# Learning About Social Networks from Mobile Money Transfers

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## Highlights

▶ I link data on nearly all mobile money transfers in Denmark – a country where >80% of the population are users – to population-wide government registers and bank transaction data

▶ The social network based on transfers has strikingly similar properties to Facebook

▶ Links in the network span ties formed in schools, colleges, workplaces and family

▶ High-earners form especially segregated networks, as do immigrants who arrived to Denmark older and who earn less

▶ Friends' income shocks affect individuals' spending, suggesting large multipliers to stimulus and shocks

▶ Findings suggest a new agenda: research collaborations with apps can overcome barriers to answering many questions about social networks

## Context and Data: The Growth of Mobile Money Apps

Key features of mobile money apps:

1. Focus on making social payments easier, cheaper and faster
2. Tendency toward dominant provider per country/region, given network effects
3. Enormous popularity



Above: MobilePay adoption and representativeness.
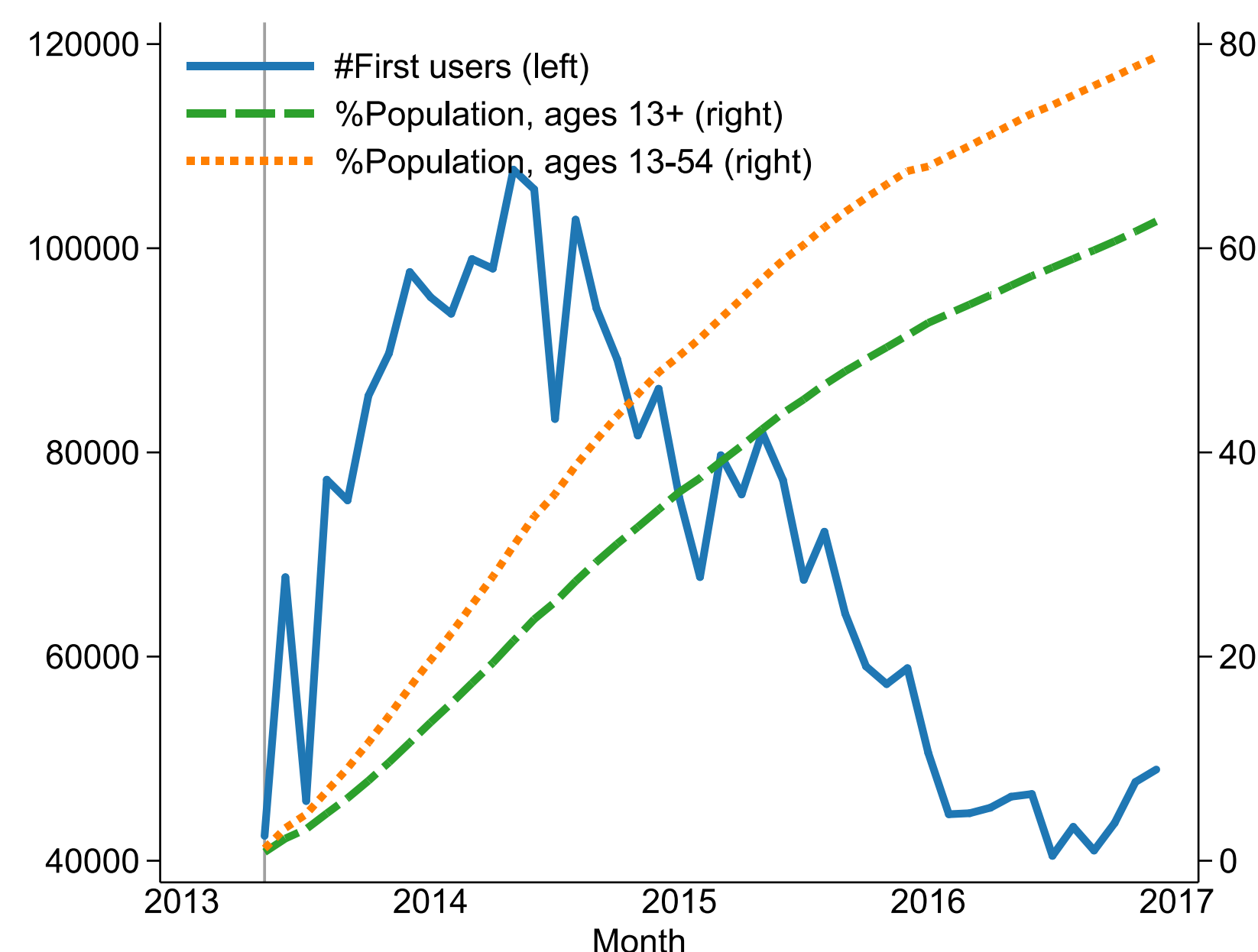
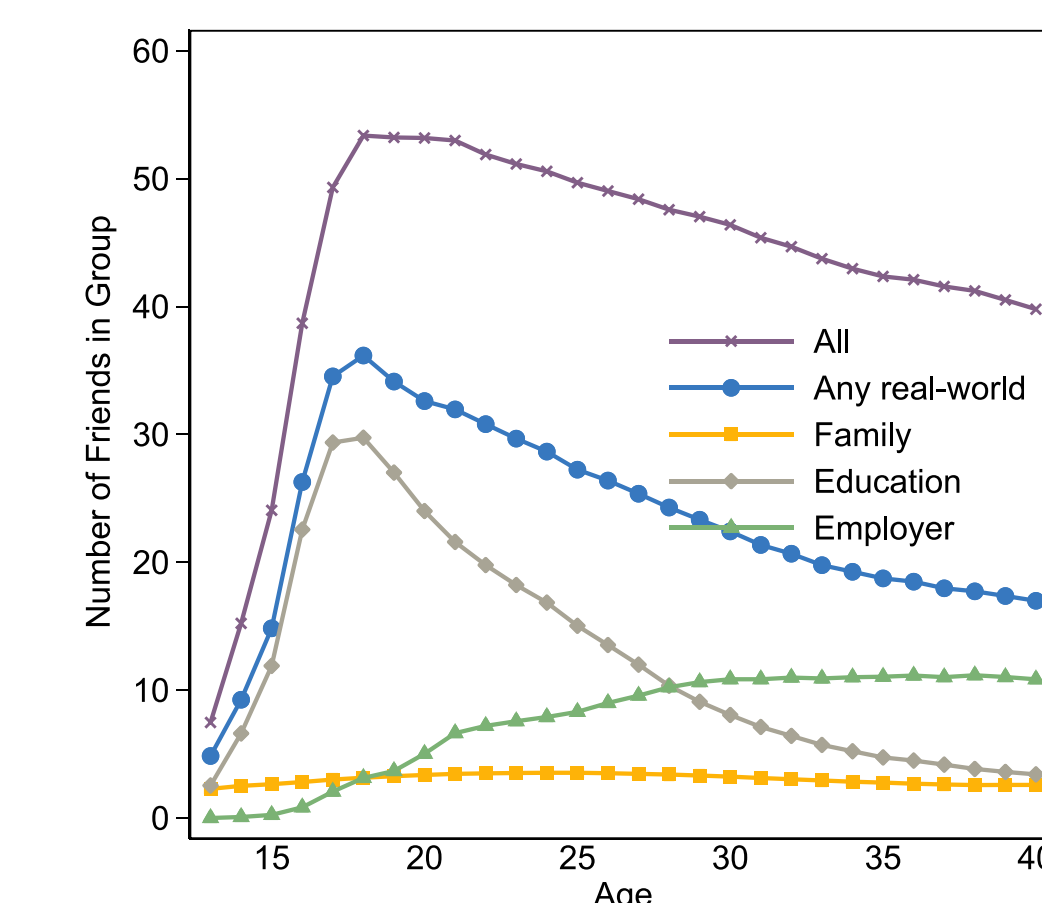Key features mean population-scale data on social networks are in creation, for example by:

• PayPal's Venmo (U.S): 40 million users
• Tencent's WeChat (China): almost 1 billion users
• MobilePay (Denmark): over 80% of population

Show the value of mobile money transfer data for research on networks by linking 3 data sources:
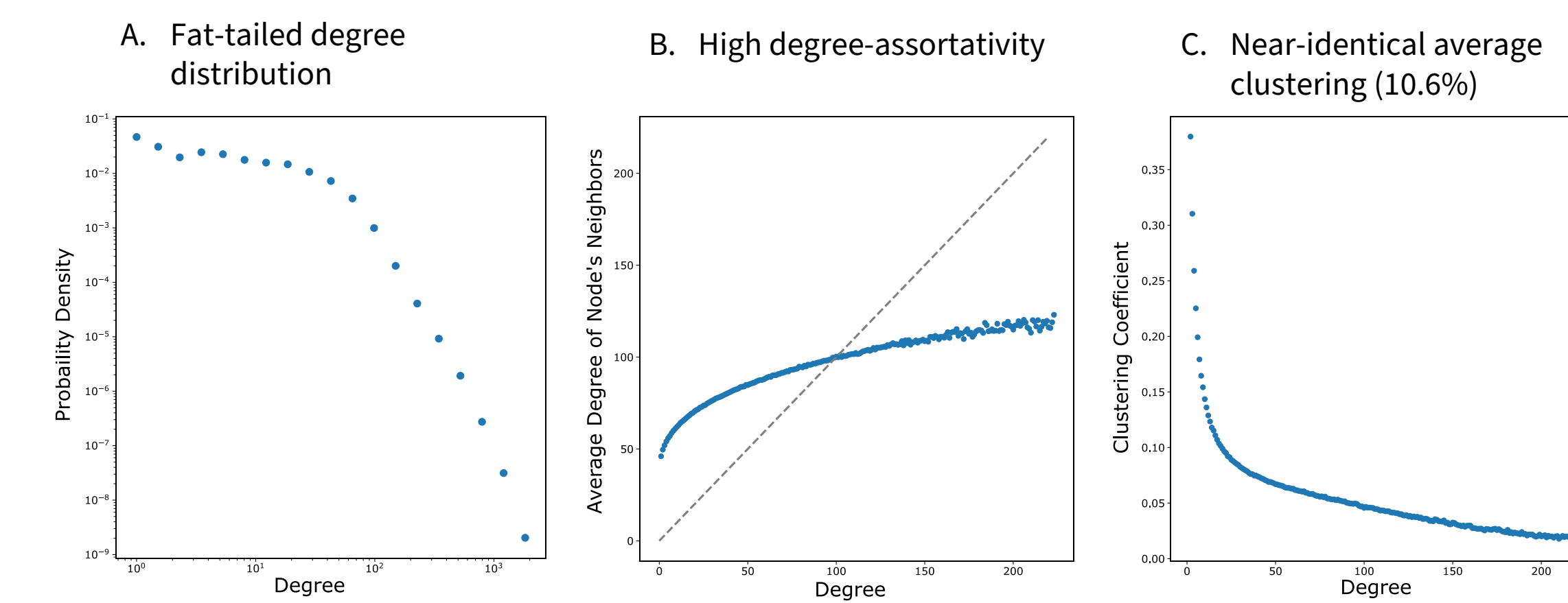
1. All 450m P2P transfers using MobilePay (mobilepay.dk) in Denmark, Jun. 2013-Jan. 2017
2. Population-wide government admin. data on family relations, education, work and balance sheets
3. Bank transaction data from country's largest bank, Danske Bank, including all expenditures

▶ Most comprehensive window on population's social ties and outcomes, tracked over time, yet accessed by researchers

## Validation: Transfers Reveal Real-World Friendship Networks

**1.** Ties represent real-world relationships and reveal how friendships evolve with age



**Left:** The majority of ties in the network are family or friends formed through common schools, colleges, work places, or accommodation. These institutional ties are persistent: educational friends remain almost 10% of ties throughout 30s.

**2.** Network structure is strikingly similar to that of online social networks, for example, Facebook [1]

A. Fat-tailed degree distribution

B. High degree-assortativity

C. Near-identical average clustering (10.6%)



**Below:** Immigrant community structures appear to form based on common region of origin, language and culture.



**3.** Friendships display homophily and segregation and linked data provides new insights on their magnitudes and correlates



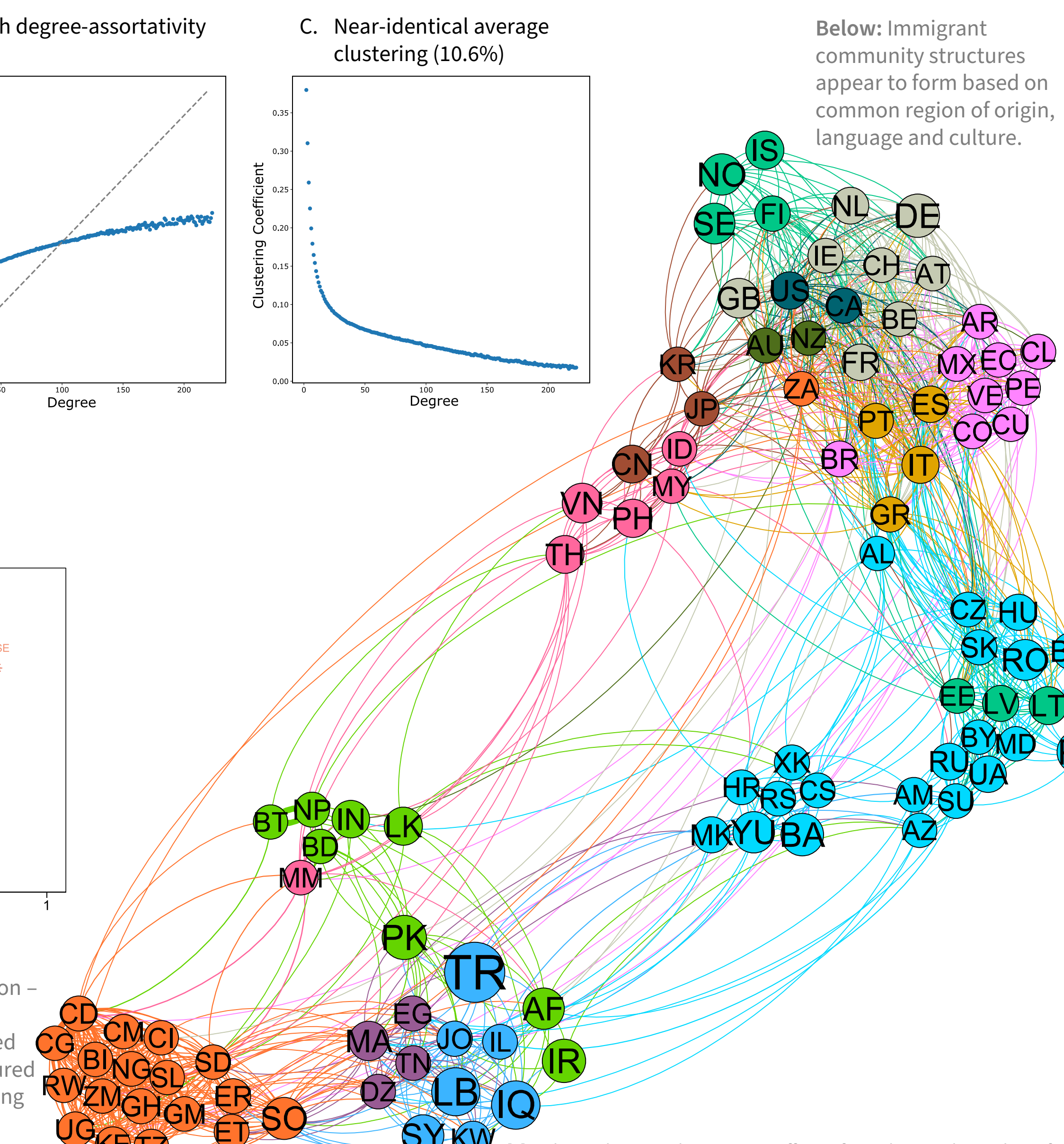Slopes: Mean: 0.50, Median: 0.69, P75: 0.51, P25: 0.63
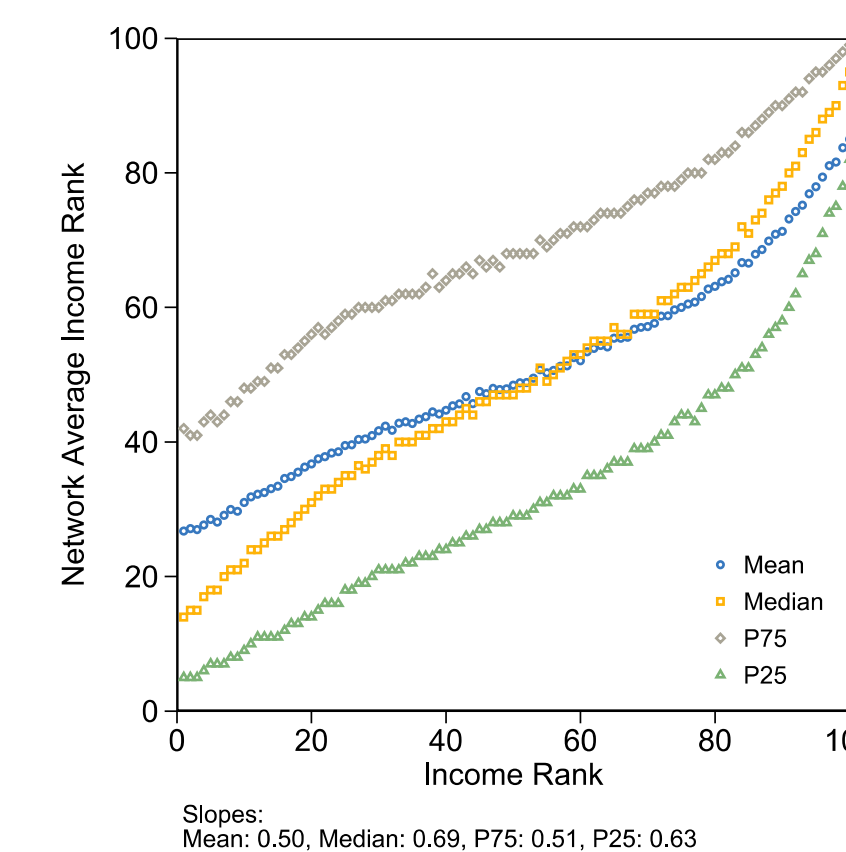
**Above:** Friendships are stratified by economic status. High-income earners form particularly concentrated social networks. These divisions can impact the extent to which information spreads through society.
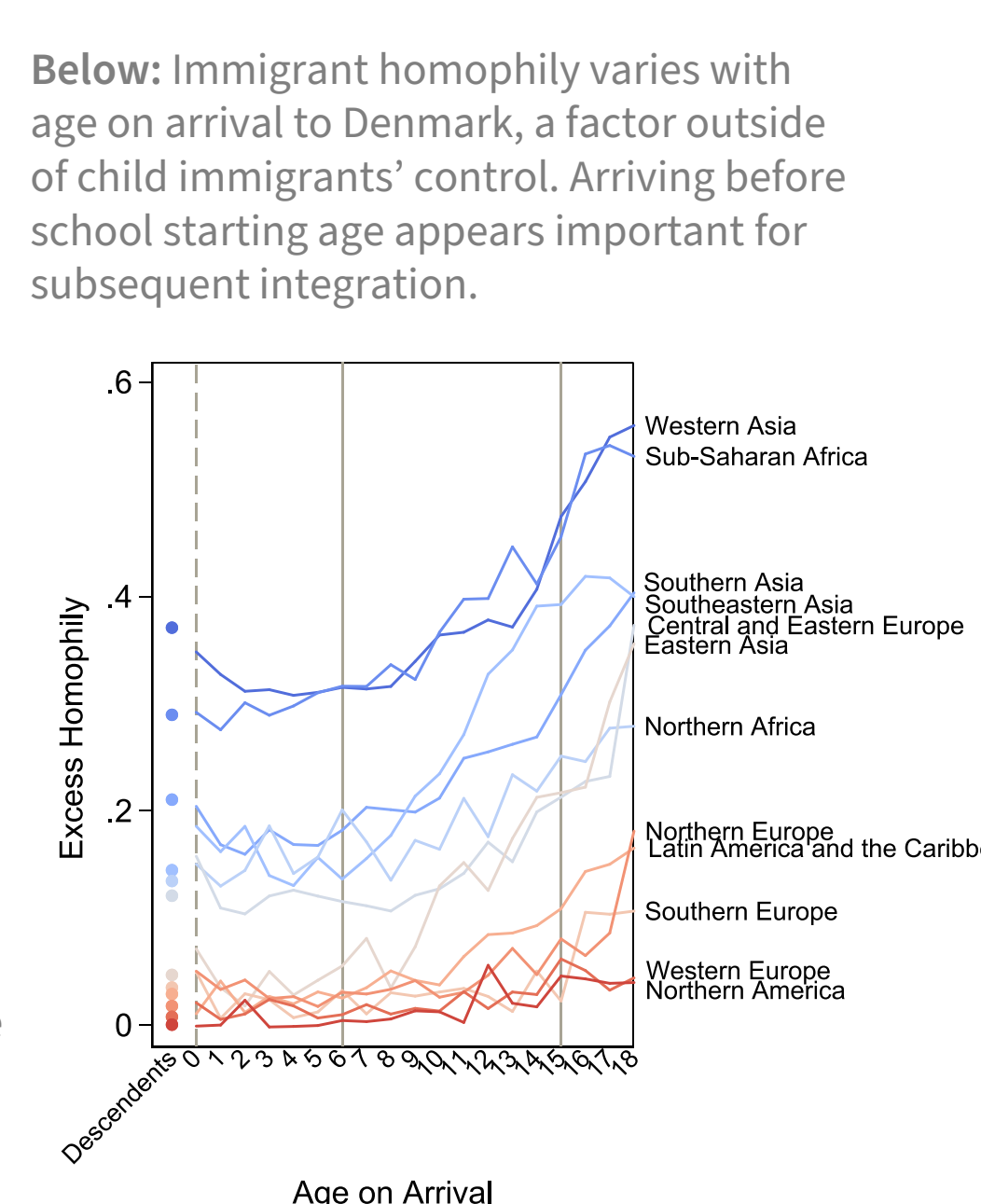
**Below:** Immigrant homophily varies with age on arrival to Denmark, a factor outside of child immigrants' control. Arriving before school starting age appears important for subsequent integration.
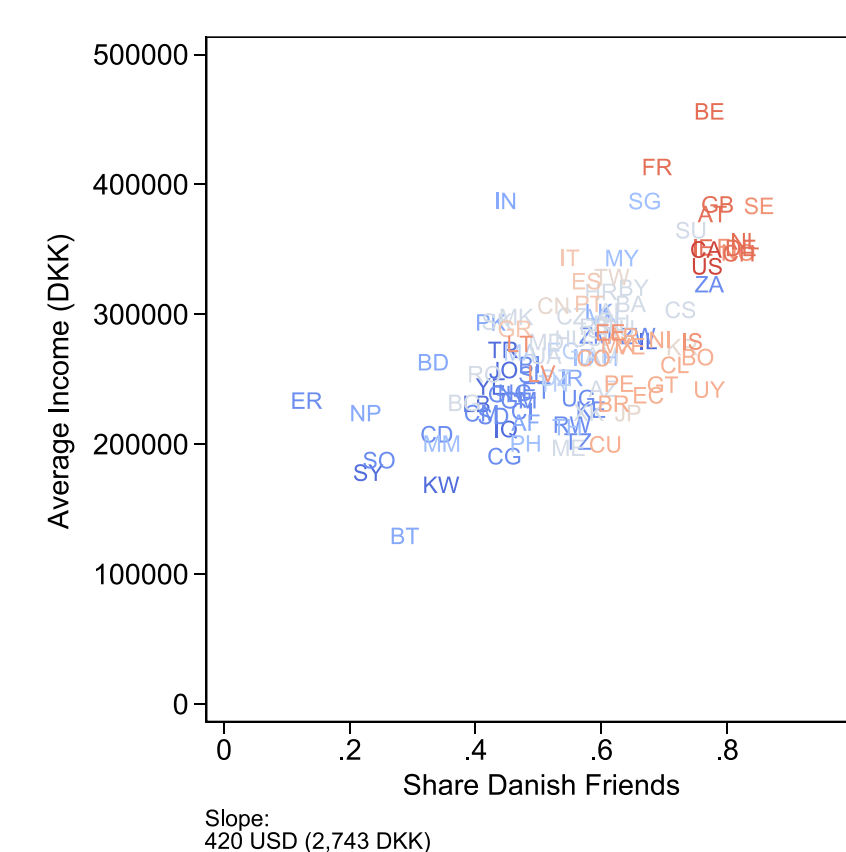


**Above:** Immigrant social integration – measured by the average share of Danish friends – is highly correlated with economic integration, measured by average income at prime working ages.

Slope: 420 USD (2,743 DKK)

[1] Bailey et al. 2018. "The Economic Effects of Social Networks: Evidence from the Housing Market." *Journal of Political Economy.* 126(6)
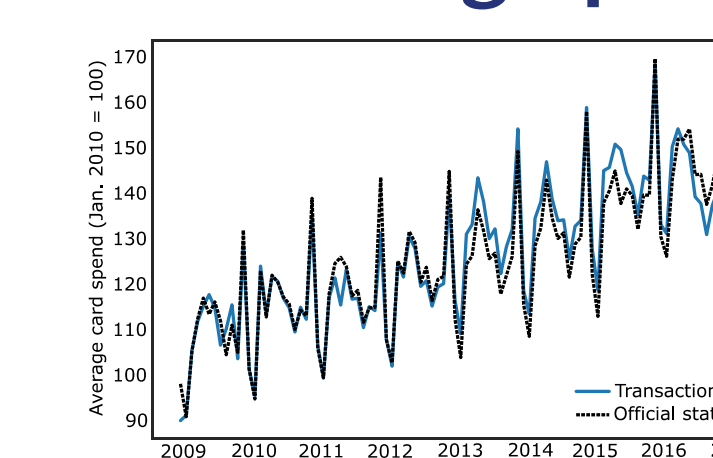
## Application: Social Influence on Consumer Spending

**Question**
Do people change their spending behaviour when a friend experiences an income shock?
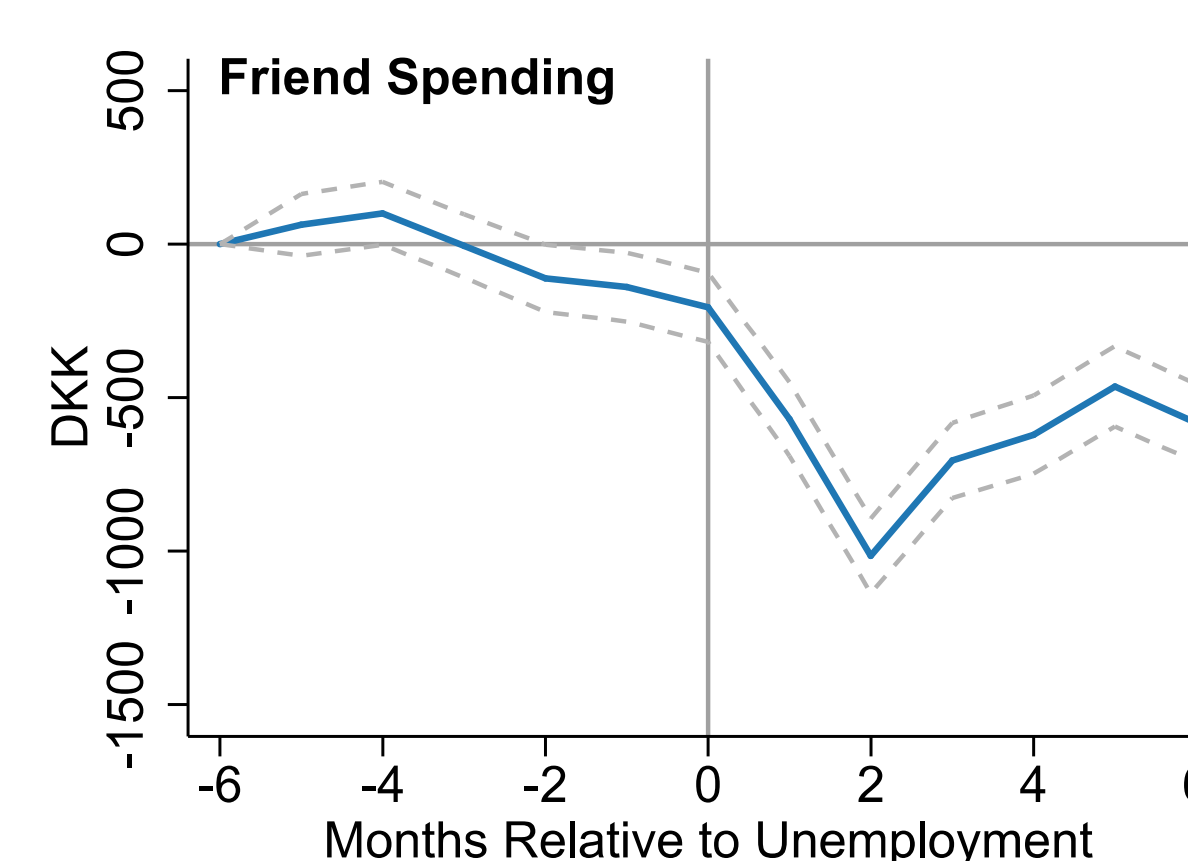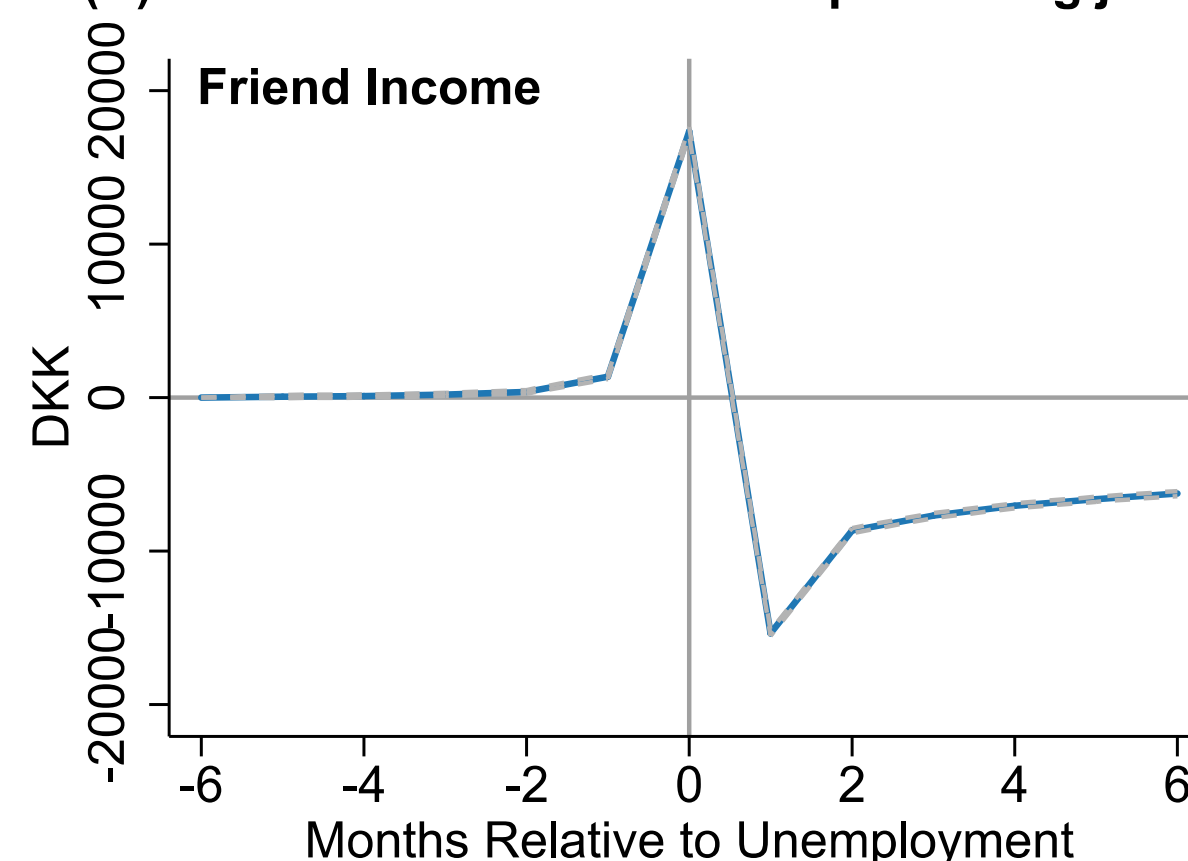
**Method**
Event-study identifies dynamics of spending around month in which friend working in different industry suddenly loses their job
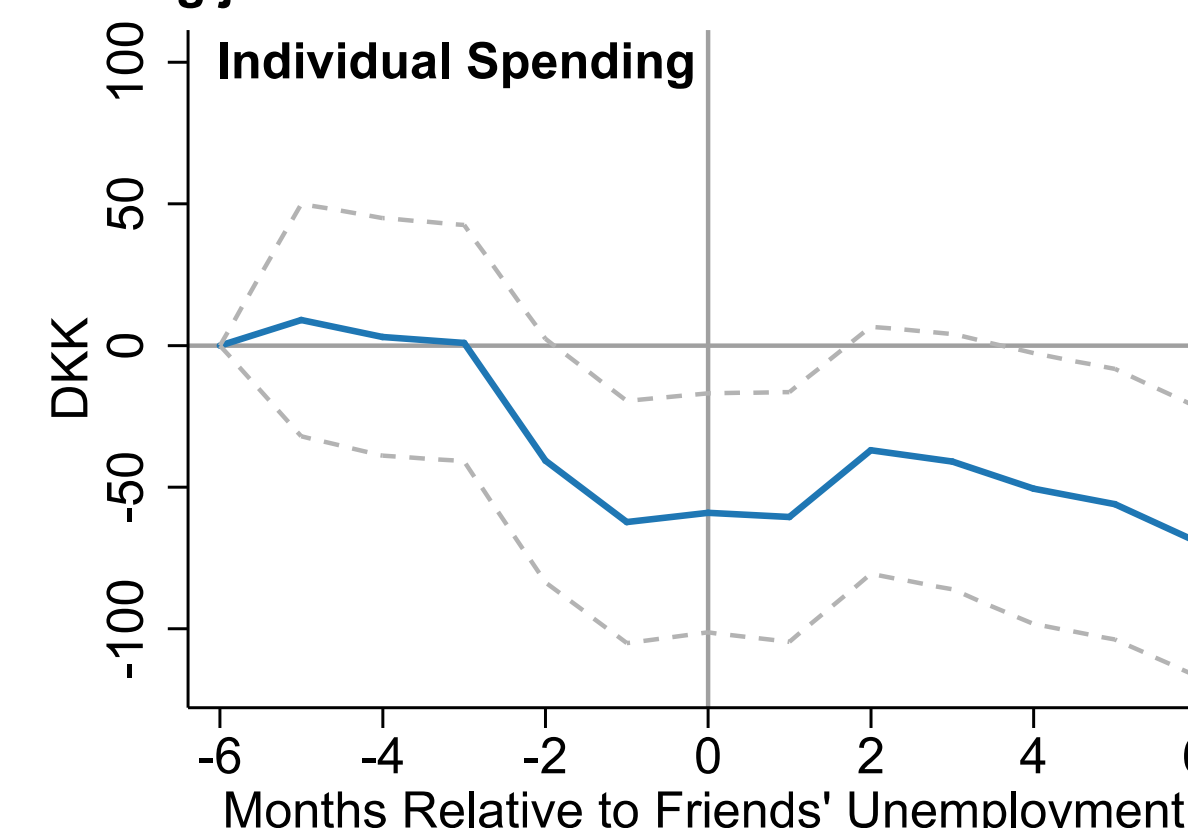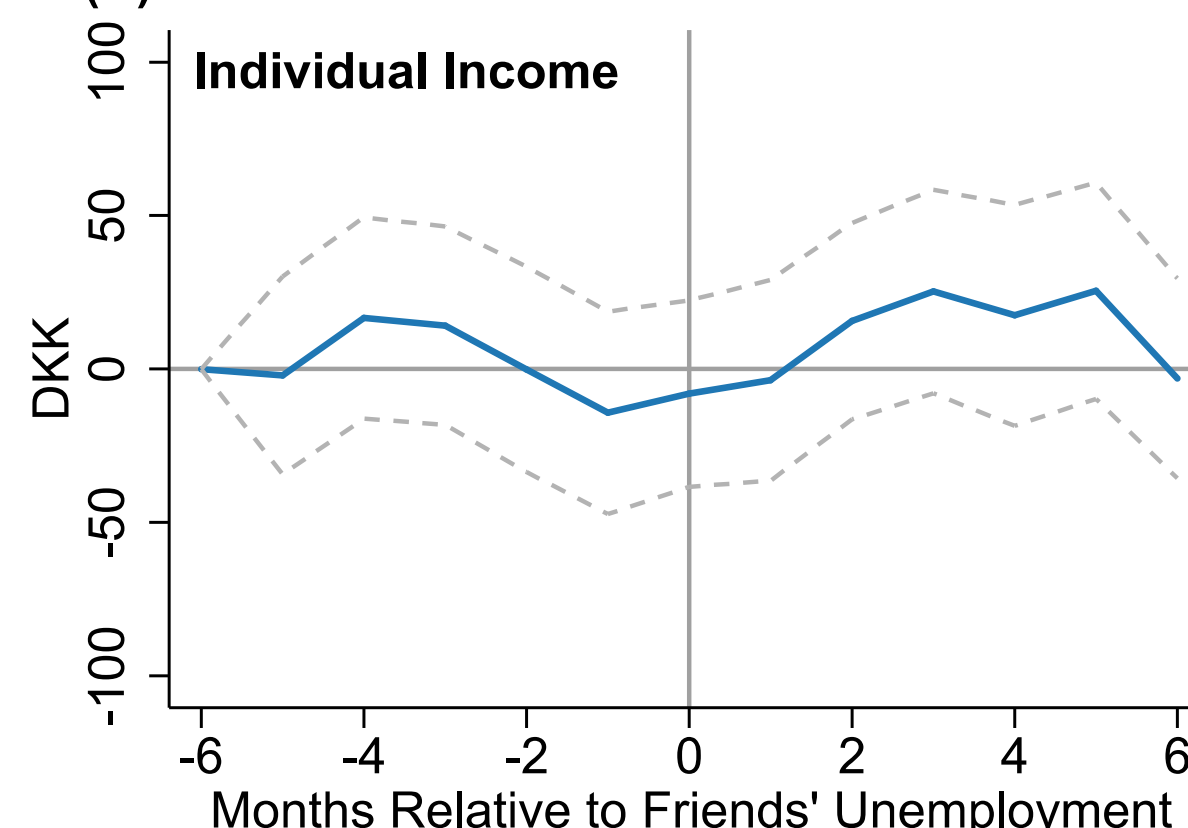
**Measuring Spending**



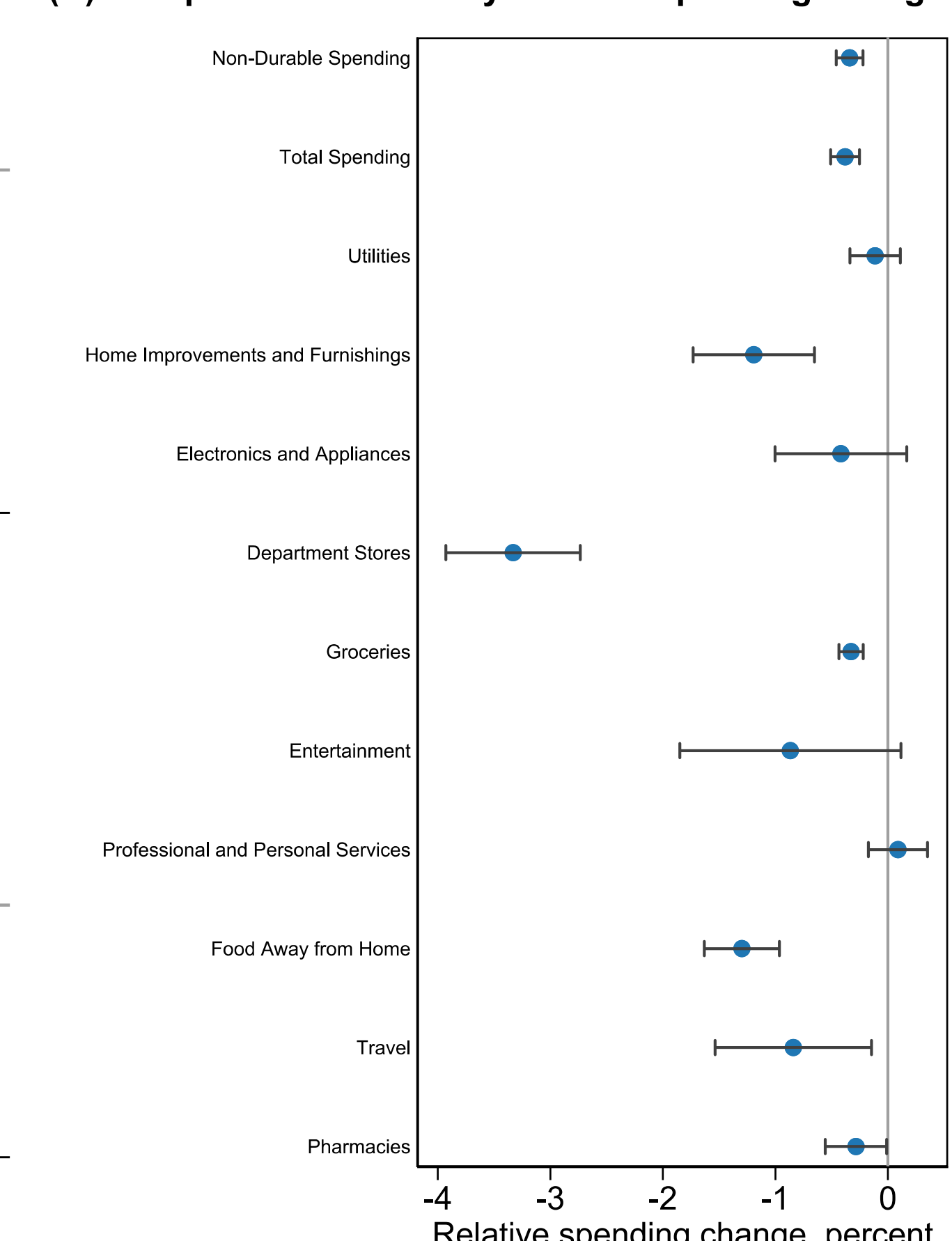Exploit linked transaction data from Denmark's largest bank

**(A) Event studies for friends experiencing job loss:**



**(B) Event studies for individuals with friends experiencing job loss:**



**(C) Composition of socially induced spending change:**



**Results**

1. People cut spending in same month as friend
2. Social multiplier of 2, larger than studies using indirect network measures
3. Influence extends beyond social expenses to personal durables, suggesting channel through expectations