

Experimental PPI Aggregation System



Introduction

- Prior to the mid-1980s, PPI produced only goods based price indexes
- Due to the rapid growth of the services sector, the PPI undertook an effort to expand its coverage to include services and construction price indexes

Introduction

- January 1985 - first services price index for rail transportation published
- Through Mid 1990s- mainly transportation sector indexes added
- Last two decades- coverage expanded to include sectors for information, health care, real estate, professional services, administrative services, finance and insurance, and wholesale and retail trade

Introduction

- Since the initiative began, PPI planned to add services and construction price indexes to the aggregate indexes featured in the press release
- PPI now believes coverage of these areas is high enough to produce meaningful aggregate inflation numbers
 - ▶ 77.4 percent of services covered
 - ▶ 28.6 percent of construction covered

Introduction

- PPI introduced the experimental aggregation system in January 2011
- System aggregates goods, services and construction price indexes
- PPI plans to transition to new system as primary focus of the press release as early as January 2014
- All indexes in the current SOP system will continue to publish as part of the new system

Overview

- Stage of Processing (SOP) system indexes are currently PPI headline numbers.
- SOP system only includes goods.
- PPI developed a new experimental aggregation system that includes goods, services, and construction.

Overview: Important Criteria for PPI Aggregation Systems

- Include all commodities for which PPI currently has indexes.
- Cover both intermediate and final demand.
- Additional indexes should be able to be added to the system.
- Eliminate or minimize multiple counting problems.
- Conceptually understandable.
- Analytically useful:
 - Price transmission analysis
 - Source of inflation pressures

Overview: Background Research

Research

- International PPI aggregation systems
- US PPI Aggregation Systems
- Academic work- Joel Popkin, Robert Archibald
- Internal BLS meetings

I/O Table

Commodity Produced		Consuming Industry:															
		Intermediate Demand												Final Demand			
Commodity Type	Detailed Commodity	1	2	3	4	5	6	7	8	9	10	11	12	PC	CI	Gov	Exp
Unprocessed Goods	1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	2					Q											
	3					R											
Processed Goods	4					S											
	5					T											
	6					U											
Construction	7					V											
Traditional Services	8					W											
	9					X											
Trans Services	10					Y											
Trade Services	11					Z											
	12					AA											
	Imports					AB											

PPI Aggregate Coverage Expansion






Commodity Produced		Consuming Industry:															
		Intermediate Demand												Final Demand			
Commodity Type	Detailed Commodity	1	2	3	4	5	6	7	8	9	10	11	12	PC	CI	Gov	Exp
Unprocessed Goods	1																
	2																
	3																
Processed Goods	4																
	5																
	6																
Construction	7																
Traditional Services	8																
	9																
Trans Services	10																
Trade Services	11																
	12																
	Imports																

Experimental PPI System- Final demand

- Commodities assigned to aggregate indexes based commodity type.
- Commodity types: goods, transportation services, trade services, traditional services

Final Demand Indexes

Commodity Produced		Intermediate demand												Final Demand			
Commodity type	Detailed Commodity	1	2	3	4	5	6	7	8	9	10	11	12	PC	CI	Gov	Exp
Unprocessed Goods	1																
	2																
	3																
Processed goods	4																
	5																
	6																
Construction	7																
Traditional Services	8																
	9																
Trans Services	10																
Trade Services	11																
	12																
	Imports																

	FD goods		FD construction
	FD traditional services		FD trade services
	FD transportation services		

Final Demand Structure

Index	Relative Importance
Final demand	100.000
Final demand goods	37.205
Final demand foods	5.954
Final demand energy	7.036
Final demand goods less foods and energy	24.215
Final demand services	60.738
Final demand traditional services	37.609
Final demand transportation services	4.250
Final demand trade services	18.879
Final demand construction	2.057

Final Demand Structure (Continued)

Index	Relative Importance
Final demand services	60.738
Final demand traditional services	37.609
Finished traditional services	33.312
Finished consumer traditional services	31.677
Private capital investment traditional services	1.635
Government purchased traditional services	2.948
Government purchased traditional services, excluding capital investment	2.848
Government purchased traditional capital investment services	0.101
Traditional services for export	1.349
Final demand transportation services	4.250
Final demand trade services	18.879

Final Demand Special Indexes

Special Groupings	Relative Importance
Final demand less exports	89.091
Final demand less government	91.635
Final demand less foods, food and beverage for immediate consumption, and energy	86.466
Final demand less foods and energy	87.010
Final demand less foods and food and beverage for immediate consumption	93.502
Final demand less foods	94.046
Final demand less energy	92.964
Final demand less trade services	81.121
Final demand less distributive services	77.980
Final demand goods less energy	30.169
Final demand goods less foods	31.251
Final demand services less trade services	41.859
Final demand distributive services	22.020
Final demand goods plus final demand distributive services	59.225

Final Demand Special Indexes

Total finished goods, services, and construction	80.726
Total finished less foods, food and beverage for immediate consumption, and energy	69.477
Total finished less foods and energy	70.022
Total finished less foods and food and beverage for immediate consumption	75.343
Total finished less foods	75.888
Total finished less energy	74.860
Finished goods	26.063
Finished goods less energy	20.197
Finished goods, excluding foods	21.225
Finished services	53.365
Private capital investment services	3.958
Finished distributive services	19.124
Finished services less trade services	36.203
Finished services less distributive services	34.241
Total private capital investment (goods, services, and construction)	11.888
Finished goods plus finished distributive services	45.187

Final Demand Special Indexes

Total exports	10.909
Goods for export	7.552
Services for export	3.357
Total government purchases	8.365
Government purchased goods	3.590
Government purchased services	4.016
Personal consumption	68.837
Personal consumption goods (finished consumer goods)	19.430
Personal consumption goods less energy	13.564
Personal consumption goods less foods	14.592
Personal consumption services	49.407
Personal consumption less trade services	53.613
Personal consumption less distributive services	52.036

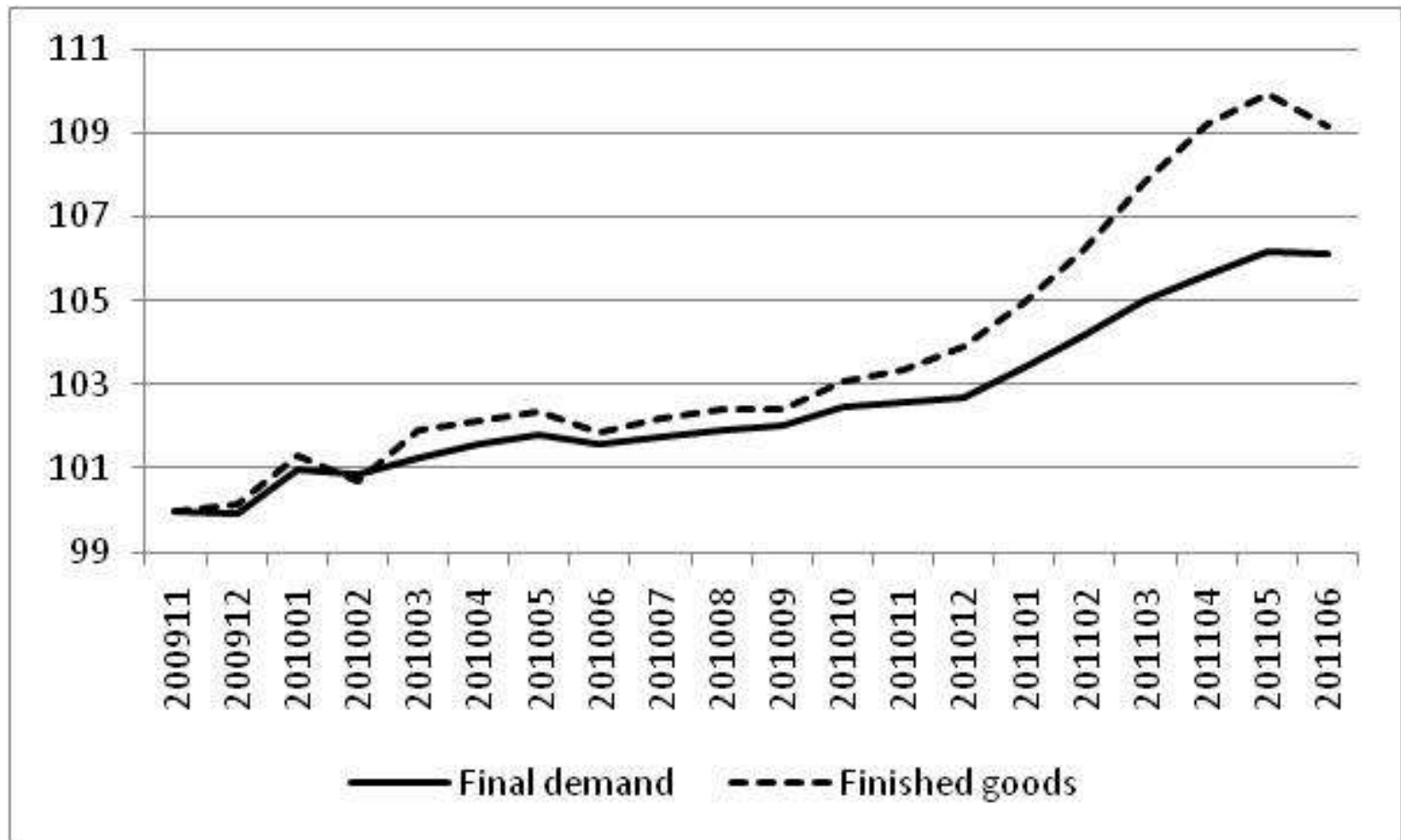
Questions

- Does the structure under final demand make sense?
- Are there any additional special indexes you would like?
- Which indexes would you find useful and why?
- Which indexes are not useful and why?
- Which numbers should the press release focus on?

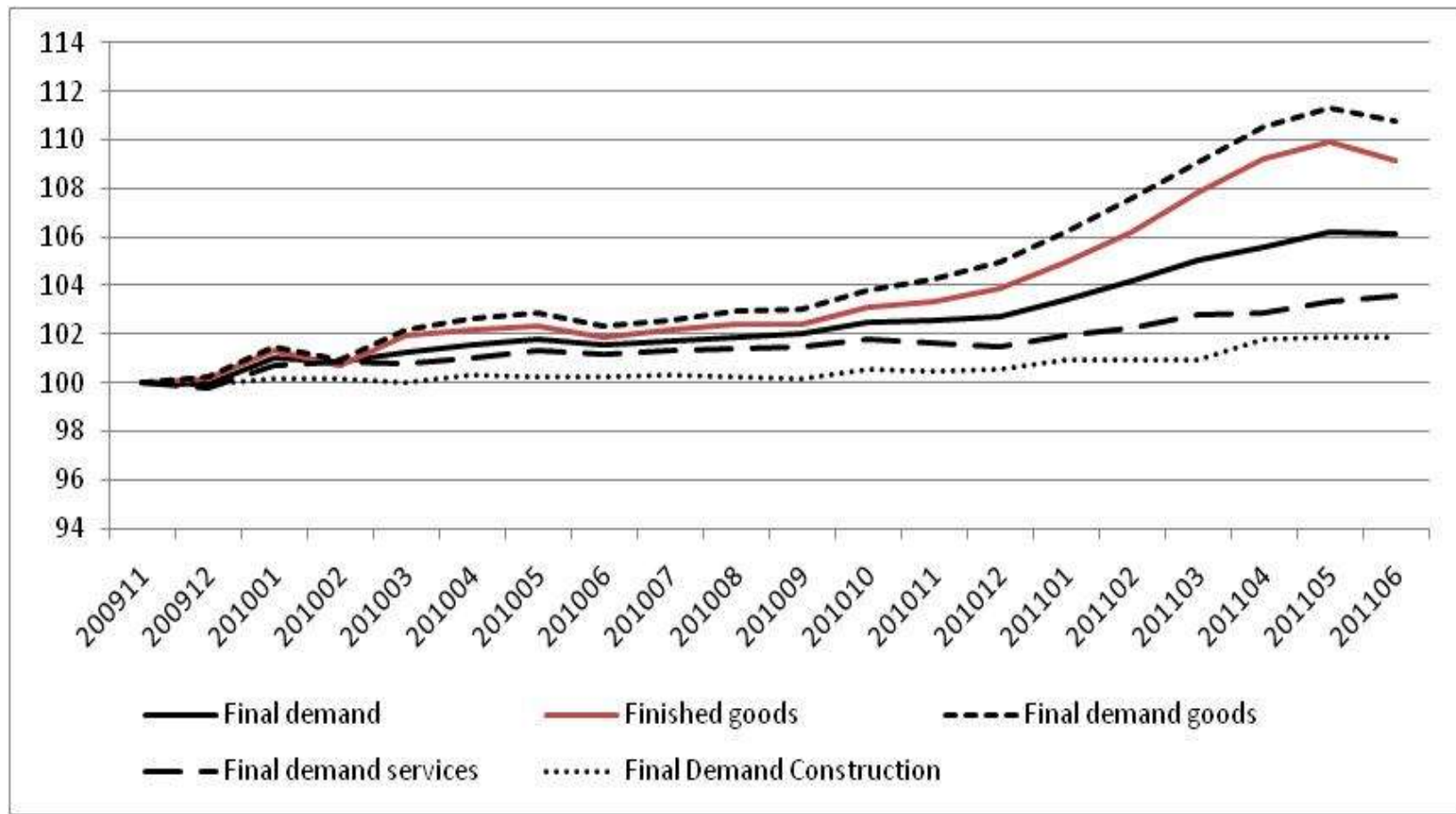
Commodities Relative Importance to Final Demand

Code	Index	Relative importance
Goods		
054121	Residential electric power	2.359
141105	Trucks, 14,000 lbs. and under	1.826
057104	Unleaded regular gasoline	1.822
142102	Civilian aircraft	1.287
141101	Passenger cars	1.127
Traditional Services		
512101	Hospital inpatient care	5.632
511101	Physician care	3.768
511104	Hospital outpatient care	2.967
451101	Legal services	1.988
512102	Nursing home care	1.441
401101	Securities brokerage, dealing, and investment advice	1.300
392101	Deposit services (partial)	1.108
511105	Dental care	1.106
411104	Property and casualty insurance	1.088
Trade services		
581101	Food and alcohol retailing	2.579
571101	Machinery and equipment wholesaling	1.992
582101	Health and beauty care retailing, including optical goods	1.848
586101	Automobile retailing	1.554
583101	Apparel retailing	1.434
579101	Other commodities wholesaling	1.413
578101	Food wholesaling	1.097
Transportation services		
301202	Long-distance motor carrying	1.353
302201	Airline passenger services	1.095

Final Demand versus Finished Goods



Final Demand and Components versus Finished Goods



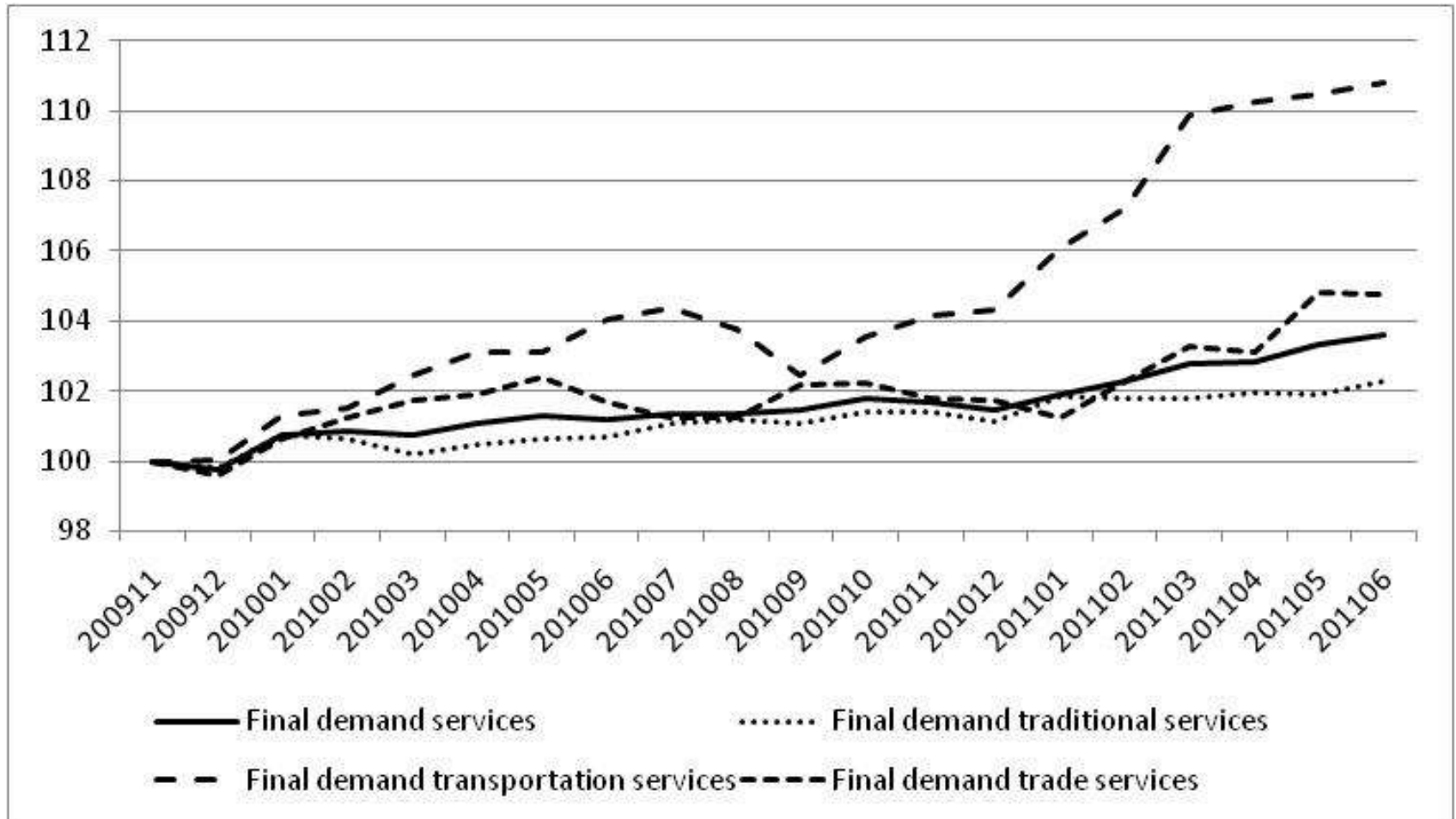
Commodities Impact on Final Demand Nov 2009-June 2011

Code	Index	RI	% change Nov 2009 to June 2011	Impact on FD
057104	Unleaded regular gasoline	1.822	52.2	0.951
581101	Food and alcohol retailing	2.579	13.4	0.345
579101	Other commodities wholesaling	1.413	16.1	0.227
054121	Residential electric power	2.359	7.8	0.184
512101	Hospital inpatient care	5.632	3.1	0.176
057303	No. 2 diesel fuel	0.311	54.7	0.170
053201	Liquefied petroleum gas	0.376	43.9	0.165
012202	Corn	0.147	108.9	0.160
057103	Unleaded premium gasoline	0.338	47.3	0.160
057302	Home heating oil and distillates	0.321	46.9	0.150
451101	Legal services	1.988	6.8	0.135
511104	Hospital outpatient care	2.967	4.5	0.135
301202	Long-distance motor carrying	1.353	9.8	0.132
302201	Airline passenger services	1.095	12.0	0.131
511101	Physician care	3.768	3.4	0.126
391201	Residential real estate loans (partial)	0.603	20.9	0.126
057203	Jet fuel	0.233	52.8	0.123
586101	Automobile retailing	1.554	7.8	0.121
571101	Machinery and equipment wholesaling	1.992	5.7	0.114

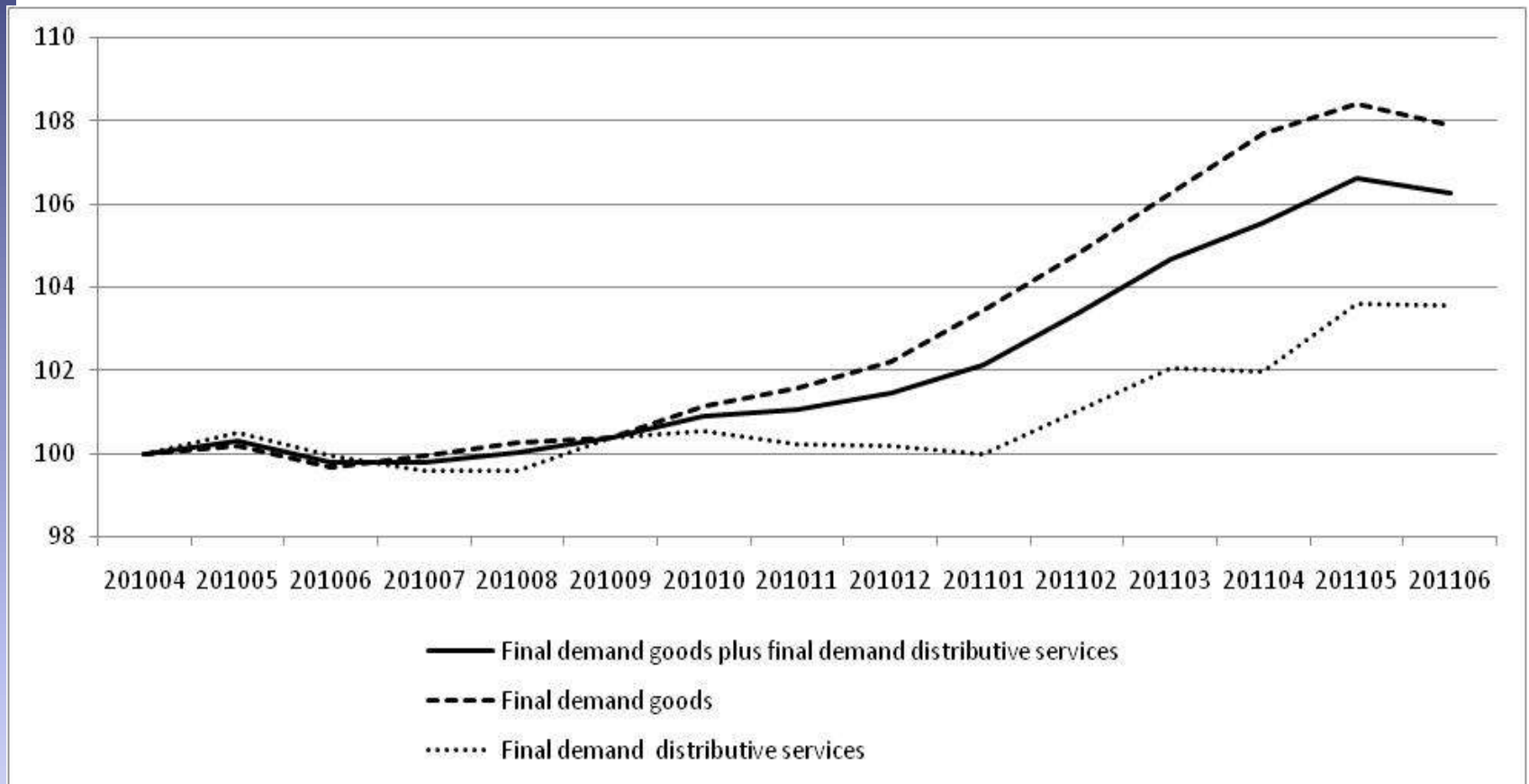
Commodities Impact on Final Demand Nov 2009-June 2011

Code	Index	RI	% change Nov 2009 to June 2011	Impact on FD
392101	Deposit services (partial)	1.108	-31.2	-0.346
577101	Apparel wholesaling	0.34	-27.4	-0.093
432101	Residential property sales and leases, brokerage fees and commissions	0.909	-4.4	-0.040
141105	Trucks, 14,000 lbs. and under	1.826	-2.2	-0.039
372101	Cellular phone and other wireless telecommunication services, except paging	0.462	-6.8	-0.031
585101	TV, video, and photographic equipment and supplies retailing	0.236	-12.0	-0.028
58E101	Major household appliances retailing	0.111	-24.2	-0.027
572101	Furnishings wholesaling	0.186	-12.8	-0.024
011302	Fresh vegetables, except potatoes	0.19	-11.9	-0.023
117839	Integrated microcircuits	0.136	-13.9	-0.019
141101	Passenger cars	1.127	-1.7	-0.019
115101	Electronic computers	0.102	-16.7	-0.017
017107	Eggs for fresh use	0.092	-15.3	-0.014
063805	Digestive and genito-urinary systems	0.226	-5.8	-0.013
584101	Computer hardware, software, and supplies retailing	0.258	-3.7	-0.009
576101	Paper and plastics products wholesaling	0.141	-5.3	-0.007
117601	Telephone and telegraph equipment	0.262	-2.4	-0.006
371202	Long distance business wired telephone service	0.282	-2.1	-0.006

Final demand Services by Type



Final Demand Goods and Distributive Services



Personal Consumption PPI versus CPI

■ PPI

- ▶ Price paid to producer
- ▶ BEA definition of industry output

■ CPI

- ▶ Price paid by consumer

Personal Consumption PPI versus CPI

- PPI
 - ▶ Excludes imports (not domestically produced)
- CPI
 - ▶ Includes imports (purchased domestically)
- PPI
 - ▶ Sales and excise taxes excluded
- CPI
 - ▶ Sales and excise taxes included

PPI versus CPI

■ PPI

- ▶ Modified Laspeyres
- ▶ Weight updated every 5 years
- ▶ No Geometric mean

■ CPI

- ▶ Modified Laspeyres
- ▶ Weight updated every 2 years
- ▶ Uses Geometric mean

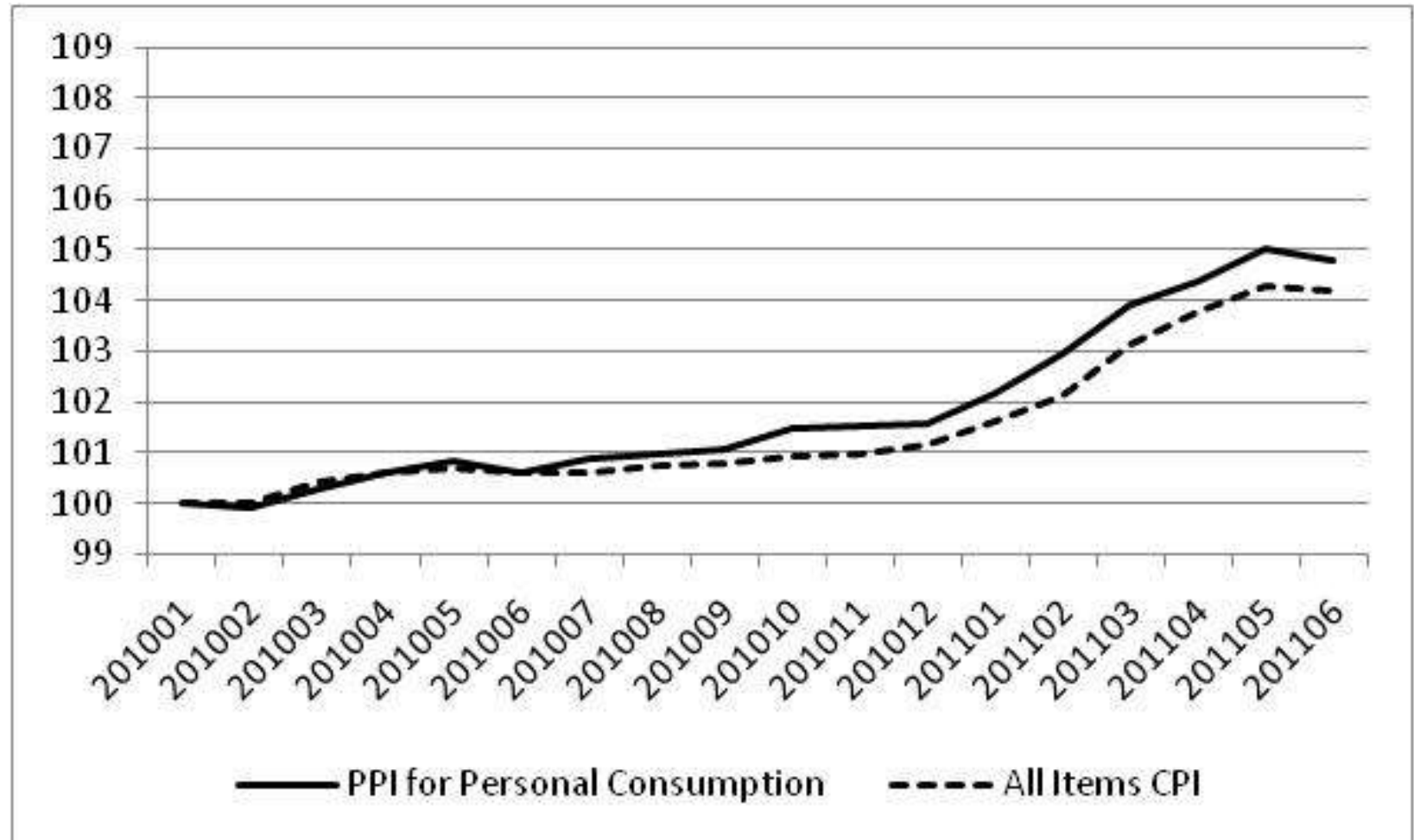
PPI versus CPI

- PPI
 - ▶ Utilities defined as good
- CPI
 - ▶ Utilities defined as service
- PPI
 - ▶ Trade and transportation are services separated from good
- CPI
 - ▶ Trade and transportation included in the value of good in CPI

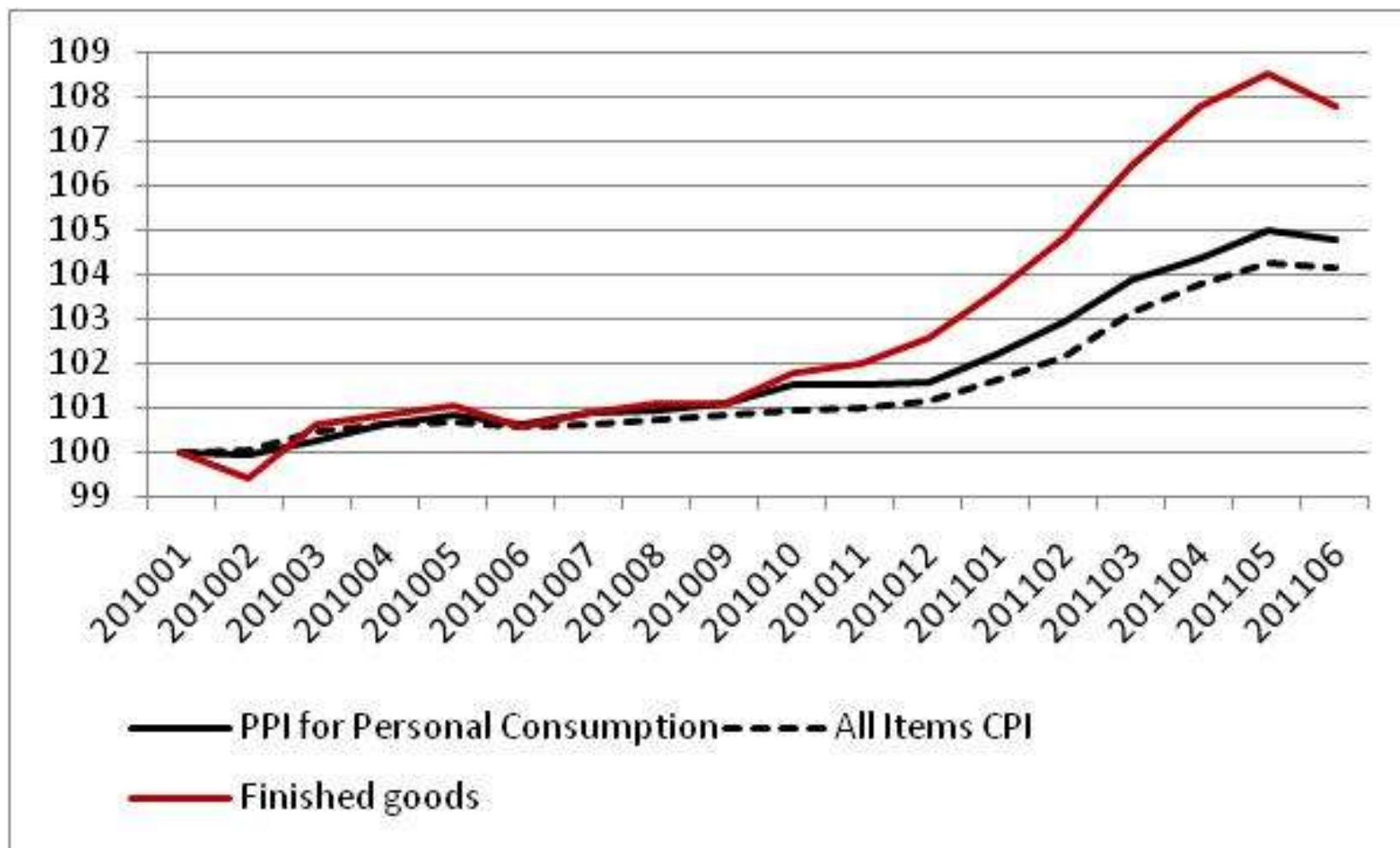
PPI versus CPI

- PPI
 - ▶ Prices are collected for a given day in the month
- CPI
 - ▶ Prices are collected throughout month
- Release schedule
 - ▶ PPI typically are released prior to CPI

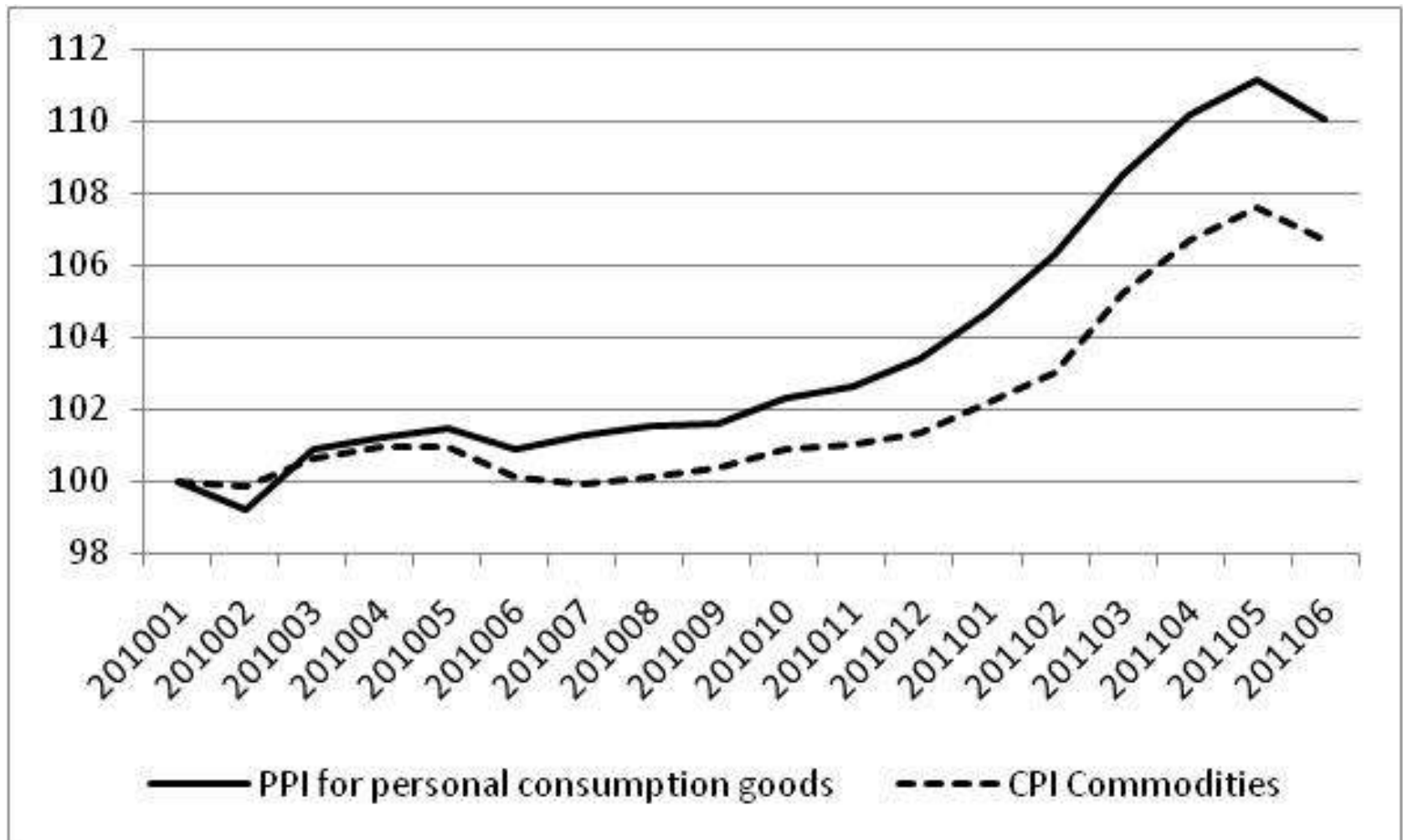
PPI for Personal Consumption versus CPI



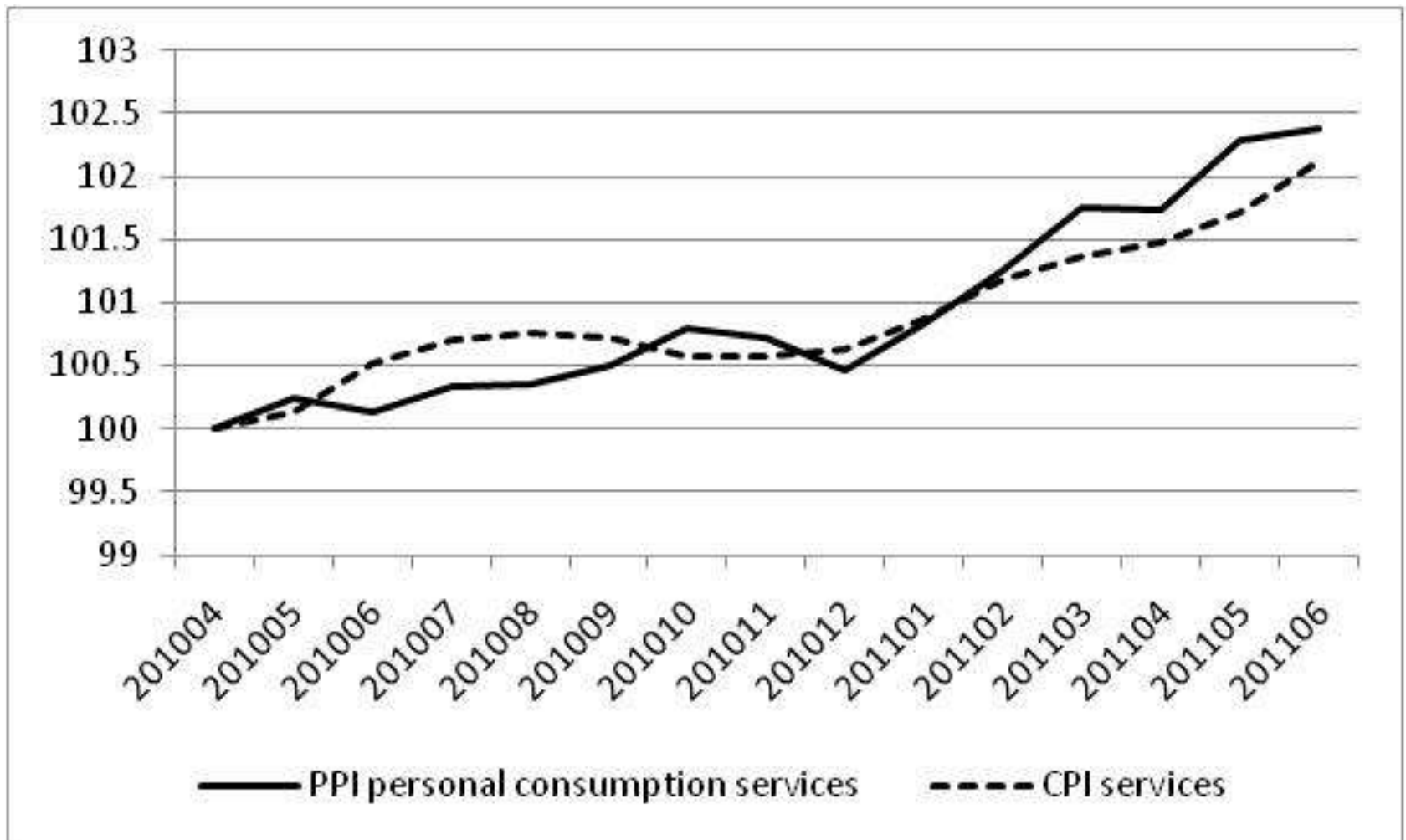
PPI for Personal Consumption versus CPI and Finished Goods



PPI for Personal Consumption Goods versus CPI Commodities



PPI for Personal Consumption Services versus CPI Services



PPI versus GDP Price Index

■ PPI

- ▶ Modified Laspeyres
- ▶ Weight updated every 5 years

■ GDP

- ▶ Fisher-Ideal index
- ▶ Chain weighted
- ▶ Geometric mean of a Laspeyres and Paasche index

PPI versus GDP Price Index

■ PPI

- ▶ Exports included
- ▶ Imports excluded (by definition not produced domestically)

■ GDP

- ▶ Net exports (Exports – Imports)

PPI versus GDP Price Index

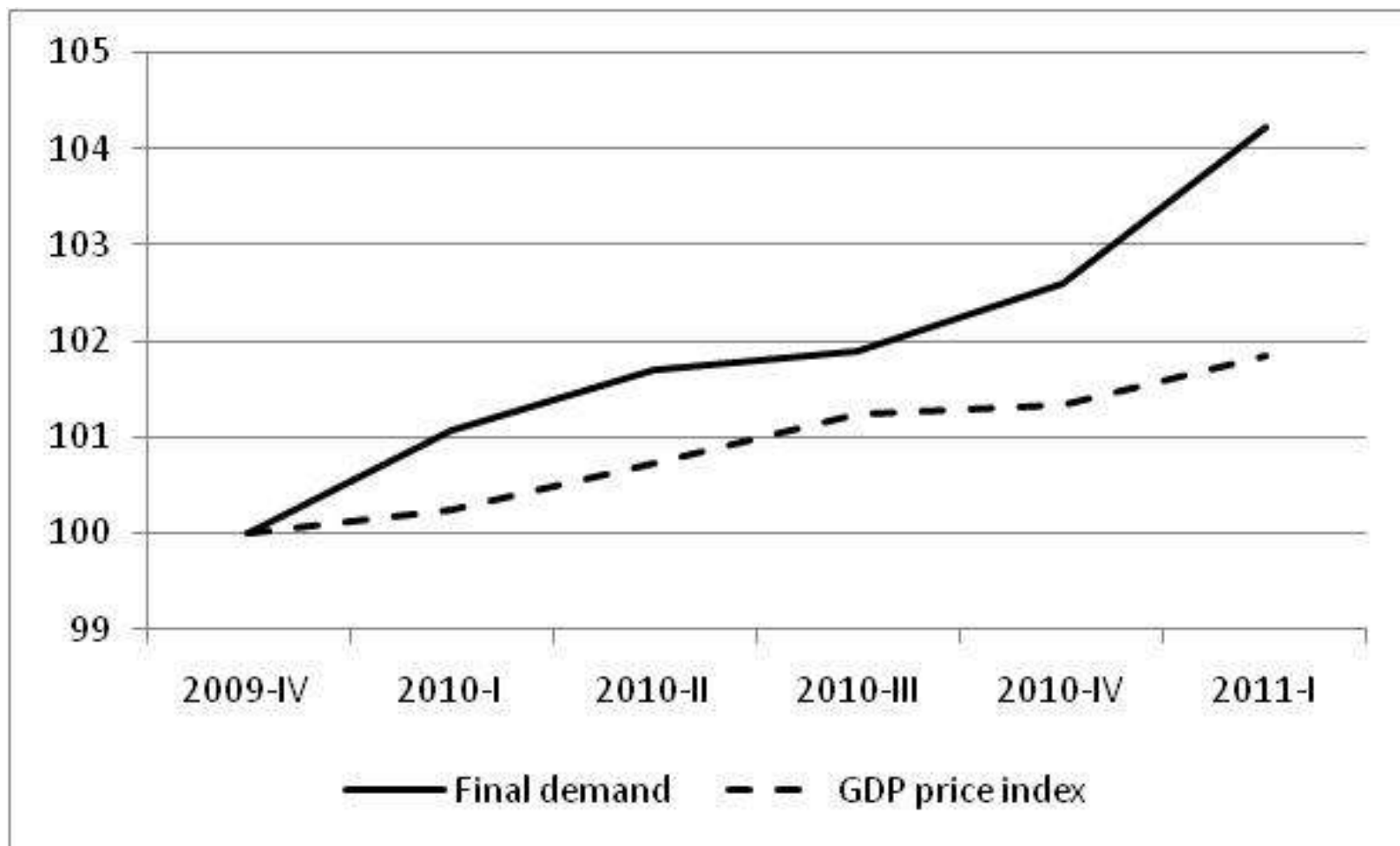
■ Example

- ▶ a change in the price of imported petroleum that is fully passed on to U.S. consumers would be fully reflected in the price index for final demand but not in the GDP price index, because imports are subtracted in deriving GDP

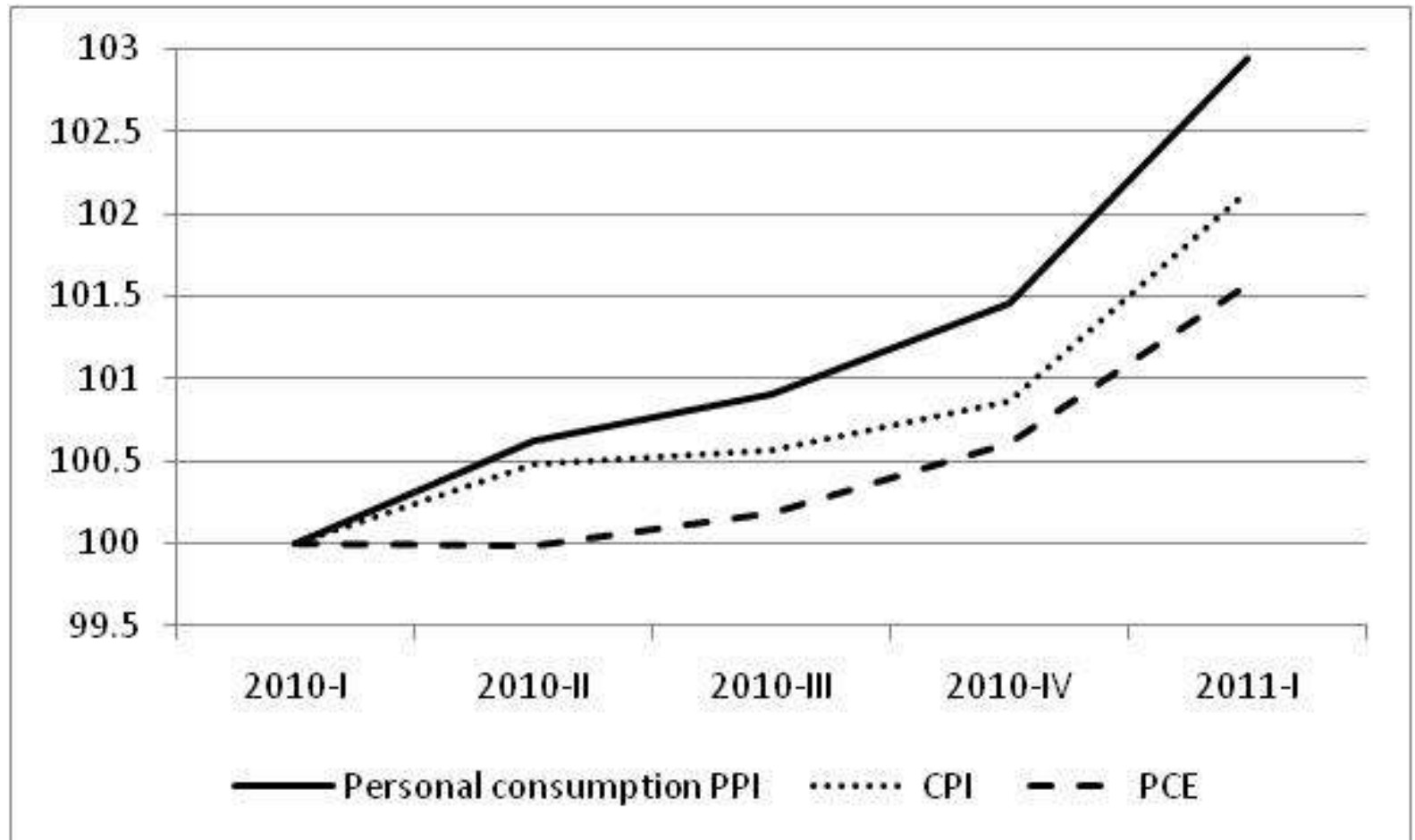
PPI versus GDP Price Index

- PPI
 - ▶ Released monthly
- GDP price deflator
 - ▶ Released quarterly

PPI for Final Demand versus BEA GDP Price Index



PPI for personal Consumption versus CPI and PCE



Value Added of New Final Demand Indexes

- Adds services and construction to current PPI coverage
- Detailed indexes by type of buyer and type of commodity
- Available monthly
- Trade and transportation services separated from value of good
- Producer perspective

Two Treatments of Intermediate Demand

- Two separate treatments have been created for different data users.
 - ▶ **Commodity Type**
 - Similar to current SOP
 - Adds intermediate services and intermediate construction
 - Does not prevent multiple counting
 - ▶ **Commodity Flow**
 - Adds intermediate services and intermediate construction
 - Eliminates multiple counting

Commodity Type

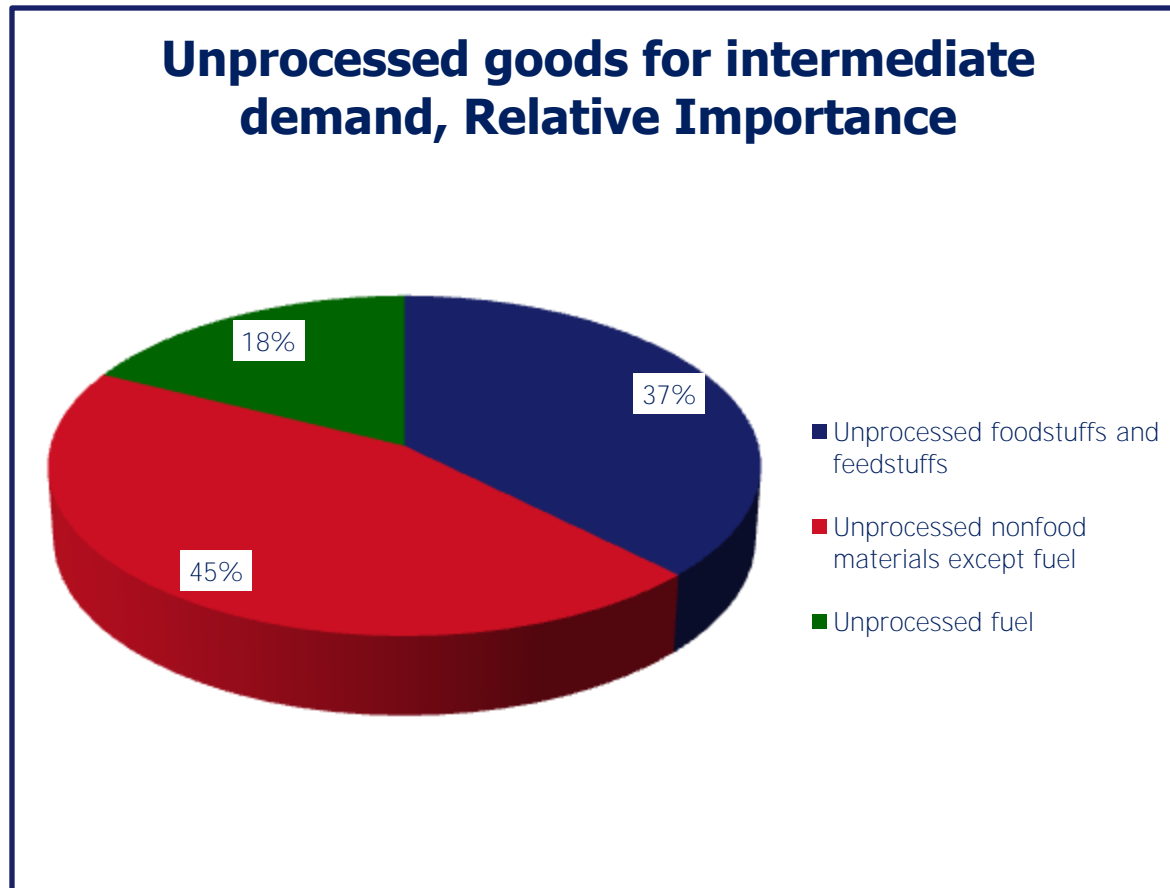
- No overall Intermediate Demand index.
- Indexes track price change for intermediate demand commodities grouped by type of commodity.
- Six commodity types: unprocessed goods, processed goods, construction, traditional services, transportation services, and trade services.

Unprocessed Goods

- ID 62 – Unprocessed goods for intermediate demand.
- Continuous with current SOP 1000 – Crude materials.

Unprocessed goods for intermediate demand	Relative Importance
Unprocessed foodstuffs and feedstuffs	37.458
Unprocessed nonfood materials	62.542
Unprocessed nonfood materials except fuel	44.902
Unprocessed nonfood materials except fuel to manufacturing industries	43.538
Unprocessed nonfood materials except fuel to nonmanufacturing industries	1.364
Unprocessed fuel	17.640
Unprocessed fuel to manufacturing industries	0.626
Unprocessed fuel to nonmanufacturing industries	17.014

Unprocessed Goods Relative Importance



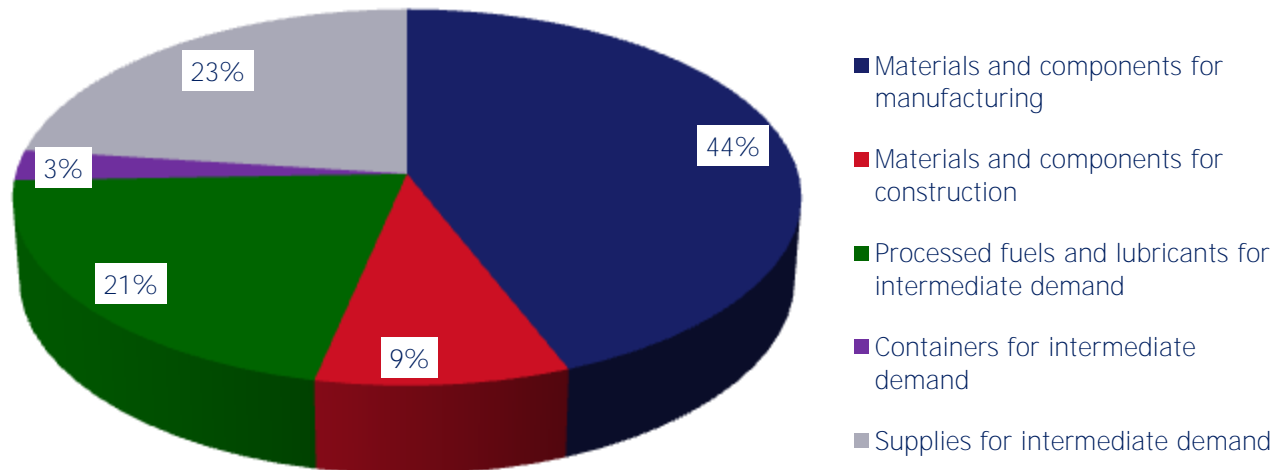
Processed Goods

- ID 61 – Processed goods for intermediate demand.
- Continuous with current SOP 2000 – Intermediate materials, supplies and components.
- Multiple counting has not been eliminated.

Processed goods for intermediate demand	Relative Importance
Materials and components for manufacturing	44.054
Materials for manufacturing	28.079
Materials for food manufacturing	3.422
Materials for nondurable manufacturing	14.845
Materials for durable manufacturing	9.812
Components for manufacturing	15.975
Components for nondurable manufacturing	0.549
Components for durable manufacturing	15.426
Materials and components for construction	9.279
Materials for construction	5.168
Components for construction	4.111
Processed fuels and lubricants for intermediate demand	21.116
Processed fuels and lubricants to manufacturing industries	5.619
Processed fuels and lubricants to nonmanufacturing industries	15.497
Containers for intermediate demand	2.607
Supplies for intermediate demand	22.944
Supplies to manufacturing industries	2.913
Supplies to nonmanufacturing industries	20.030
Supplies to nonmanufacturing industries, feeds	1.625
Supplies to nonmanufacturing industries, other than feeds	18.405

Processed Goods Relative Importance

Processed Goods for Intermediate Demand, Relative Importance



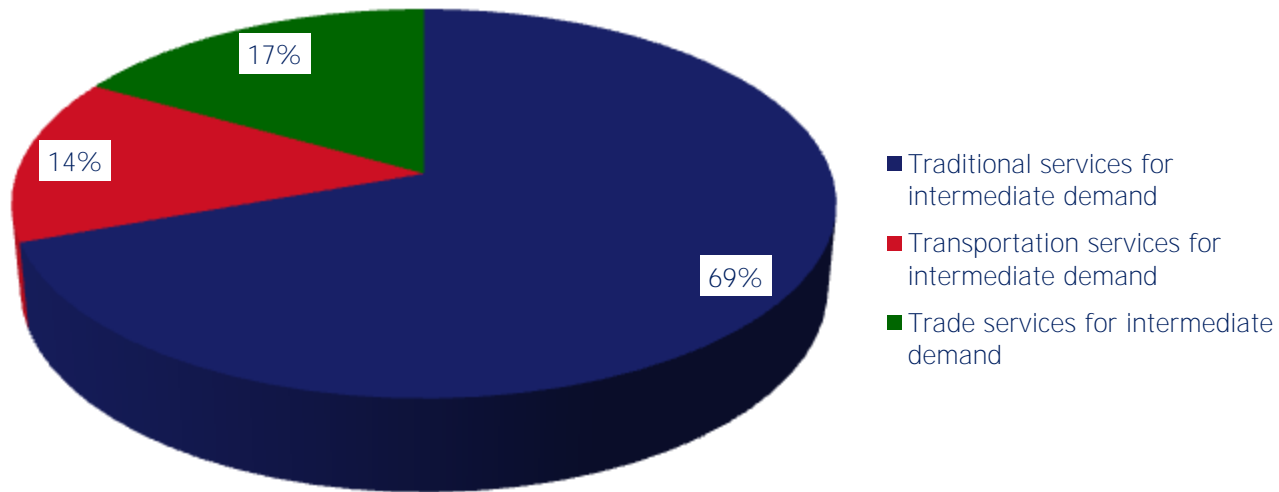
Services for Intermediate Demand

- ID 63 – **Services for Intermediate Demand**
- New aggregation, not previously included in SOP.
- **Traditional services for intermediate demand** would include legal or accounting services to business.
- **Transportation services for intermediate demand** would include trucking of intermediate demand goods or business travel.
- **Trade services for intermediate demand** would include the service of selling office supplies to a business.

Services for intermediate demand	Relative Importance
Traditional services for intermediate demand	69.415
Traditional services for manufacturing industries	2.163
Traditional services for nonmanufacturing industries	67.252
Transportation services for intermediate demand	13.809
Intermediate transportation of passengers	0.877
Intermediate transportation of passengers to manufacturing industries	0.170
Intermediate transportation of passengers to nonmanufacturing industries	0.707
Intermediate transportation of goods	12.932
Trade services for intermediate demand	16.776

Services Relative Importance

**Services for Intermediate Demand,
Relative Importance**



Construction for Intermediate Demand

- ID 64 – **Construction for Intermediate Demand**
- New aggregation, not previously included in SOP.
- Includes maintenance & repair construction purchased by firms. New construction is not included - this is in Final Demand.

Question

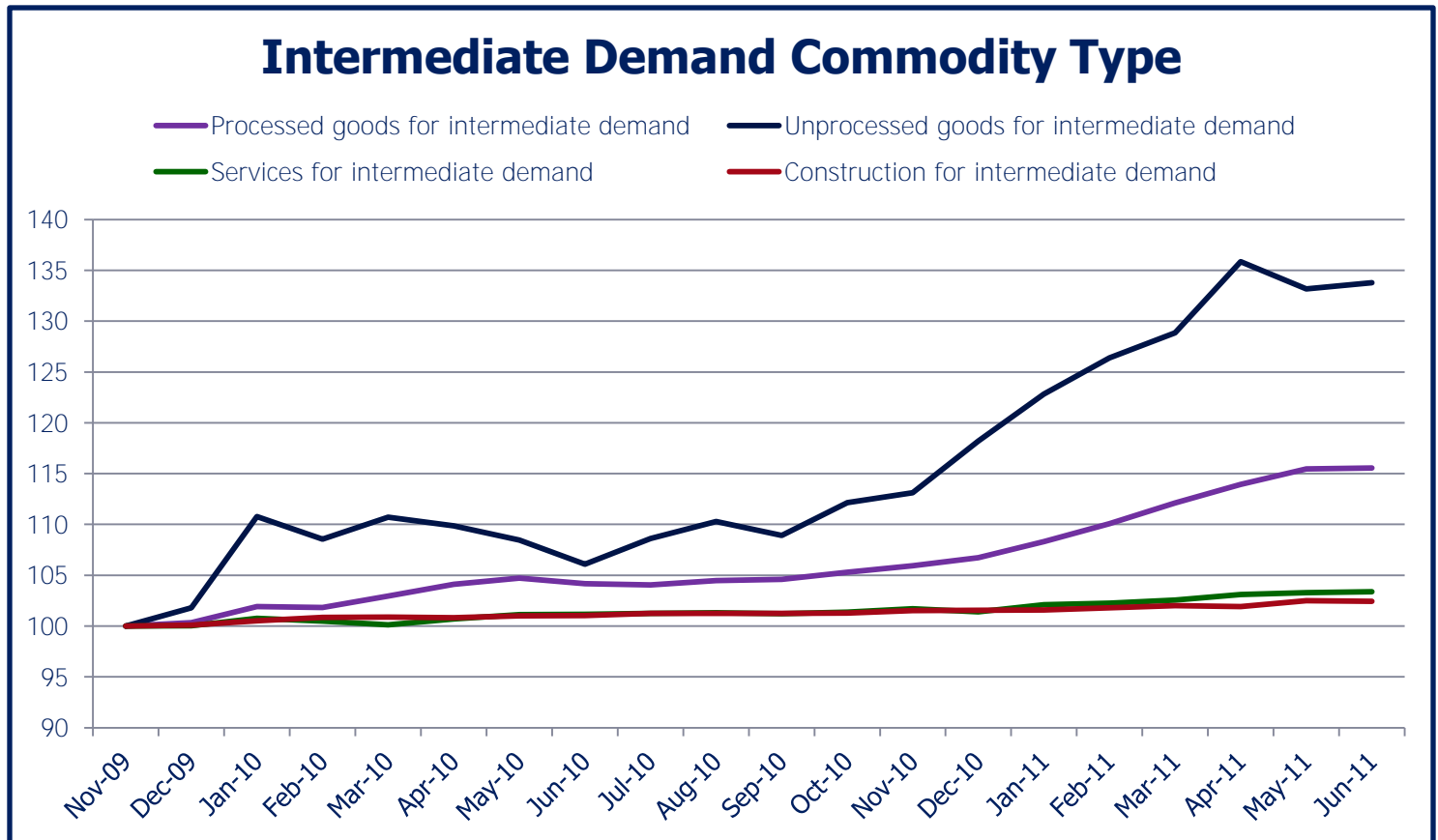
- Is this an appropriate level of detail for intermediate demand?

Special groupings

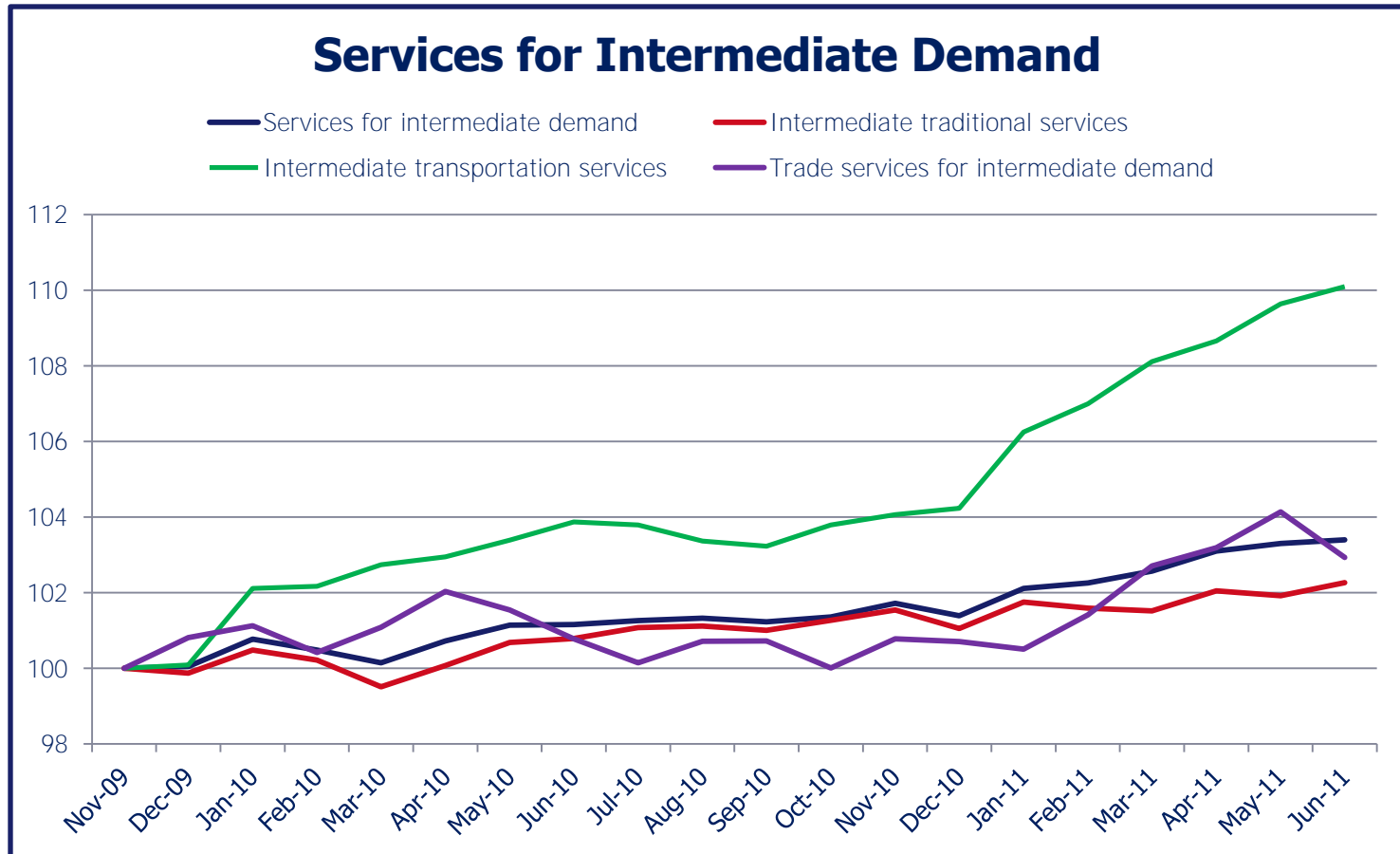
- Eleven special groupings
- Relative importance for each special grouping is by commodity type.
- Are there other special groupings that should be created?

Special groupings	Relative Importance
Processed materials less foods and feeds	92.209
Processed foods and feeds	7.791
Processed energy goods	22.072
Processed materials less energy	77.928
Processed materials less foods and energy	70.137
Intermediate distributive services	29.708
Processed goods plus intermediate distributive services	—
Unprocessed materials less agricultural products	59.512
Unprocessed energy materials	39.560
Unprocessed materials less energy	60.440
Unprocessed nonfood materials less energy	22.981

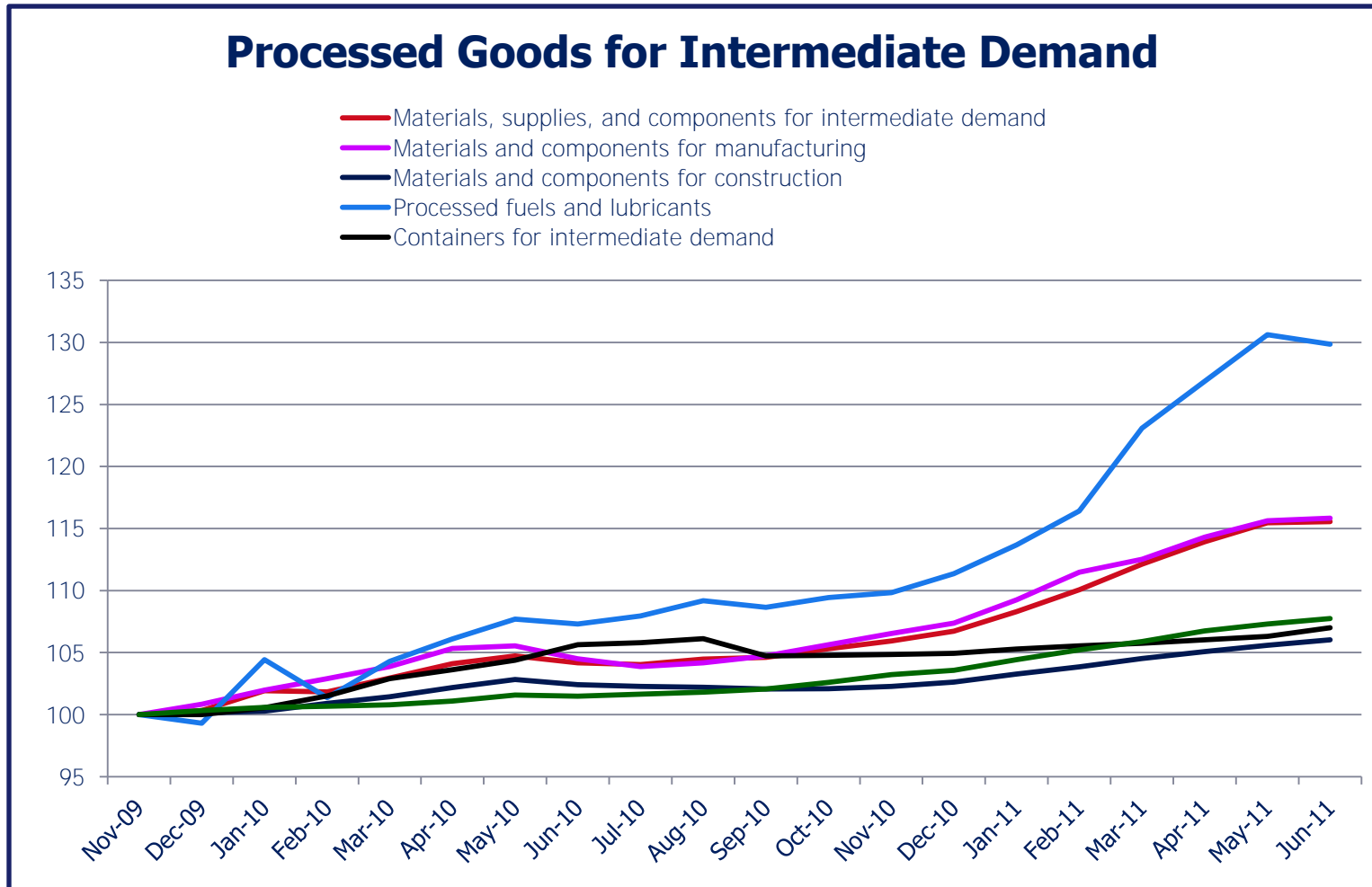
Intermediate Demand Commodity Type



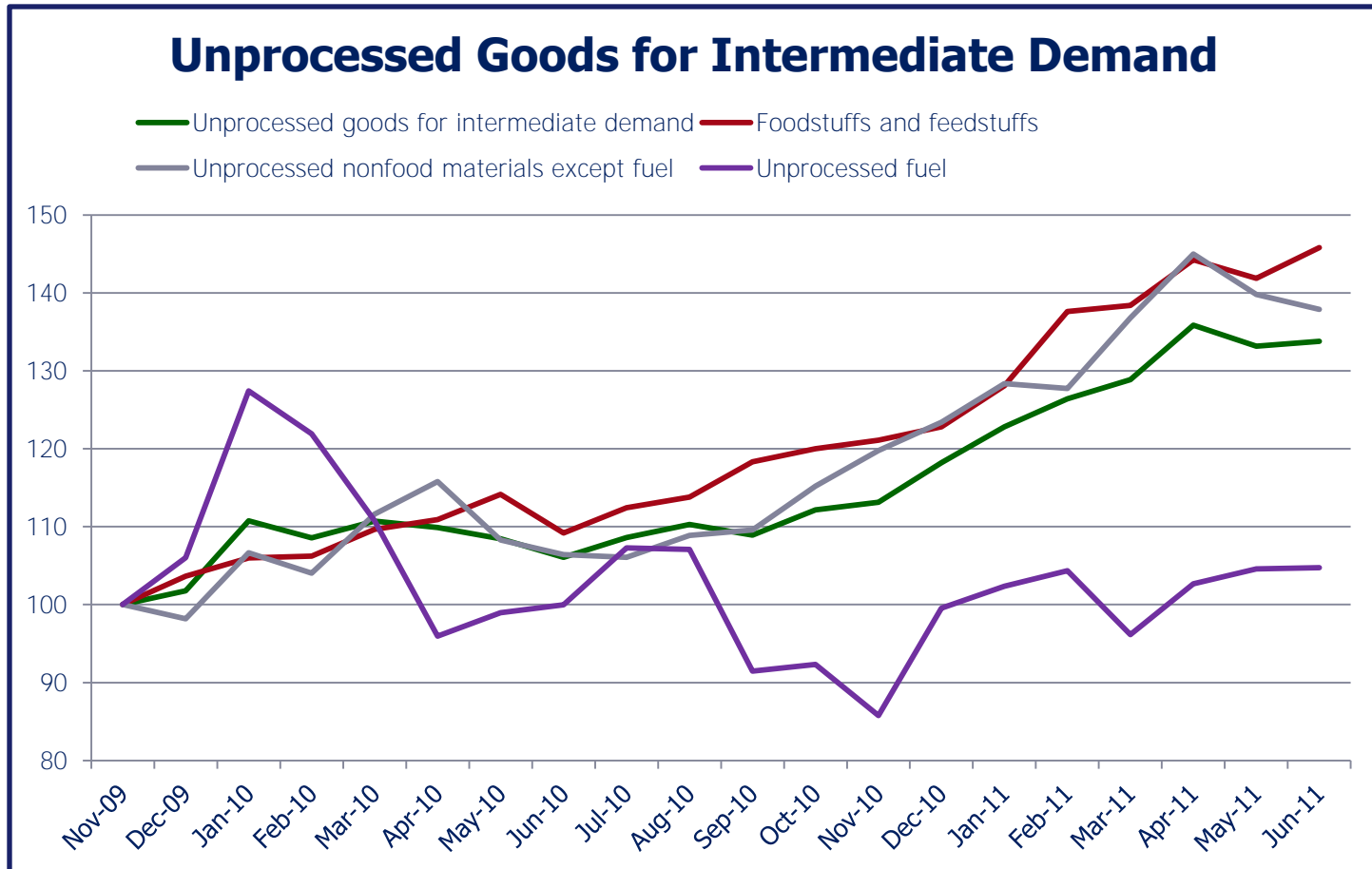
Services for Intermediate Demand



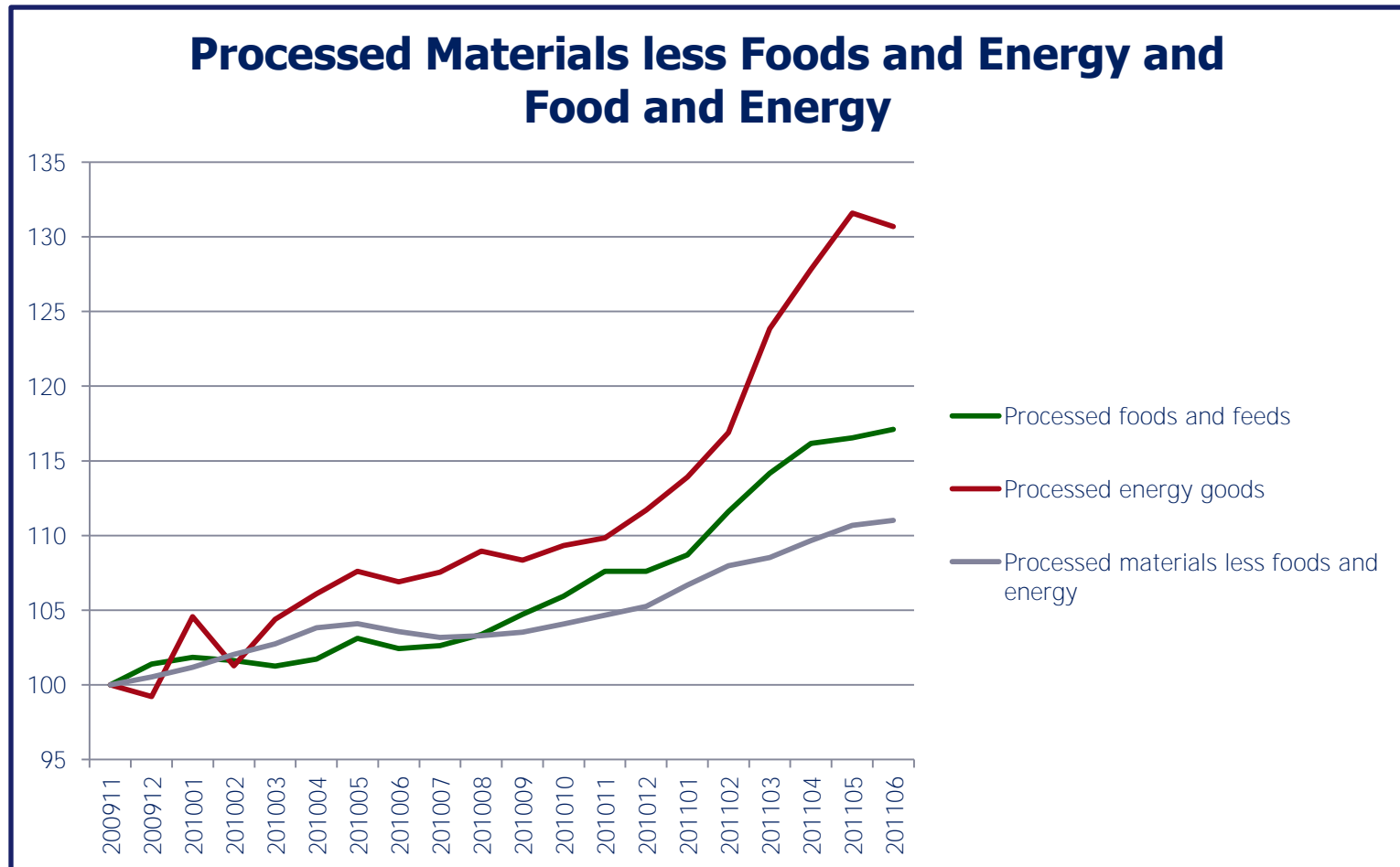
Processed Goods for Intermediate Demand



Unprocessed Goods for Intermediate Demand



Food, Energy and Processed Materials Less Food and Energy



Improvements to Intermediate Demand

- Addition of Construction for Intermediate Demand and Services for Intermediate Demand.
- Provides information on inflation by commodity type, providing more complete coverage of U.S. economy.
- However, does not eliminate multiple counting.

Question

- How significant is the concern of multiple counting in this treatment of intermediate demand?

Intermediate Demand by Flow Outline

- Goals and Definitions
- Assignment Process
- Questions
- Publication Structures
- Index Analysis
- Questions

Intermediate Demand by Flow Goals

- Break intermediate demand into stages to facilitate analysis of price flows.
- Assign industries to stages so that output of one stage is primarily an input to the next.

Example: Iron ore mining (S1) → Steel mills (S2) → Car parts Mfg (S3) → Car Mfg (S4) → FD

Intermediate Demand by Flow Diagram

Commodity		Producing/Consuming Industry:															
		Intermediate demand												Final Demand			
Commodity type	Detailed Commodity	Stage 1			Stage 2			Stage 3			Stage 4			PC	CI	Gov	Exp
		Ind 1	Ind 3	Ind 8	Ind 2	Ind 4	Ind 10	Ind 5	Ind 9	Ind 11	Ind 6	Ind 7	Ind 12				
Unprocessed Goods	1				FFI												
	2				IF												
	3				FFI												
Processed goods	4	BF	BF	BF	IF	IF	IF	FF	FF	FF	FFS	FFS	FFS				
	5				BF												
	6				BF												
Construction	7				BF												
Traditional Services	8				FFI												
	9				BF												
Trans Services	10				IF												
Trade Services	11				BF												
	12				BF												
	Imports																

Stage 1 ID
 Stage 2 ID
 Stage 3 ID
 Stage 4 ID

Intermediate Demand by Flow Industry Assignment Decisions

- Maximize net forward flow of the system.
 - ▶ **Net forward flow** = (forward flow of output + forward flow of inputs) – (backflow of output + backflow of inputs).
- Avoid internal flow and skips.
- Determine the industry assignment rules and the appropriate # of stages.
 - ▶ Process must be repeatable

Intermediate Demand by Flow

Selecting Decision Rules

- Analyze potential decisions rules by testing models with different combinations of # of stages and use cutoffs.
 - ▶ 33 models with four stages
 - ▶ 4 models with three stages
 - ▶ No five stage models were tested
- Use BEA's I/O Tables to determine each industry's make and use value for each commodity.

Intermediate Demand by Flow Detailed Process for Each Model:

Start with the stage closest to Final Demand and process iteratively. Example is for a four stage model with cutoffs 75, 65, 60.

Calculate the % of each industry's production that is used by FD. Assign all industries that meet or exceed the first cutoff value to the Stage 4.

	Industry								
	1	2	3	4	5	6	7	8	9
% shipment to FD	60	75	30	55	90	70	65	40	10
Assignment		4			4				

Intermediate Demand by Flow Detailed Process for Each Model:

For all remaining industries, calculate the % of production that is used by FD or industries in the Stage 4. Assign all industries that meet or exceed the second cutoff value to the Stage 3.

	Industry								
	1	2	3	4	5	6	7	8	9
% shipments to FD	60	75	30	55	90	70	65	40	10
% shipments to Stage 4	3		10	35		0	30	15	10
Assignment		4		3	4	3	3		

Intermediate Demand by Flow Detailed Process for Each Model:

For all remaining industries, calculate the % of production that is used by Final Demand or industries in Stage 3 or 4. Assign all industries that meet or exceed the third cutoff value to Stage 2.

	Industry								
	1	2	3	4	5	6	7	8	9
% shipments to FD	60	75	30	55	90	70	65	40	10
% shipments to Stage 4	3		10	35		0	30	20	10
% shipments to Stage 3	35		60					0	35
Assignment	2	4	2	3	4	3	3	2	

Intermediate Demand by Flow

Detailed Process for Each Model:

- All remaining industries are assigned to Stage 1.
- Net forward flow and other flow statistics are calculated for the model.
- The same process is followed for each model.

Intermediate Demand by Flow

Final Model Analysis Steps

- The best performing models based on net forward flow were analyzed in more detail to determine the final assignments. No three stage models were among the top performers.
 - ▶ Industries were moved if change would result in a forward flow gain of \$5 million or more.
 - ▶ Economic intuitiveness of moves was analyzed.
 - ▶ Level of skips and internal flow were examined.
- The 4 stage model with cutoffs of 75,65, 65 was selected.

Intermediate Demand by Flow

Final Assignment Statistics

Overall Flow Statistics

Type of Flow	% of Shipments
Forward Flow	83.6
Next Stage	50.4
Skips	33.2
Internal Flow	10.7
Back Flow	5.7

Intermediate Demand by Flow

Final Assignment Statistics

Stage Statistics

Stage	# of Industries			% of Production	
	Total	Goods Producers	Construction producers		Service Producers
1	61	44	1	16	17.0
2	96	70	0	26	18.4
3	125	98	2	25	25.5
4	141	97	7	37	39.1

Intermediate Demand by Flow Industry Assignments by Stage

Stage 1

Crop Farming, Metal Mining, Basic Chemical Manufacturing, Primary Metal Manufacturing, Professional Services

Stage 2

Animal Farming, Petroleum Refining, Plastics, Fabricated Metal Manufacturing, Administrative Services

Stage 3

Animal Processing, Nonmetallic Mineral Product Manufacturing, Semiconductors, Wholesale Trade, Telecommunication

Stage 4

Food Manufacturing, Apparel, Machinery Manufacturing, Health Care, Retail Trade

Assignment Questions

- Are you comfortable with the general approach for assigning industries to stages?
- Do you have any specific suggestions for another approach or changes we might make to our approach?
- Do you have any general questions or suggestions about the methodology and process we used?

Intermediate Demand by Flow Type of Indexes

- Identify and calculate a set of indexes that allow users to trace price flows through the intermediate stages to final demand economy.
 - ▶ Net output indexes – Track producer prices for the net output of the industries in each stage by using industry net output indexes.
 - ▶ Net input indexes – Track producer prices for the net inputs consumed by industries in each stage by using wherever made commodity or wherever provided services indexes.
- Net input selected because provide better support for pass-through analysis.

Intermediate Demand by Flow

Main Publication Structure

Stage 4 intermediate demand

Inputs to stage 4 goods producers

Inputs to stage 4 services producers

Inputs to stage 4 services producers, goods

Inputs to stage 4 services producers, food

Inputs to stage 4 services producers, energy

Inputs to stage 4 services producers, goods excluding foods and energy

Inputs to stage 4 services producers, services

Inputs to stage 4 services producers, traditional services

Inputs to stage 4 services producers, transportation services

Inputs to stage 4 services producers, transportation of passengers

Inputs to stage 4 services producers, transportation of goods

Inputs to stage 4 services producers, trade services

Inputs to stage 4 services producers, construction

Inputs to stage 4 construction producers

Intermediate Demand by Flow Special Indexes

Total goods inputs to stage 4 intermediate demand

Total foods inputs to stage 4 intermediate demand

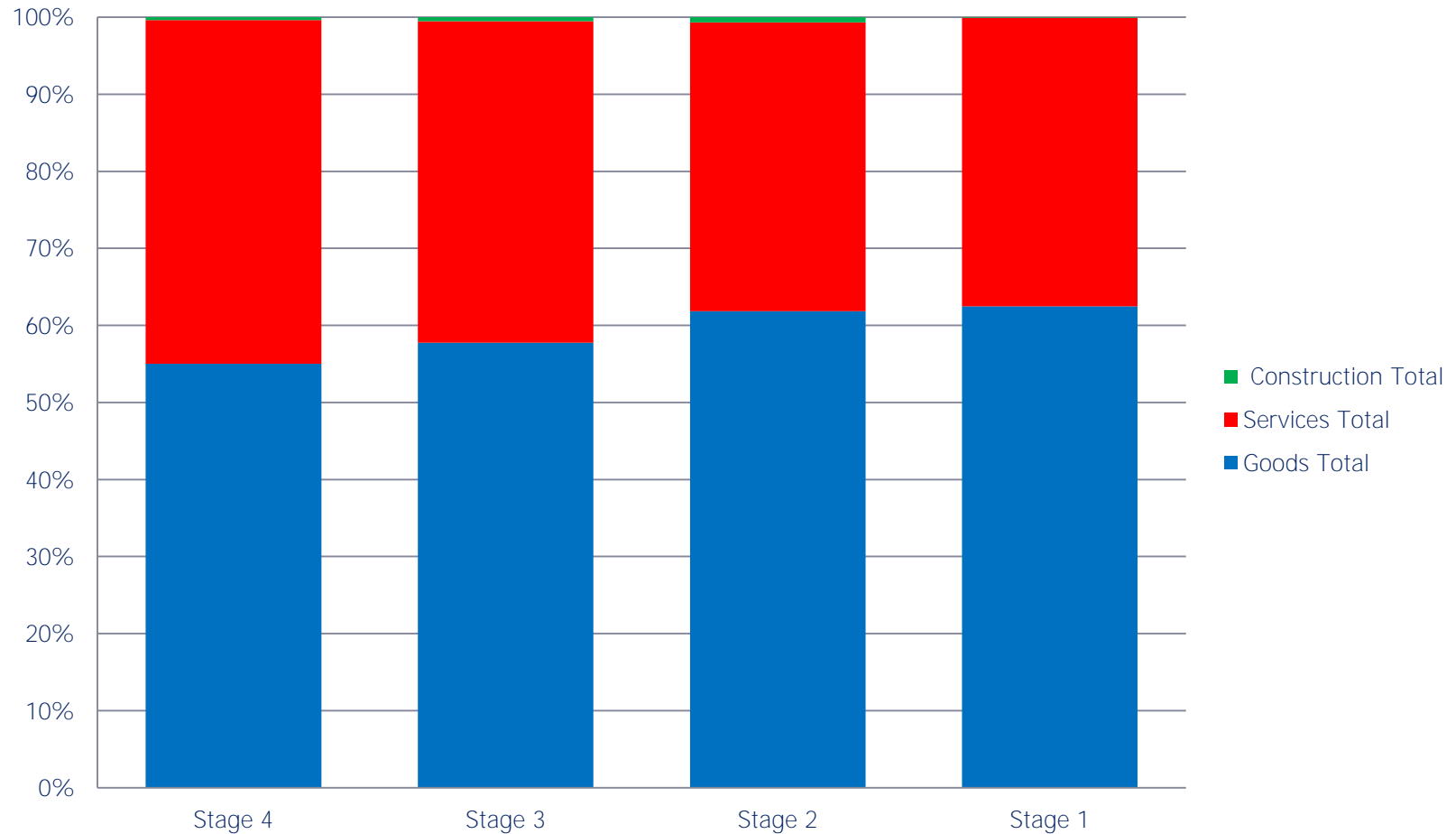
Total energy goods inputs to stage 4 intermediate demand

Total goods less food and energy inputs to stage 4 intermediate demand

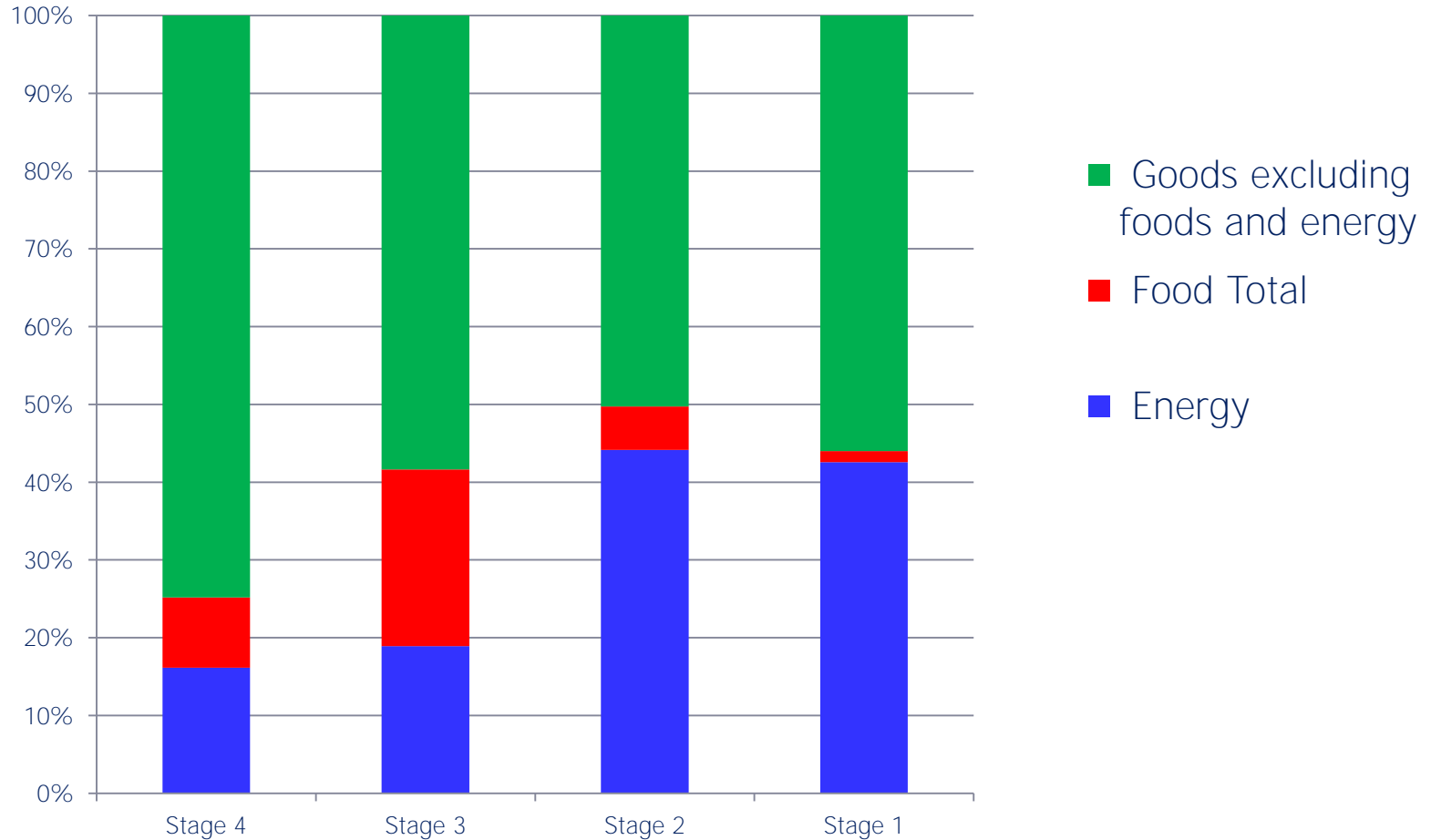
Total services inputs to stage 4 intermediate demand

Total construction inputs to stage 4 intermediate demand

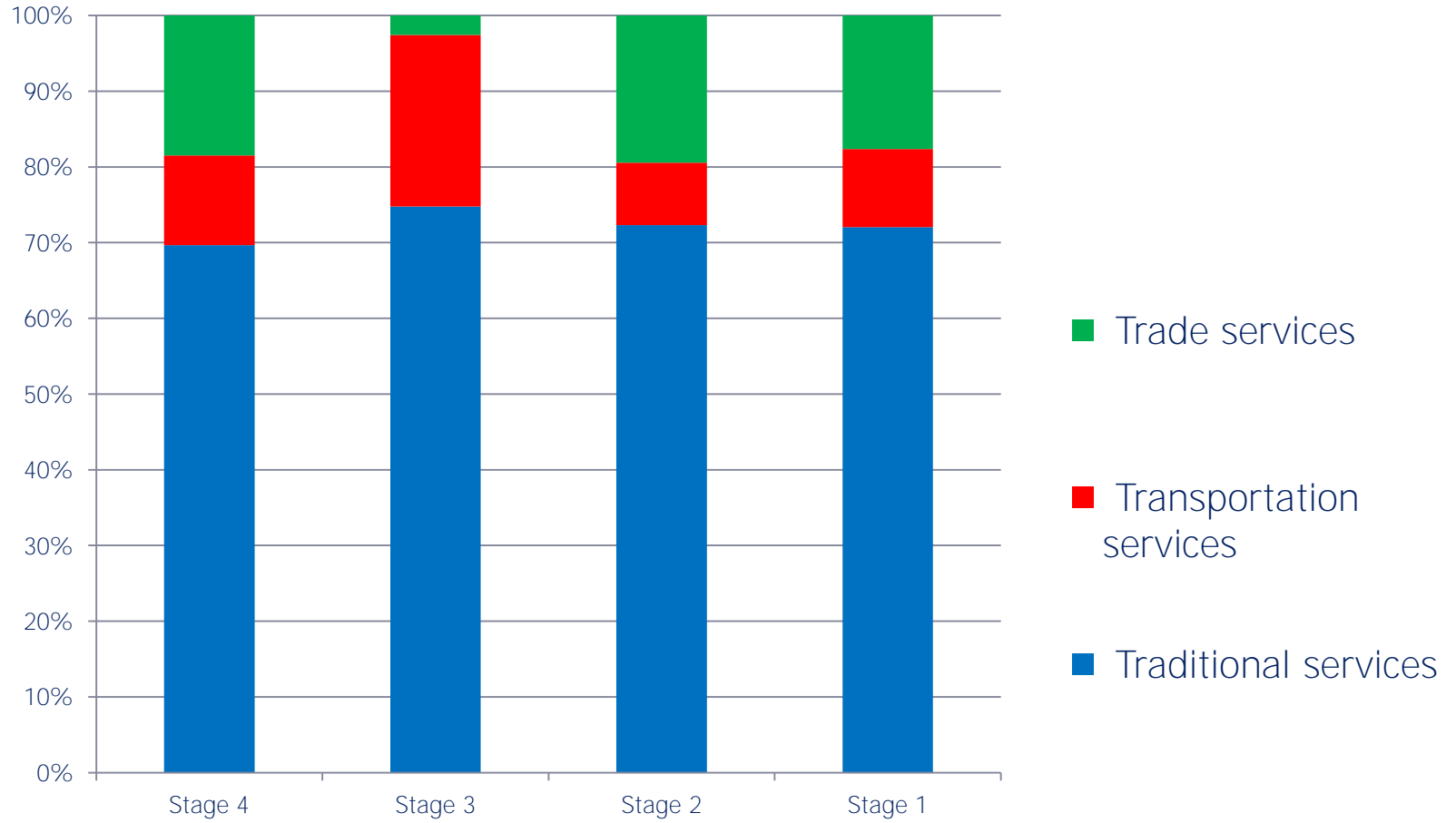
Intermediate Demand by Flow Type of Product used by Stage



Intermediate Demand by Flow Type of Goods Used by Stage



Intermediate Demand by Flow Type of Services Used



Intermediate Demand by Flow

Top 5 inputs

Stage 4

Title	Rel Imp
Motor vehicle parts	4.295
Securities brokerage, dealing, and investment advice	3.075
Commercial electric power	2.943
Parts and supplies for machinery and equipment wholesaling	2.897
Legal services	1.775

Stage 3

Title	Rel Imp
Commissions from sales of property and casualty insurance	3.644
Slaughter steers and heifers	3.576
Milk, eligible for fluid use	2.908
Legal services	2.905
Courier and messenger services, except air	2.501

Intermediate Demand by Flow

Top 5 inputs

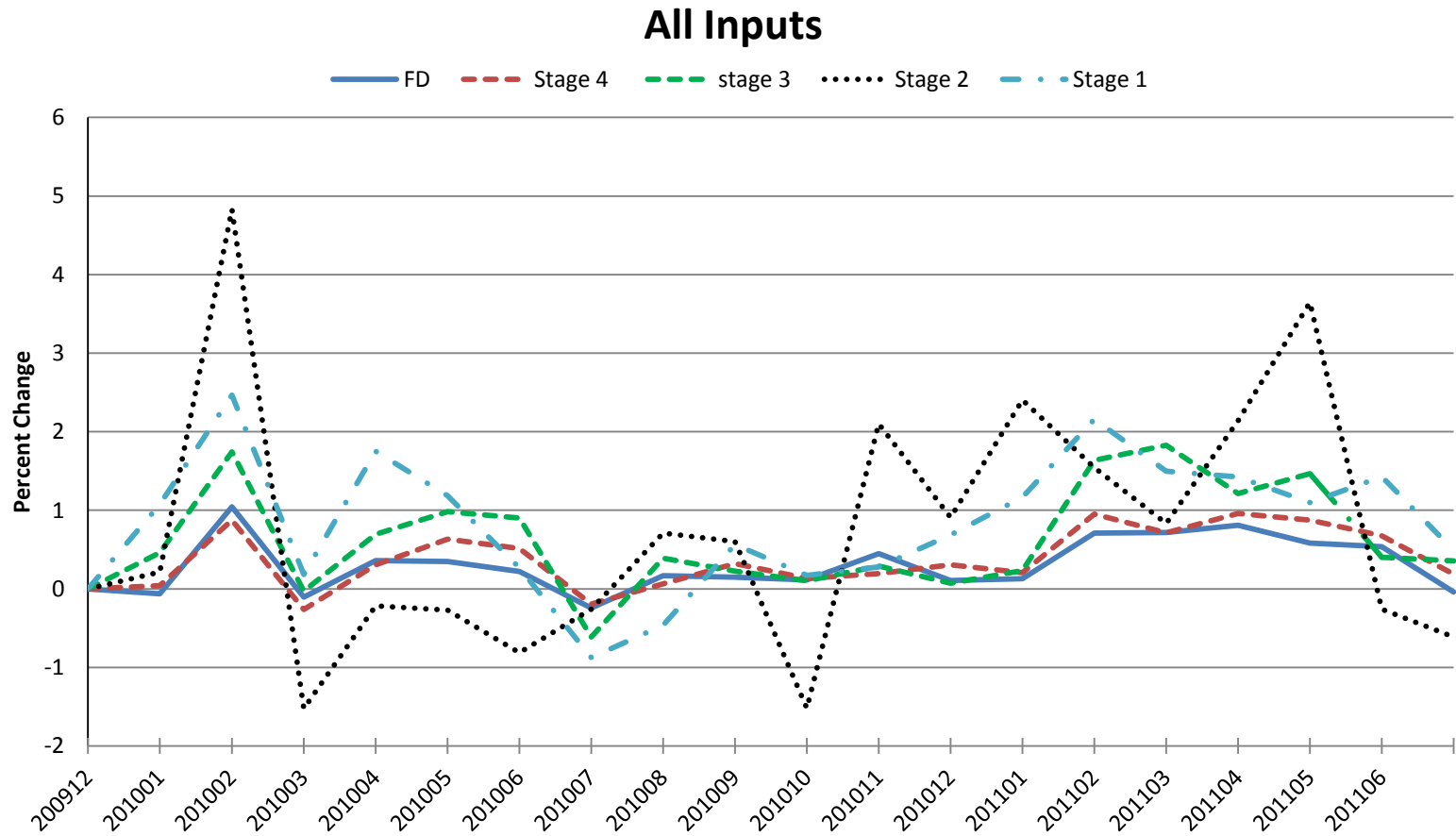
Stage 2

Title	Rel Imp
Crude petroleum (domestic production)	13.457
Natural gas	8.596
Legal services	3.142
Liquefied petroleum gas	2.552
Other basic organics	2.405

Stage 1

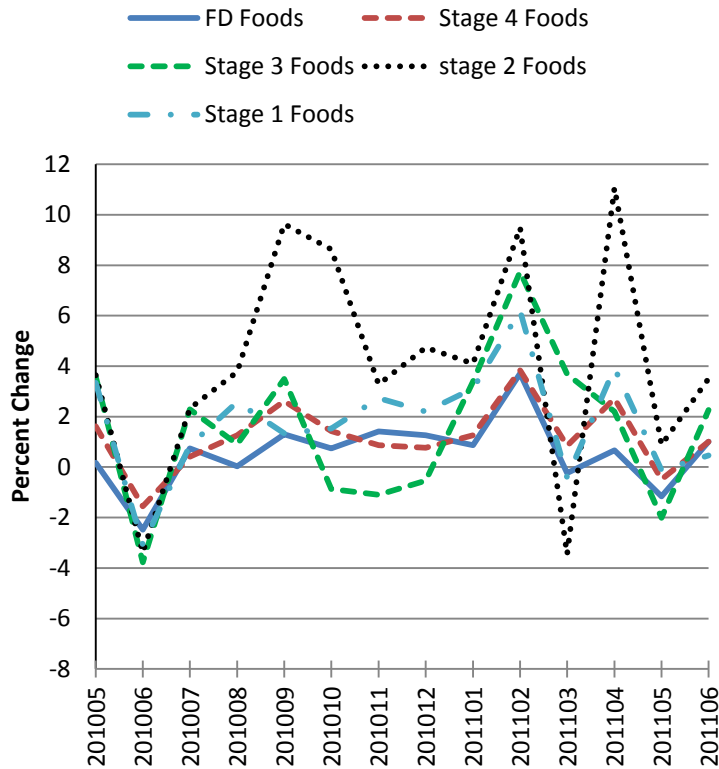
Title	Rel Imp
Commercial electric power	8.853
Industrial electric power	7.827
Primary basic organic chemicals	7.074
Securities brokerage, dealing, and investment advice	4.822
Carbon steel scrap	4.68

Intermediate Demand by Flow Index Change FD and all ID Stages

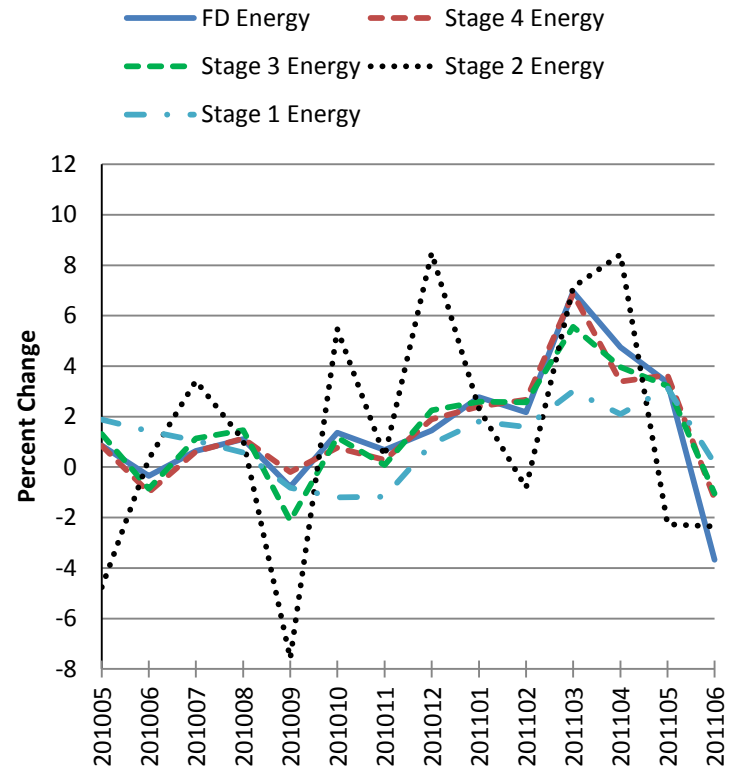


Intermediate Demand by Flow Index Change by Stage

Foods Inputs

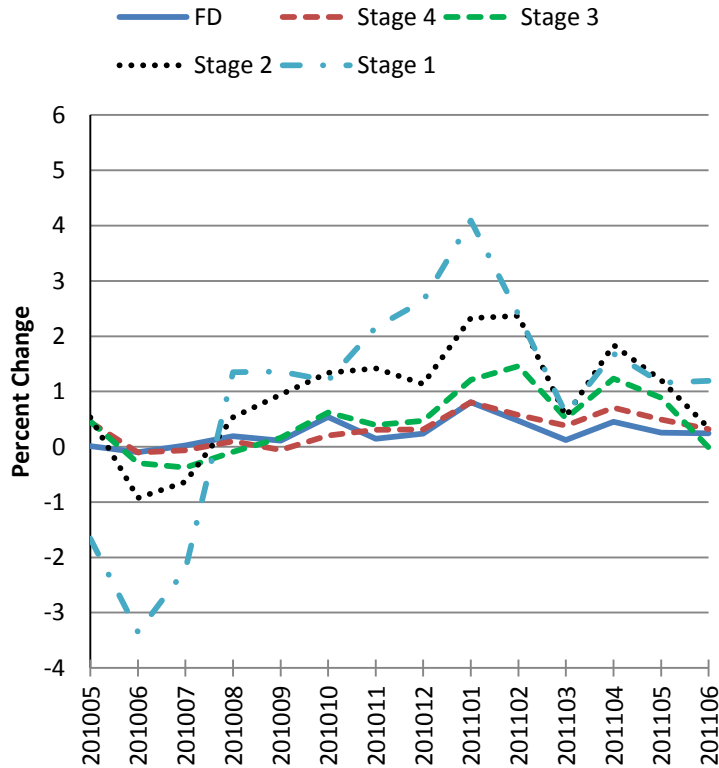


Energy Inputs

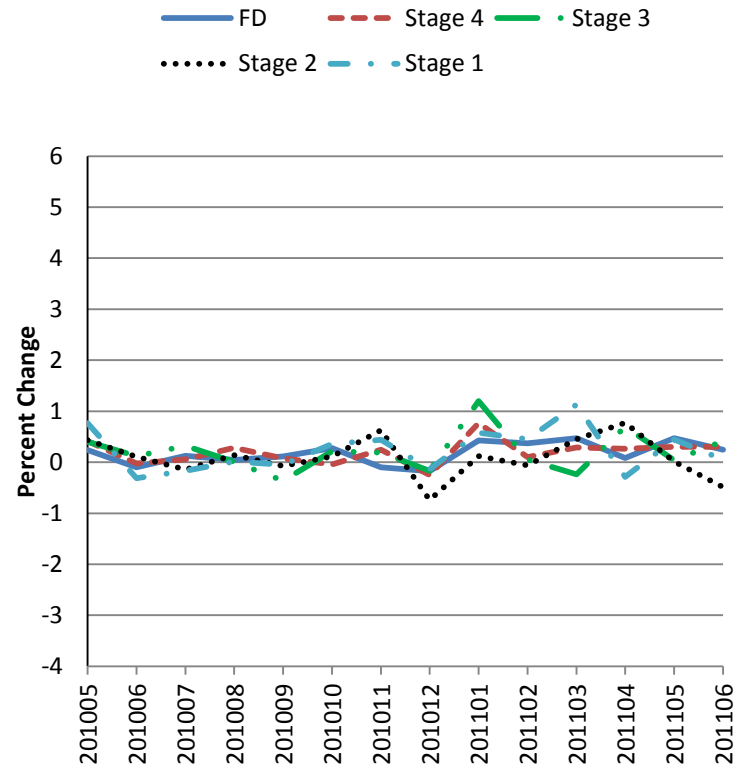


Intermediate Demand by Flow Index Change by Stage

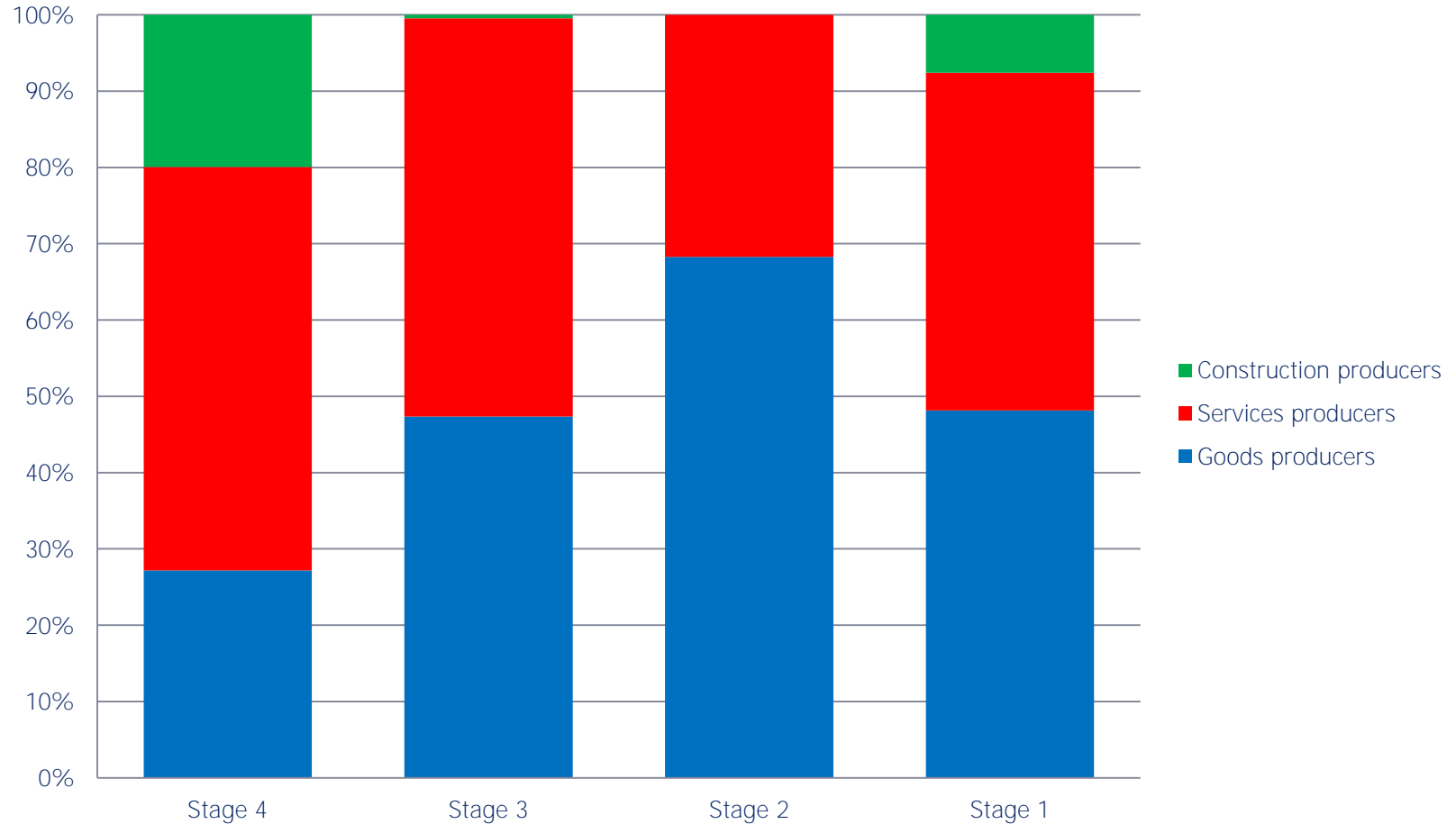
Goods less Food & Energy Inputs



Services Inputs

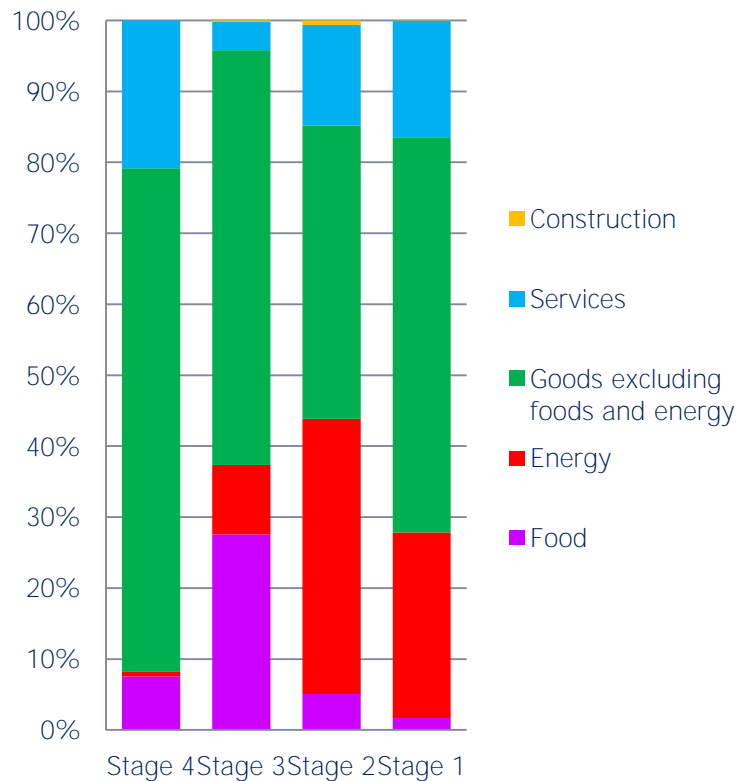


Intermediate Demand by Flow Inputs by Type of Producer

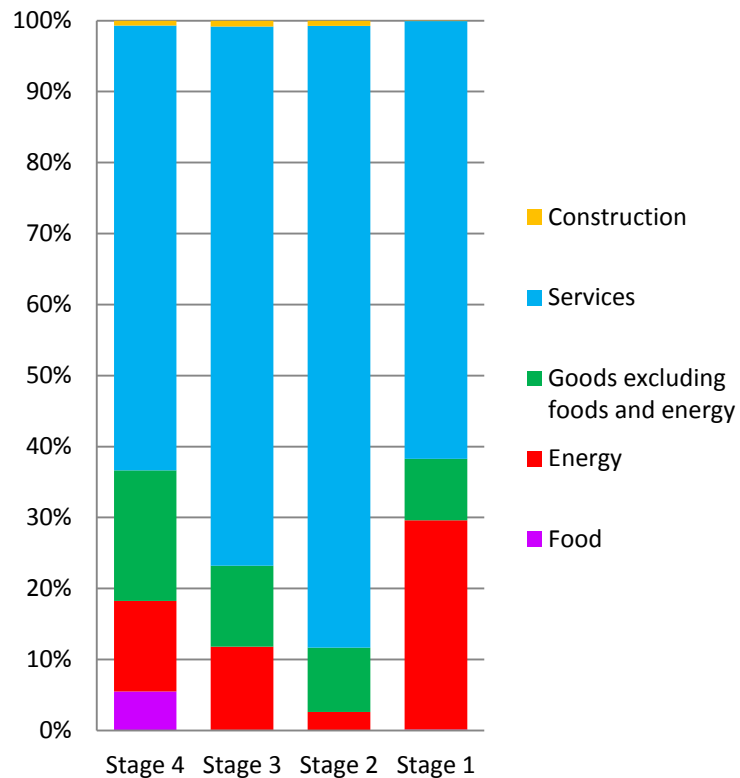


Intermediate Demand by Flow Inputs by Type of Product

Goods Producers

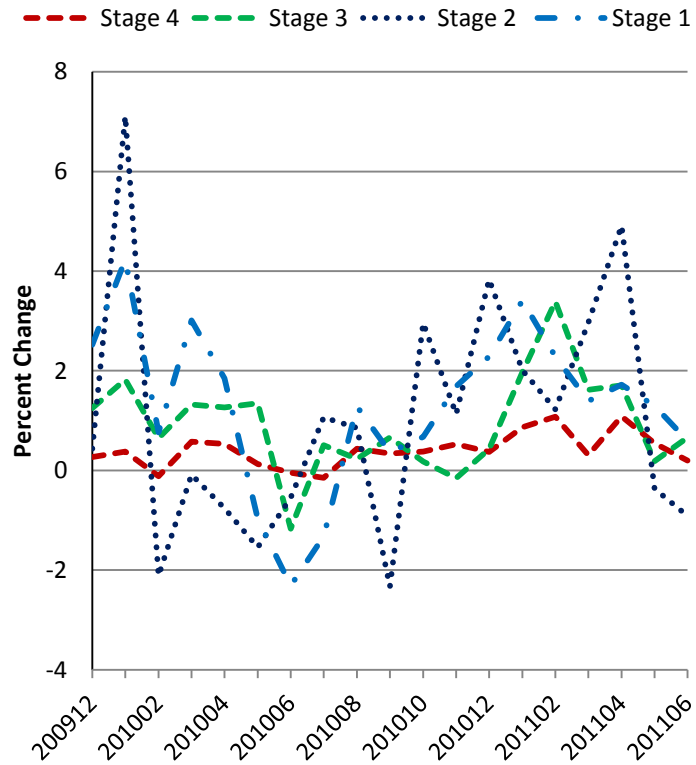


Services Producers

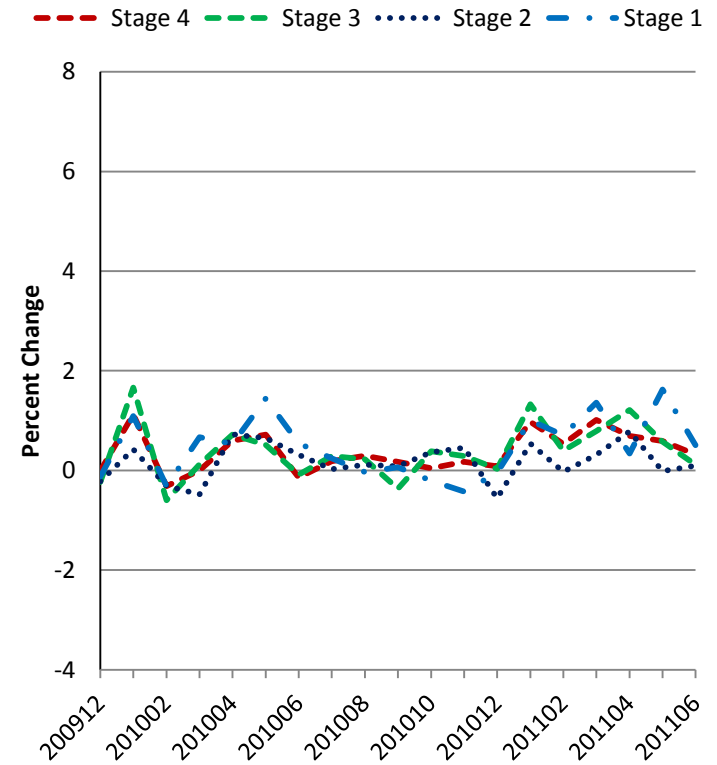


Index Movement by Stage

Inputs to Goods Producers



Inputs to Service Producers



Intermediate Demand by Flow Value Added

- Flow based approach facilitates pass-through analysis
- Supports analysis by both type of producer and type of product
- Includes services and construction
- Eliminates multiple counting through stage creation and net weighting

Index Questions

- Which intermediate indexes do you think we should focus on in our press release?
- Do you see a use for output indexes for the intermediate stages? If so, how would you use them?
- Do you think the indexes for inputs to Stage 1 are analytically useful?
- Are there indexes that we have not created that you think would be useful? If so what are they and how would you recommend using them?
- What other comments or questions do you have?

Overview of Quality Adjustment

- Preferred quality adjustment method is to use the production or provider cost difference between the old item and the new item –this is referred to as explicit quality adjustment.
- Production or provider cost differences are used to net out the price differences between the items and to have the index reflect only pure price change.
- For example, in the cable TV industry, provider cost is usually available to quality adjust for changes in the channels provided to customers.

Overview of Quality Adjustment

For some service industries, there is limited information on providers' costs:

- Develop a pricing method that removes the need for quality adjustments (e.g. average prices)
- Hedonic models have been used to determine a value of quality adjustment if there are sufficient item data available.

Overview of Quality Adjustment

Explicit quality adjustment using secondary sources:

- Private passenger auto insurance
- General medical and surgical hospitals
- Nursing care facilities

Overview of Quality Adjustment

Average prices collected for these industries:

- Majority of retail and wholesale trade
- Scheduled passenger air transportation
- Newspaper publishers
- Periodical publishers
- Radio broadcasting (advertising)
- Television broadcasting (advertising)
- Cable networks (advertising)
- Paging services
- Commercial banking
- Savings institutions
- Lessors of nonresidential buildings
- Lessors of miniwarehouses and self-storage units
- Temporary help services

Overview of Quality Adjustment

Hedonic models used for these industries:

- Beer, wine, and liquor stores
- Security guards and patrol services

Hedonic models researched for these industries:

- Janitorial services
- Hotels and motels

Services Seasonality

- The experimental indexes will be indirectly adjusted.
- X12 requires 36 months of data to adjust.
- PPI historically uses 60 months of data to adjust.
- Services commodity indexes started between January 2008 and June 2009.

Services Seasonality

- Services industry data has more history
- Used industry as proxy for commodity data
- Tested 141 6-digit NAICS industries price indexes for seasonality
- 32 or 23% of indexes passed
 - ▶ $F(s) > 7$; $M7 < 1$; $Q < 1$

Services Seasonality- Indexes Passing Seasonality Tests

Industry	Title	F(S)	M7	Q
622110	General medical and surgical hospitals	72.397	0.329	0.26
541110	Offices of lawyers	69.709	0.592	0.37
515112	Radio stations	41.886	0.365	0.35
721110	Hotels and motels, except casino hotels	37.273	0.563	0.52
511120	Periodical publishers	35.566	0.481	0.33
517510	Cable and other program distribution	32.231	0.579	0.3
623110	Nursing care facilities	30.263	0.364	0.26
483211	Inland water freight transportation	26.29	0.429	0.32
524114	Direct health and medical insurance carriers	21.81	0.764	0.47
517110	Wired telecommunications carriers	19.146	0.498	0.37
621991	Blood and organ banks	18.117	0.47	0.23
486910	Refined petroleum product pipeline transport	18.071	0.806	0.48
488320	Marine cargo handling	17.572	0.607	0.39
484110	General freight trucking, local	17.556	0.675	0.46
511140	Directory and mailing list publishers	17.457	0.743	0.37
531120	Lessors of nonresidential buildings	17.38	0.591	0.56
621610	Home health care services	16.521	0.805	0.55
621111	Offices of physicians, except mental health	14.504	0.711	0.39
492110	Couriers	13.917	0.532	0.51
721120	Casino hotels	13.483	0.582	0.64
515120	Television broadcasting	13.212	0.838	0.67
515210	Cable and other subscription programming	12.672	0.651	0.46
481111	Scheduled passenger air transportation	12.531	0.801	0.62
541610	Management consulting services	12.257	0.631	0.33
522110	Commercial banking	11.571	0.593	0.53
448310	Jewelry stores	10.889	0.756	0.47
511130	Book publishers	10.296	0.695	0.54
713910	Golf courses and country clubs	10.116	0.7	0.53
484122	General freight trucking, long-distance, LTL	9.499	0.948	0.54
517212	Cellular and other wireless carriers	8.201	0.939	0.52
441110	New car dealers	7.922	0.918	0.57
488119	Other airport operations	7.194	0.963	0.52

Services Seasonality Questions

- Should PPI adjust services and construction indexes using less than 60 months of data?

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