CONSUMPTION INEQUALITY AND THE FREQUENCY OF PURCHASES

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GROWING INTEREST IN INEQUALITY

- Rising economic inequality in the U.S. and other advanced economies has become one of the most widely discussed topics among economists, policymakers and the general public.
- We've seen sharply rising income and wealth inequality since the early 1980s.



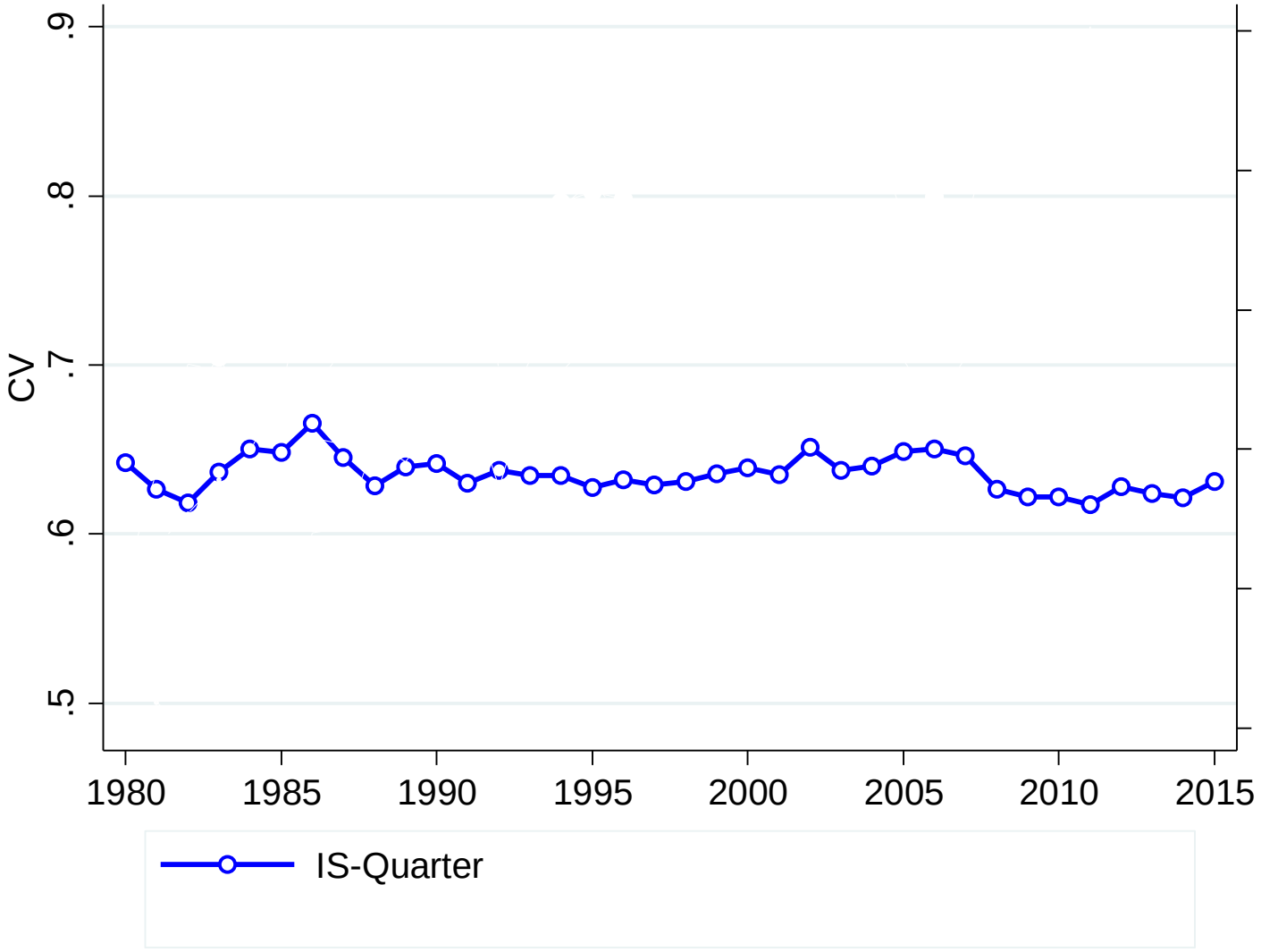
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  - Using the Interview Survey, Krueger and Perri (2005) show consumption inequality has not risen. They argue larger transitory shocks have raised smoothing motives and helped spur rise in financial sector.

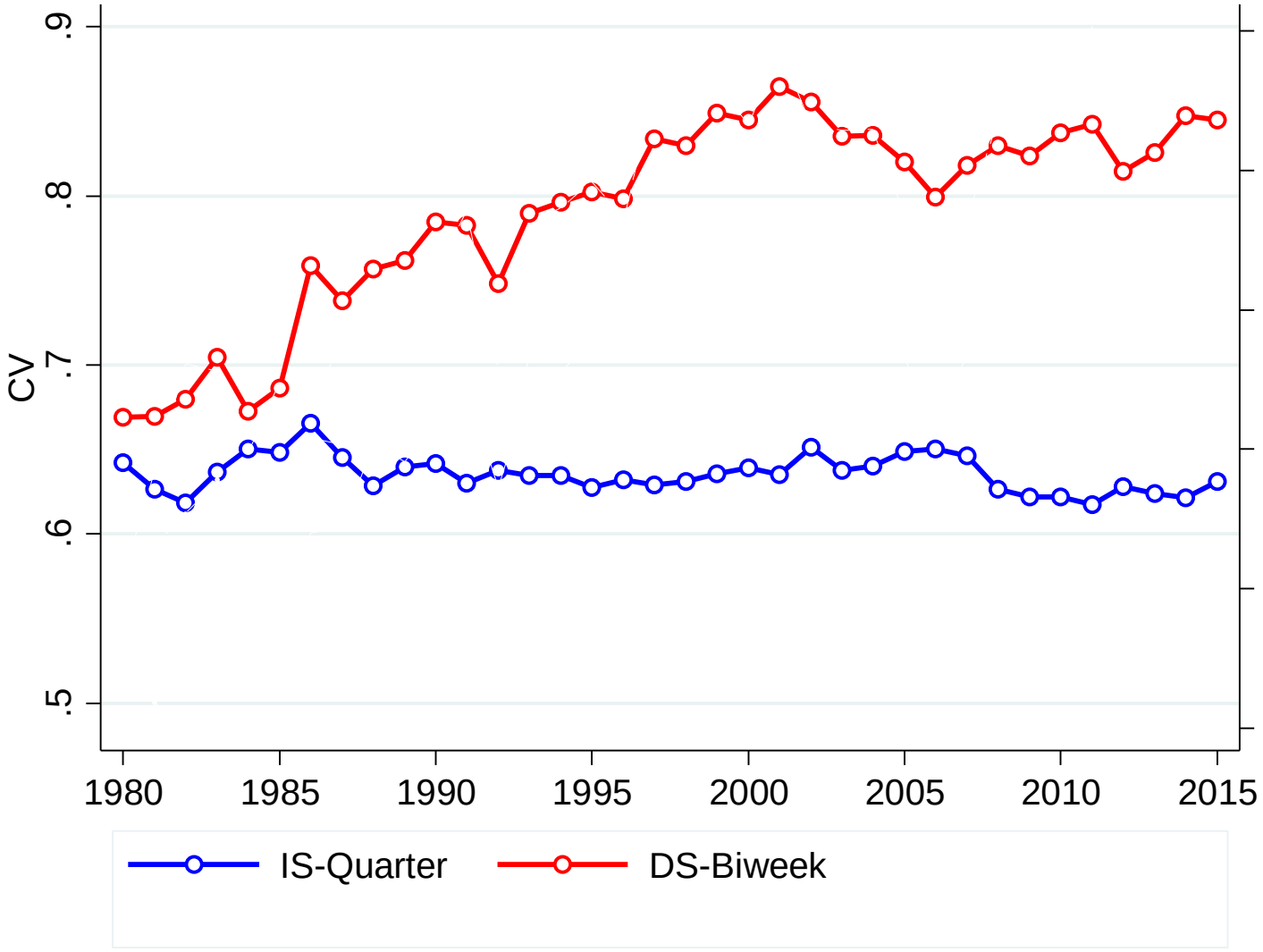
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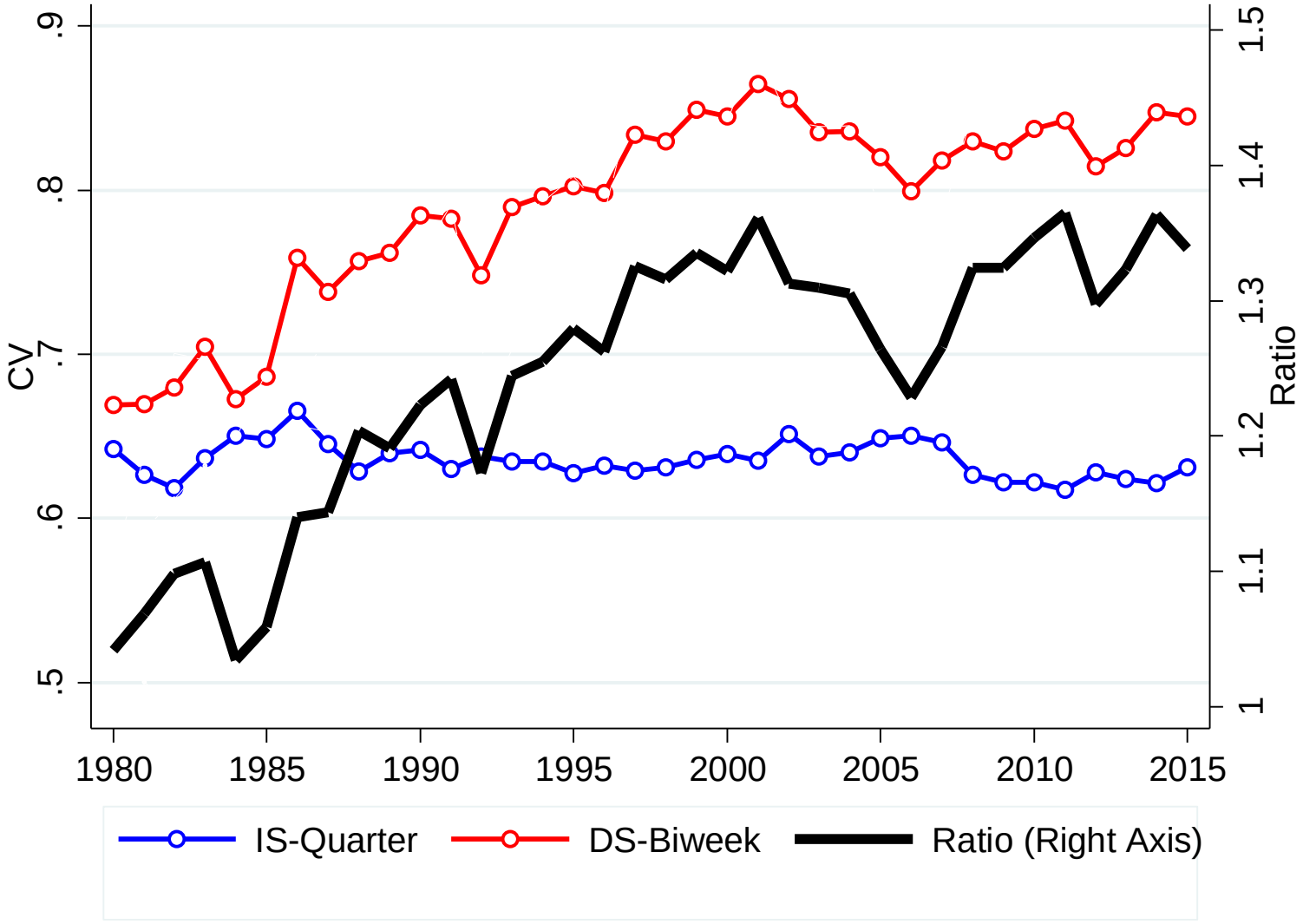
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  - Using the Interview Survey, Krueger and Perri (2005) show consumption inequality has not risen. They argue larger transitory shocks have raised smoothing motives and helped spur rise in financial sector.
  - Using the Diary Survey, Attanasio et al. (2007), Aguiar and Bils (2015) show that consumption inequality has tracked income inequality once one addresses measurement issues in consumption data.

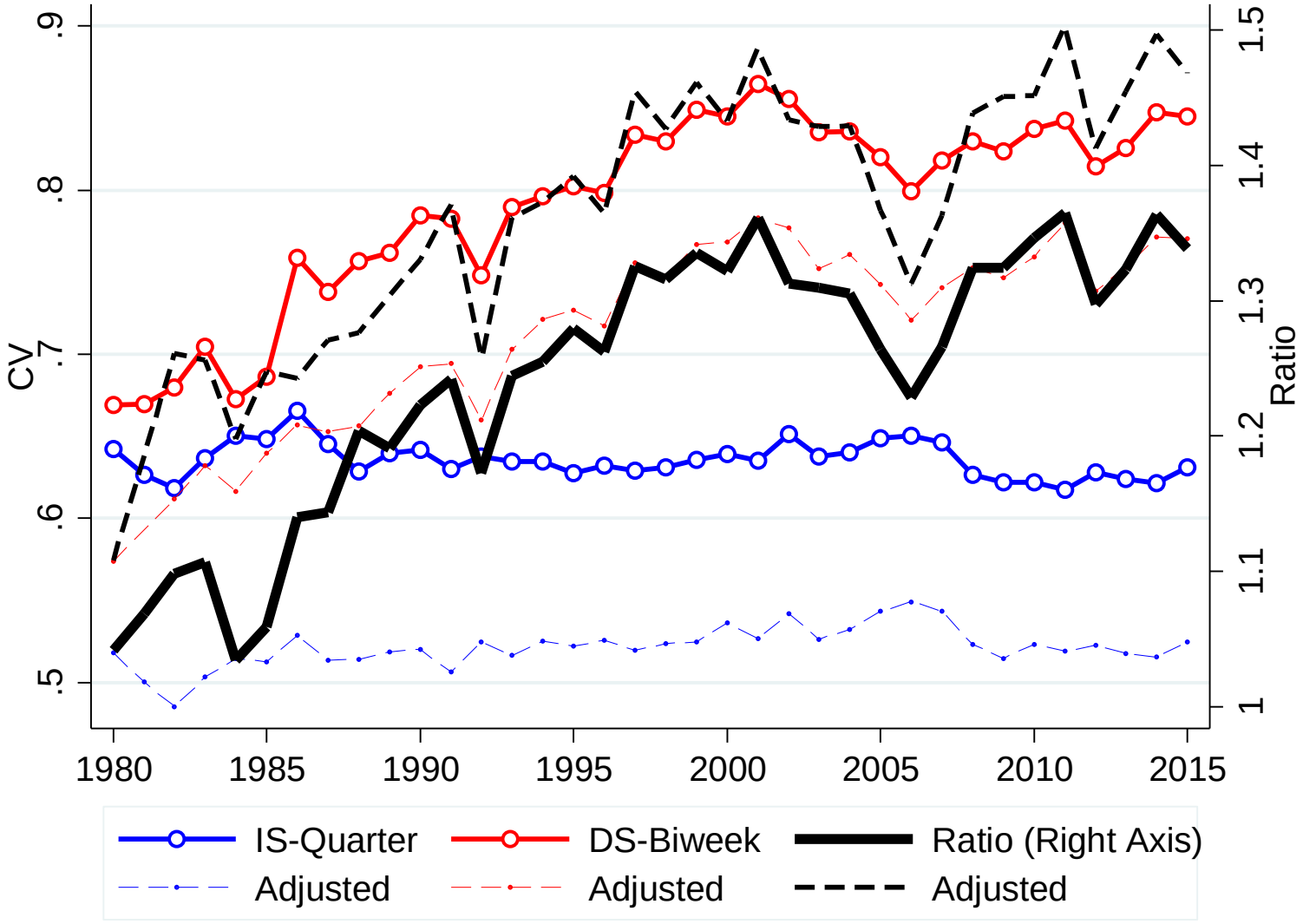
CONSUMPTION INEQUALITY



CONSUMPTION INEQUALITY



CONSUMPTION INEQUALITY



Two surveys in the CEX: Diary Survey and Interview Survey. The two yield starkly different implications for trends in consumption inequality.

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- The shorter the measurement period for expenditures, the bigger the rise in expenditure inequality will appear to be.

WHAT WE DO

- Document a falling frequency of purchases by US households and show that aggregating household expenditures over different time lengths can account for *all* of the differences in trends of expenditure inequality observed in US data.

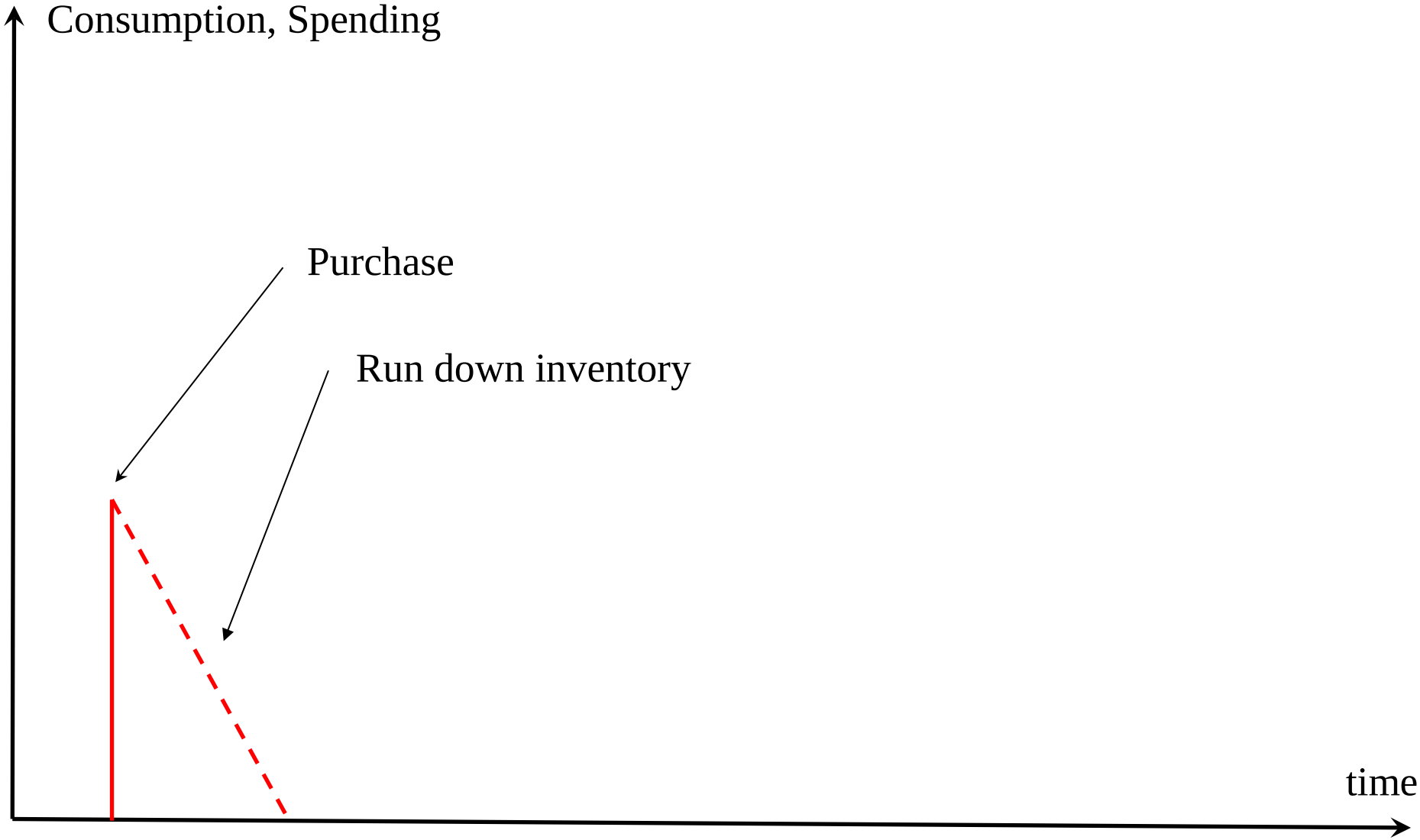
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- Document a falling frequency of purchases by US households and show that aggregating household expenditures over different time lengths can account for *all* of the differences in trends of expenditure inequality observed in US data.
- Provide diverse evidence of increased "stocking up" by households:
  - Households spend positive amounts on fewer days of the week.
  - Households do fewer shopping trips but spending more on each trip.
  - Households buy larger quantities/volumes of goods on each trip.
  - Households spend less time on shopping overall.

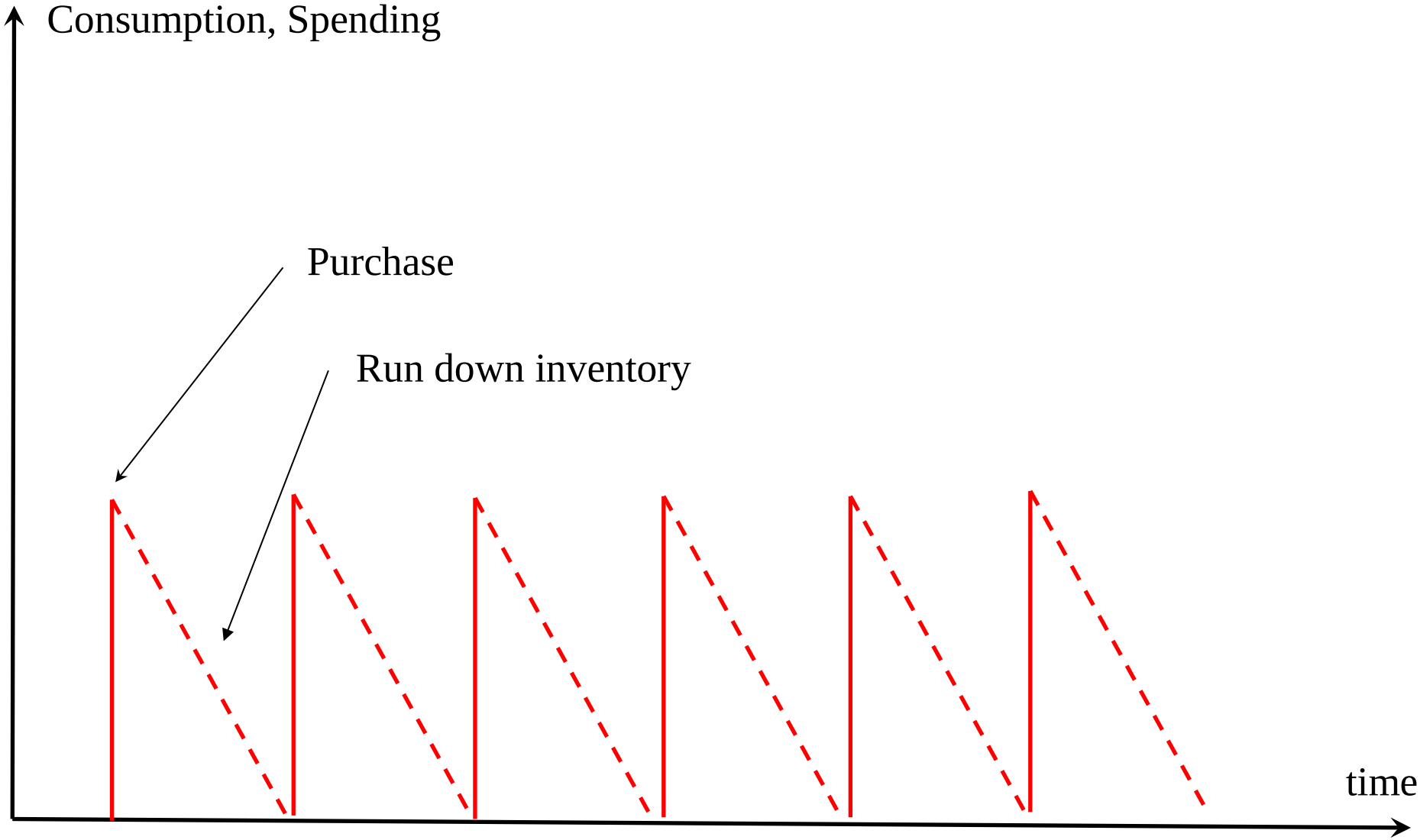
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- Provide diverse evidence of increased “stocking up” by households.
- Provide evidence that the rise of “warehouse/club” (Costco, Sam’s Club, BJ’s, etc.) retailers has contributed to this trend.
  - The time dispersion in an individual’s expenditures is more strongly correlated with their share of expenditures going to club stores when expenditures are measured at high frequencies.

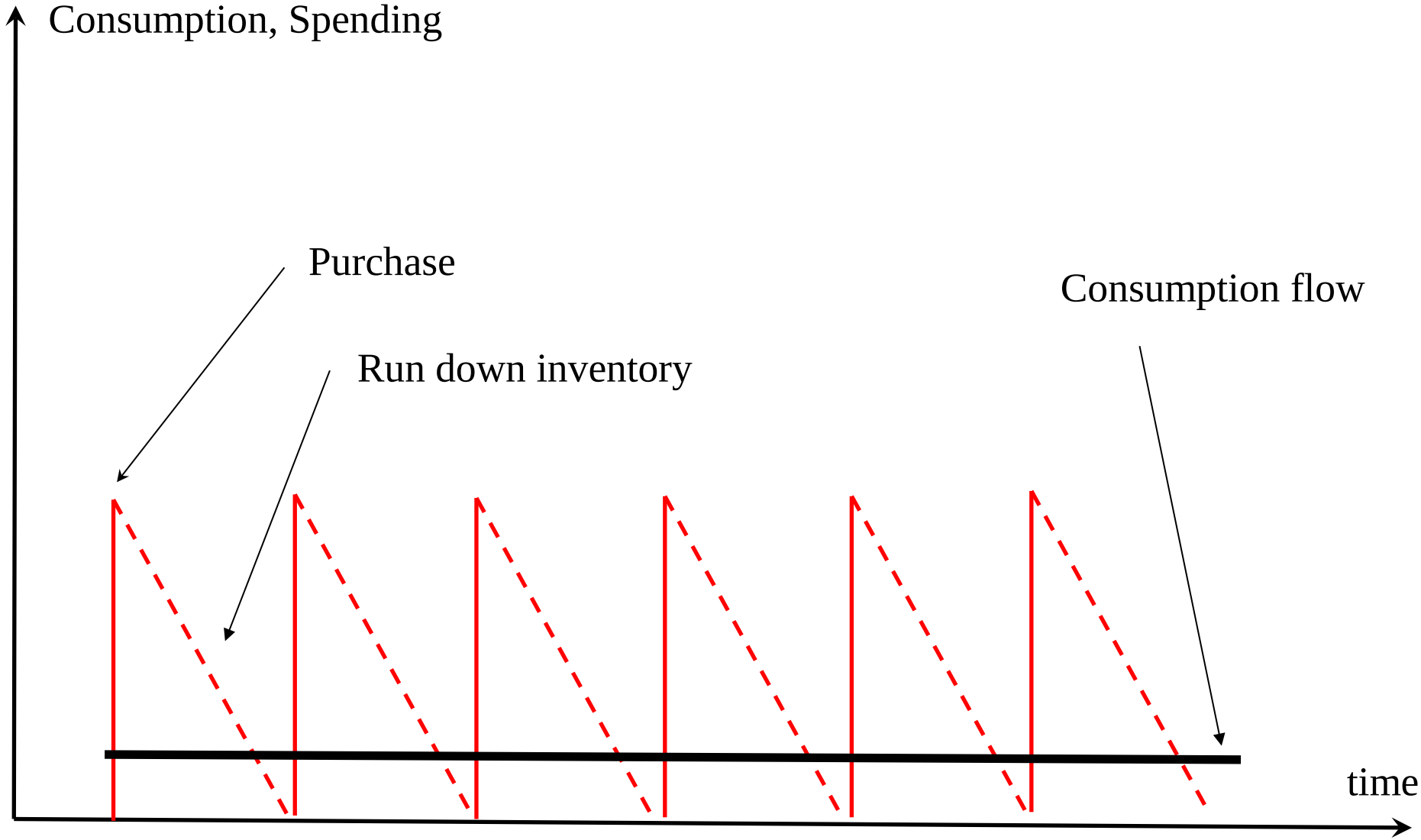
A Simple Framework



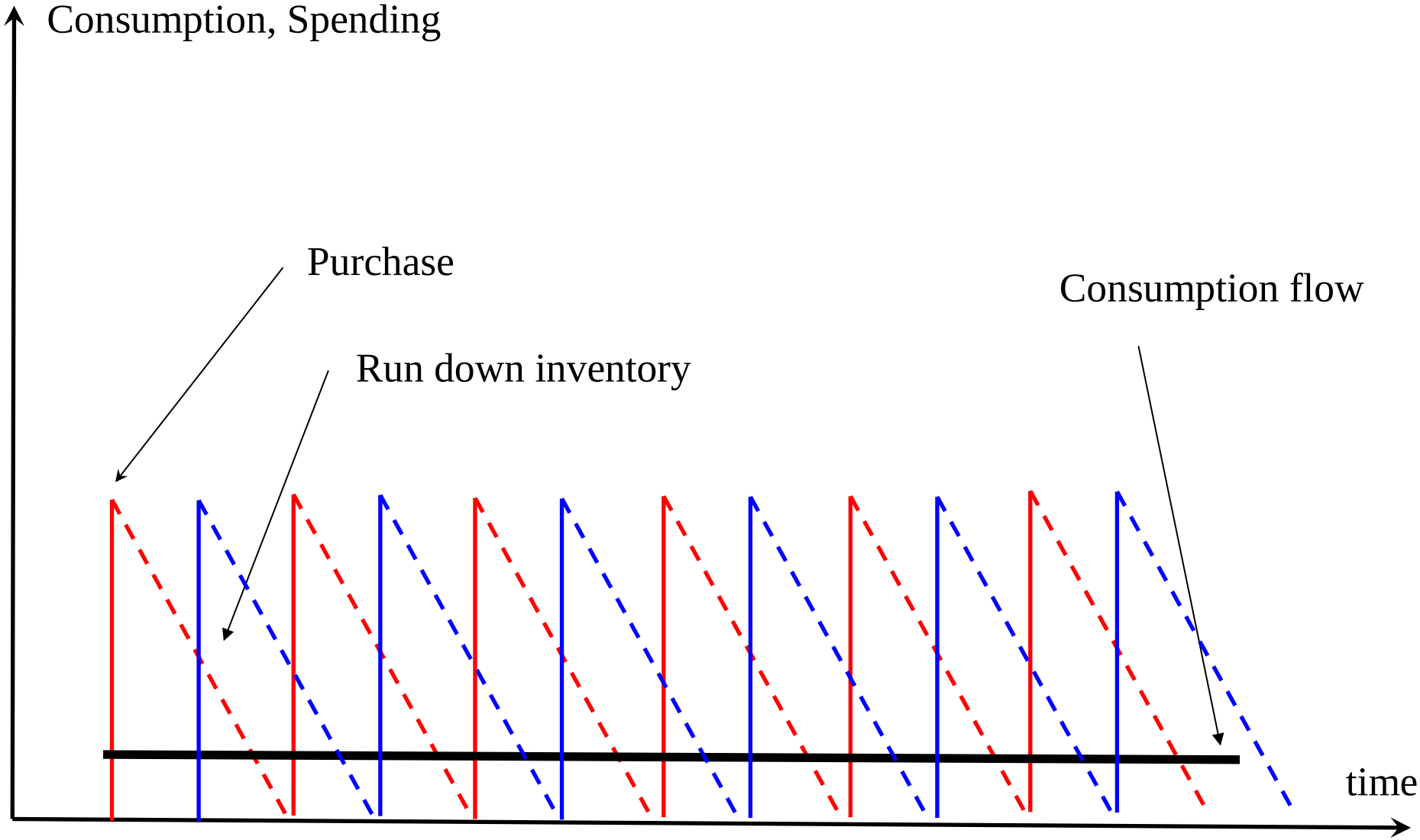
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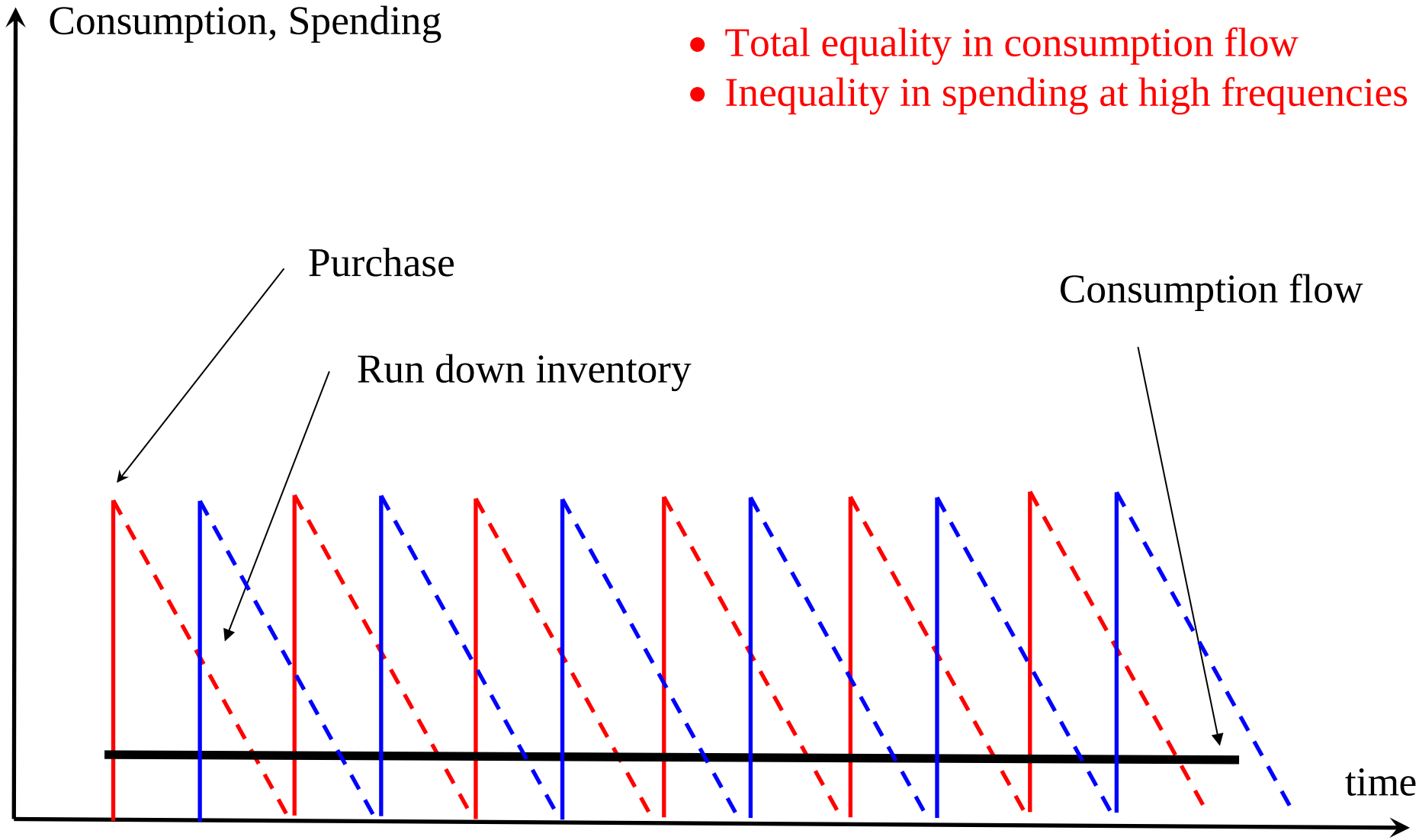
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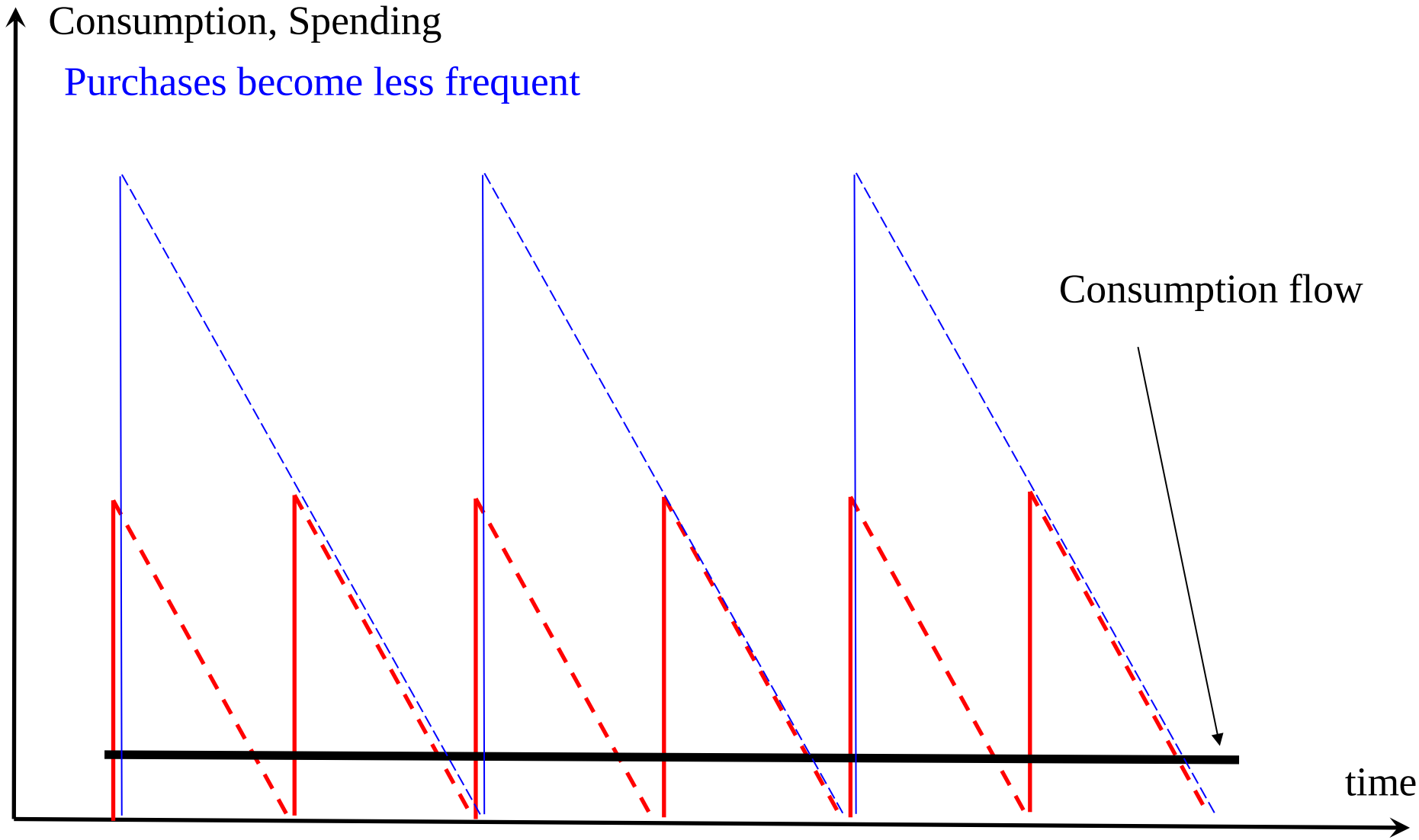
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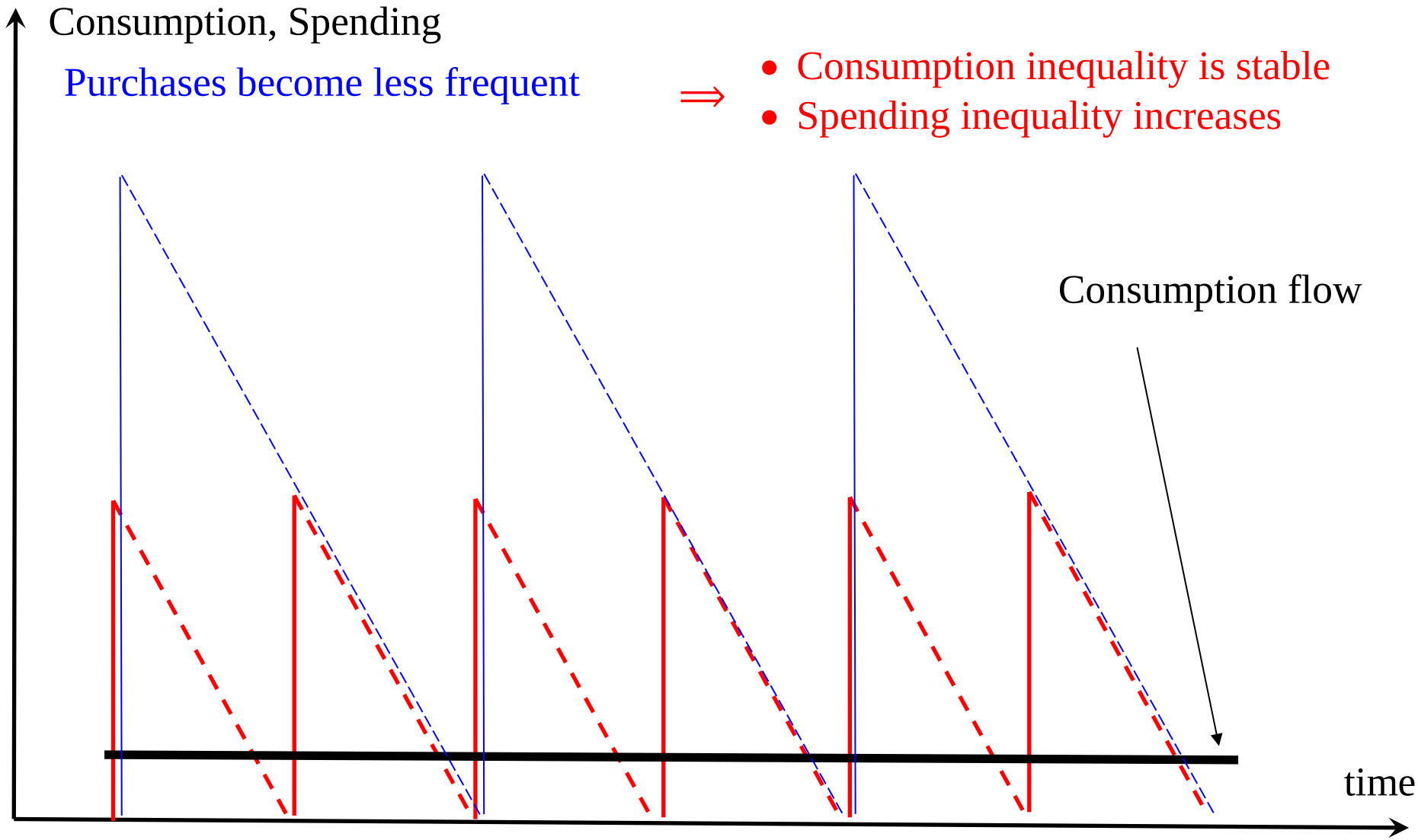
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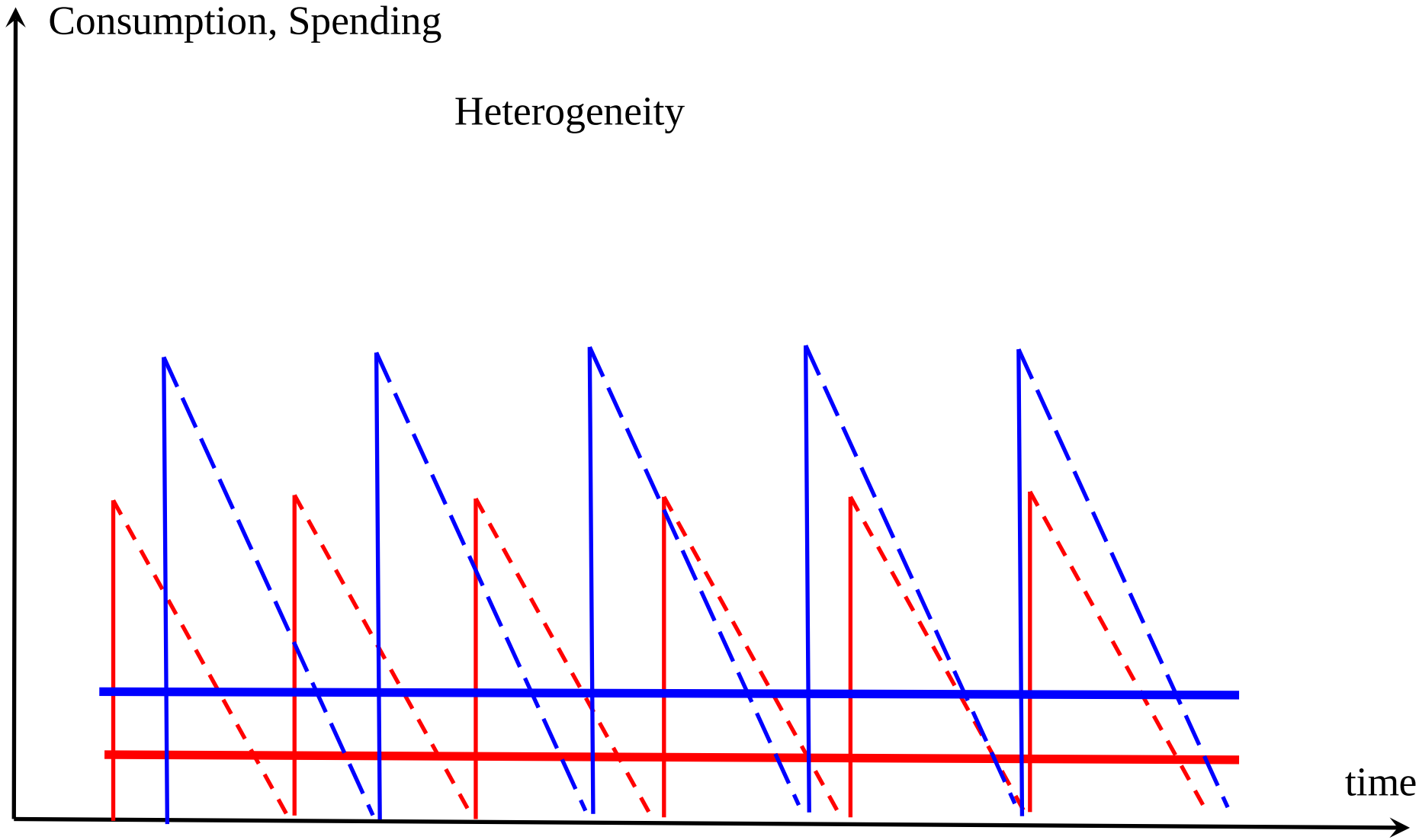
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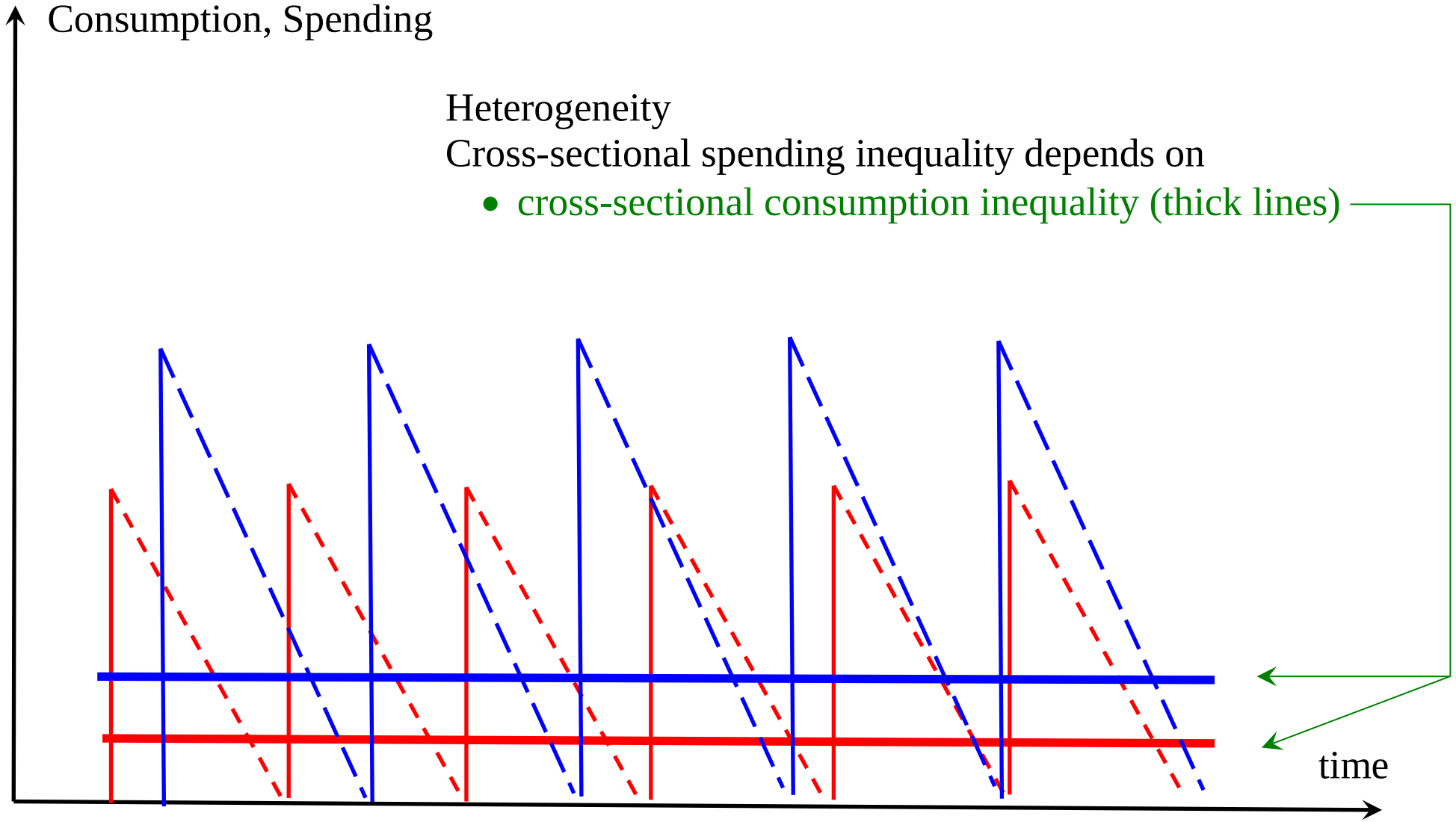
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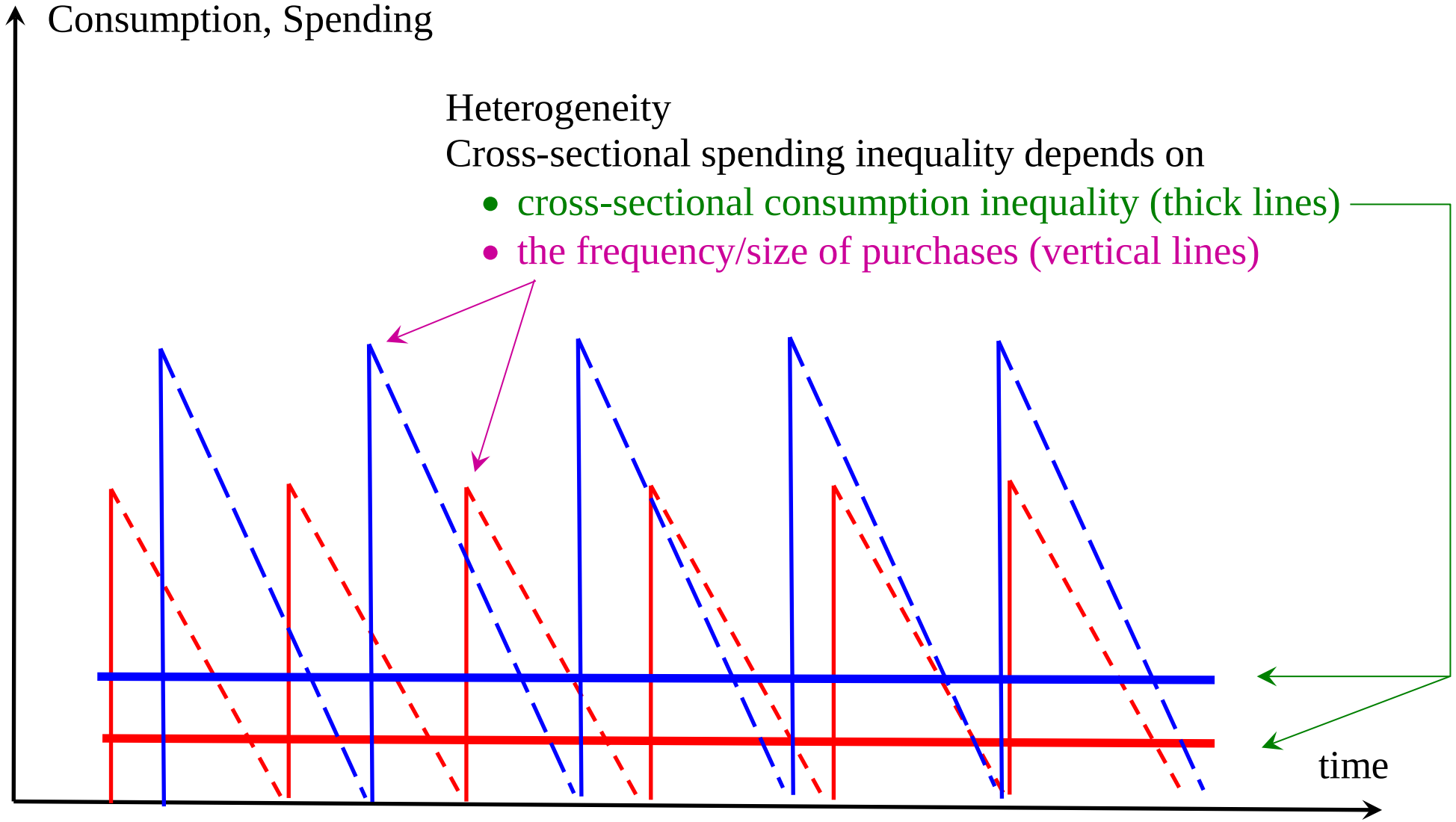
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TWO PRIMARY CEX SURVEYS OF SPENDING

	Interview Survey	Diary Survey
Size of cross-section:	>5,000 per quarter	~4,500 per year
Time period of recorded expenditures:	Monthly-quarterly	Daily spending over two-week periods
Categories of goods:	95% of spending	Comprehensive after 1985
Time period:	1980-current	1980-current with breaks.
Track spending:	1 month/1 quarter	2 weeks

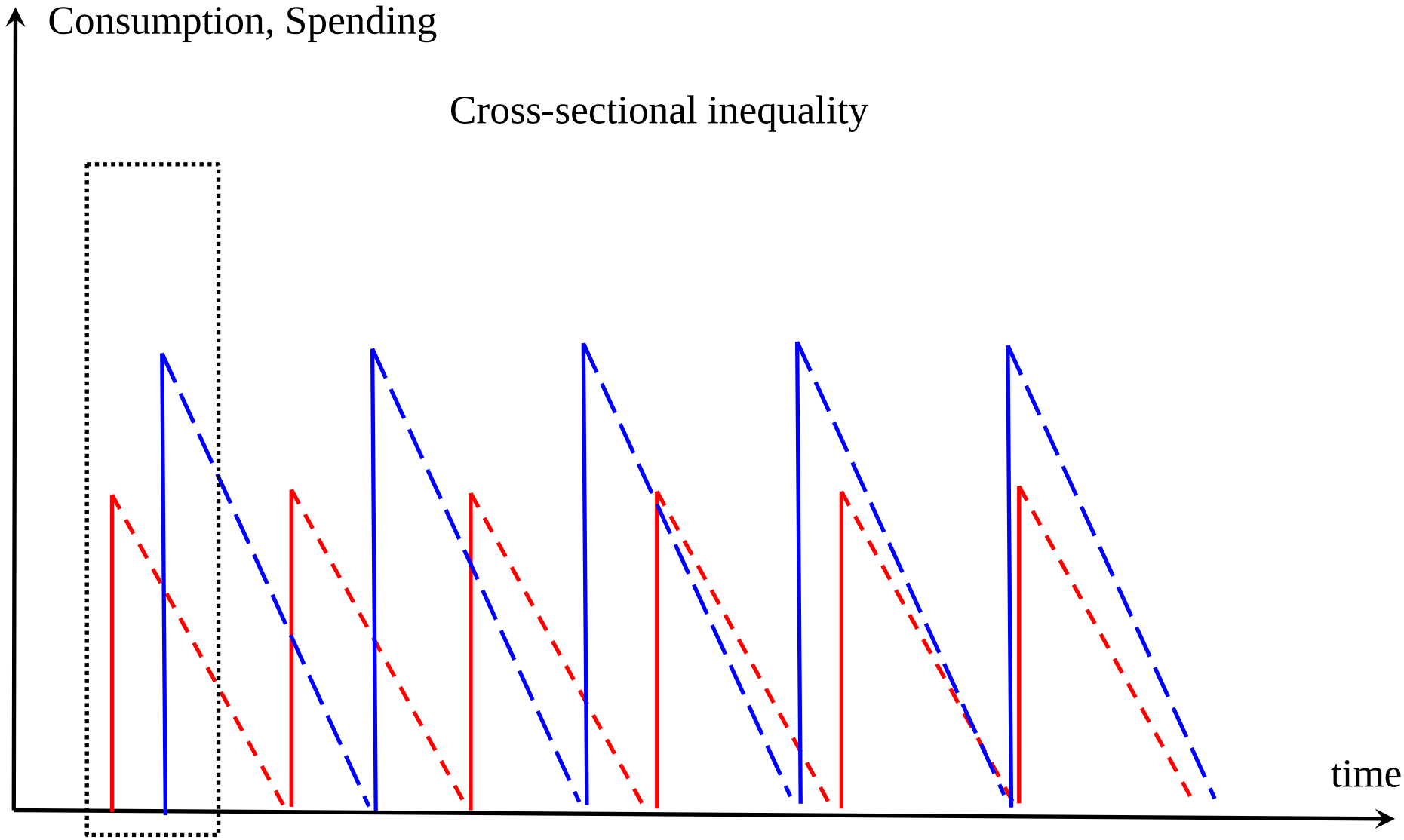
MEASURING INEQUALITY IN SPENDING

- Measure of expenditure inequality: *Coefficient of Variation* (CV)

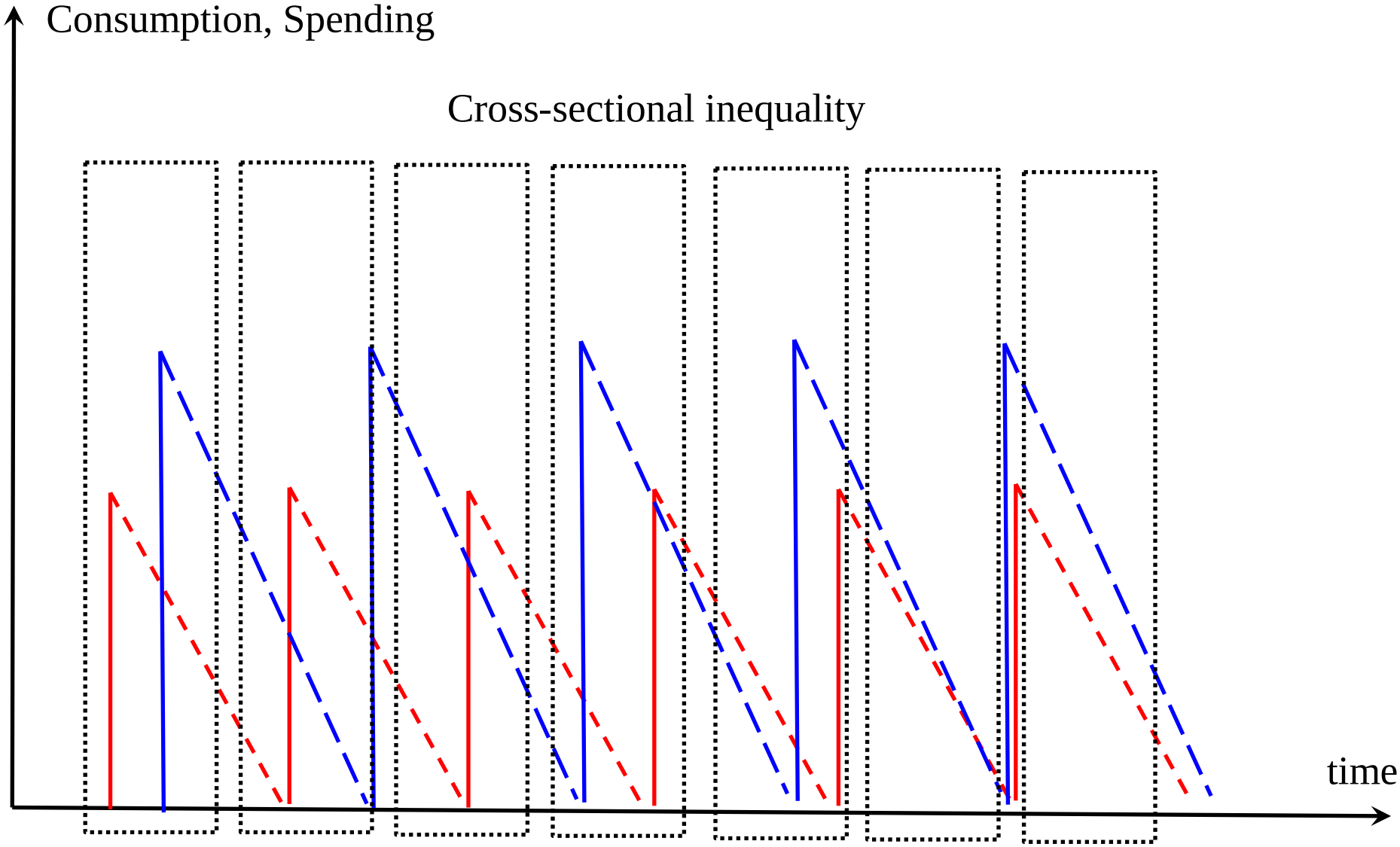
- Let X_{htp} be spending of household h in period p (a week, bi-week, month, quarter of a given year, or a year itself) of calendar year t.

- For each year t, we calculate the cross-sectional coefficient of variation $\overline{CV}_{tp} = \sigma_{tp}/\bar{X}_{tp}$ where average spending for year t is $\bar{X}_{tp} = \frac{1}{\#h\#p}\sum_p \sum_h X_{htp}$ and the standard deviation of spending for the period is $\sigma_{tp}^2 = \left(\frac{1}{\#h\#p}\sum_p \sum_h \left(X_{htp} - \bar{X}_{tp}\right)^2\right)$.

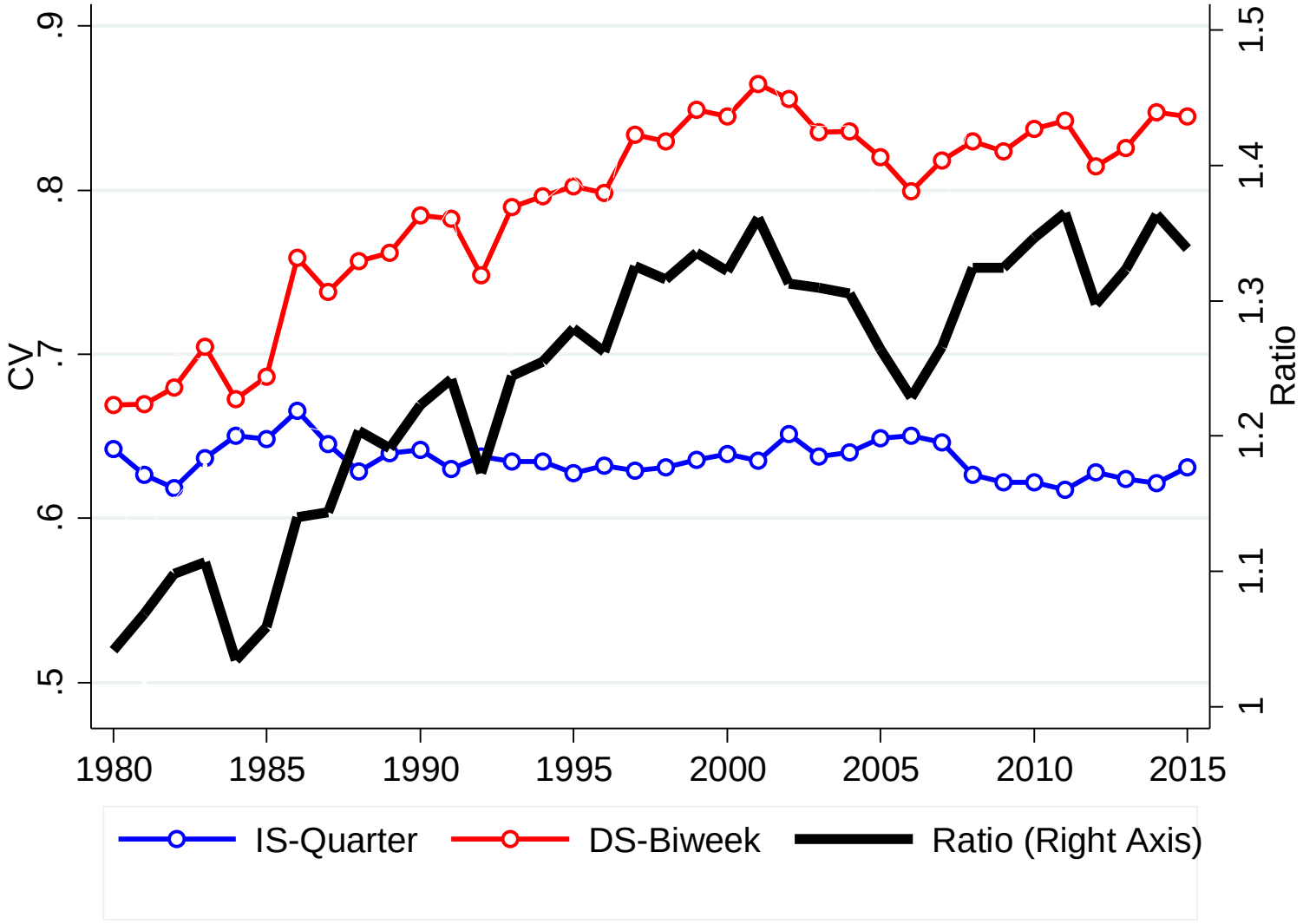
A Simple Framework



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MEASURING INEQUALITY IN SPENDING



The Diary Survey points toward a sharp rise in expenditure inequality while the Interview Survey does not.

THE NIELSEN HOMESCAN DATA

	Nielsen	Diary Survey
Size of cross-section:	40,000-70,000 per year	~4,500 per year
Time period of recorded expenditures:	Daily records of transactions over years.	Daily spending over two-week periods
Categories of goods:	30% of spending (“barcode” purchases)	Comprehensive after 1985
Time period:	2004-2014	1980-current with breaks.
Track spending:	3-4 years	2 weeks

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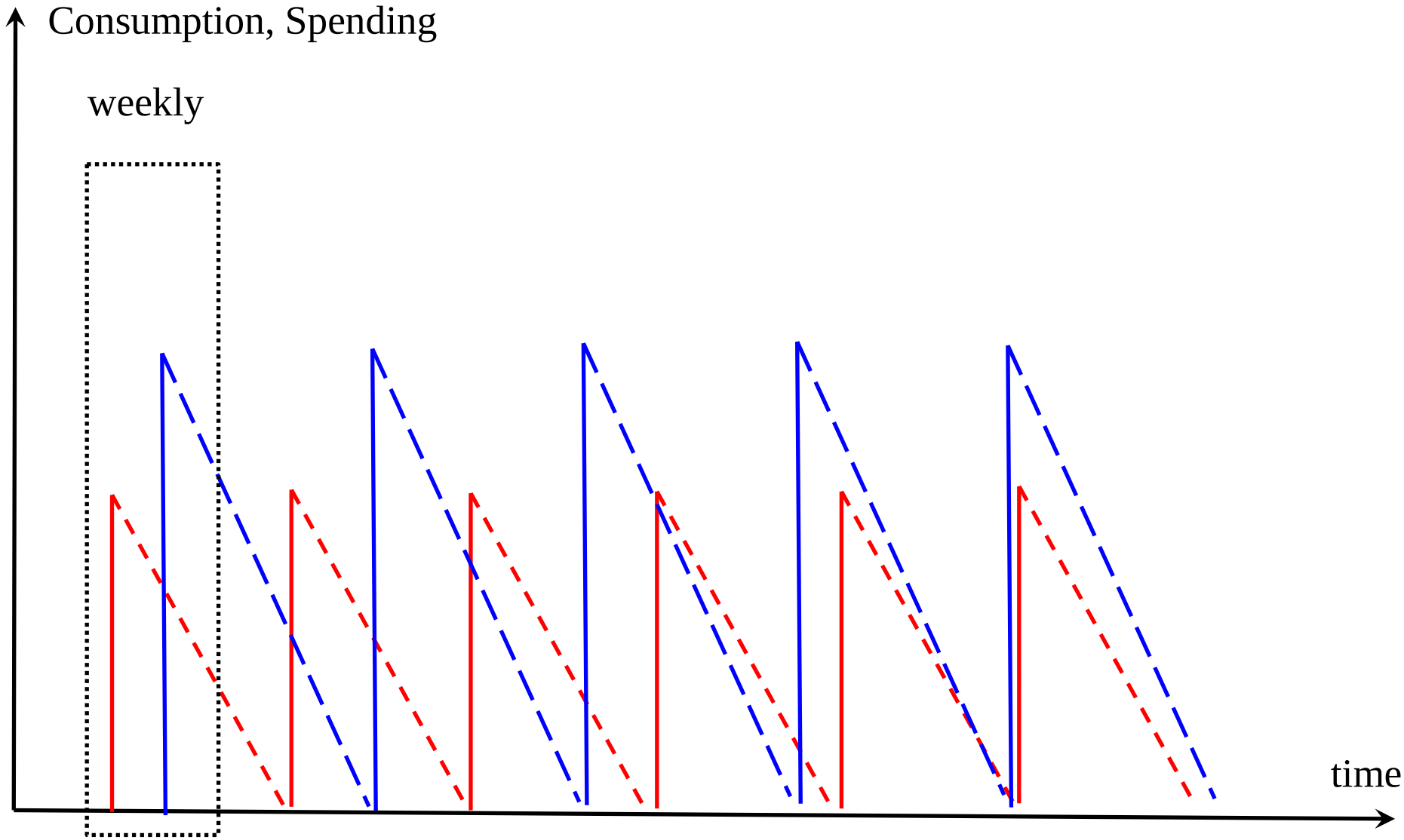
Our paper appendix has a bridge between UCC codes and Nielsen Data categories.

How Time Aggregation Affects Inequality Trends

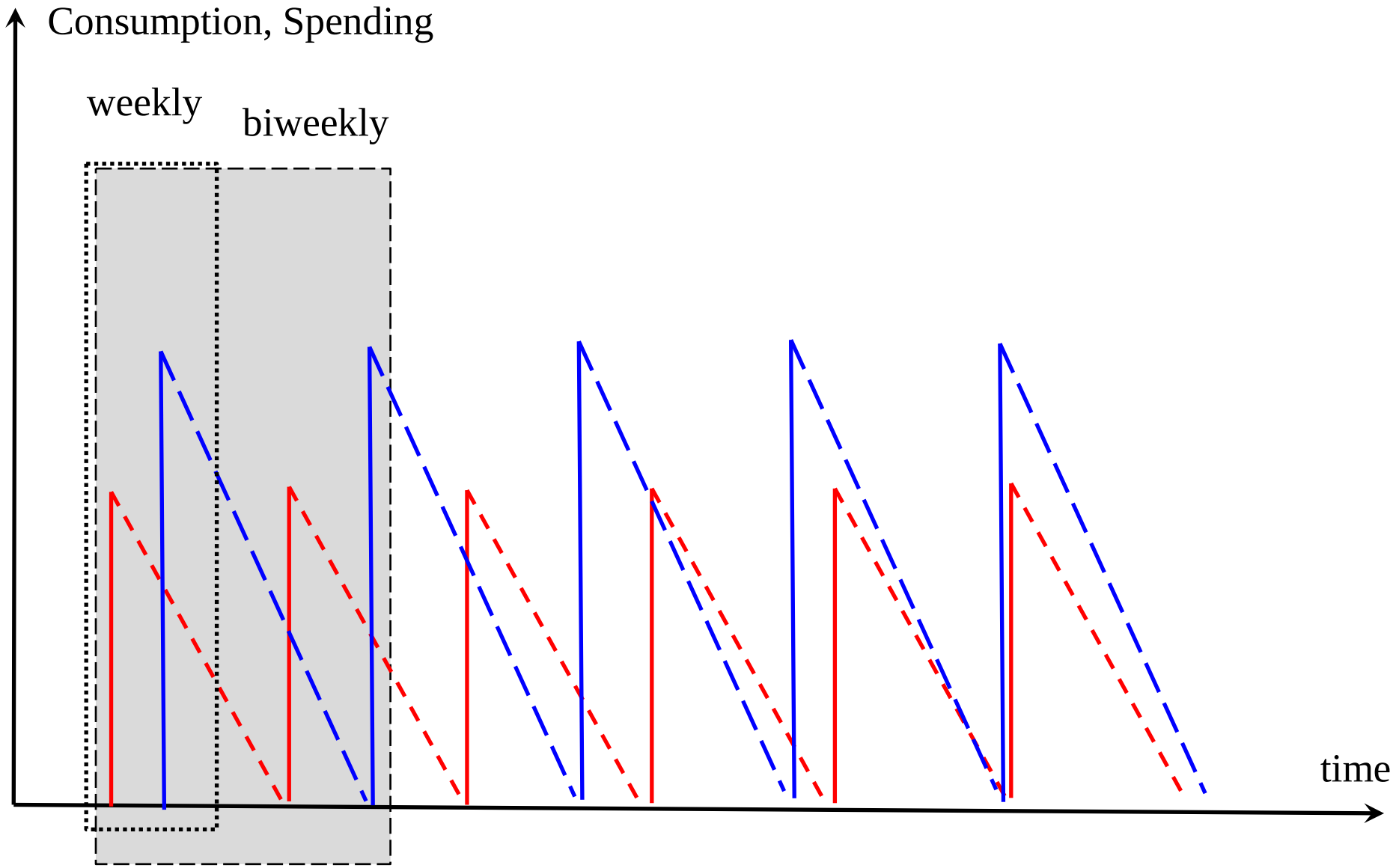
- In Nielsen data, we can aggregate household expenditures to different frequencies:
  - Weekly
  - Biweekly
  - Monthly
  - Quarterly
  - Annually

  then measure the average dispersion of expenditures (CV) for each year for each underlying length of time used to measure expenditures.
- We can then assess how trends in expenditure inequality vary with frequency used for time aggregation of expenditures.

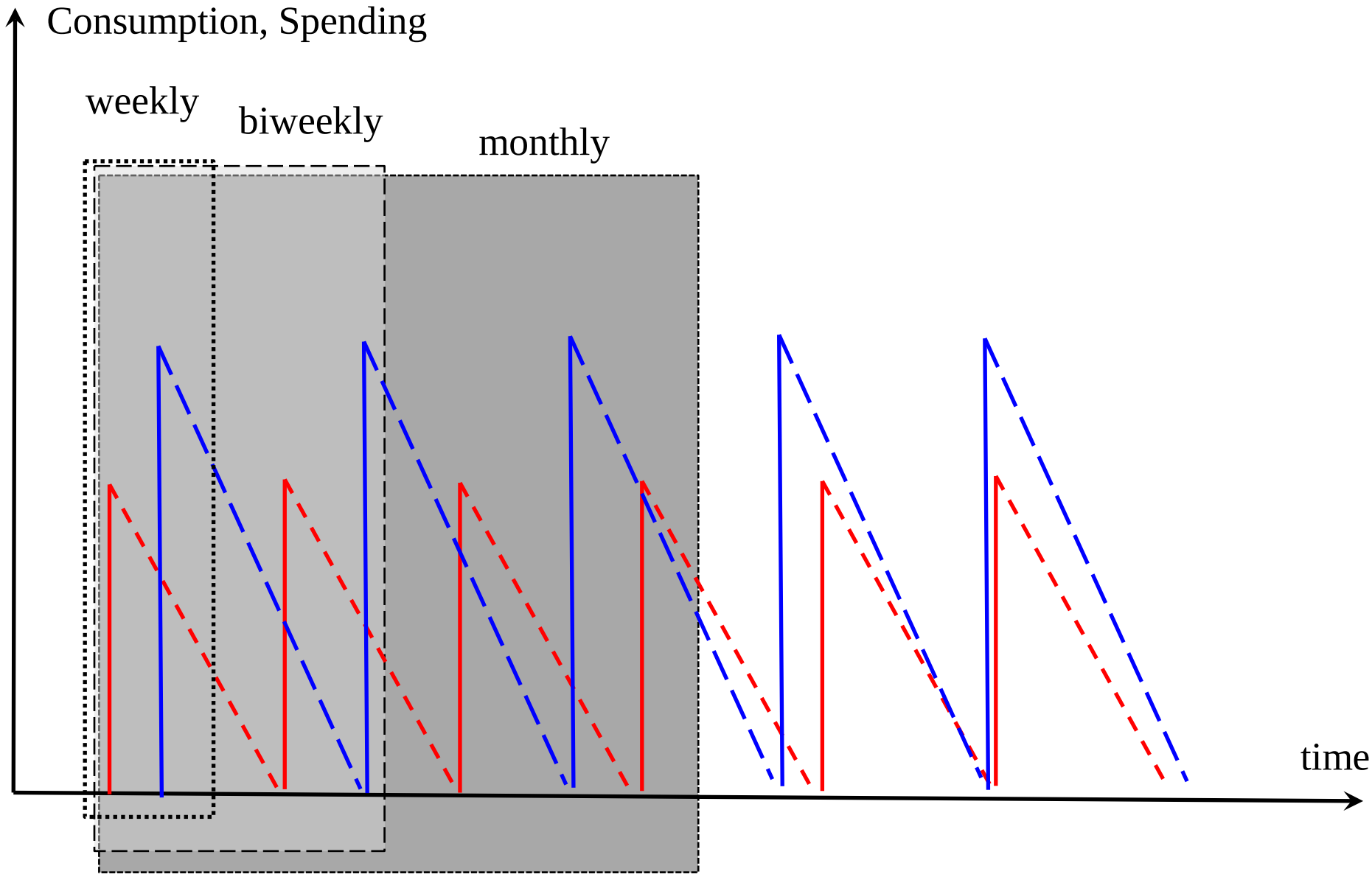
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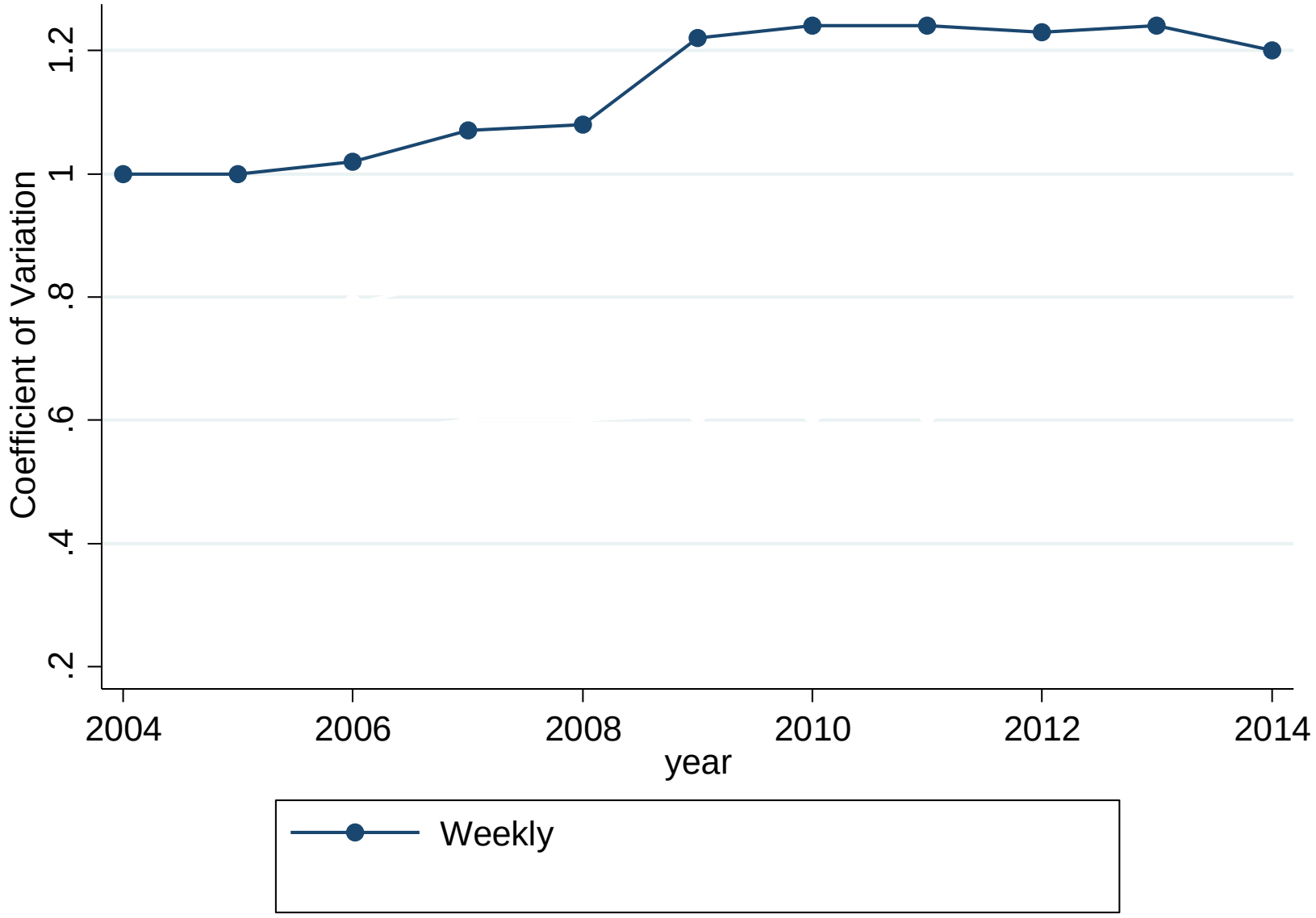
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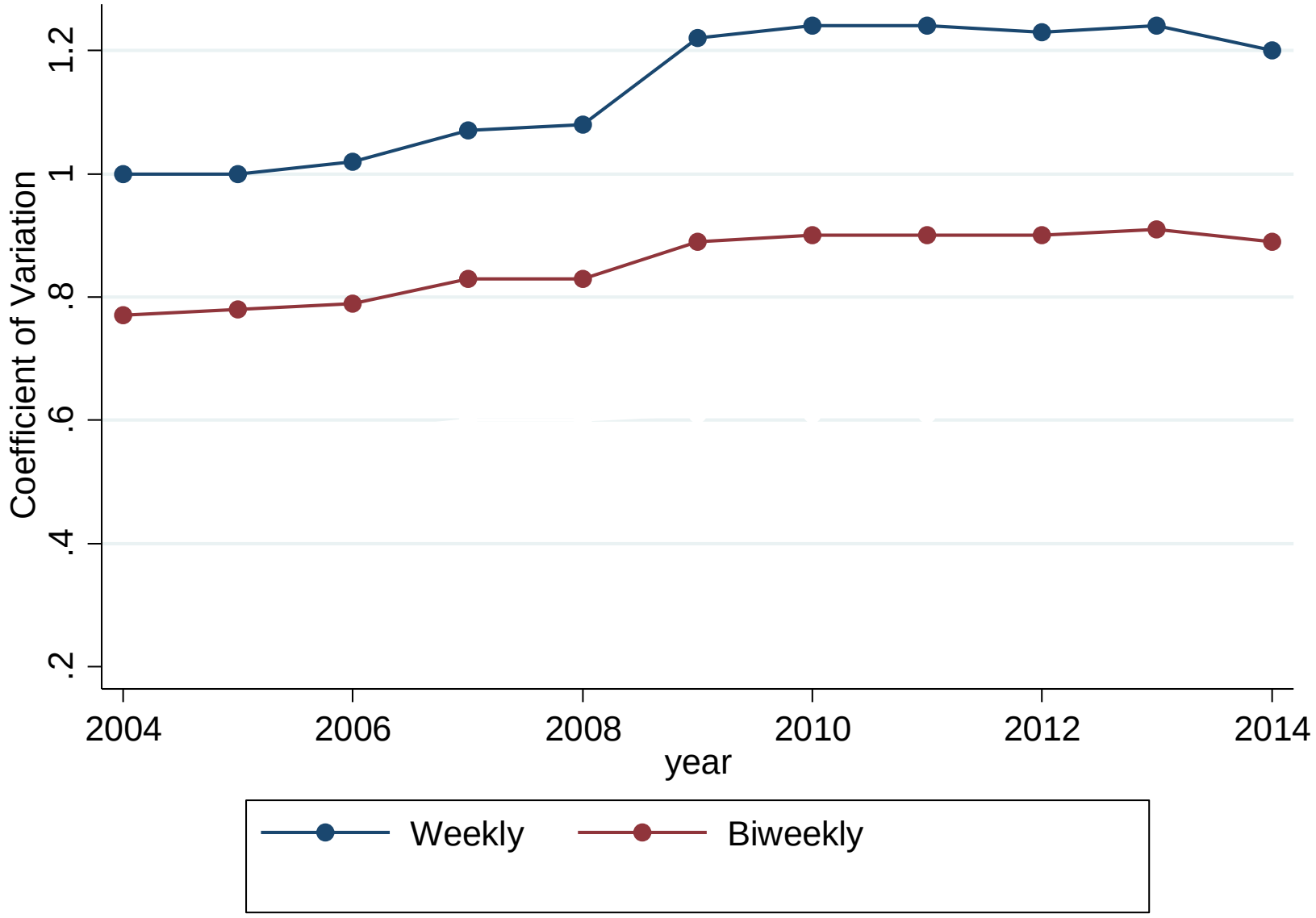
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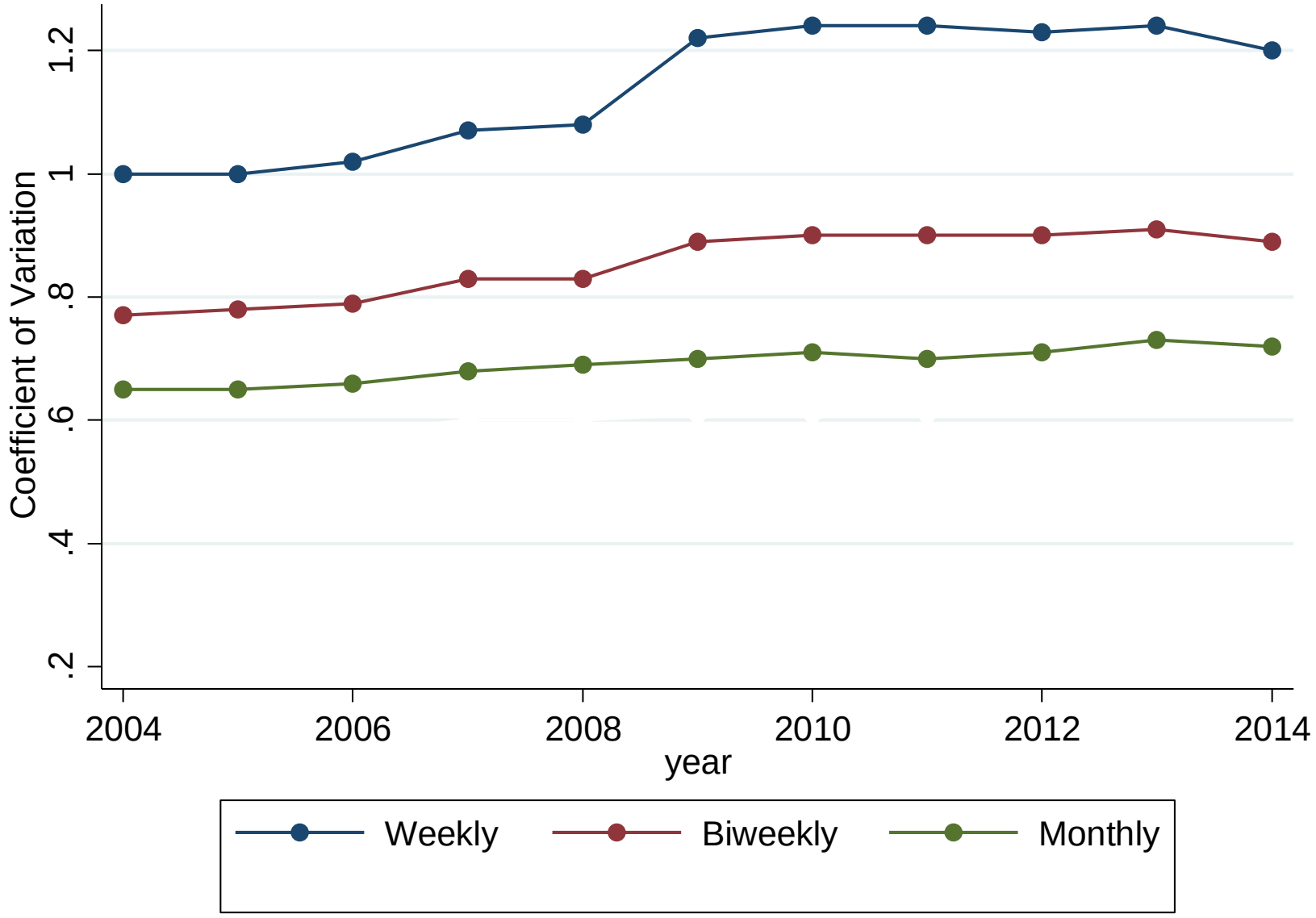
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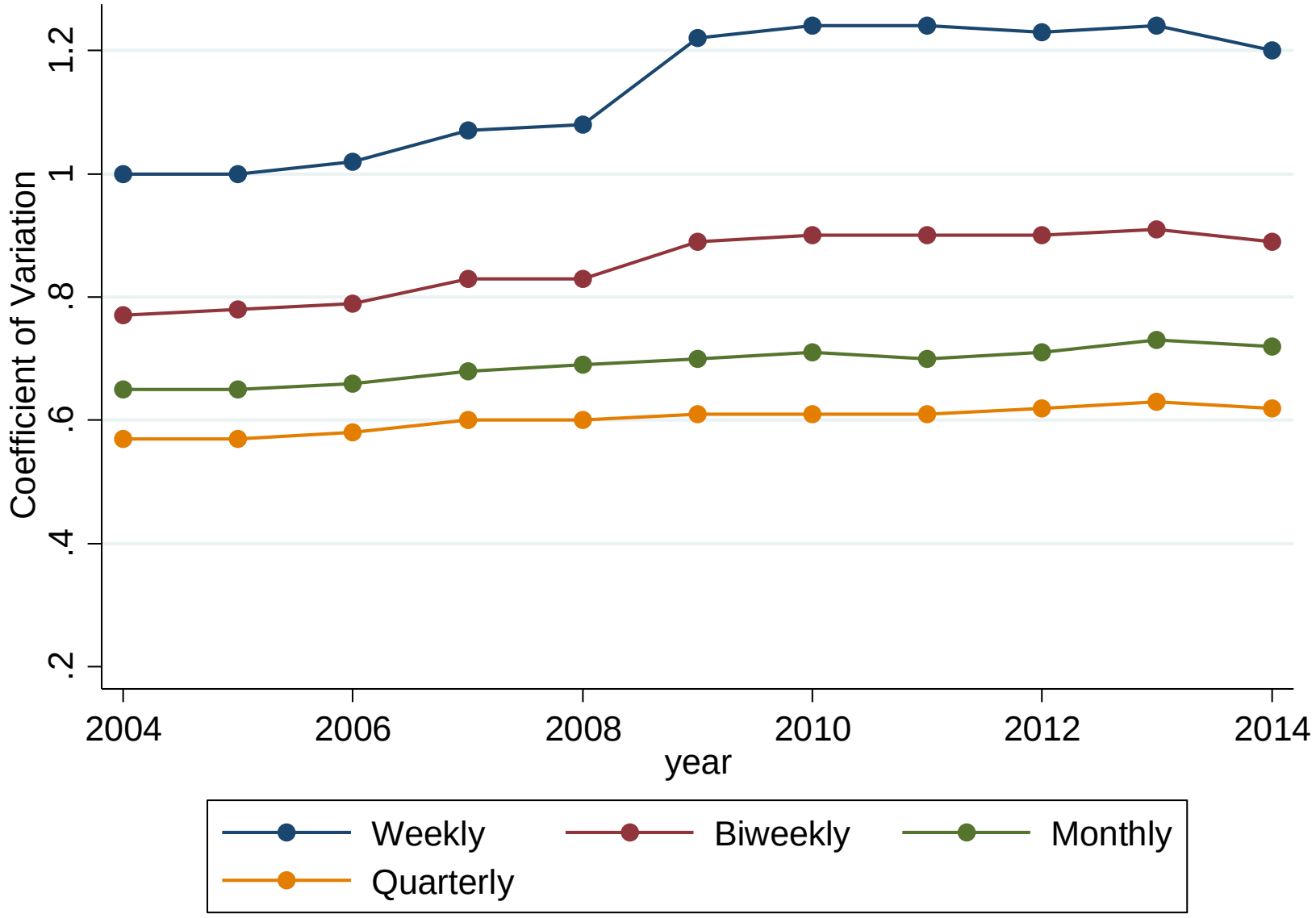
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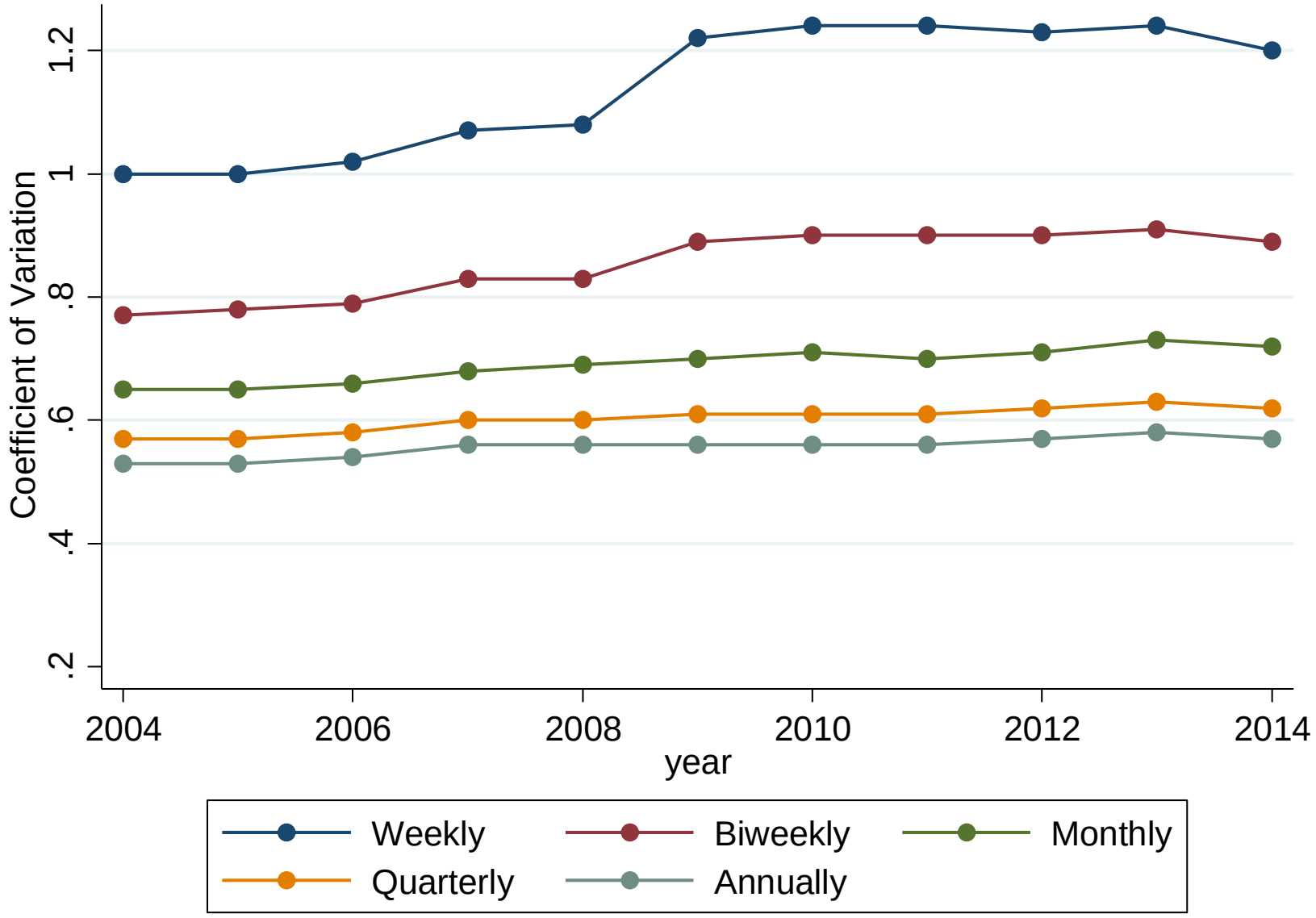
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EVIDENCE FOR CHANGING SHOPPING PATTERNS

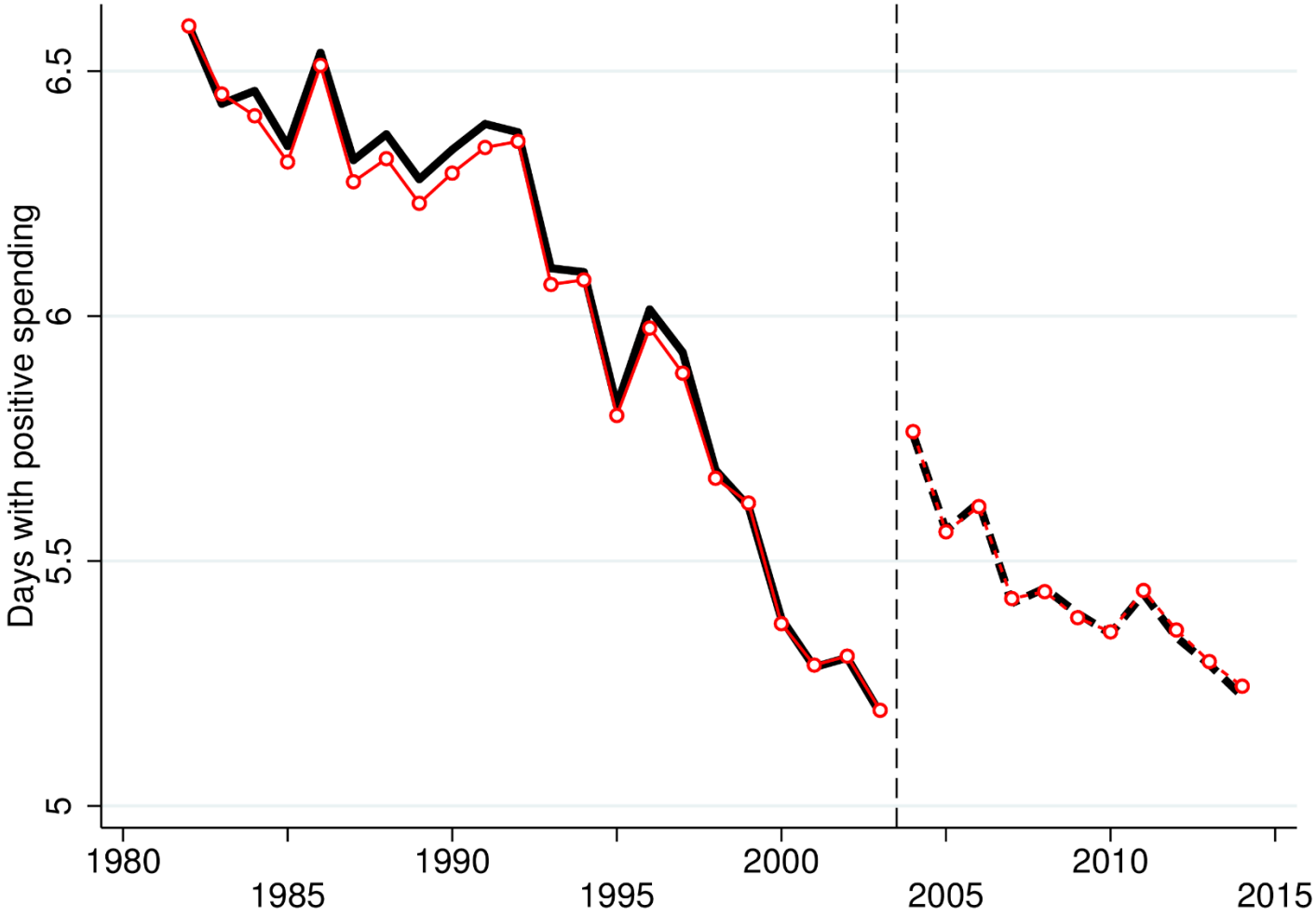
1. Number of days with positive expenditures falls over time.

   - The Diary Survey provides daily information on expenditures. So we can compute the number of days over two-week period during which any positive expenditures occur.

   - We can condition households' number of days with positive expenditures on observable household characteristics (age, household income, number of members in the household, etc.) to control for changing characteristics of households.

   - There is a break in DS 2005 (we think due to CAPI and changes in Diary "placement" practices)

MEASURING SHOPPING FREQUENCY (CEX)

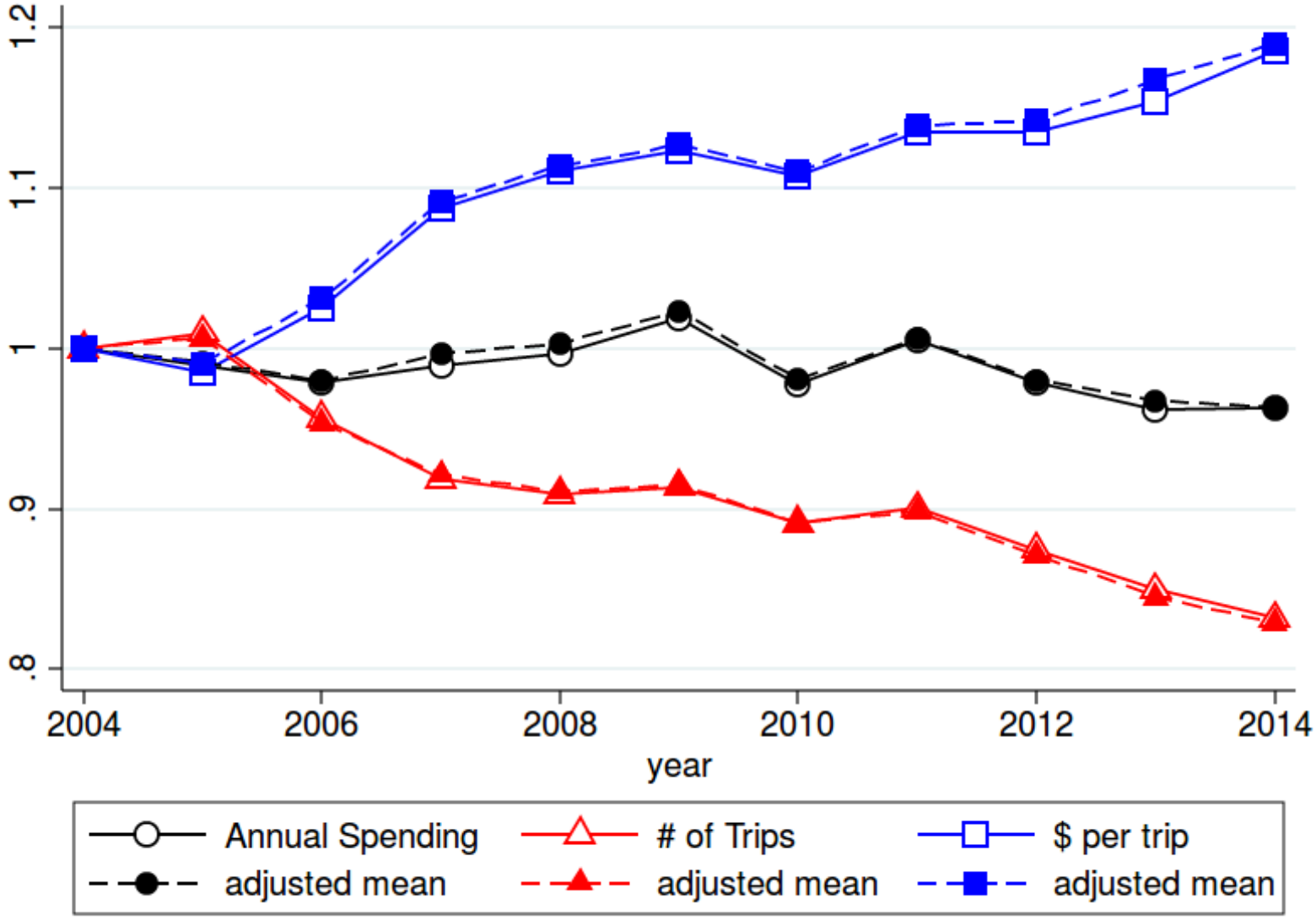


The frequency of shopping has fallen by a third since 1980.

EVIDENCE FOR CHANGING SHOPPING PATTERNS

1. Number of days with positive expenditures falls over time.
2. Households do fewer but larger trips over time.
   - In Nielsen data, we observe shopping trips.
   - We can decompose annual household expenditures into intensive margin (average spent per shopping trip) and extensive margin (number of trips per year).
   - We can condition on observable household characteristics.

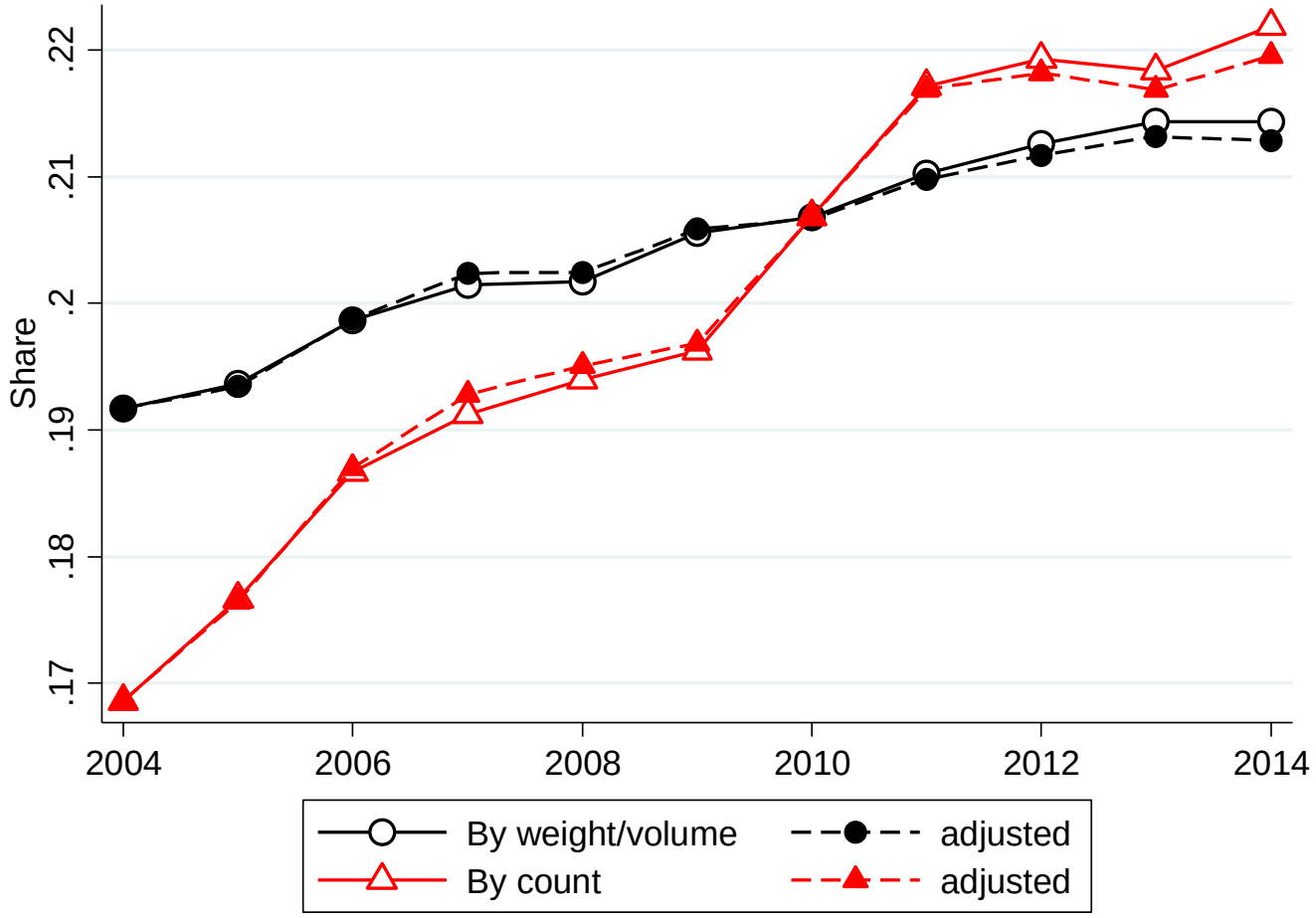
FEWER BUT LARGER SHOPPING TRIPS OVER TIME



EVIDENCE FOR CHANGING SHOPPING PATTERNS

1. Number of days with positive expenditures falls over time.
2. Households do fewer but larger trips over time.
3. Households buy larger quantities/volumes over time.
   - In Nielsen data, we observe count sizes and volumes. Specifically, indicator for “multipack” purchases [e.g. crate of wine].
   - So we can measure whether households are buying same volumes/quantities over time.

LARGER QUANTITIES PURCHASED OVER TIME



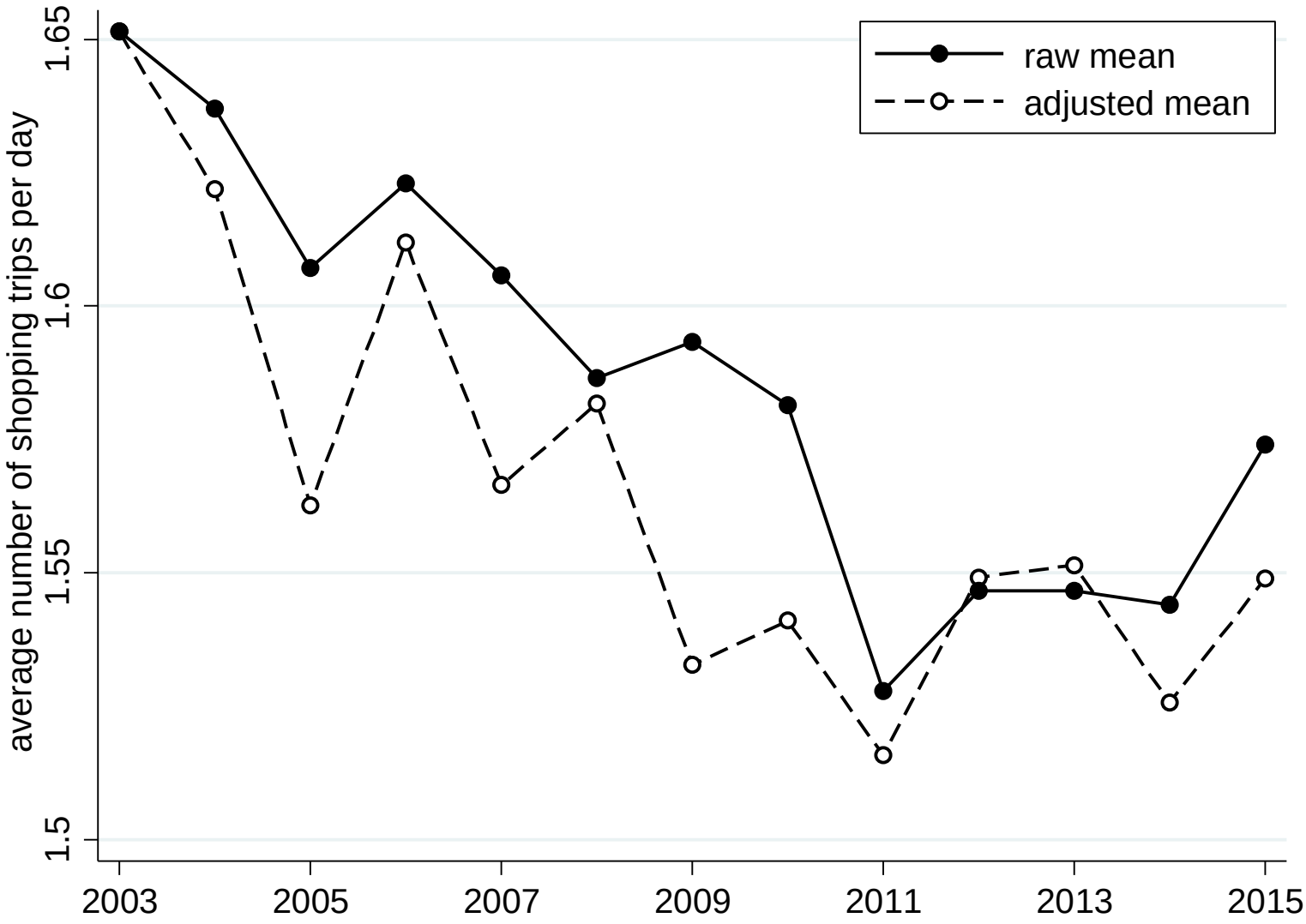
EVIDENCE FOR CHANGING SHOPPING PATTERNS

1. Number of days with positive expenditures falls over time.
2. Households do fewer but larger trips over time.
3. Households buy larger quantities/volumes over time.
4. Households spend less time shopping over time.
   - We use American Time Use Survey to track time spent on shopping.
   - Approximately 25,000 households per year recall activities for 24-hour period.
   - Shopping time includes travel time, comparison time, etc.).
   - We can decompose shopping time into intensive margin (average time per trip) and extensive margin (number of trips).
   - Consistent data starts in 2003.
   - We can condition on observable household characteristics.

LESS TIME SPENT ON SHOPPING OVERALL

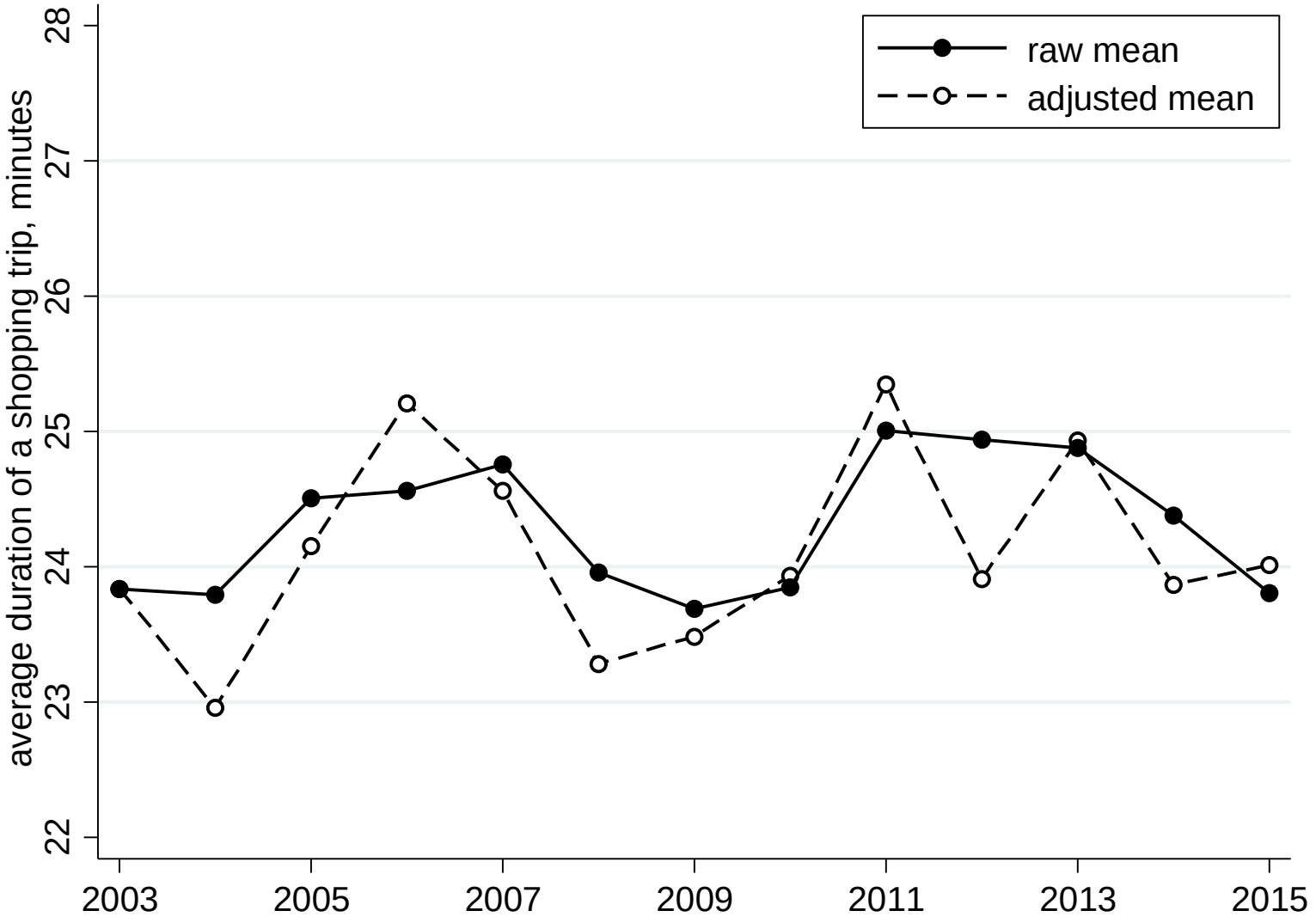


DUE MAINLY TO FALLING NUMBER OF TRIPS



Number of trips per day (conditional on having a trip) for purchases of goods.

LITTLE CHANGE IN AVERAGE TIME SPENT ON A TRIP

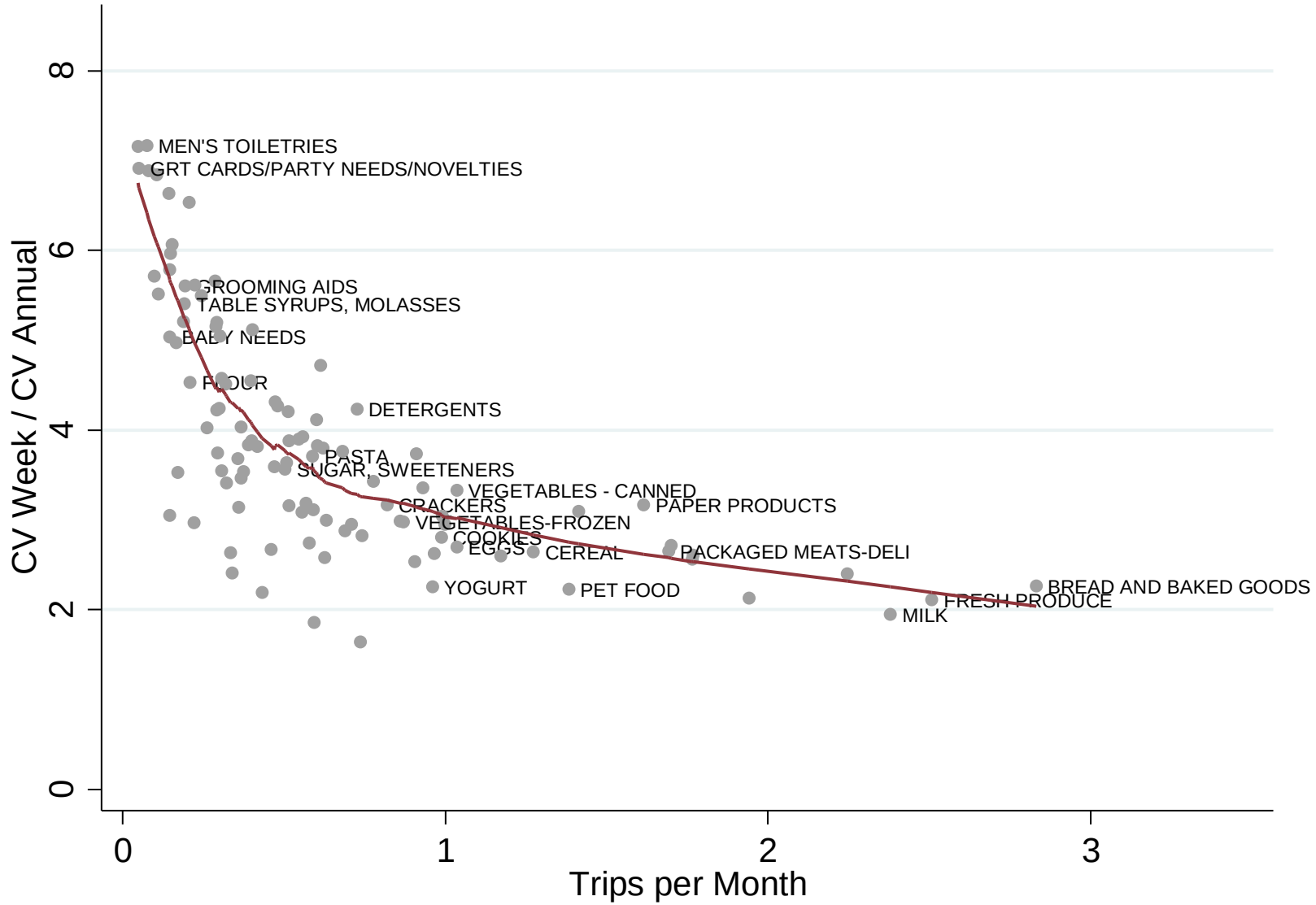


All of this is consistent with increasing stocking up by households.

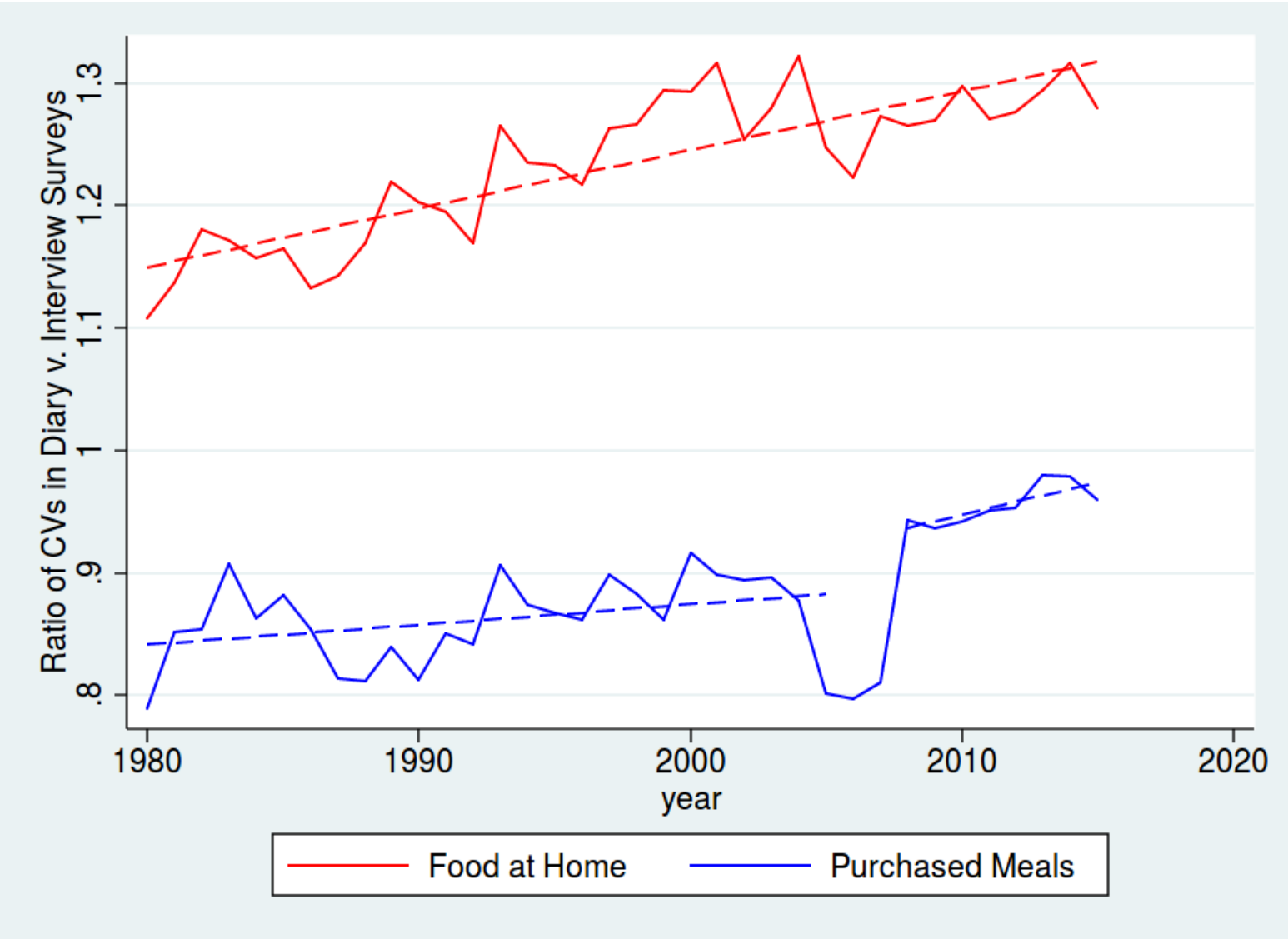
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4. Households spend less time shopping over time.
5. Categories with less frequent purchases have larger high-frequency cross-sectional dispersion of spending.
   - For each category calculate dispersion of spending at the weekly frequency and at the annual frequency.
   - Compare i) frequency of purchases and ii) the ratio of weekly to annual dispersion.

SPENDING INEQUALITY AND FREQUENCY OF PURCHASES



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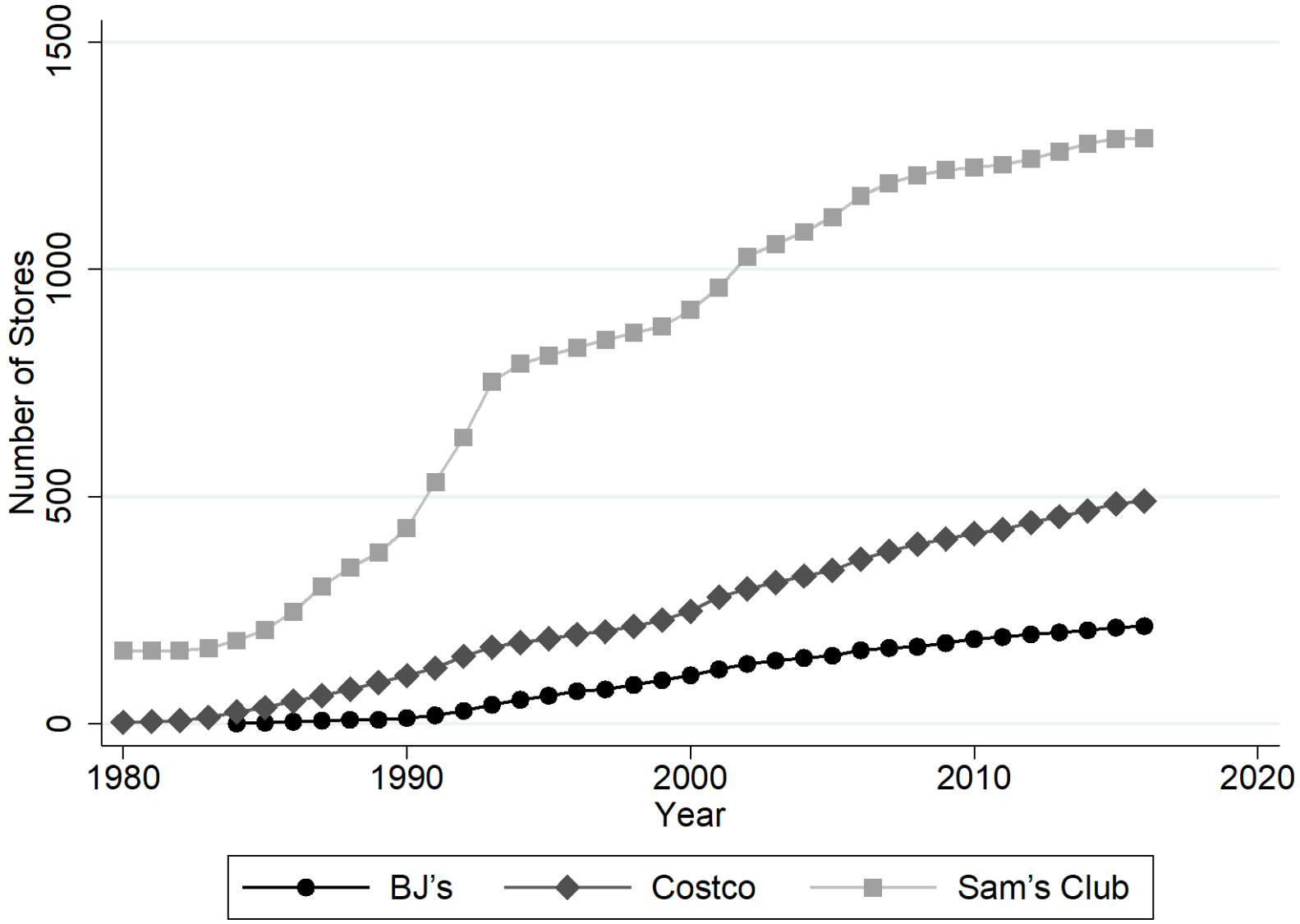


- Breaks in 2004 (DS) and 2007:Q2 IS, when "food out" reference period month→week

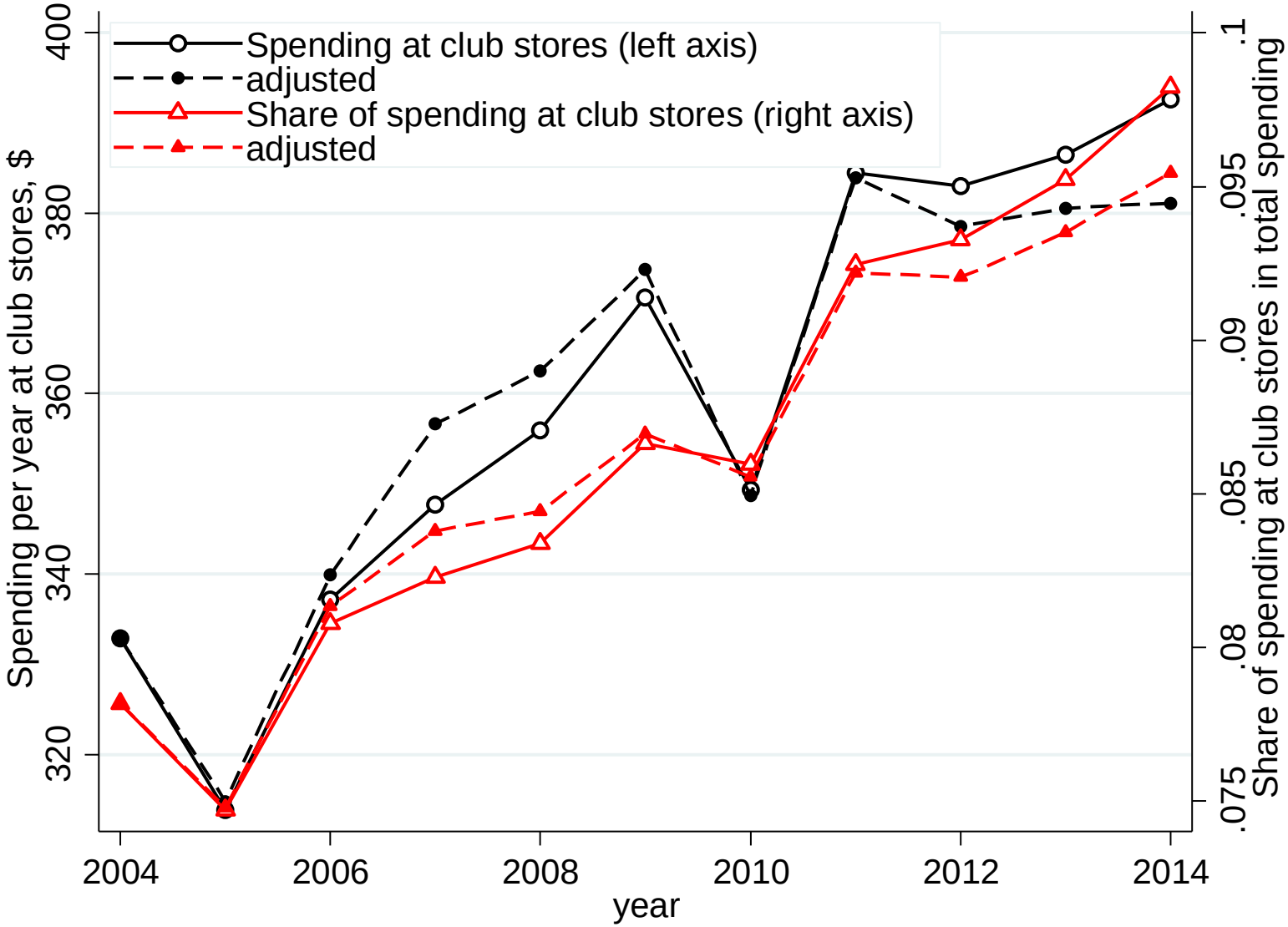
POSSIBLE SOURCES FOR THESE TRENDS

- **Reduced cost of "stocking up" from increasing prevalence of "warehouse/club" stores.**
- Others (see paper):
  - A rise in the fixed cost of shopping (financial or opportunity).
  - Reduced cost of storage.
  - Rising economies of scope in shopping trips.
  - Increased ease of financing larger shopping trips.

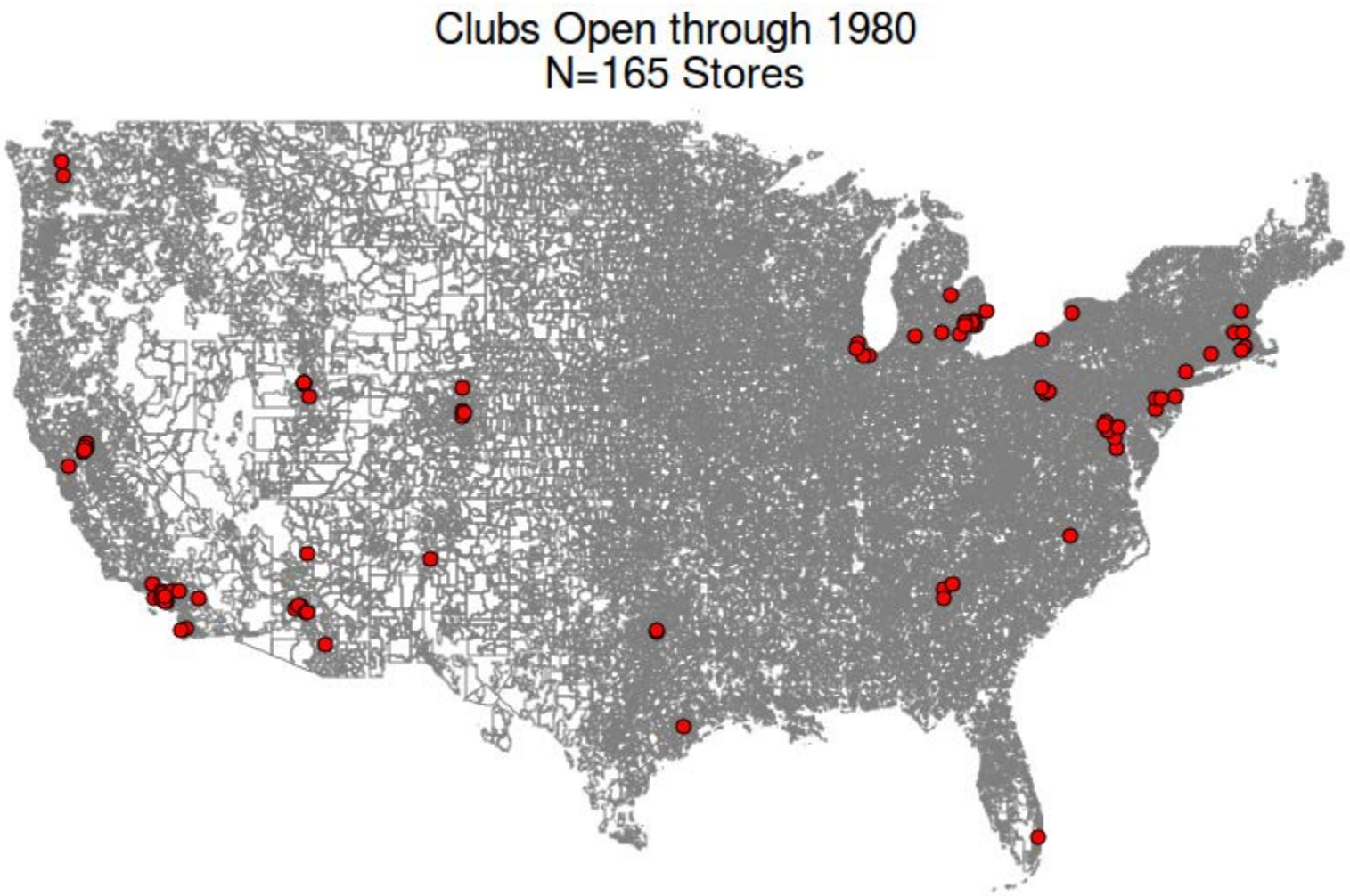
RISING PREVALENCE OF CLUB STORES



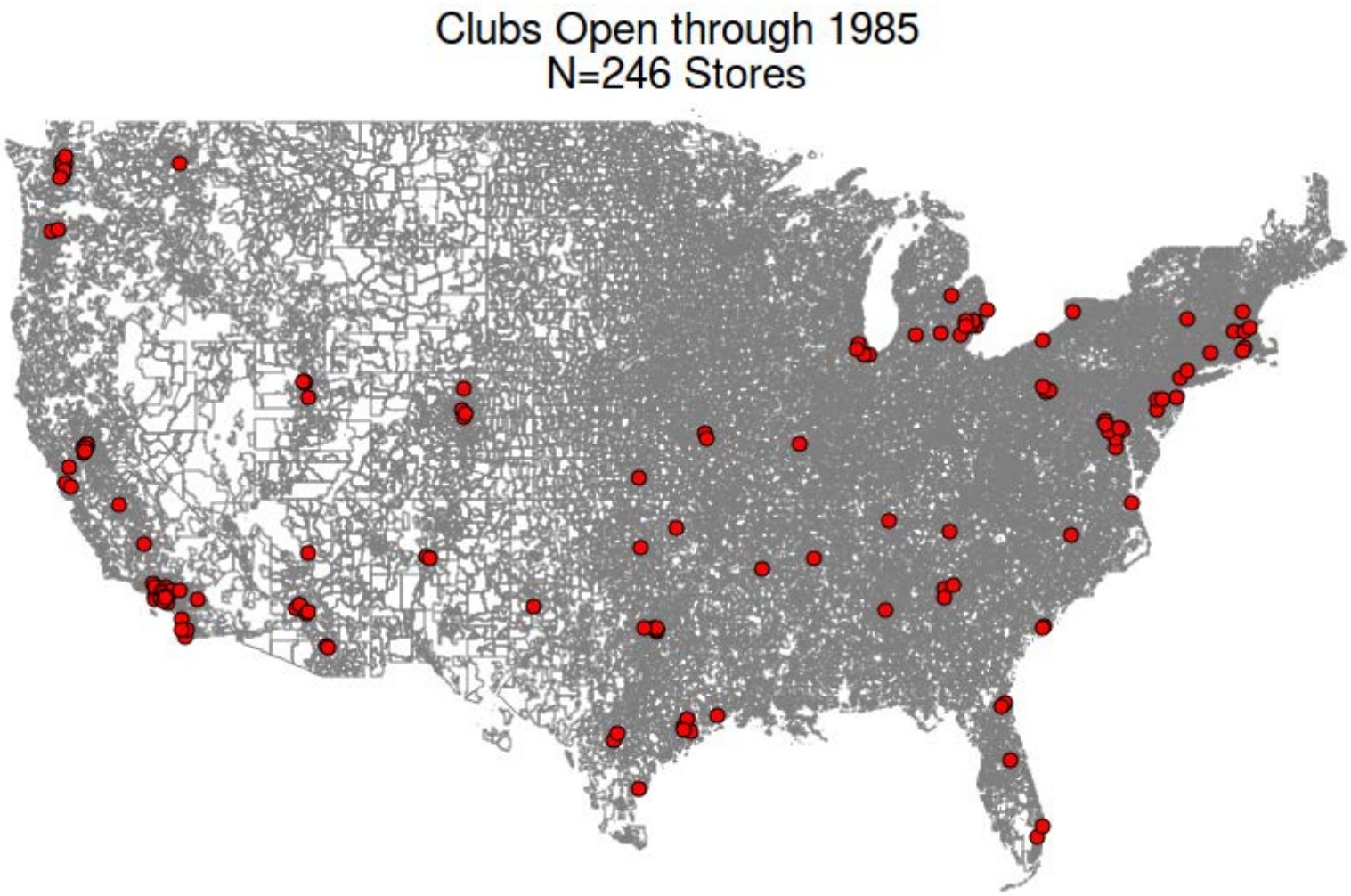
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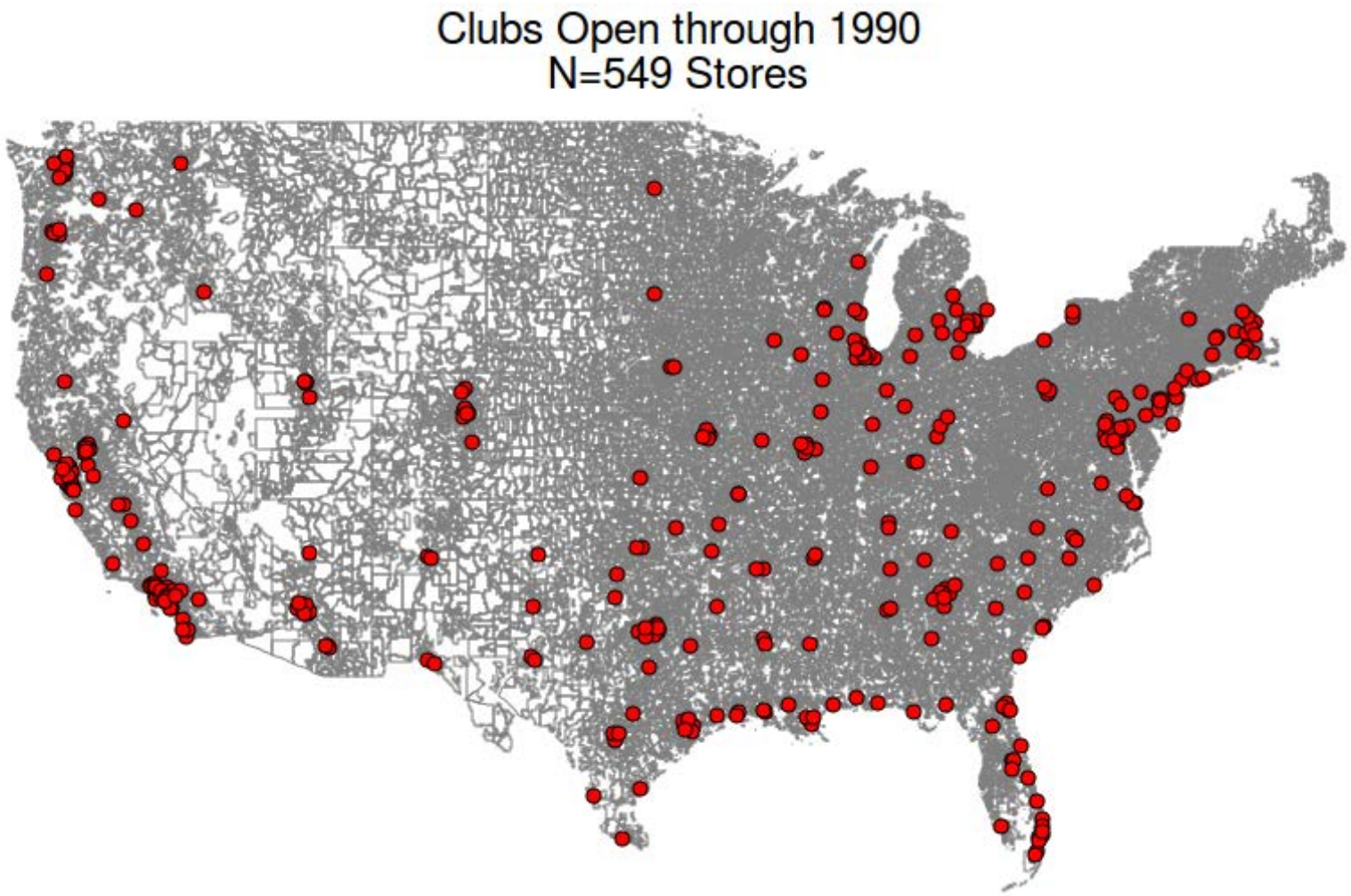
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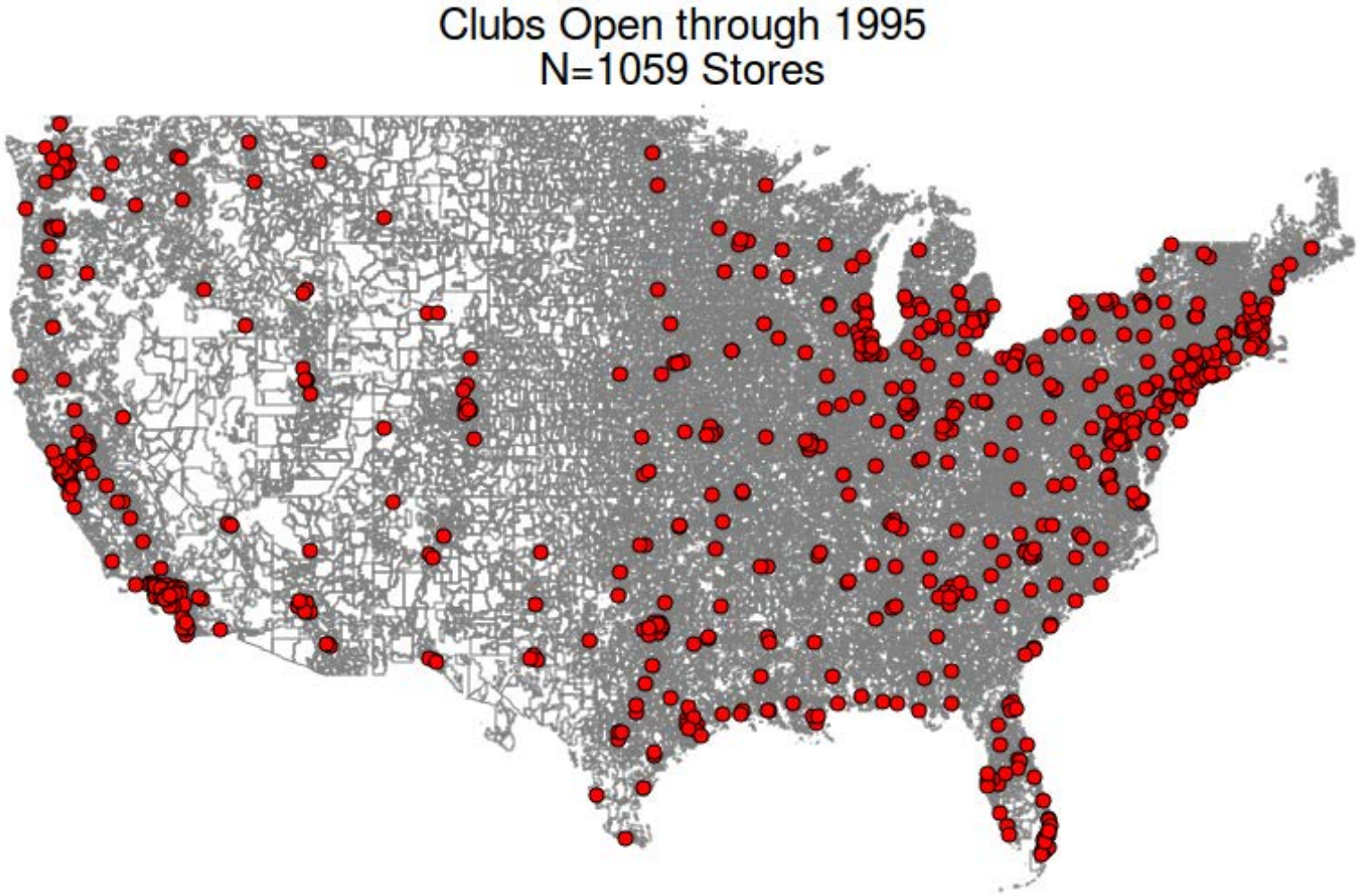
RISING PREVALENCE OF CLUB STORES



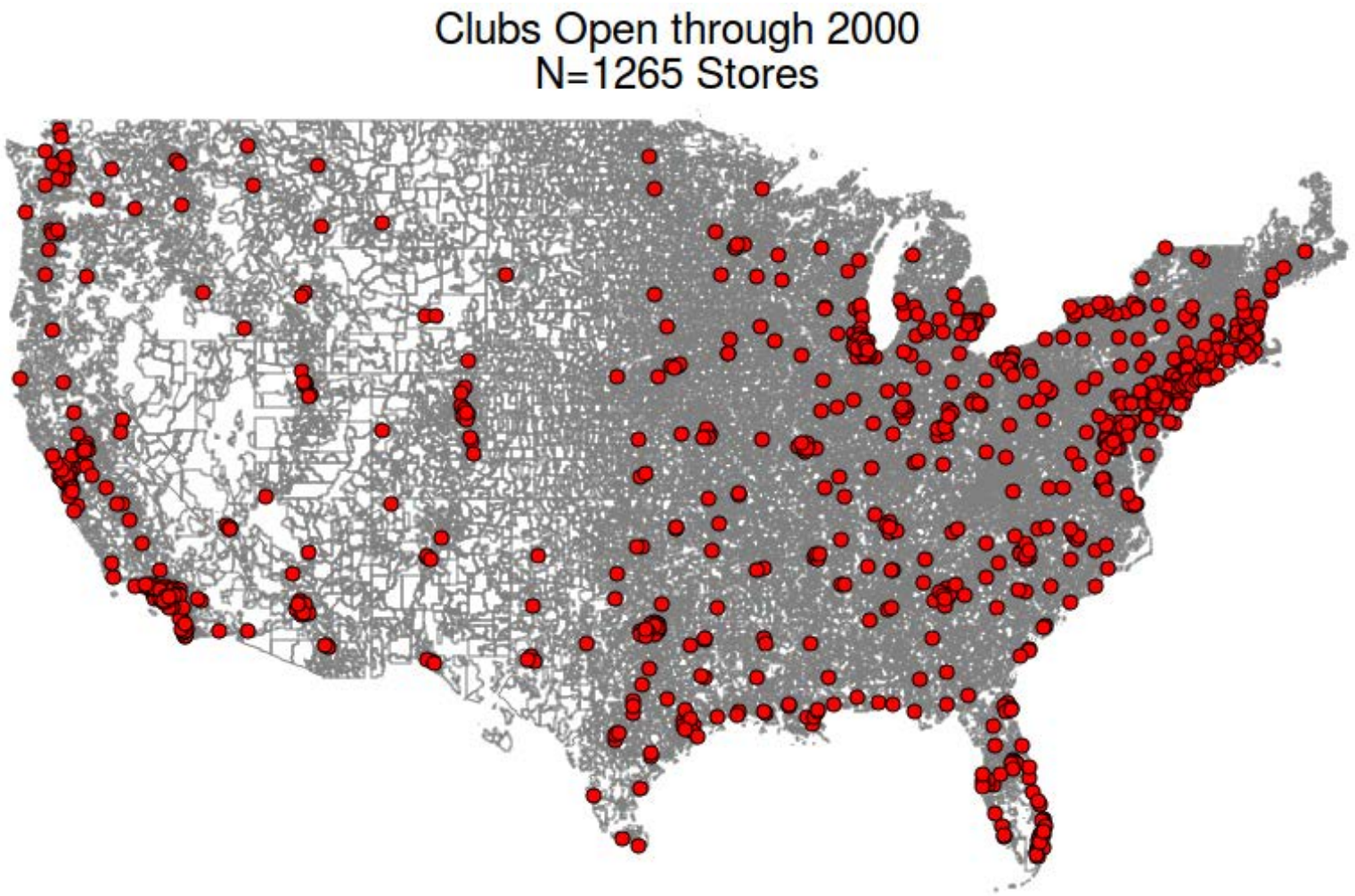
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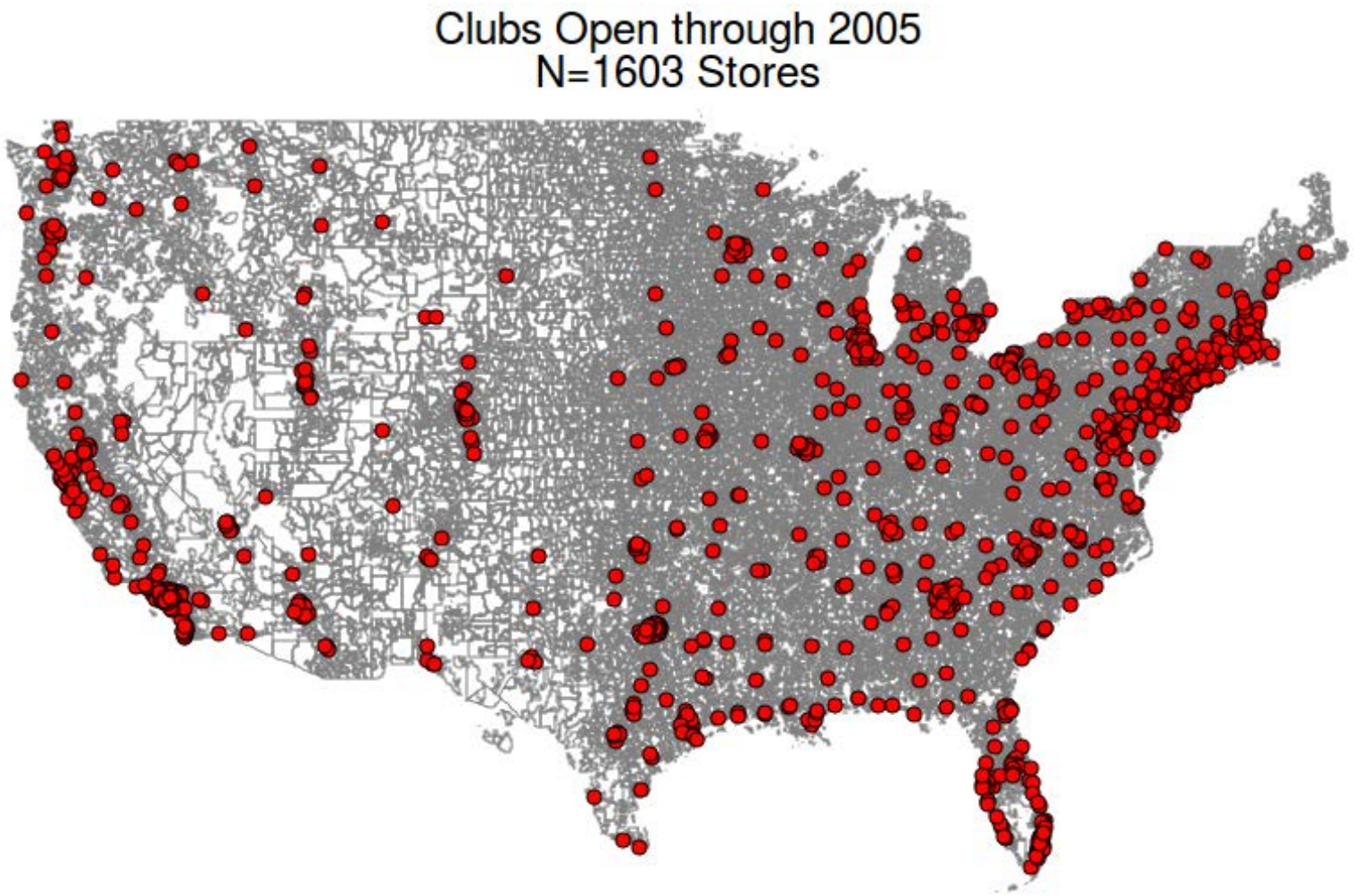
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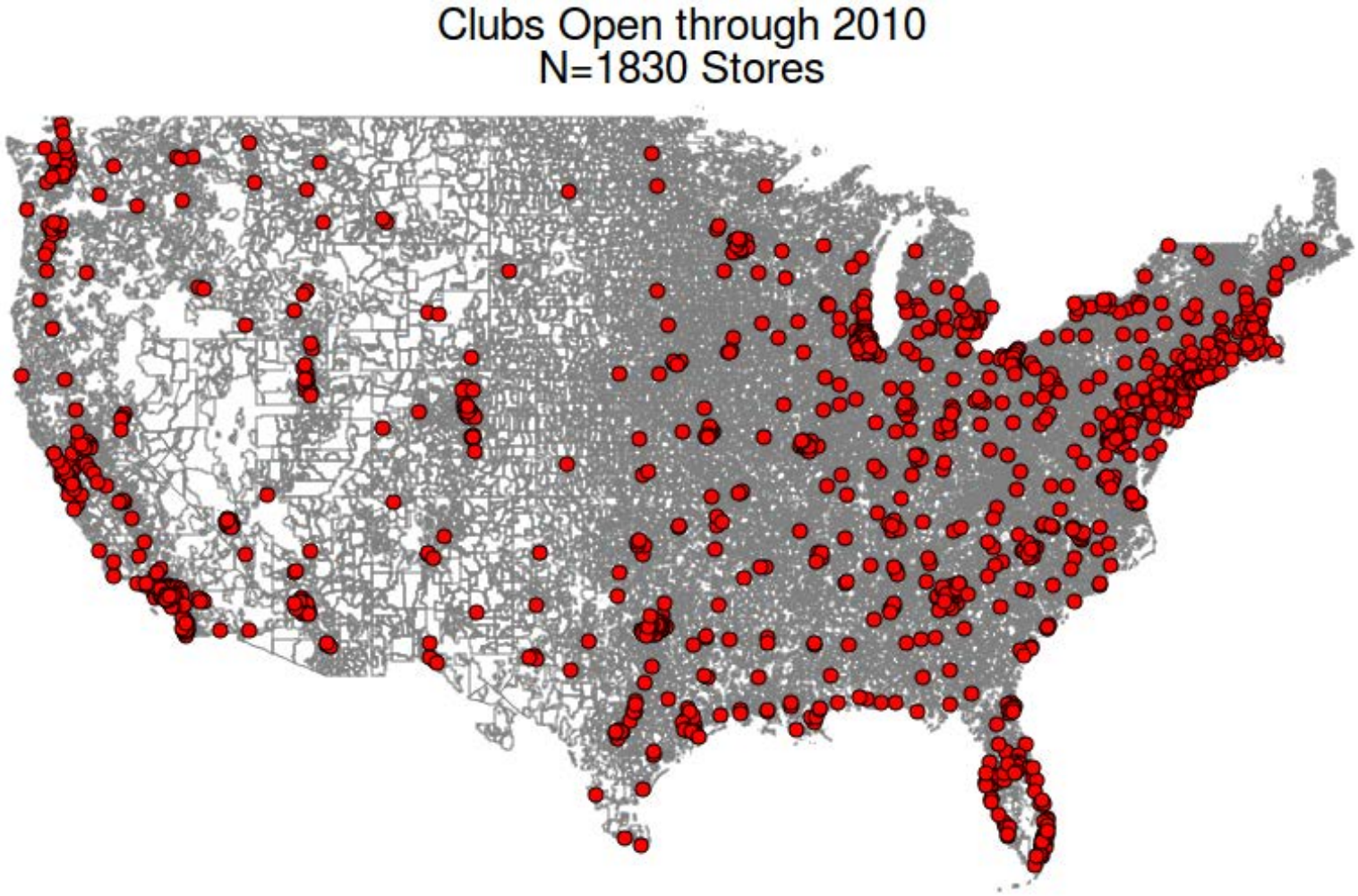
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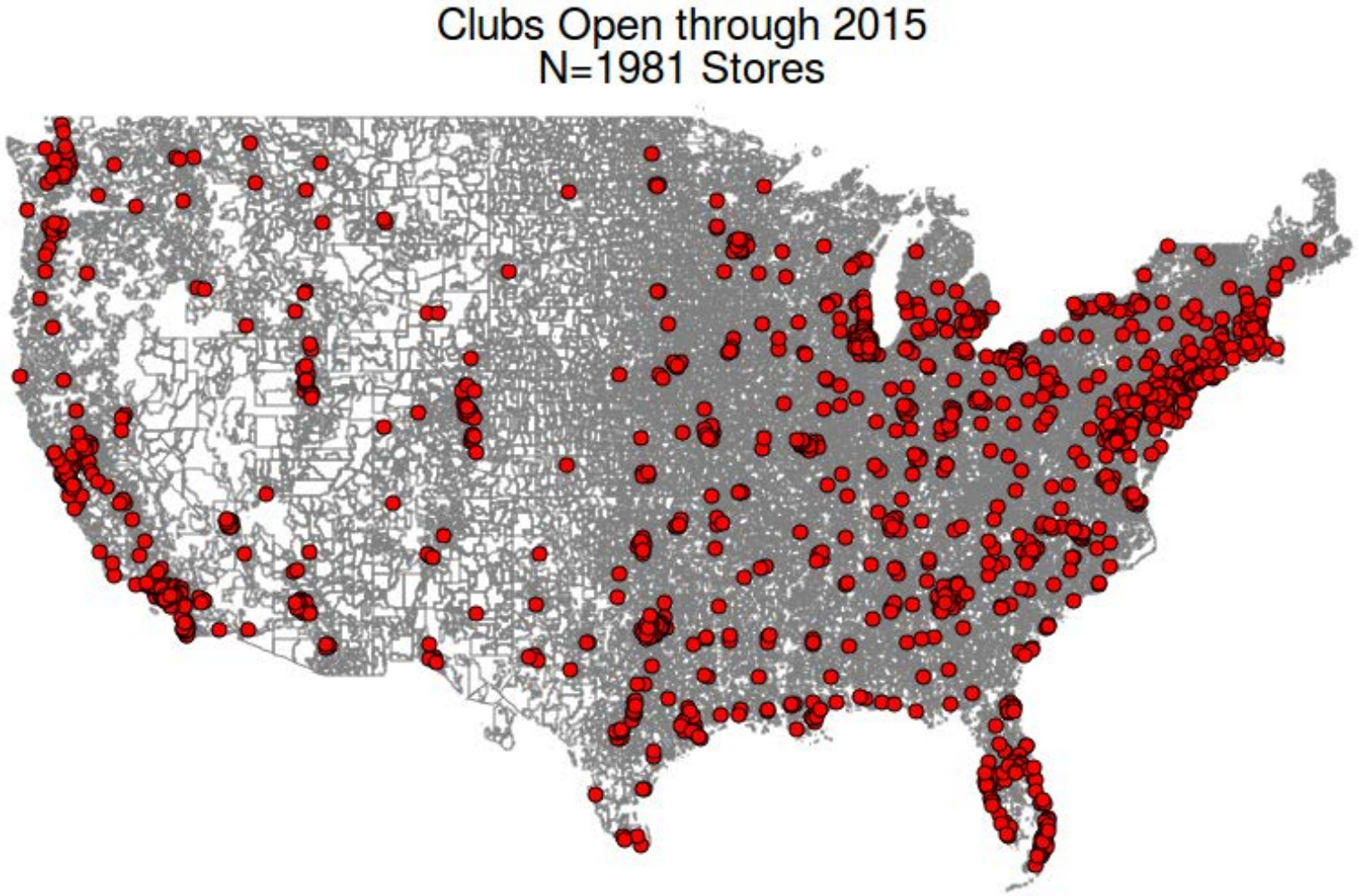
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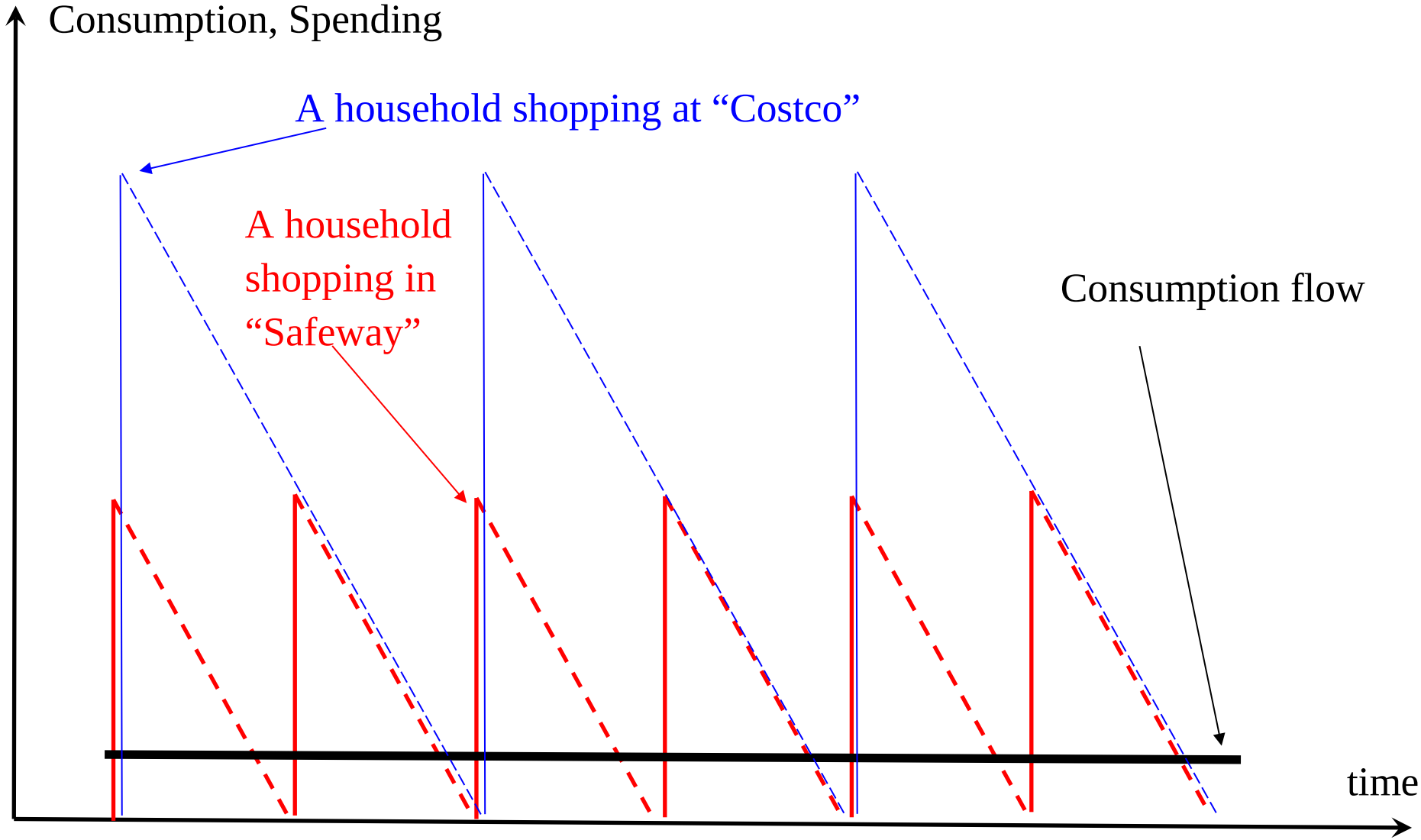
RISING PREVALENCE OF CLUB STORES



SHOPPING AT CLUB STORES AND EXPENDITURE VOLATILITY

- Households who stock up more at club stores (higher share of expenditures) should do less frequent shopping trips and therefore display higher volatility in their expenditures (time-series CV for individual's expenditures over a year).
- This should be increasingly true when expenditures are measured at high frequencies (e.g. weekly vs quarterly).

A SIMPLE FRAMEWORK



SHOPPING AT CLUB STORES AND EXPENDITURE VOLATILITY

- Households who stock up more at club stores (higher share of expenditures) should do less frequent shopping trips and therefore display higher volatility in their expenditures.

- This is exactly what we find:

  - Using club store openings as a source of exogenous variation, we find club store shopping can account for approximately **40 percent** of the trend rise in the cross-sectional dispersion of expenditures measured at the weekly frequency relative to the quarterly or annual frequency (see paper).

CONCLUSION

- We document a persistent decline in the frequency of shopping and argue that this can account for much of the apparent rise in expenditure inequality for **nondurables** in the Diary survey.

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- Important caveats for users of the DS, or users comparing trends across the DS and IS!