Preferences or Prices? Differences in Home vs Market Production in Europe and the US

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February 12, 2019

Abstract

Compared to Americans, Europeans allocate less time to market work, and more time to home production and leisure. However, it has been challenging to establish whether this is due to differences in market prices, broadly construed (e.g., taxes and minimum wages), or whether we need to invoke differences in norms and preferences. The key challenge is the lack of appropriate variation in the data. While we observe differences in the relative prices of different forms of home production, long run price elasticities are difficult to estimate, since we lack exogenous price variations that are large and persistent. In this paper, we exploit a unique Swedish policy to estimate the long-run demand response to a change in the price of home production. The policy provided a permanent 50% wage subsidy for household services, which brought the relative price of cleaning services in Sweden in line with US levels. Our analysis compares the evolution of the demand for cleaning services over time in Sweden compared to that in neighboring countries. We make a number of points. First, demand adjustment is very gradual; if we stop our analysis after a couple of years, we only find a modest demand response. However, with a longer time horizon of ten years, we find a very large increase in the demand for cleaning services, corresponding to an estimated elasticity of around 4. After the full adjustment, Swedish consumption patterns of cleaning services are close to those in the US. Thus, our finding supports that prices might explain a large share of the transatlantic differences in home versus market production. Furthermore, our results support that habits or other adjustment frictions make it important to distinguish between the short-run and long-run effects of price changes when it comes to policies that affect household behavior.

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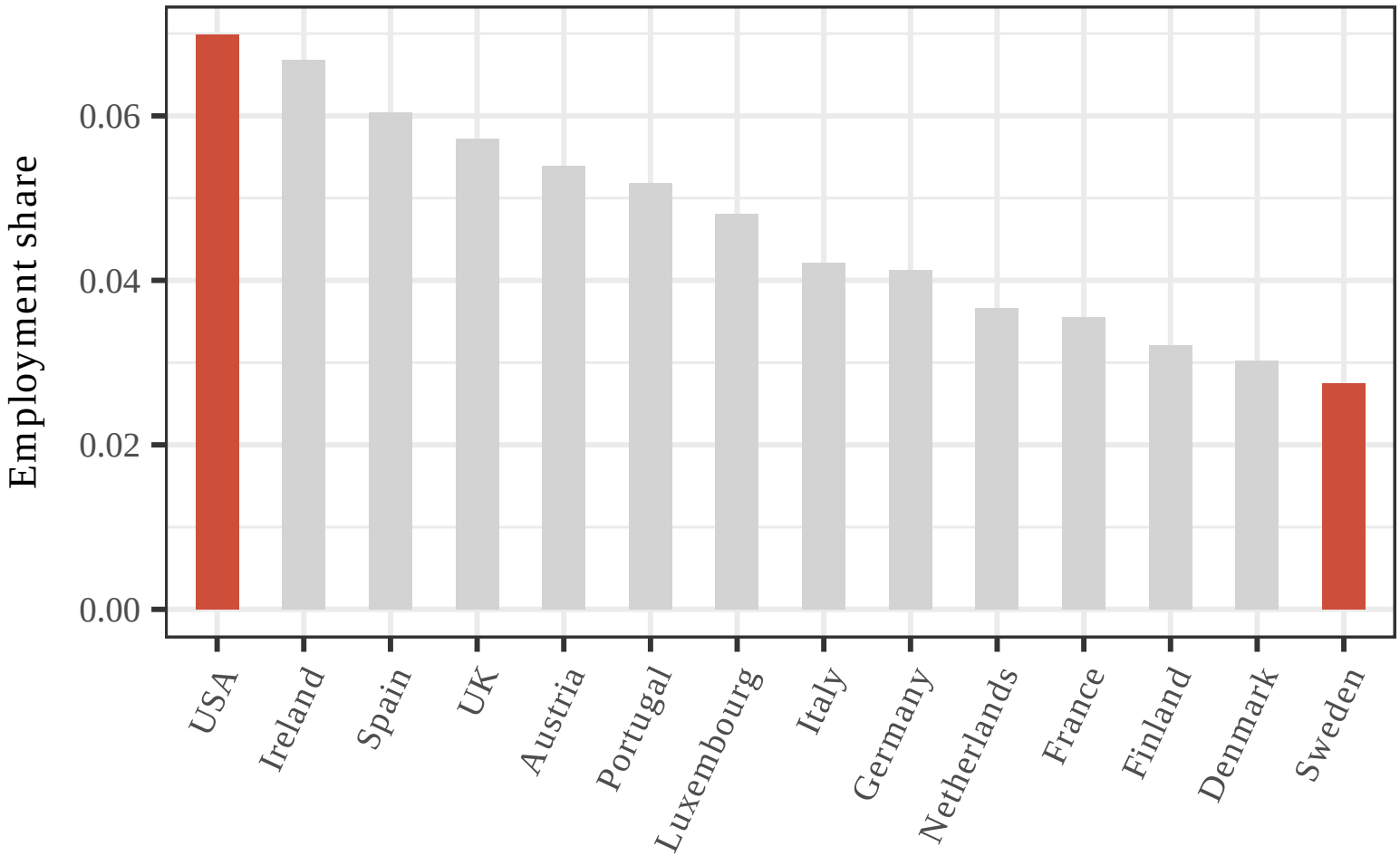
Preferences or Prices? – Differences in Home vs Market Production Between Europe and the US

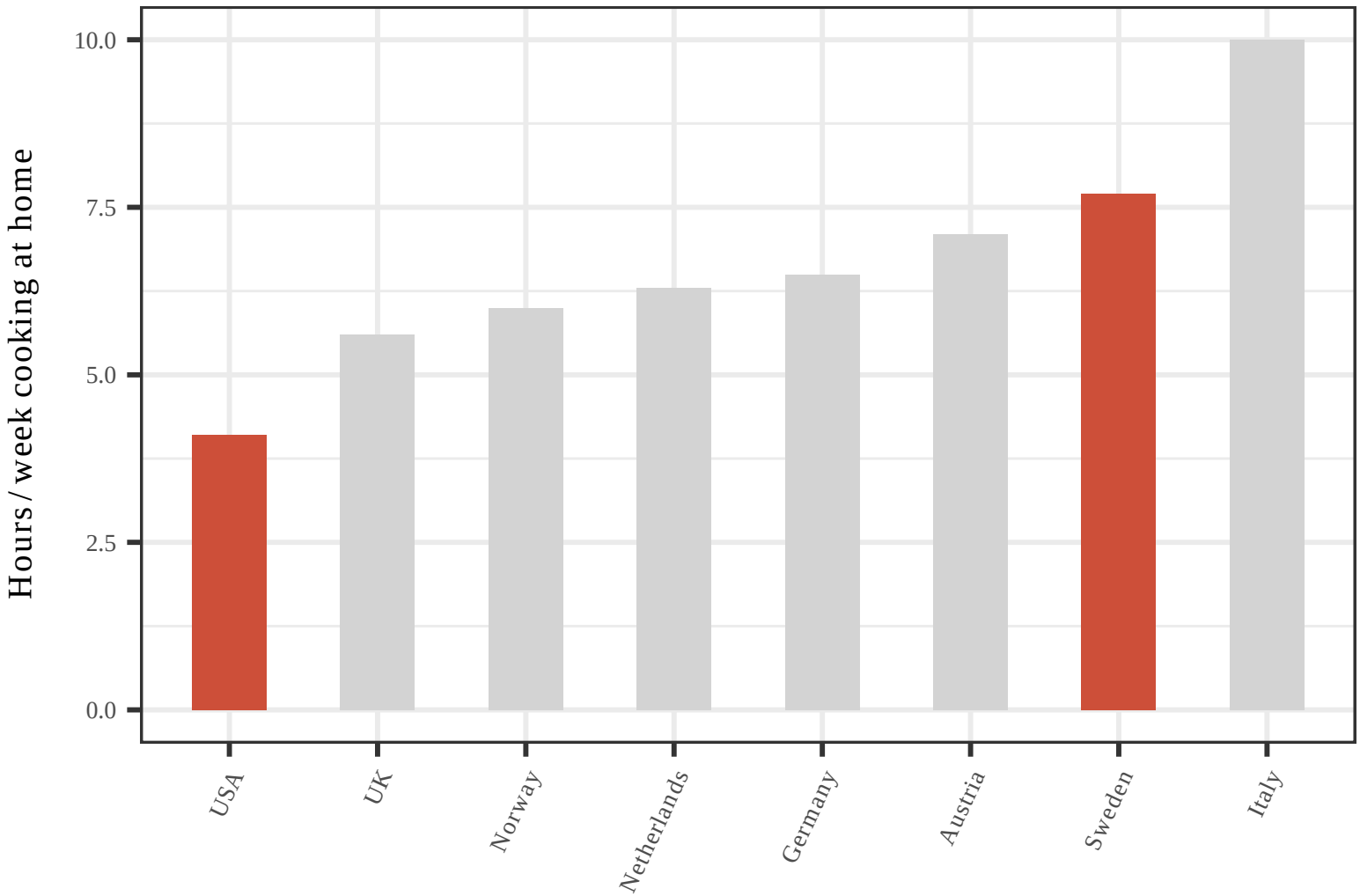
Axel Gottfries Hannes Malmberg

Employment share Hotels & Restaurants



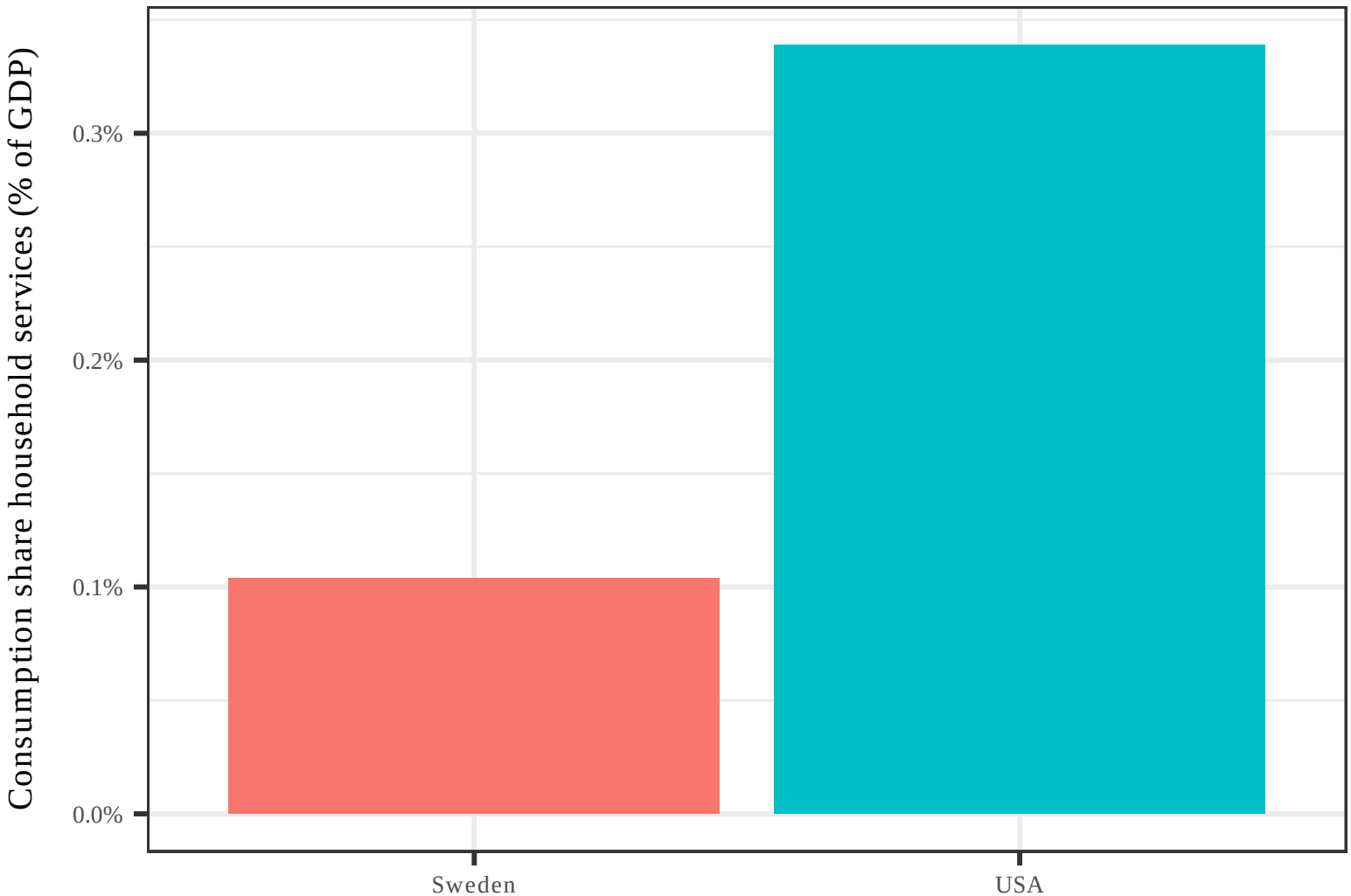
Source: EU KLEMS

Time spent cooking per week in Europe and the US



Source: Freeman et al. (2005)

Household services consumption in Sweden and the US

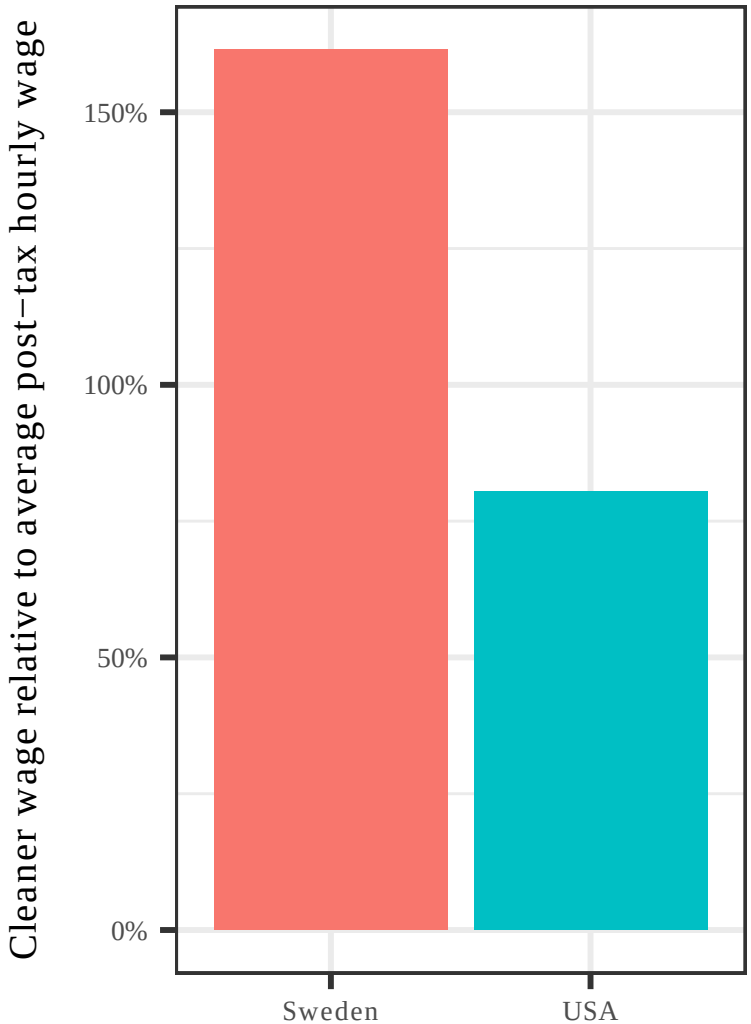


Source: Swedish National Accounts, CEX

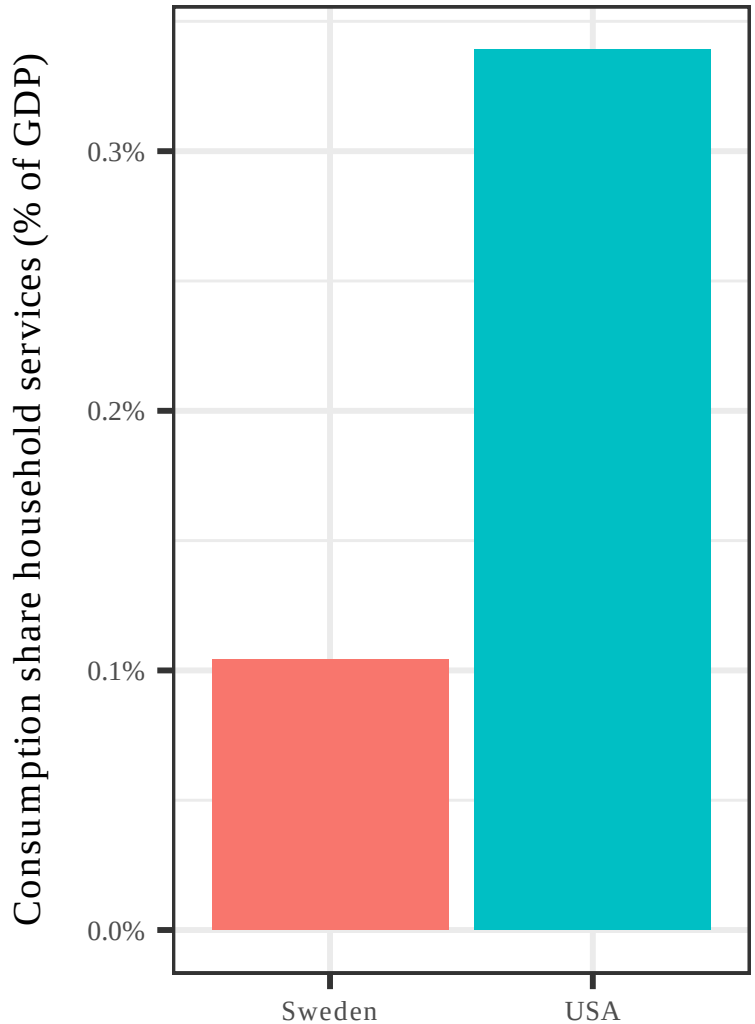
Prices versus preferences

- Explanations for US vs European differences
  - (i) Relative price differences
    - Higher taxes (Olovsson, 2009)
    - Higher minimum wages (Freeman and Schettkat, 2005)
  - (ii) Preference differences
    - Blanchard (2004)
    - Alesina et al (2005)

Cleaning wages and household service consumption

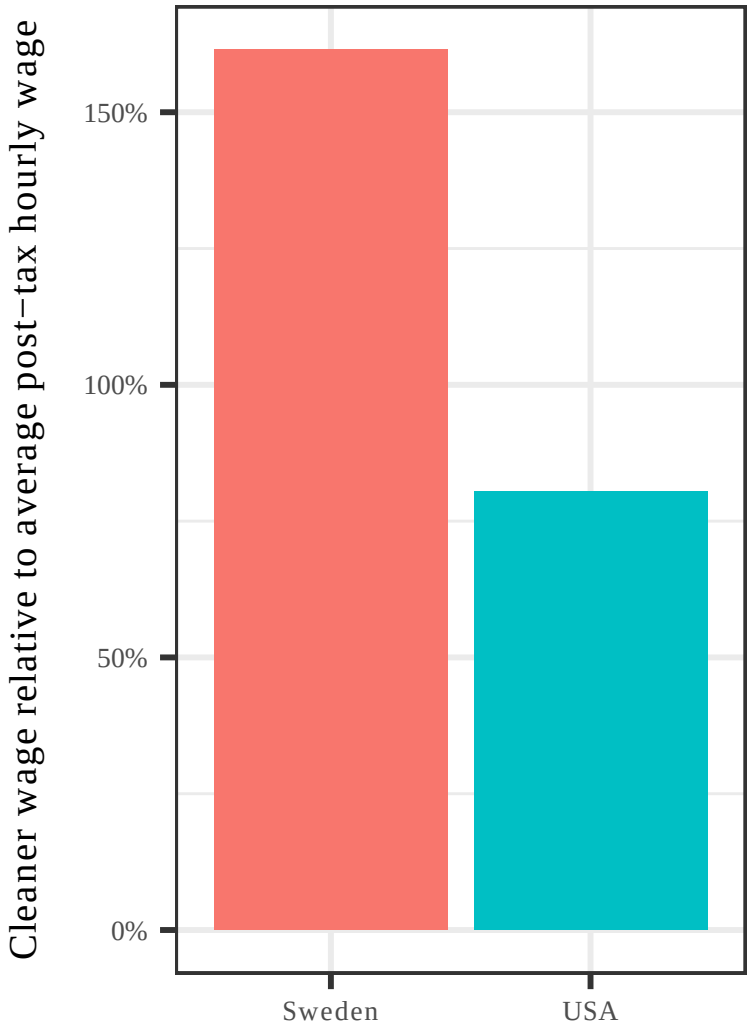


Source: Statistics Sweden, BLS



Source: Swedish National Accounts, CEX

Cleaning wages and household service consumption



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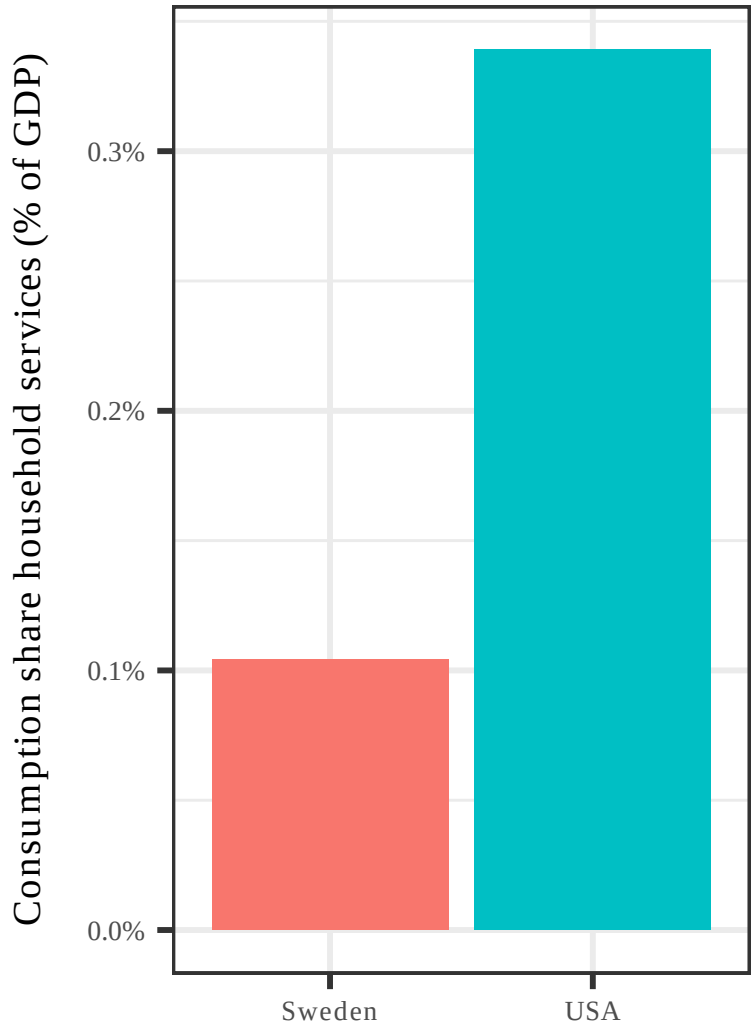
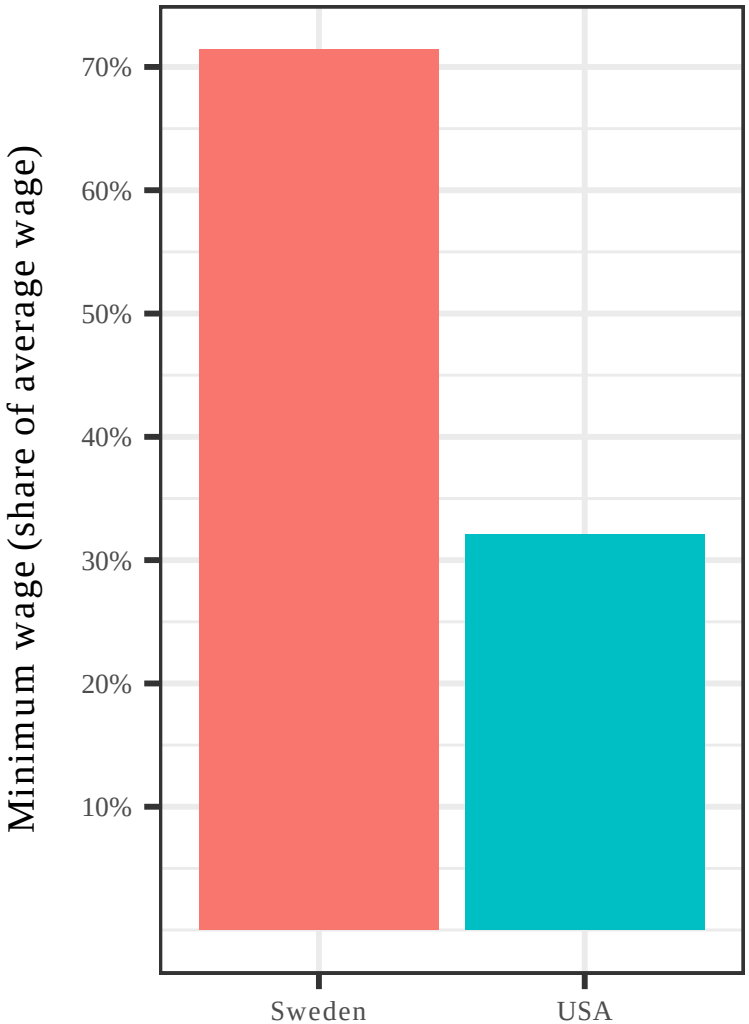


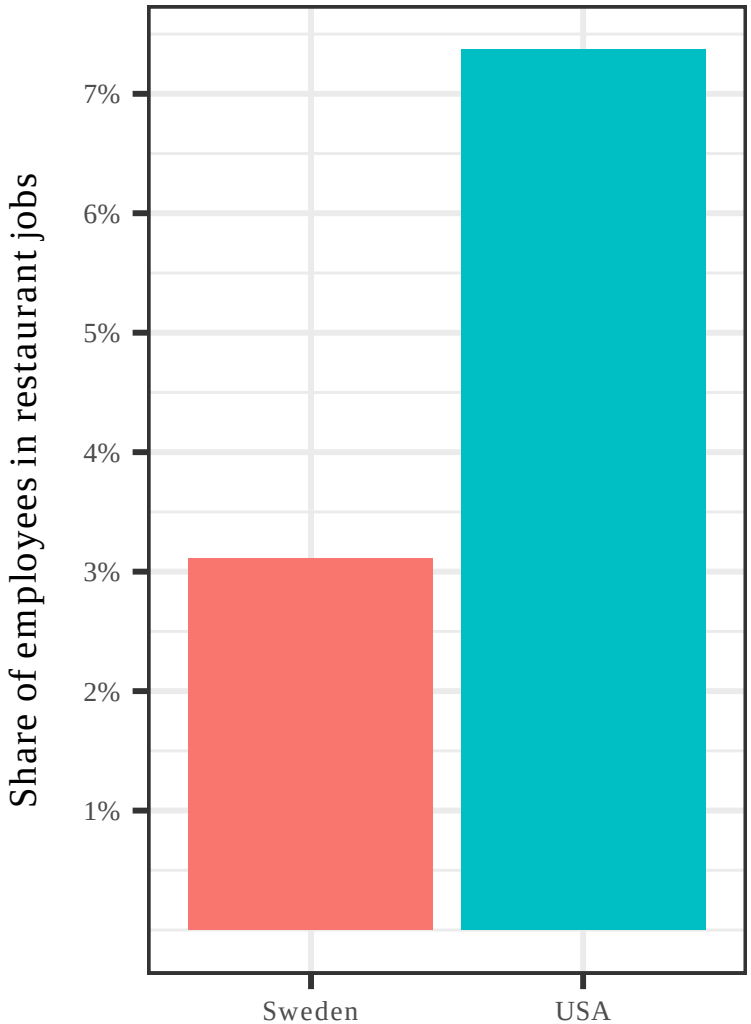
Source: Swedish National Accounts, CEX

Required elasticity of household service consumption w.r.t. prices ≈ 1.6

Minimum wages and restaurant employment



Source: Statistics Sweden, DOL



Source: Statistics Sweden, OES

Required elasticity of restaurant employment w.r.t. minimum wage ≈ 1.1

Micro elasticities and preference differences

Option 1: Insufficient price differences $\rightarrow$ preference differences needed

Option 2: Long-run global elasticities $\neq$ short-run local estimates

- Habits (Campbell and Cochrane, 1999)
- Consumption commitments (Chetty and Szeidl, 2007, 2016)
- Putty-clay production (Sorkin, 2015)

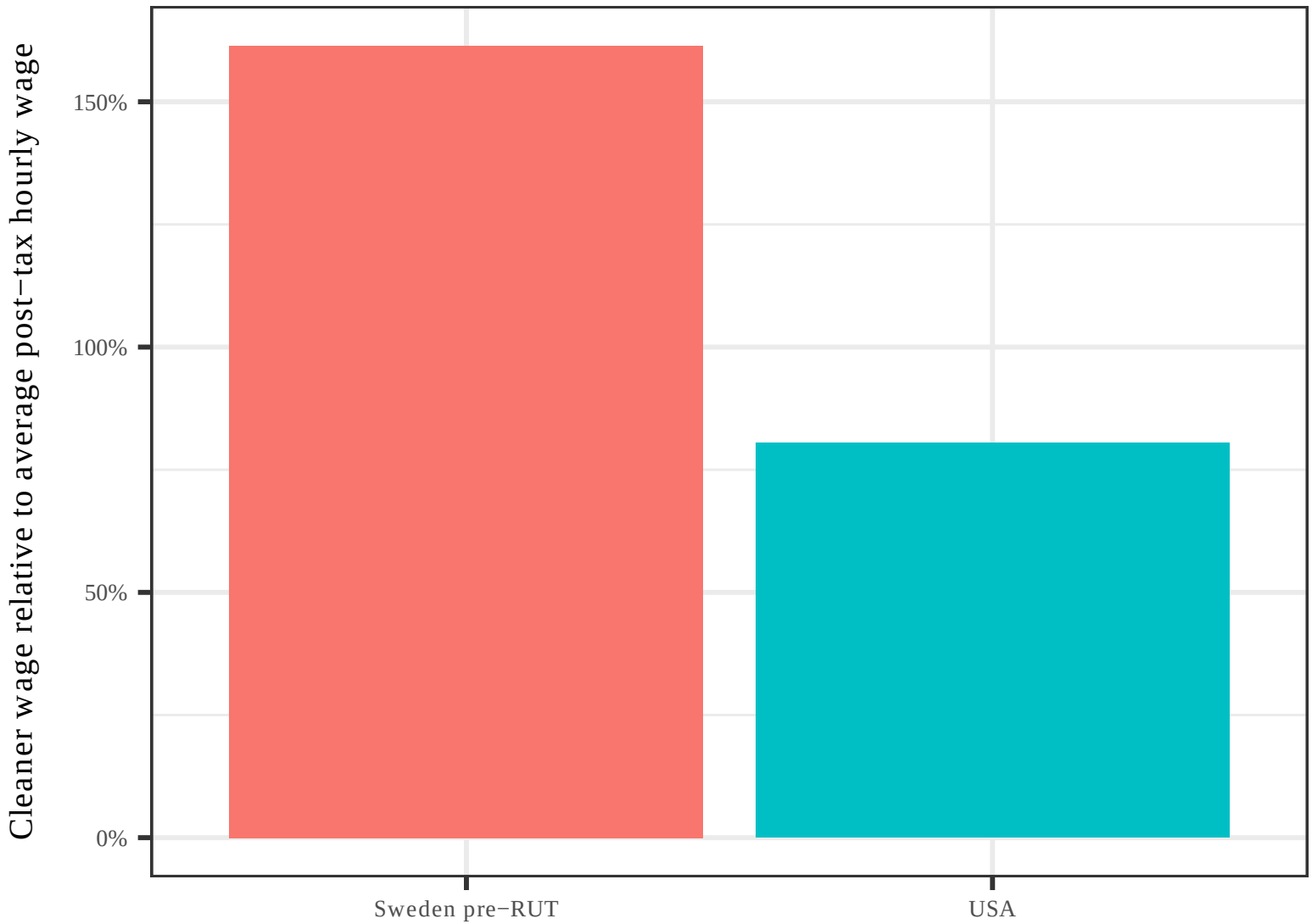
Swedish Case Study

- US vs Europe: different preferences for home production?
  - Or prices explain consumption patterns?
- Challenge: find home production substitute + price variation
  - Exogenous
  - Persistent
  - Quantitatively similar to Swedish-US difference
- Today: Swedish reform $\rightarrow$ large subsidy for housekeeping services

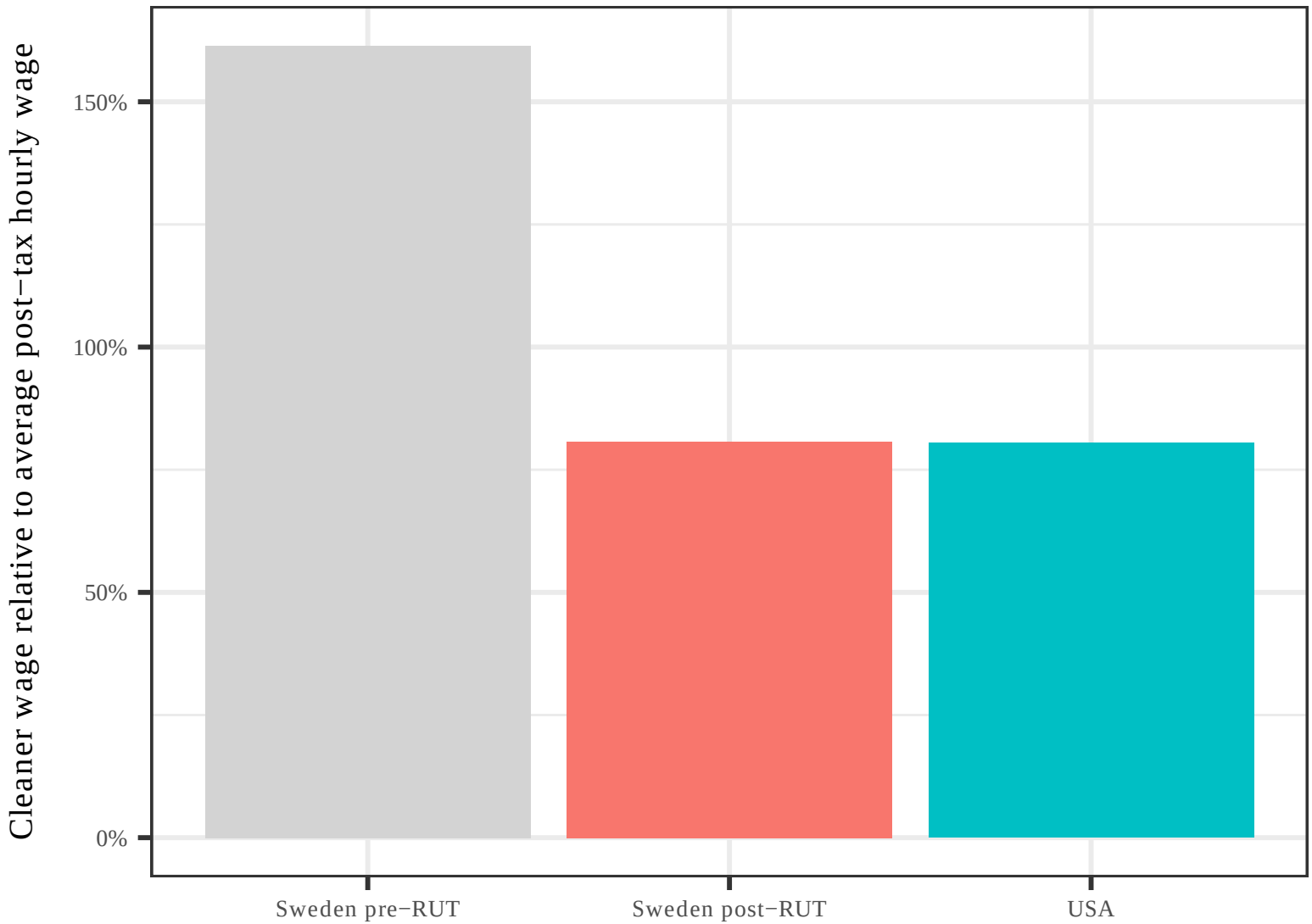
Policy experiment

- After a change in government, Sweden introduced subsidy for household services in 2007
  - Mostly cleaning
    - 90% in 2010 (SCB, 2011)
  - Other unqualified household work
    - Tutoring, Gardening, Snow removal, Personal care
- 50% labor cost subsidy up to SEK $50,000$ ($\sim$ \$$6,000$) per year and person
  - Later reduced to SEK $25,000$ for persons below 65
- Restriction: total subsidy $\leq$ total income tax bill
  - E.g., dual breadwinner couple could use up to $\sim$ \$$12,000$ of subsidies
  - With few exceptions, all full-time workers qualify
  - Combined RUT and renovation subsidy must be less that SEK $50,000$
- From 2009: No application by individual required for subsidy
- Tax authority reports statistics on total use of subsidy
  - Good data quality

Pre- and post-reform prices



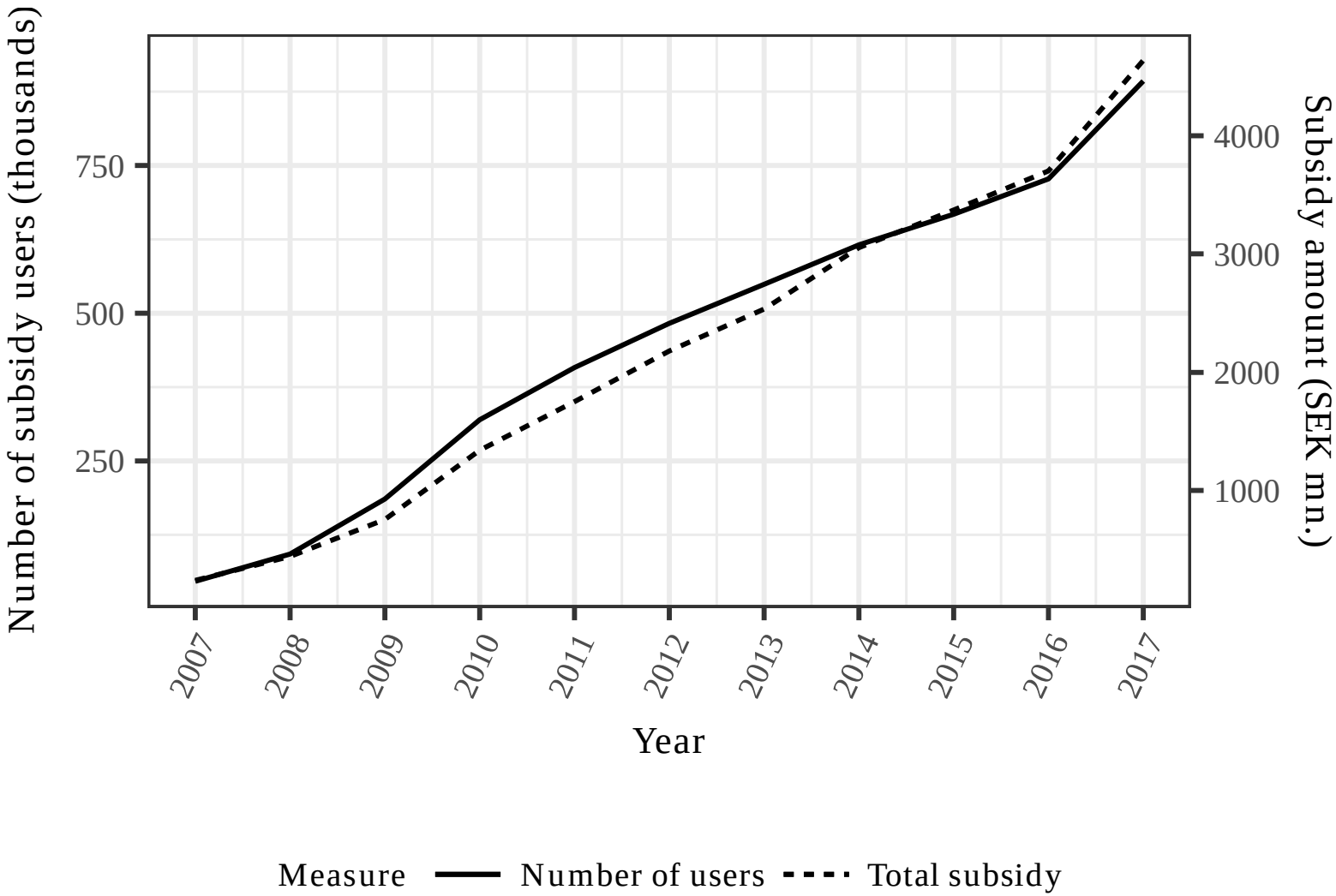
Pre- and post-reform prices



Questions

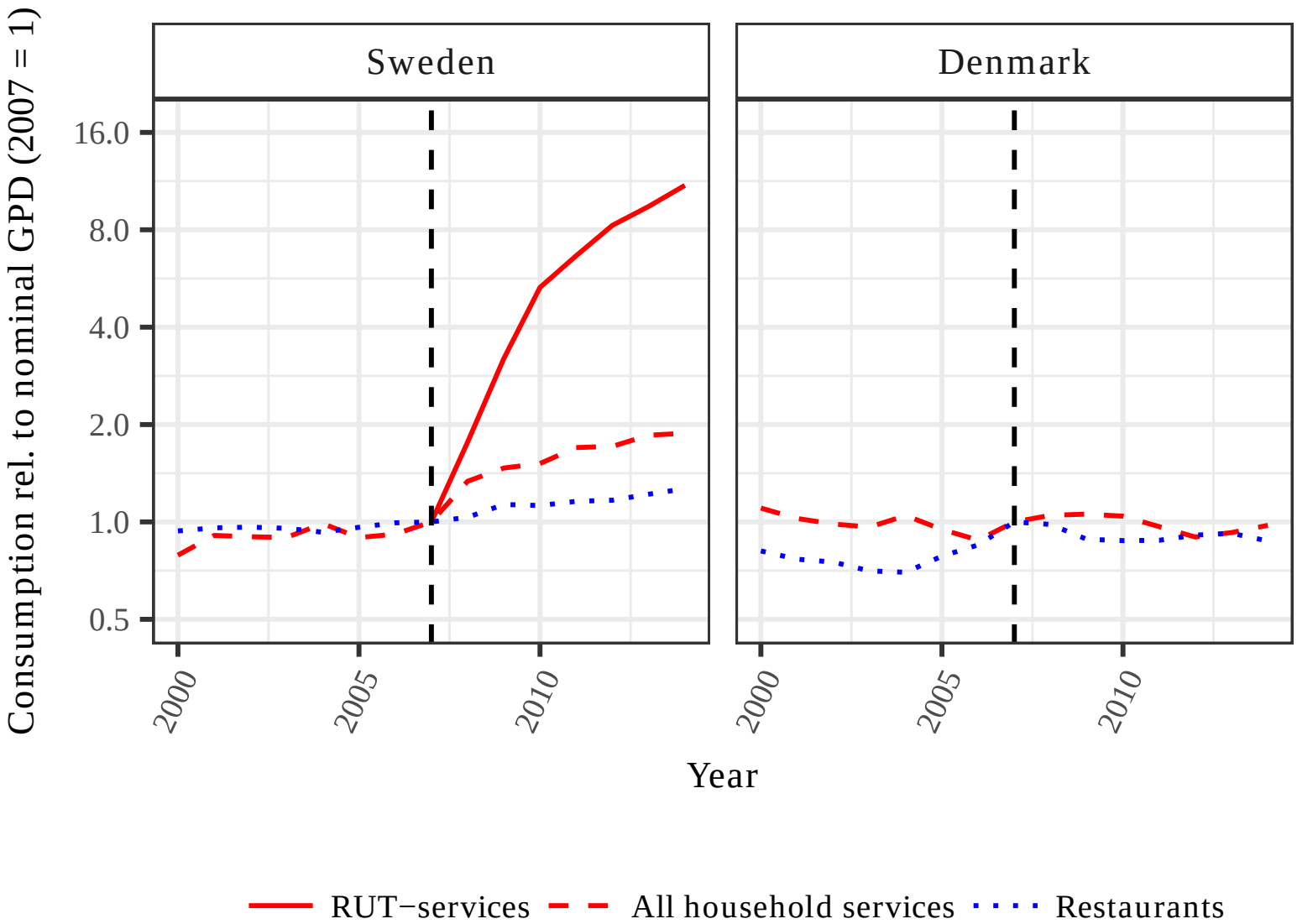
- How strong is demand response to new prices?
- Are US and Swedish consumption of cleaning services similar after policy?
- Do long-run and short-run responses differ?

Users and total spending



Source: Skatteverket (2018)

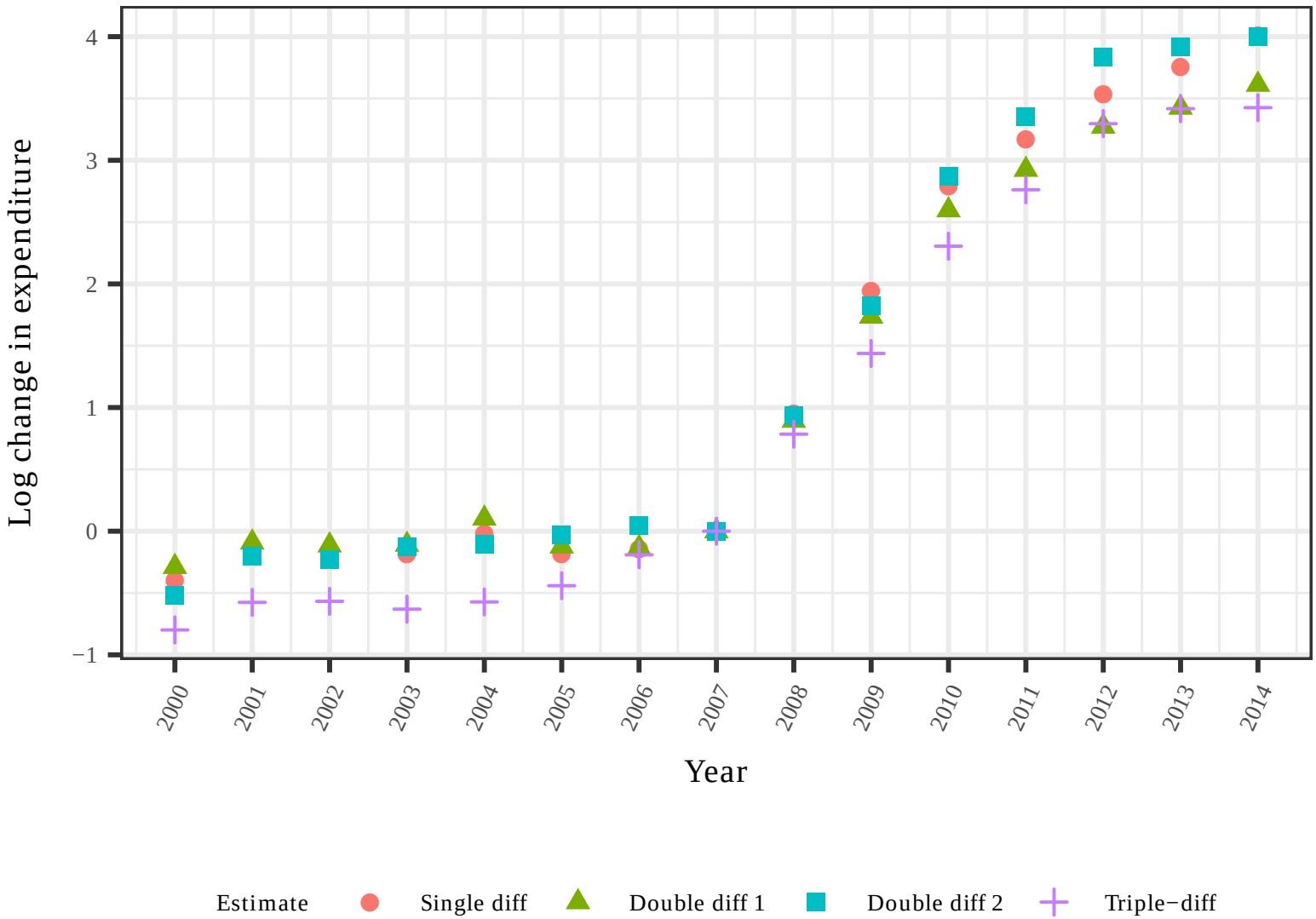
Consumption patterns in Sweden and Denmark



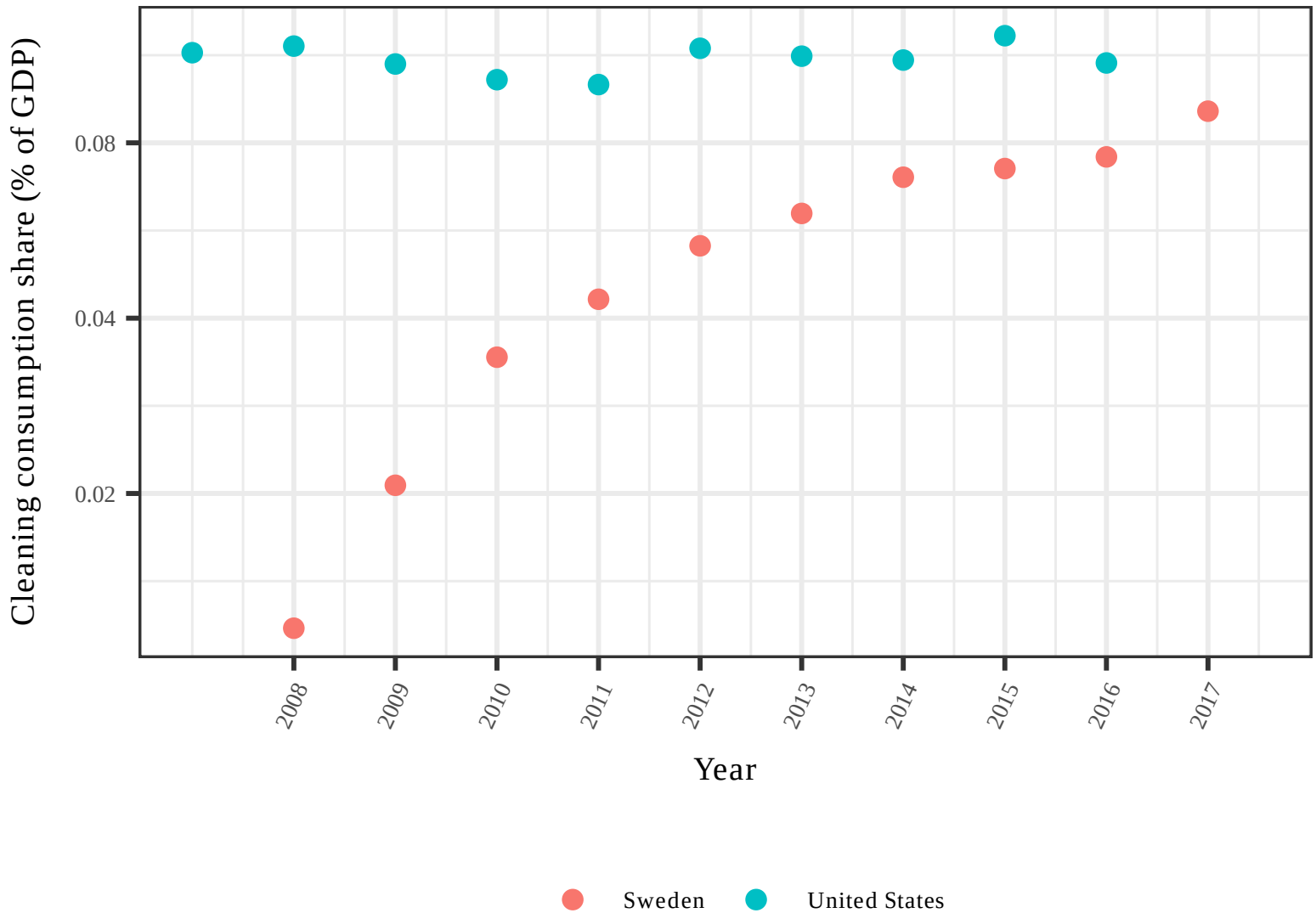
Parameter estimates

- Large and persistent treatment $\rightarrow$ large and sluggish response
- Counterfactual trend required for elasticity estimate
- Diff-in-diff relative to a variety of trends
  - Nominal GDP
  - Restaurants in Sweden
  - Household services in Denmark
  - RUT vs restaurants in Sweden vs cleaning services vs restaurants in Denmark
- Divide by price change from subsidy to obtain elasticity

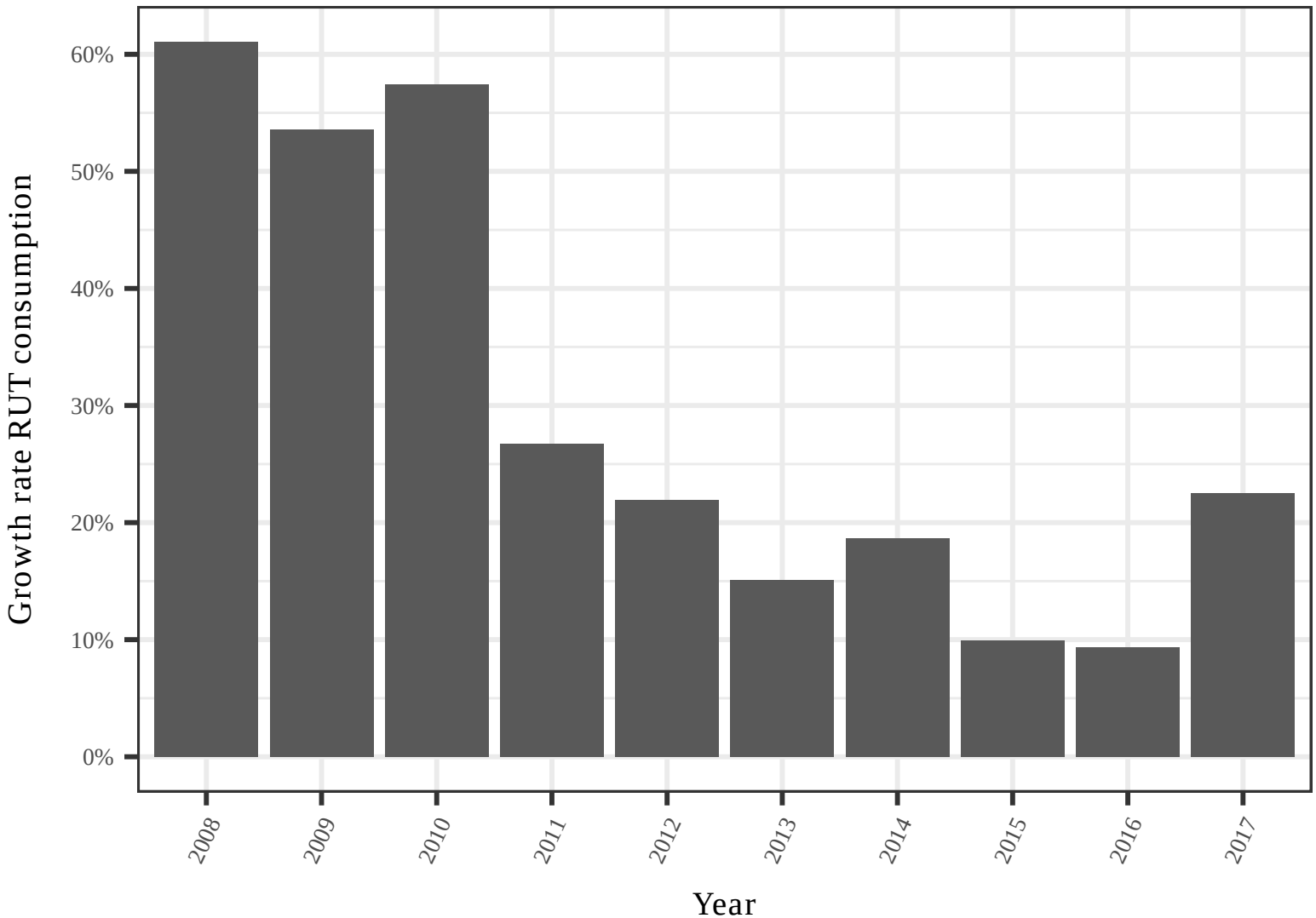
Price elasticity estimates



Cleaning consumption as a share of GDP



Growth rate of RUT consumption in Sweden



Source: Swedish Tax Authority

Summary

Large price decrease of cleaning services in Sweden

- Large, gradual, quantity response
- Consumption gap vs the US shrinking considerably over time
- Suggestive evidence that convergence is incomplete

Questions:

- What is reasonable estimate of total long-run response?
- What preferences differences needed to fit US vs Swedish data?

Informal work

Interpret data

Required preference differences assessed using demand model

Elasticity estimate: ~ 4

- Constant elasticity assumption problematic
  - E.g., additional log point price decrease $\rightarrow$ cleaning 10% of private consumption

Question: can we rationalize our numbers?

Next: Discrete choice model

- Simple setup of make vs buy decision
  - Captures extensive margin nature of choice
- Use to fit moments and predict final demand
- Calculate required preference differences to fit US vs Swedish differences in consumption patterns

Simple random utility formulation

- Household decision to outsource household services

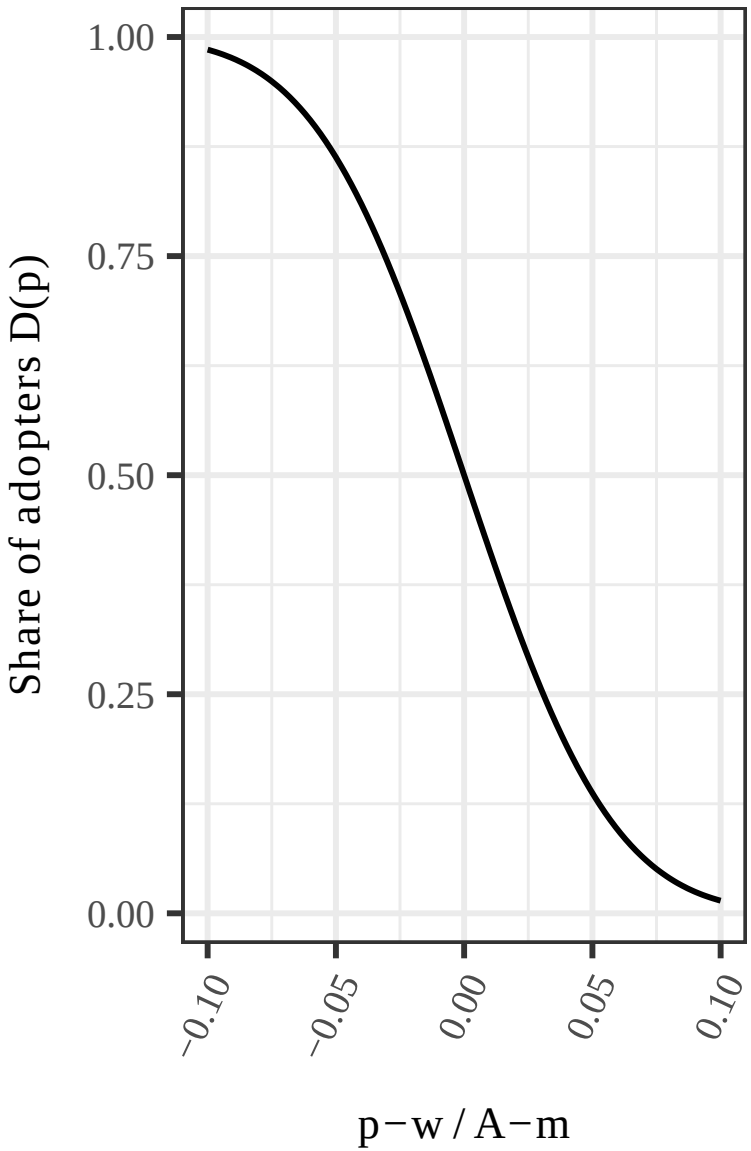
$$V_i = (w_i/A + m - p + \varepsilon_i)h, \quad \varepsilon_i \sim F \tag{1}$$

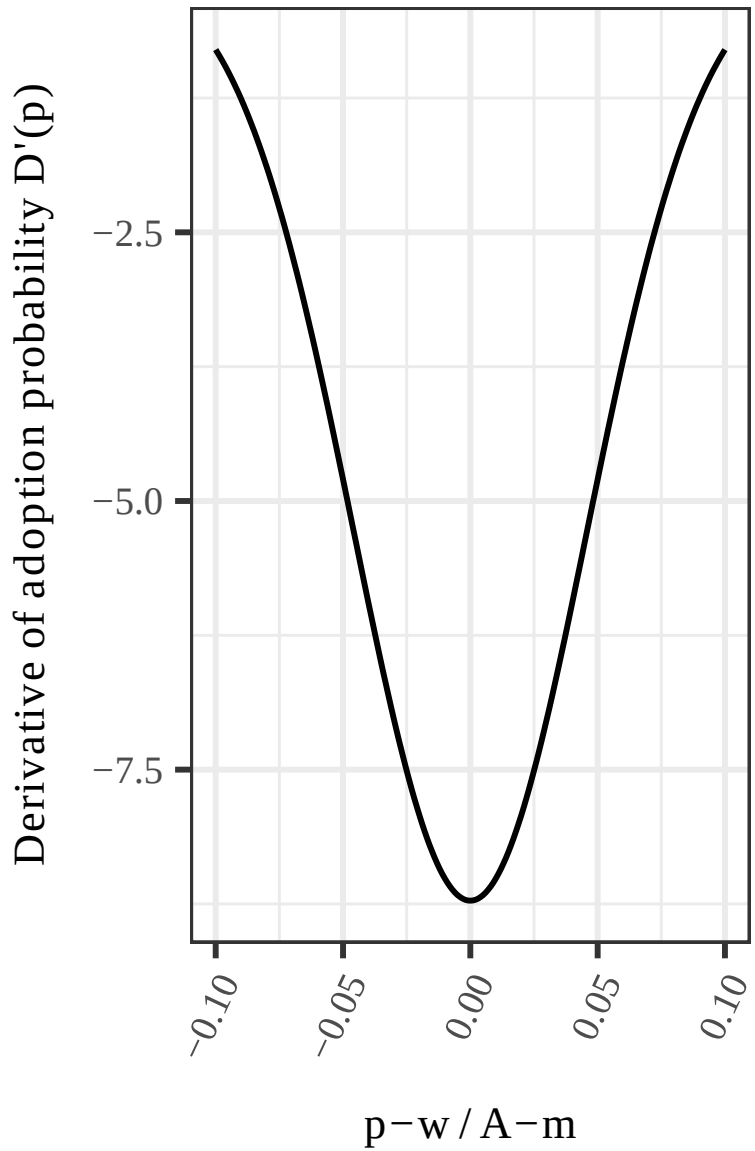
  - w_i : Post-tax hourly wage
  - A : relative productivity
  - m : additional consumption value of market production
  - p : price of household service
  - ε_i : idiosyncratic preference
  - h : scale of project (hours)

- Probability of outsourcing service

$$D(p, w_i/A, m) = F(w_i/A + m_p - p). \tag{2}$$

Share and derivative of outsourcing probability





Specification

Utility

$$V_{i,t} = w_{i,t}/A + m - p_t + \varepsilon_i \quad \varepsilon_i \sim Gumbel(0, \sigma)$$

- w_i: hourly post-tax wage
- p: hourly household cleaning service price

Poisson adoption rate $\lambda \rightarrow$ adoption share satisfies

$$\begin{aligned} \hat{\pi}(\theta)_{t,i} &= \exp(-\lambda)\hat{\pi}(\theta)_{t-1,i} + (1 - \exp(-\lambda))\mathbb{P}(V_{i,t} > 0) \\ \hat{\pi}(\theta)_{2006,i} &= \mathbb{P}(V_{i,2006} > 0) \end{aligned}$$

- $\theta = \{A, \sigma, m, \lambda\}$

Calibration

Parameters θ calibrated to minimize

$$\hat{\theta} = \arg\min_{\theta} \sum (\hat{\pi}(\theta)_{t,i} - \pi_{i,t})^2$$

- i : 10 income brackets (tabulated by Swedish Tax Authority)
- t : $2007, \ldots, 2015$

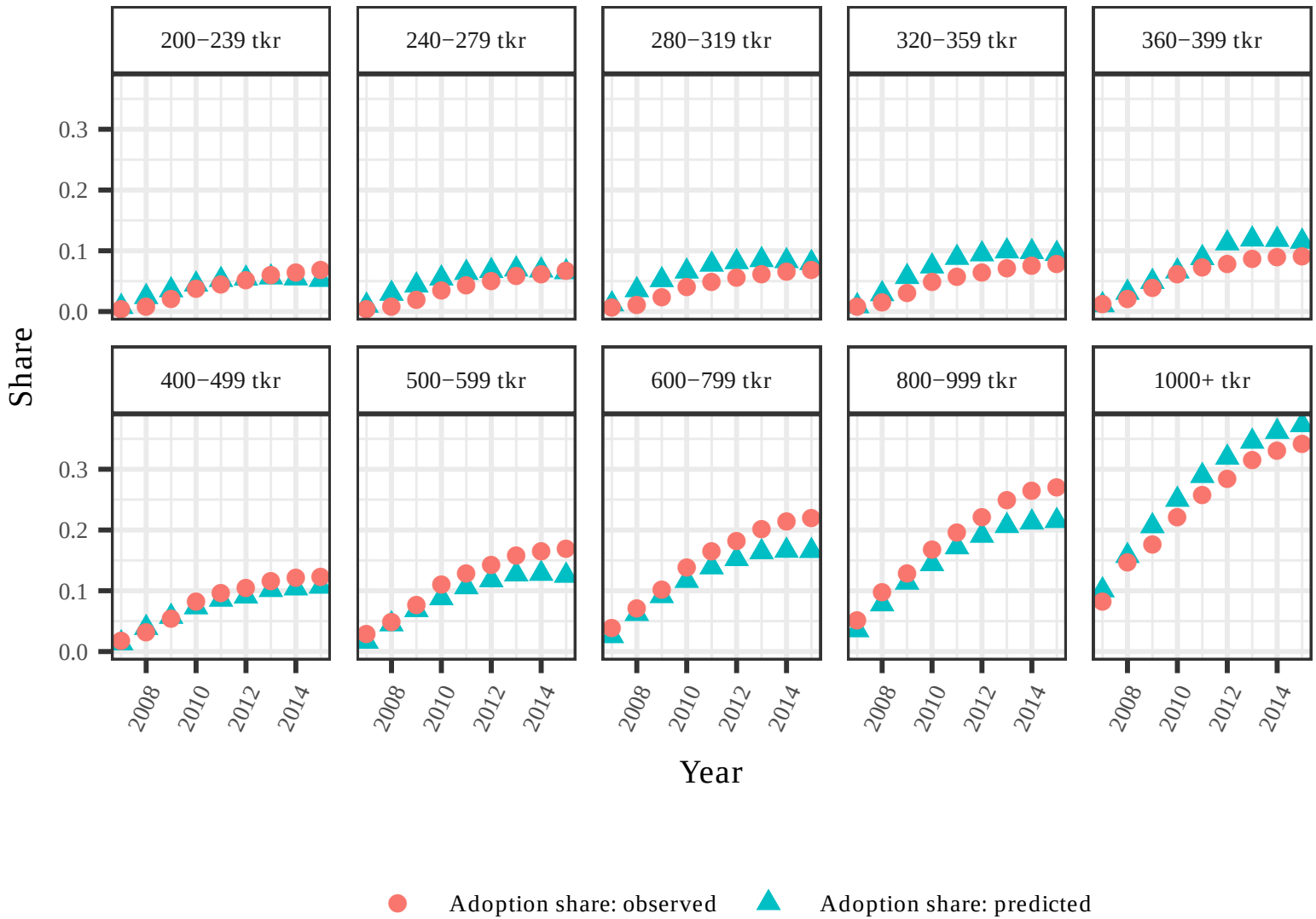
Variables

- $p_{i,t} = \begin{cases} w_t^{clean} \times \xi \times (1 - \alpha/2)^{-1} & t = 2006 \\ w_t^{clean} \times \xi & t \geq 2007 \end{cases}$
  - ξ: ratio of posted post-subsidy hourly price of largest cleaning company in 2018 and cleaner wages
  - α: reported labor share of cleaning (determines subsidy)
- $w_{i,t} = \frac{w_{i,t}^{year}}{\bar{h}^{SWE}} \left(1 - \tau_t(w_{i,t}^{year})\right)$

Calibrated values

- $A = 1.13$
  - Similar time requirement to make versus buy
  - Somewhat higher than survey evidence (mean ≈ 0.7)
- $\lambda = 0.08$
- $m =$ SEK 99 per hour of work
- $\sigma =$ SEK 56

Predicted and observed adoption rates



Predicted long-run response

Consumption-income ratio in income group i

$$\rho_i = s_{clean} \times \frac{\bar{c}_{i,2015}|adoption}{y_i}$$

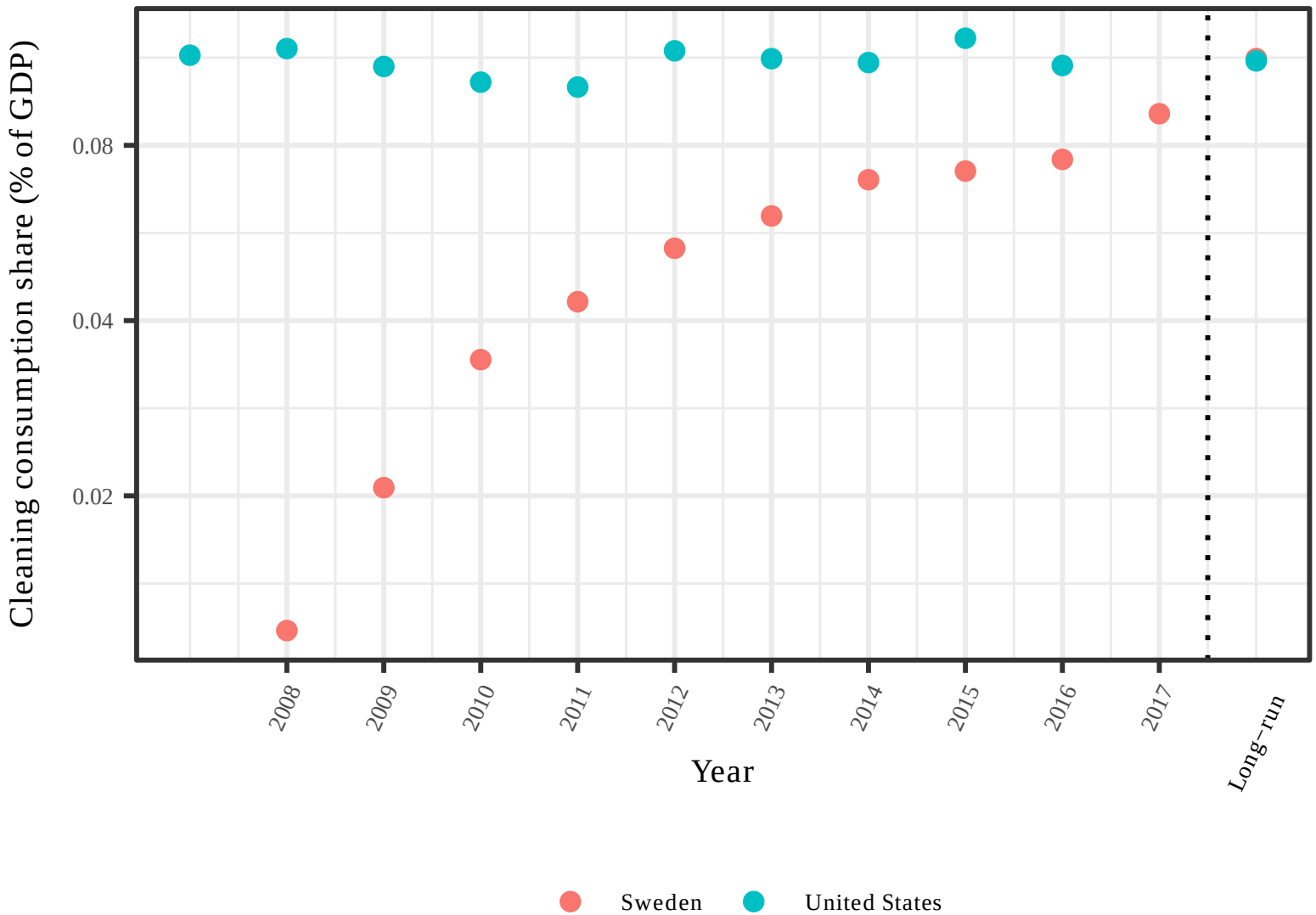
- $s_{clean} = 0.9$: share of cleaning in RUT consumption

Estimated long-run response

$$\frac{\sum_{i>200K} n_i y_i \pi(\hat{\theta})_{t\to\infty,i} \rho_i \frac{1}{1-s_{c,<200K}}}{GDP_{2015}}$$

- $s_{c,<200K} = 0.2$
  - RUT consumption share of individuals with $<$ SEK 200,000

Long-run response



Calibrating preference differences

Predicted US consumption with estimated parameters

$$s_{US}(\theta) = \frac{\sum_{i>200K} n^{US}_{i,2015} y_i \pi(\theta; \tau^{US})_{t\to\infty,i} \rho_i \frac{1}{1-s^{US}_{c,<200K}}}{GDP^{US}_{2015}}$$

US tax payments (Kaplan, Mitman and Violante, 2017)

$$T(y) = y - 0.75y^{1-0.151} \Longrightarrow T'(y) = 1 - 0.64y^{-0.151}$$

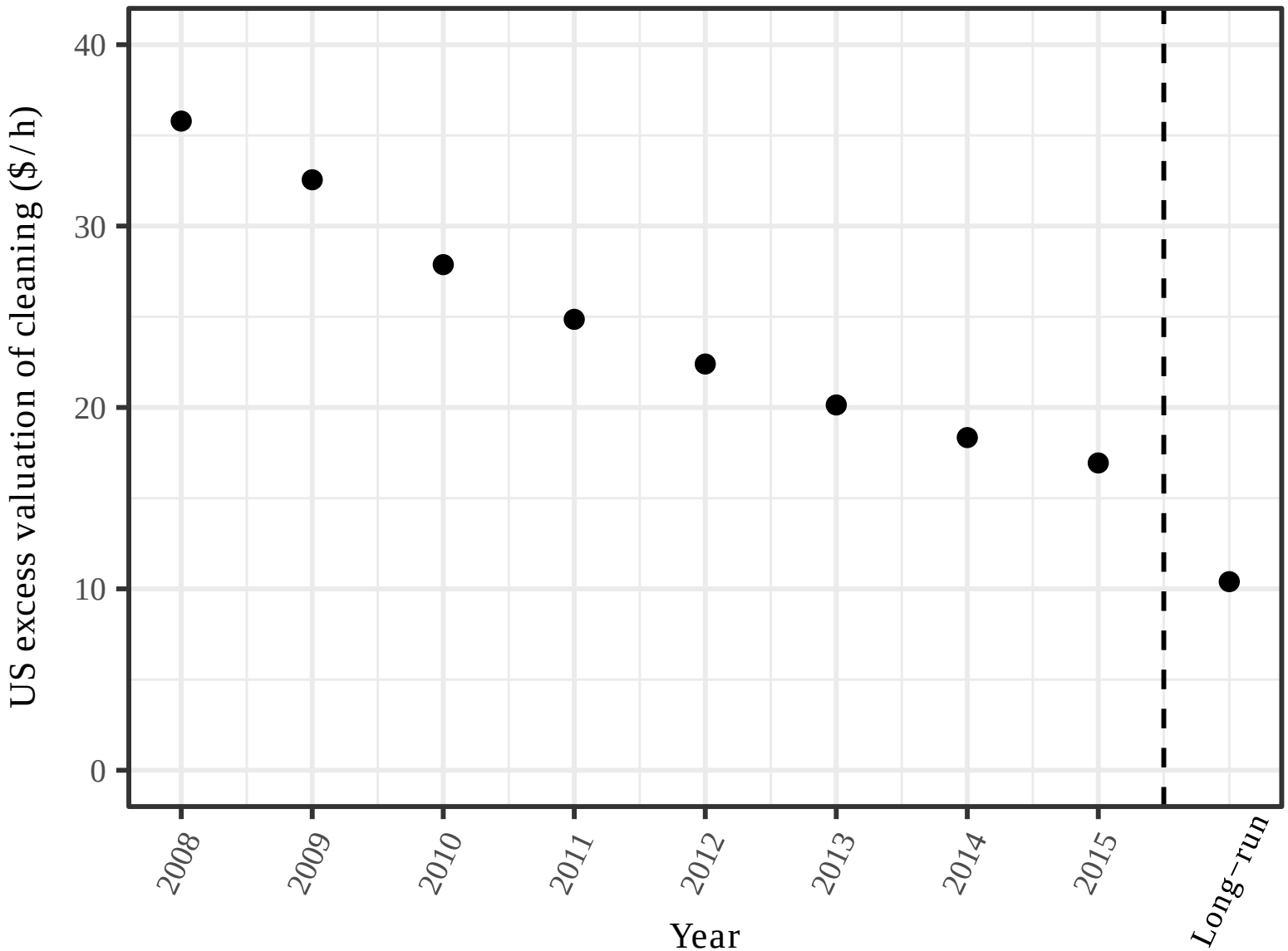
US preferences m_{US} based on long-run and short-run Swedish estimates

- m^{∞}_{US} solves $s_{US}((\hat{\theta}^{SWE}_{-m}, m^{\infty}_{US}) = s_{US}$
- m^{t}_{US} solves $s_{US}((\hat{\theta}^{SWE,t}_{-m}, m^{t}_{US}) = s_{US}$
  - $\hat{\theta}^{SWE,t}$ estimate on t consumption, assuming $\lambda = \infty$, $A = A^{\infty,SWE}$

Differences in Swedish and US preferences

$$\Delta m^t = m^t - m^t_{US}$$

Effect of long time-horizon on preference parameter



Conclusion

Question: Prices or preferences cause of different home production patterns?

Today: large, persistent, subsidy analyzed

- Large increase in quantity demanded
- Substantial reduction in consumption differences versus the US
- Convergence gradual over time

Calibrated discrete choice model

- Rationalizes high local elasticity
- Adoption patterns broadly consistent with Poisson adoption model
- Estimated preference differences fall sharply with estimation window

To do

- Explicit treatment of illegal market in model
- Treatment of households versus individuals
- Multiple estimates of consumption expenditures

THANK YOU!

Informal work

RUT users 2010

- 65% claimed they did it themselves
- 6% that bought on black market
- 25% that they had it legal

8% claimed they would buy on the black market without subsidy

Estimated total black market work in 2005: 7.5 M hours

Conservative assumption: nothing gone by 2007, all gone by 2017

- Total increase in consumption: 8.5M hours to 16M hours

Back