

On the Move

Changing Mechanisms of Mexico-U.S. Migration



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Cornell University

There are 12 million Mexican-born in the United States, about half of them are undocumented.

Who are these migrants? What brings them here?

Many theories, from multiple disciplines, speak to these questions.

Neoclassical economics:

Individuals migrate to maximize earnings.

New economics of labor migration:

Families send migrants to diversify risks to earnings.

Cumulative causation:

Individuals follow former migrants in family or community.

These theories are not mutually exclusive.

Empirical work fails to capture causal heterogeneity.

Most studies characterize the average case and select a theory that best accounts for that case.

This study considers the following:

Individuals might migrate for different reasons.

Different theories might apply to different groups or under different circumstances.

How do we capture the heterogeneity in migration behavior?

Strategy

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1. Fix the outcome and study only the migrants.
2. Search for different groups among migrants. Groups are defined by shared configurations of attributes. Assumption: Individuals with similar attributes face similar opportunity structures.
3. Study the conditions that set apart each group from the other groups as well as non-migrants.

Who migrates?

When?

Why?

Data

Mexican Migration Project (MMP) surveyed about 200 randomly-selected households in 143 Mexican communities from 24 states between 1982 and 2013.

Our sample contains 19,243 migrants observed during their first U.S. trip between 1965 and 2010.

Method: Cluster analysis

Discovers groups with similar attributes in data

Method: Cluster analysis

How it works:

1. Choose and scale the relevant attributes

Method: Cluster analysis

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2. Choose an algorithm: K-means

Method: Cluster analysis

How it works:

1. Choose and scale the relevant attributes
2. Choose an algorithm: K-means
3. Choose a similarity measure: City-block distance

$$d_{ij} = \sum_{k=1}^p |x_{ik} - x_{jk}|$$

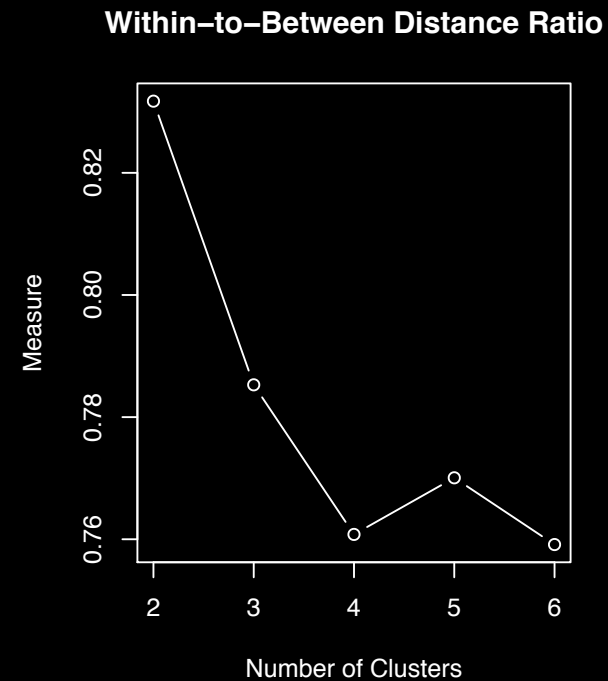
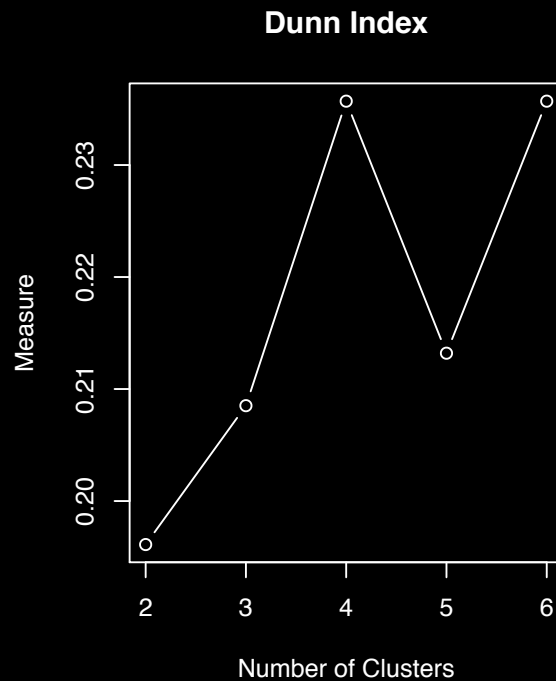
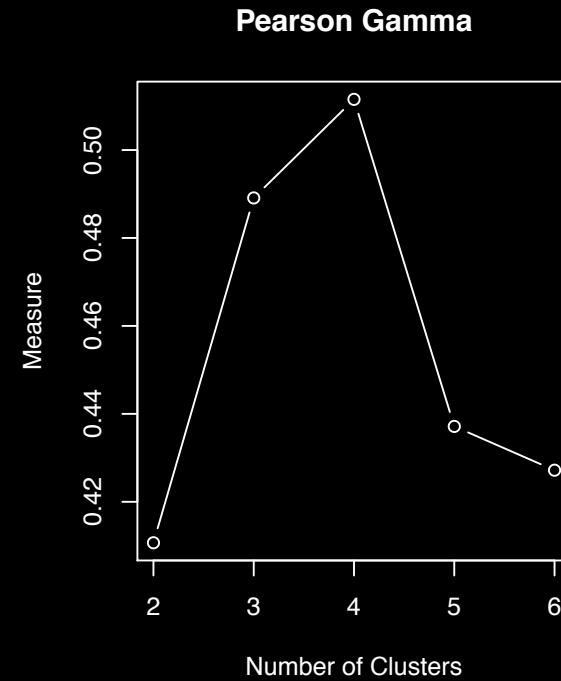
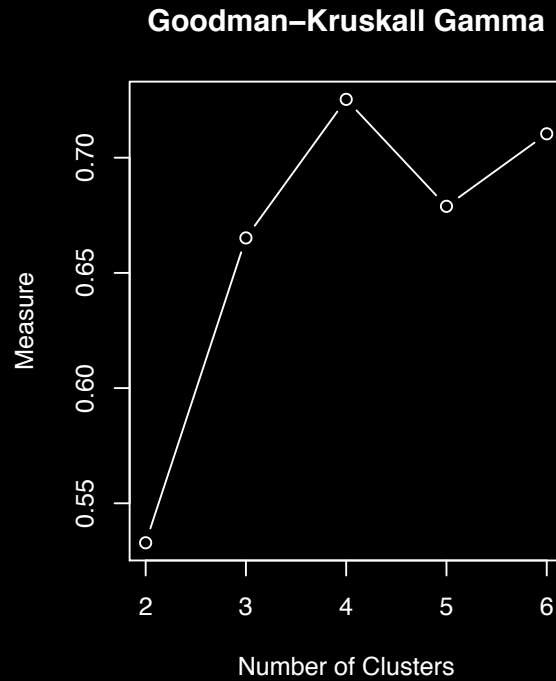
d_{ij}	distance between individuals i and j
x_{ik}	value of attribute k for individual i
p	number of attributes

Method: Cluster analysis

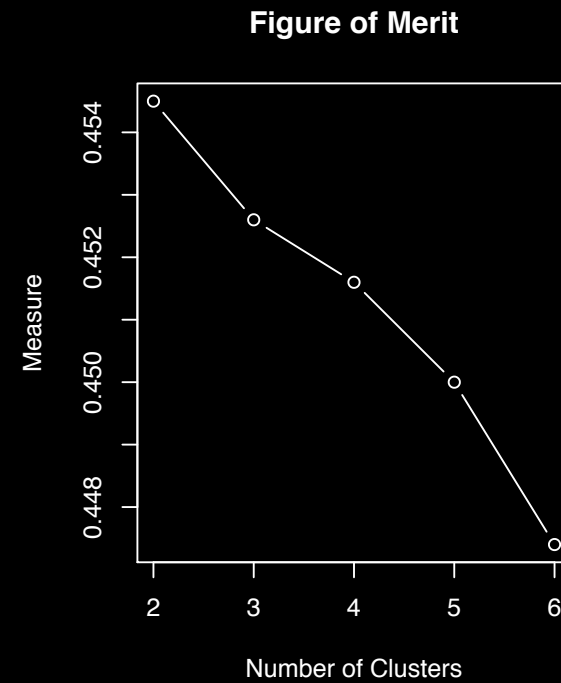
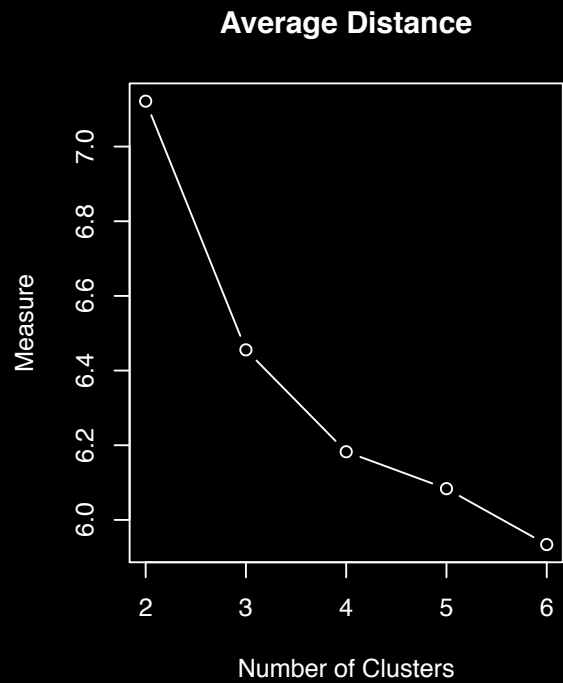
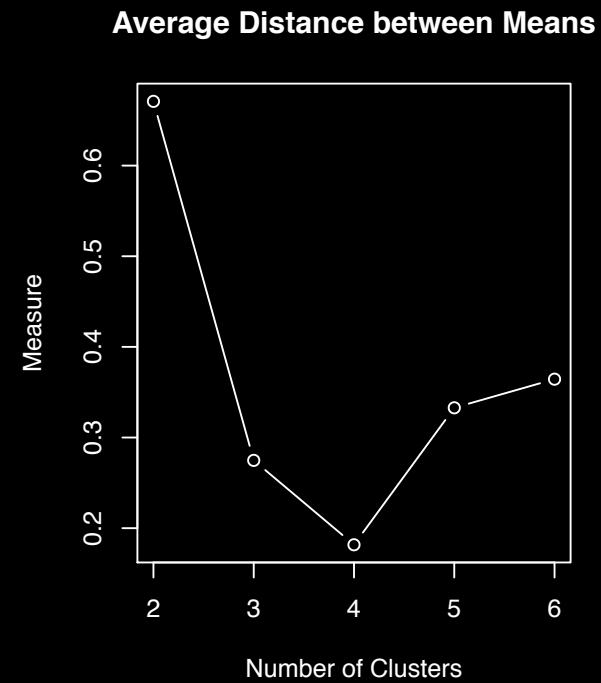
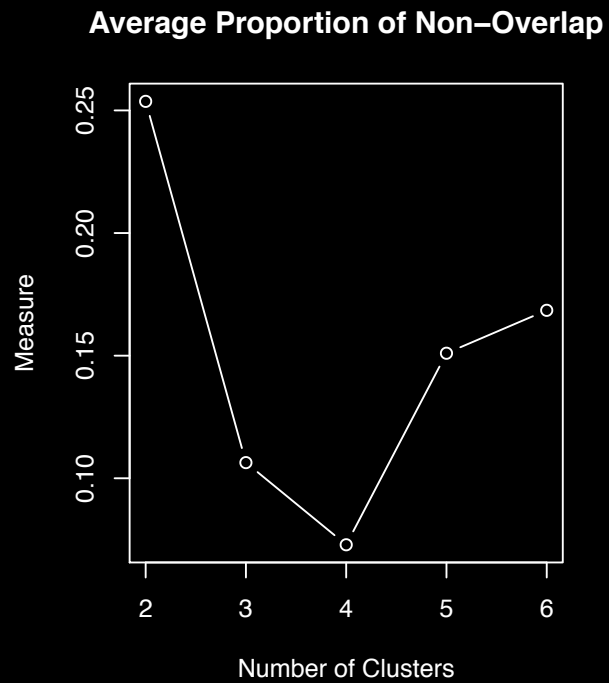
How it works:

1. Choose and scale the relevant attributes
2. Choose an algorithm: K-means
3. Choose a similarity measure: City-block distance
4. Determine K, the number of clusters, using cluster validation measures

Cluster validation measures



Cluster stability measures



Who migrates?

When?

Why?

Cluster 1

Man

No education

No assets

Rural community

Central-west

Cluster 1

- Man
- No education
- No assets
- Rural community
- Central-west

FROM PARTIAL DATA

- Household head
- Married
- Frequent trips
- Sends remittances
- Returns to Mexico

Cluster 1

- Man
- No education
- No assets
- Rural community
- Central-west

FROM PARTIAL DATA

- Household head
- Married
- Frequent trips
- Sends remittances
- Returns to Mexico

CIRCULAR
MIGRANTS

Cluster 2

Man

Primary education

Owns land/business

Poor community

Central-west

Cluster 2

Man

Primary education

Owns land/business

Poor community

Central-west

FROM PARTIAL DATA

Younger son

Single

Sends remittances

Returns to Mexico

Cluster 2

Man

Primary education

Owns land/business

Poor community

Central-west

FROM PARTIAL DATA

Younger son

Single

Sends remittances

Returns to Mexico

CRISIS

MIGRANTS

Cluster 3

Woman

Primary education

Ties to U.S. migrants

Rural community

Central-west

Cluster 3

Woman

Primary education

Ties to U.S. migrants

Rural community

Central-west

FROM PARTIAL DATA

Daughter or spouse

Married

Single trip

Settles in the U.S.

Cluster 3

Woman

Primary education

Ties to U.S. migrants

Rural community

Central-west

FROM PARTIAL DATA

Daughter or spouse

Married

Single trip

Settles in the U.S.

FAMILY
MIGRANTS

Cluster 4

Man

Middle school +

Owens home

Urban community

Border or Central

Cluster 4

Man

Middle school +

Owens home

Urban community

Border or Central

FROM PARTIAL DATA

Son or head

Works in a factory

Earns high wages

Cluster 4

Man

Middle school +

Owens home

Urban community

Border or Central

FROM PARTIAL DATA

Son or head

Works in a factory

Earns high wages

URBAN

MIGRANTS

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Man	Man	Woman	Man
No education	Primary education	Primary education	Middle school +
No assets	Owens land/business	Ties to U.S. migrants	Owens home
Rural community	Poor community	Rural community	Urban community
Central-west	Central-west	Central-west	Border or Central

FROM PARTIAL DATA

Household head	Younger son	Daughter or spouse	Son or head
Married	Single	Married	Works in a factory
Frequent trips	Sends remittances	Single trip	Earns high wages
Sends remittances	Returns to Mexico	Settles in the U.S.	
Returns to Mexico			

CIRCULAR
MIGRANTS

CRISIS
MIGRANTS

FAMILY
MIGRANTS

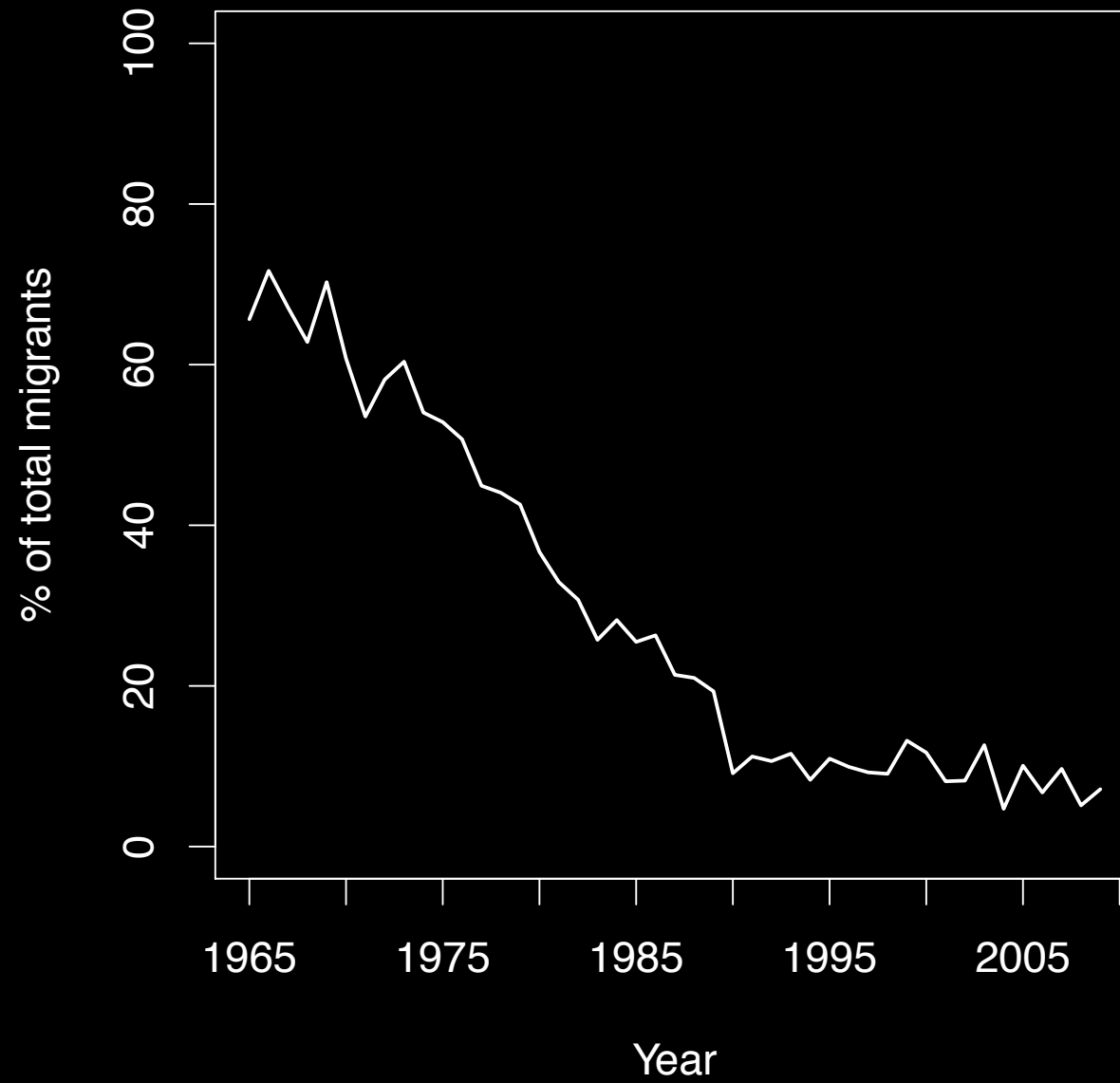
URBAN
MIGRANTS

Who migrates?

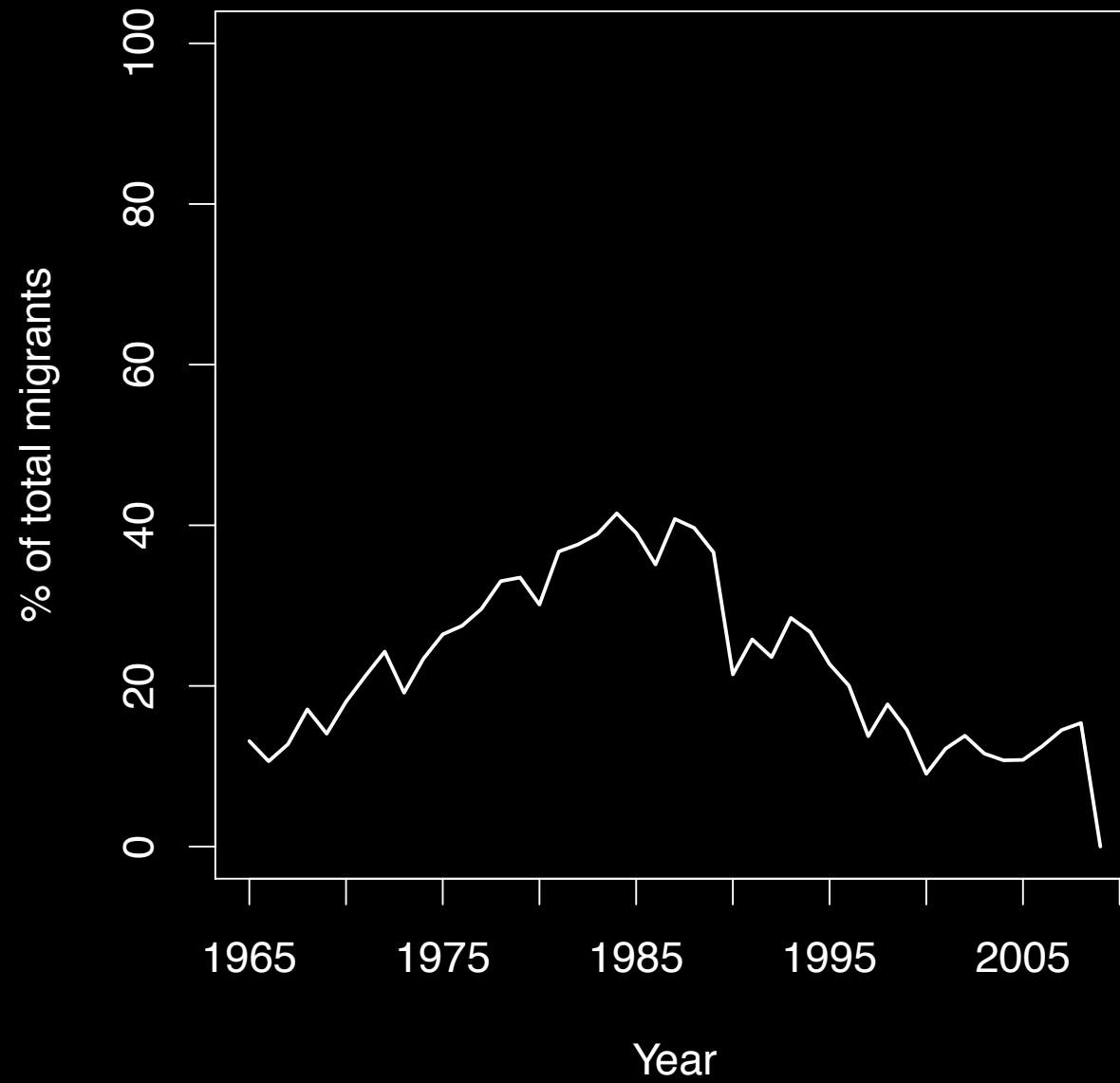
When?

Why?

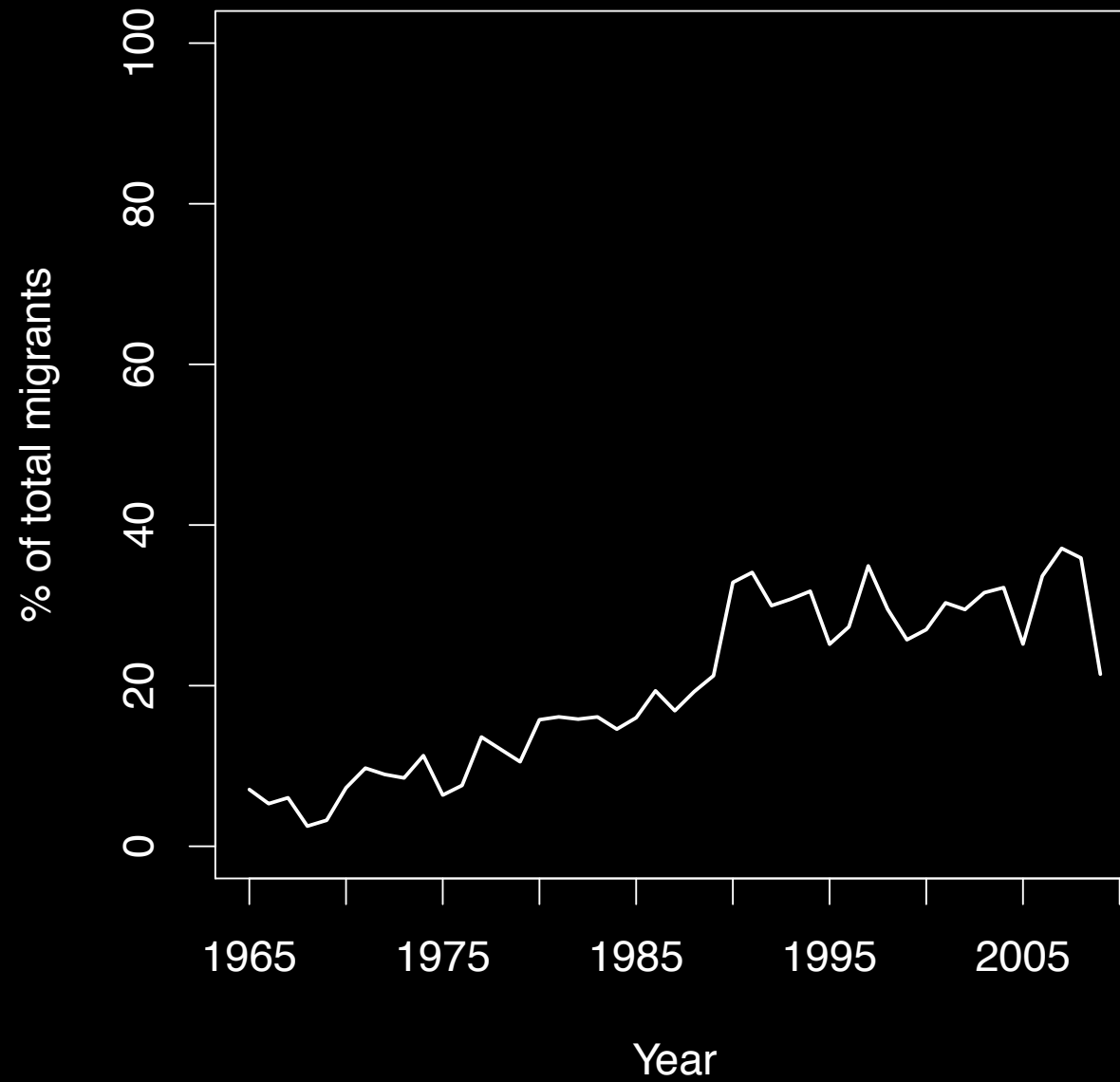
CIRCULAR MIGRANTS



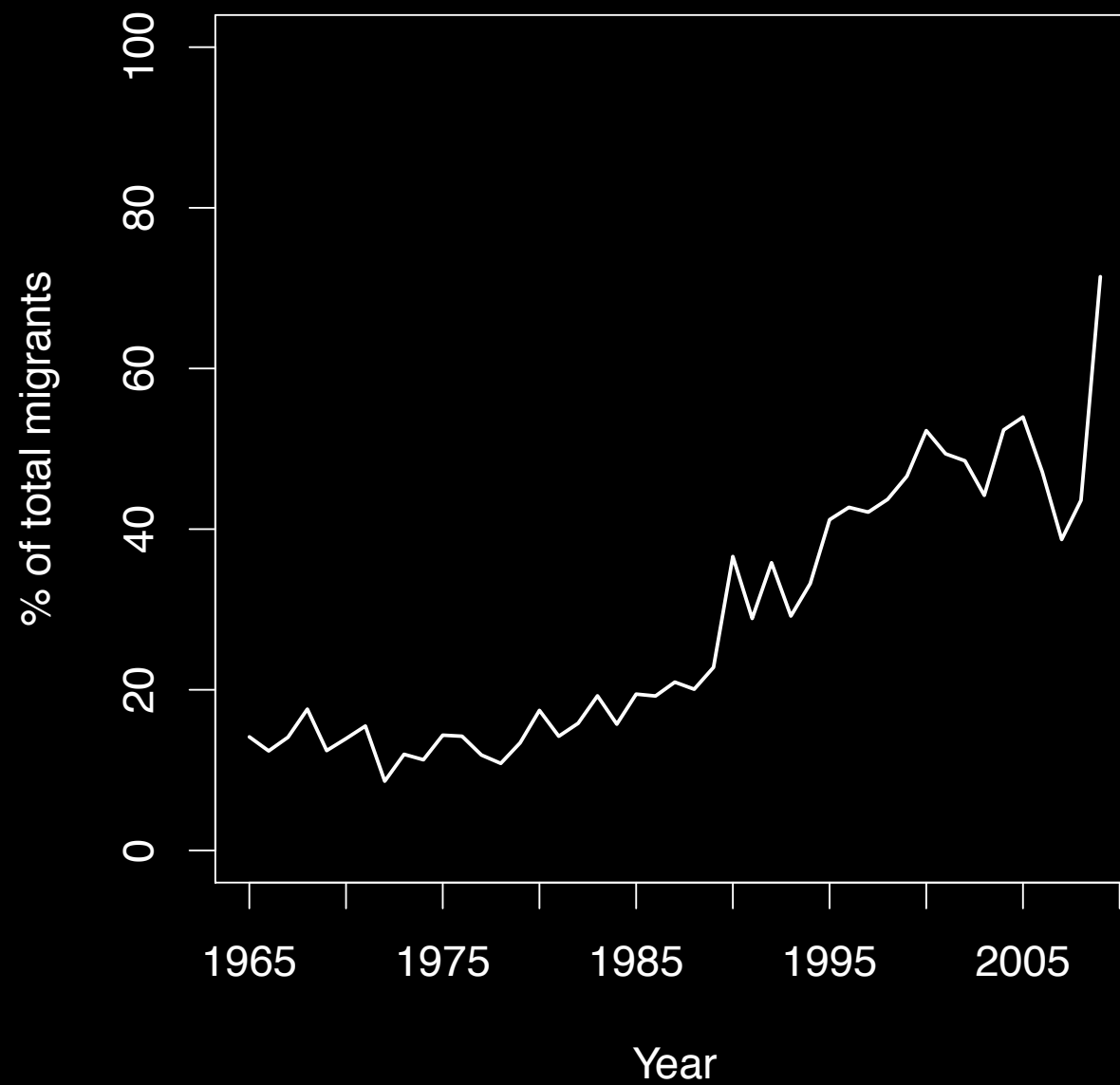
CRISIS MIGRANTS



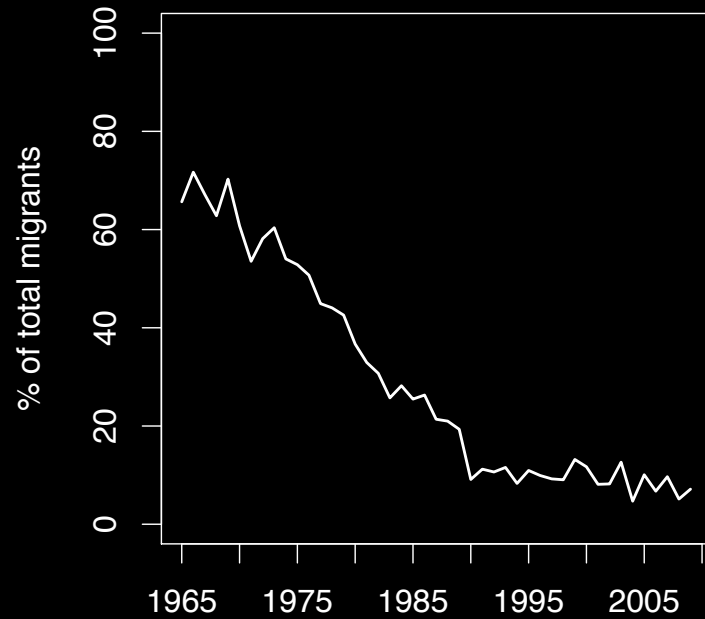
FAMILY MIGRANTS



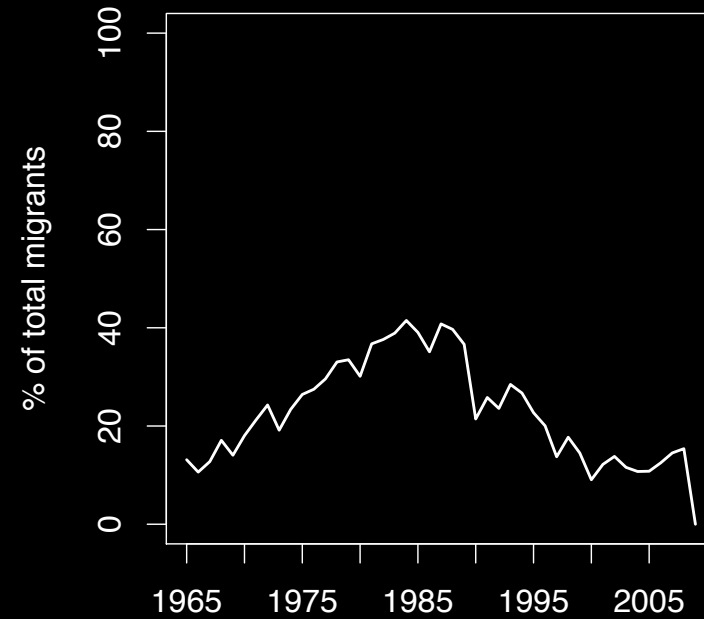
URBAN MIGRANTS



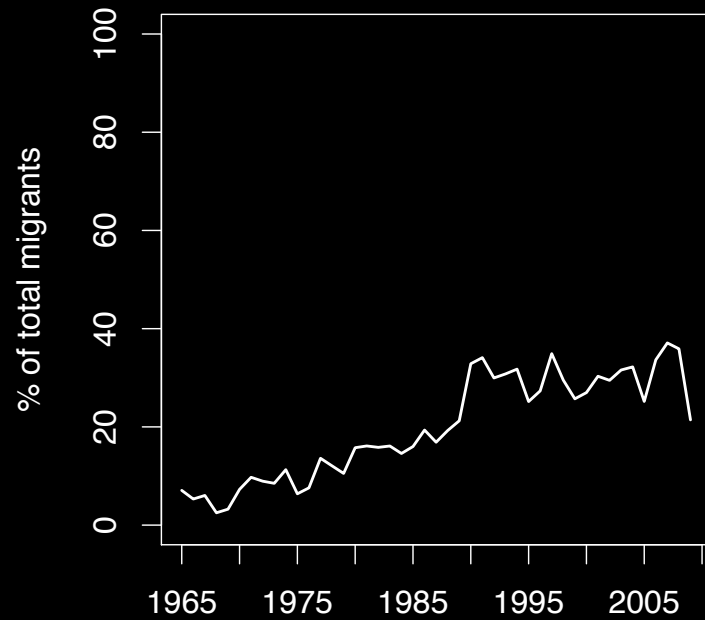
CIRCULAR MIGRANTS



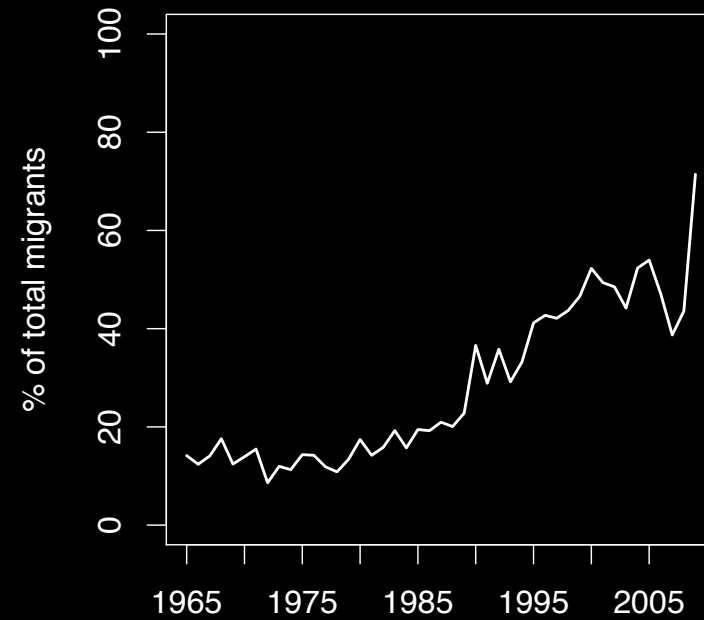
CRISIS MIGRANTS



FAMILY MIGRANTS



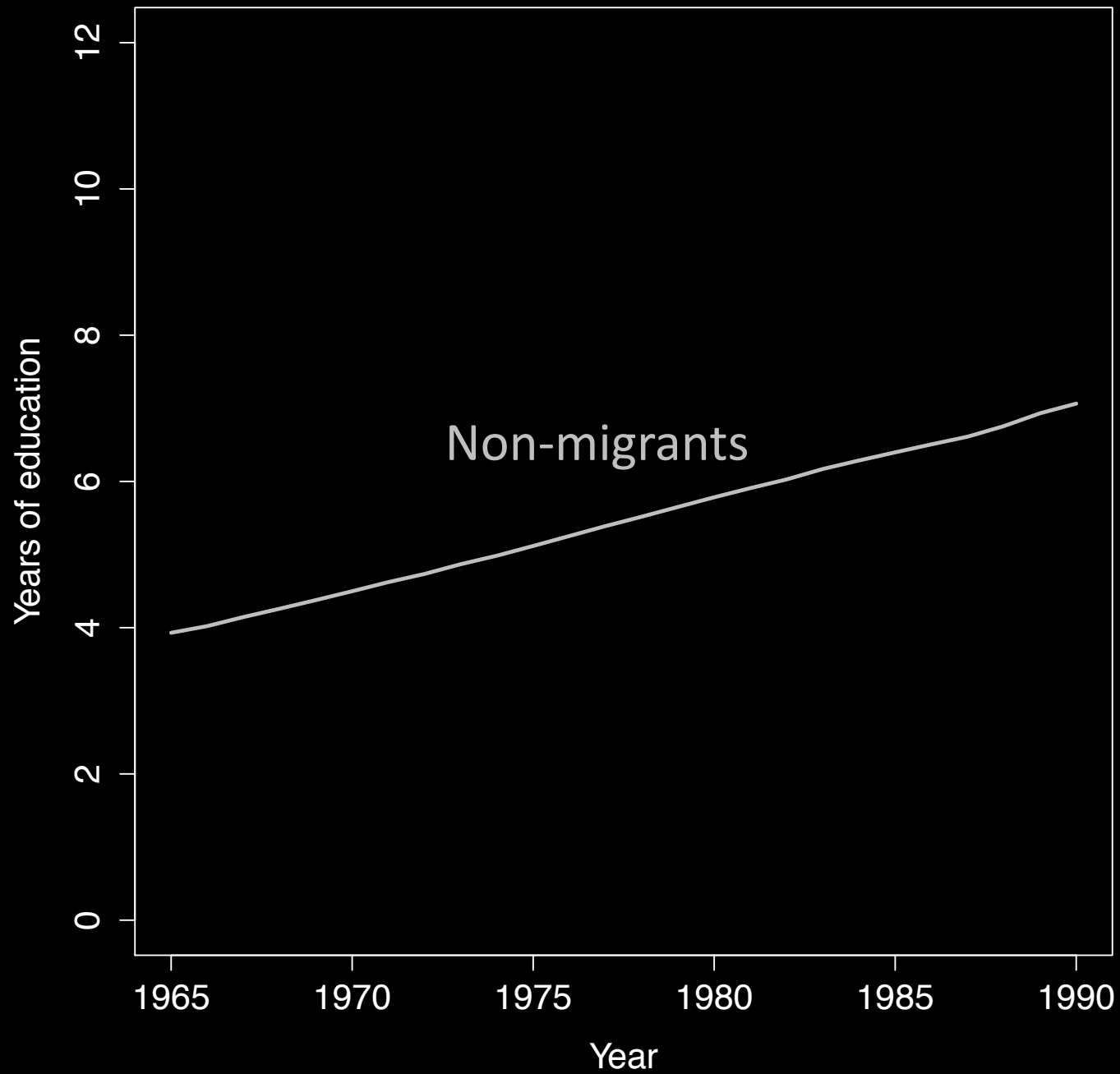
URBAN MIGRANTS



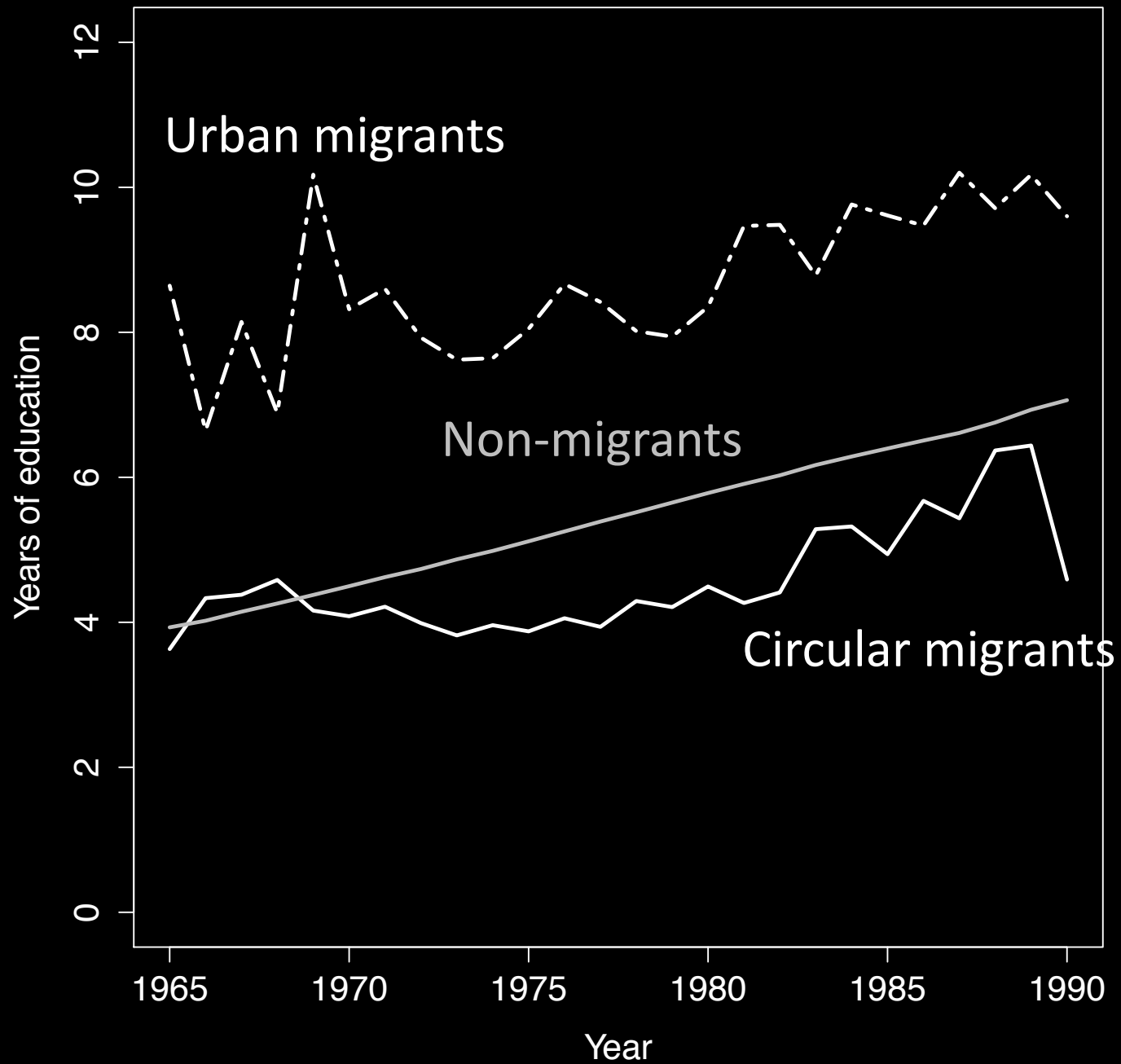
Each migrant group becomes prevalent in a particular period.

Are differences between groups real or are they an artifact of secular trends in Mexico?

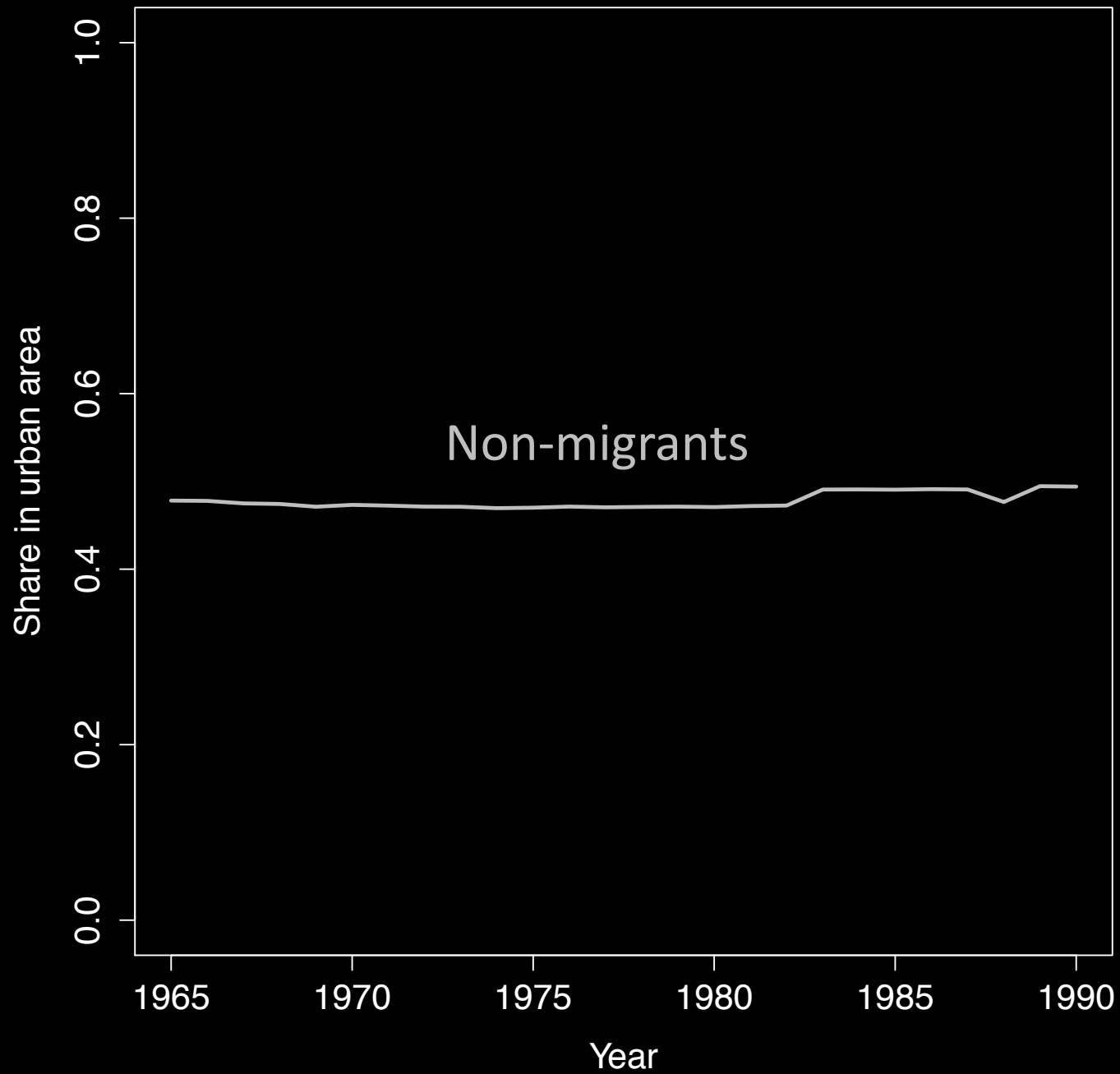
TRENDS IN EDUCATION



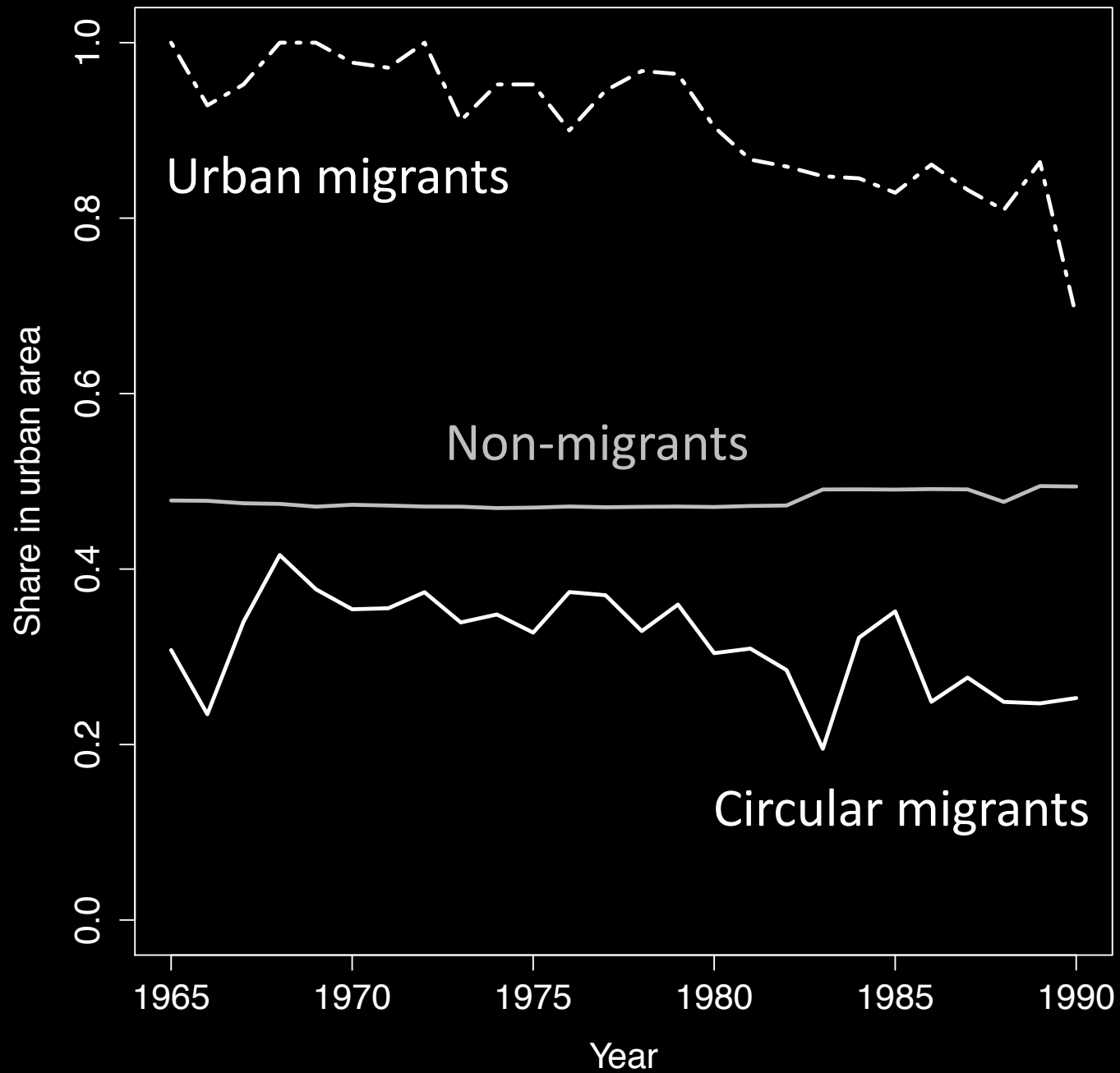
TRENDS IN EDUCATION



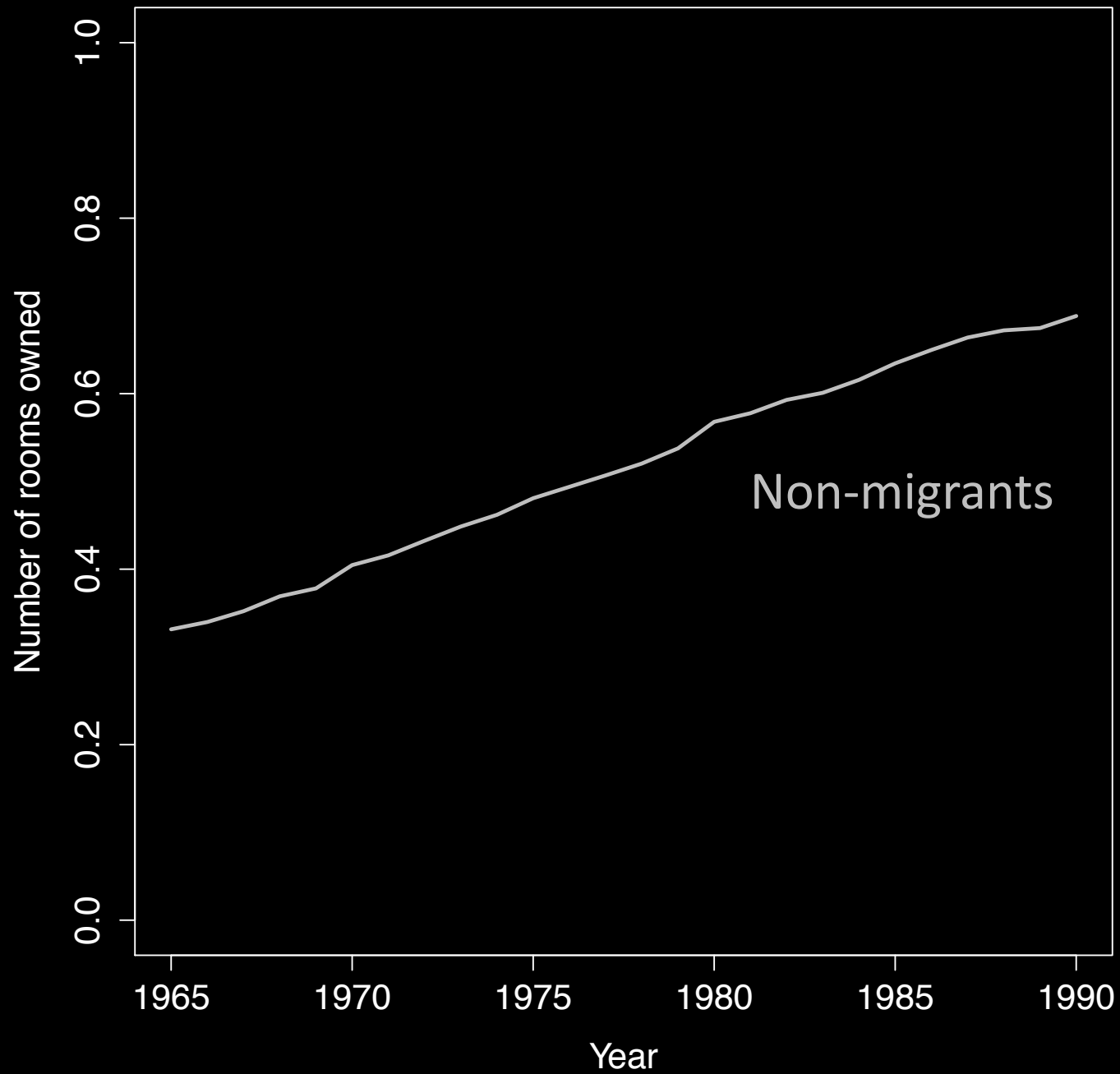
TRENDS IN URBAN RESIDENCE



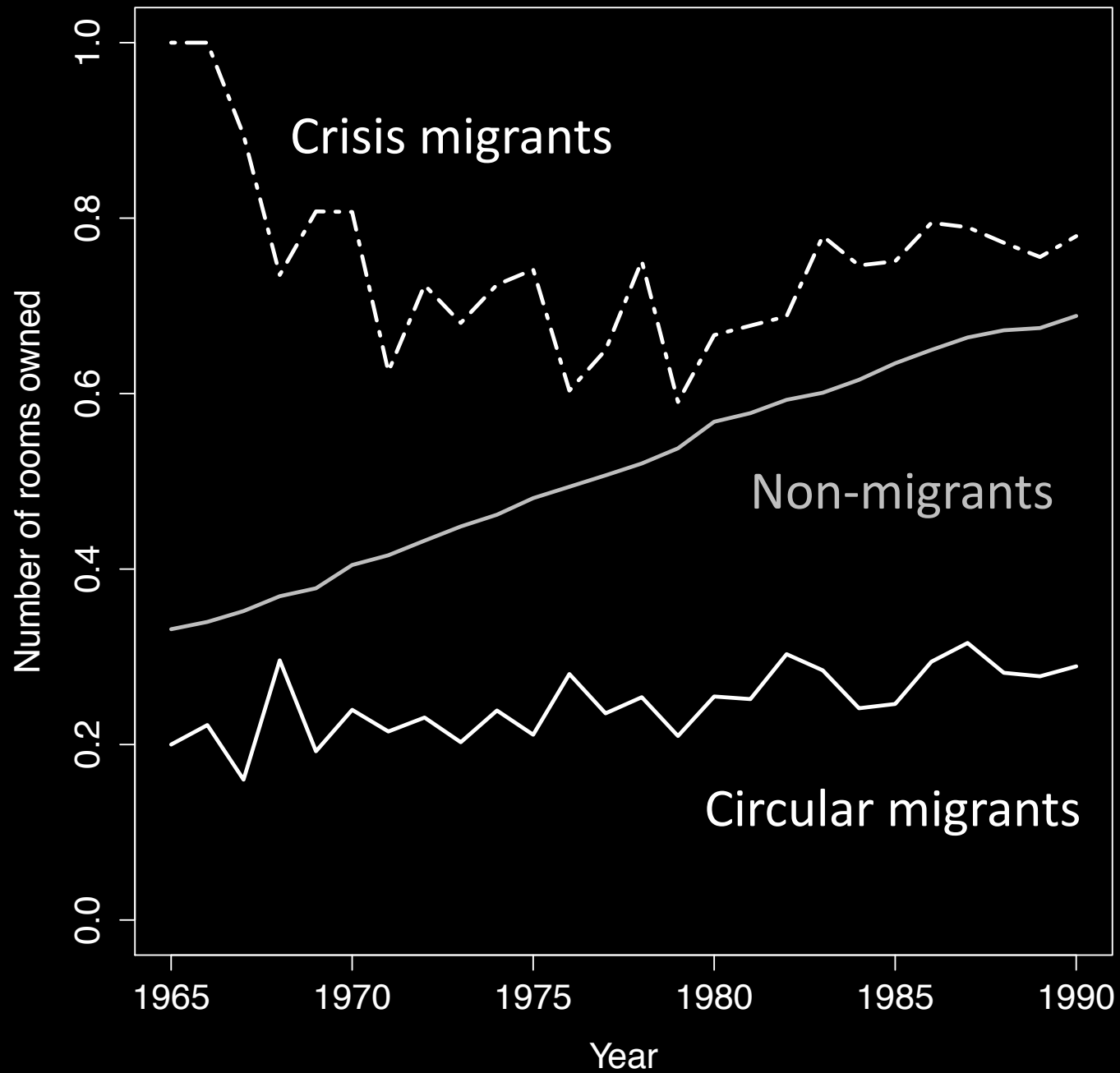
TRENDS IN URBAN RESIDENCE



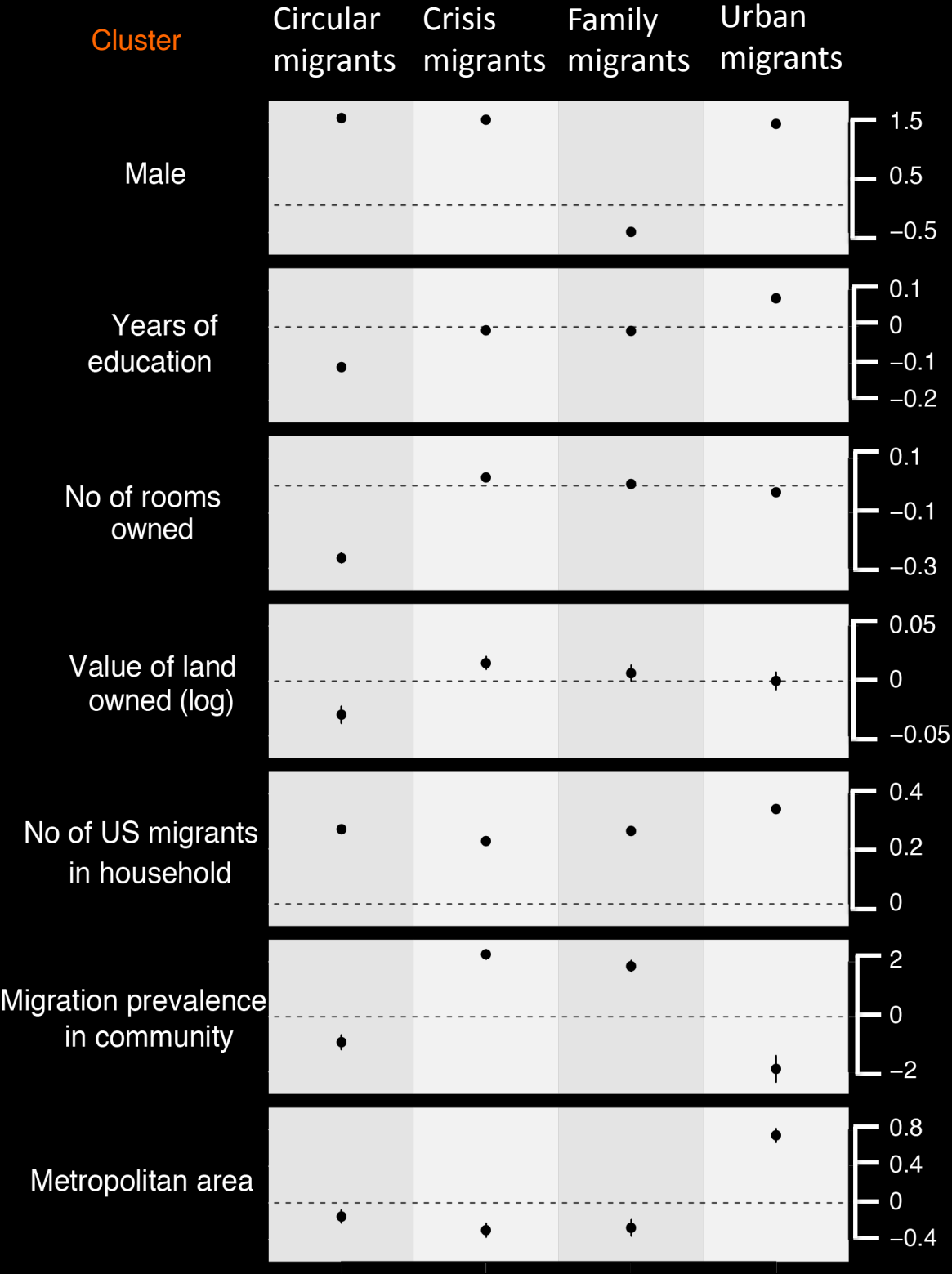
TRENDS IN WEALTH



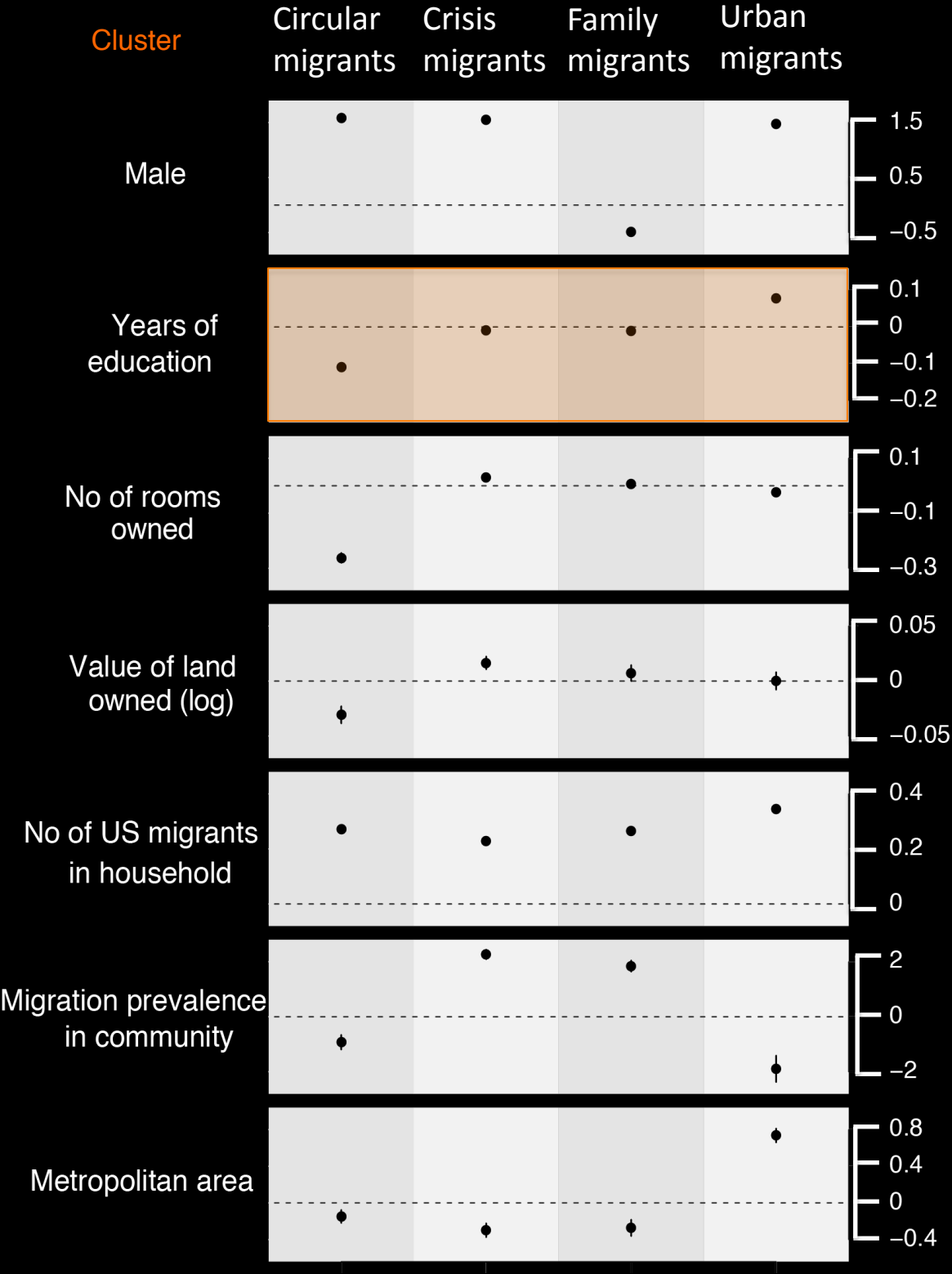
TRENDS IN WEALTH



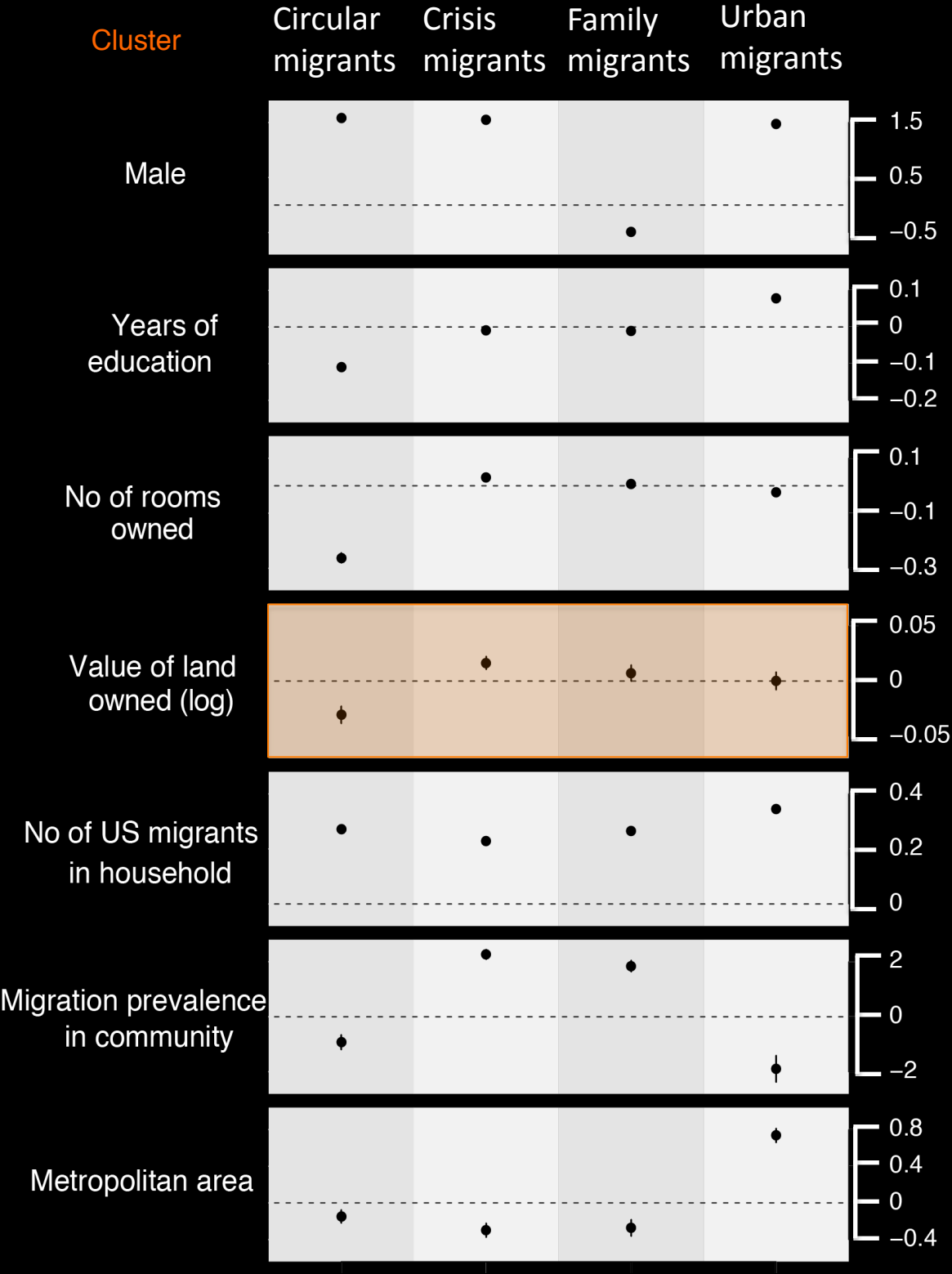
Logit model of first-migration (run separately for each cluster)



Logit model of first-migration (run separately for each cluster)



Logit model of first-migration (run separately for each cluster)



The distinct characteristics of each group are not just a reflection of changing Mexican population over time, but also of **changing selectivity** of migrants from that population.

Who migrates?

When?

Why?

Are different groups responding to
different **macro-level** conditions?

Neoclassical model	Low-skill wage in US GDP per capita in MX Unemployment in US Unemployment in MX Border patrol enforcement (BPE) budget
New economics	Inflation in MX
Cumulative causation	MX migrant stock in US Visa availability for MX in US
Segmented markets	Δ in employment in migrant-heavy sectors in US
World systems	MX-US trade
Other	Lagged birth rate in MX

Standardized estimates from an OLS model of
annual number of first-time migrants (per 1000 of population)

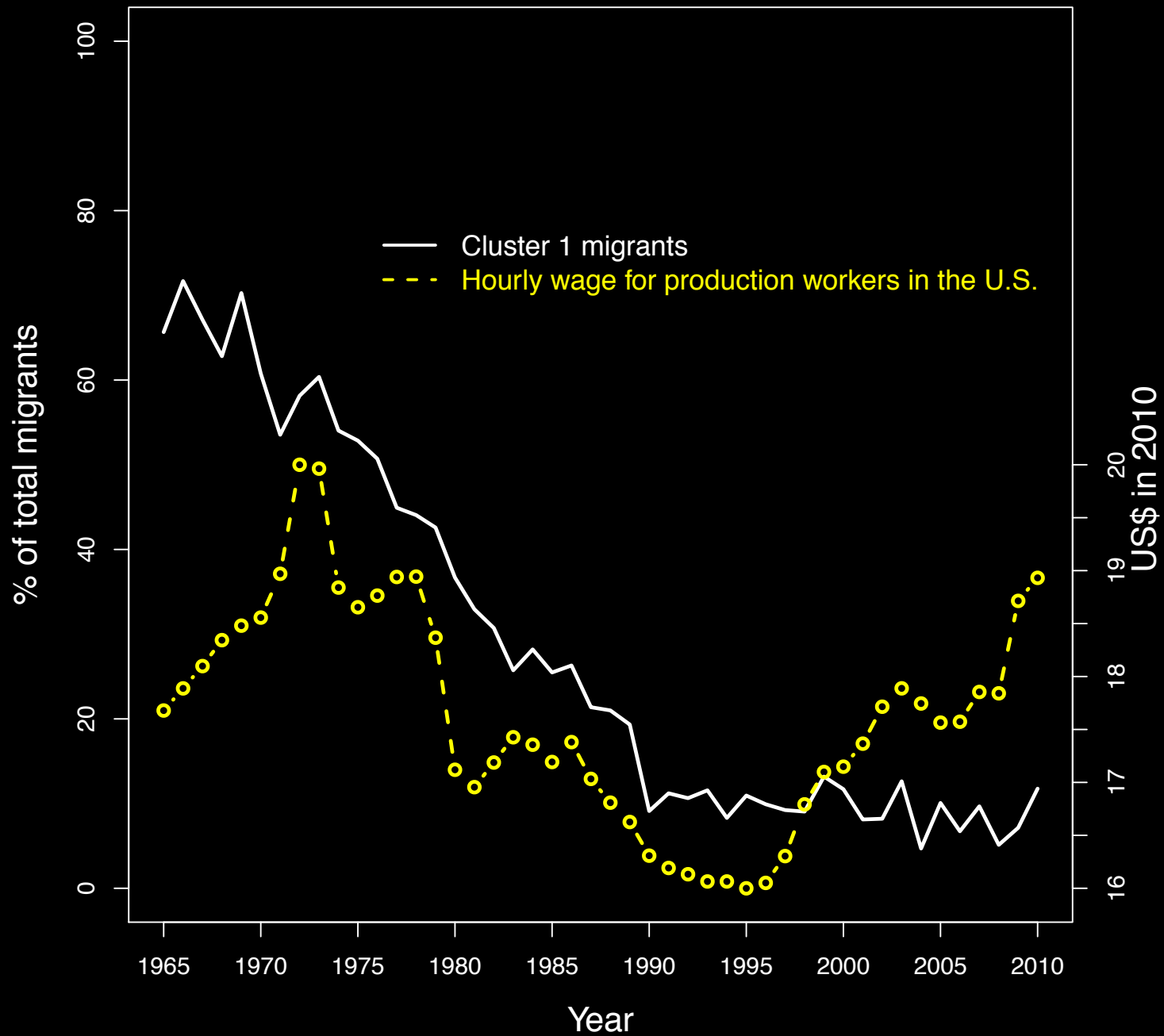
	Circular migrants	Crisis migrants	Family migrants	Urban migrants
US hourly low-skill wage	0.9	0.3	-0.1	-0.1
MX GDP per capita	-0.7	-0.2	-1.2	-2.2
Log (Border Patrol budget)	-1.2	-0.8	-0.4	-0.5
MX inflation rate	-0.1	0.5	0.2	0.3
Log (visas to Mexicans)	-0.1	0.1	0.4	0.1
Log of US exports to MX	0.7	0.9	1.5	2.6
R ²	0.9	0.8	0.8	0.7

Coefficient significant (p<0.05)

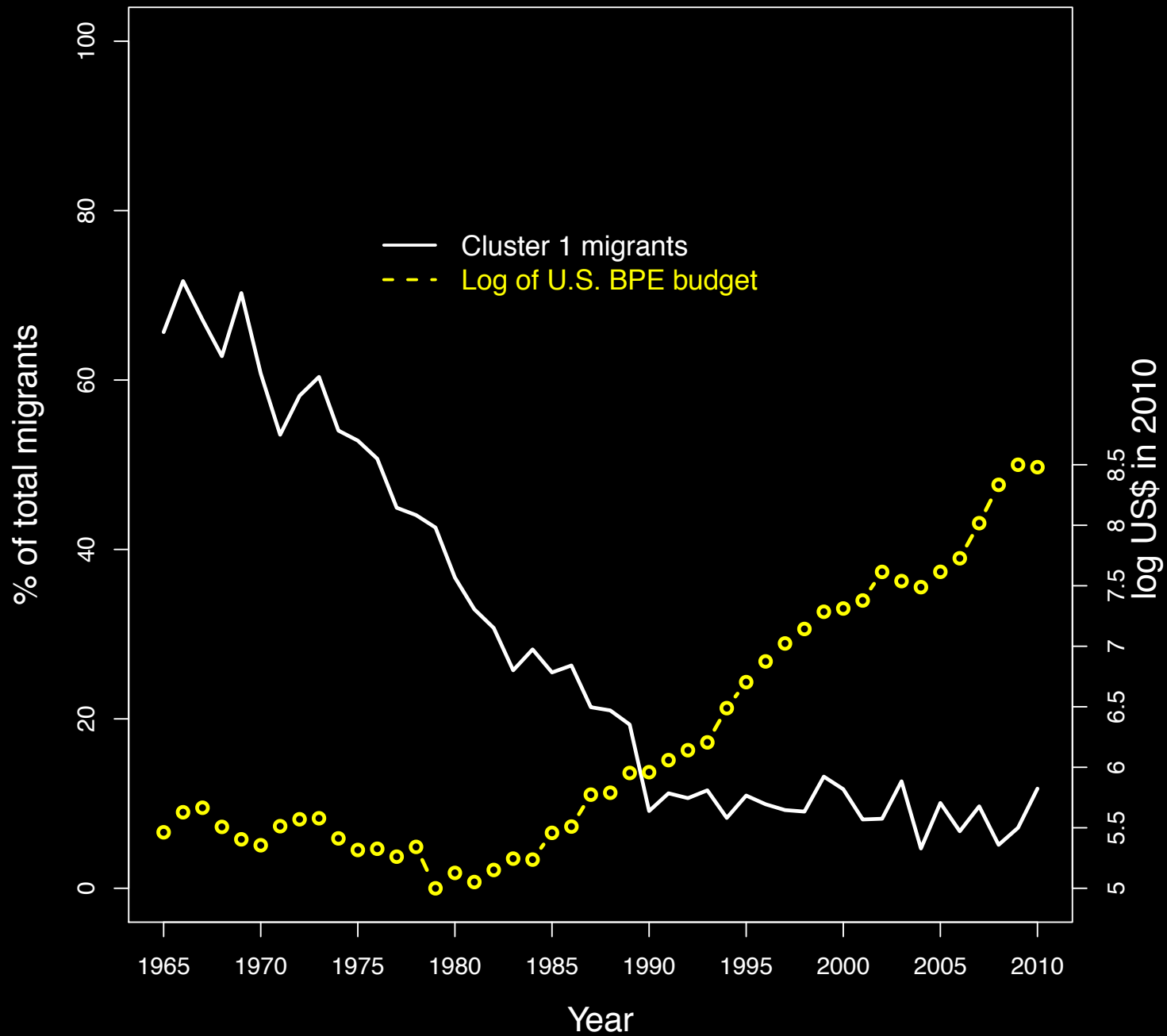
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CIRCULAR MIGRANTS & US WAGES



CIRCULAR MIGRANTS & BORDER PATROL BUDGET



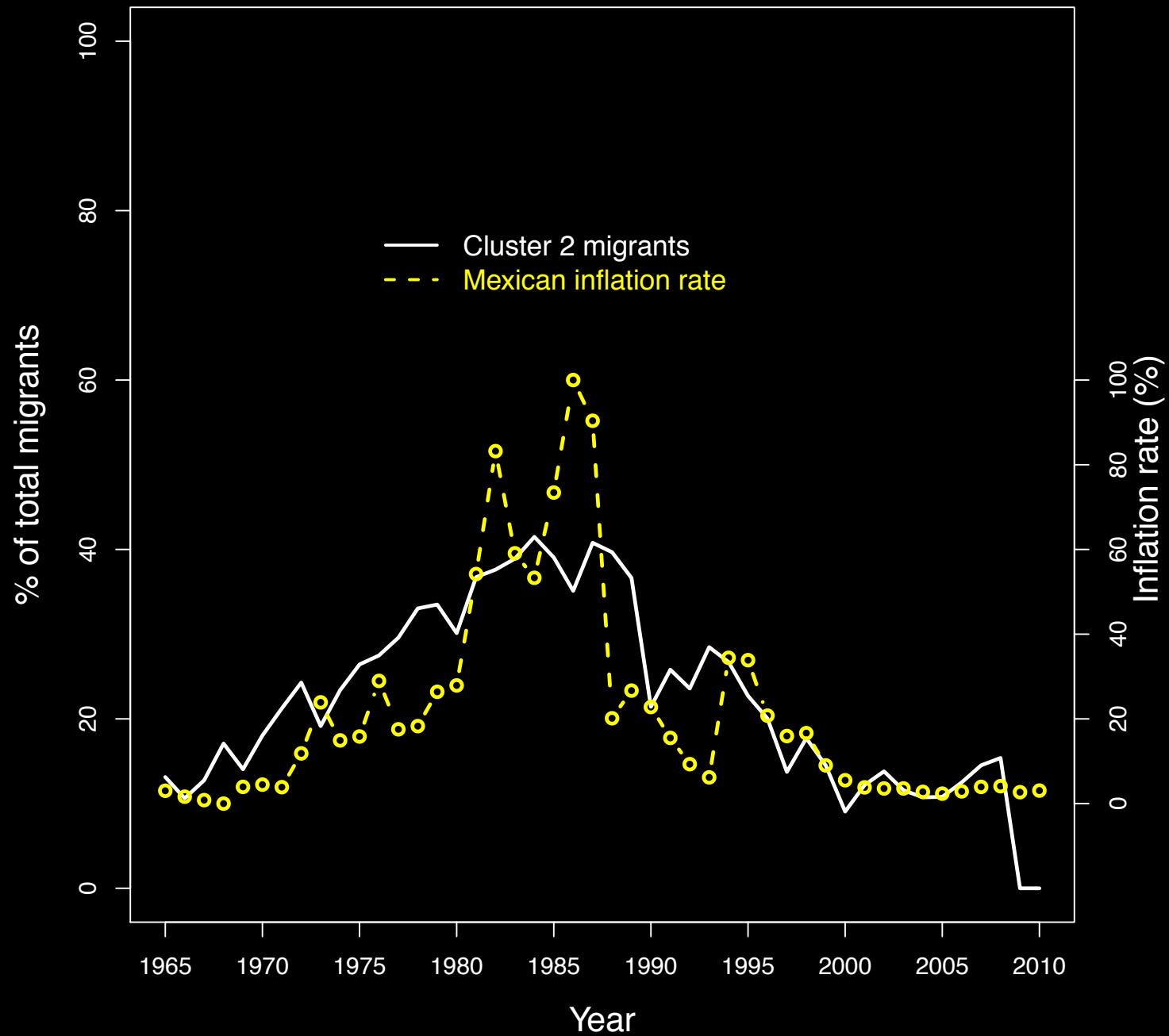
CIRCULAR MIGRANTS ~ Neoclassical model

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CRISIS MIGRANTS & MEXICAN INFLATION



CIRCULAR MIGRANTS ~ Neoclassical model

CRISIS MIGRANTS ~ New economics model



The number of crisis migrants....

doubled in the coffee-growing states after
the coffee crisis



Map by Joseph T. McGuire and Jeff Blossom, Center for Geographic Analysis, Harvard University

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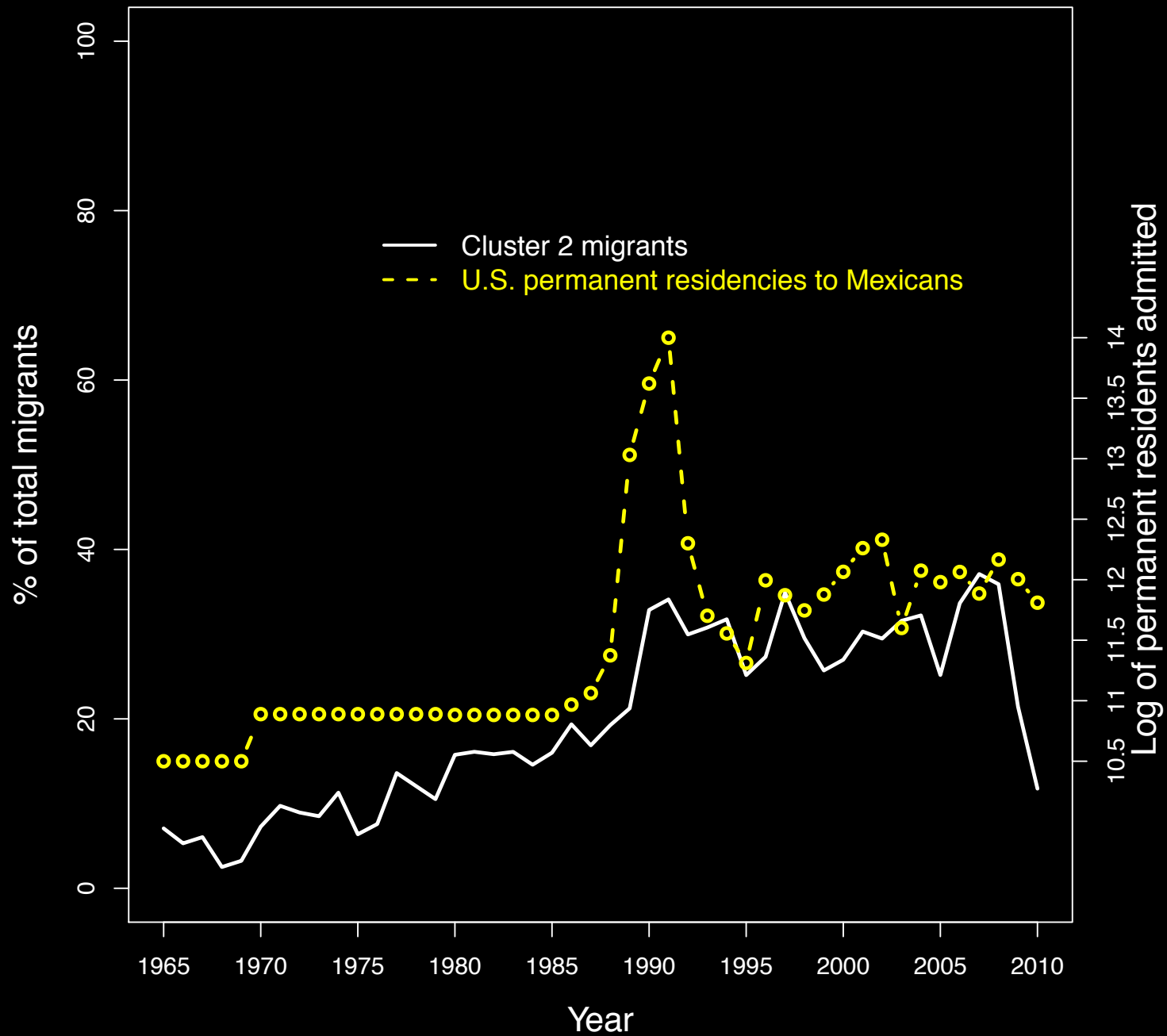
increased by 50 percent in the states hit
by the earthquake

Meso-level analysis increases confidence in the aggregate regression estimates.

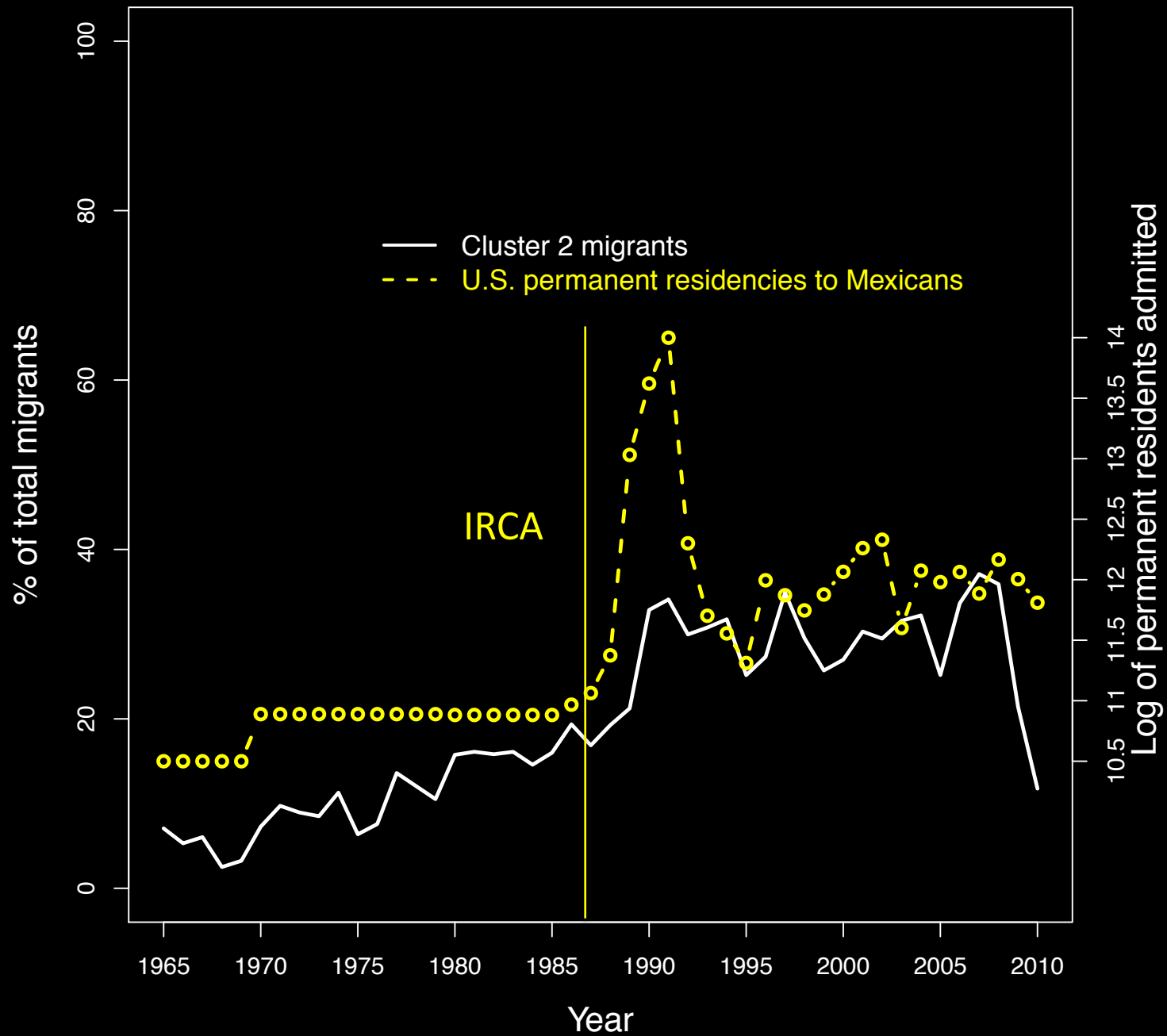
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FAMILY MIGRANTS & US RESIDENCIES TO MEXICANS



FAMILY MIGRANTS & US RESIDENCIES TO MEXICANS



CIRCULAR MIGRANTS ~ Neoclassical model

CRISIS MIGRANTS ~ New economics model

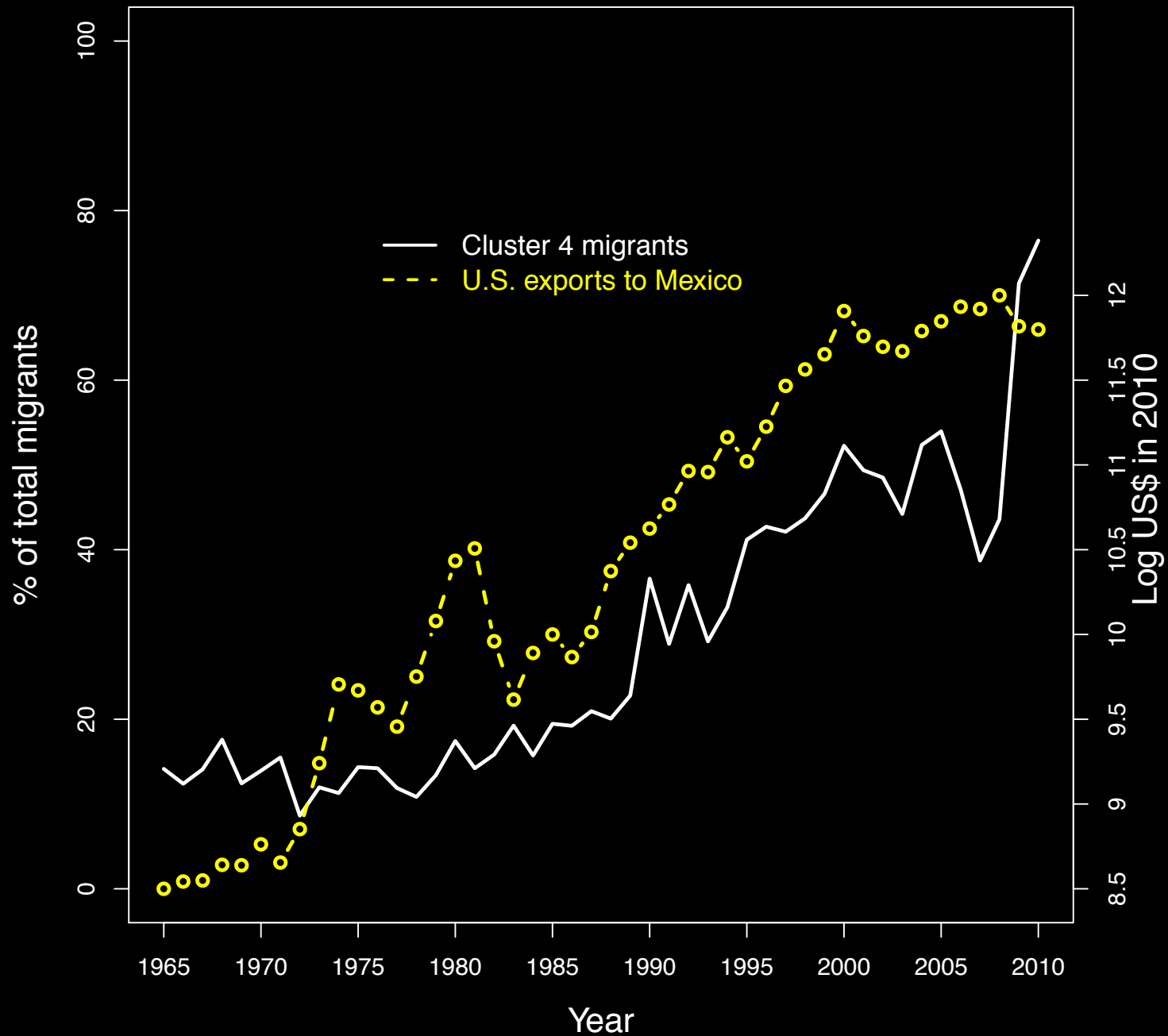
FAMILY MIGRANTS ~ Cumulative causation model

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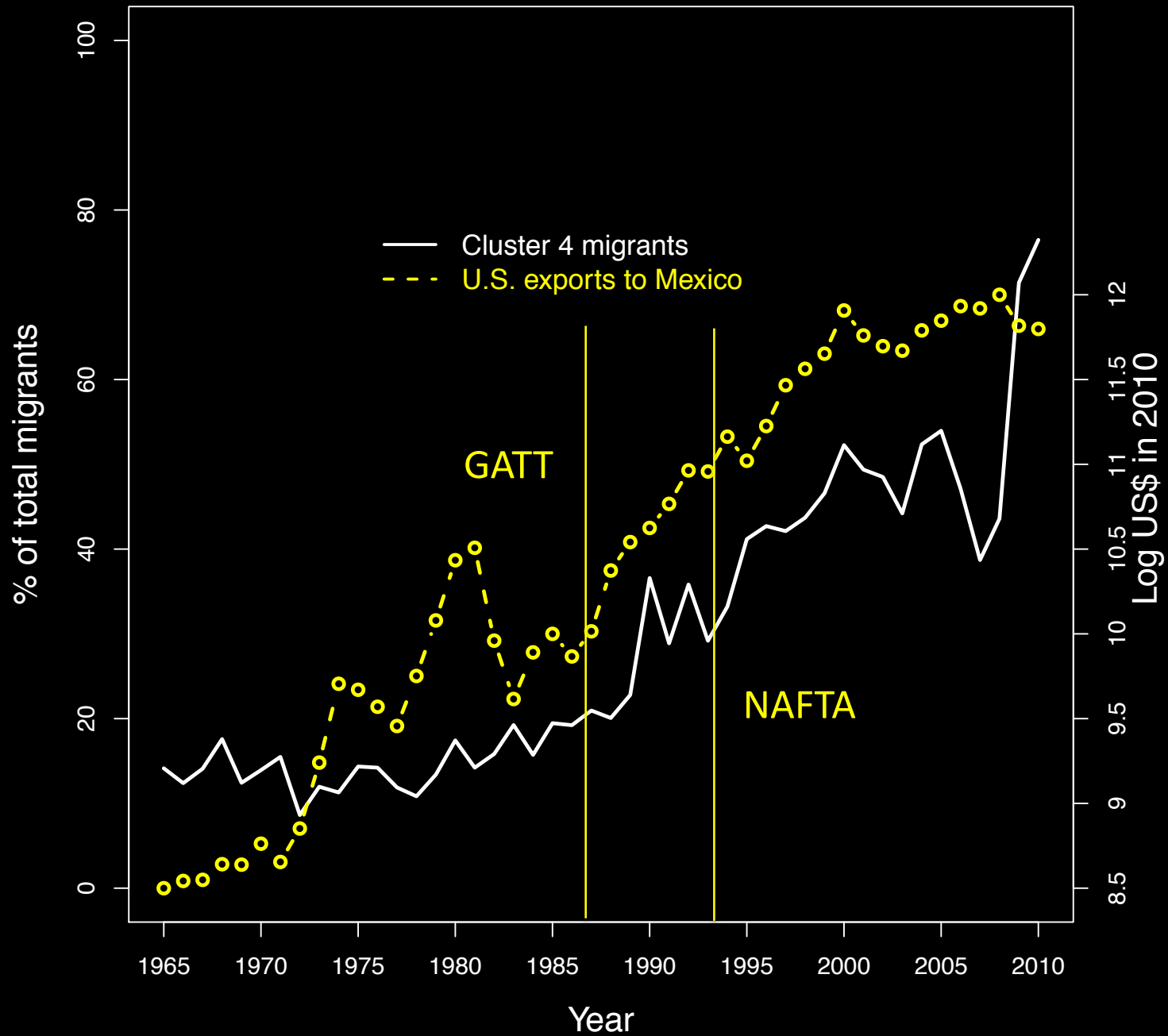
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URBAN MIGRANTS & TRADE WITH THE US



URBAN MIGRANTS & TRADE WITH THE US



CIRCULAR MIGRANTS ~ Neoclassical model

CRISIS MIGRANTS ~ New economics model

FAMILY MIGRANTS ~ Cumulative causation model

URBAN MIGRANTS ~ World-systems model



Map by Joseph T. McGuire and Jeff Blossom, Center for Geographic Analysis, Harvard University



“...one of two or three cardinal problems that social science has not yet come to grips with is precisely this issue of heterogeneity... The ubiquity of heterogeneity means that for the most part we substitute actuarial probabilities for the true individual probabilities, and therefore we generate mainly descriptively accurate but theoretically empty and prognostically useless statistics.” (Letter from Otis Dudley Duncan to Yu Xie, 30 July 1996)

“The most important discovery [in microeconomic investigations] was the evidence on the pervasiveness of heterogeneity and diversity in economic life. When a full analysis of heterogeneity in responses was made, a variety of candidate averages emerged to describe the “average” person, and the long-standing edifice of the representative consumer was shown to lack empirical support.” (James Heckman, Nobel Memorial Lecture in Economic Sciences, 8 December 2000)