

Macroeconomic Models: Weekly Update

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- Here is the hierarchy of CPI component categories/levels.
 - Major Group > expenditure class > item stratum > entry level items
 - Entry level items represent the actual sampling units.
- The conversation last week focused on Major Groups, and we identified Transportation—with a correlation of ≈ 0.85 with CPI—as a first Major Group scraping target.
- Now zoom in on Transportation, to transportation expenditure classes; and to the item stratum within expenditure classes.
 - Private Transportation
 - [4] "New and used motor vehicles"
 - [5] "Motor fuel"
 - [6] "Motor vehicle parts and equipment"
 - [7] "Motor vehicle maintenance and repair"
 - [8] "Motor vehicle insurance"
 - [9] "Motor vehicle fees"
 - Public Transportation
 - [11] "Airline fares"
 - [12] "Other intercity transportation"
 - [13] "Intracity transportation"
- I focus on the correlation in month-to-month changes as before, but this time with Transportation item stratum.
- Here are the **month-to-month change correlations** among Transportation item strata. The first row/column represents the CPI, the second the Transportation Major Group index.

	All	Tr	MVs	Fuel	P&E	M&R	Ins	Air	Inter	Intra
All items	1.000	0.854	0.129	0.839	0.043	0.193	-0.165	0.374	-0.006	0.089
Transportation	0.854	1.000	0.218	0.983	0.003	0.037	-0.142	0.383	0.057	0.056
New and used motor vehicles**	0.129	0.218	1.000	0.113	0.090	-0.115	0.032	0.103	0.020	-0.003
Motor fuel**	0.839	0.983	0.113	1.000	-0.016	0.020	-0.194	0.302	0.045	0.047
Motor vehicle parts and equipment	0.043	0.003	0.090	-0.016	1.000	0.147	-0.050	-0.027	0.014	-0.002
Motor vehicle maintenance and repair*	0.193	0.037	-0.115	0.020	0.147	1.000	0.086	0.083	-0.096	0.071
Motor vehicle insurance	-0.165	-0.142	0.032	-0.194	-0.050	0.086	1.000	0.000	-0.074	-0.002
Airline fares**	0.374	0.383	0.103	0.302	-0.027	0.083	0.000	1.000	0.082	0.086
Other intercity transportation	-0.006	0.057	0.020	0.045	0.014	-0.096	-0.074	0.082	1.000	0.072
Intracity transportation	0.089	0.056	-0.003	0.047	-0.002	0.071	-0.002	0.086	0.072	1.000

- Note: I removed the *Fees* strata from the correlation matrix displayed here to save space.
- ** *Motor fuel* (0.983), *Airline fares* (0.383), and *New and used motor vehicles* (0.218) are the strata whose month-to-month changes are the most correlated with the Transportation Major Group index month-to-month changes.
- * The *Motor vehicle maintenance and repair* stratum has a correlation of 0.037 with the transportation Major Group, but a much higher correlation of 0.193 with the CPI itself!
- ** In the reverse direction, the *New and used motor vehicles* stratum has a correlation of 0.218 with the Transportation Major Group, but a lesser correlation of 0.129 with the CPI.
- Before we saw the correlation of month-to-month changes of Transportation item strata with m-to-m changes in CPI. Consider the same **across all major groups**. Below are the top 25 such correlations, along with their "Relative Importance Weights" for calculating the CPI.

	item_name	Cor	RIW
1	Motor fuel	0.8389	3.979
2	Lodging away from home	0.4325	0.839*
3	Household energy	0.3980	4.051
4	Airline fares	0.3744	0.702*
5	Jewelry	0.3232	0.164*
6	Women's footwear	0.2976	0.329*
7	Food away from home	0.2808	5.830
8	Food at home	0.2699	8.427
9	Women's apparel	0.2697	1.210
10	Cable and satellite television service	0.2579	1.468
11	Men's apparel	0.2484	0.653*
12	Miscellaneous personal services	0.2402	1.122
13	Pet services including veterinary	0.2343	0.399*
14	Professional services	0.2200	3.032
15	Photographic equipment and supplies	0.2173	0.058*
16	Postage and delivery services	0.2106	0.144*
17	Alcoholic beverages	0.1994	1.015
18	Sports equipment	0.1958	0.214*
19	Motor vehicle maintenance and repair	0.1932	1.168
20	Watches	0.1908	0.046*
21	Club membership	0.1699	0.602*
22	Rent of primary residence	0.1640	7.159
23	Medicinal drugs	0.1524	1.696
24	Toys	0.1514	0.277*
25	Furniture and bedding	0.1502	0.769*

- Notice that some strata, despite being quite correlated to CPI, have surprisingly low weights for the actual CPI calculation (weights below 1 are starred). This suggests, other things being equal, that more information is somehow baked into the price of these goods.