

## Appendix: U.S. Data on Cross-state Specialization and Price Dispersion

### 1. Regional specialization

*Additional explanations to the figure on convergence in the composition of value added across U.S. states*

The values in the figure are obtained as follows (identical to AY's procedure in the case of China). First, for each state, the shares of agriculture, industry (including construction) and services in gross state product are calculated. Second, the three mean shares, across states, of agriculture, industry, and services are calculated. Third, the absolute deviations (or squared deviations) of a particular state's agricultural share from the average state agricultural share, and similarly for industry and services, are calculated. Fourth, the deviations are summed across sectors for each state, and then across states. Using, in the second and third step, nationwide shares instead of mean state shares yields the same time patterns. Using eight regions instead of states, with either variation of average sectoral shares, yields the same time patterns.

U.S. data on agriculture, industry, and services exclude government (13.55% of the sum of gross state product across states in 1977, and 12.03% in 2001); only for private value added is the distinction between three sectors available. (A separate analysis of government data only shows drastic convergence across states, at a rate exceeding convergence in the private primary, secondary, and tertiary sectors; omitting the government sector, thus, biases the results reported here towards divergence.) Industry is the sum of mining, construction, and manufacturing. Services is the sum of transportation & utilities, wholesale trade, retail trade, F.I.R.E., and "services."

### *Convergence within industry*

In contrast to China, the U.S. also experienced increasing convergence *within industry* (Figure 1). I.e., if the U.S. within-industry data were Chinese data, AY would have the most detailed (and compelling) evidence of increasing trade barriers in China possible.

Industry consists of mining and manufacturing. Mining consists of the subsectors metal mining, coal mining, oil and gas extraction, and nonmetallic minerals (except fuels). Manufacturing consists of the 21 subsectors lumber and wood products; furniture and fixtures; stone, clay, and glass products; primary metal industries; fabricated metal products; industrial machinery and equipment; electronic and other electric equipment; motor vehicles and equipment; other transportation equipment; instruments and related products; miscellaneous manufacturing; food and kindred products; tobacco products; textile mill products; apparel and other textile products; paper and allied products; printing and publishing; chemicals and allied products; petroleum and coal products; rubber and misc. plastics products; leather and leather products.

The overall change in the within-industry data between 1977 and 2001, or between the high point of 1981 and 2001, is relatively small at approximately 10% and 20% of the 1977 and 1981 level, about half the size of the change in the case of only the three economic sectors (primary, secondary, and tertiary sector, figure in the paper).

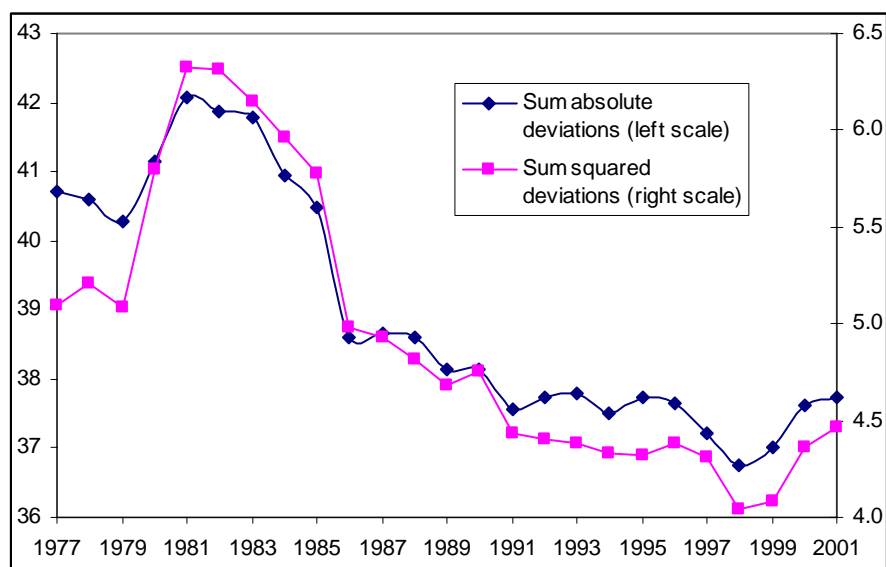
## 2. Price dispersion: additional explanations to the figure on price dispersion across U.S. cities in the paper

David Parsley and Shang-Jin Wei assembled price data from publications of the American Chamber of Commerce Researchers Association (included in the publication *Cost of Living Index*). They chose from a larger set of data based on criteria of completeness and comparability. Their data, posted at <http://mba.vanderbilt.edu/david.parsley/Research.htm> (last accessed on 2 Jan. 08) come in three files: for non-perishable goods (used here), for perishable goods (not used here), and for services (not used here). As explained in the appendix on price data, prices of perishable goods may come with additional complications; Chinese price data do not cover services.

When price data for a particular product in a particular period are available for 5 cities or more, they are available for at least 33 cities out of the maximum of 48 cities. When fewer than 5 price observations are available, this typically means that no price observation at all for this product in this quarter is available (none in any city).

The total number of price observations is  $89,856 = 72 \text{ quarters (1/75 through 4/92)} \times 48 \text{ cities} \times 26 \text{ products}$ ; some of these observations do not come with a value (no price value is available). These observations translate into 1465 values of price *dispersion* out of a theoretically possible 1872 values ( $72 \text{ quarters} \times 26 \text{ products}$ ). The calculations were done as in the case of China.

The 26 non-perishable goods are aspirin, baby food, beer, cigarettes, coffee, corn flakes, frozen corn, game, jeans, liquor, man's shirt, canned orange juice, canned peaches, shampoo, shortening, soft drink, sugar, canned peas, tennis balls, tissue, canned tomatoes, toothpaste, canned tuna, underwear, washing powder, wine. The 48 cities are Birmingham, AL; Mobile, AL; Blythe, CA; Indio, CA; Palm Springs, CA; Denver, CO; Lakeland, FL; Boise, ID; Champaign, Urbana, IL; Peoria, IL; Ft. Wayne, IN; Indianapolis, IN; Cedar Rapids, IA; Lexington, KY; Louisville, KY; Baton Rouge, LA; Lafayette, LA; New Orleans, LA; Benton Harbor, MI; Traverse City, MI; Columbus, MS; St. Joseph, MO; St. Louis, MO; Falls City, NE; Hastings, NE; Omaha, NE; Reno, Sparks, NV; Newark, NJ; New York, NY; Hickory, NC; Columbus, OH; Altoona, PA; Rapid City, SD; Vermillion, SD; Chattanooga, TN; Knoxville, TN; Abilene, TX; El Paso, TX; Ft. Worth, TX; Houston, TX; Lubbox, TX; Salt Lake City, UT; Charleston, WV; Appleton, WI; Eau Claire, WI; Madison, WI; Oshkosh, WI; Casper, WY.



The data are gross state product data, approximately corresponding to the national concept of GDP. The deviations in this figure are across 25 subsectors of industry (and the 51 states).

The calculation procedures match those of Alwyn Young (2000) and use mean state shares. (Using nationwide shares yields the same time pattern.)

Source: <http://www.bea.gov/bea/regional/gsp/> (accessed 22 May 2004). See notes on webpage for definitional issues.

**Figure 1. Convergence in the Composition of Industrial Value Added Across U.S. States**