Products, Pricing and Pass-through

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Background & Company Information

IKEA is a major international presence in retail home furnishings:

- Over 300 stores in 38 countries.

- Among the top-ten furniture retailers in the US.

- 3rd largest wood-products purchaser after Home Depot and Lowe's.

- Over 21 billion Euros in annual sales.

Background & Company Information

IKEA sales by country:

Germany	16%
US	11%
France	10%
UK	7%
Italy	7%

IKEA sales by regions:

Europe	80%
North America	15%
Asia/Australia	5%

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Countries in our sample:

- Germany
- US
- France
- UK
- Sweden
- Canada
- Italy (in progress)

Years: 1994-2010

Over 100,000 Observations

The IKEA Catalog

A great laboratory for studying international pricing by a single multinational

3 Reasons to focus on the IKEA catalog:

1. **Size of the market**
   - 200 million copies of the 2010 IKEA catalogs.

2. **Timing**
   - IKEA publishes a catalog of its products in July of every year, e.g.,
     $\implies$ 2011 catalog was released in July/August 2010
   - Prices remain unchanged over the course of the catalog year.
   - The catalog prices are excellent measures of transactions prices.

3. **Detailed descriptions**
   - The catalog specifies each good in detail.

The IKEA Catalog

The catalog specifies the good in detail:

BILLY bookcase $69.99/ea
RA. W31$\frac{1}{2}$ x D11 x H79$\frac{1}{2}$"

- **Name**

- Description

- Dimensions (cm or inches)

- Units

- Price in local-currency

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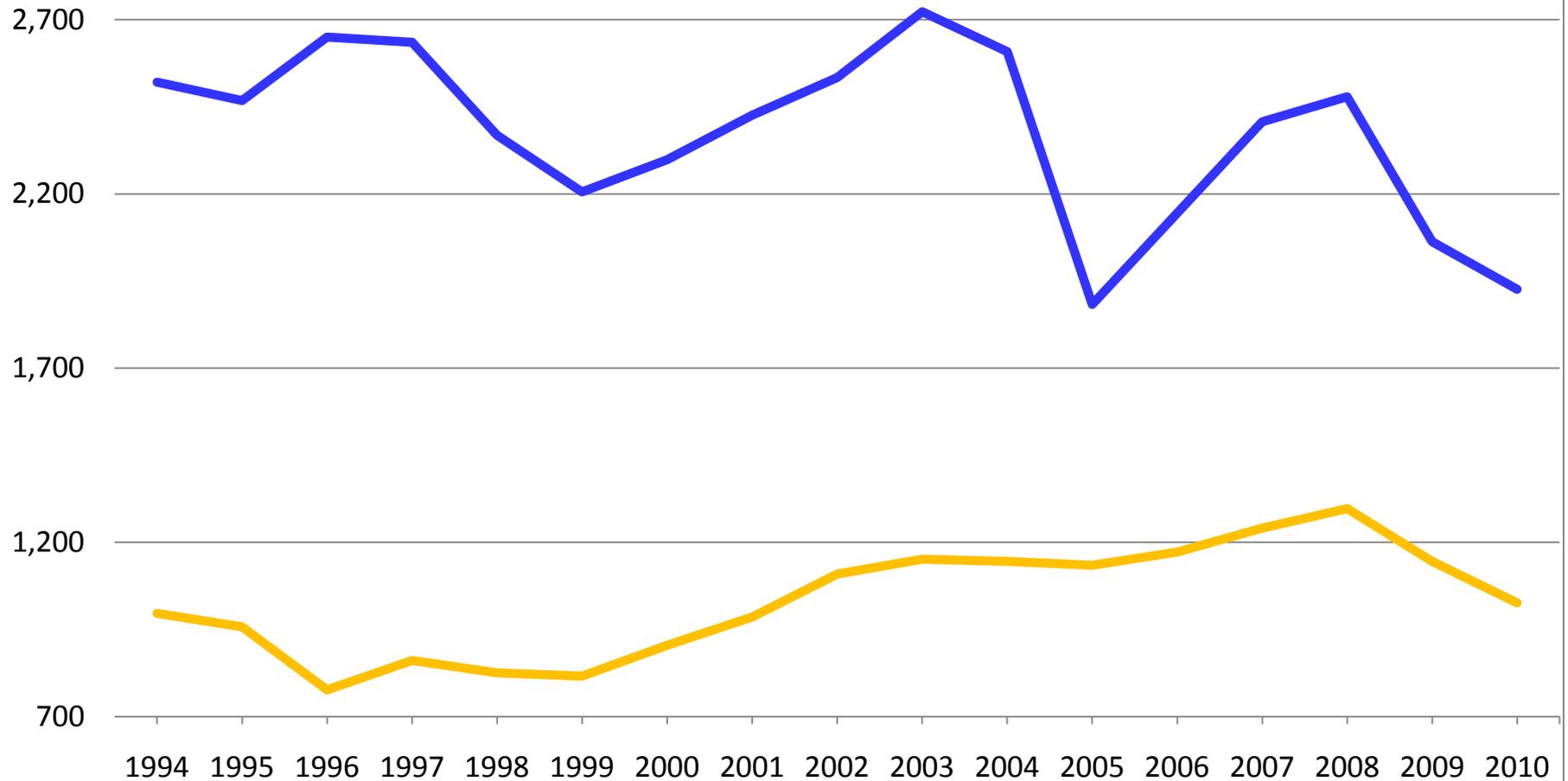- Dimensions (cm or inches)

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- **Price in local-currency**

Local-currency pricing means that IKEA should consider the exchange rate when setting prices 1 year in advance

Number of Observations in IKEA catalogs

The number of observations in a typical catalog has risen
But the number of distinct goods has fallen

Legend: Average Observations, Distinct Goods

Y-axis values: 700, 1,200, 1,700, 2,200, 2,700

X-axis values: 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010

Law of One Price

- The Law of One Price (LOP) states that the exchange-rate adjusted price of a good will be the same across countries.

- LOP holds if transportation and non-traded costs are identical, and pricing is competitive

- Empirically, this law fails miserably.

Law of One Price

- Some notation:
  - p_{ijt}: local-currency price of good i in country j at date t.
  - e_{jt}: exchange rate between Sweden and country j, expressed as local-currency units per Swedish krona.
  - $\overline{p}_{it}$: mean price of good i at date t across all countries, j.

- The LOP deviation is $(p_{ijt} \times e_{jt}) - \overline{p}_{it}$
  - mean-zero for every good at a particular date t.
  - won't necessarily be mean-zero for a particular country.

Law of One Price

Wide dispersion in LOP deviations across country

Percent Deviations from Law of One Price
Means

Goods	Canada	Germany	France	Sweden	UK	US
All	8.4%	-3.4%	-2.5%	-7.6%	3.1%	5.0%

Law of One Price

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Percent Deviations from Law of One Price
Means

Goods	Canada	Germany	France	Sweden	UK	US
All	8.4%	-3.4%	-2.5%	-7.6%	3.1%	5.0%
New	7.4%	-2.9%	-2.2%	-6.7%	2.8%	5.0%
Cont.	9.7%	-4.0%	-2.8%	-8.5%	3.4%	5.0%

Law of One Price

Similar standard deviations across high- and low-average-deviation countries

Percent Deviations from Law of One Price
Standard Deviations

Goods	Canada	Germany	France	Sweden	UK	US
All	16.6%	14.6%	13.2%	13.3%	14.7%	15.8%

Law of One Price

Similar standard deviations across high- and low-average-deviation countries

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Standard Deviations

Goods	Canada	Germany	France	Sweden	UK	US
All	16.6%	14.6%	13.2%	13.3%	14.7%	15.8%
New	16.3%	13.8%	13.0%	12.5%	14.2%	15.4%
Cont.	16.8%	15.3%	13.5%	13.9%	15.1%	16.1%

Law of One Price

Autoregressive parameters imply half-life deviations from LOP of 3-4 years

Autoregressions for Deviations
from the Law of One Price

Ind. variable	Canada	Germany	France	Sweden	UK	US
AR(1)	0.67	0.67	0.66	0.62	0.72	0.74
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	4240	5817	5691	5807	5490	3850
R-squared	0.46	0.43	0.46	0.39	0.49	0.55

Standard errors in parentheses

Exchange Rate Pass-Through

Are exchange-rates "passed through" to prices?

- Usual regression:

$$p_{ijt} = \beta c_{it} + \gamma e_{jt} + \mu_{ijt},$$

  where the price p_{ijt} depends on
  - Cost c_{it}
  - Exchange rate e_{jt}
  - Other perturbations μ_{ijt}
  (e.g., markup, transportation, and non-traded costs)

- Usual results: pass-through coefficient, γ, is less than 1.

Exchange Rate Pass-Through
Pass-through regressions

- Cost measures are frequently not available. Wages and output are used as proxies for cost measures.

- We can "proxy" for the cost term by including the Swedish price as a control for the common, unobservable, cost

$$p_{ijt} = \alpha_j + \beta_j p_{i,SE,t} + \gamma_j e_{jt} + \left(\mu_{ijt} - \mu_{i,SE,t} \right).$$

$\quad\quad$ \$ $\quad\quad\quad\quad$ sek $\quad\quad$ \$/sek $\quad\quad$ other perturbations

- The pass-through regression takes the form:

$$\Delta p_{ijt} = \alpha_j + \beta_j \Delta p_{i,SE,t} + \gamma_j \Delta e_{jt} + \mu_{ijt}.$$

Exchange Rate Pass-Through

Cost matter; Exchange rate does not

$$\Delta p_{ijt} = \alpha_j + \beta_j \Delta p_{i,SE,t} + \gamma_j \Delta e_{jt} + \mu_{ijt}$$

Ind. variable	Canada	Germany	France	UK	US
Swedish price	0.25	0.34	0.31	0.41	0.27
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Exchange rate	-0.01	0.05	0.13	0.07	0.13
	(0.03)	(0.04)	(0.03)	(0.02)	(0.02)
Observations	2,759	4,438	4,295	4,410	2,466
R-squared	0.05	0.08	0.08	0.14	0.08

Standard errors in parentheses

Do IKEA prices predict exchange-rates?
Cumby (1997)

- If US price is higher than Swedish price, then the US dollar is expected to depreciate.

- Expected devaluation:

$$E_t \Delta e_{jt} = E_t(e_{j,t+1} - e_{jt}) = (p_{ijt} - e_{jt} - p_{i,SE,t}).$$

- Actual devaluation:

$$\Delta e_{jt} = (e_{j,t+1} - e_{jt}).$$

- To test the theory that ex-ante price differential should predict price changes, we estimate the following regression:

$$\Delta e_{jt} = \alpha_j + \beta_j E_t \Delta e_{jt} + u_{t+1}.$$

Do IKEA prices predict exchange-rates?
Cumby (1997)

$$\Delta e_{jt} = \alpha_j + \beta_j E_t \Delta e_{jt} + u_{t+1}.$$

Ind. variable	Canada	Germany	France	UK	US
$E_t \Delta e_{jt}$	0.04	0.03	0.02	0.01	0.04
	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Observations	3,955	5,921	5,761	5,710	3,577
R-squared	0.01	0.01	0.00	0.00	0.01

Standard errors in parentheses

Conclusion

- We examine international pricing behavior using every items of six countries IKEA catalogs from 1994 to 2010

- Within the context of these data, we provided evidence on:

  1. <u>LOP</u>: Wide dispersion in LOP deviations across countries

  2. <u>Exchange-rate pass-through</u>: Costs seem to be an important determinant in IKEA's pricing decision; Exchange rate is not.

Let's turn the floor over to...

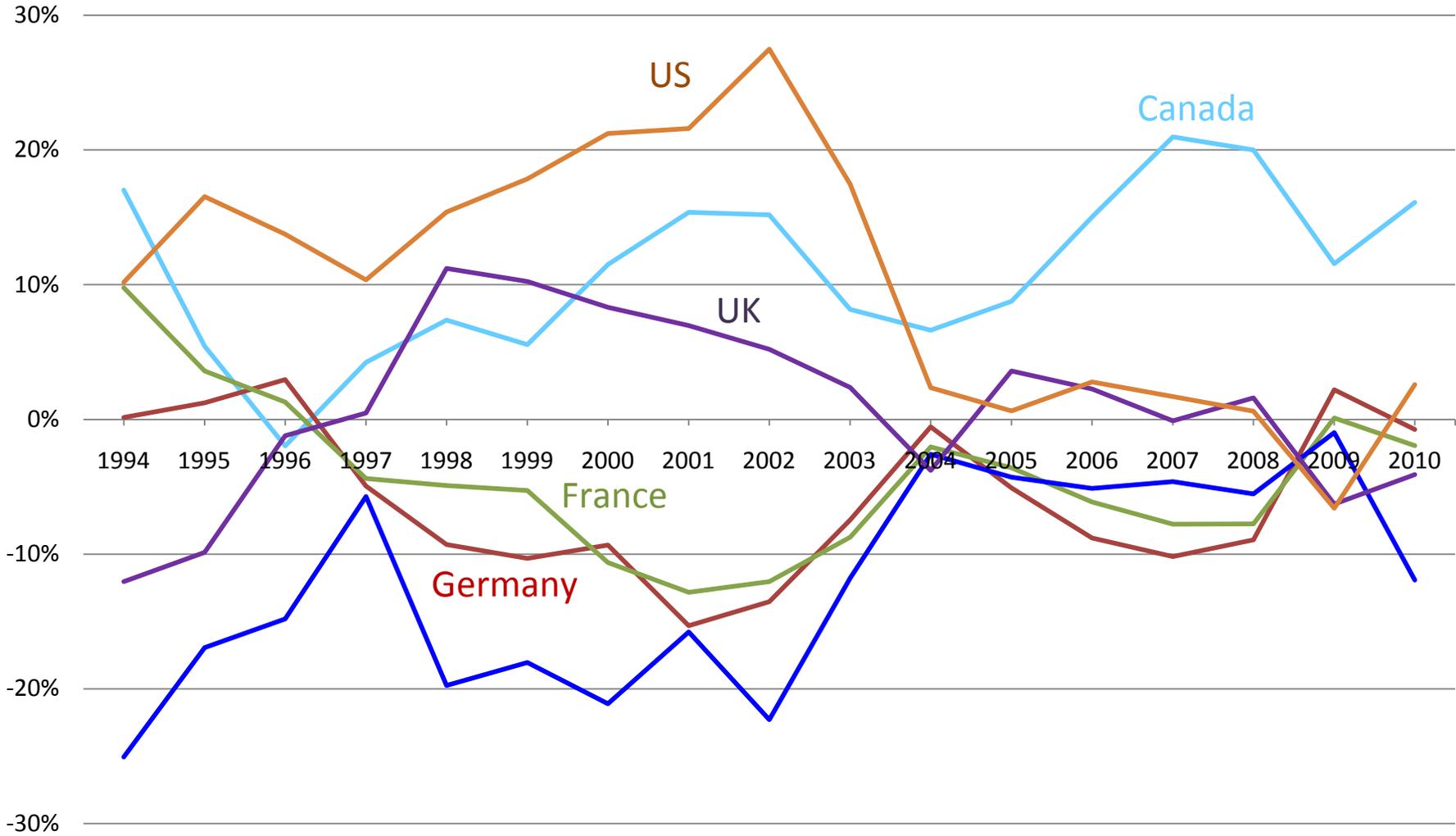### ...the designated complaint department for this paper
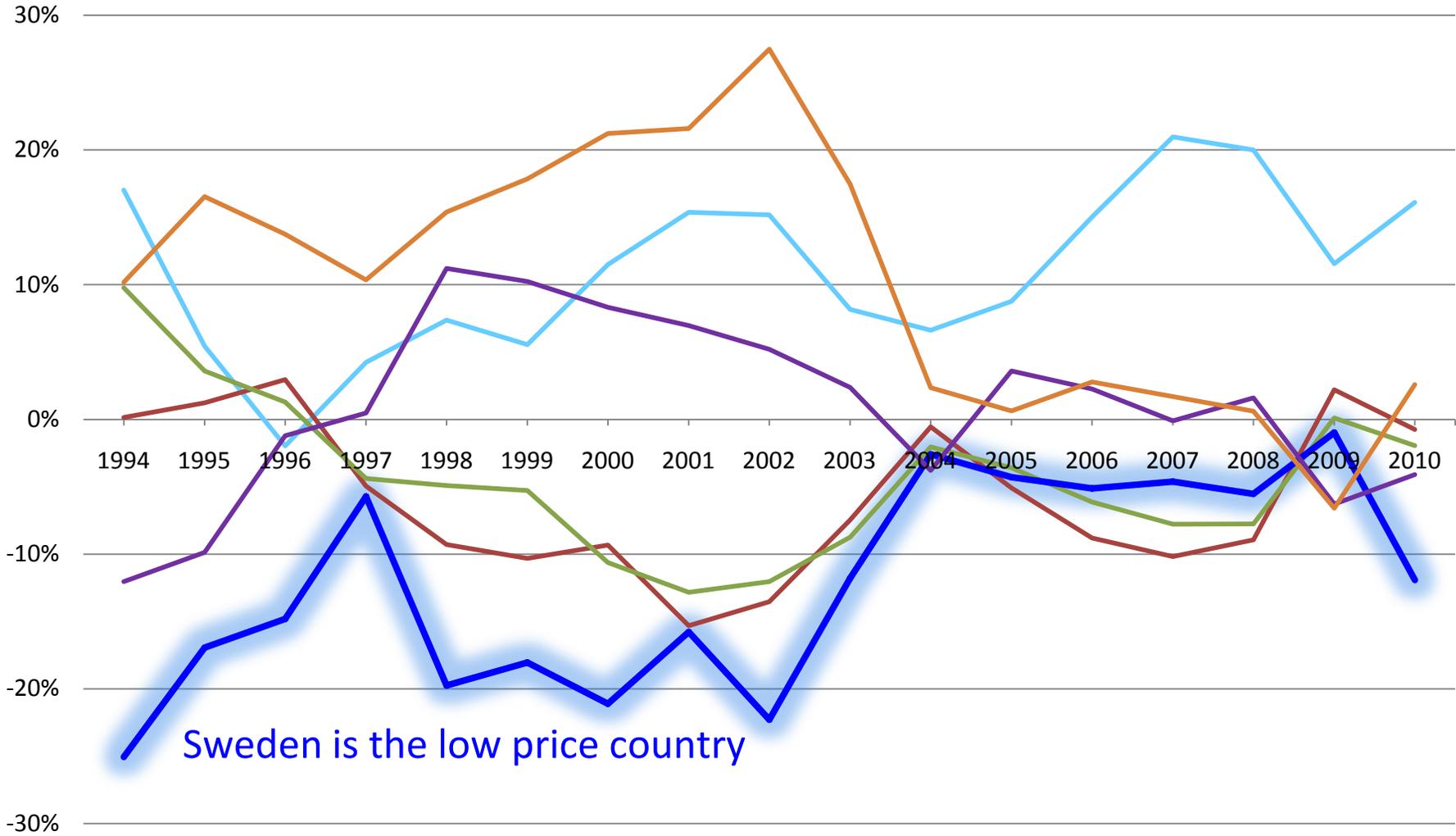
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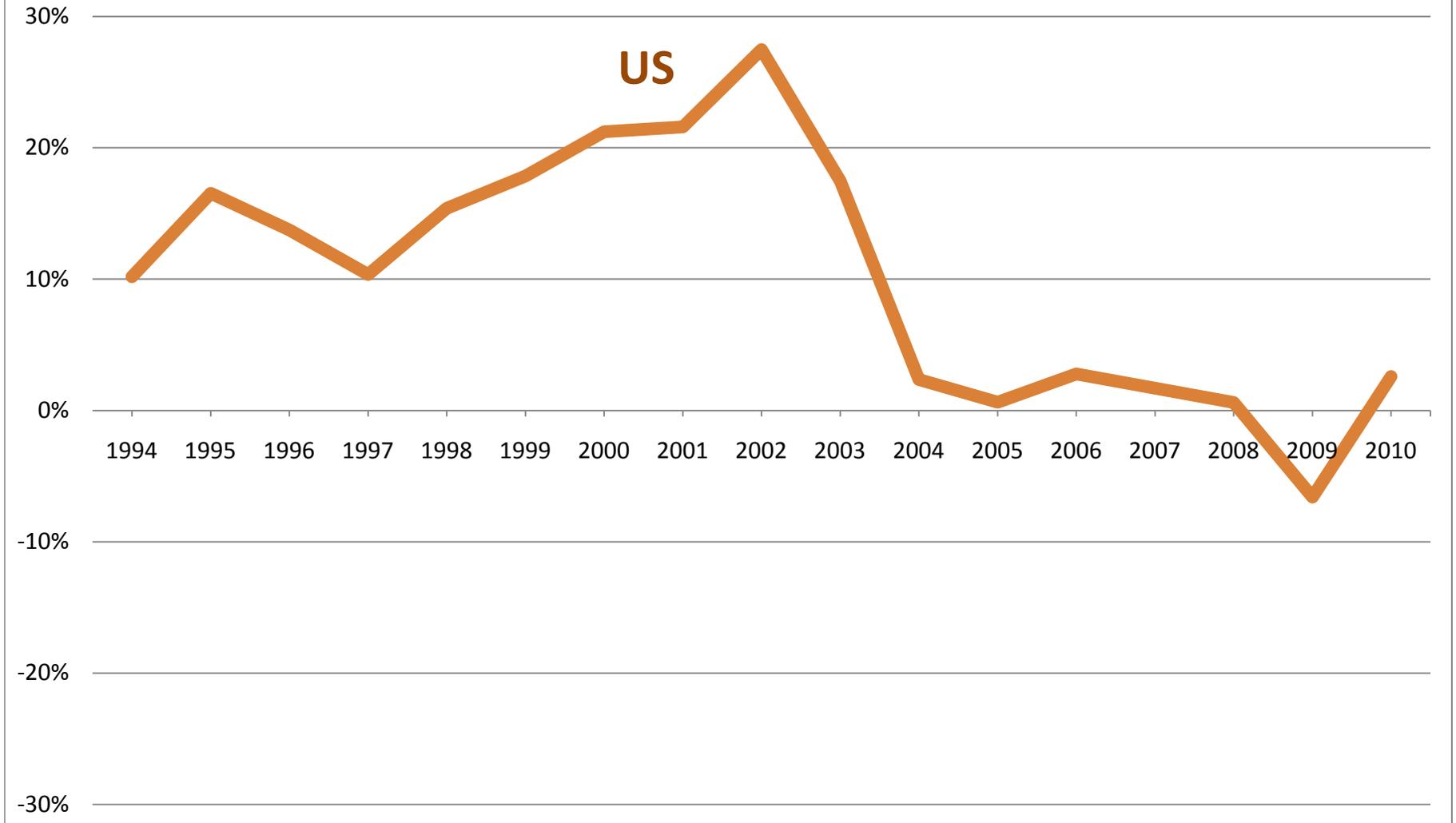
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Legend: Canada, Germany, France, Sweden, United Kingdom, United States

Sweden is the low price country