



*Biases to Manufacturing Statistics from Trade*  
*Ana Aizcorbe*  
*Bureau of Economic Analysis*

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# Overview

- Bottom line: Papers argue that growth of manufacturing sector is overstated owing to biases in underlying price deflators
- General comments:
  - Papers make a compelling argument that the biases are potentially important
  - Hard to pin down further
  - Alterman's input price index is promising.
- Rest of comments
  - Give an intuitive explanation of the problems
  - Provide perspective on the problem in that context

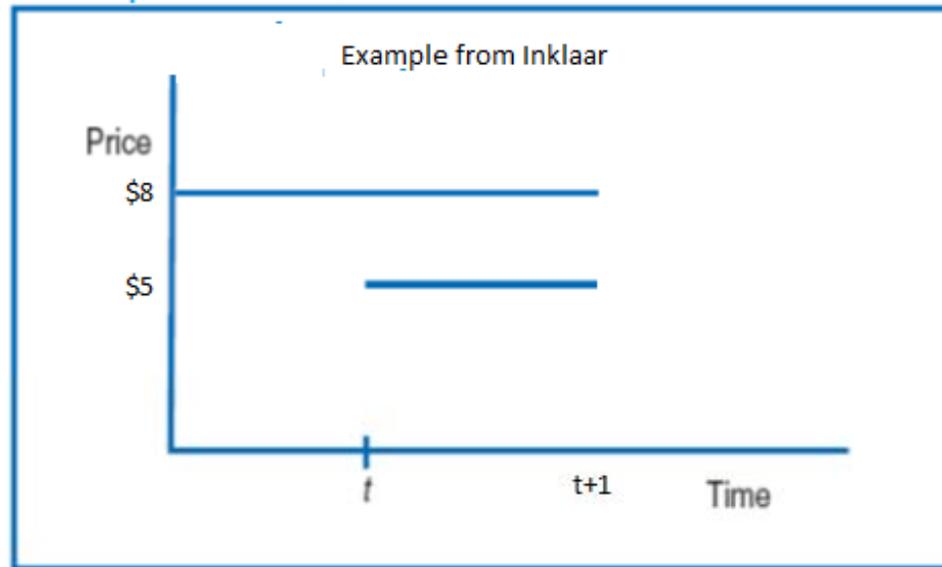
# Biases in deflators overstate value added

- Example: calculation of real value added for domestic PC manufacturer

	Real growth	Biases
Gross output (GO)	$\Delta GO / \Delta P^{GO}$	too high
Less Intermediate Inputs (II)	- $\Delta II / \Delta P^{II}$	- too low
Equals Value added (VA)	= $\Delta \text{real value added}$	= too high

Argument: there are biases in  $\Delta P^{GO}$  and  $\Delta P^{II}$

# Bias in $\Delta P^I$ – Issue is how to define the good



Note:

- Version of Reinsdorf “Outlet Substitution” problem
- Diewert and Nakamura: Size of bias depends on (i) gap between prices, (ii) shift in spending
- Hinges on whether the goods are “identical”
- Can’t be fixed by use of Fisher Indexes or more frequent updating of weights
- Question: How long does this last?

# Bias in $\Delta P^{GO}$

Example: Economy produces computers using disk drives (D) and semiconductor chips (C)

Real  
Gross Output  
 For 3 sectors

Value Added  
 For PCs

$$\Delta GO_{PC} / \Delta P_{PC}^{GO}$$

$$\Delta GO_{PC} / \Delta P_{PC}^{GO}$$

$$\Delta GO_D / \Delta P_D^{GO}$$

$$- \Delta GO_D / \Delta P_D^{GO}$$

$$\Delta GO_C / \Delta P_C^{GO}$$

$$- \Delta GO_C / \Delta P_C^{GO}$$

- Question: to what extent are biases from gross output price indexes offsetting for intermediate goods?

# Bias in $\Delta P^{GO}$ -- a recurring issue

- There is a nagging thought that price indexes for consumer electronic goods fall “too fast”
- Declines are almost entirely due to quality improvements

**Matched-Model Price Indexes for IT Goods, Oct. 2001 – Oct. 2004 (monthly rates)**

Categories	Price Indexes			Difference Between Indexes
	<u>Törnqvist</u>	<u>Fisher</u>	<u>Average</u>	<u>Average Less Törnqvist</u>
Desktop PCs	-2.77	-2.71	0.06	2.83
Notebook PCs	-3.97	-3.93	-0.15	3.82
PDA's	-2.99	-2.98	-1.69	1.30

- Many are generally suspicious of results from hedonic regressions
  - But, some indexes are matched-model (MM) indexes

# Quality improvements and $\Delta P^{GO}$ -- perspective

Example:

Compare price declines (CAGR) for devices that are fairly one-dimensional and that show extremely rapid price declines.

- MPU:
  - 1988-1994: 30% for price/transistor vs. 30% for MM index
  - 1994-2001: 38% for price/transistor vs. 63% for MM index
  
- DRAM:
  - 1974-1986: 36% for price per Mb vs. 44% for MM index.
  
- Difficult to assess this with more complicated goods.

# Summary

These papers point to potentially important problems

Some unresolved issues remain:

- $\Delta P^{II}$ 
  - How big is the bias?
- $\Delta P^{GO}$ 
  - How big is the offset?
  - Need more evidence on potential understatements of indexes
- The Alterman “input price” indexes are promising.