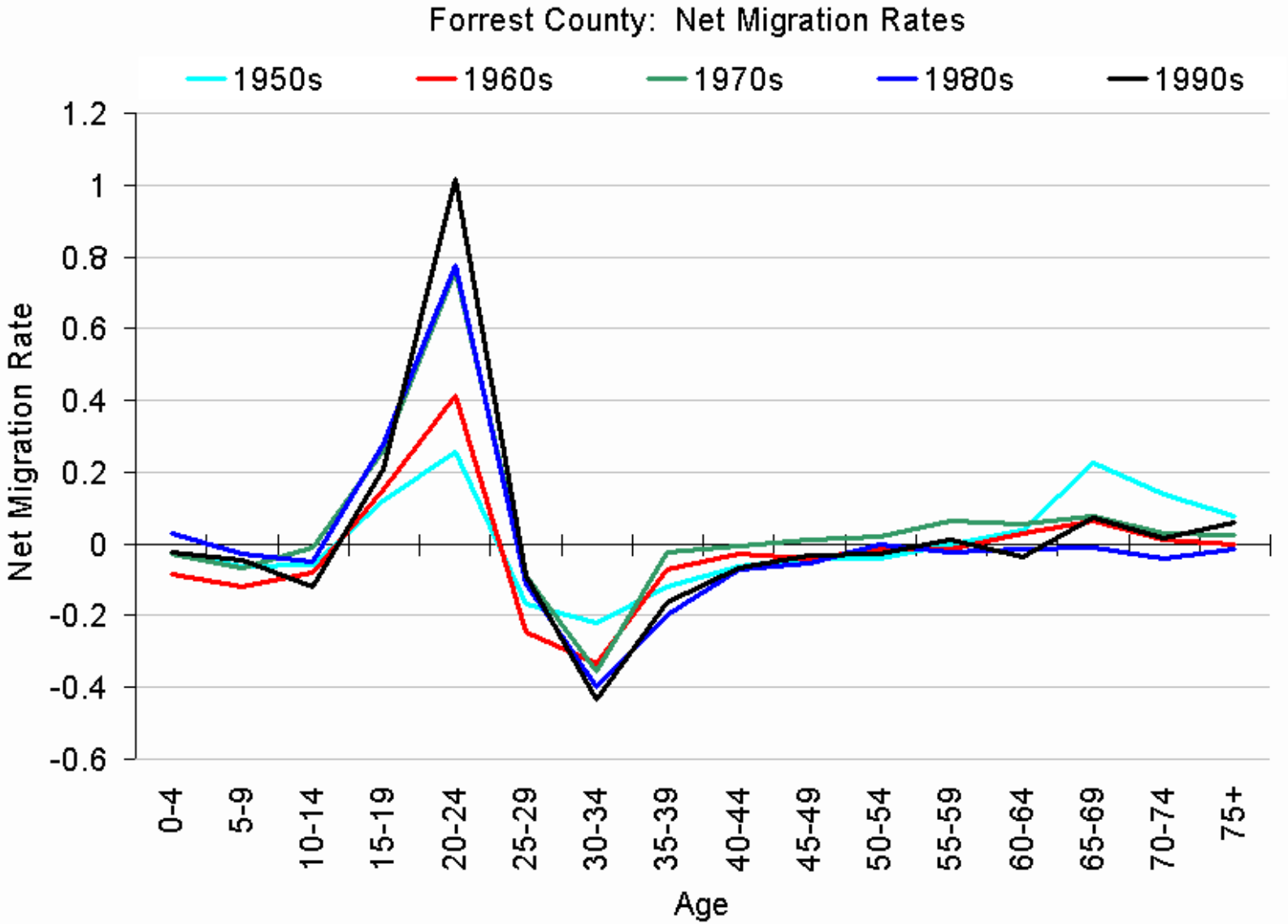

Clay County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

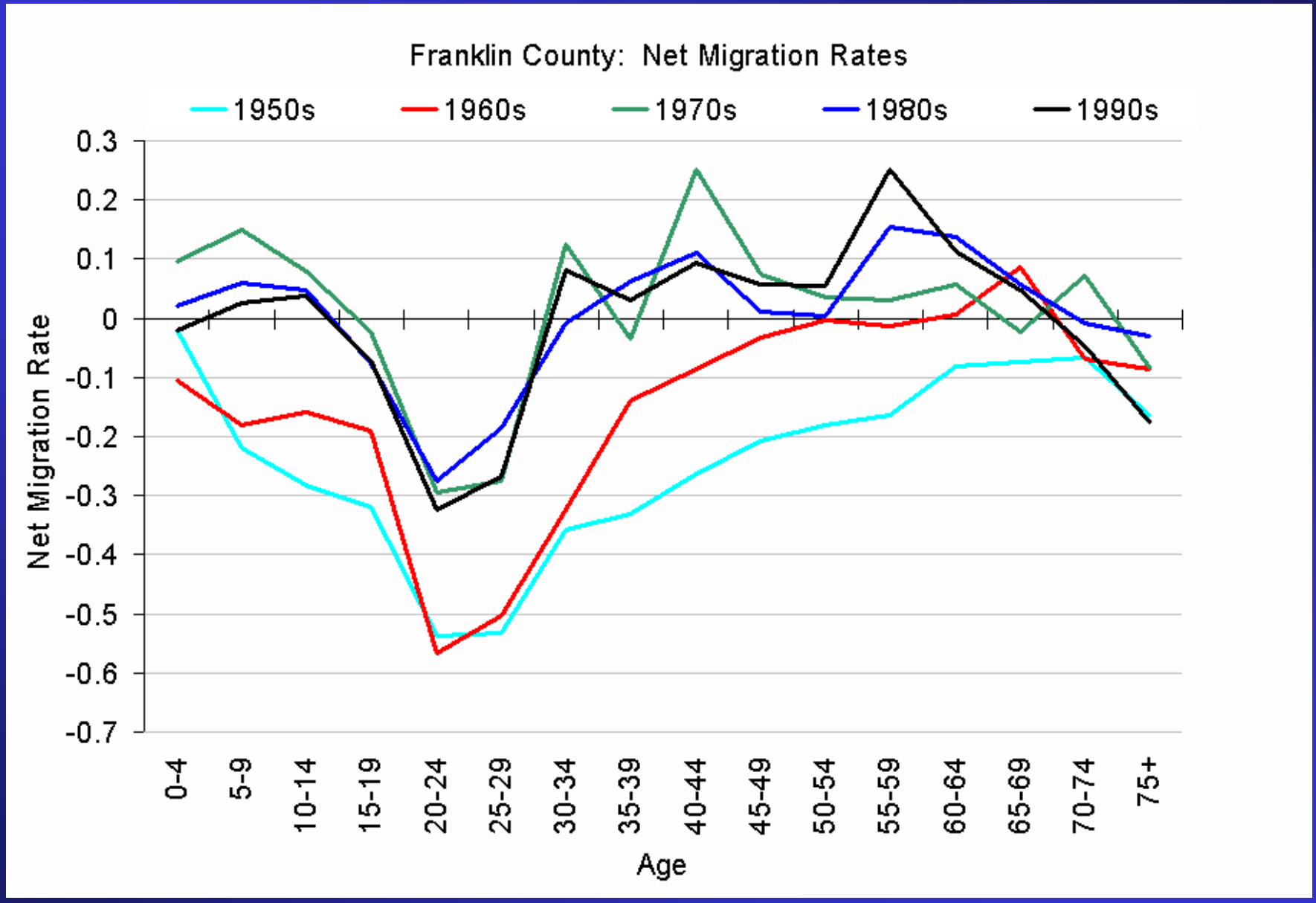

Coahoma County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

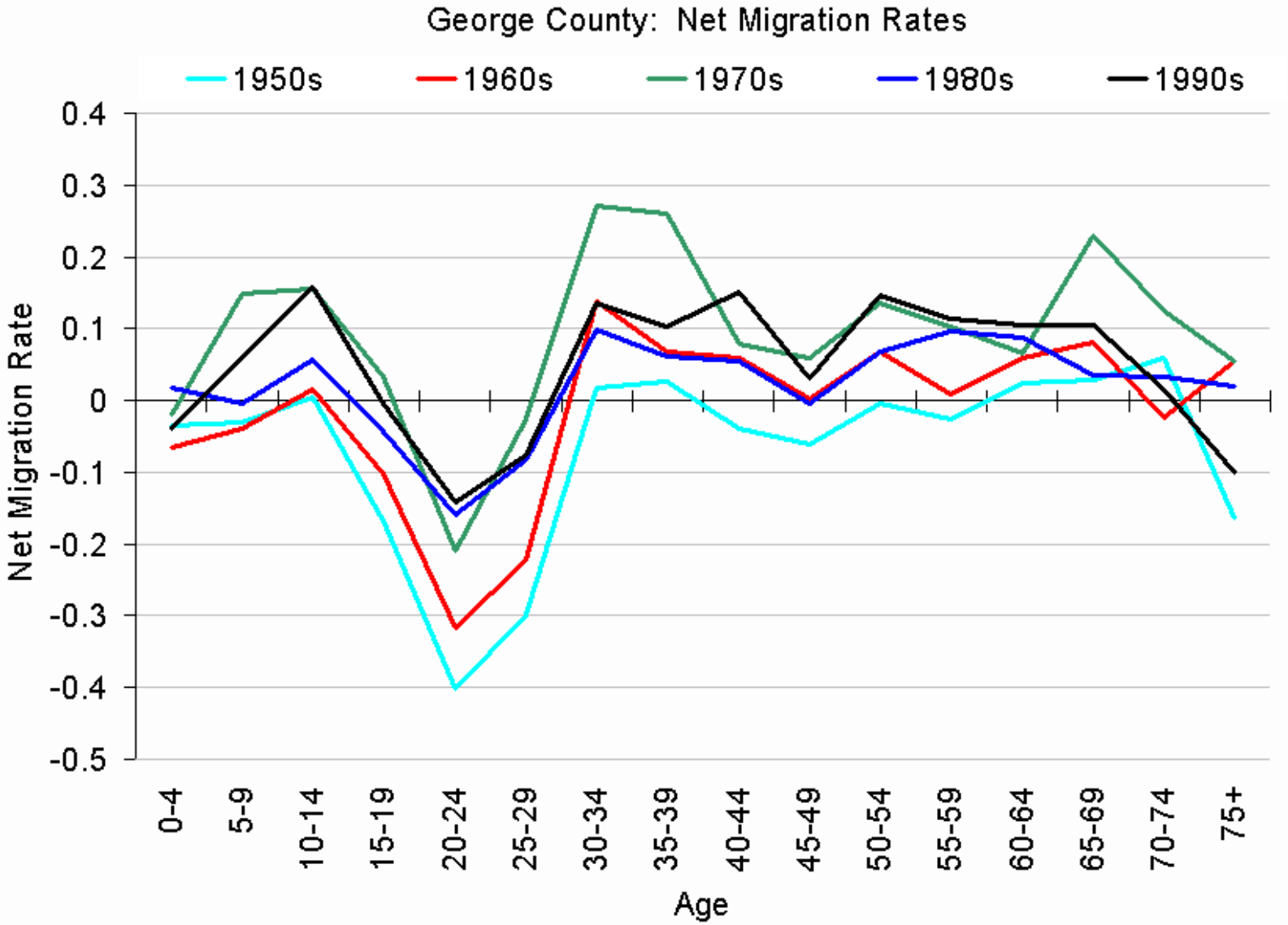

Copiah County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

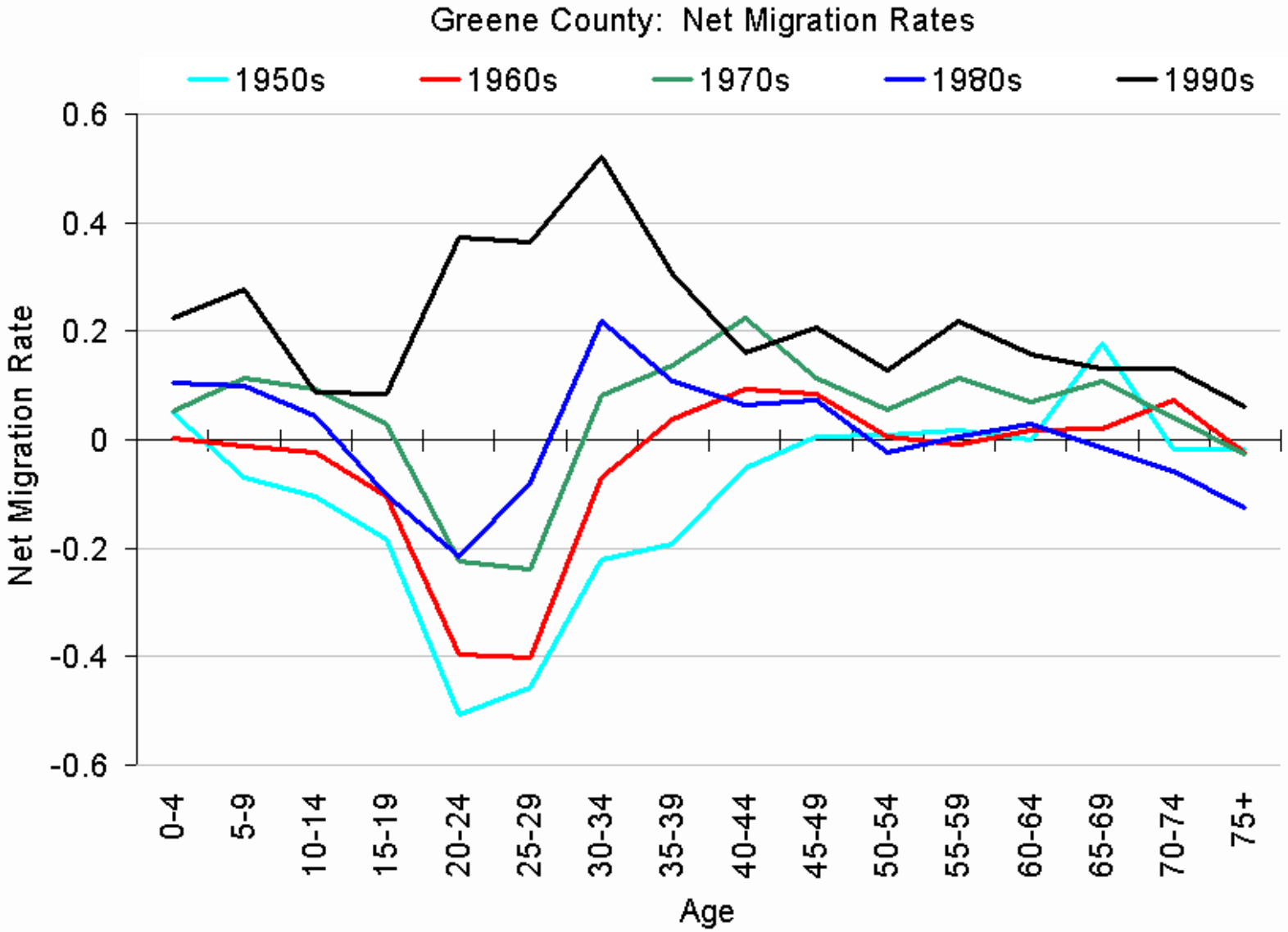

Covington County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

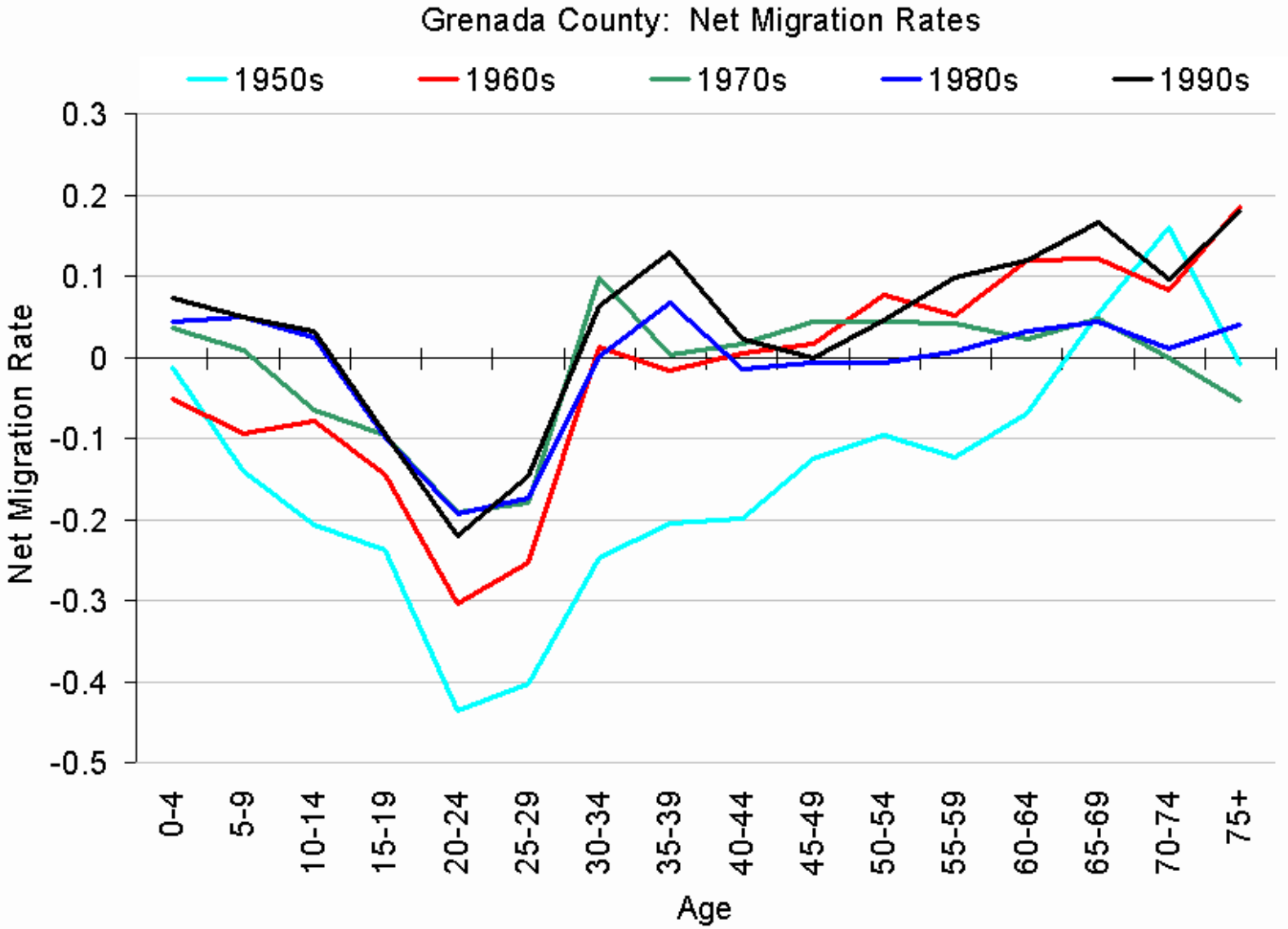

DeSoto County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

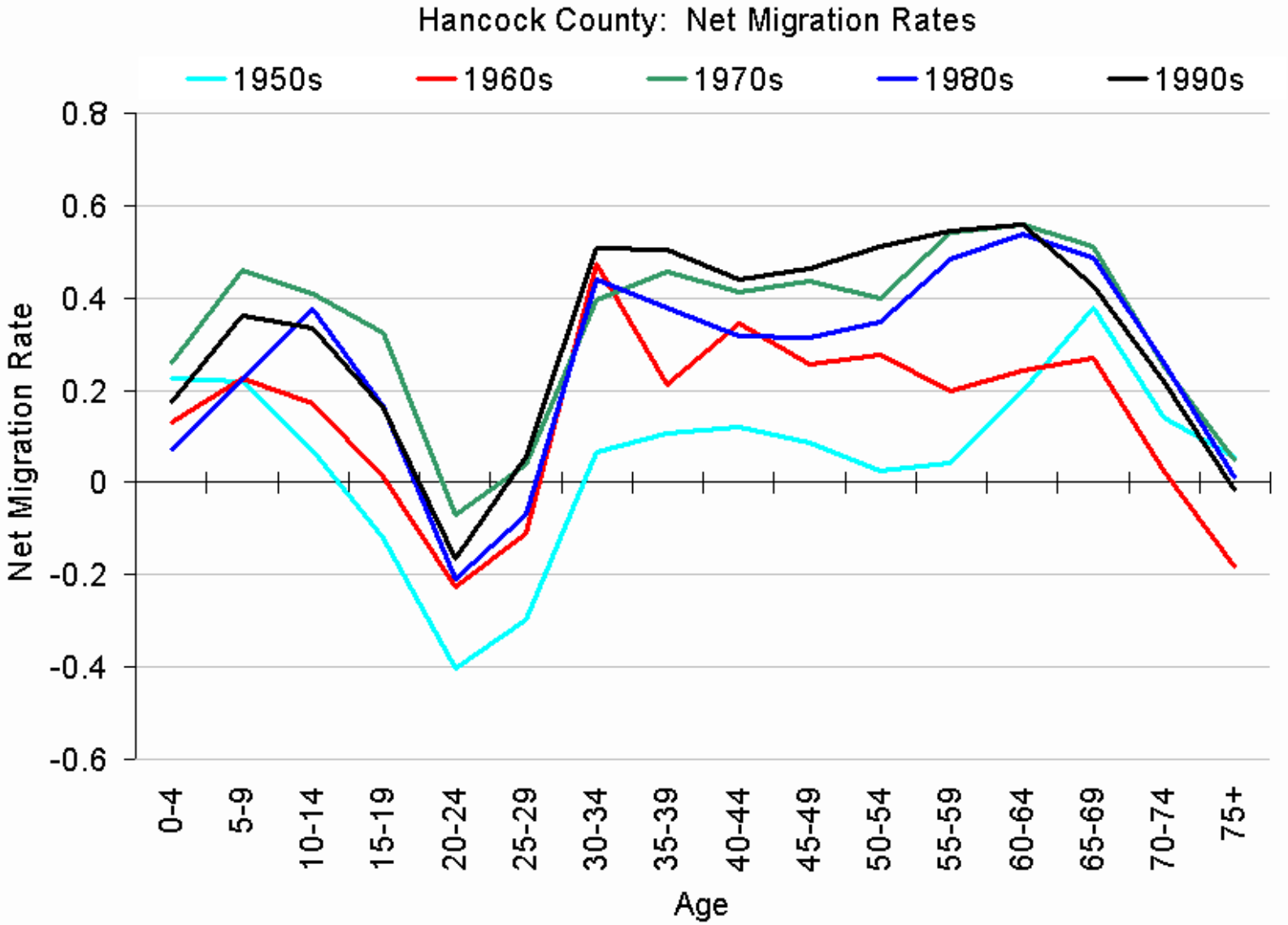

Forrest County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

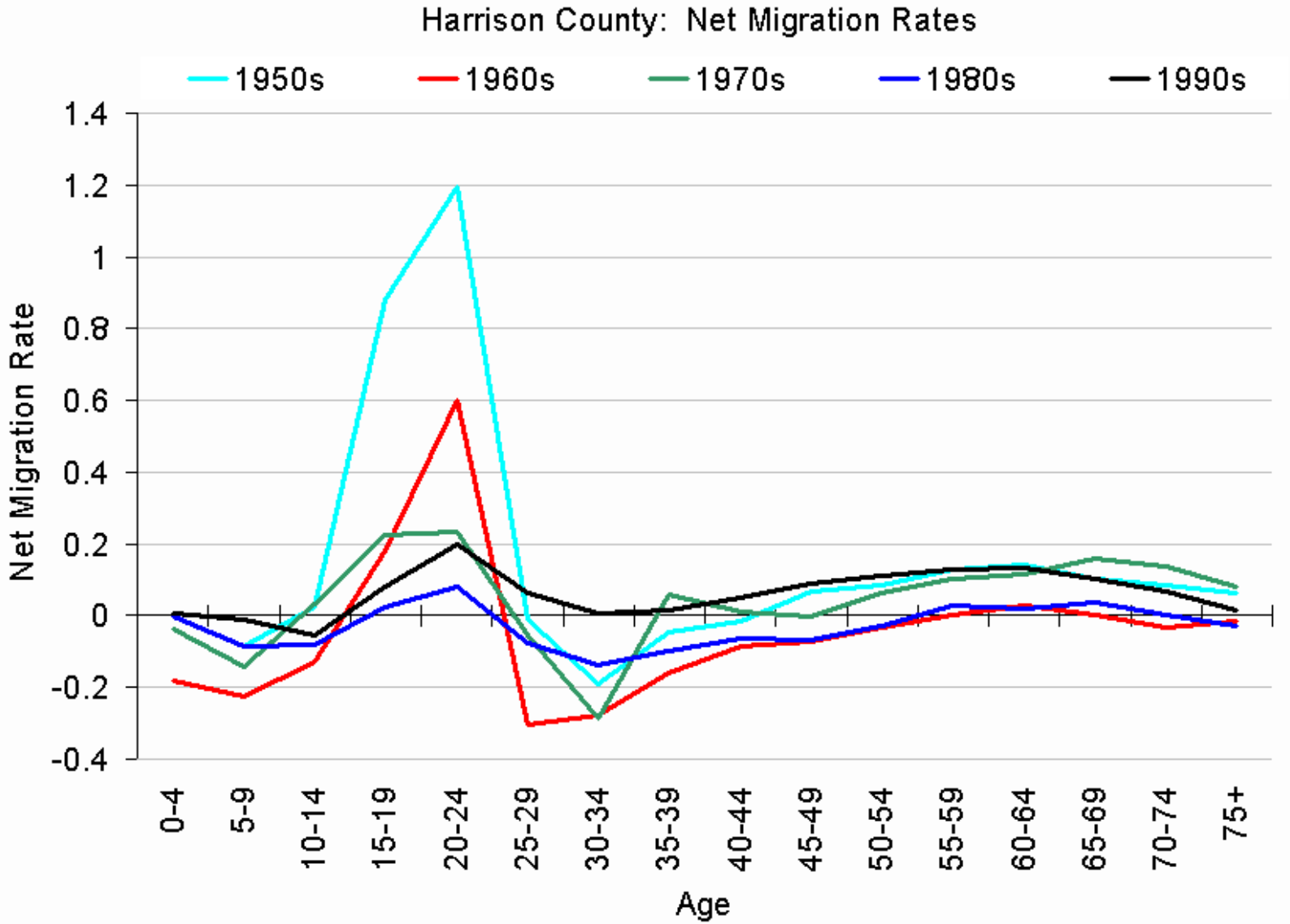

Franklin County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

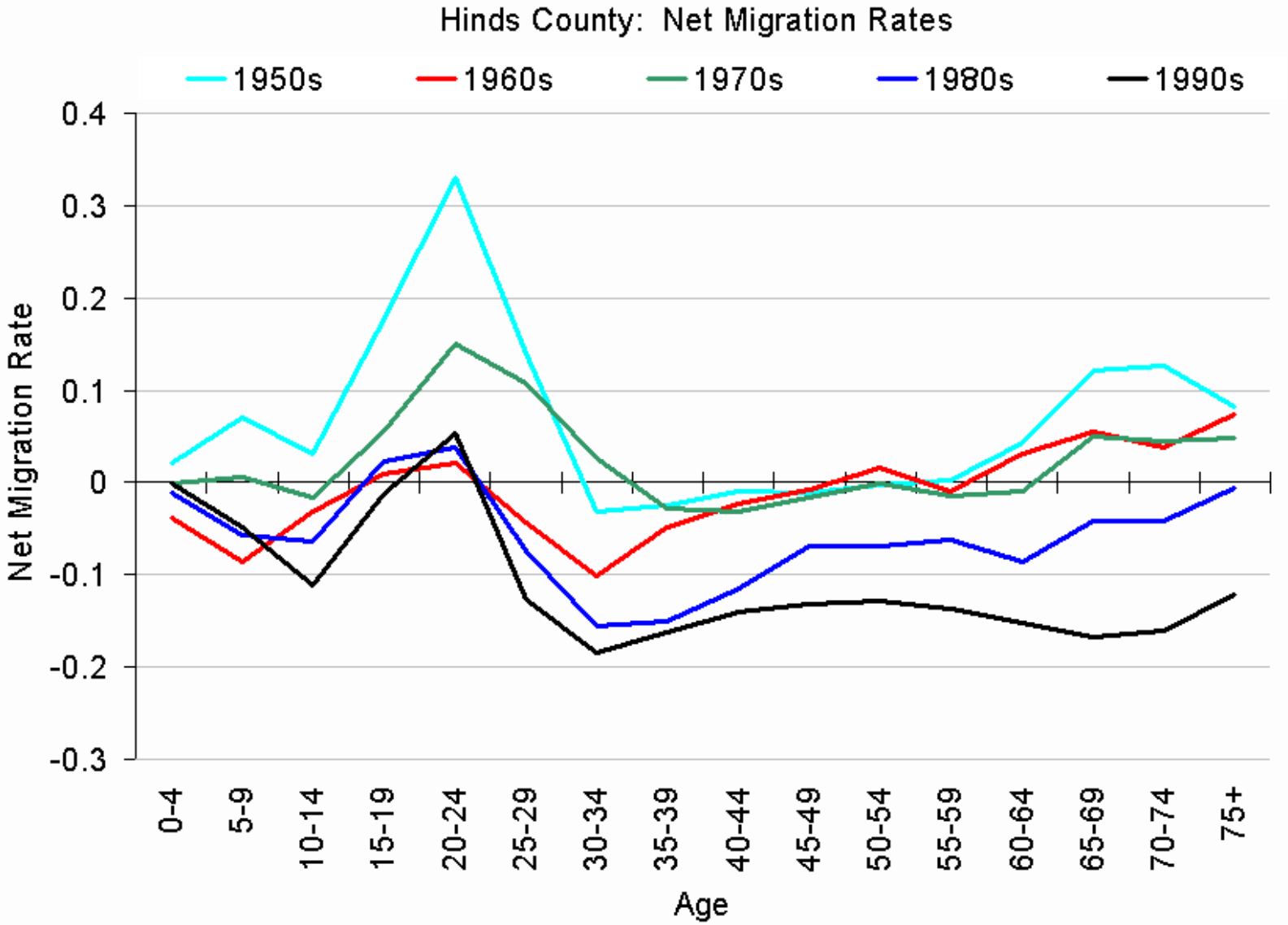

George County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

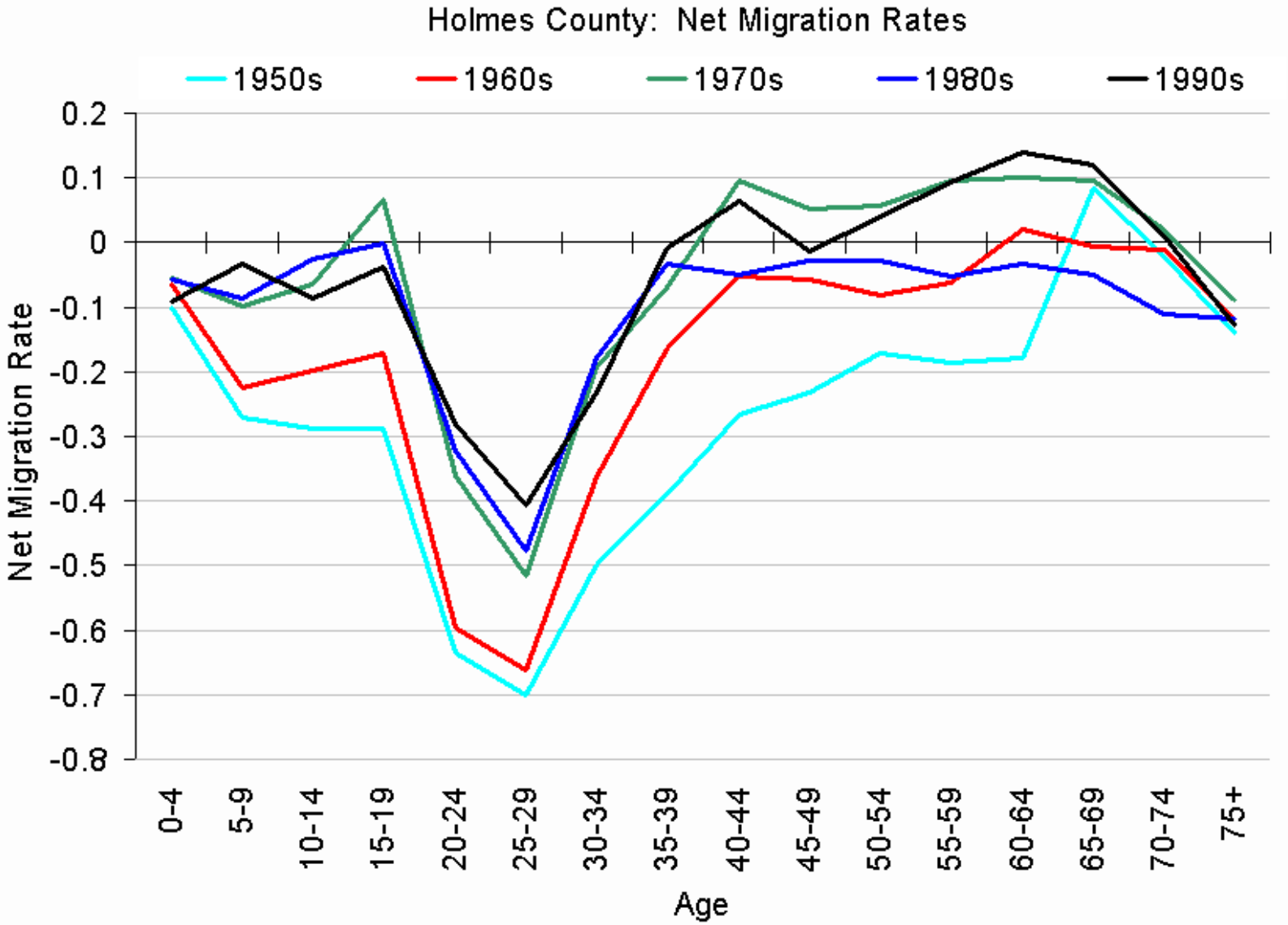

Greene County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

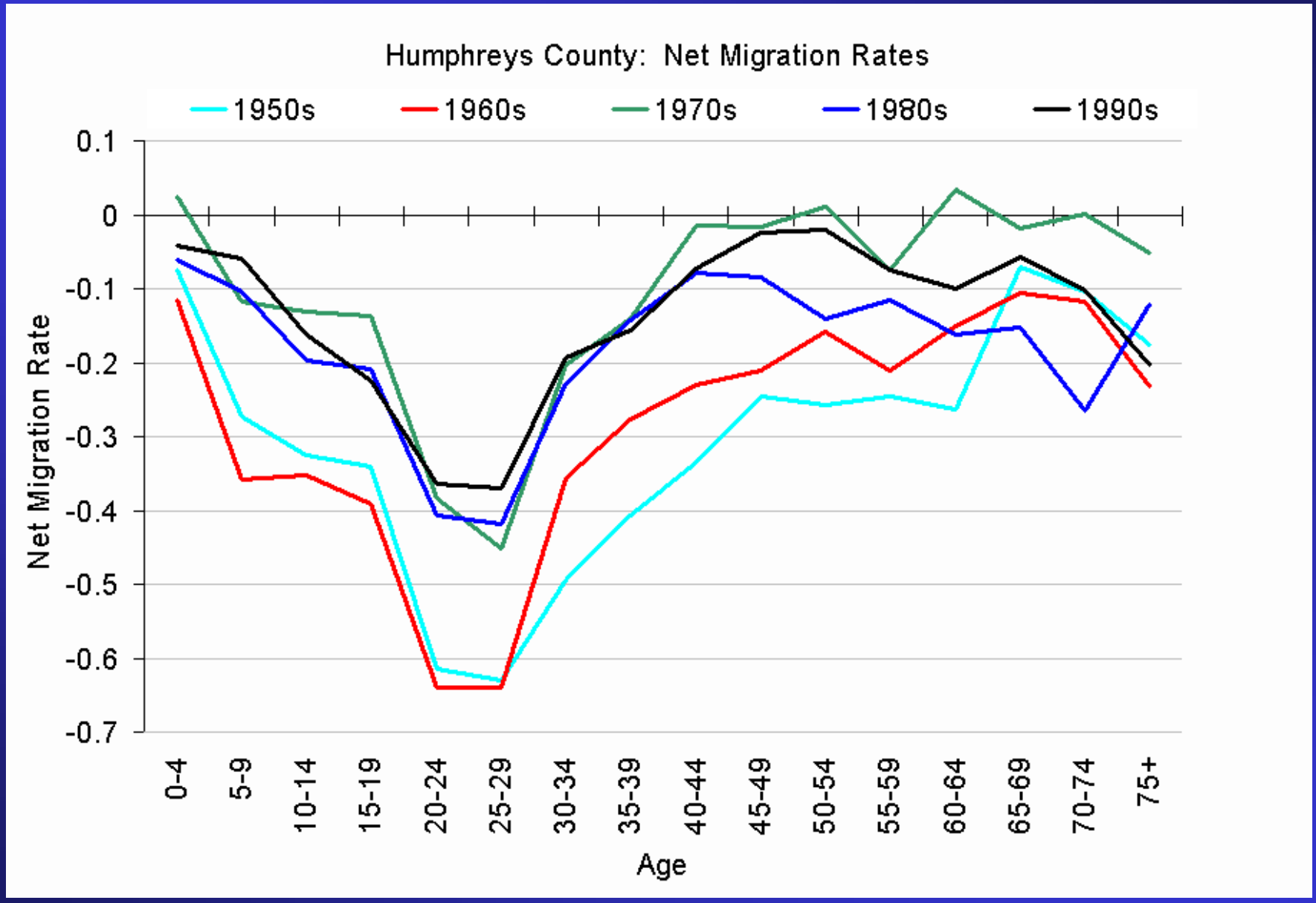

Grenada County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

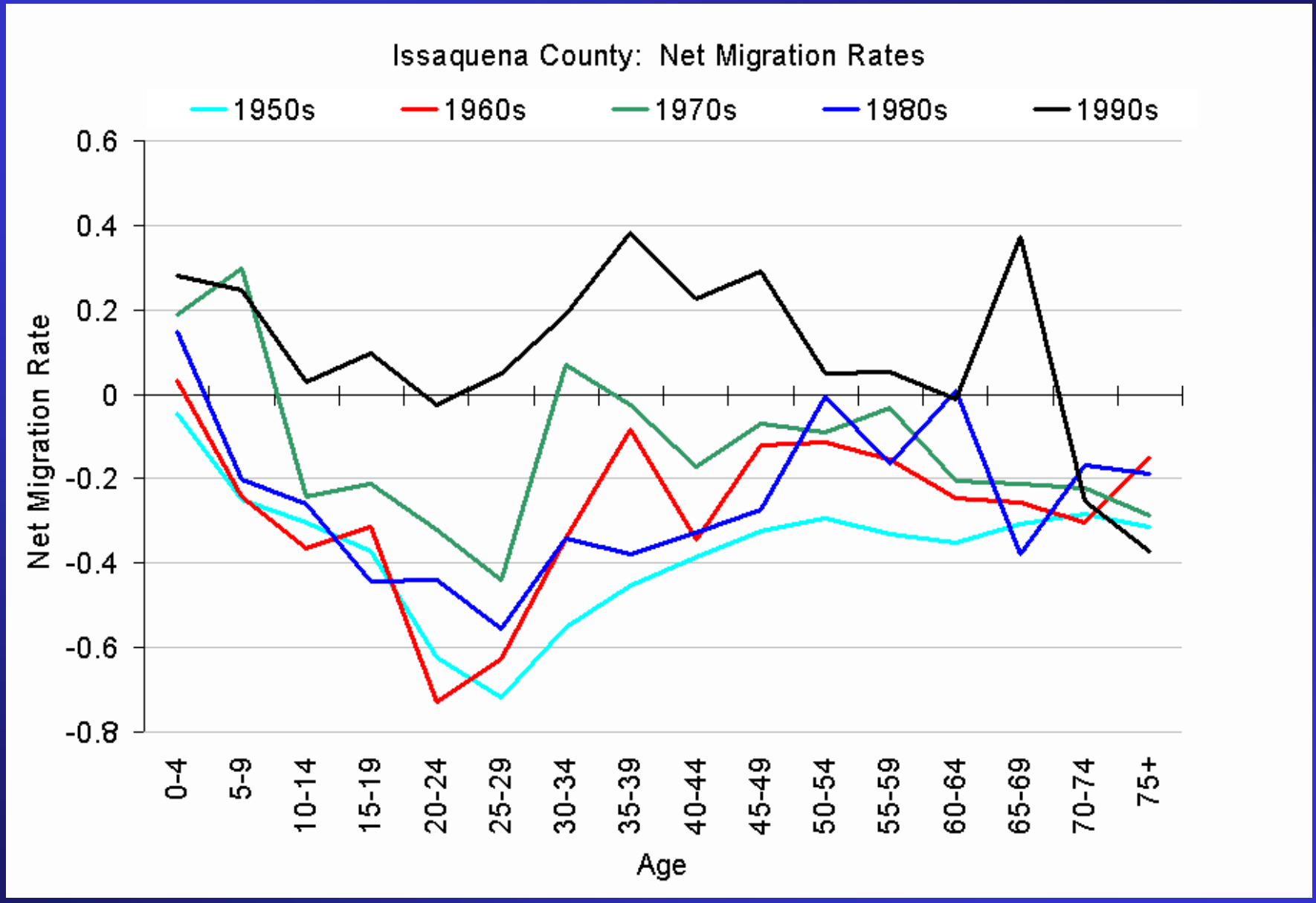

Hancock County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

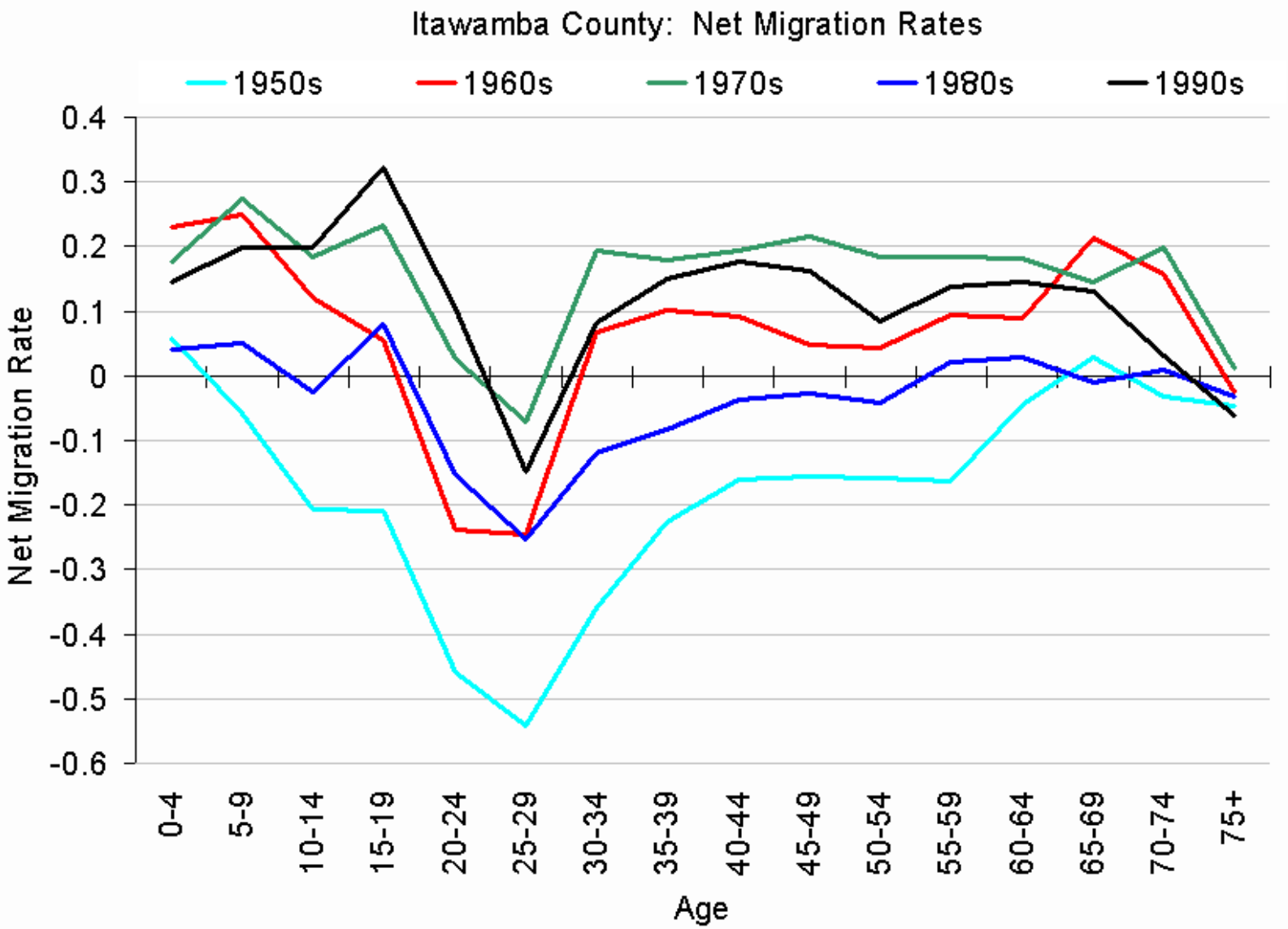

Harrison County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

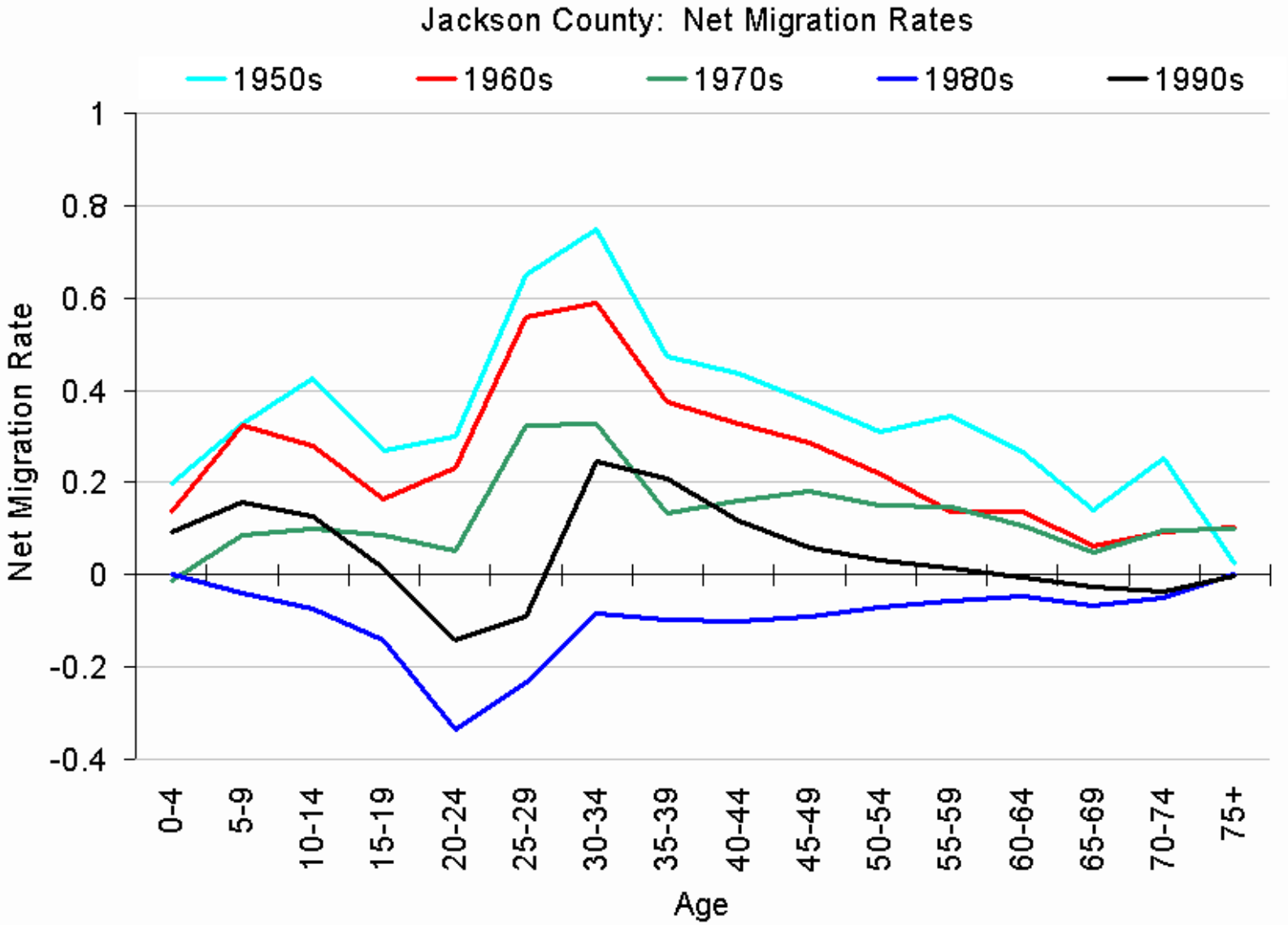

Hinds County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

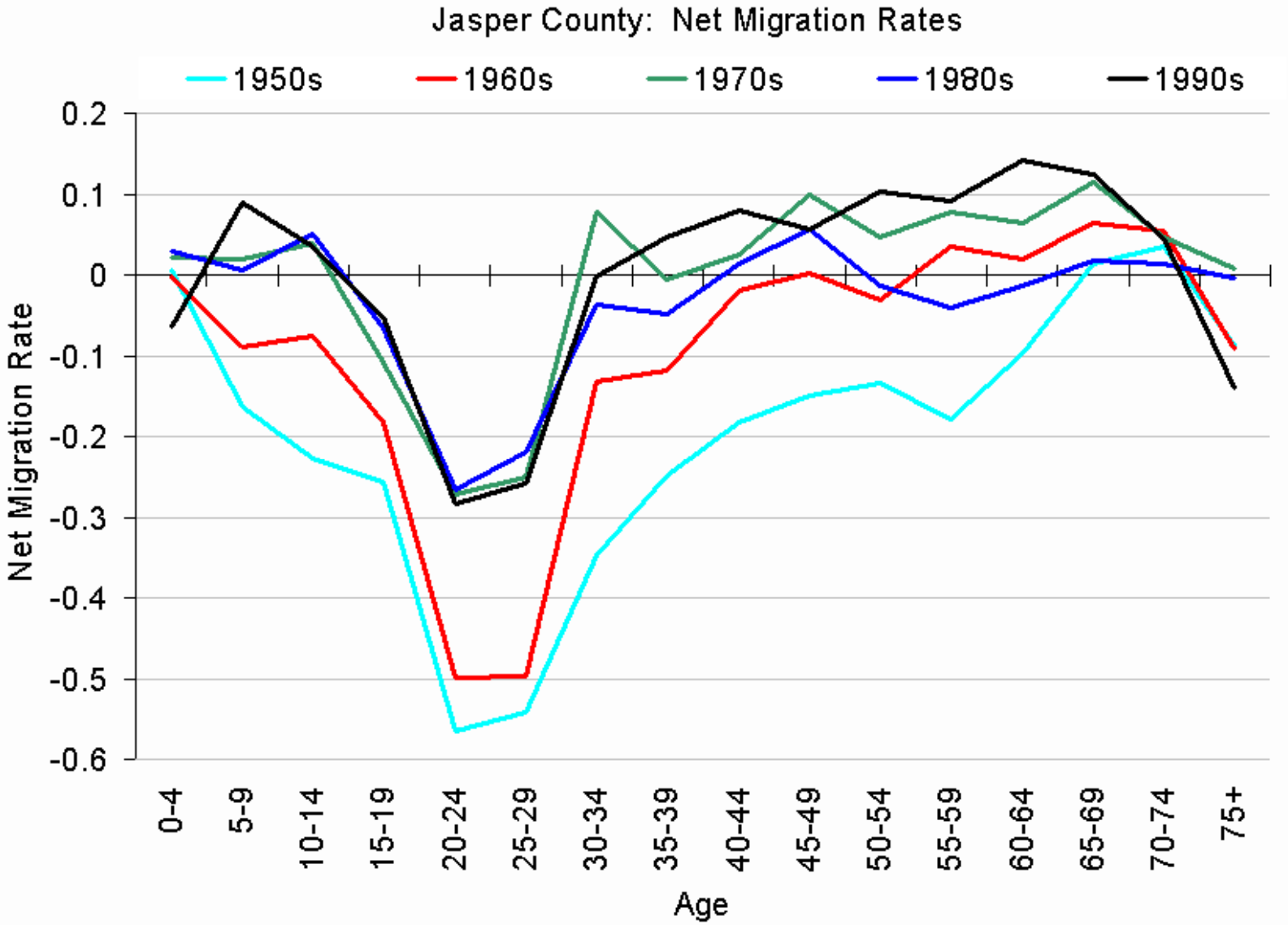

Holmes County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

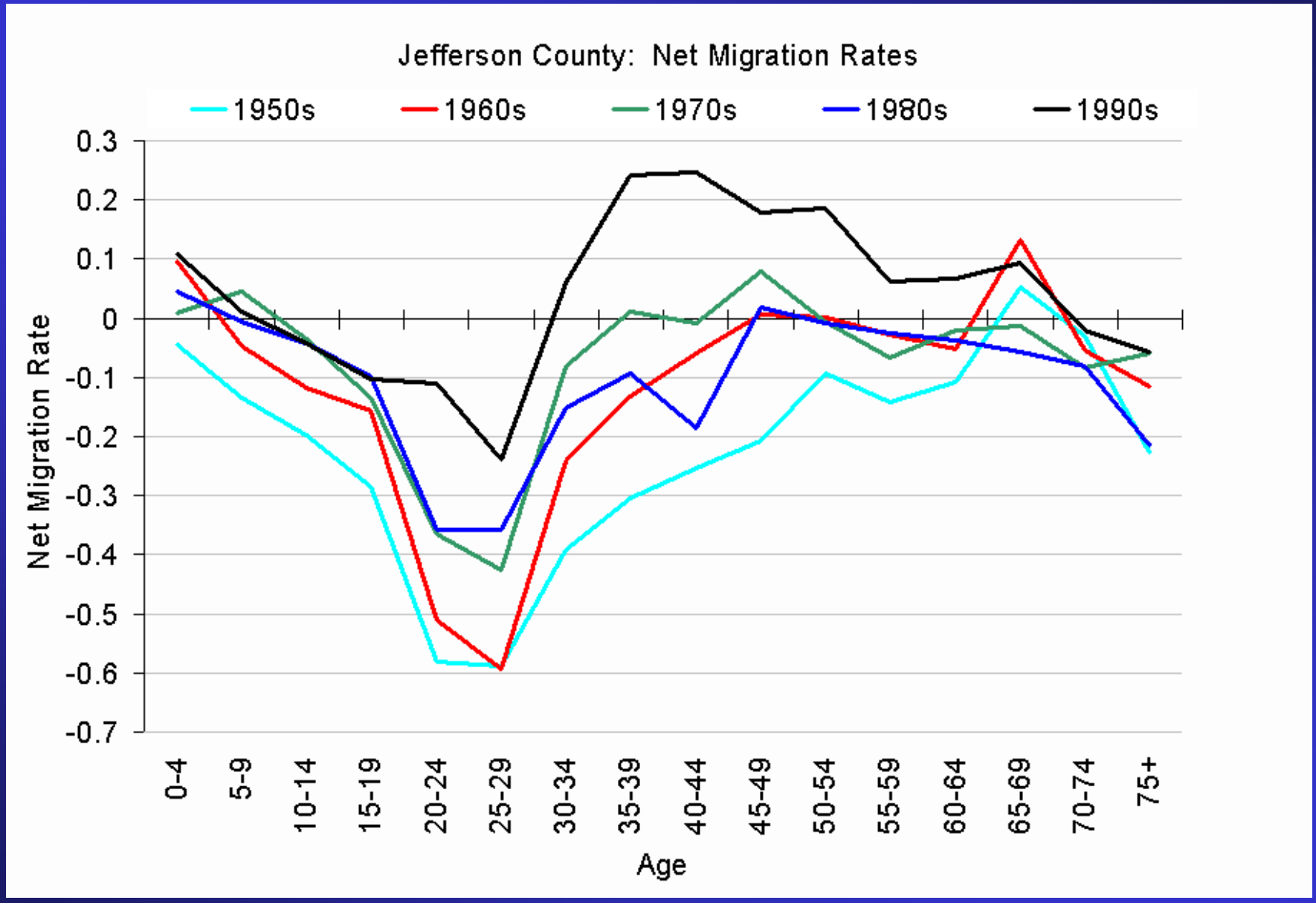

Humphreys County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

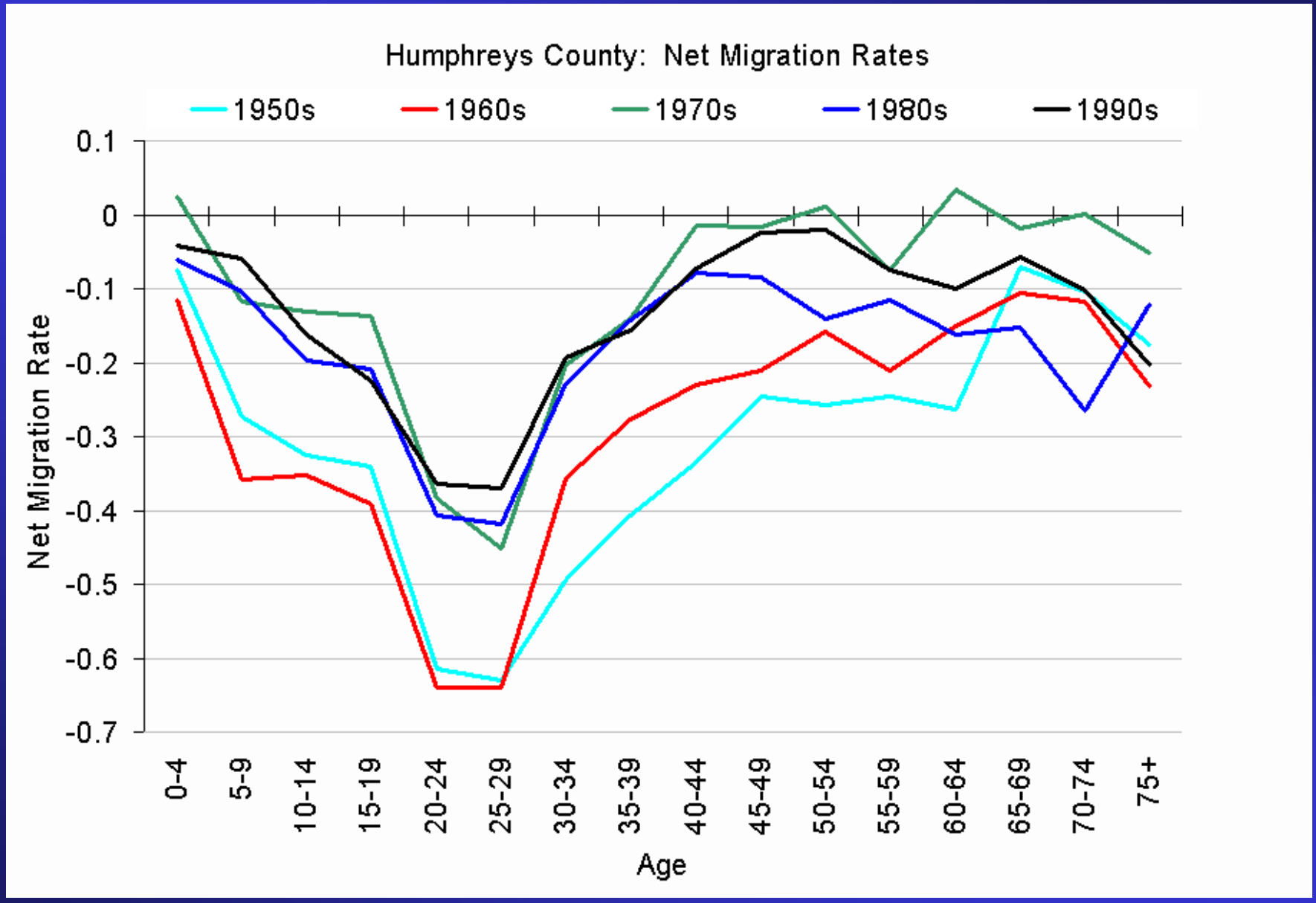

Issaquena County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

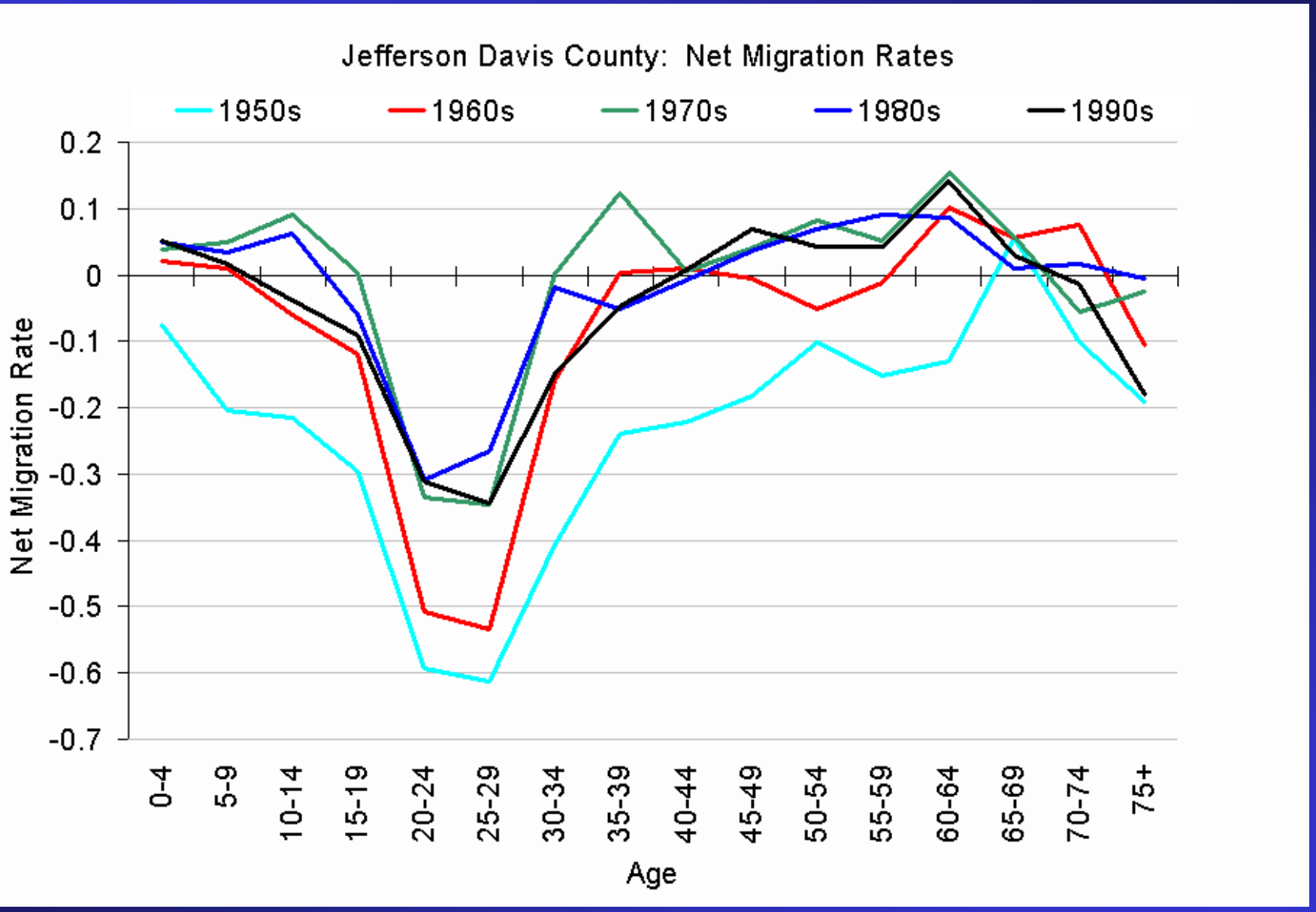

Itawamba County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

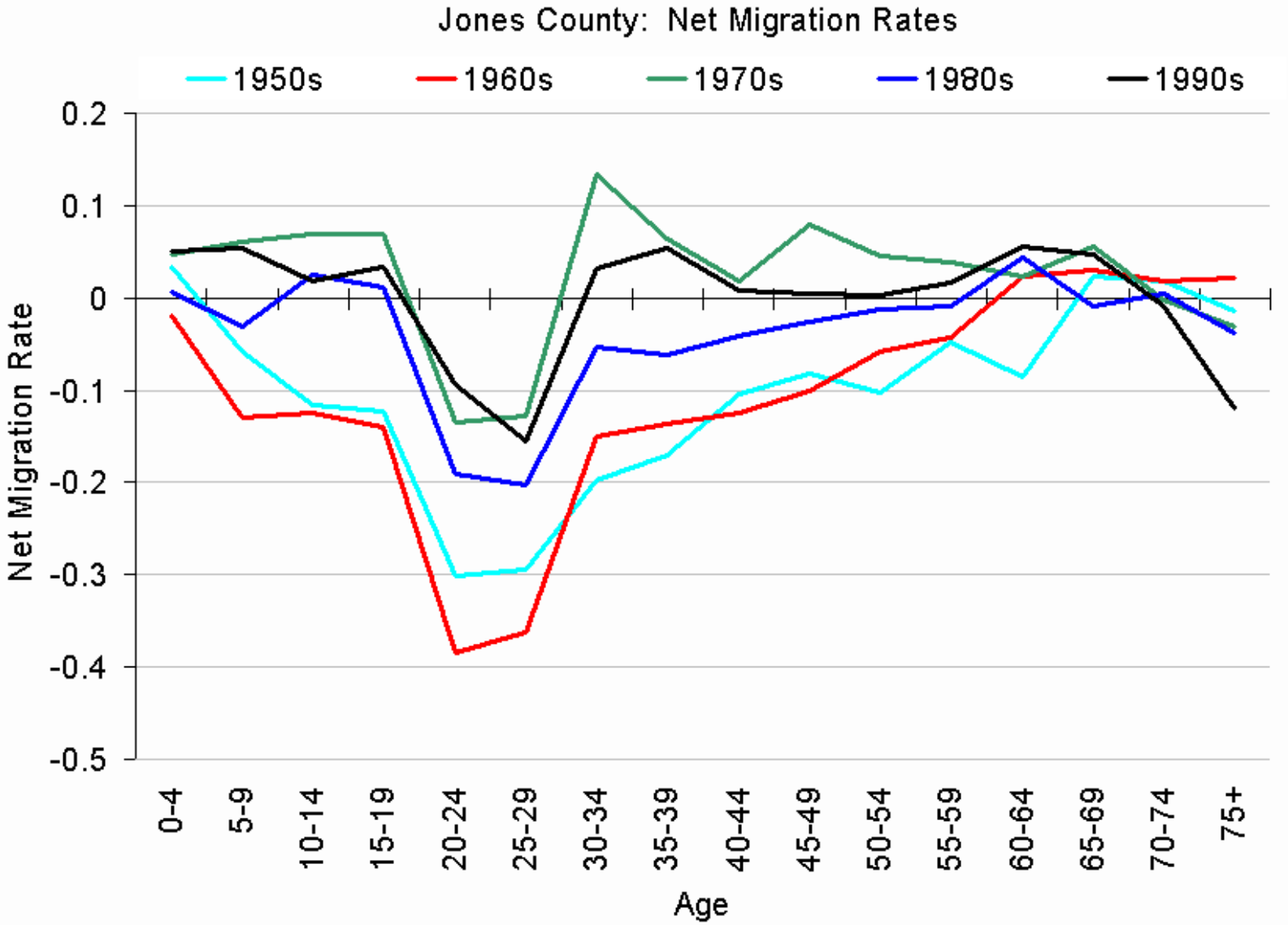

Jackson County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

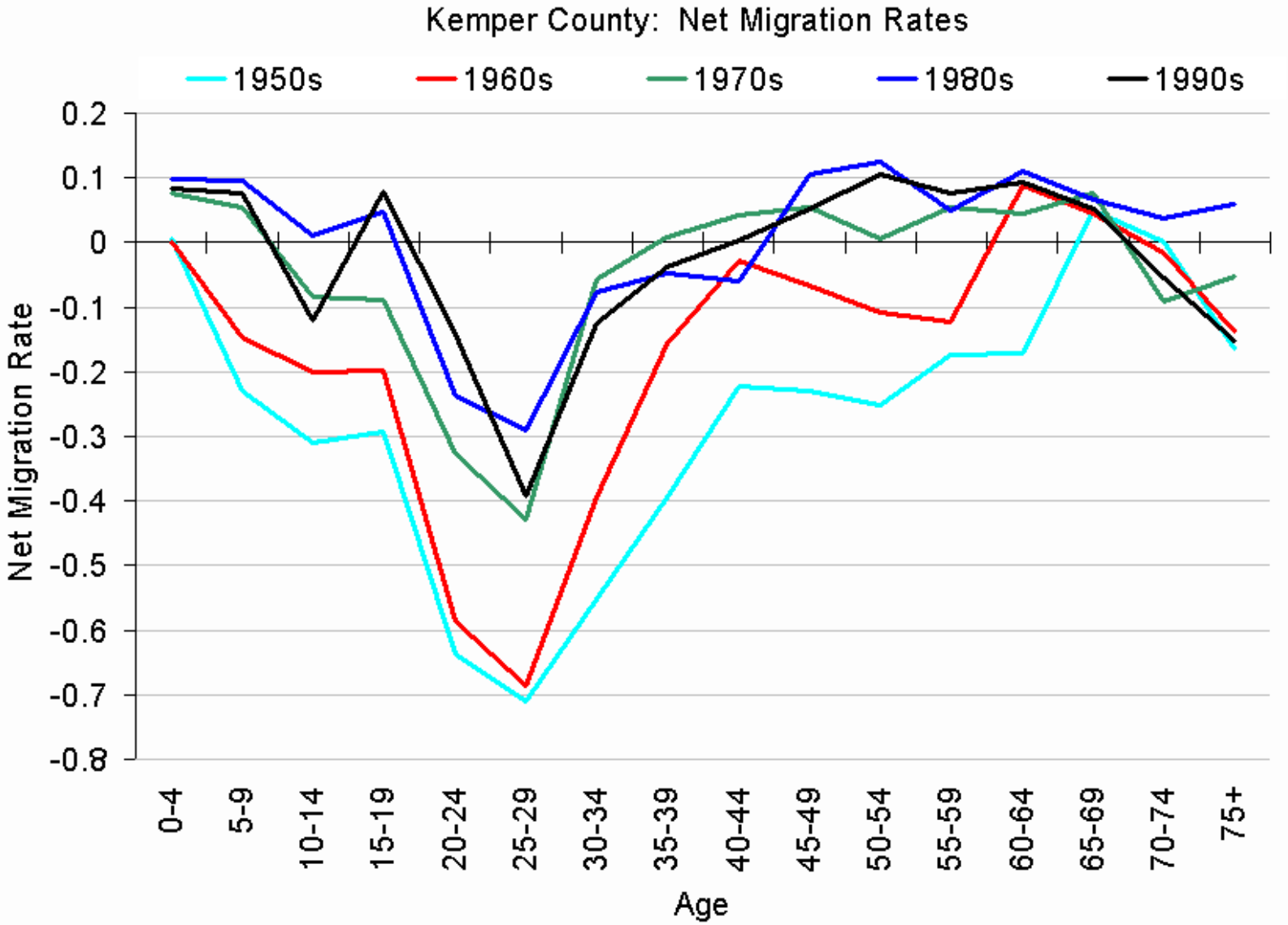

Jasper County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

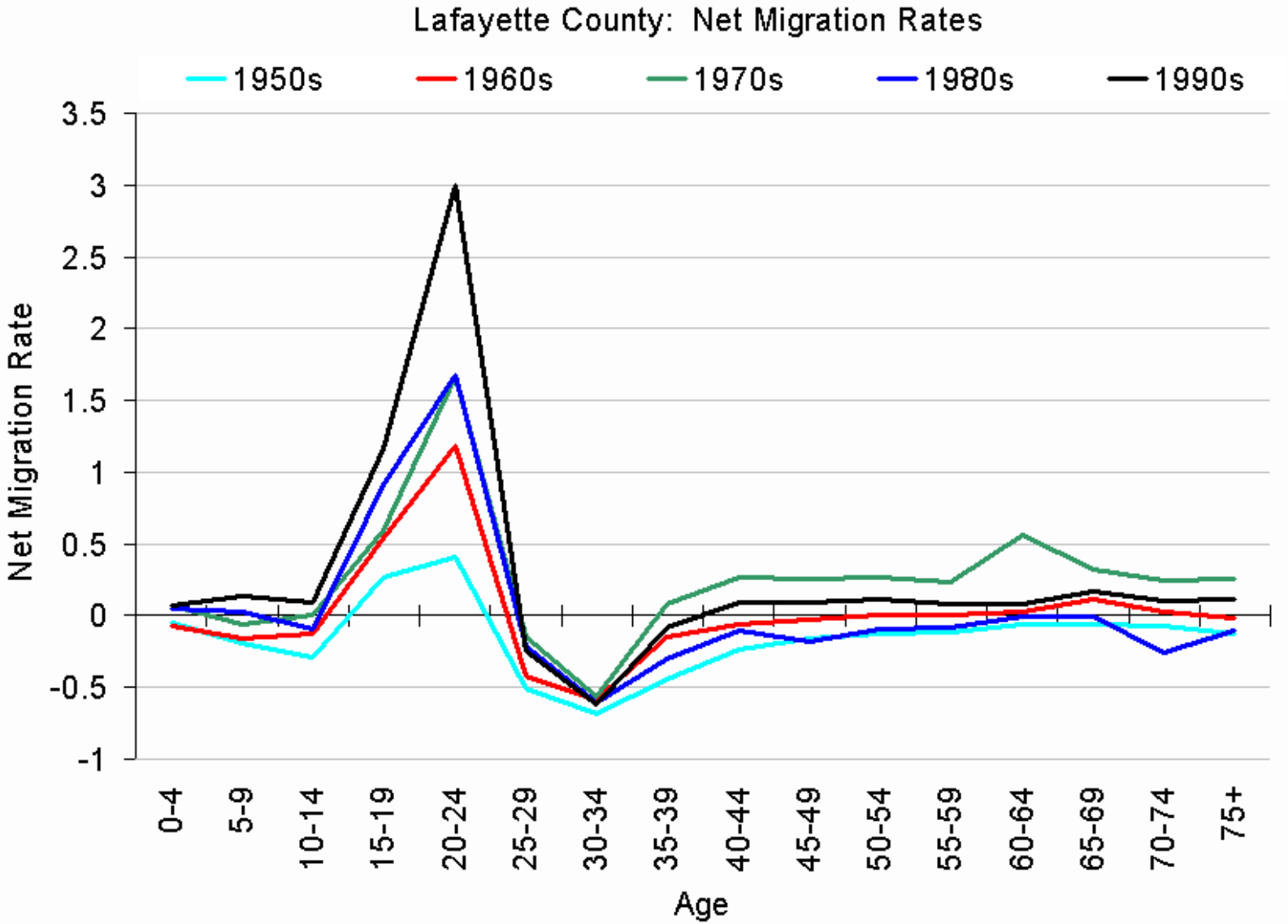

Jefferson County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

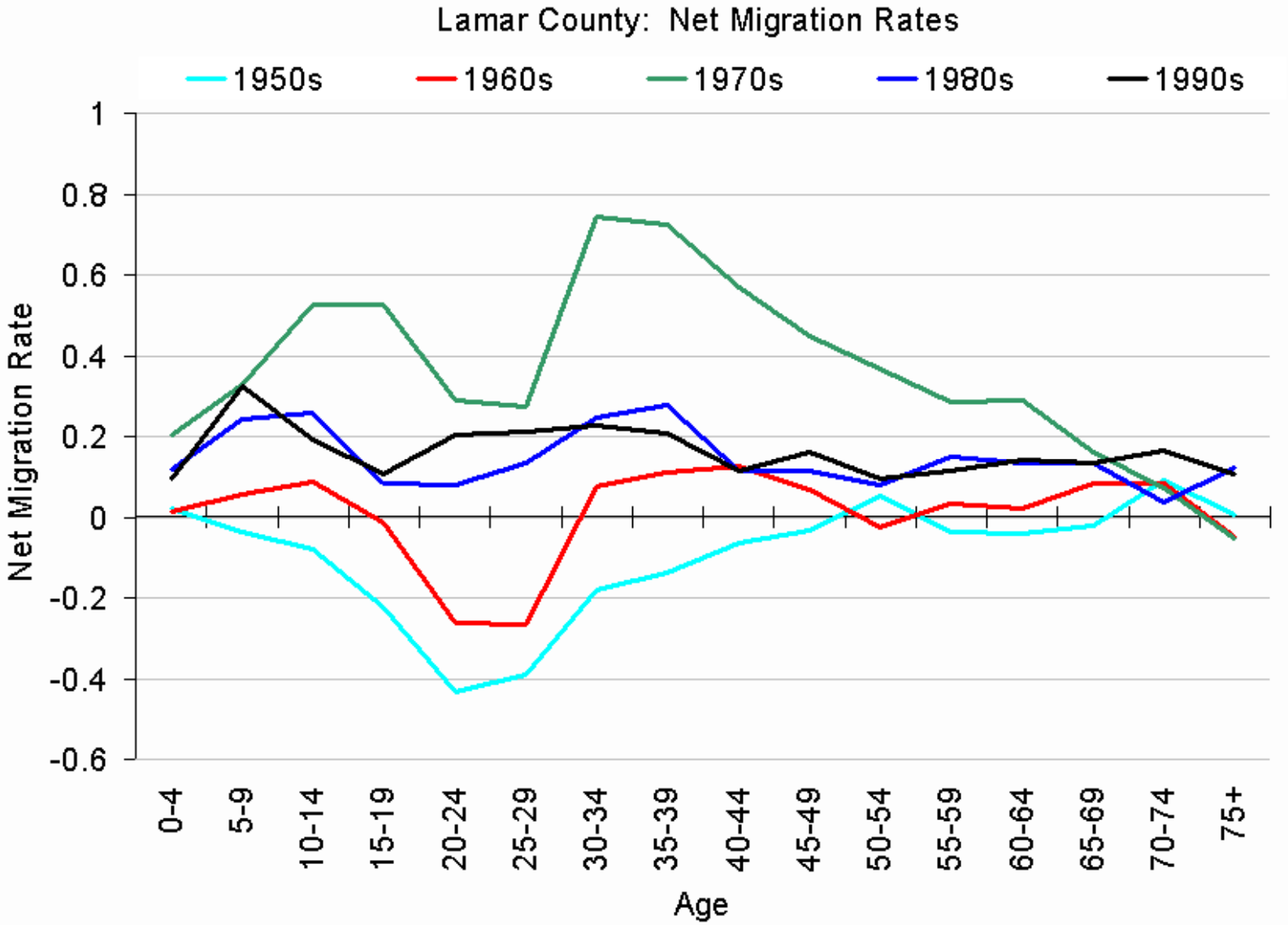

Humphreys County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

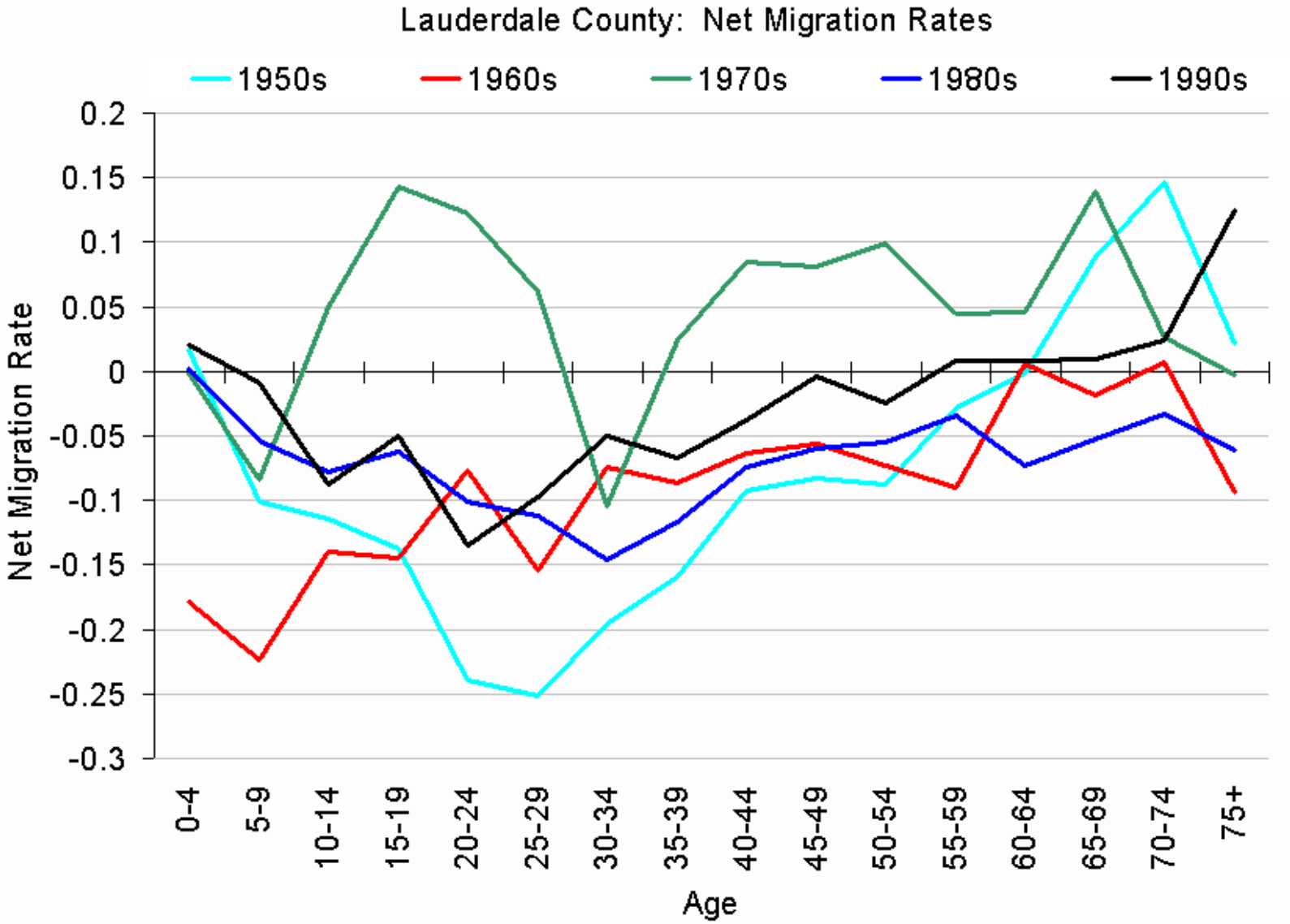

Jefferson Davis County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

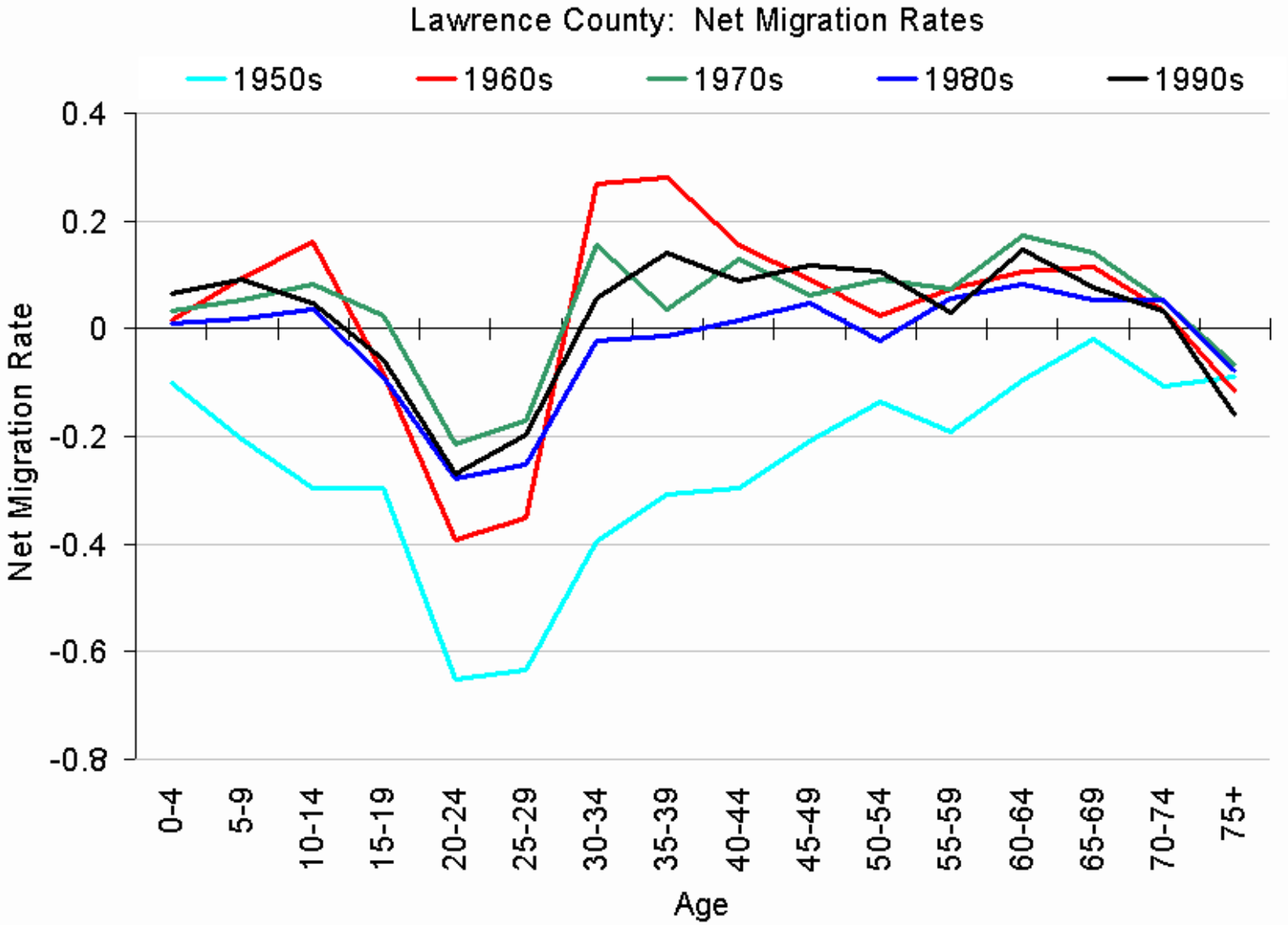

Jones County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

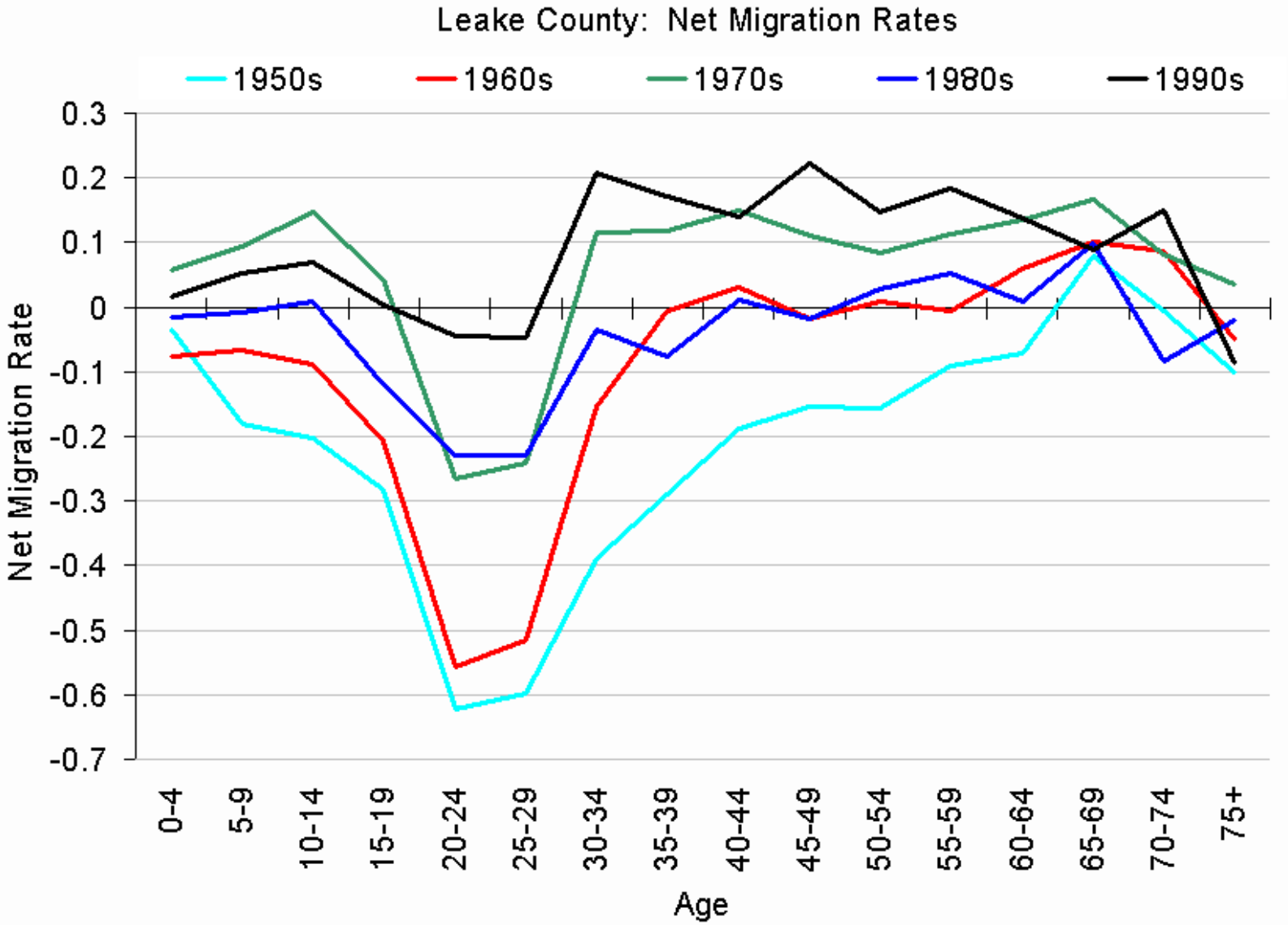

Kemper County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

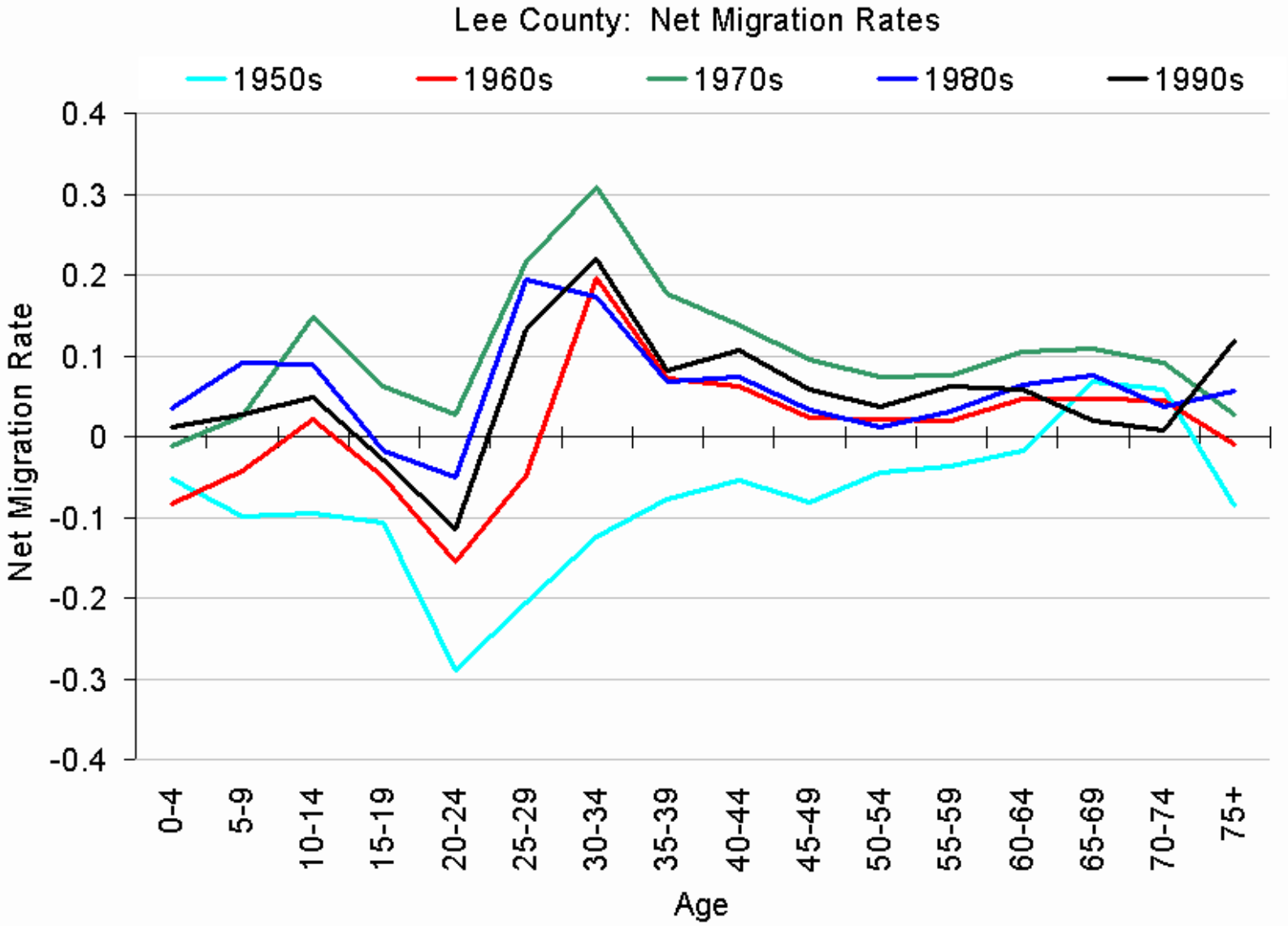

Lafayette County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

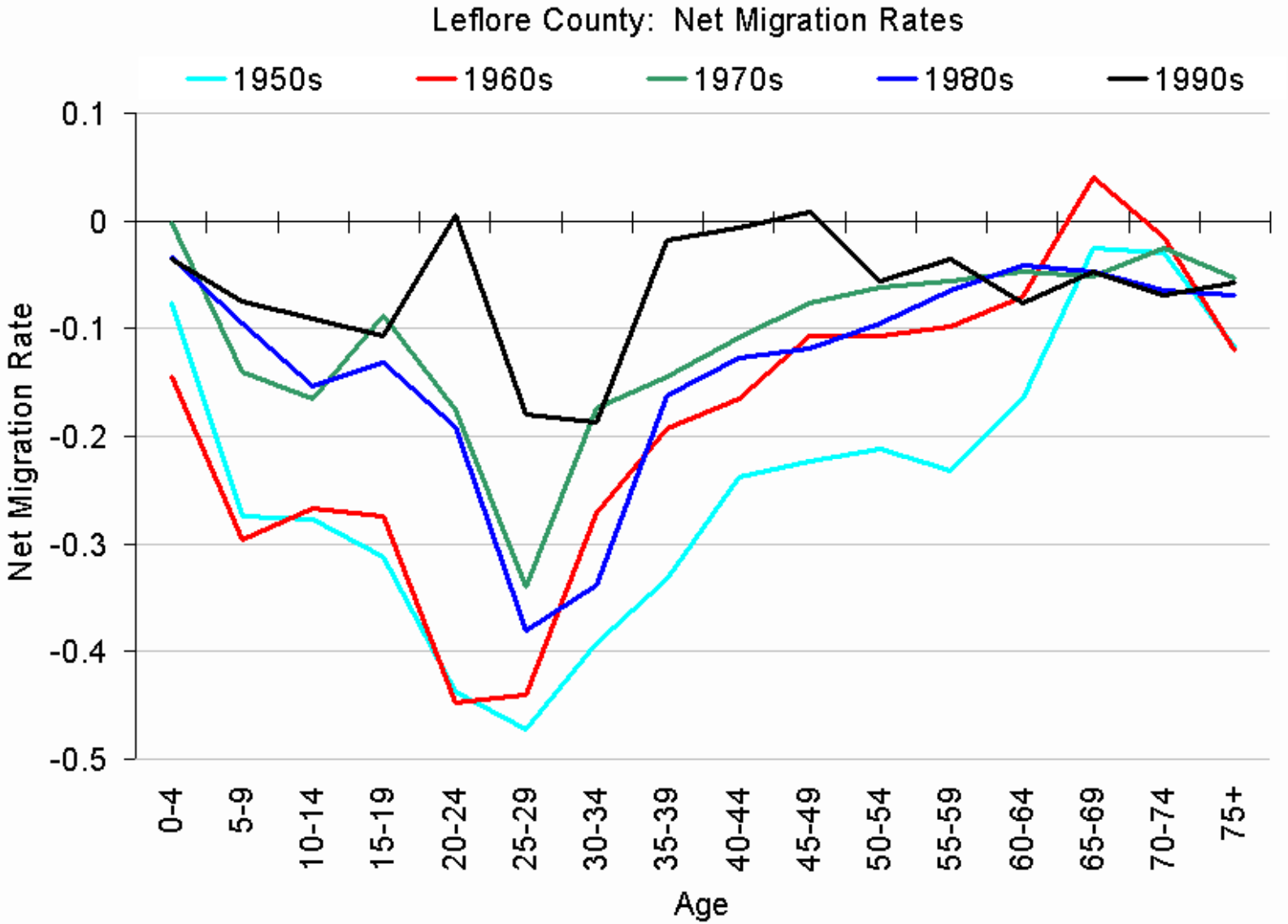

Lamar County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

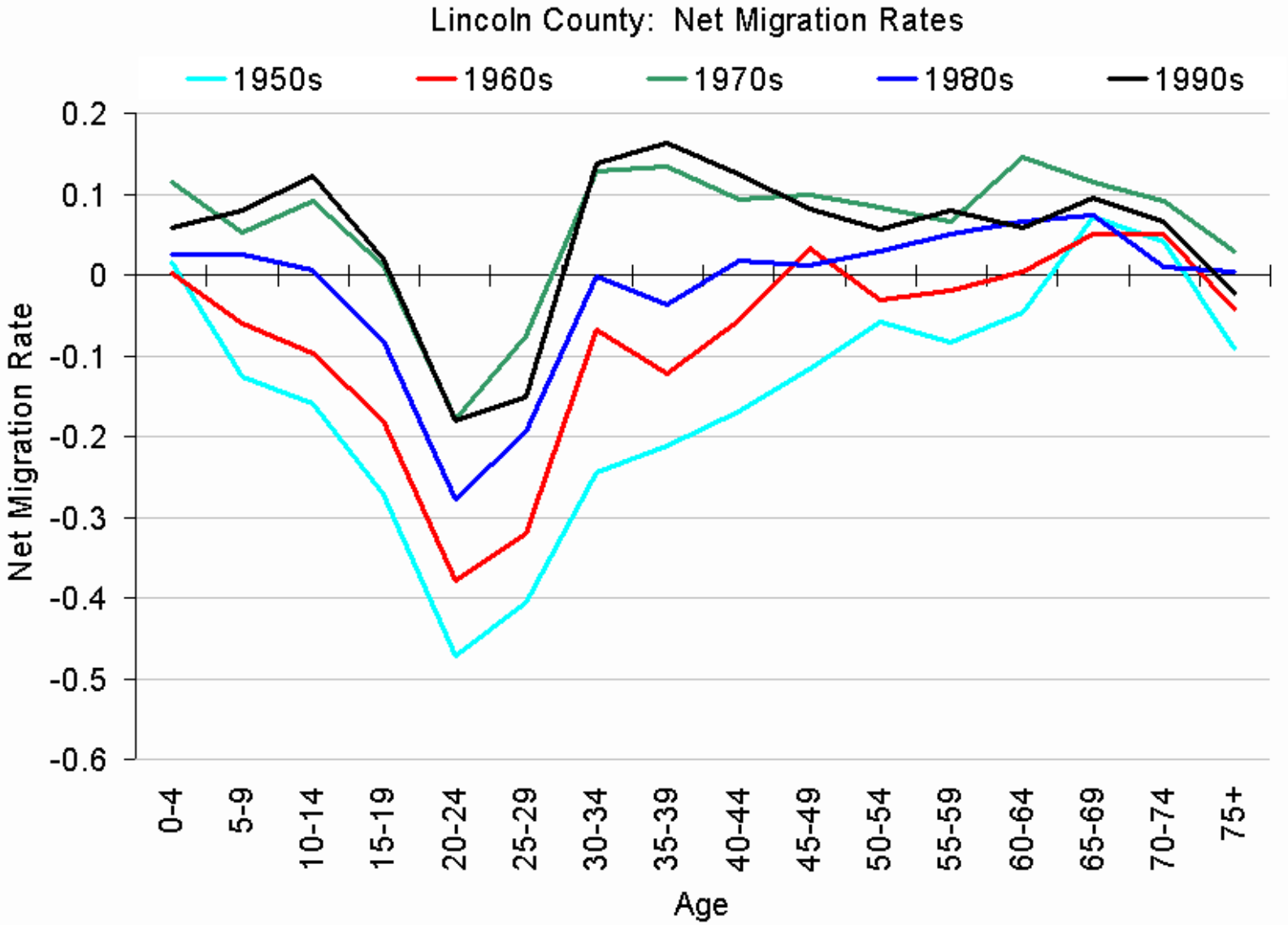

Lauderdale County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

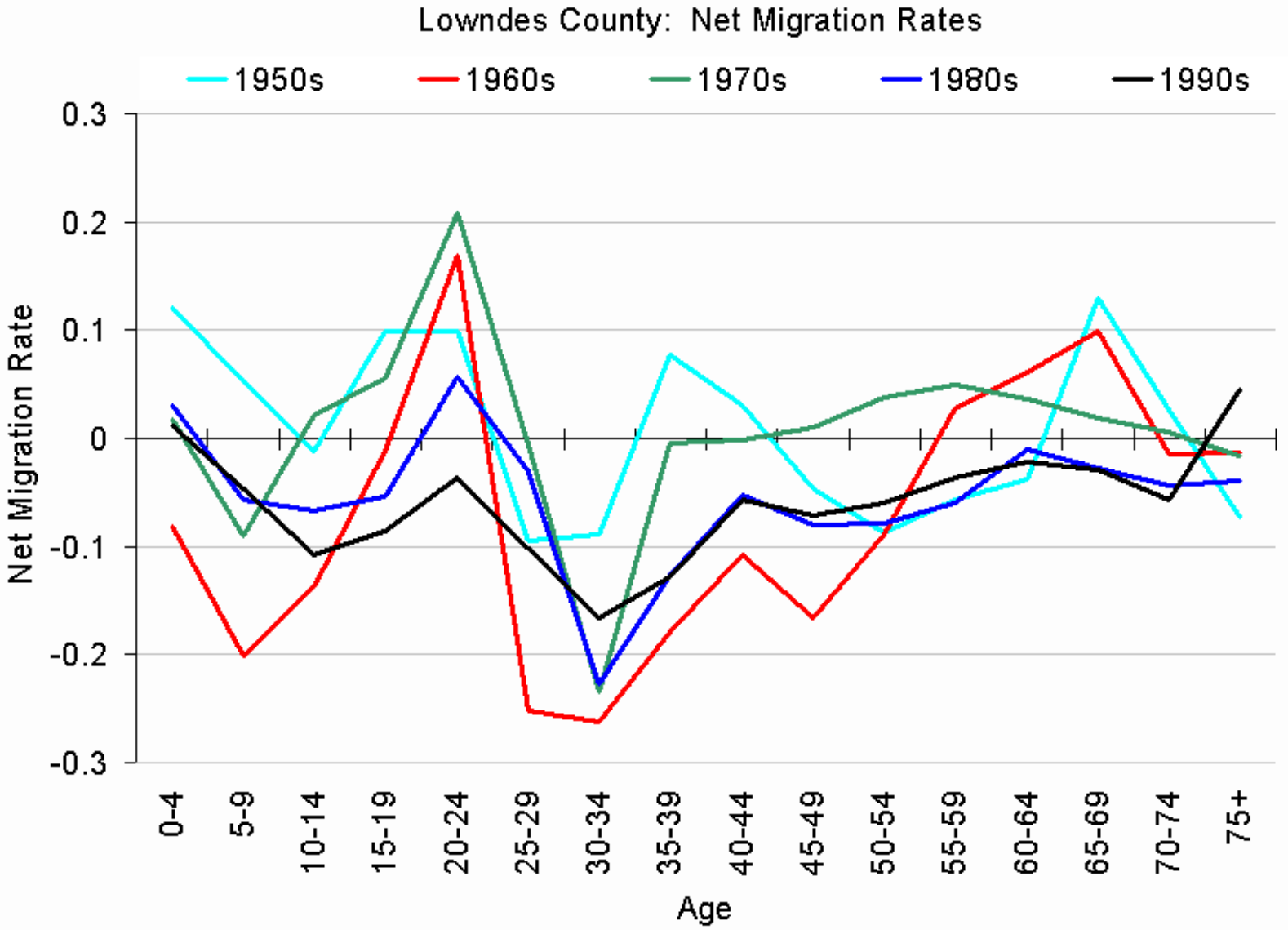

Lawrence County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

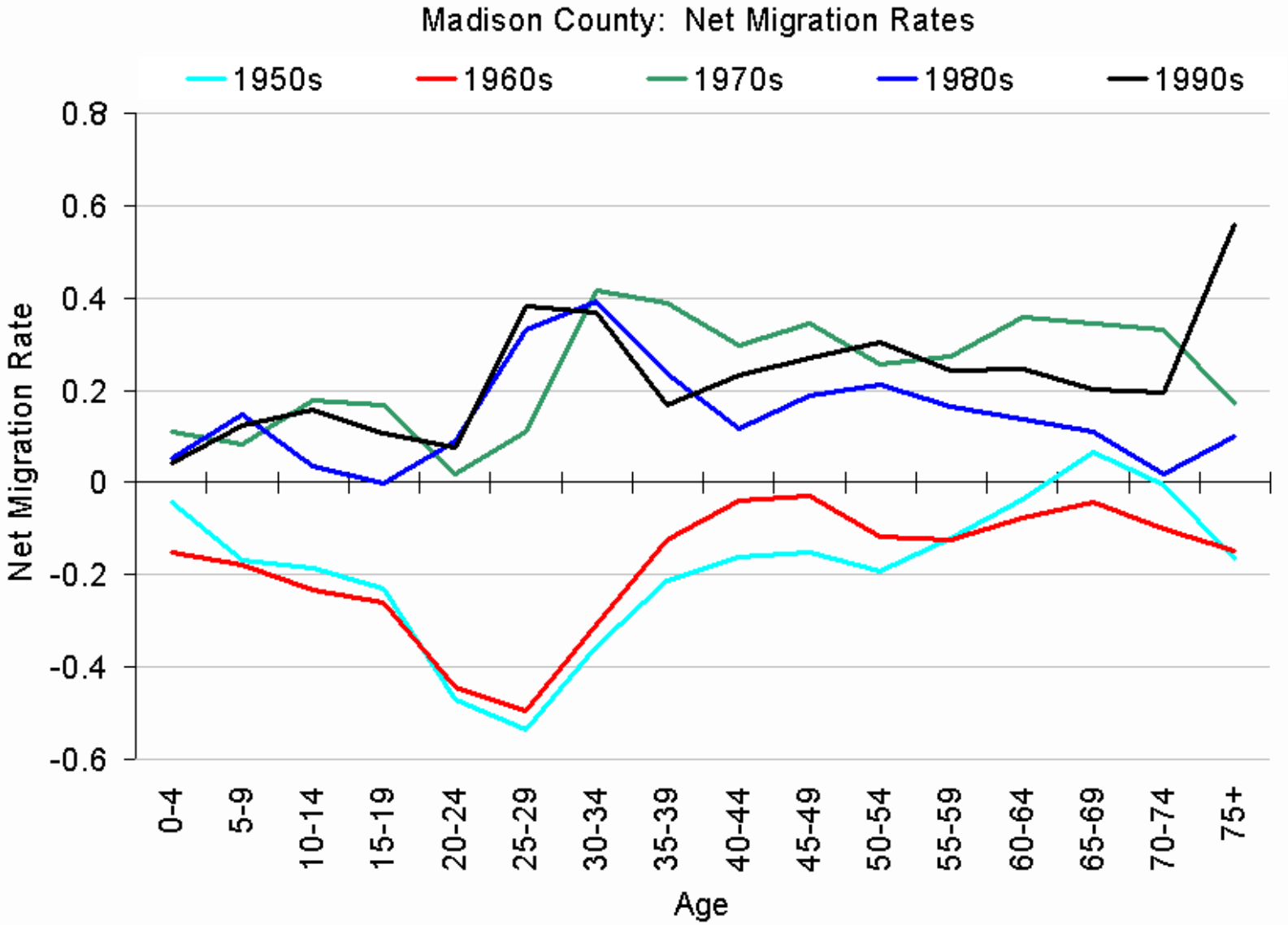

Leake County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

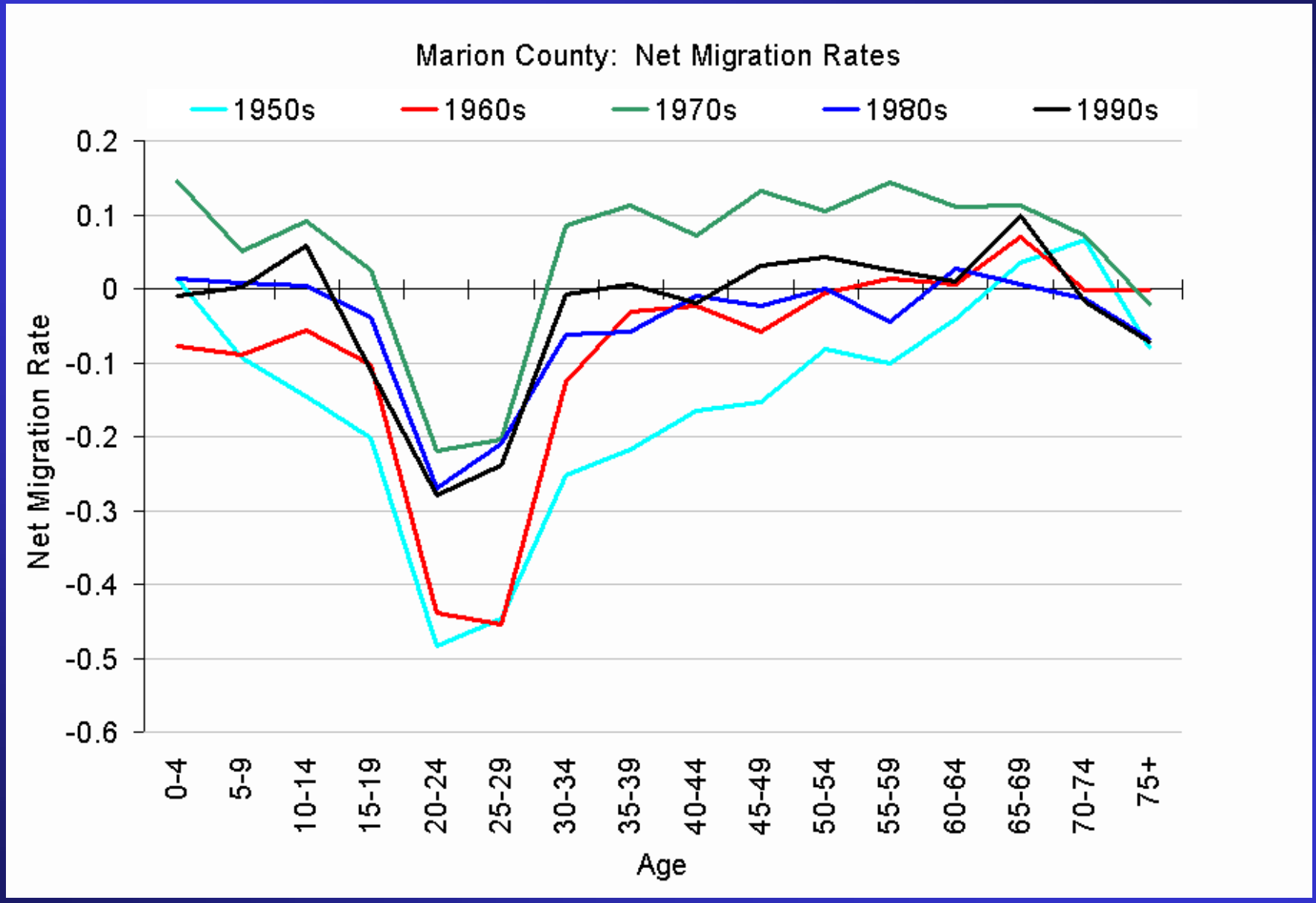

Lee County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

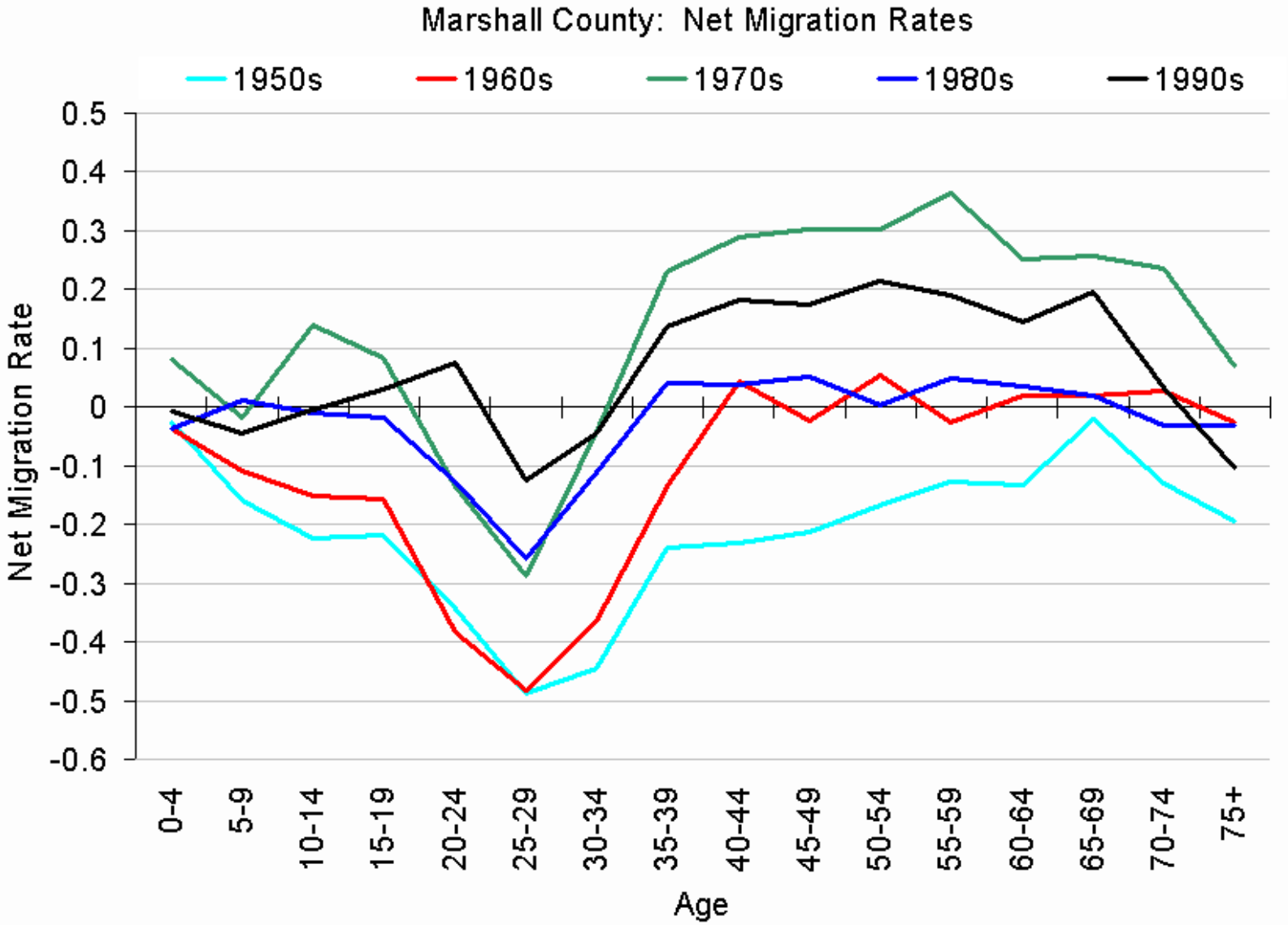

Leflore County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

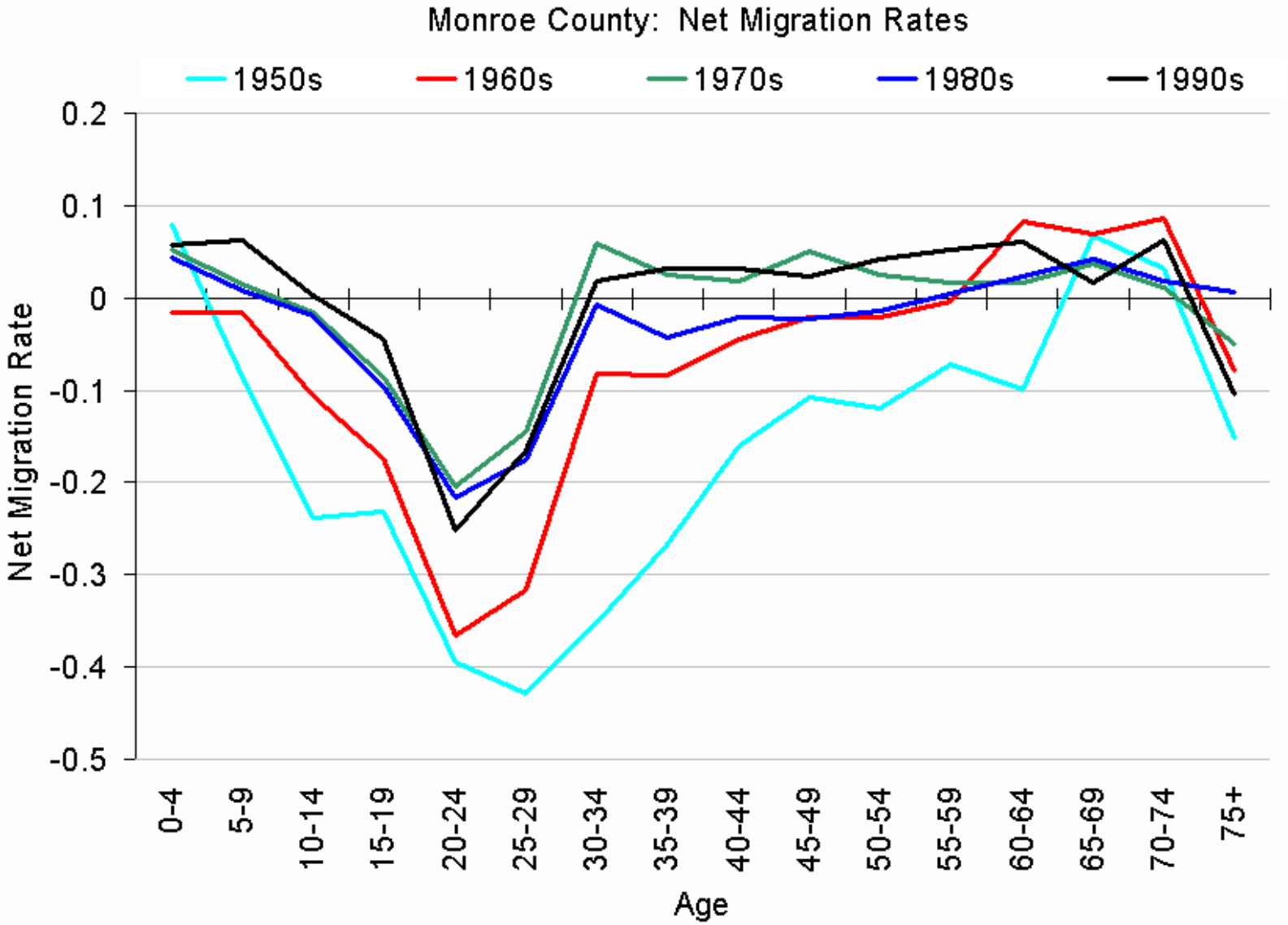

Lincoln County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

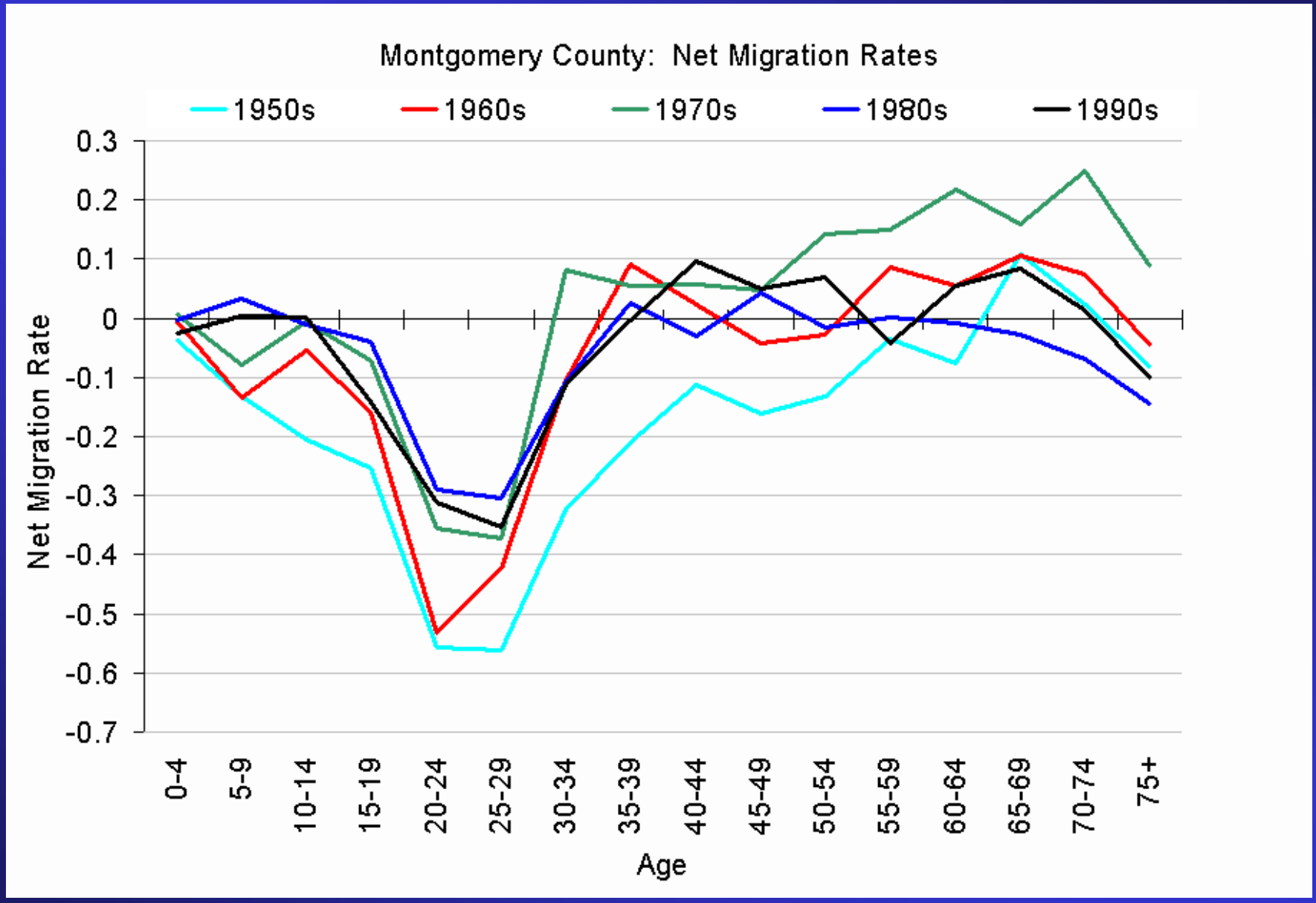

Lowndes County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

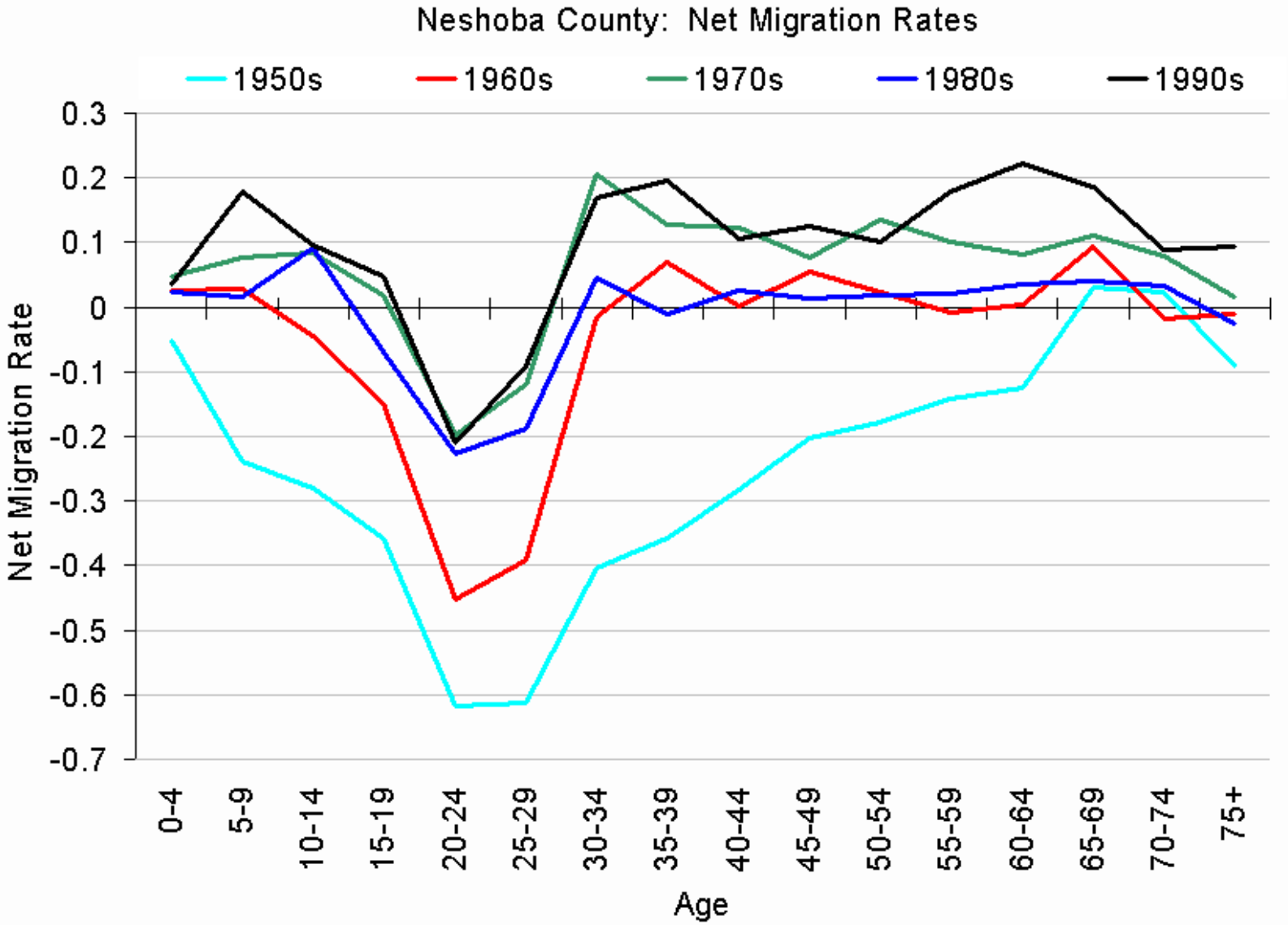

Madison County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

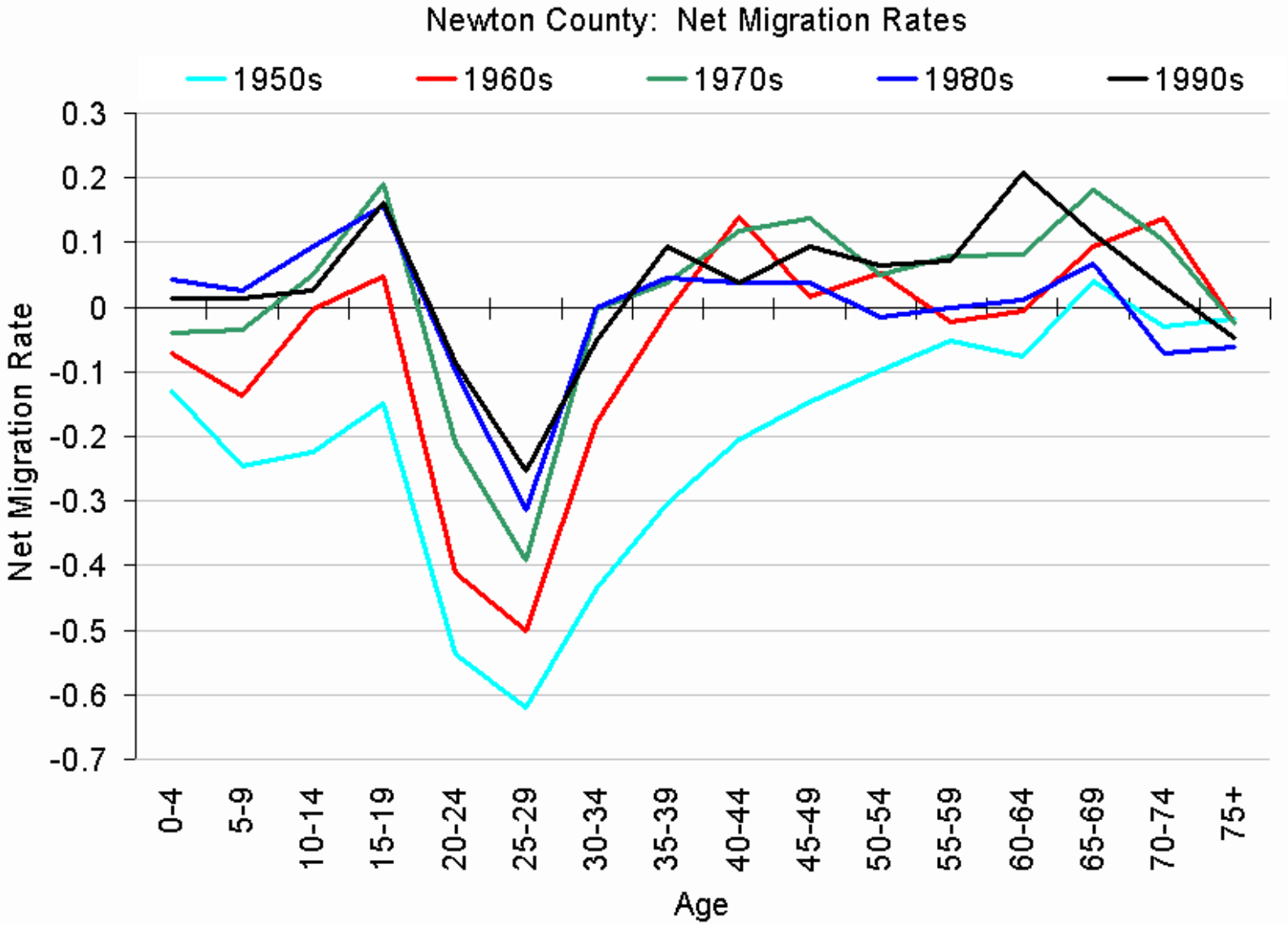

Marion County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

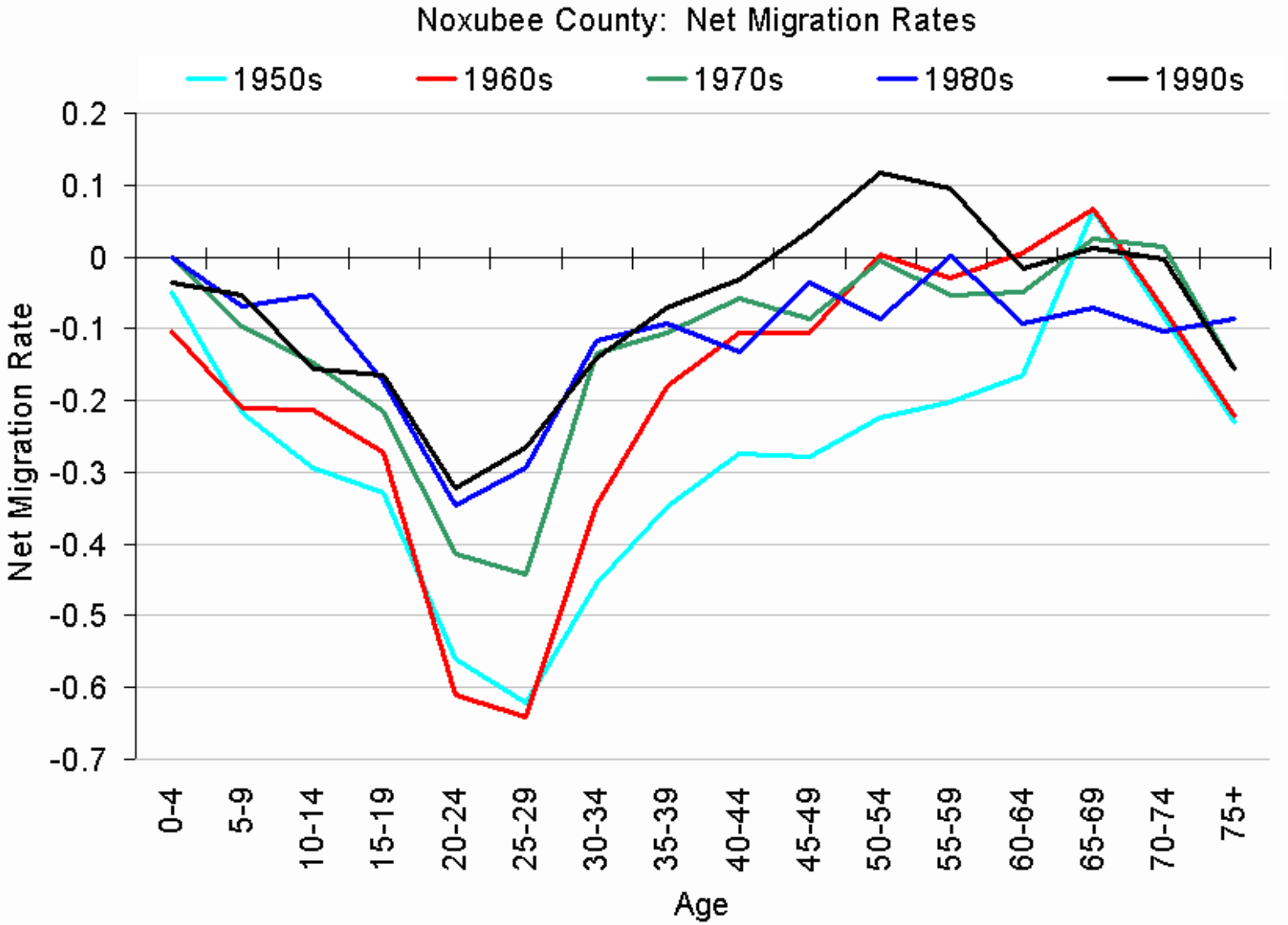

Marshall County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

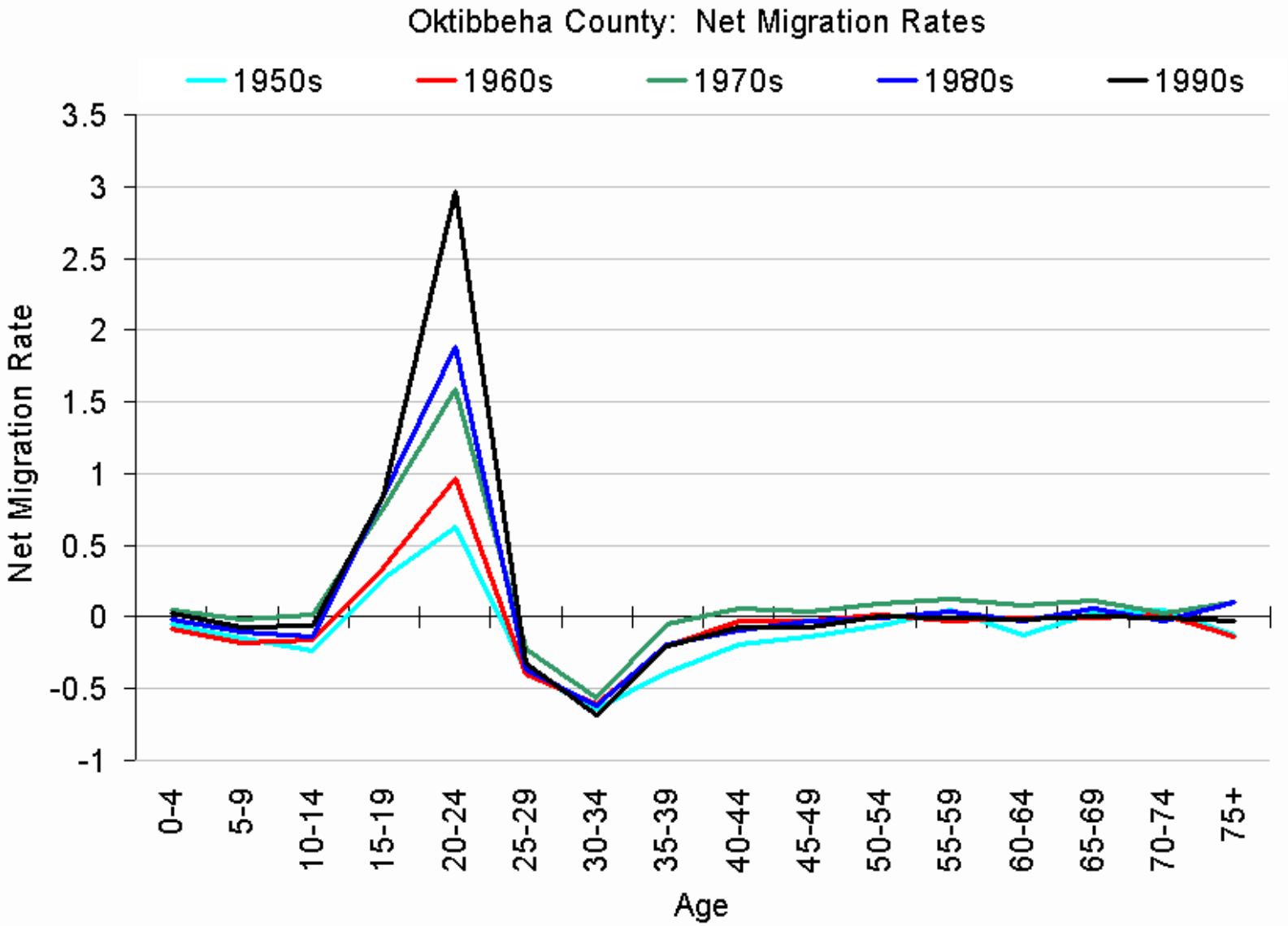

Monroe County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

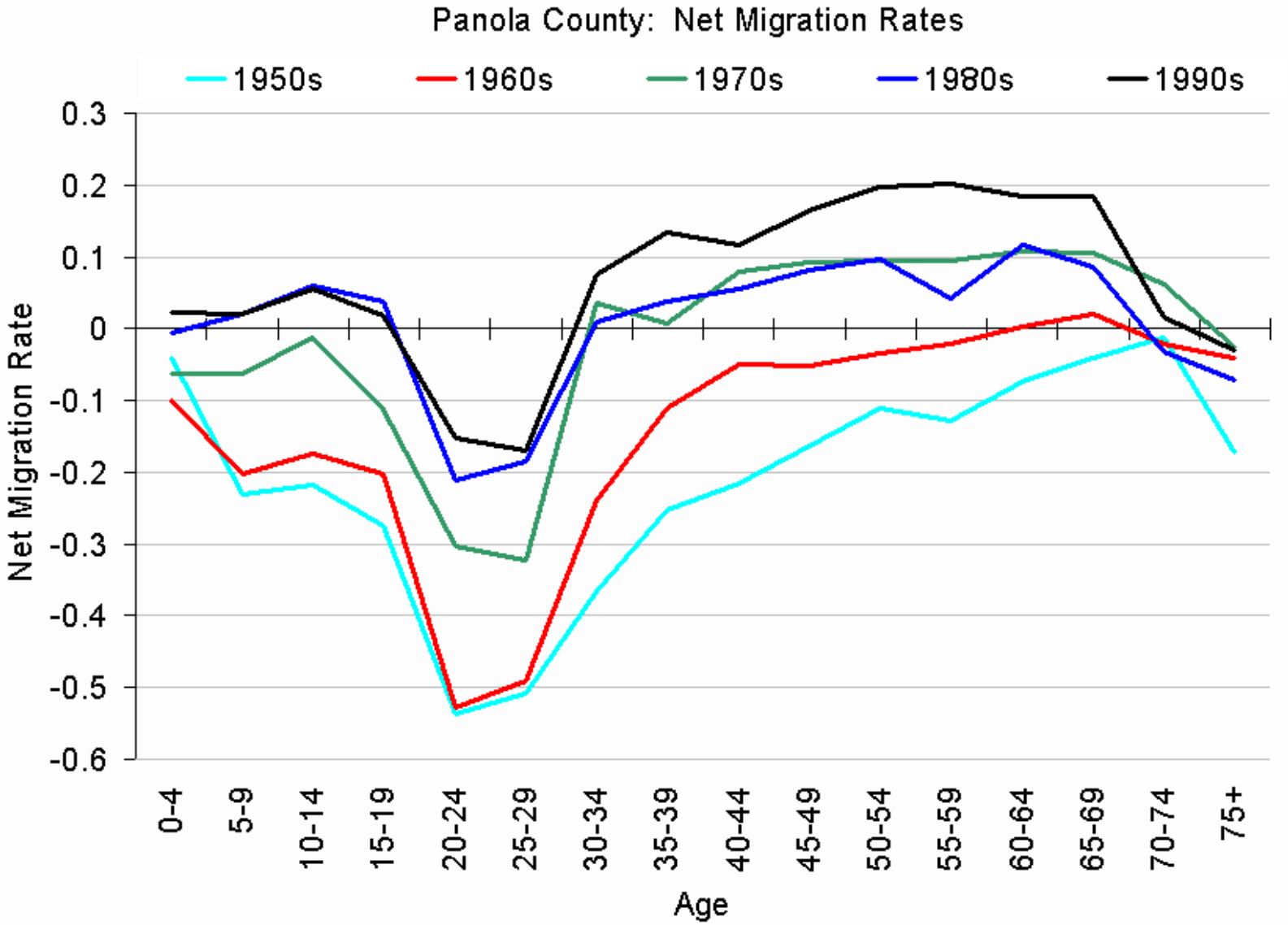

Montgomery County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

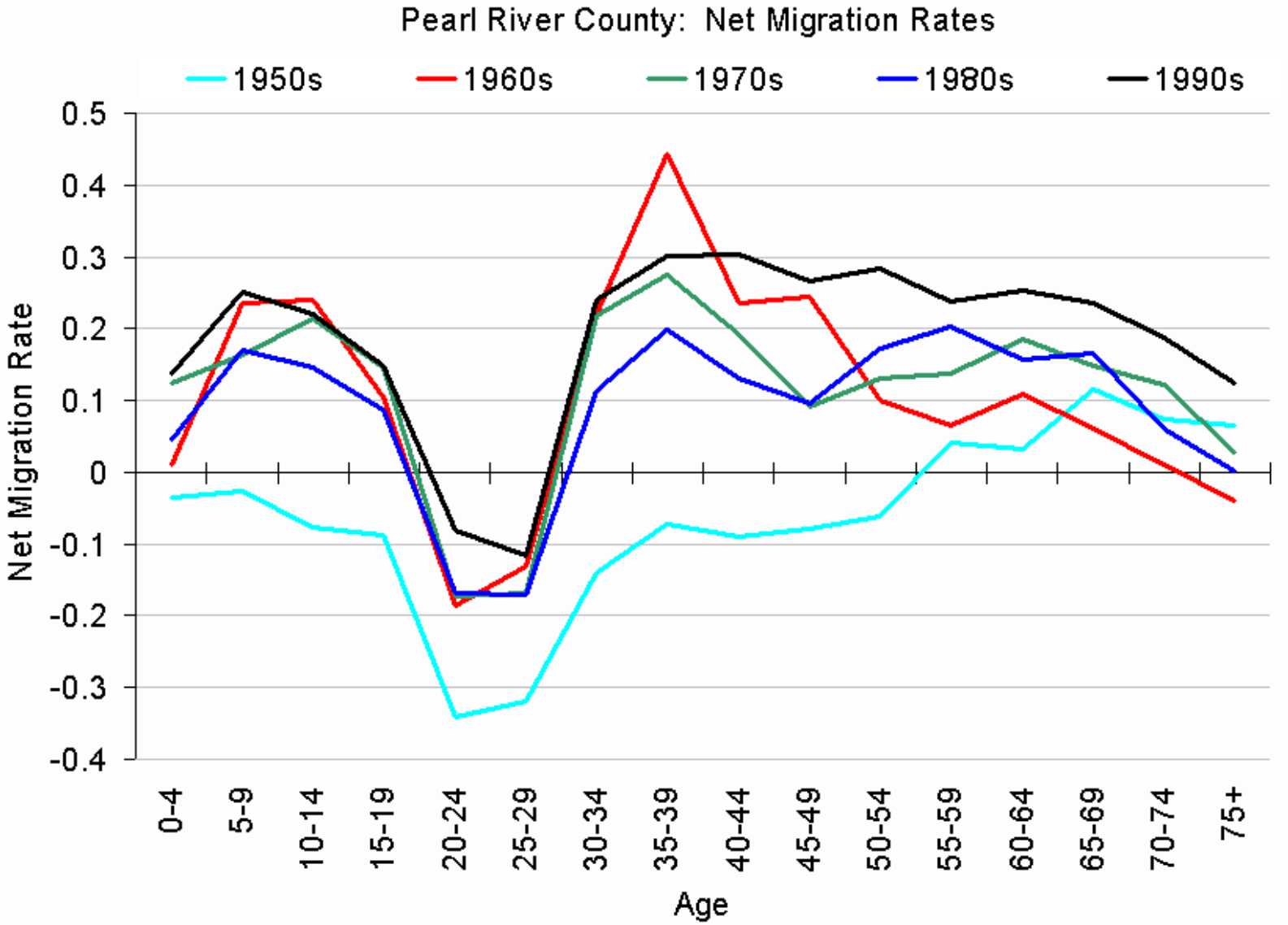

Neshoba County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

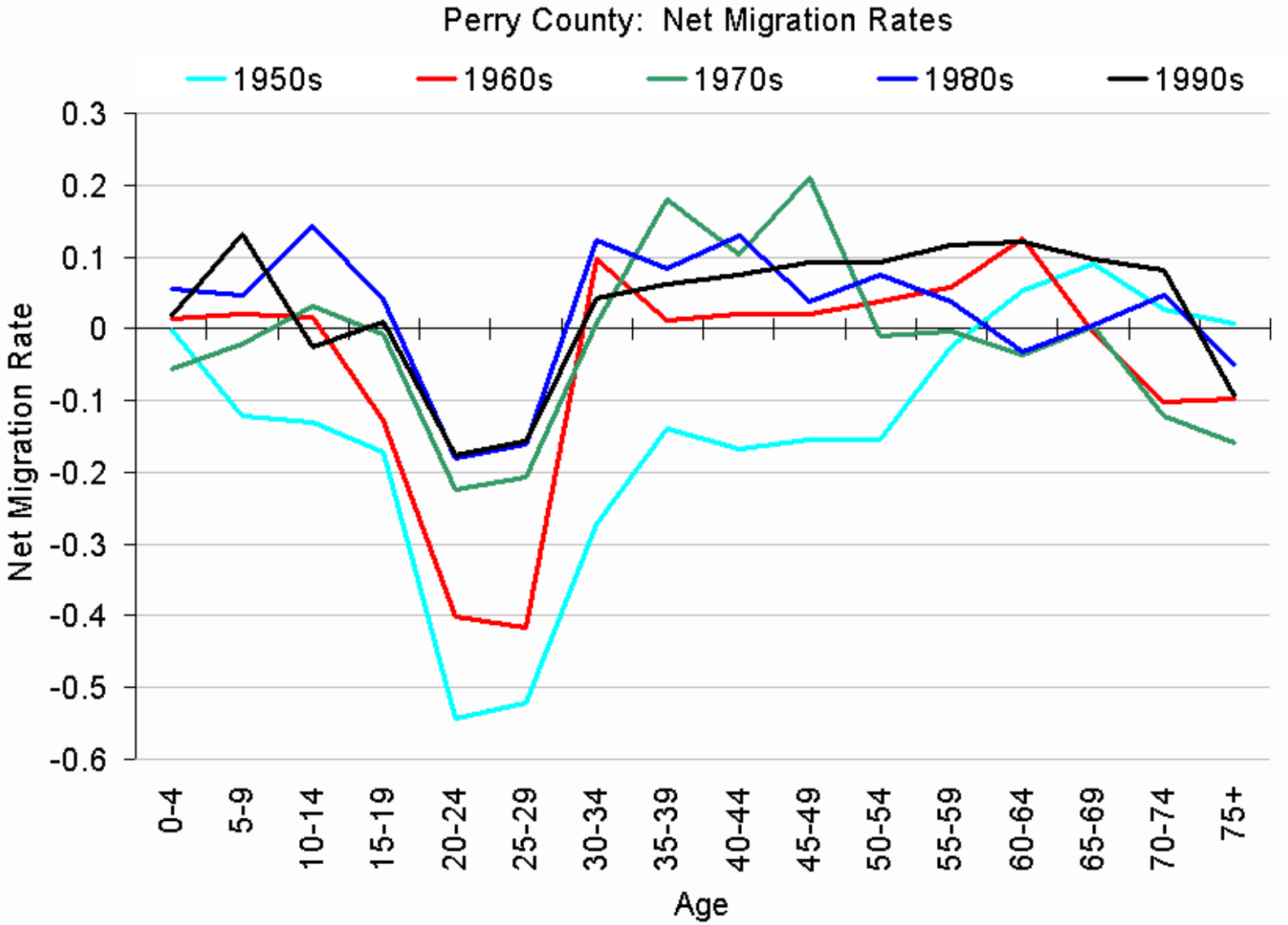

Newton County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

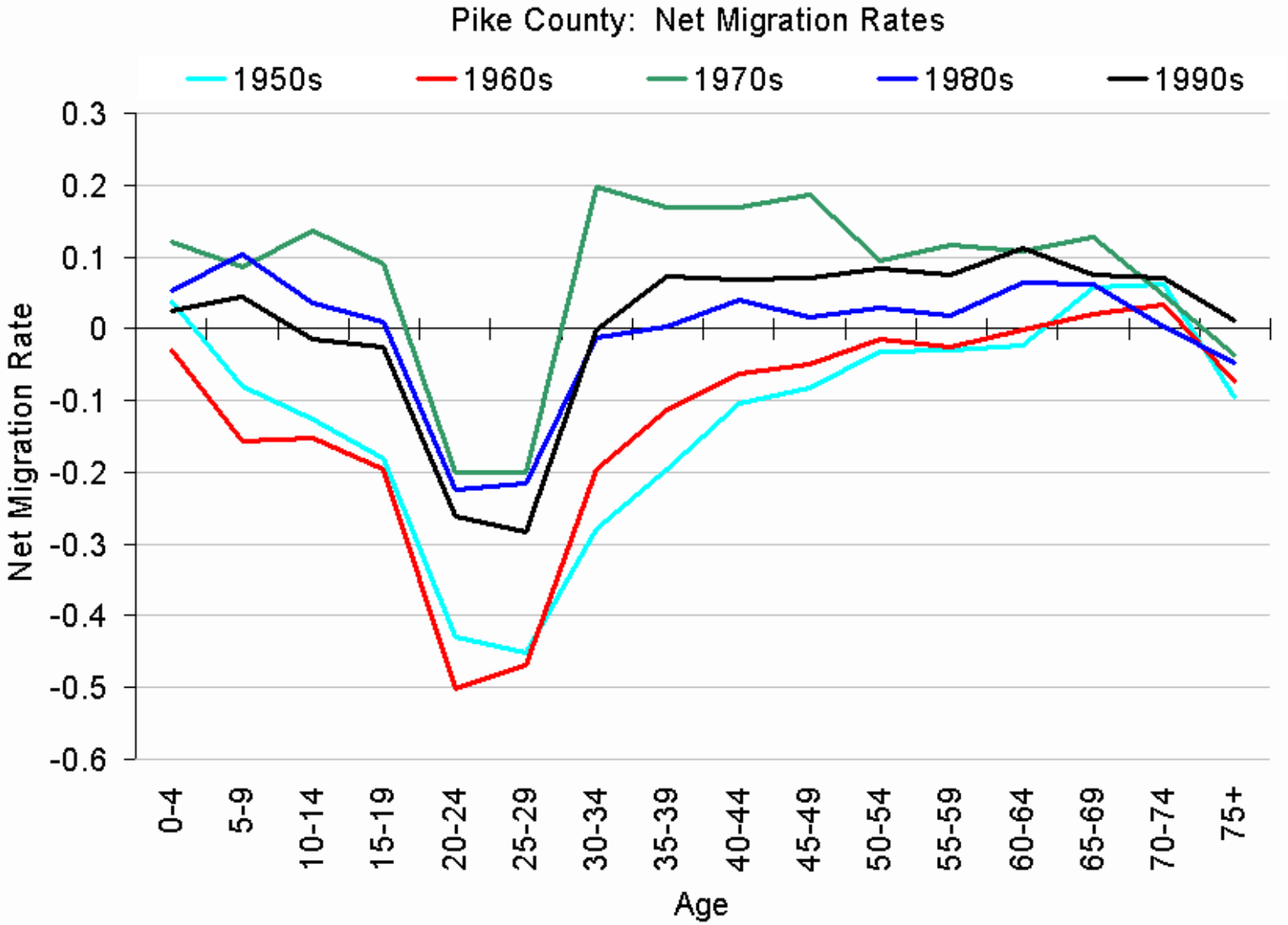

Noxubee County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

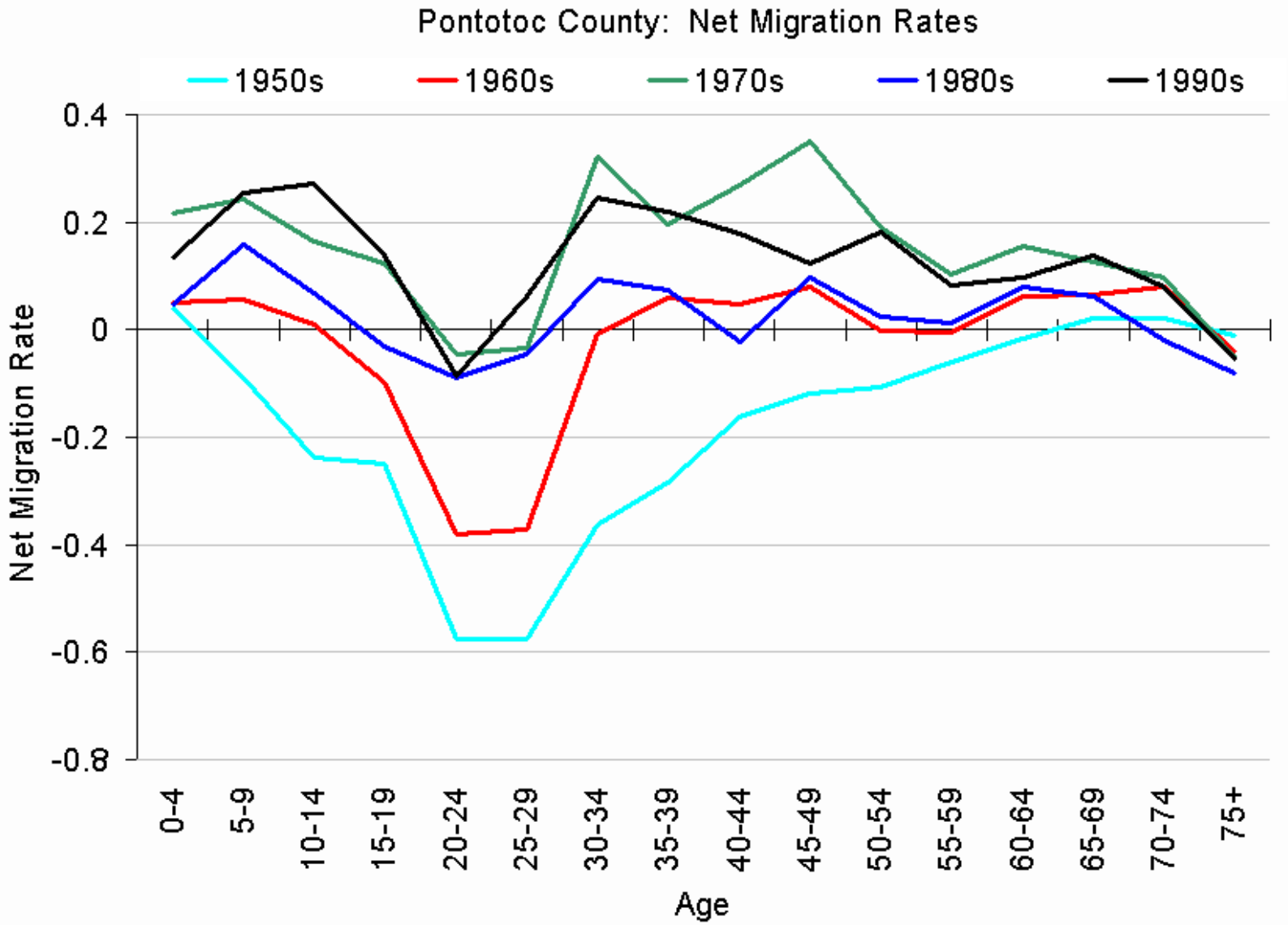

Oktibbeha County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

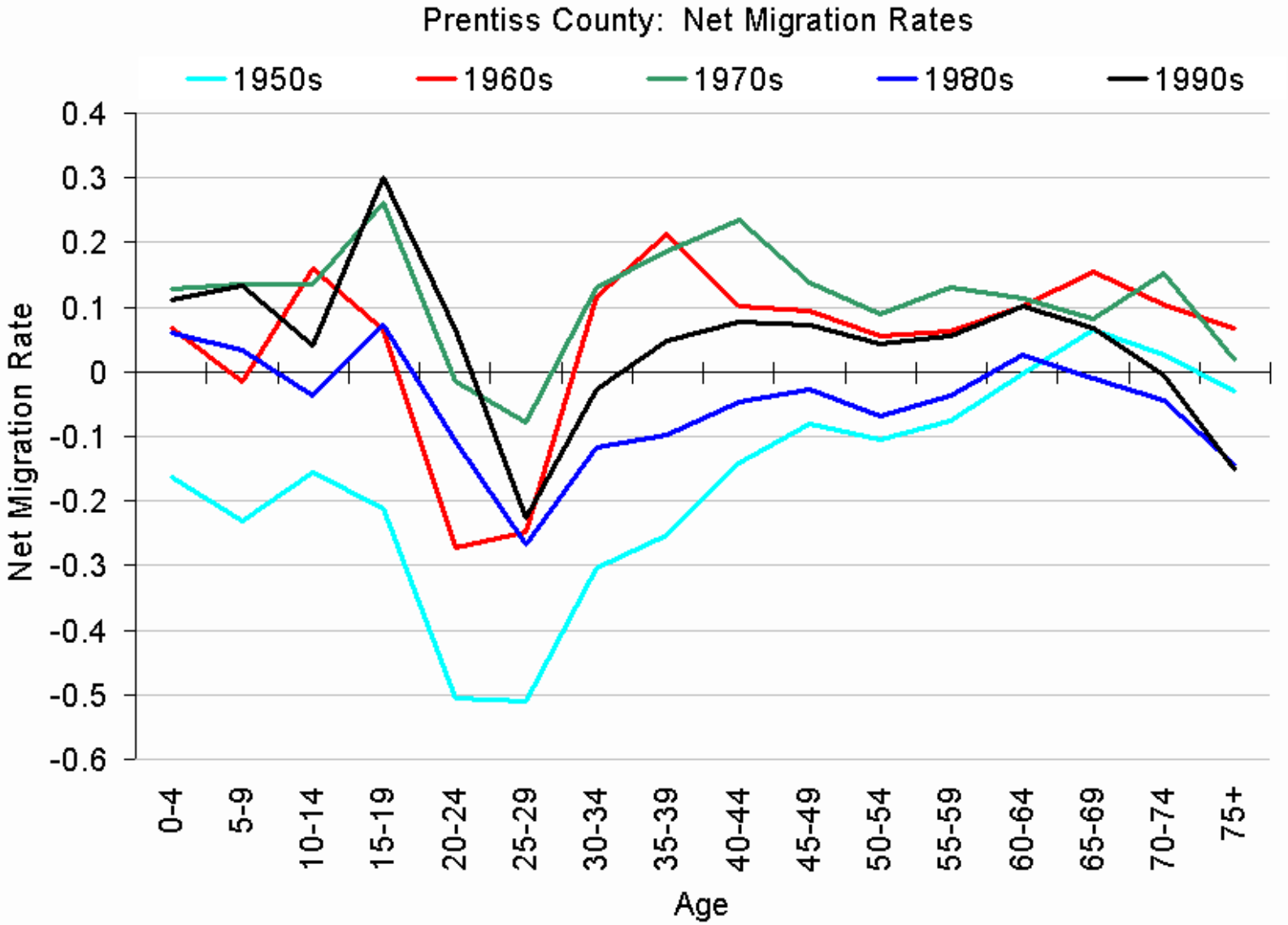

Panola County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

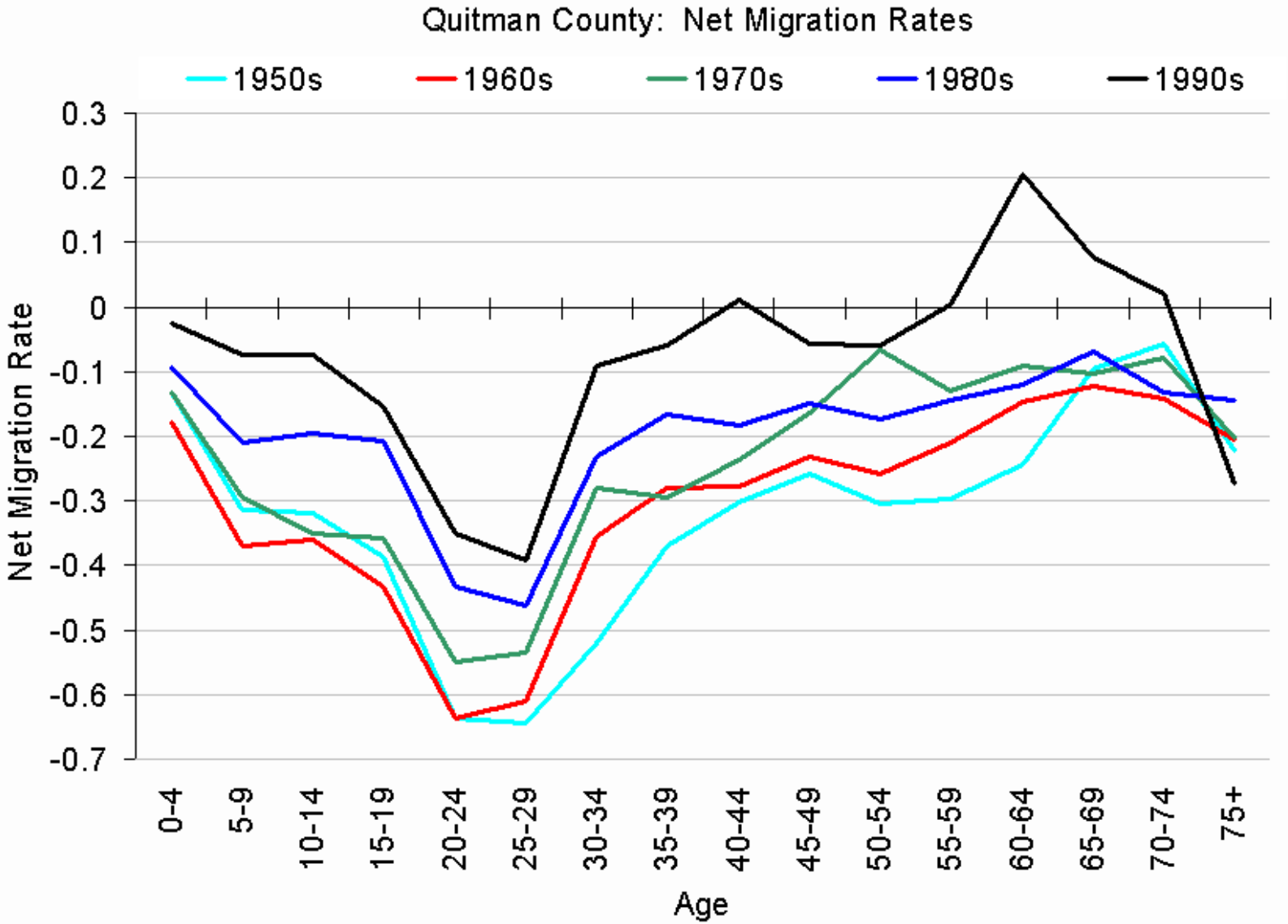

Pearl River County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

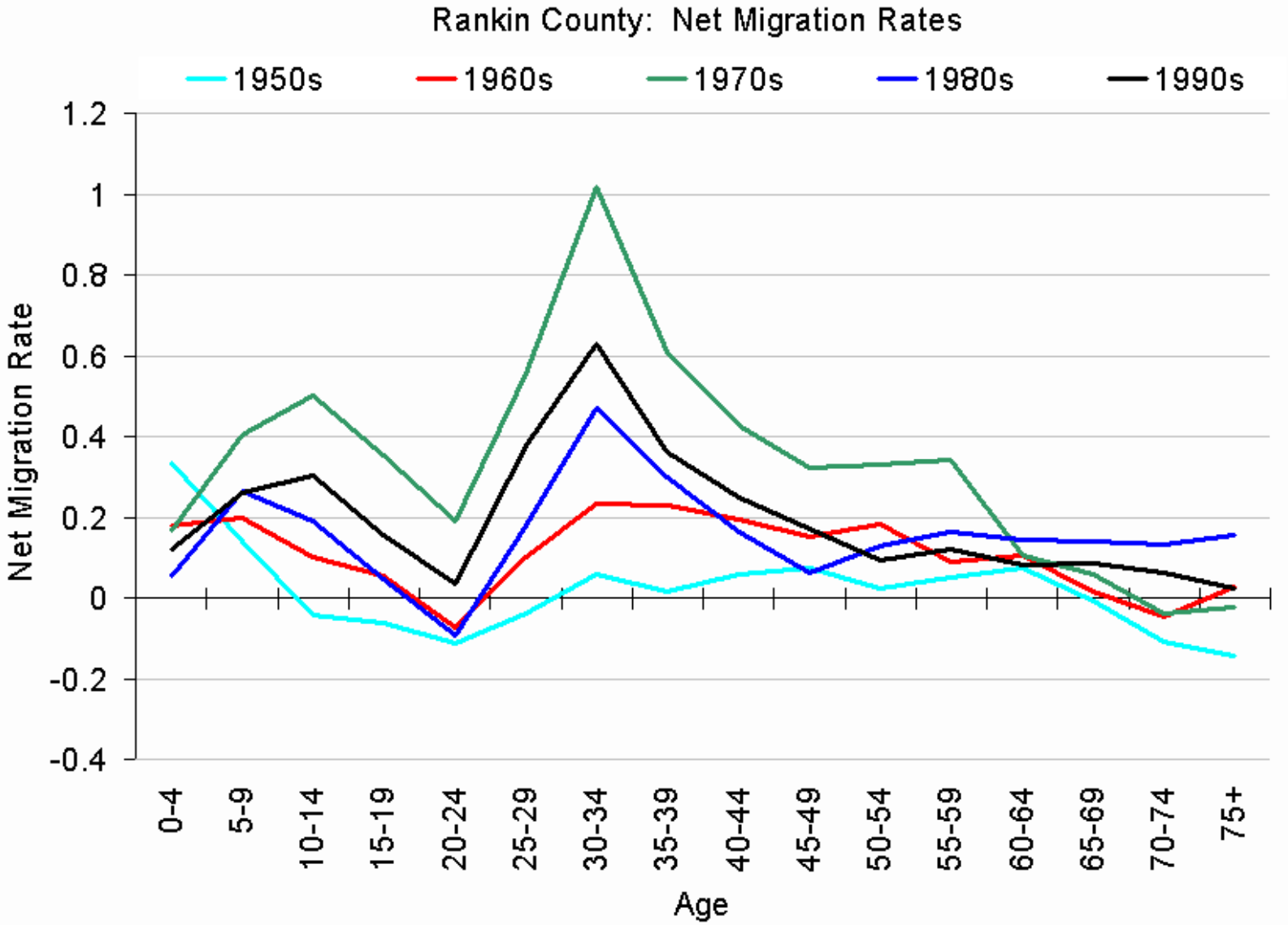

Perry County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

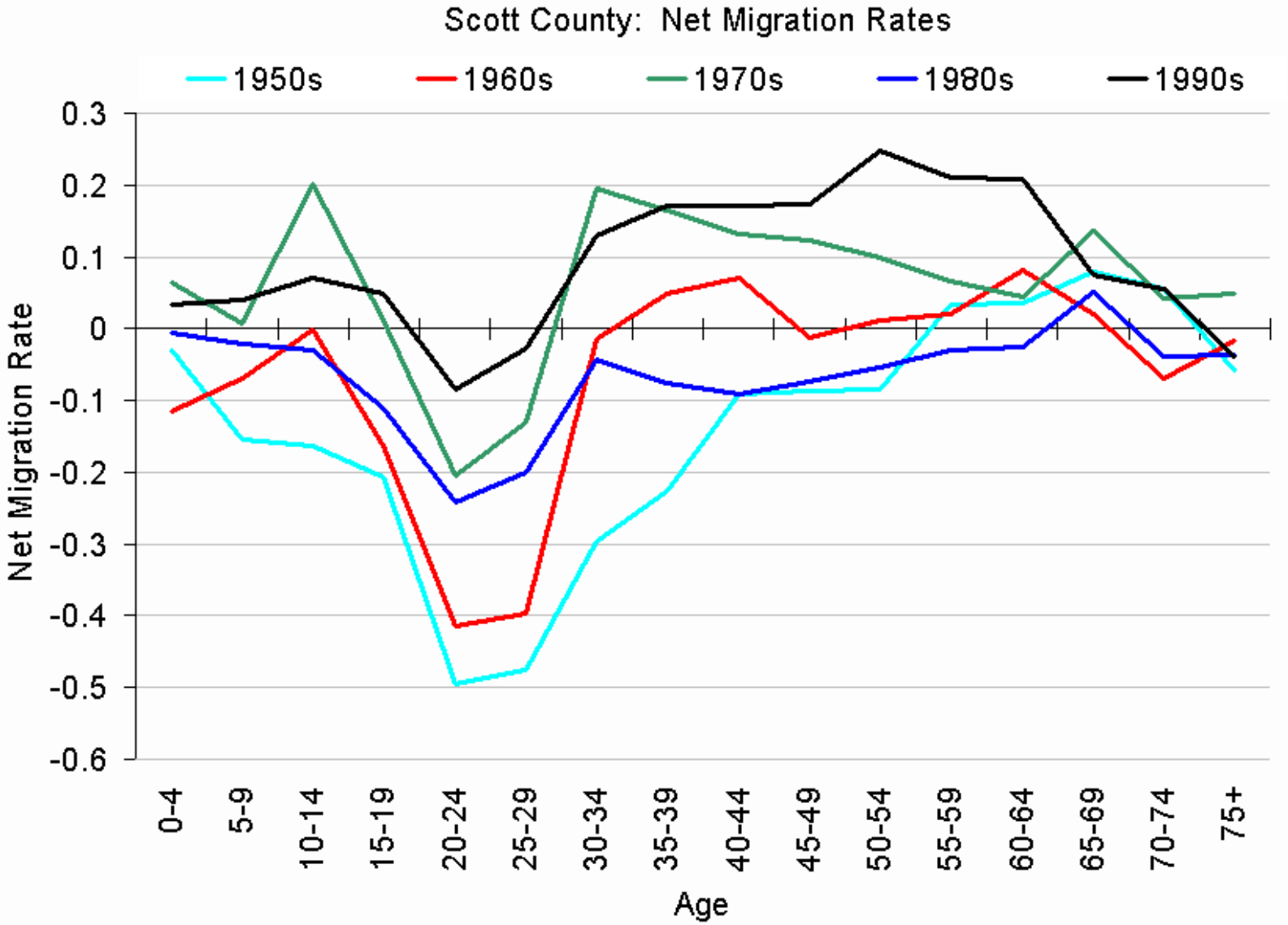

Pike County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

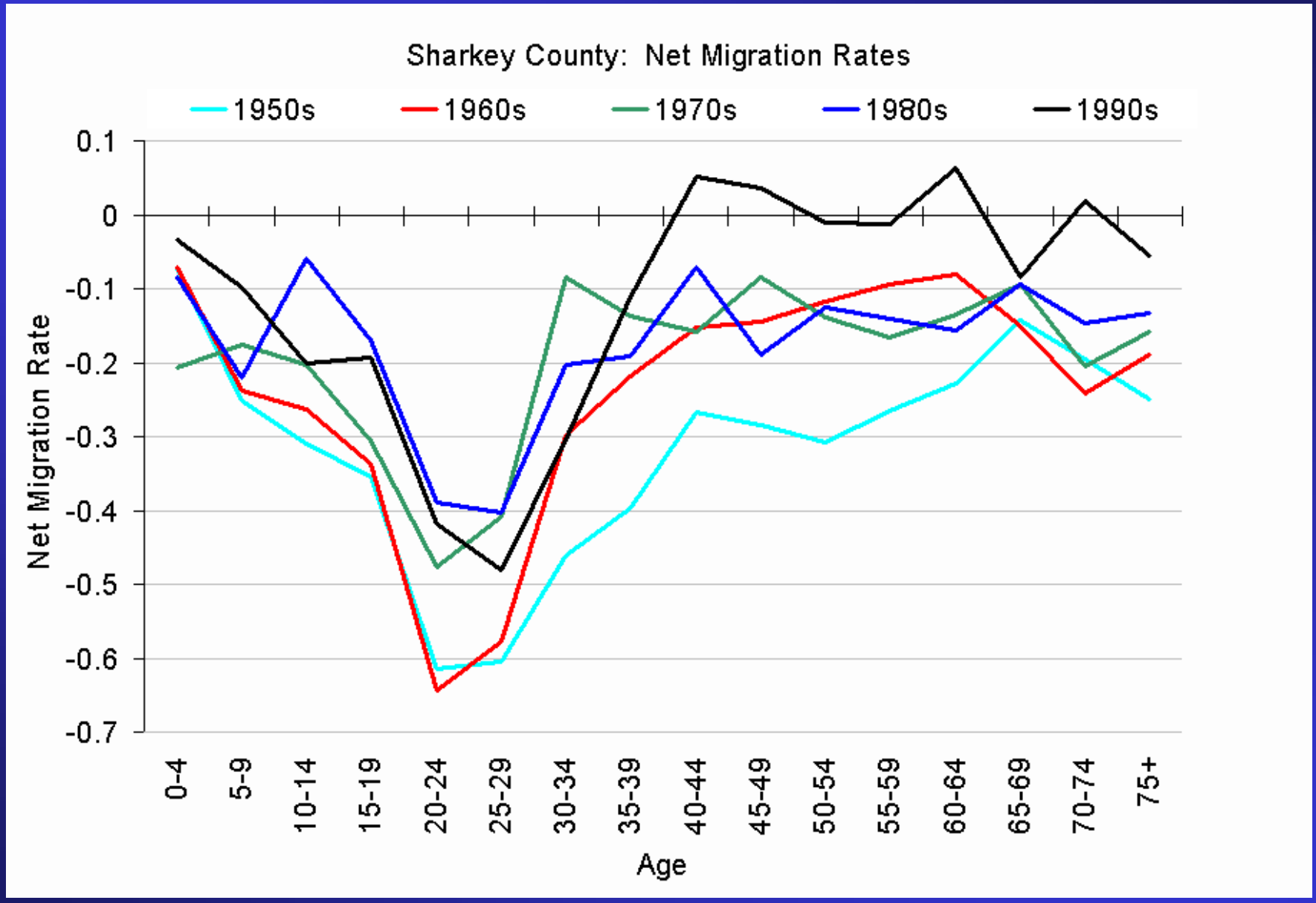

Pontotoc County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

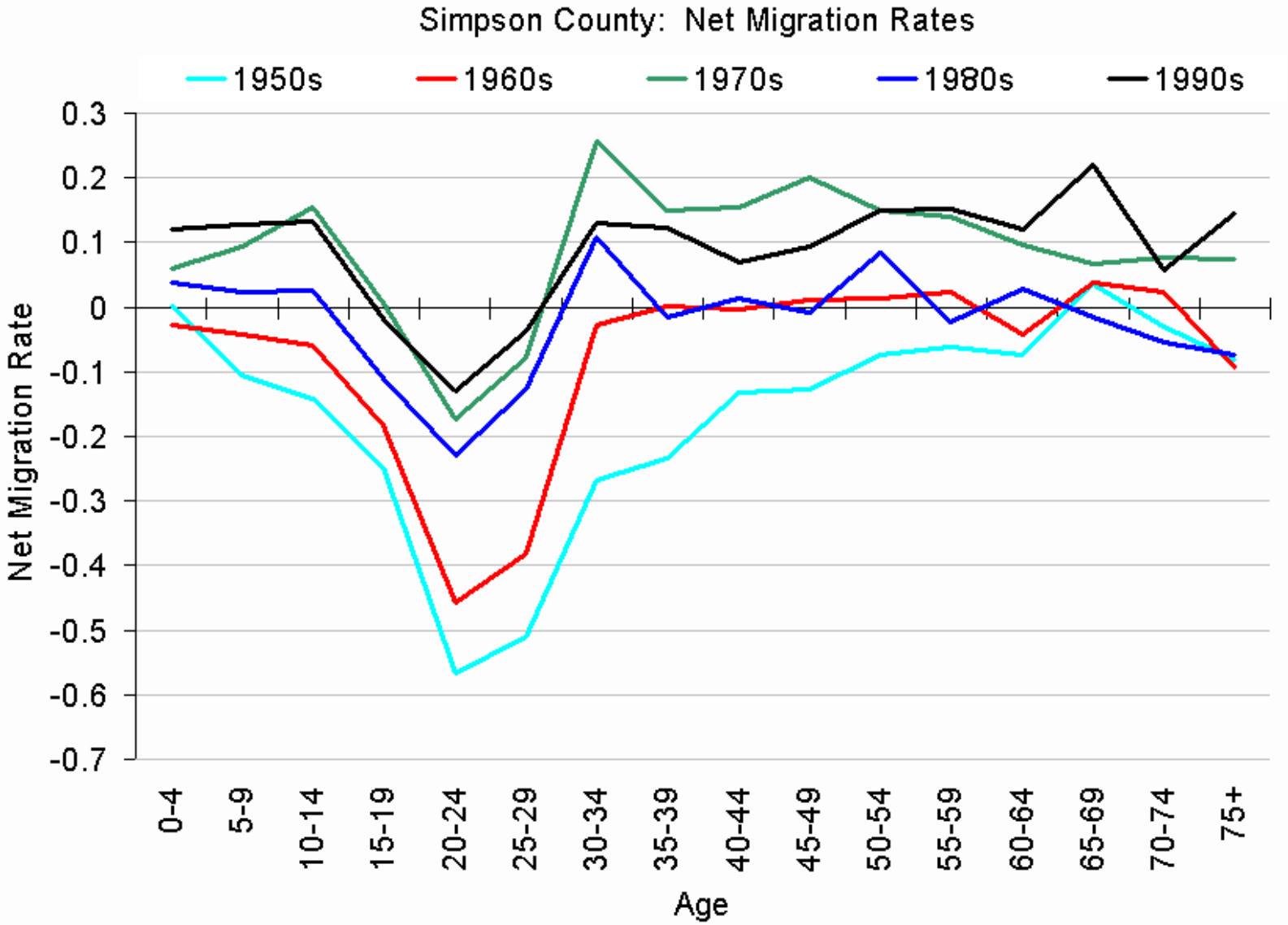

Prentiss County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

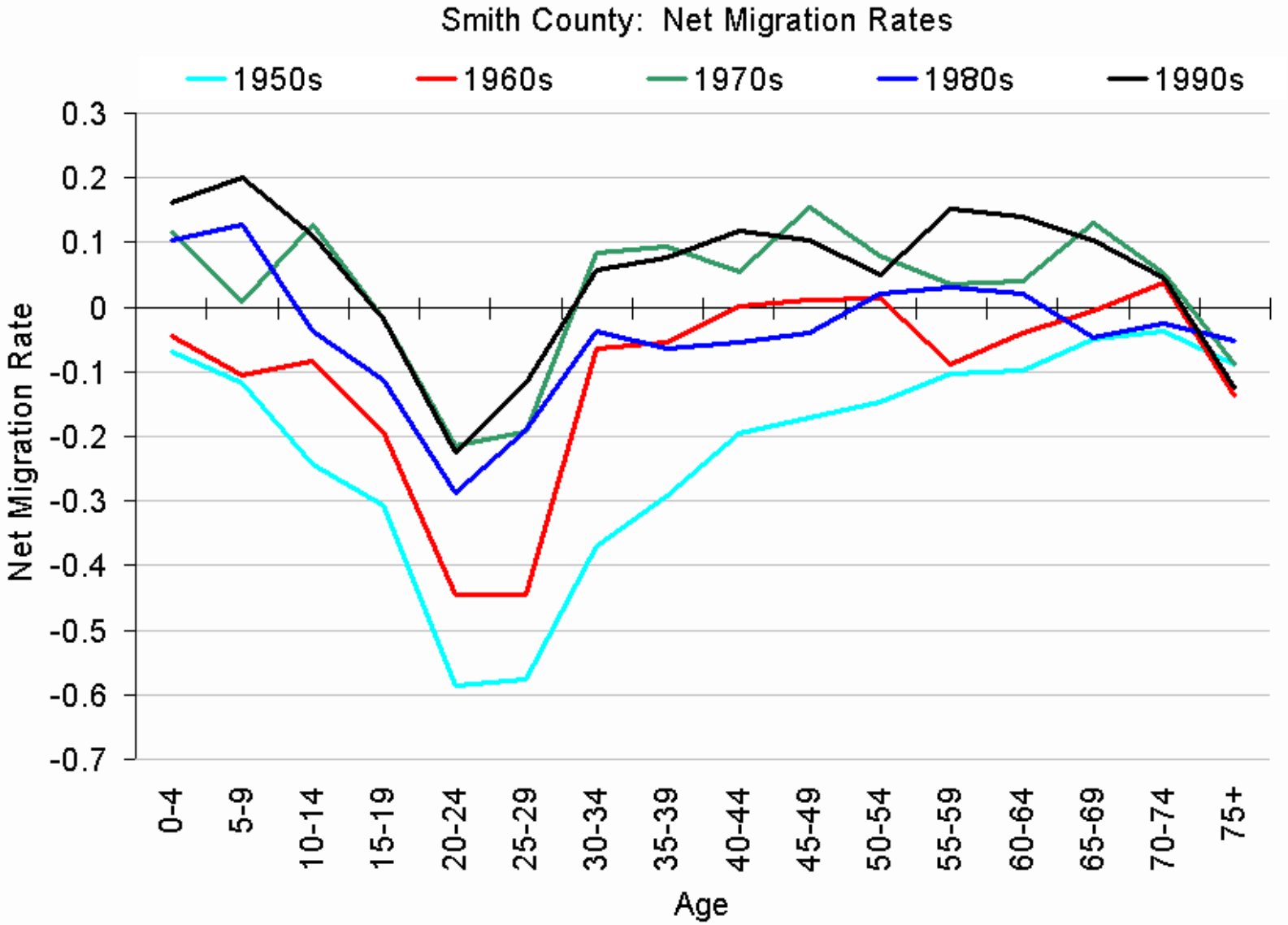

Quitman County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

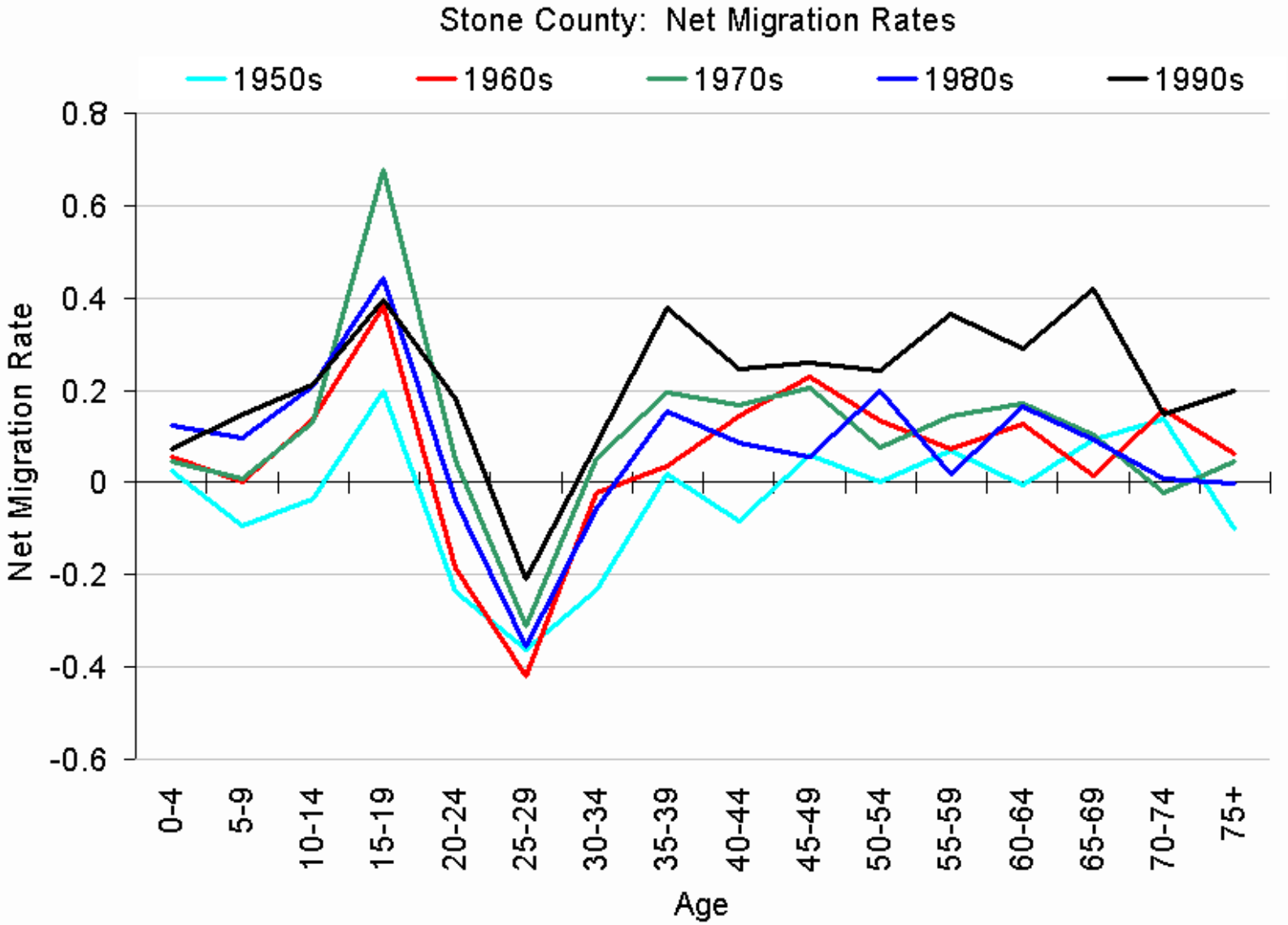

Rankin County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

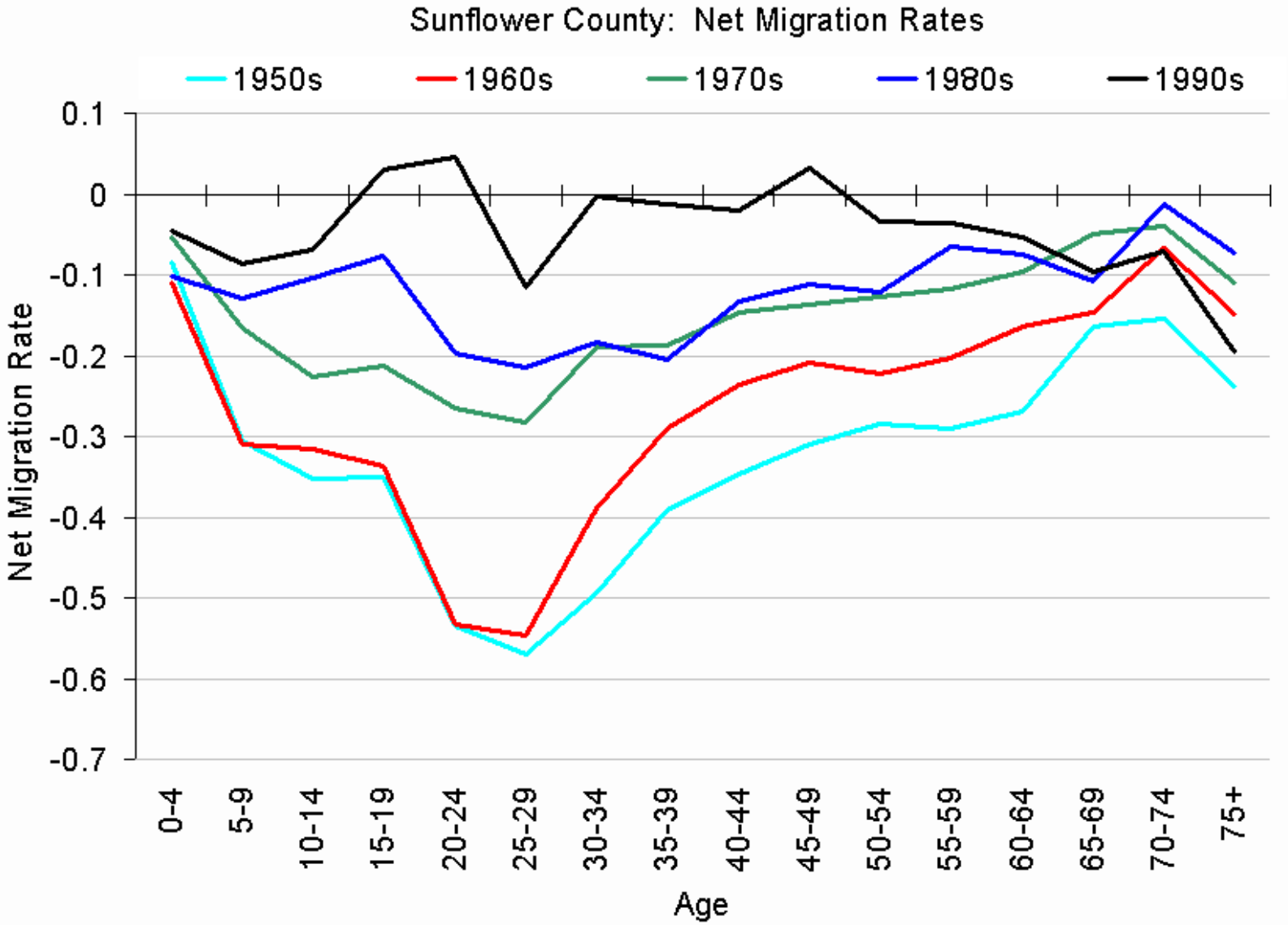

Scott County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

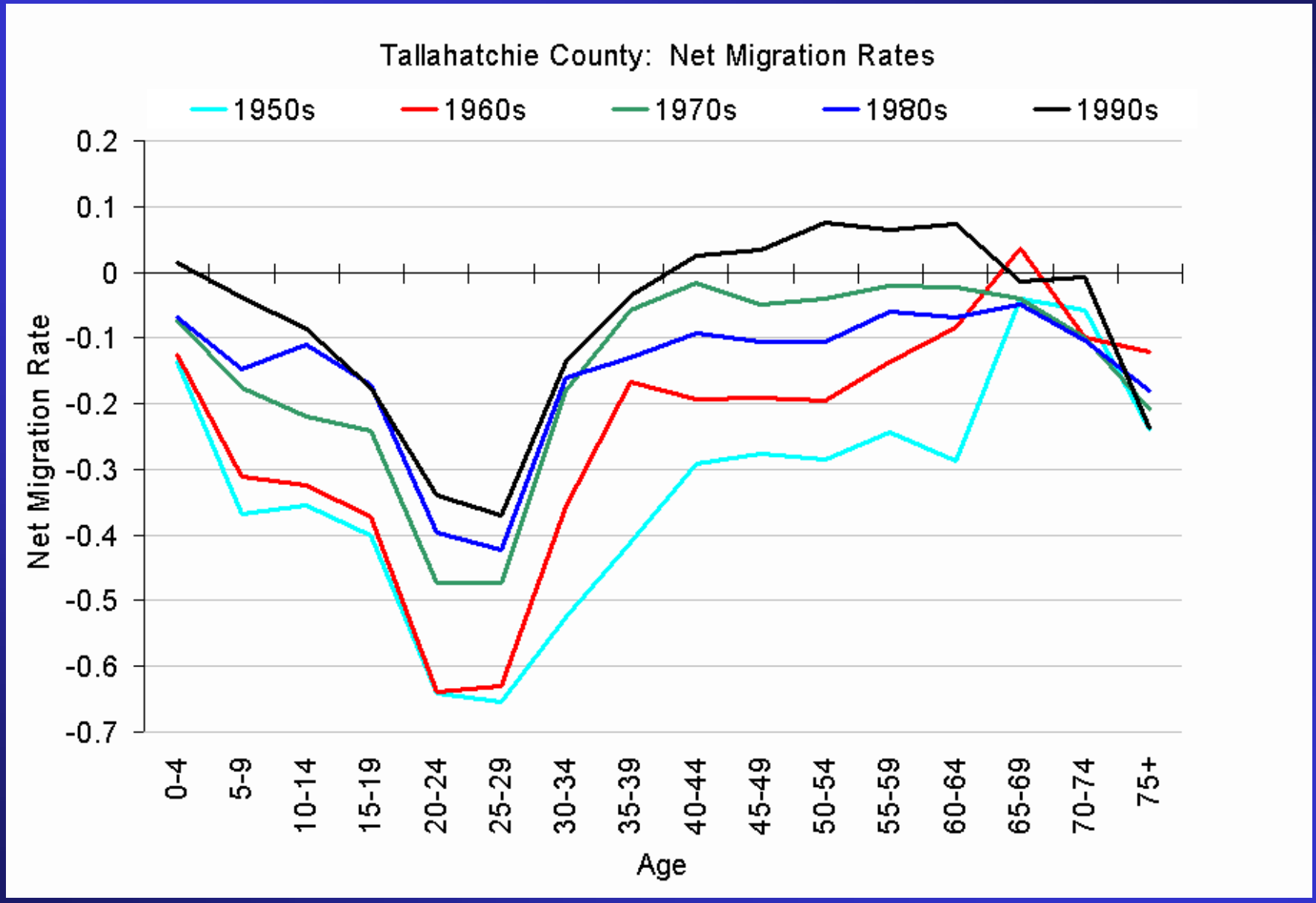

Sharkey County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

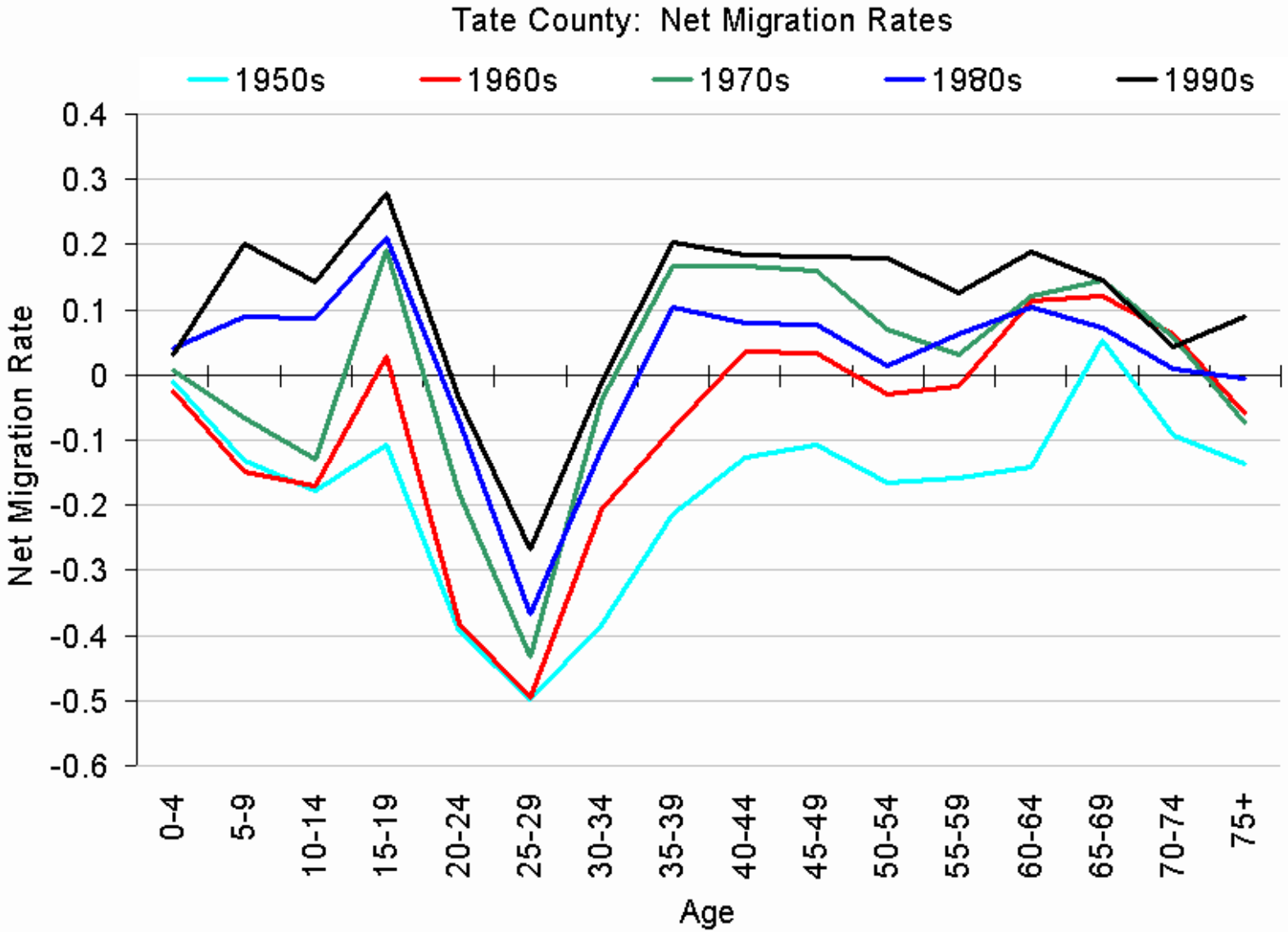

Simpson County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

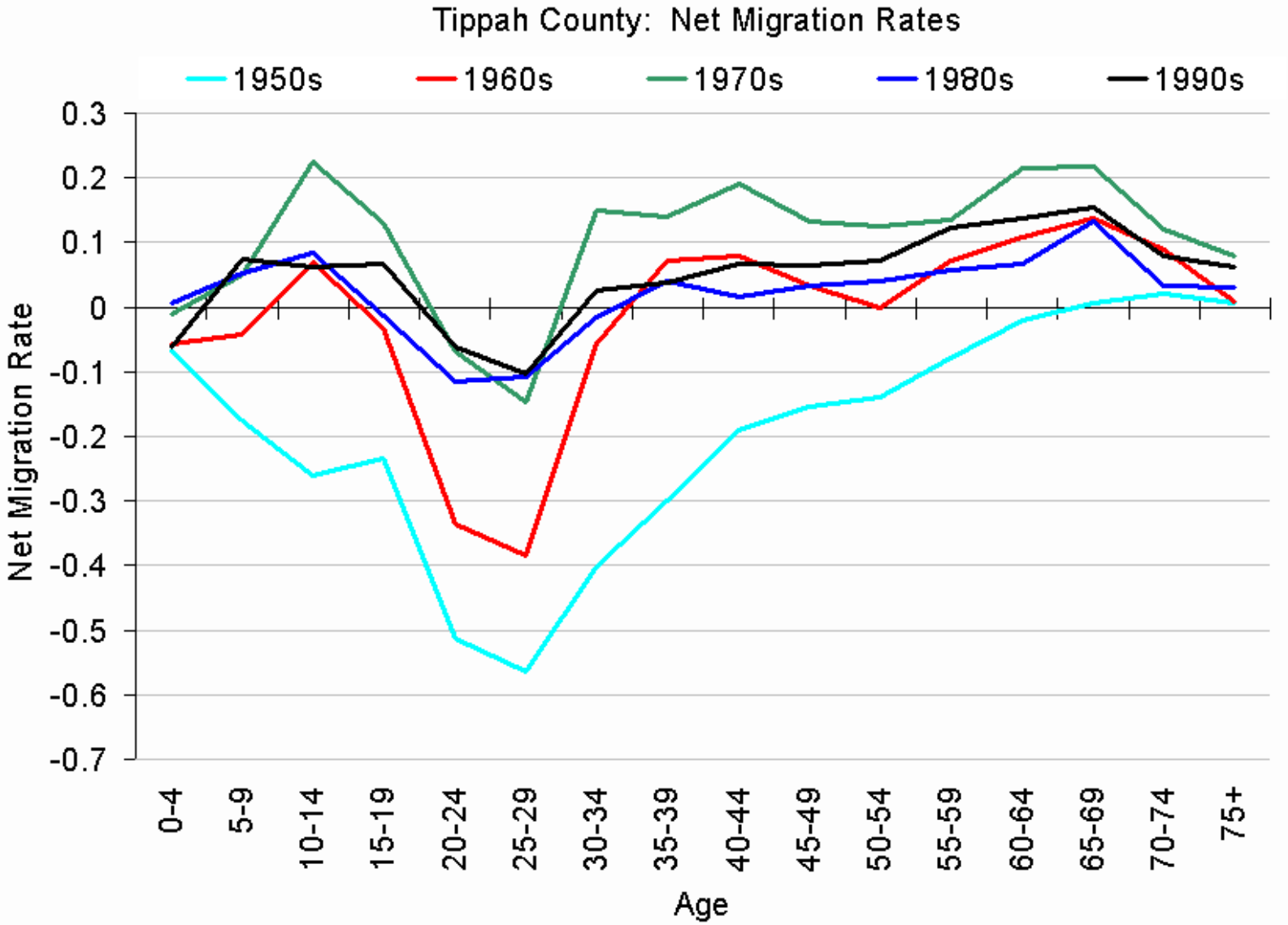

Smith County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

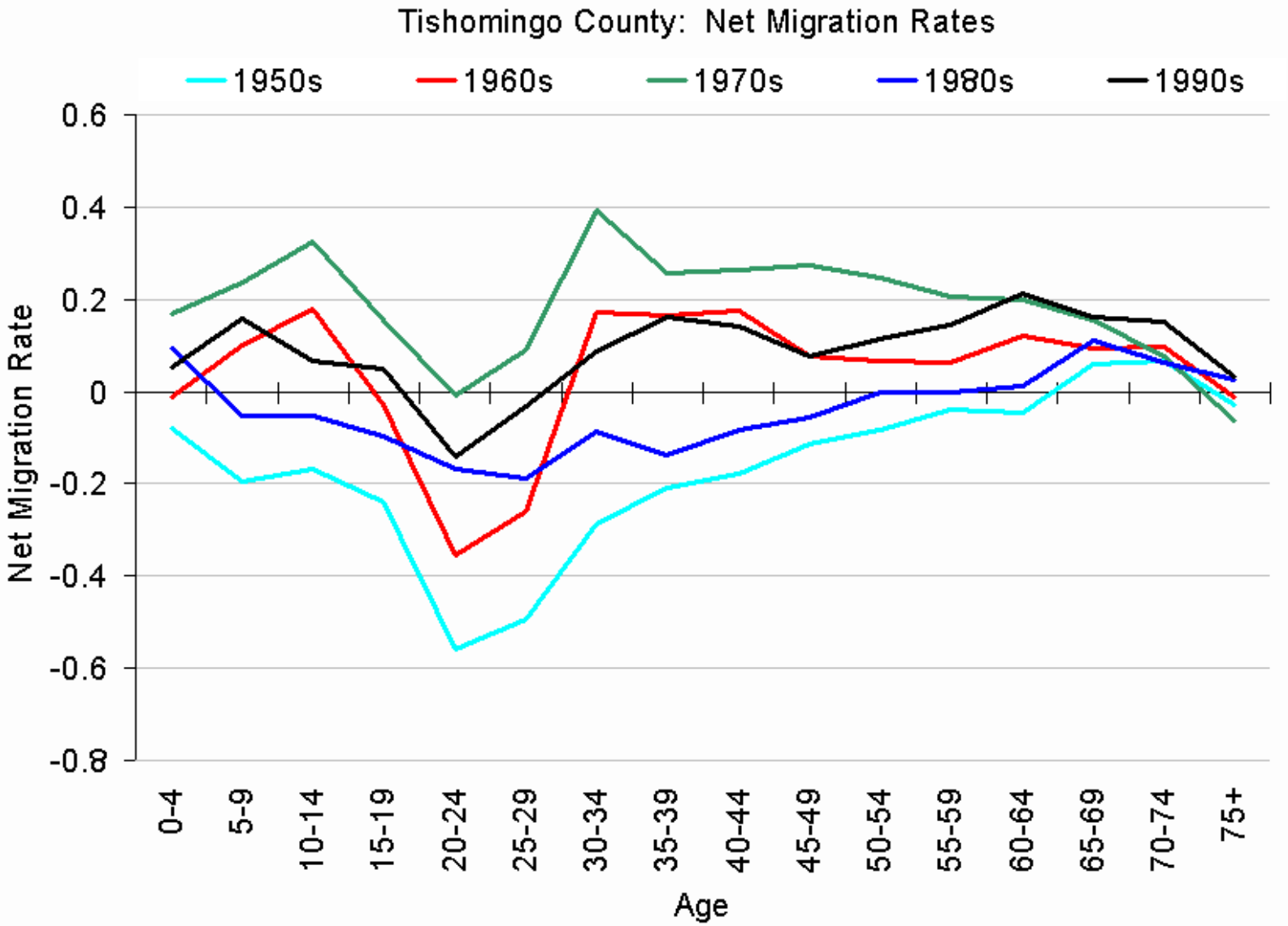

Stone County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

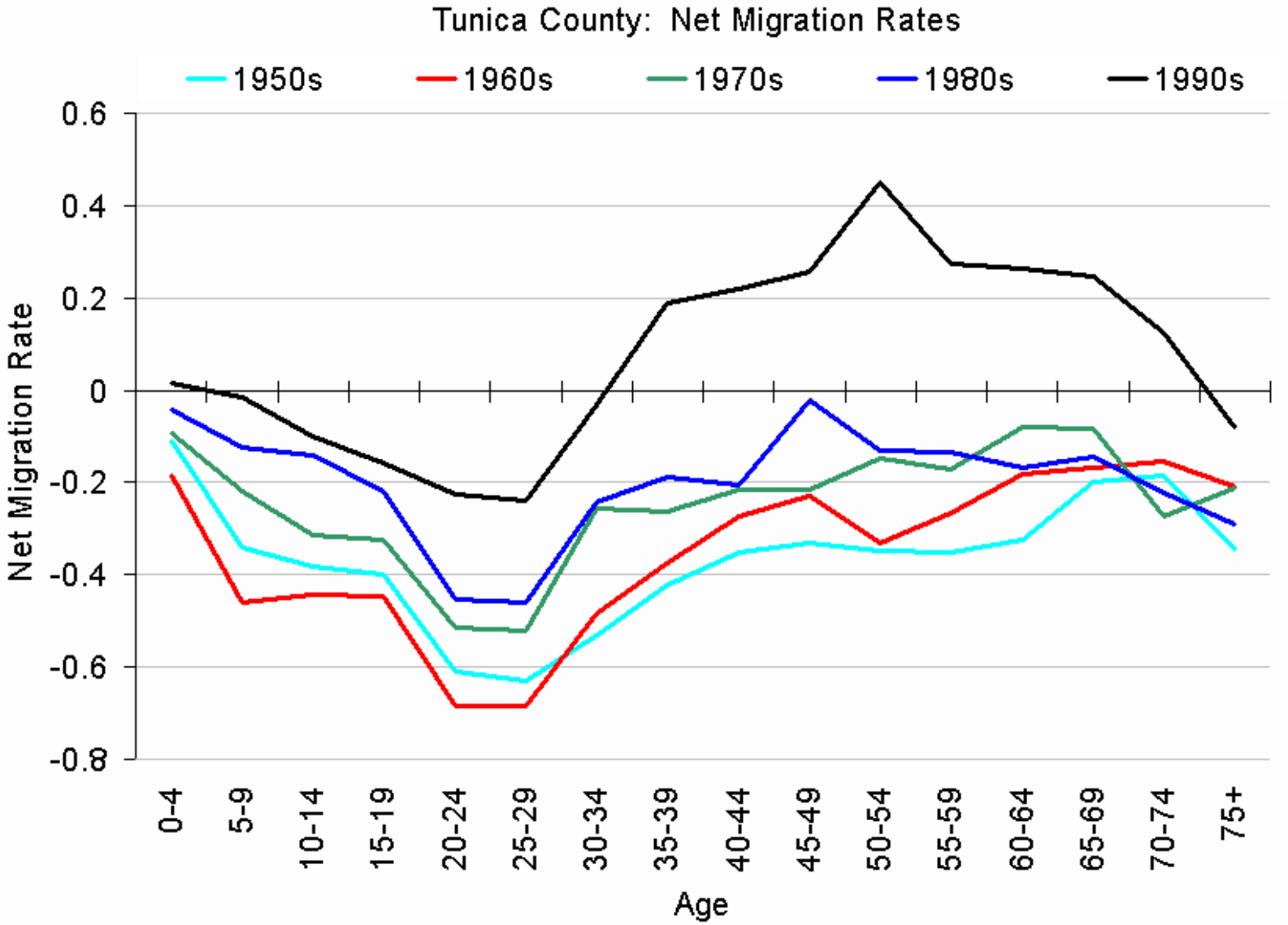

Sunflower County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

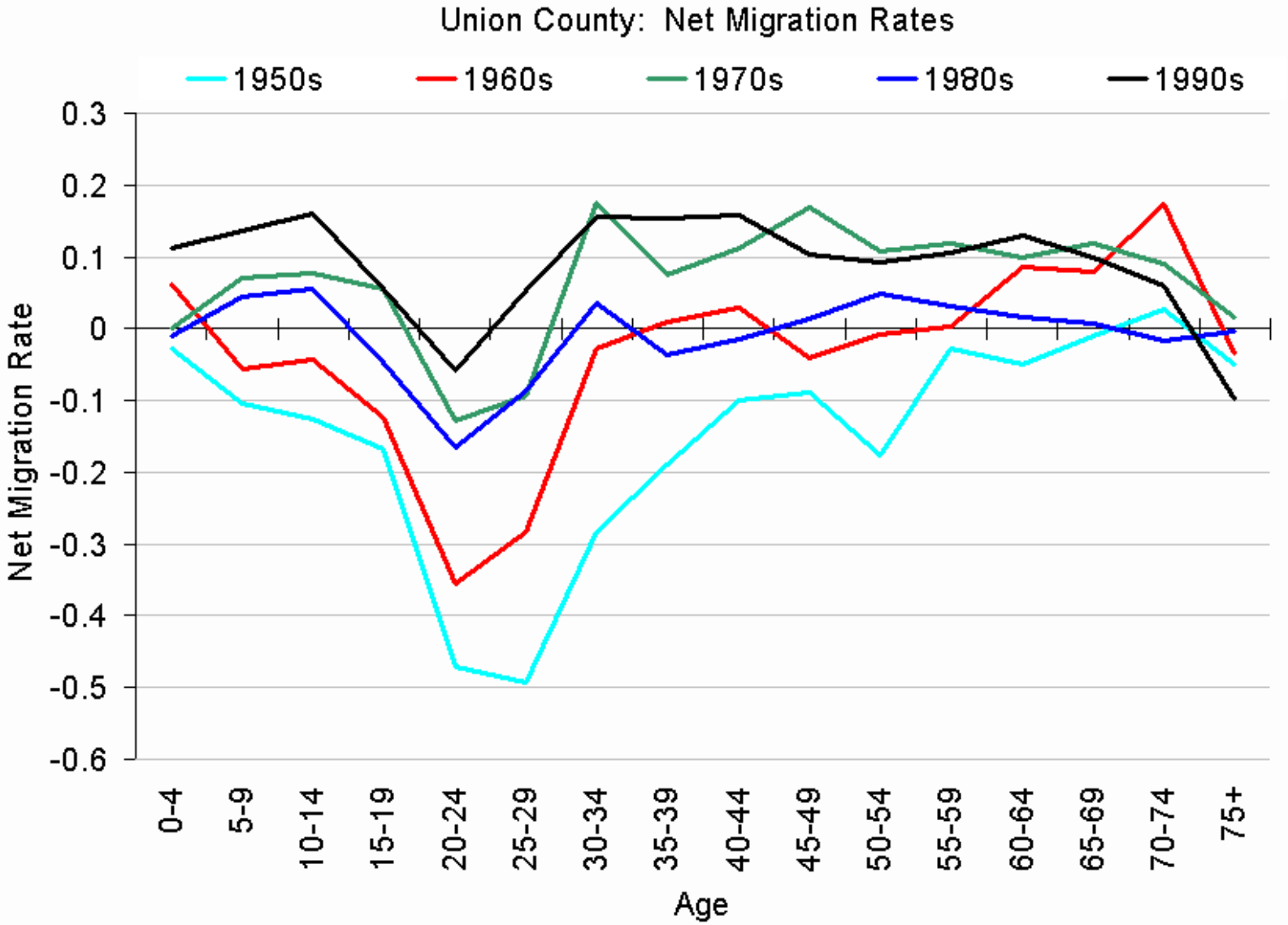

Tallahatchie County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

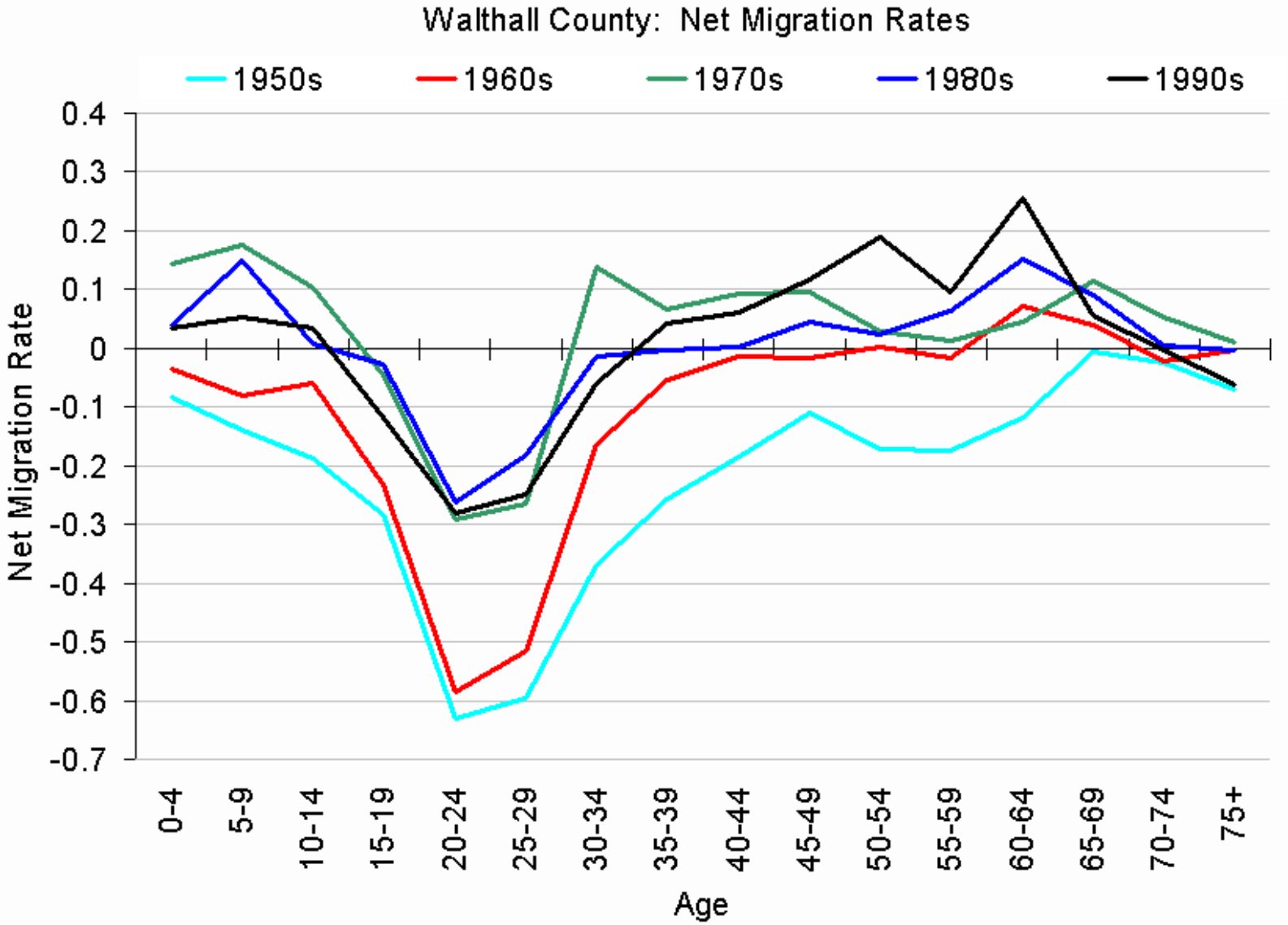

Tate County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

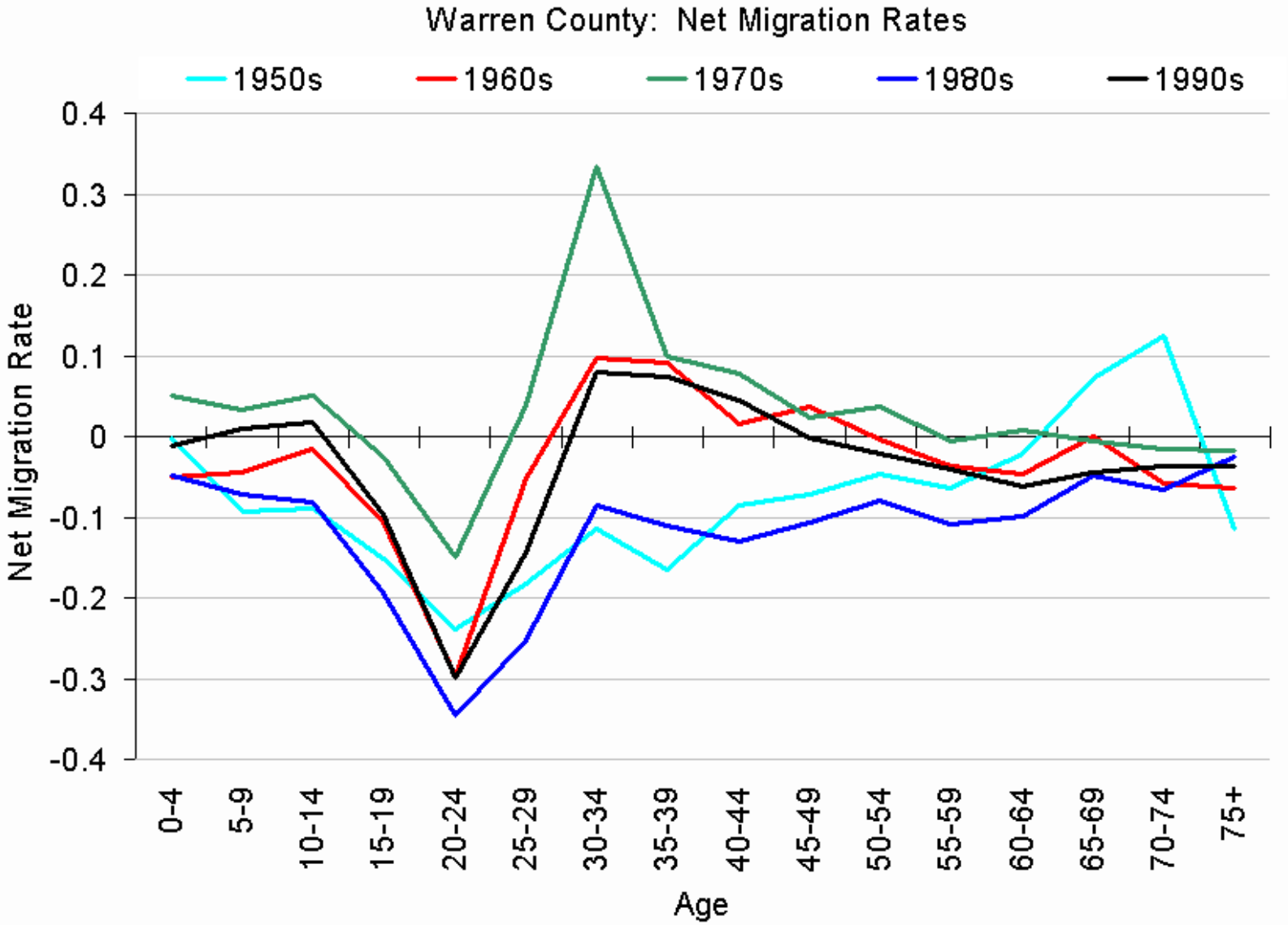

Tippah County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

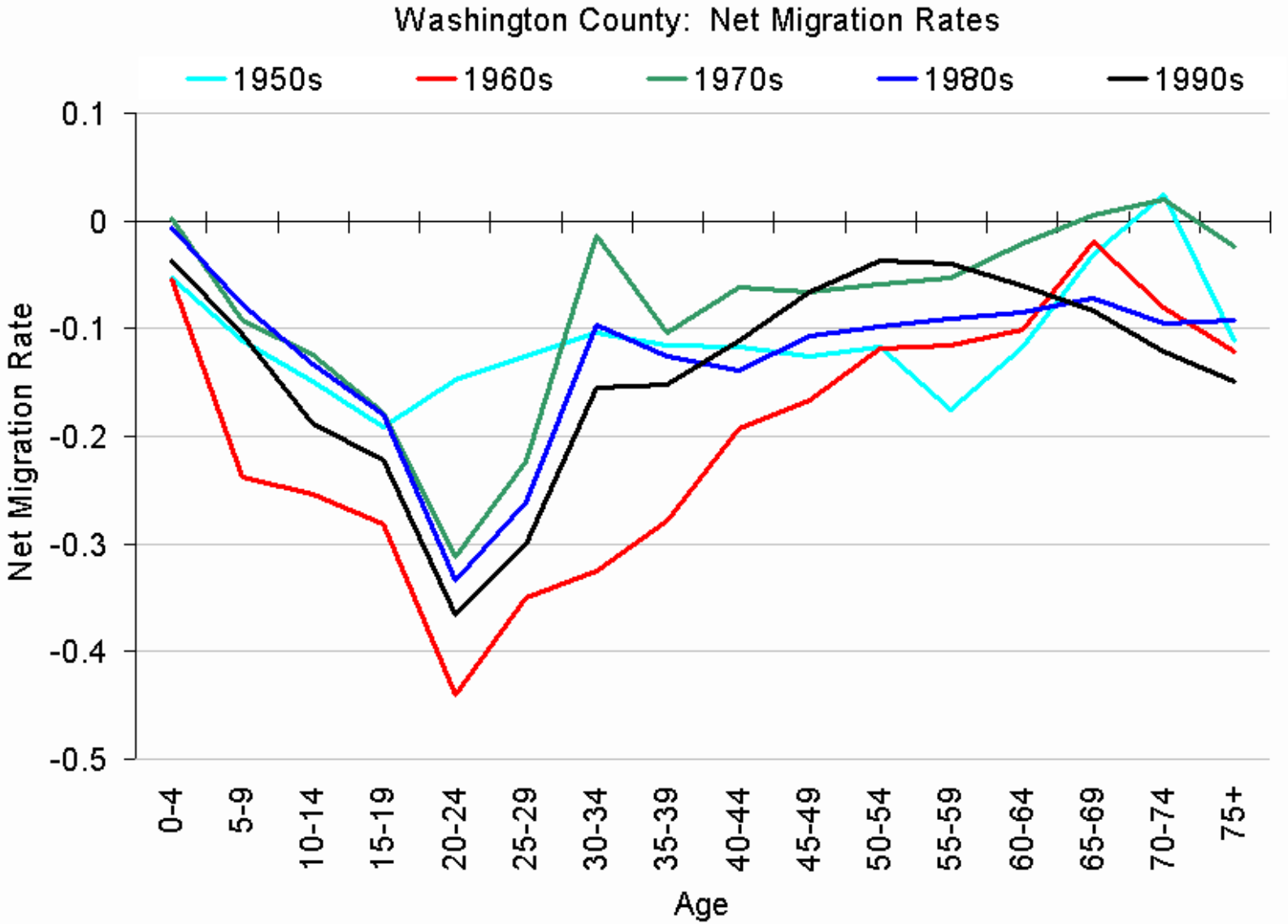

Tishomingo County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

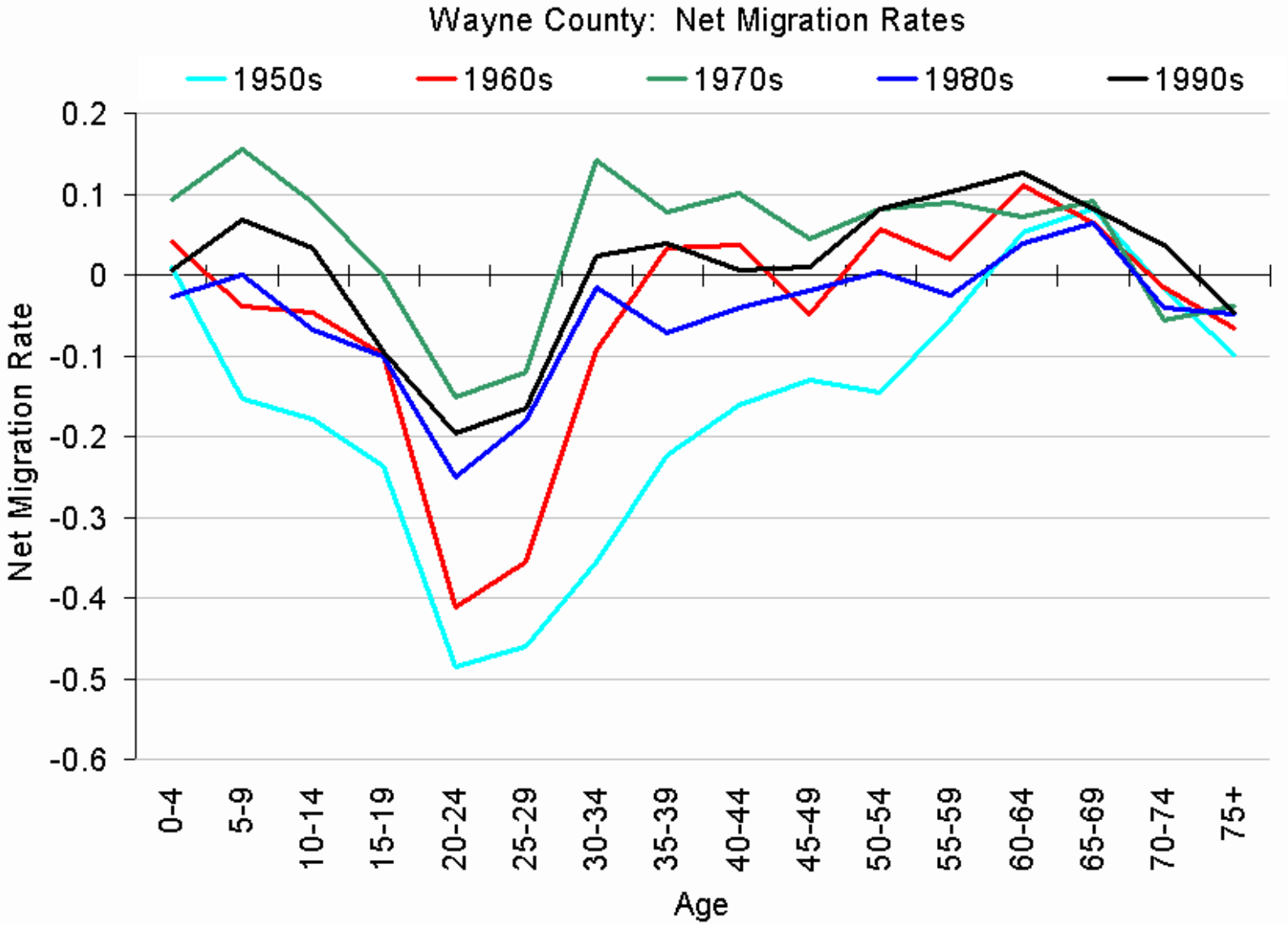

Tunica County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

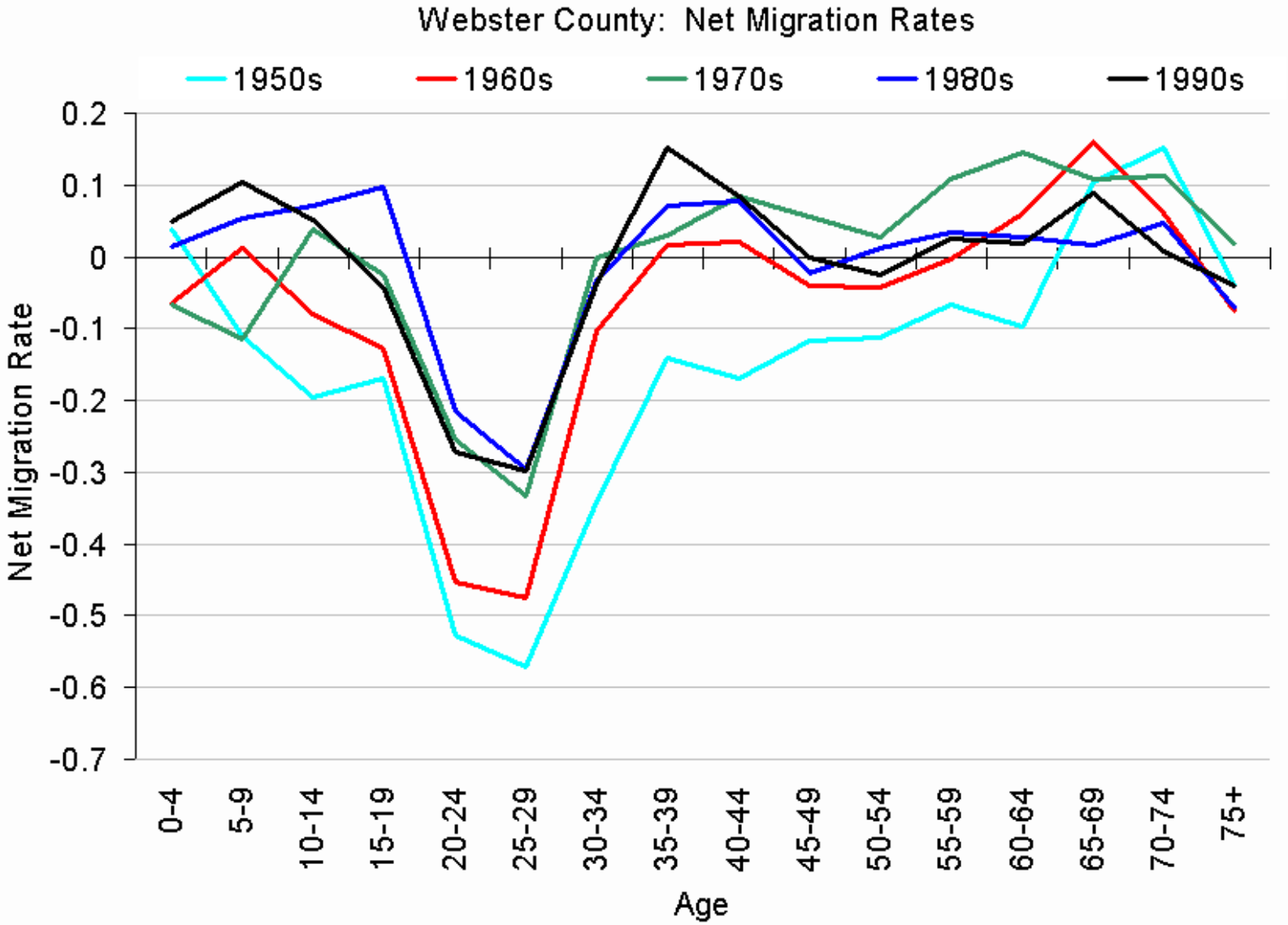

Union County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

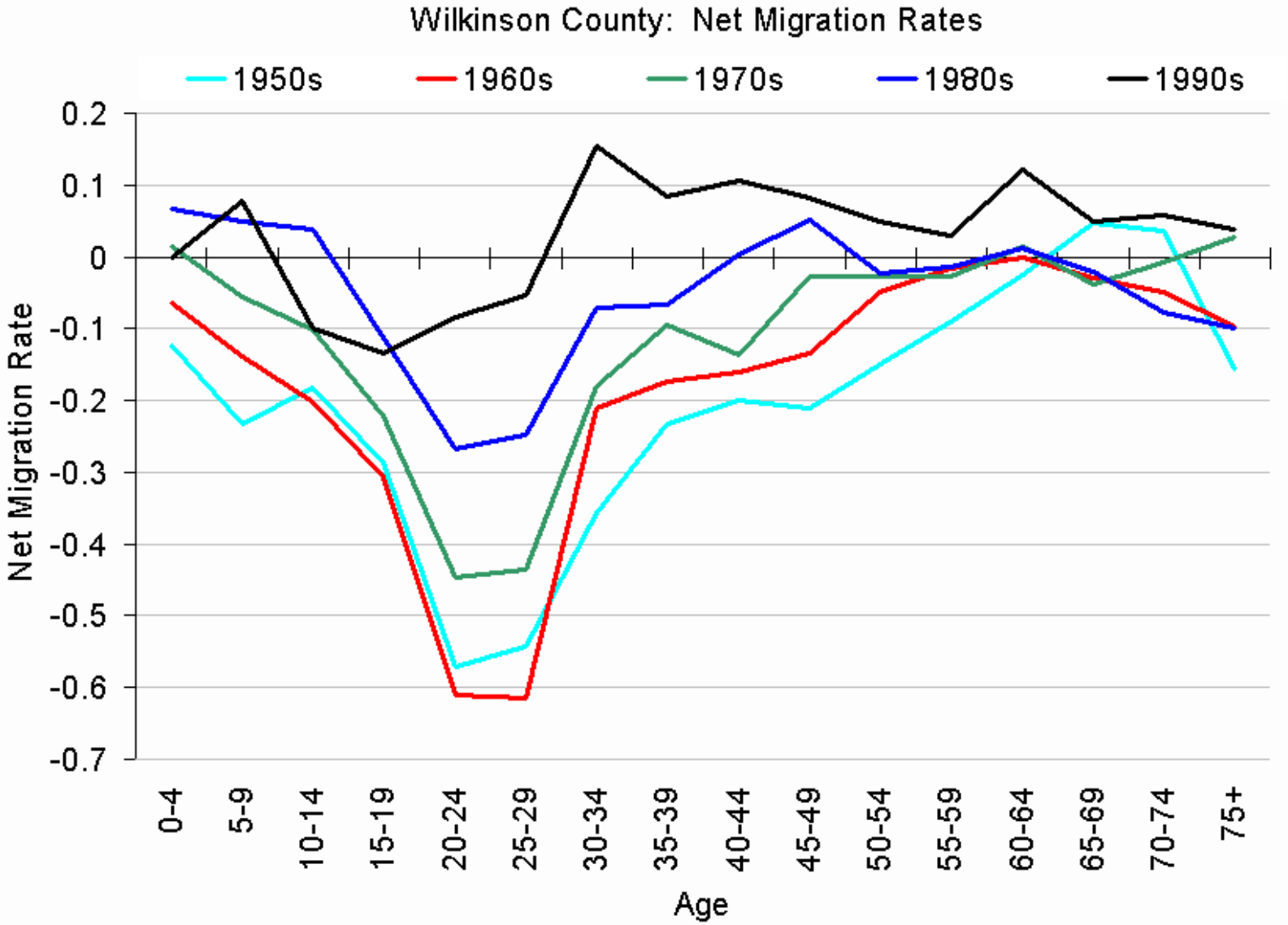

Walthall County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

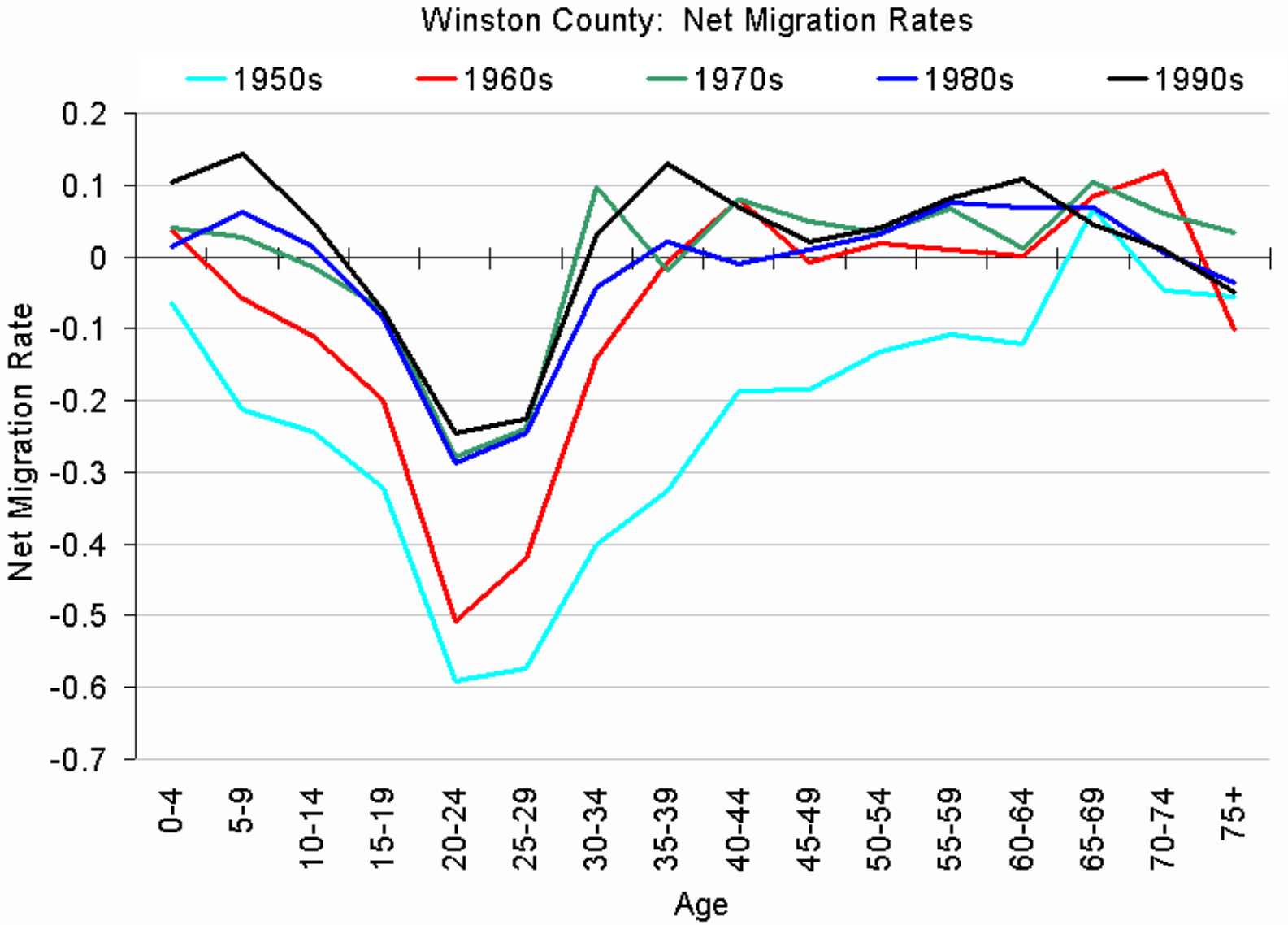

Warren County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

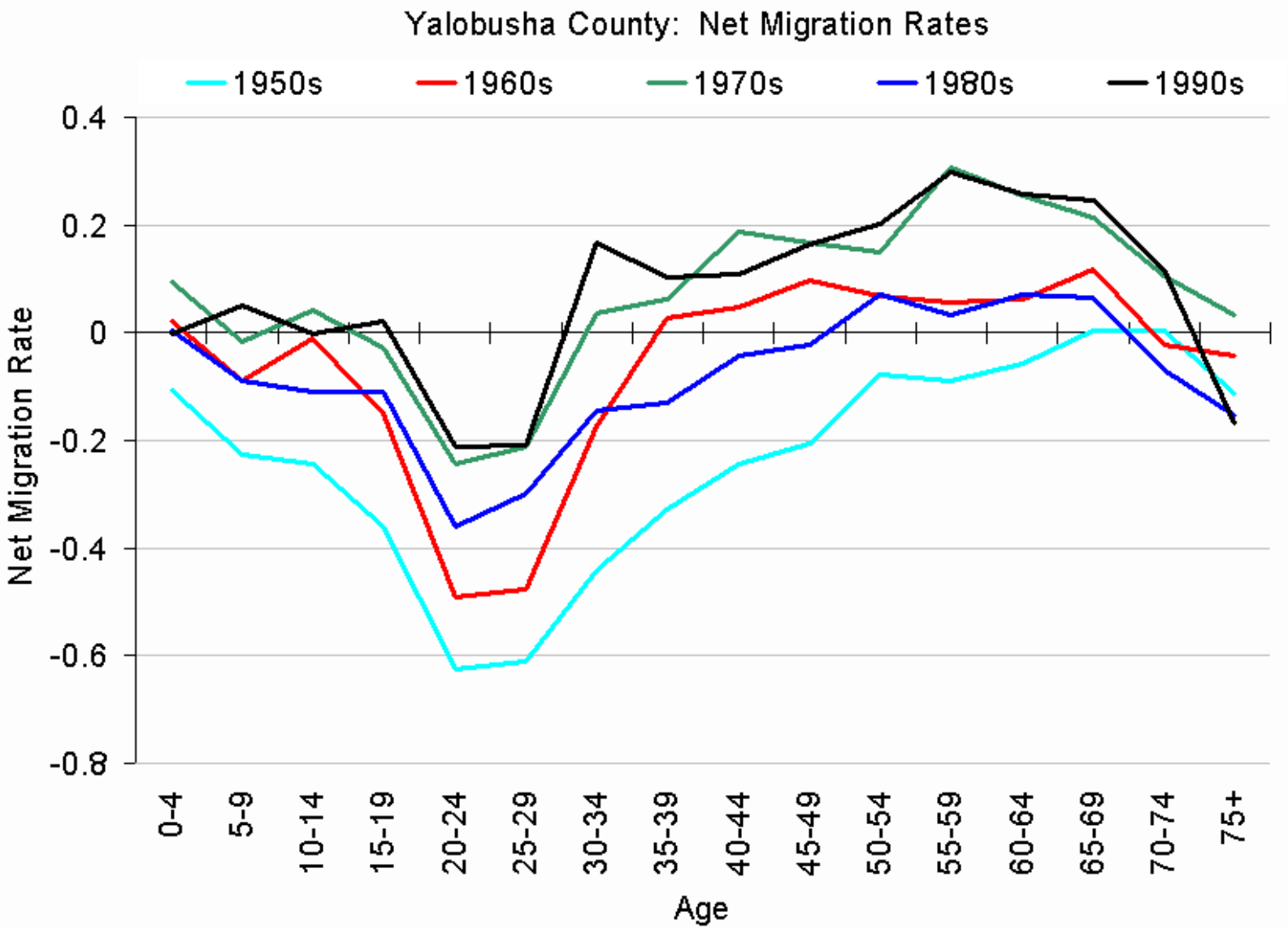

Washington County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

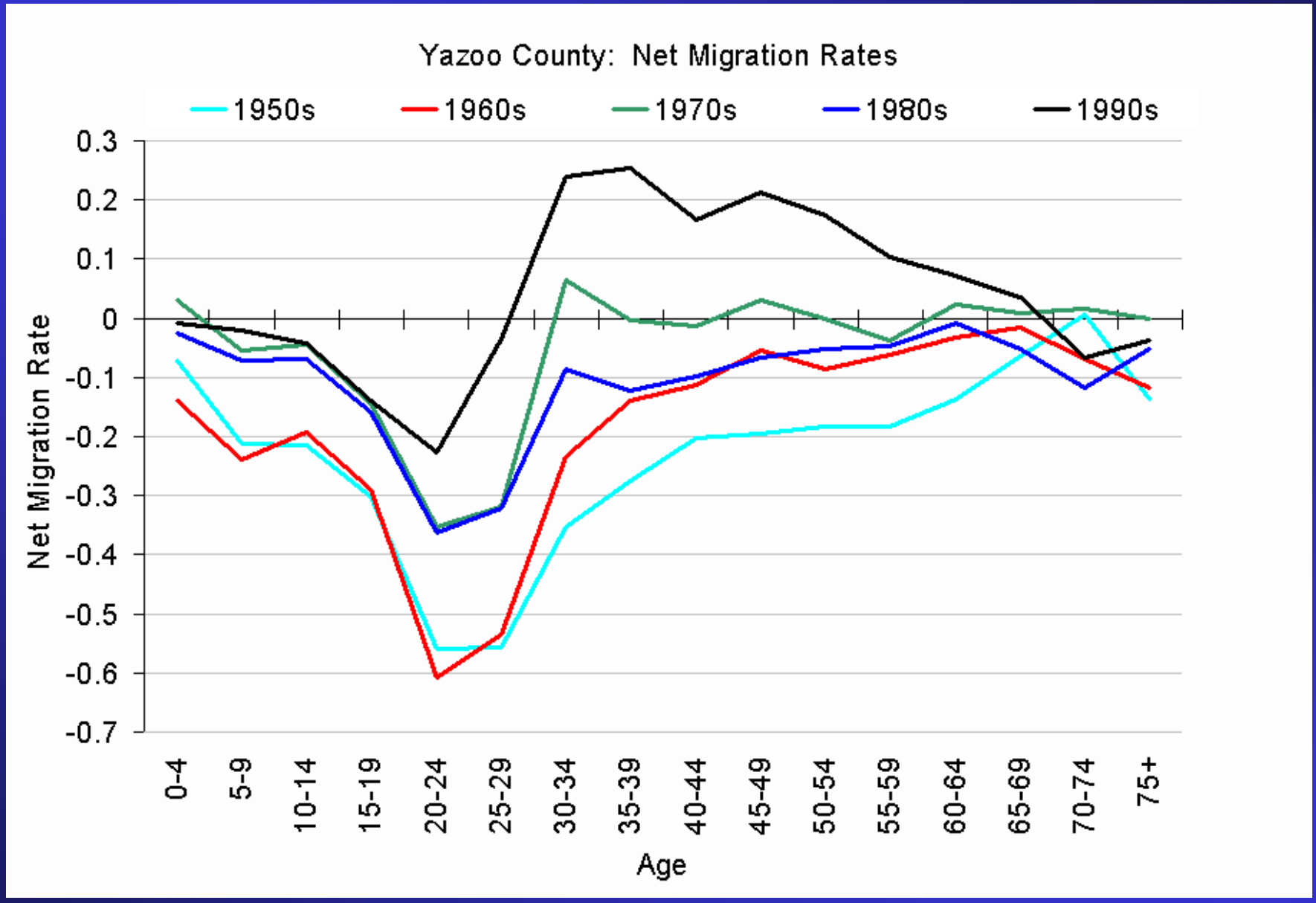

Wayne County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Webster County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Wilkinson County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Winston County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Yalobusha County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
Net Migration Rate
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age


Yazoo County: Net Migration Rates
1950s
1960s
1970s
1980s
1990s
Net Migration Rate
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+
Age

Our Methodology

- Derive (adjusted) 1990 base population
- Survive the 1990 base forward to get expected 2000 population
- Derive (adjusted) 2000 population
- Subtract expected 2000 population from 2000 adjusted population to get net migration (by sex, age, and race/ethnicity)

Deriving the 1990 base population

- Began with the Modified Age, Race and Sex (MARS) file.
- At the county level, controlled MARS data to the PES adjusted redistricting data.
- At the national level, controlled to Black and non-Black male and female totals, by age, using Census Bureau's most recent Demographic Analysis (DA) numbers.

Birth and death data details

- Data were taken from the Natality and Mortality detail files, 1990 to 1999, published by the National Center for Health Statistics (NCHS).
- Some states didn't record Hispanic origin on death certificates until the mid-90's. We imputed Hispanic origin for these deaths.
- Imputed a small number of other births and deaths unknown Hispanic origin.
- Used life table survival rates for final three age groups

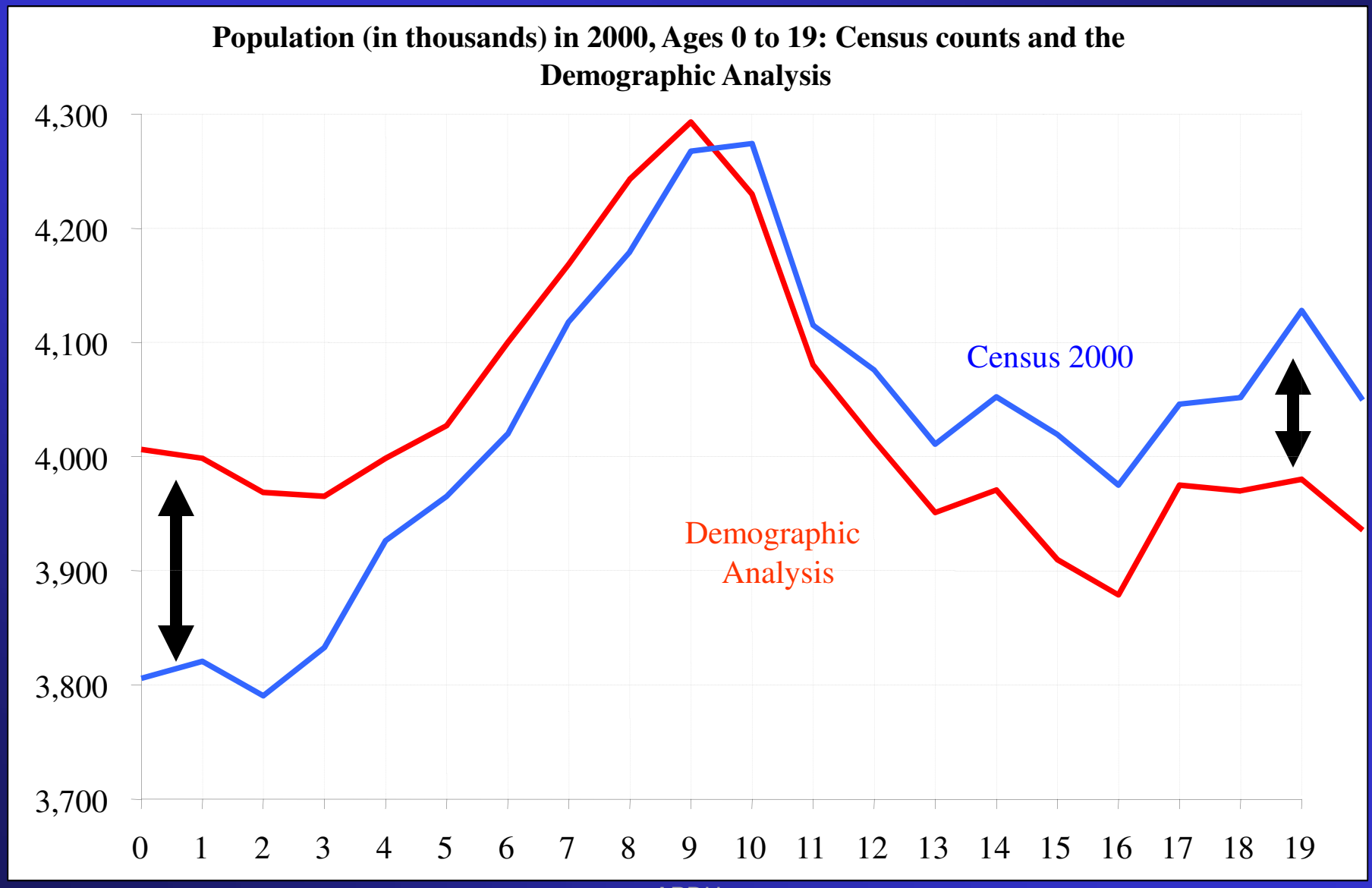
Deriving the 2000 population

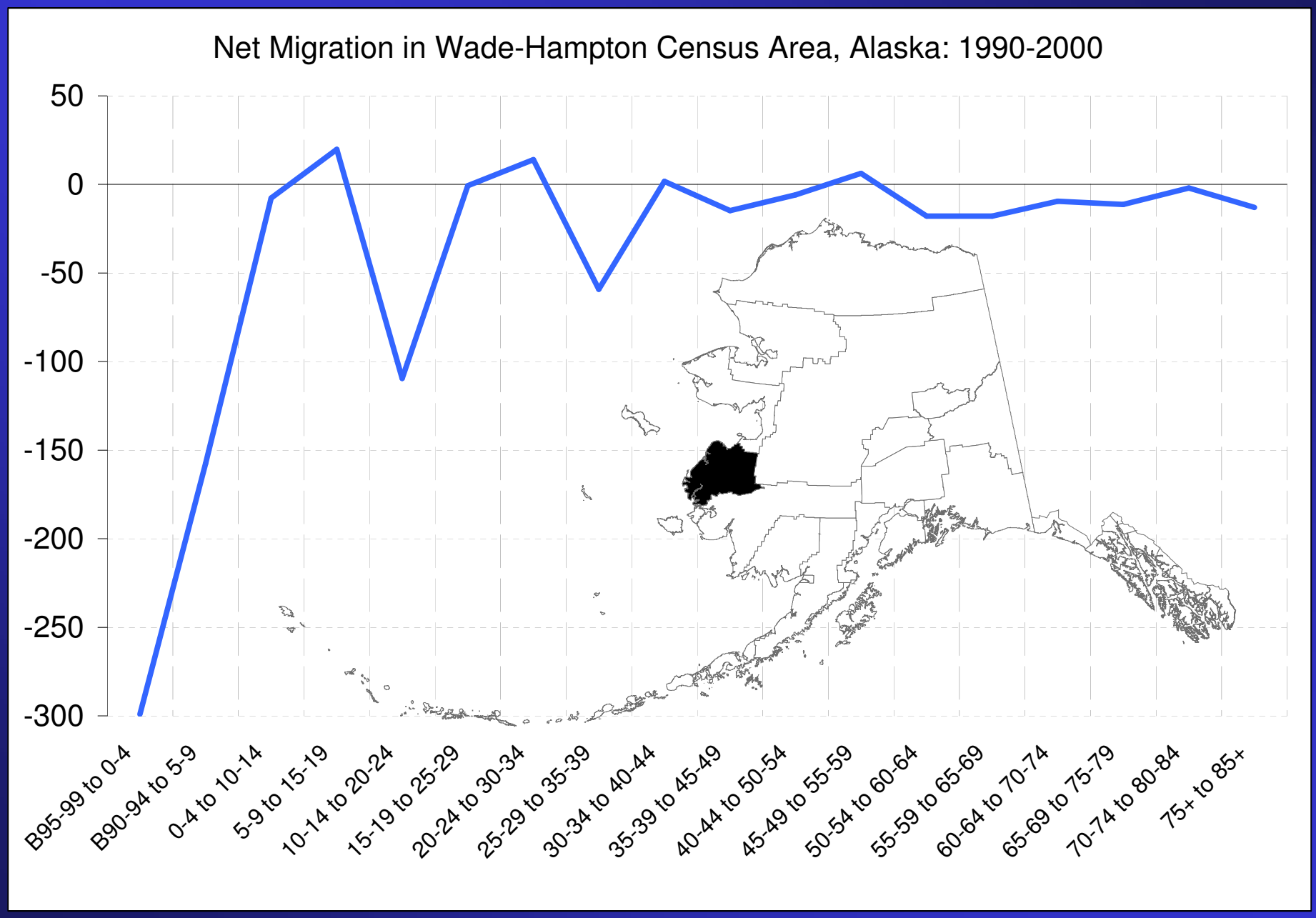
- Began with the Modified Race (MR) file.
- At the county level, controlled MR data to the ACE adjusted redistricting data.
- At the national level, controlled to Black and non-Black male and female totals, by age, using Census Bureau's most recent Demographic Analysis (DA) numbers.

For example: Children in the 2000 Census

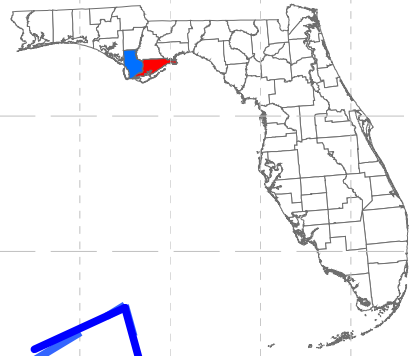
- Some data on younger members of large households were lost.
- Imputation of persons deep in the household roster was done without a good donor pool in large parts of the US.
- Result was under-imputation (under-enumeration) of young children and over-imputation (over-enumeration) of older children.
- For us, the signal that something was wrong was a large net out-migration from the US of kids 0-4.
- We may never know the "truth." DA suggests errors in one direction; ACE-REV-II suggests the opposite.

Census' undercount of children




Net Migration in Wade-Hampton Census Area, Alaska: 1990-2000
50
0
-50
-100
-150
-200
-250
-300
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65-69 to 75-79
70-74 to 80-84
75+ to 85+

Male Net Migration in Franklin and Gulf Counties, Florida: 1990-2000



Our release included

- Net migration (and expected and actual 2000 populations) for:
  - U.S. counties
  - By 5-year age groups, up to age 85+
  - By sex
  - By Race/Hispanic origin
    - Hispanics, Non-Hispanics
    - Whites: Total, Hispanic and Non-Hispanic
    - Black or African American
    - Asian and Pacific Island and Native Hawaiian
    - American Indian and Alaska Native

Availability

- When will these data be available?
  - This fall
- Where will these data be available?
  - ICPSR (Inter-university Consortium for Political and Social Research)
  - The data will most likely be publicly available from Applied Population Laboratory, University of Wisconsin-Madison

Some Further Notation

$$P_2 = P_1 - D_{P_1} + M_I - M_O - D_{M_I}$$

- Surviving Population

$$P_1^S = P_1 - D_{P_1} = SP_1 = \text{Expected } P_2$$

- Net Migration

$$NM = M_I - M_O = \text{Observed } P_2 - \text{Expected } P_2$$

- Use survival rates to find deaths to the starting population

$$D_{P_1} = (1 - S) \cdot P_1$$

Two Formulas for Net Migration

- The first employs life tables to find deaths:

$$NM = P_2 - (P_1 - (1 - S) \cdot P_1 - D_{M_I}),$$

or, simplified,

$$NM = P_2 - (S \cdot P_1 - D_{M_I})$$

- The second counts deaths directly:

$$NM = P_2 - (P_1 - D)$$

Enumerated Deaths

Total deaths (D), the sum of deaths to the beginning population and deaths to in-migrants, can be counted directly.

$$D = D_{P_1} + D_{M_I}$$

Error in Net Migration Estimates

- Estimates of net migration do not necessarily match the reality of true net migration, even when we've taken care of deaths to migrants.

- Each component in the balancing equation is actually an estimate and an associated error term.

$$P_1^T = P_1^E + \varepsilon_{P_1}$$

$$P_2^T = P_2^E + \varepsilon_{P_2}$$

$$S^T = S^E + \varepsilon_S$$

$$D_{M_I}^T = D_{M_I}^E + \varepsilon_{D_{M_I}}$$

$$D^T = D^E + \varepsilon_D$$

As an illustration, take estimated net migration using enumerated deaths

$$NM^T = P_2^T - \left(P_1^T - D^T\right)$$

$$NM^T = \left(P_2^E + \varepsilon_{P_2}\right) - \left(\left(P_1^E + \varepsilon_{P_1}\right) - \left(D^E + \varepsilon_D\right)\right)$$

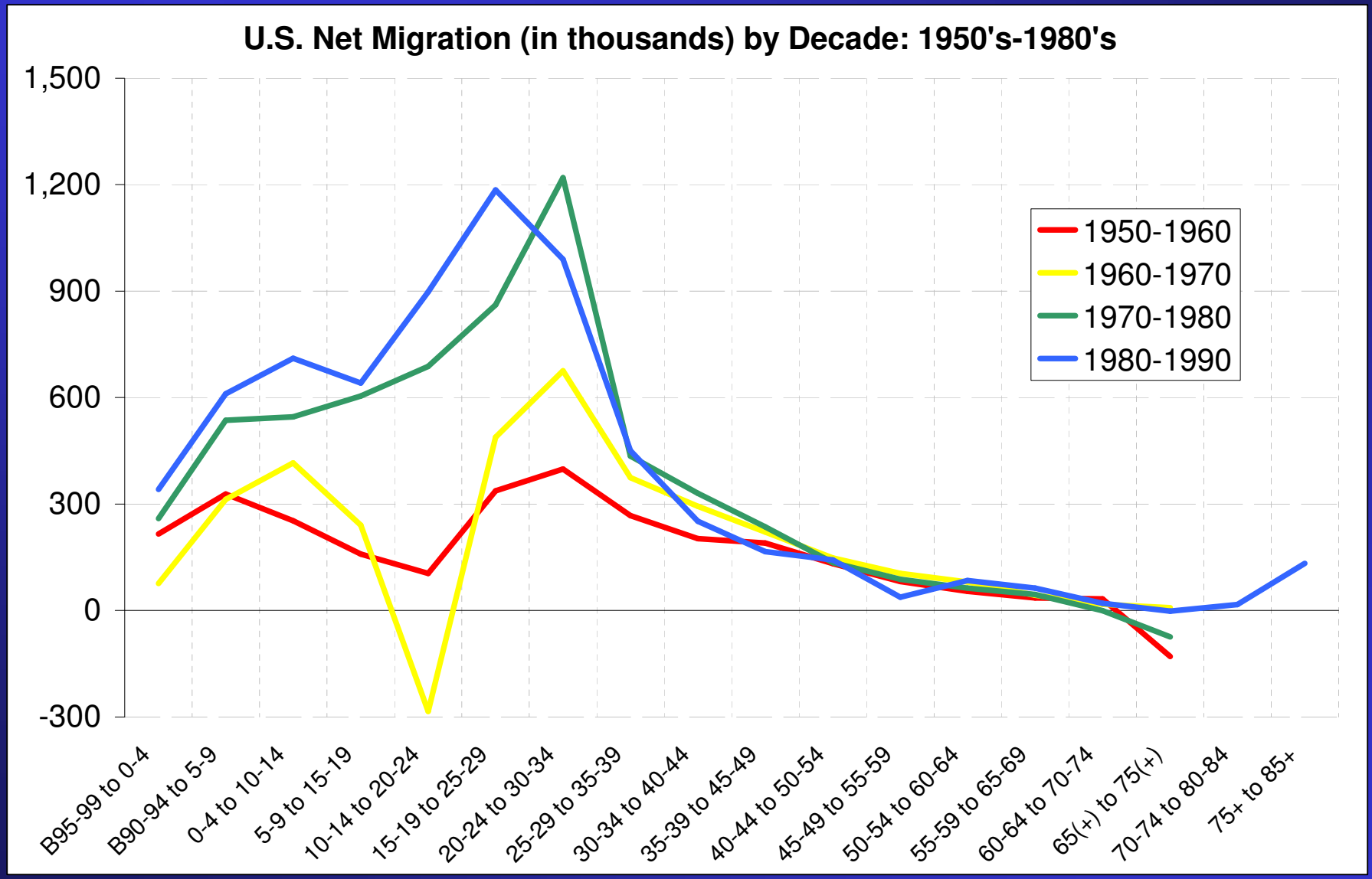
$$NM^T = P_2^E - P_1^E + D^E + \xi$$

True net migration is a function of our estimate of net migration plus a somewhat complex error term

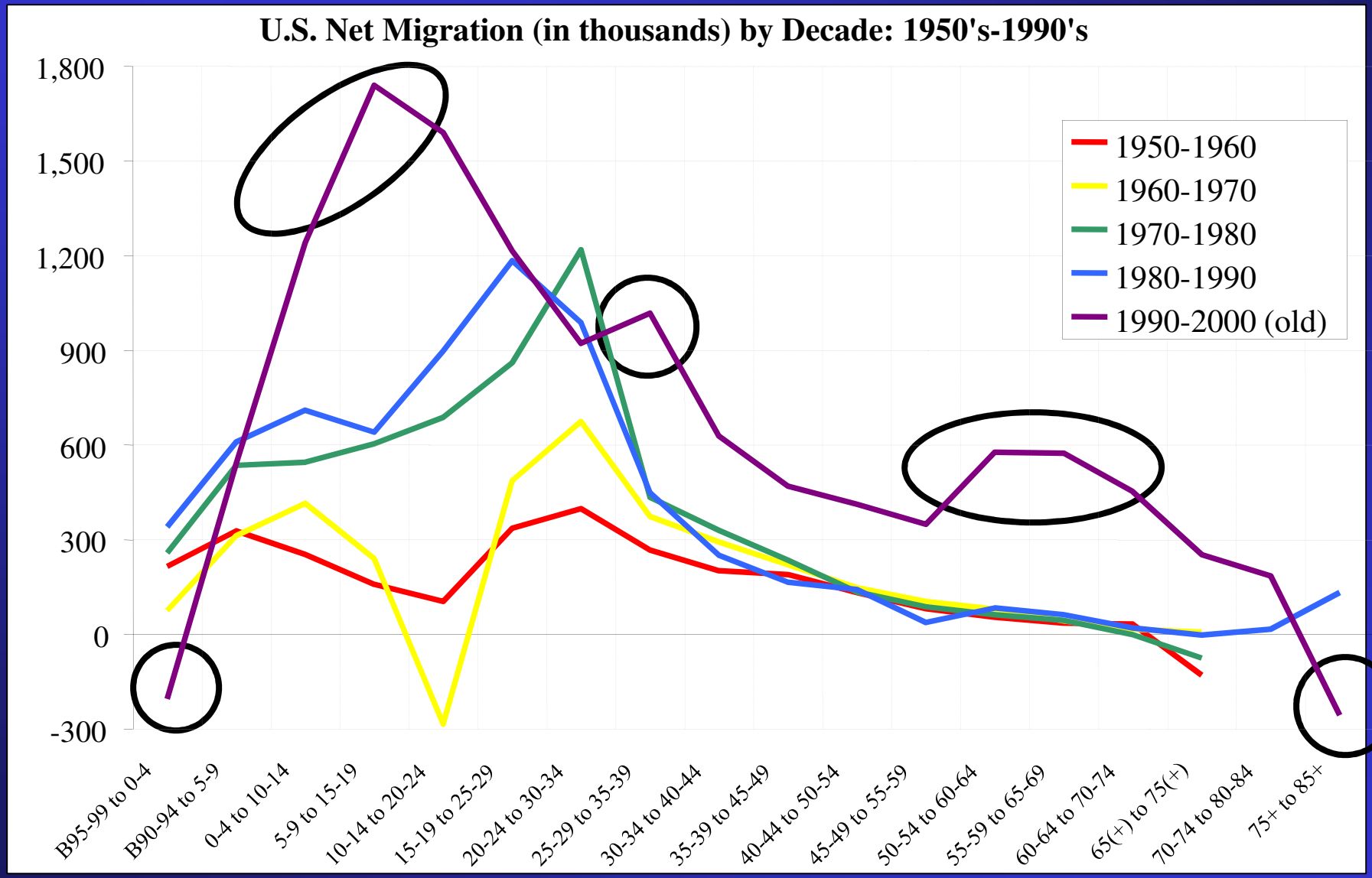
Our initial method was different from our current method:

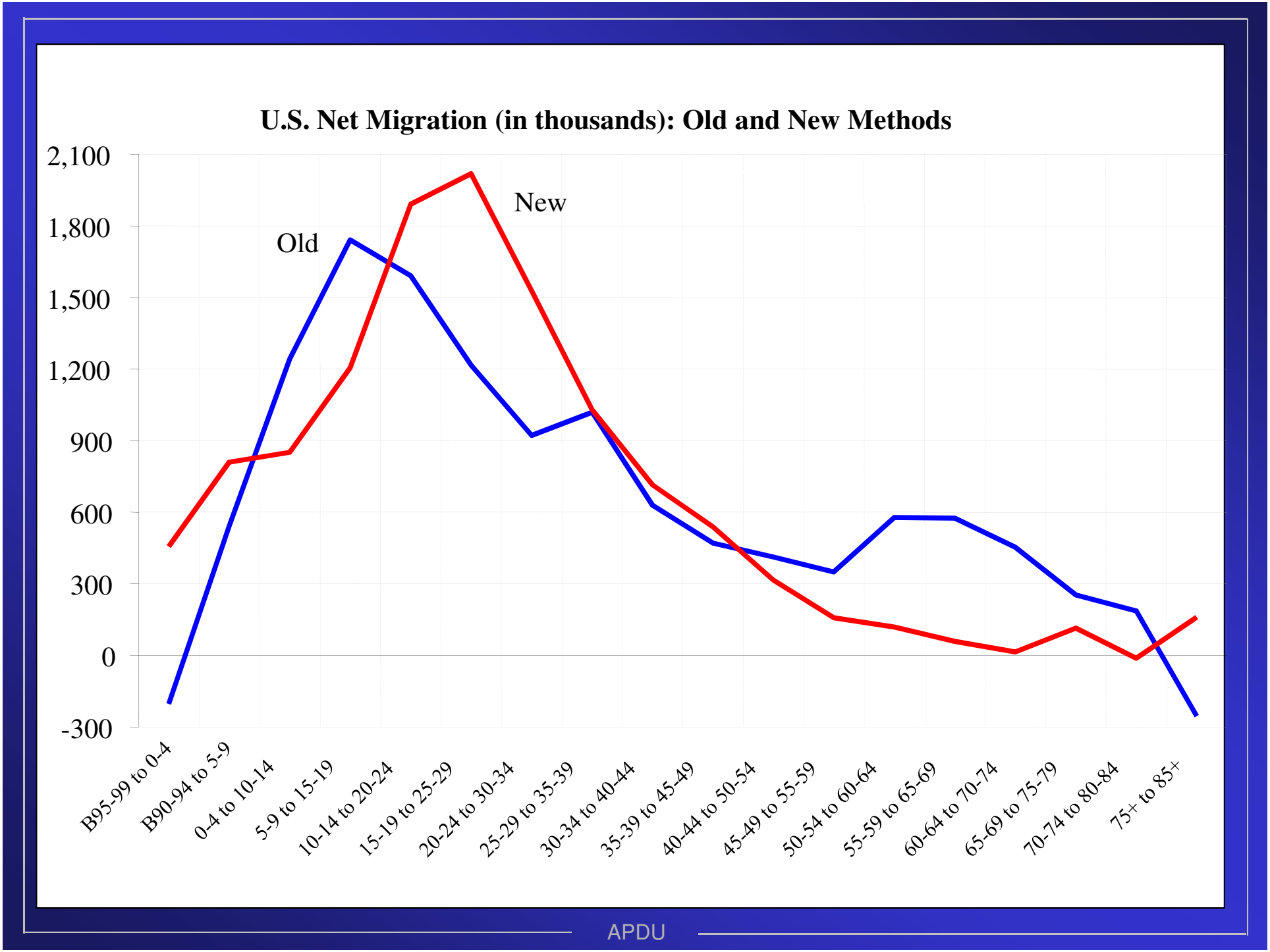
- 1990 Population
  - Adjusted MARS using Post-Enumeration Survey (PES) data and the State Net Population Matrix (NPAM).
  - Census Bureau recommended this method.
- 2000 Population
  - At the time, the Modified Race (MR) and ACE revisions had not yet been released. Instead, we used Summary File 1 data.

National-level net migration

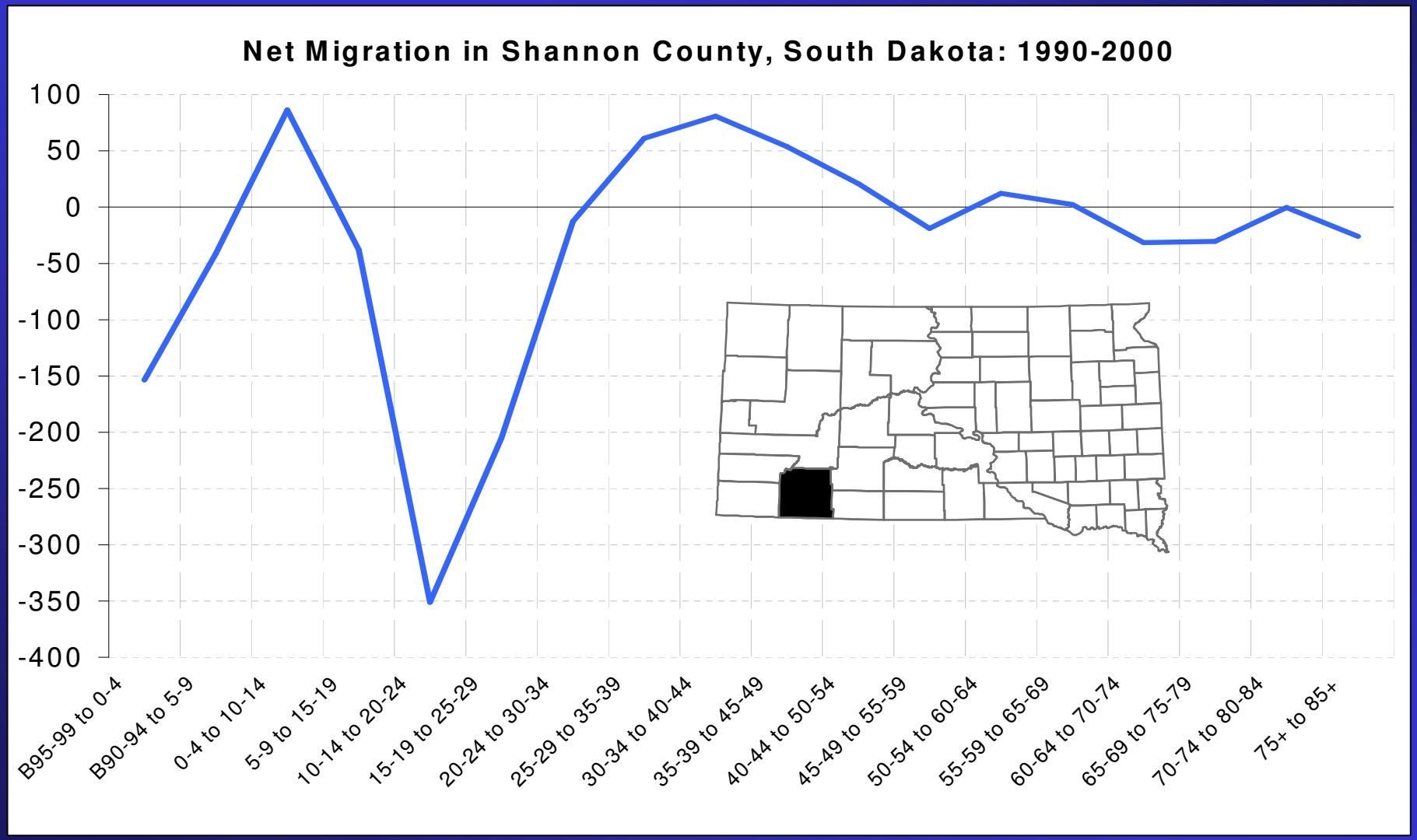


Add the 1990 – 2000 data

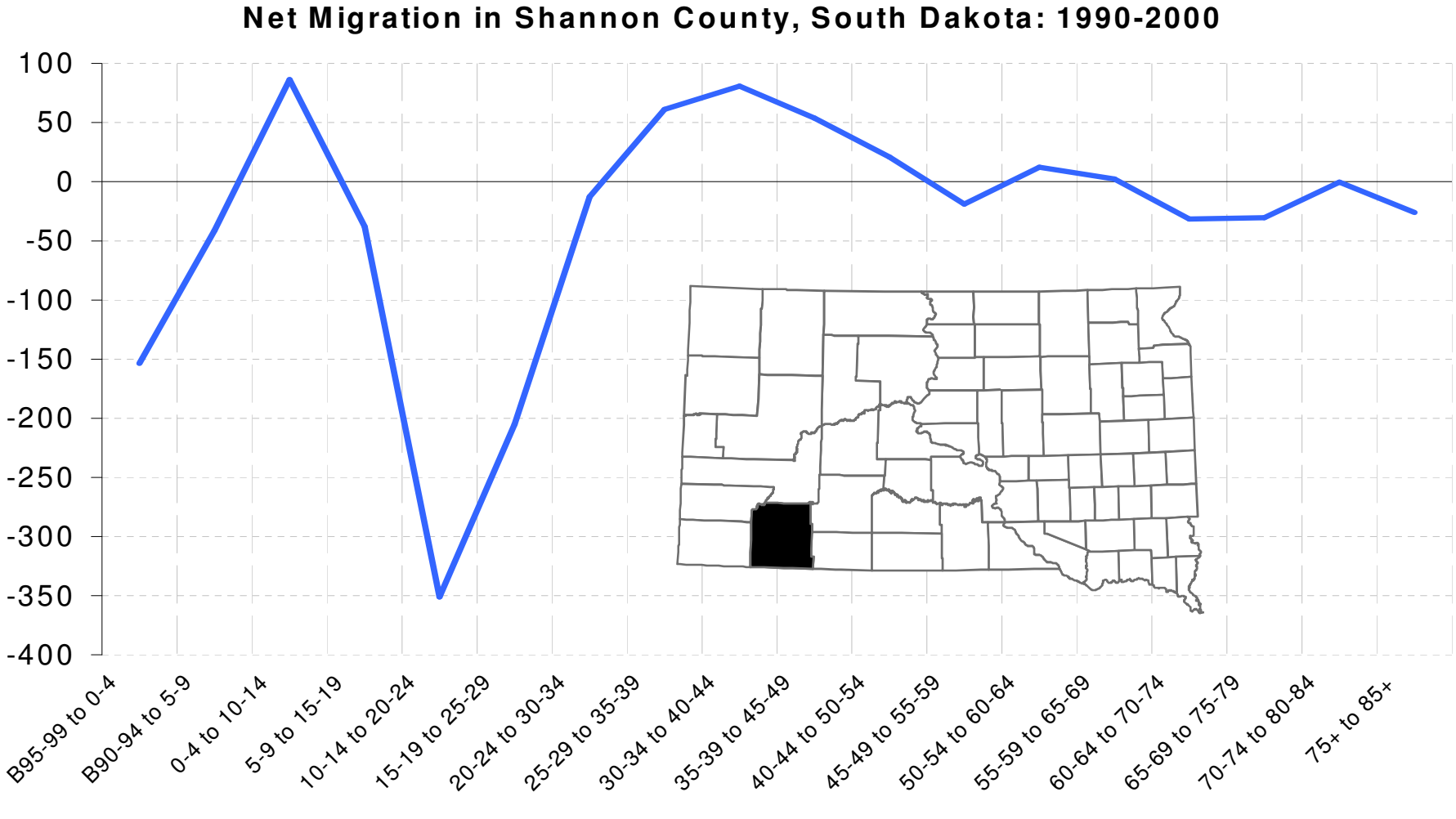


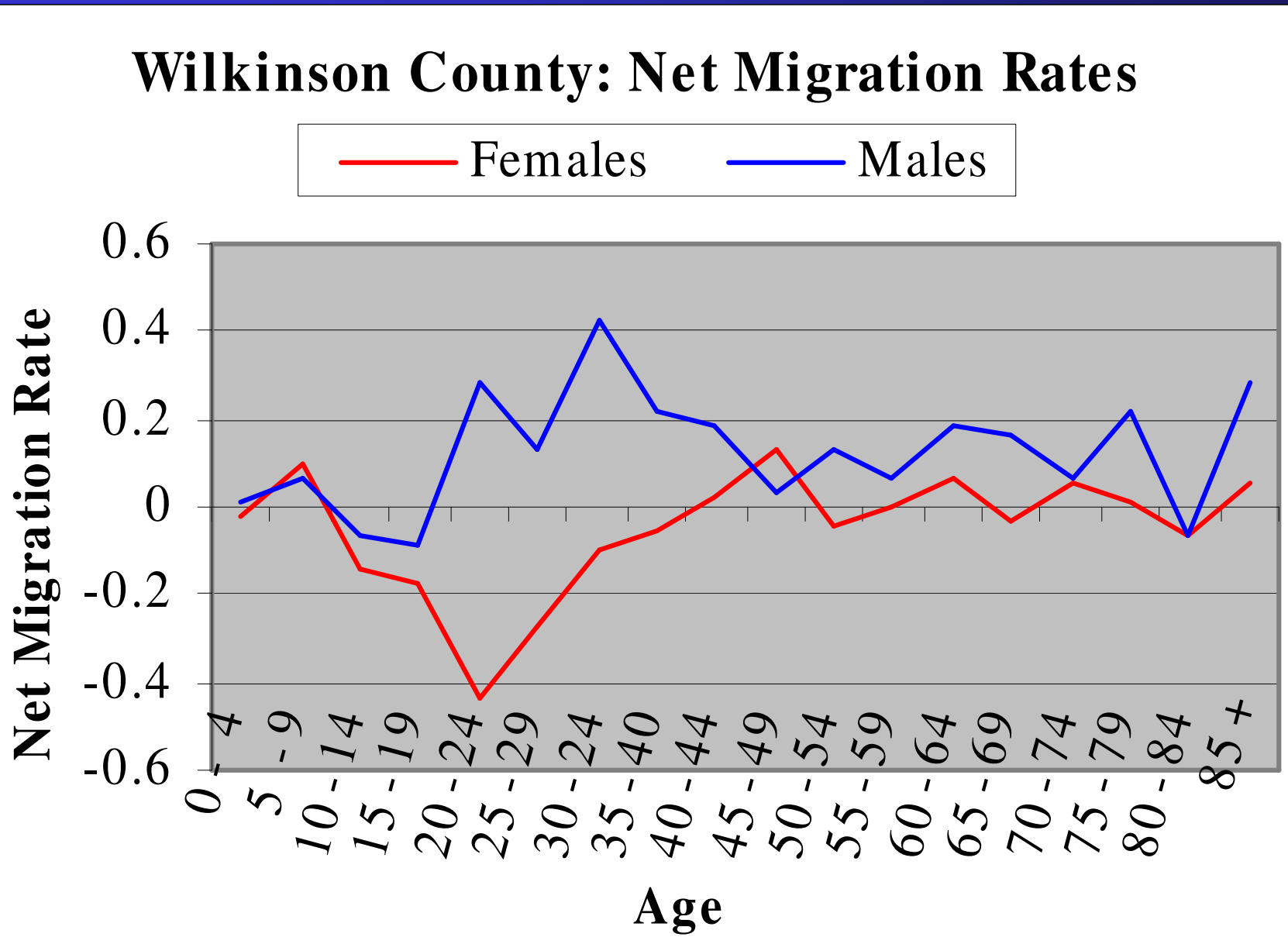

U.S. Net Migration (in thousands): Old and New Methods
2,100
1,800
1,500
1,200
900
600
300
0
-300
New
Old
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65-69 to 75-79
70-74 to 80-84
75+ to 85+

Shannon County's population increased by 26% in the 1990's

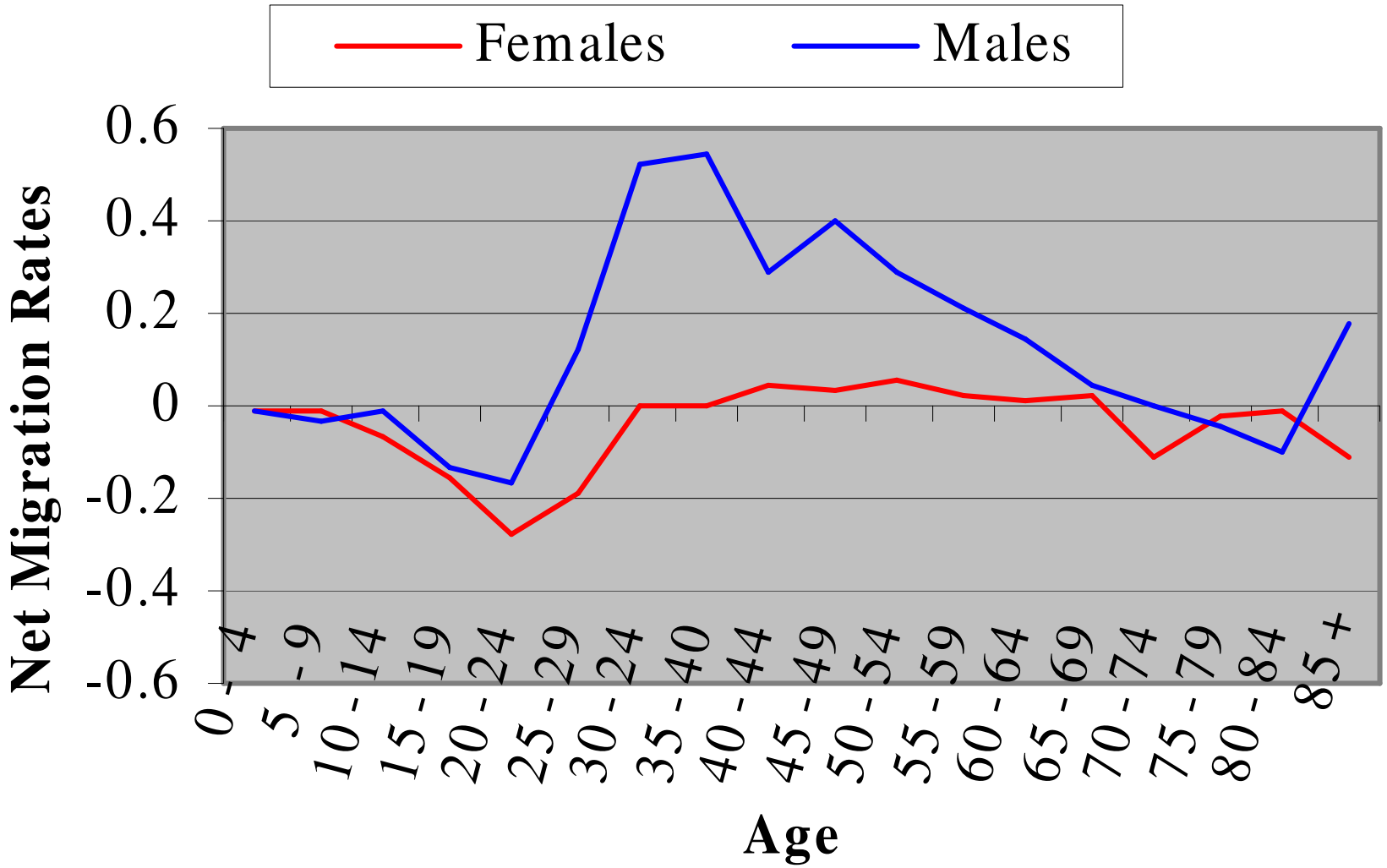


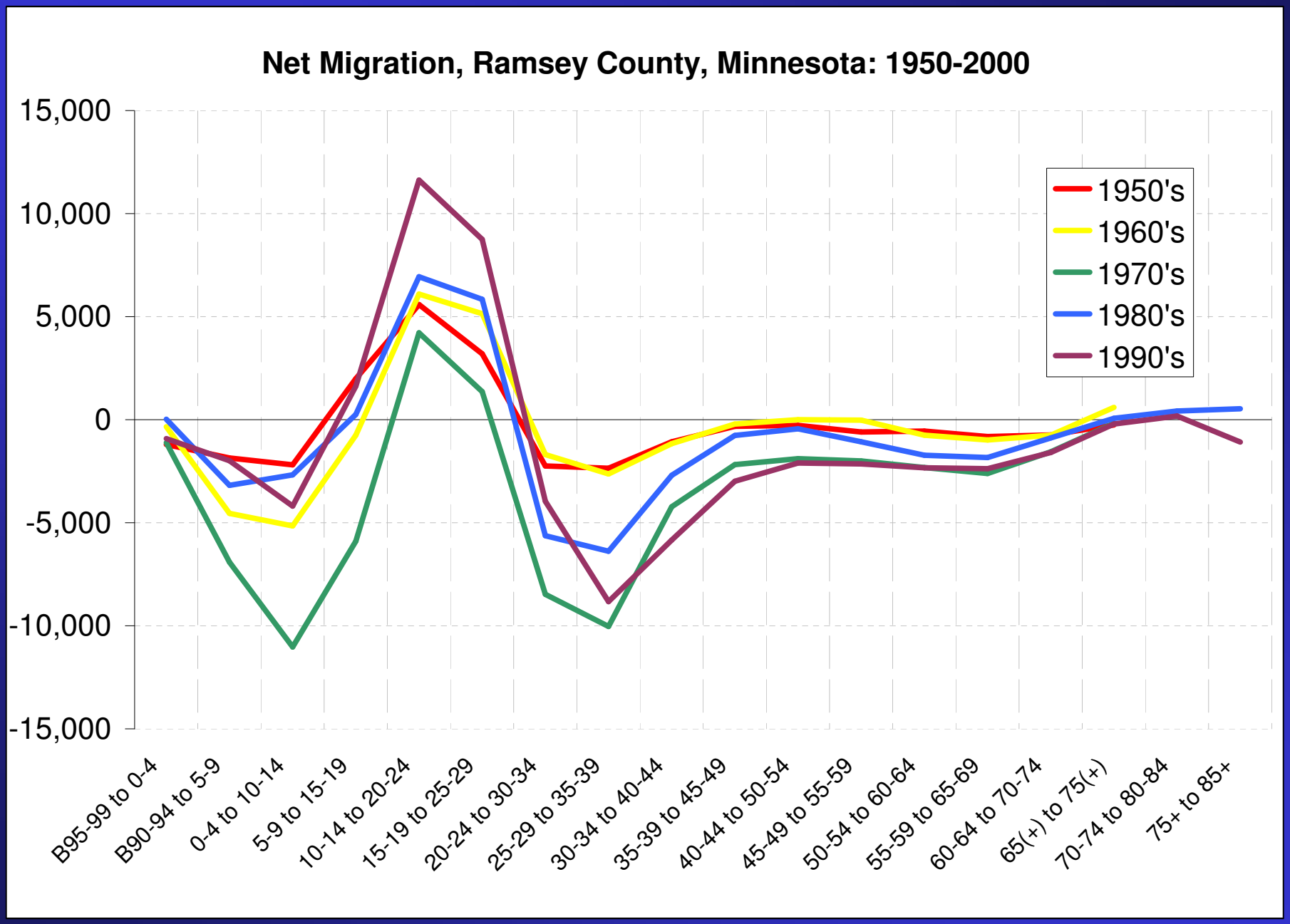
Shannon County's population increased by 26% in the 1990's




Wilkinson County: Net Migration Rates
Females
Males
Net Migration Rate
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0 - 4
5 - 9
10 - 14
15 - 19
20 - 24
25 - 29
30 - 24
35 - 40
40 - 44
45 - 49
50 - 54
55 - 59
60 - 64
65 - 69
70 - 74
75 - 79
80 - 84
85 +
Age

Yazoo County: Net Migration Rates



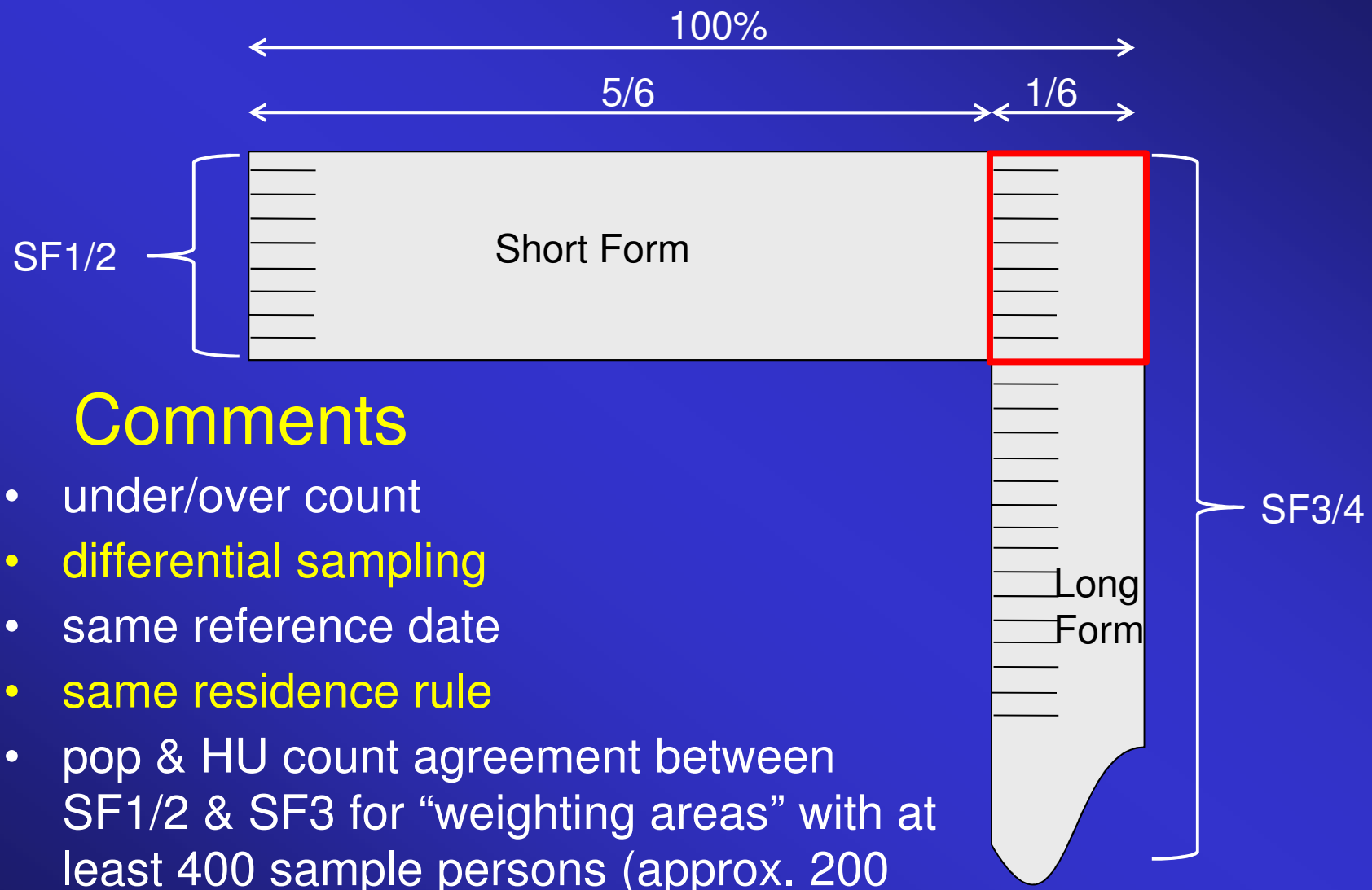

Net Migration, Ramsey County, Minnesota: 1950-2000
15,000
10,000
5,000
0
-5,000
-10,000
-15,000
1950's
1960's
1970's
1980's
1990's
B95-99 to 0-4
B90-94 to 5-9
0-4 to 10-14
5-9 to 15-19
10-14 to 20-24
15-19 to 25-29
20-24 to 30-34
25-29 to 35-39
30-34 to 40-44
35-39 to 45-49
40-44 to 50-54
45-49 to 55-59
50-54 to 60-64
55-59 to 65-69
60-64 to 70-74
65(+) to 75(+)
70-74 to 80-84
75+ to 85+

Measuring Social & Economic Change in the 21st Century

Paul Voss
UNC Chapel Hill
4/23/10

- Many of the old rules have changed
- In particular, lost is the strong link between the decennial census & the survey for gathering social, economic & housing change

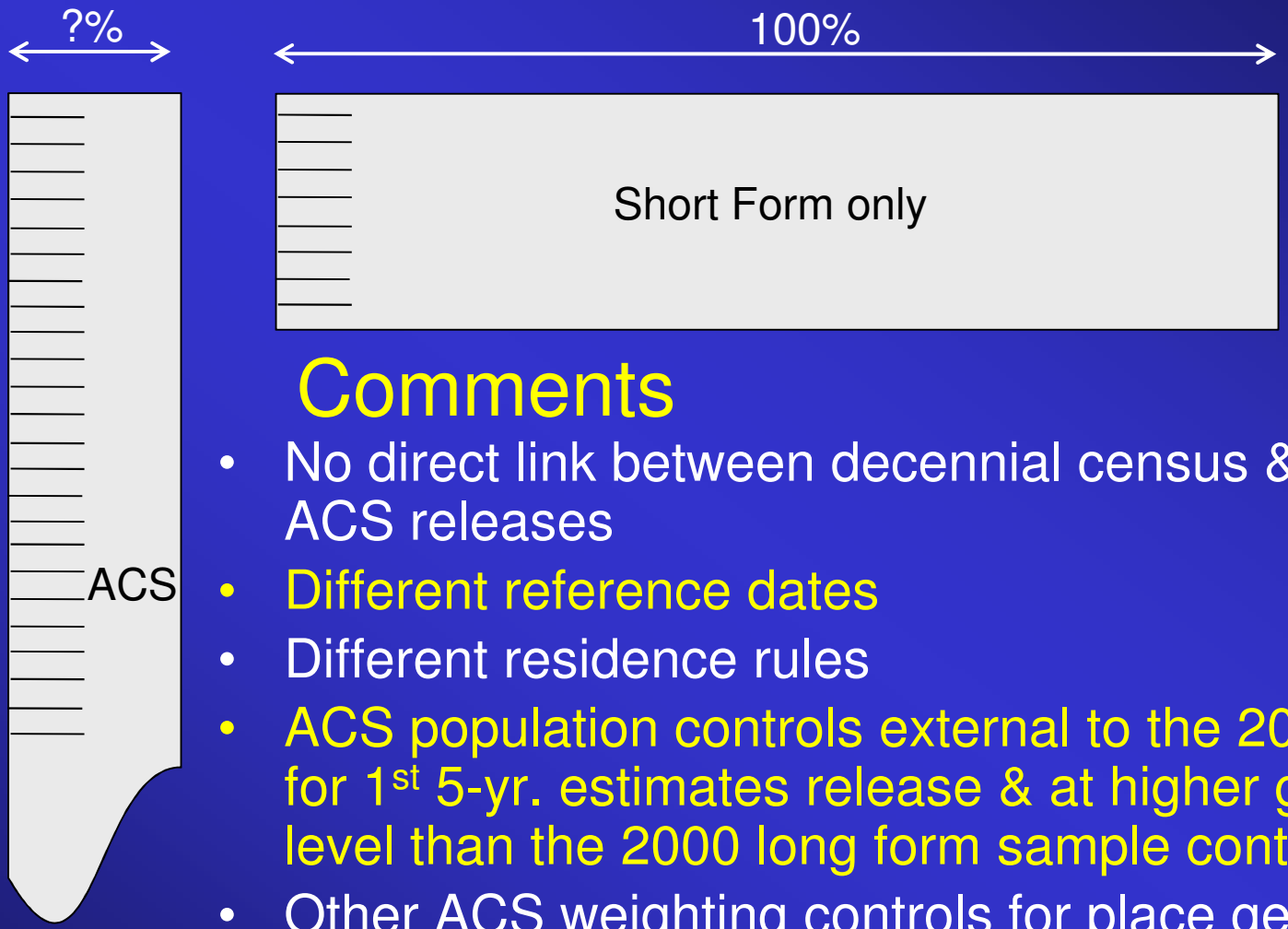
Recent censuses…



Comments

- under/over count
- differential sampling
- same reference date
- same residence rule
- pop & HU count agreement between SF1/2 & SF3 for “weighting areas” with at least 400 sample persons (approx. 200 completed long forms)

2010 Census



Comments

- No direct link between decennial census & early ACS releases
- Different reference dates
- Different residence rules
- ACS population controls external to the 2010 census for 1st 5-yr. estimates release & at higher geographic level than the 2000 long form sample controls
- Other ACS weighting controls for place geography presently under consideration?
- 1st 5-yr. ACS estimates for different geography (2000-plus) than 2010 Census

Implications & Cautions

- Practice of measuring population change in clean decennial chunks will likely change
  - Reference date for 2005-09 5-yr. ACS estimates approximately July 1, 2007
- The end-of-period (ACS) data make more difficult comparisons that once were easy & straight forward
  - Residence rules for ACS will require imaginative ways of thinking about & comparing data to the past
  - Analyses involving county data (or lower in the geographic hierarchy) should use the 5-yr. ACS estimates
  - For now, end-of-period data are a bit fuzzier; in future, both beginning & end point data more fuzzy

Migration data & the ACS

- Fresh opportunities
  - ACS, CPS & IRS migration data – all 1-yr. reference period
  - Benefit from continuous monitoring; migration data no longer available just for 2nd half of decade; time-series opportunities; timeliness
  - Upside: fewer return & repeat moves go unreported
- Possible Downside
  - Migration is a rare event. Much smaller sample of migrants than provided by the 5-yr. reference period; higher levels of uncertainty in flow estimates

Migration data & the ACS

- Questions
  - Reference date is now a moving target (different for different monthly samples). Does this matter? Why? How?
  - Will the ACS residence rule add additional noise to the data arising from – for instance – seasonality issues?
  - How does one construct migration rates when numerator is a rolling sample number?
  - Special migration data file from ACS? Every year? Highly unlikely. We've lost some things despite the potential gain of more frequent & more timely data? With smaller sample & short migration reference interval, we've probably lost forever a county-county migration flow file