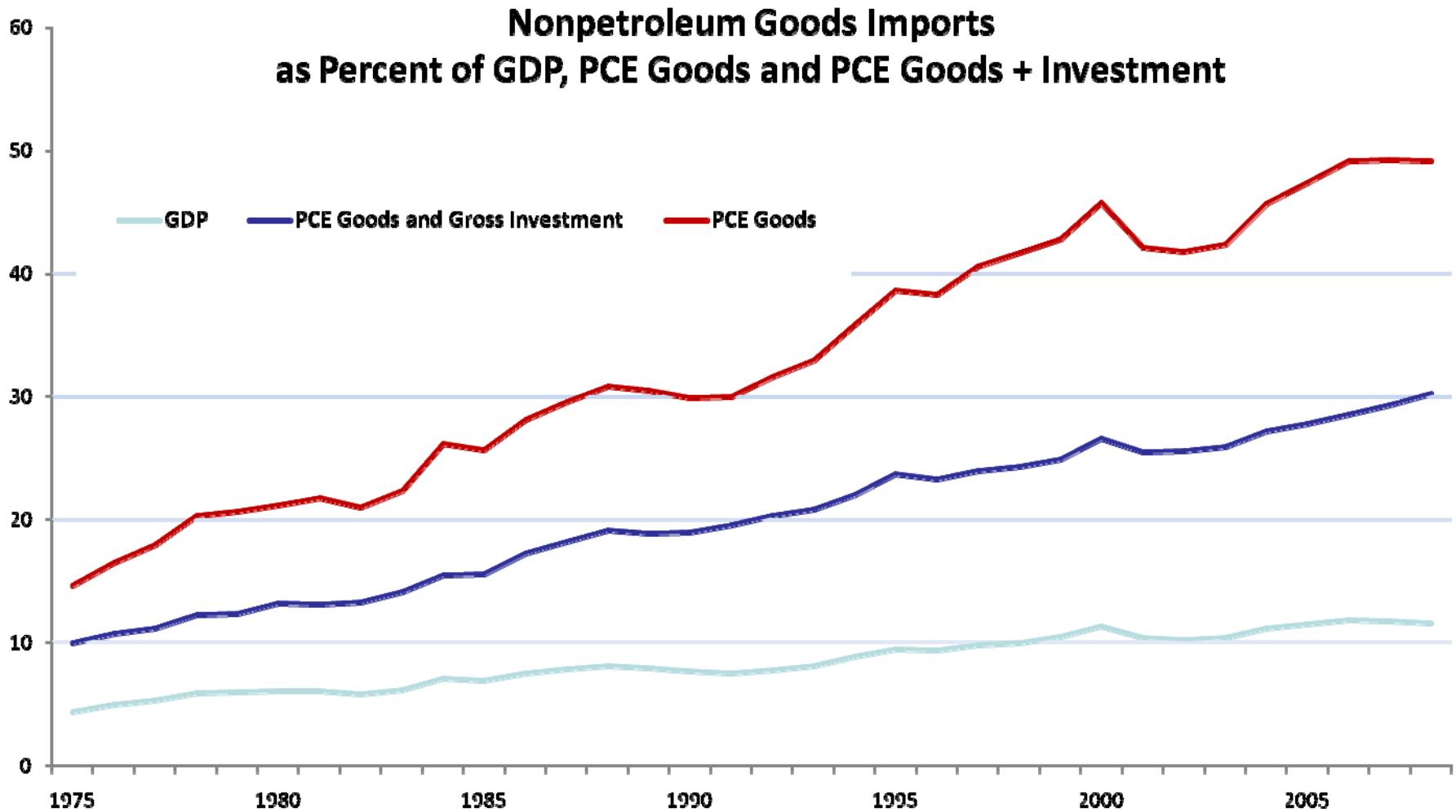


# Are there Unmeasured Declines in Prices of Imported Final Consumption Goods?

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# Growth of imports has been dramatic



# Import prices seem to be a driver of import growth

- Import growth does not itself imply that the item's relative price is falling (net domestic supply may have had a negative shock), but in this case there are reasons to suspect a role for low prices .
- Causes of import growth include lower transport costs, lower communications costs, better ability to manage logistics of fragmented supply chains, multi-lateral trade liberalizations, economic liberalizations, scale economies, growth in varieties, and rapid capital deepening and productivity growth in some countries.
- Many of these factors act to reduce prices of imports to US buyers.
- Domestic price levels are low in some emerging suppliers of imports.
- Market participants say that prices are causing import substitution.

# Price differentials for substituted imports can be hard to measure

- Competing foreign products may be substituted for domestic ones, but we don't have a buyer's index for intermediate inputs that allows comparisons of foreign to domestic prices.
- Substituted import may be a new good in the import price index.
  - New goods enter via linking, so they don't affect the index's level.
  - Effect is analogous to outlet substitution bias.
- Price changes tend to coincide with variety changes in import indexes, so they get linked out (Nakamura and Steinsson, 2008).
  - ⇒ upward bias when prices are falling (downward when rising).



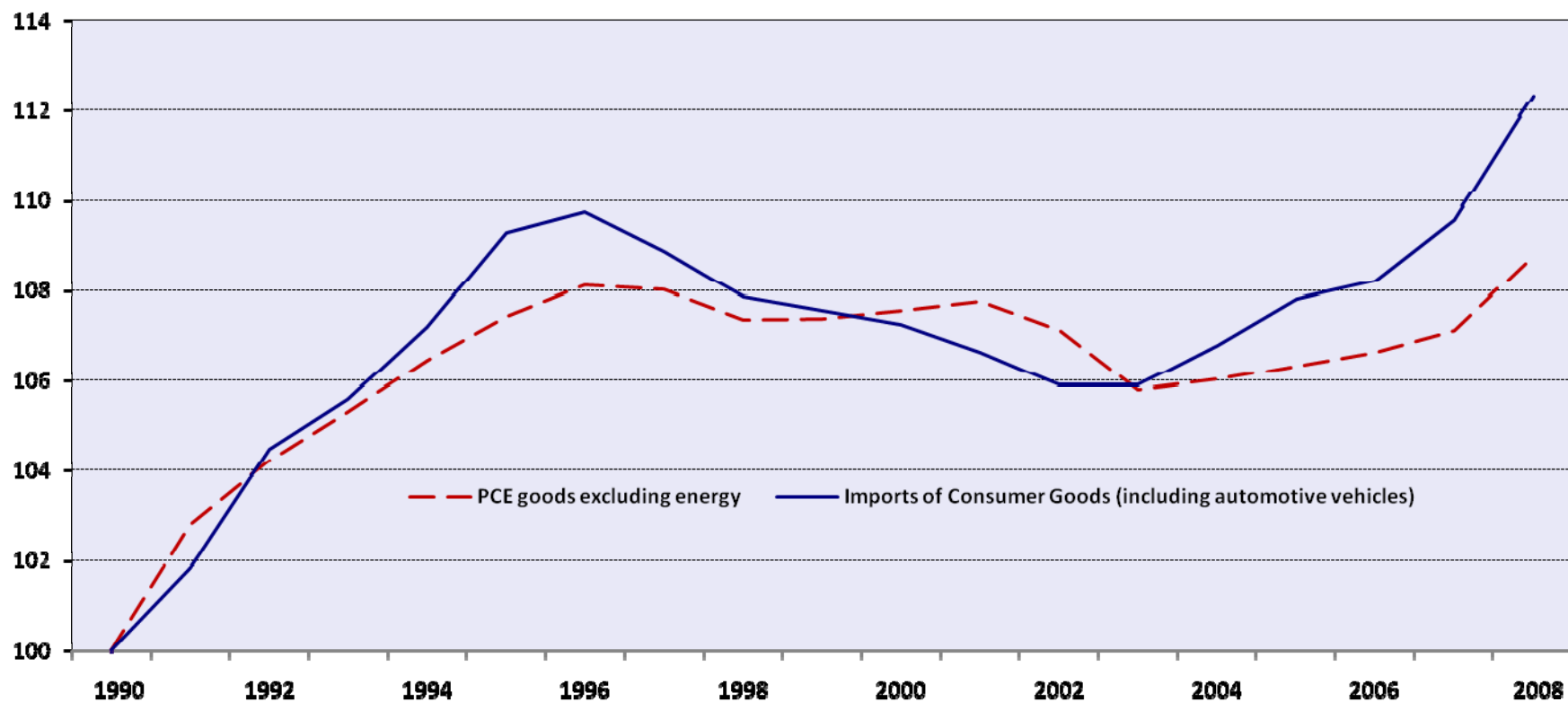
# CPIs for imported personal consumption items

- At least some of any cost savings due to substitution of lower-priced foreign sources of supply should be passed on to consumers.
- We hypothesize is that some price change for final consumer goods experiencing import substitution is linked out of the import price index but not linked out of the CPI because:
  - 1) CPI can compare prices from foreign and domestic suppliers if consumers would regard versions as comparable.
  - 2) CPI makes more use of hedonics and other quality adjustment techniques that reduce reliance upon linking.
- If so, CPI should have lower growth than import index for final consumption items seeing substitution of lower-priced imports.

# Comparisons of Aggregated Price Indexes

- Import price index for consumer goods has **faster** growth than the index for PCE goods excluding energy after 2003, but it covers a different mix of products.

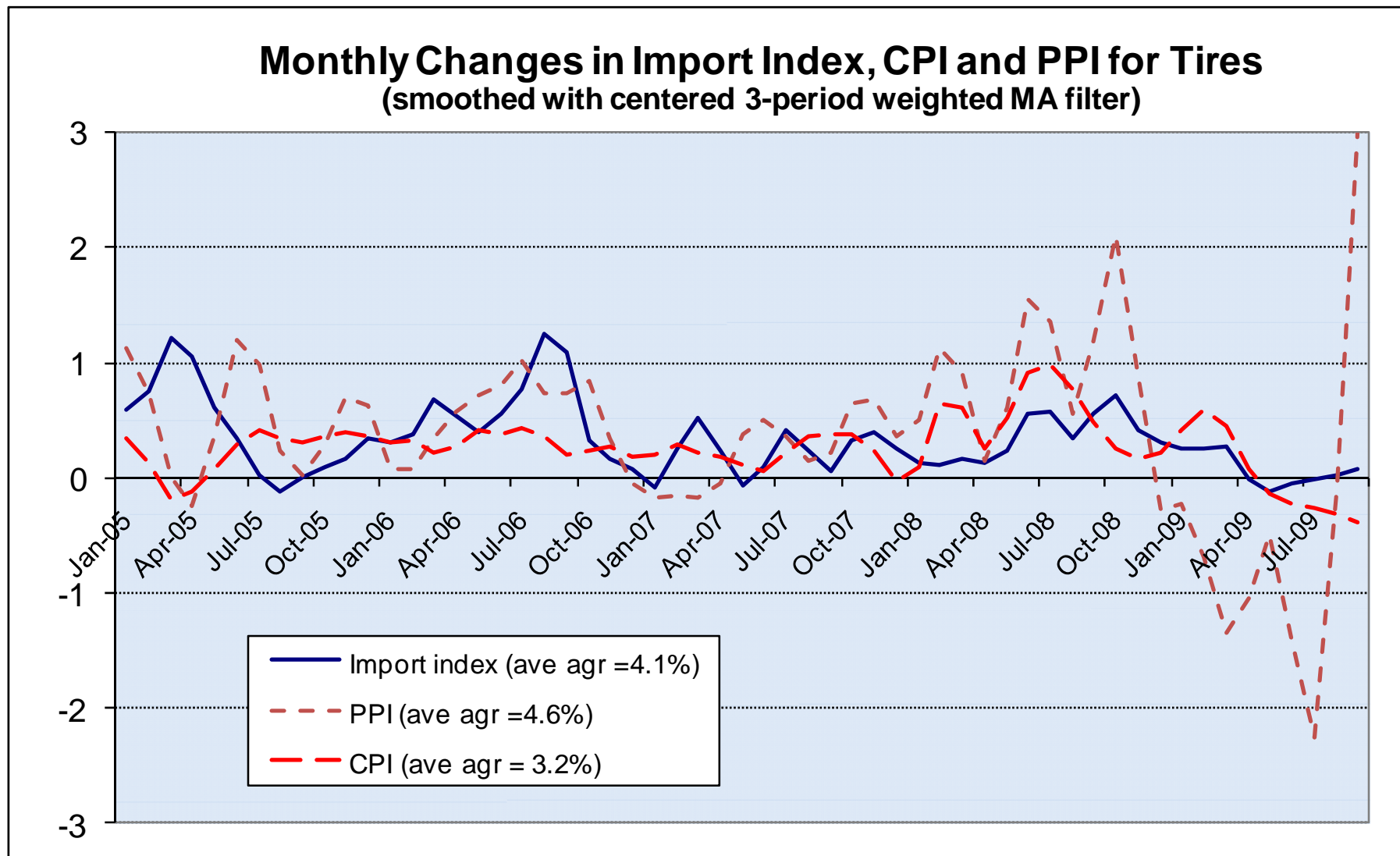
**Price Indexes for Consumer Good Imports and for Goods in Personal Consumption Expenditures (ex. Energy)**



# Our Research Strategy

- Use BEA's Industry Accounts data to identify commodities that are used in PCE and that are supplied at least partly from imports.
- Fisher indexes of *suppliers' prices* for commodity combine the domestic and imported supplies of each of these commodities.
- Fisher indexes of *purchasers' prices* include transportation and distribution margins and commodity taxes.
- Compare indexes of purchaser prices with matched CPIs.
- Compare supplier prices to CPIs—difference implies a value for index for transportation & distribution margins and commodity taxes.
- Estimate effects at more aggregated level using indexes that weight commodities by their importance in PCE uses.

# Import, Domestic and Consumer Indexes: Example of Tires







# Reasons for caution in interpreting results

- Unmatchable items and energy were excluded.
- Quality of the price indexes for distribution margins used to calculate our indexes of purchasers' prices is unclear.
- CPIs are often not available at a sufficiently detailed level of aggregation, so matches are not as good as we would like.
- Declining tariff rates should be reflected in the CPIs, but tariffs are excluded from measurement concept of the import indexes.
- We don't know the indexes' variances, but they are positive.

Therefore:

- small discrepancies are not a matter of concern.
- patterns of discrepancies that are substantial and consistently in one direction are suggestive of presence of an effect, but not proof.

# Growth Rate Differences from Matched CPIs , 1997-2007



	Supplier's prices	Purchaser's prices	Import Prices	Domestic Prices	MEMO: Matched CPIs
<b>Nondurables ex apparel</b>	<b>0.3</b>	<b>-0.6</b>	<b>-0.6</b>	<b>0.6</b>	<b>2.2</b>
Food	0.0	-0.7	0.1	0.0	2.1
Alcohol	0.0	-0.6	-0.5	0.0	1.9
Misc. household supplies	0.6	-0.1	-0.2	1.3	1.5
Paper products, books and magazines	1.1	0.2	-0.4	1.1	1.4
Tobacco products	-0.6	-3.3	-6.6	-0.5	8.1
<b>Durables</b>	<b>1.9</b>	<b>2.0</b>	<b>2.3</b>	<b>1.6</b>	<b>-2.2</b>
Motor vehicles and parts	0.2	0.2	0.7	-0.1	-0.1
New cars and trucks	0.4	0.5	1.2	-0.2	-0.6
Electrical equipment ex. computers	4.2	4.8	3.5	4.3	-5.6
Computers, peripherals and software	6.4	11.7	11.8	3.8	-20.8
Furniture and wood products	2.3	1.4	1.5	2.5	-0.6
Clocks and watches	1.8	1.7	1.8	1.9	-1.4
Tools, hardware and supplies	1.8	0.9	1.7	1.7	-0.2
Other durables	3.0	1.9	3.1	2.4	-0.8
<b>Apparel and textiles</b>	<b>1.5</b>	<b>1.4</b>	<b>1.5</b>	<b>1.5</b>	<b>-1.2</b>
Women's and girls' apparel	1.9	1.7	1.9	1.8	-1.5
Men's and boy's apparel	1.3	1.4	1.4	0.7	-1.5
Other apparel	2.4	1.7	2.4	2.4	-1.2
Footwear	0.6	0.5	0.6	1.2	-0.4
Textile and sewing products	1.5	1.1	1.4	1.6	-0.8
<b>All products</b>	<b>1.0</b>	<b>0.6</b>	<b>0.7</b>	<b>1.1</b>	<b>0.2</b>
<b>All products ex tobacco</b>	<b>1.1</b>	<b>0.7</b>	<b>1.0</b>	<b>1.1</b>	<b>-0.1</b>

# Supplier price index comparisons

- Index of suppliers' prices for commodities **agrees** with matched CPI in cases of food, alcoholic beverages, and vehicles and parts.
- At more aggregated level, also have near-agreement for non-durables excluding apparel.
- For durables other than vehicles and parts and for apparel items, CPIs grow more slowly in almost every case.
- Difference is 6.4 percent per year for computer-related items, 4.2 percent per year for other electric equipment, and 3 percent per year for miscellaneous durables.
- Difference is 1.5 percent per year for apparel.
- Difference is 1 percent per year for all items.

# Purchaser price index comparisons

- Purchasers' price index matches CPI for paper products and grows more 0.6 more slowly for non-durables ex apparel because of negative growth of distribution margin indexes.
- For apparel, difference from CPI growth drops to 1.4 percent.
- For durables, difference rises to 2 percent because of higher differences for computers and other electrical equipment.
- For all items ex tobacco, difference drops to 0.7 percent, implying that falling transportation and distribution margins explain 0.4 percentage points of gap between CPIs and our supplier prices.
- Items in our sample have imports, a matching CPI, and long history, so "all items" refers to about 20 percent of PCE non-energy goods.

# Similarity of Import and Domestic Prices

- Except durables, import indexes aren't higher than domestic indexes.
- For durables, growth rate of import indexes is 2.3 percentage points above matched CPIs, while growth of domestic supply indexes is just 1.6 points higher. (Domestic indexes are closer than import indexes to CPIs for vehicles/parts and for computers.)
- For all products combined, import index growth is closer to CPI than domestic index, but gaps are similar with tobacco excluded.
- For apparel and textile items, import and domestic supply prices have very similar differences from CPI growth rates, about 1.5 %.
- For non-durables, growth rate of import prices is 1.2 percentage points lower than growth rate of domestic supplier prices.

# What's the explanation for the negative gaps?

- Import price growth exceeds CPI growth for categories where CPI growth is positive and is lower for categories where it is negative.
- Consistent with Nakamura-Steinsson finding that linking in of new versions and varieties in import indexes causes bias towards 0.
- No decline in either import and domestic supplier index for items whose CPI declines.
- Consistent with substitution to lower-price imports.
- But lack of statistically significant relationship between growth in imports and CPI growth rate gap does not support latter hypothesis.

# Implied Indexes for Transport & Distribution

- Purchasers index  $\approx$  weighted average of suppliers' index and index for transportation, distribution and commodity taxes.
- Assuming that CPIs are true purchasers' indexes and that our suppliers' indexes are also correct, we can solve for the implied index for transportation, distribution and taxes.
- In these implied indexes, differences between CPIs and our suppliers' price indexes are magnified.
- Negative indexes for transportation & distribution  $\Rightarrow$  either productivity is rising or input prices are falling in these sectors.

# Prices for Transport & Distribution Ave. Growth Rates for 1997-2007



	Implied price index for Transport & Distribution	Actual price index for Transport & Distribution
<b>Nondurables ex. apparel</b>	<b>1.3</b>	<b>0.5</b>
Food	2.2	0.2
Alcohol	1.9	0.9
Misc. household supplies	1.1	0.3
Paper products, books and magazines	0.3	0.4
Tobacco products	8.7	2.4
<b>Durables</b>	<b>-7.9</b>	<b>0.1</b>
Motor vehicles and parts	-1.3	0.3
New cars and trucks	-1.8	0.4
Electrical and electronic equipment ex. Computers	-11.0	0.2
<b>Computers, peripherals and software</b>	<b>-29.7</b>	<b>0.1</b>
Furniture and wood products	-2.7	0.0
Clocks and watches	-1.7	0.1
Tools, hardware and supplies	-1.8	0.0
Other durables	-3.3	0.1
<b>Apparel and textiles</b>	<b>-2.5</b>	<b>-0.0</b>
Women's and girls' apparel	-3.0	-0.0
Men's and boy's apparel	-2.6	-0.0
Other apparel	-3.0	0.0
Footwear	-0.9	0.0
Textile and sewing products	-2.2	0.0
<b>All products</b>	<b>-0.8</b>	<b>0.3</b>
<b>All products ex tobacco</b>	<b>-1.2</b>	<b>0.2</b>



# Implied Productivity Growth in Distribution

- Assume that prices of inputs used to produce distribution services are flat or rise at a rate of 1 or 2 percent per year.
- Then for non-durables other than apparel, implied productivity change in distribution industries is near zero, which is plausible.
- For apparel, implied productivity growth seems a bit high, but not implausible.
- For durables, implied productivity growth is in range of 8 percent per year, which seems implausibly high.
- Note that for most items in PCE, difference in growth of CPI from domestic supply prices would affect estimates of industry allocation of real value added but not estimates of real GDP.

# Do Imports boost Distribution Margins?

- More wholesale & retail distribution services required to set up foreign supply chains and manage imports.
- Distribution margins need to cover cost of these extra services.
- Also possible that prices savings from switching to foreign supplier boost profits of firms in distribution trades.

What the data show:

- Trade margins are higher when imports higher (but differences in market characteristics between apparel and other items could account for correlation.)
- Trade margins grow when imports grow.
- Regression coefficients imply that 10 percentage point growth in import share leads to 1 percent point growth in trade margin share.

# Regressions of Trade Margin Share Level & Growth on Import Share Level & Growth

Dependant Variable: Average Share of Trade Margin in Final Expenditures;  $R^2 = 0.14$

	Coefficient	t statistic
<b>Intercept</b>	0.3663	29.8
<b>Share supplied by imports</b>	0.1290	4.3
<b>Growth of share of imports</b>	0.0985	1.4

Dependant Variable: Growth in Trade Margin Share of Final Expenditures;  $R^2 = 0.10$

	Coefficient	t statistic
<b>Intercept</b>	0.0067	1.2
<b>Share supplied by imports</b>	0.0272	1.9
<b>Growth of share of imports</b>	0.0934	2.8

# Conclusions

- Differences between import index growth and matched CPI growth rate for items in PCE average 1.5 to 2 percent per year for durables and apparel/textile items, but are insignificant for non-durables excluding apparel.
- But with exception of computers, domestic supplier price indexes behave similarly to import indexes.
- The differences from CPI growth rates imply high productivity growth in transportation and distribution industries.
- For most items in PCE, bias in import indexes would affect estimates of real GDP, but not bias in domestic supplier indexes.