

**The U.S. Producer Price Index for
Scheduled Air Passenger Transportation
(NAICS 493120)**

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*** The views expressed are those of the author and do not reflect the policies of the U.S. Bureau of Labor Statistics or the views of other BLS staff members**

A. Introduction

The U.S. Producer Price Index for Scheduled air passenger transportation (NAICS 481111, formerly SIC 4512) is one of a handful of price indexes in publication that measures airline prices in some form. The PPI for airlines has been in calculation since December 1989. Establishments providing air transportation of passengers or passengers and freight over regular routes and on regular schedules are included in this industry.

B. Current Pricing Methodology

The current PPI for airlines measures price change using individual fare codes. For a selected origin and destination (O&D), the PPI prices a unique fare code with a certain set of rules and restrictions. Examples of rules/restrictions include advance purchase requirements, minimum/maximum stays, Saturday stay over requirement, and refundable/non-refundable status. During each pricing period a new fare is comparable to the previous fare if the fare code is unchanged. However, if the previous fare code is unavailable a new fare code with similar rules/restrictions is selected. In general, this new fare is directly compared to the previous fare. When a fare code changes, the current methodology allows a comparison between a new fare code and a previous fare code that is a different inventory or “bucket”, but the rules/restrictions are the same or substantially similar.

This has not always been the case in the PPI for airlines. In the early years of the index, one fare code was used through time. If this fare code became unavailable, a new fare code was selected that may have an entirely different set of rules and restrictions. Any resulting price change due to this fare code change was linked out. This method of pricing changed over to the current method of allowing a comparison of different fare codes with similar rules/restrictions. This was changed to the current method to improve index quality.

More recently, a special project investigating the feasibility of internet pricing for the PPI was completed. This project researched the shift towards deeply discounted fares that were exclusively offered via the Internet. Although this project proved that using internet fares in the current pricing methodology provided no improvement in index quality, this project did provide evidence that an alternative pricing approach needed to be developed in order to capture this growing part of the industry. This issue, among others, provided a catalyst for revamping the current PPI methodology for airlines in order to greatly improve the index quality.

C. Issues with Current Methodology

In the last few years, there has been increasing concern that the PPI for airlines has been exhibiting an upward bias. Some of the issues that may be causing this upward bias include the change in the mix of distribution channels, the transition to web based fares and/or deep discount fares, the substitution of fare codes over time, and the exclusion of zero fares (frequent flier mile tickets). The PPI index for airlines has failed to capture these over time.

Over the last few years the airlines' mix of distribution channels has shifted and the internet has become increasingly more prevalent, whether through an airline's direct internet website or through one of the many web based distributors (e.g. Expedia). During the above mentioned internet pricing experiment, it was found that internet fares can disappear as quickly as they appear, making any kind of comparison using the current methodology almost impossible. In some cases these fares never reappeared. In addition, since we collect data directly from participating airlines using unique fare codes it is believed that we never correctly captured the pricing via other traditional distribution channels (e.g. call centers, consolidators, brick and mortar travel agencies) where the fare codes and pricing may be different. Different fare codes are offered through different distribution channels. For example, in any given month a consumer may find the cheapest fare on an airline's website, on a third party internet website, or through a travel agent. The current methodology does not allow for an accurate comparison of this.

Another issue is the substitution of fare codes over time. In general, the PPI has gradually moved to what is referred to as "core" fare codes. Even though many of our current fare codes may indeed be considered "discount" fare codes they do not reflect fare sales or deep discounts. These "core" fares tend to be offered all the time and may or may not be actually purchased in a given month. Although these fares do represent part of an airline's pricing, they do not represent a very big portion of it. What the PPI ends up with is a group of fare codes that tend to move up in a slow and steady manner. The conclusion drawn from this is that pricing one fare code per O&D is not very reflective of the true price trends over time. The fact that a given airline may fly hundreds of routes and price discriminates in many ways on each of those routes is evidence that pricing one fare code per O&D does not accurately measure overall industry price trends.

D. Proposal for New Methodology

These issues lead to a desire to improve the PPI for airlines. The alternative to our current approach is to collect total passenger revenue (excluding taxes and government fees) and total passengers for a given market. We can then calculate the average revenue per passenger. This proposed approach is similar to the Air Transport Association's (ATA) passenger yield index with one major difference. ATA divides total revenue by RPM (revenue passengers multiplied by miles); our alternative approach will use only

passengers in the denominator. The PPI would hold constant the trip length whereas ATA does not.

When calculating the average revenue per passenger, a number of different time periods (e.g. day, week, month) can be considered. It would be optimal to use an entire month of data. By using data for travel that occurs throughout the month, any and all travel events would be included. However, this presents a problem in that respondents would need a number of days after the end of the month to calculate the average and this would introduce a one-month lag to the index. Thus, using a 21-day time period for the current month was selected as an alternative. This allows ample time (on average 7 business days) for a participating airline to retrieve the data and submit it to be included for the current month's index. Using a 21-day period also serves to produce a lower volatility index (versus a day or week) that more accurately measures industry price trends.

Using this new method allows the PPI to capture price trends from all levels of pricing (published and unpublished) and all distribution channels. The new methodology would allow us to capture price changes due to a shift in the mix of distribution channels, web based fares or deep discount fares, infrequent fare sales, the substitution of fare codes over time, and zero fares (frequent flier mile tickets) that our current methodology does not allow.

This does not mean that the average revenue per passenger approach is perfect. In particular, will the service be consistent enough through time so that the average revenue per passenger going forward will be comparable? In order to get to a unique service and compare the average through time, the main service characteristics will be controlled for. These include:

- Region (domestic or international)
- Market (O&D)
- Cabin class (first or coach)

The average revenue per passenger collected will be for a given O&D and will be for either coach or first class passengers. Thus, the O&D and cabin class will be held constant. In addition, each market will either be classified as domestic or international, which will control for this variable. These controls should ensure comparability of data through time.

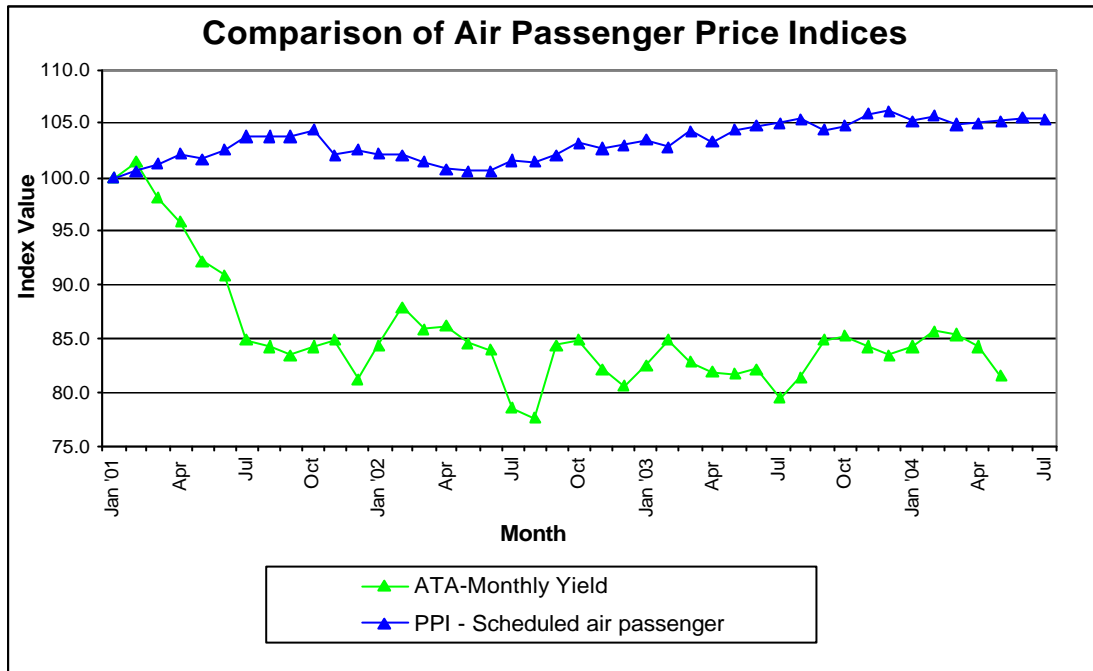
The major airlines have complex data systems. This presents a problem that involves both data timeliness and accuracy. In general, data at these airlines can be classified into two distinct types, referred to as "purchased tickets" data versus "actual flown" data. The "purchased tickets" data refers to passenger data that includes all passengers that are expected to travel for the given time period, whereas "actual flown" data represents the actual or finalized travel data. This is due to an airlines' data system where it takes time for all data to be closed out and counted, thus representing final numbers. The "purchased tickets" data includes some noise, but is available in a timely manner. The "actual flown" data is accurate, but lagged. An example of "noise" that is included in the

“purchased tickets” data is what is known as 'churn', which refers to cancel and rebooks (appears twice in the data). Through time this may become less of an issue as airlines develop methods to get cleaner data in a timely manner. The availability and timeliness of the data will be evaluated on a case by case basis because systems and capabilities vary by establishment.

It is believed that this new methodology will be a vast improvement over the current approach. It addresses most of the issues regarding the current PPI for airlines. The benefits (e.g. capturing prices from all distribution channels, inclusion of zero fares) of using average revenue per passenger far outweigh any negatives (e.g. comparability of average through time) that may exist. In fact, some of the issues that exist with the new methodology also exist in the current methodology (e.g. new entrants). We may be able to add companies to our index over time using an augmented sampling technique, but that will have to be the next iteration of the improvements to the airline index.

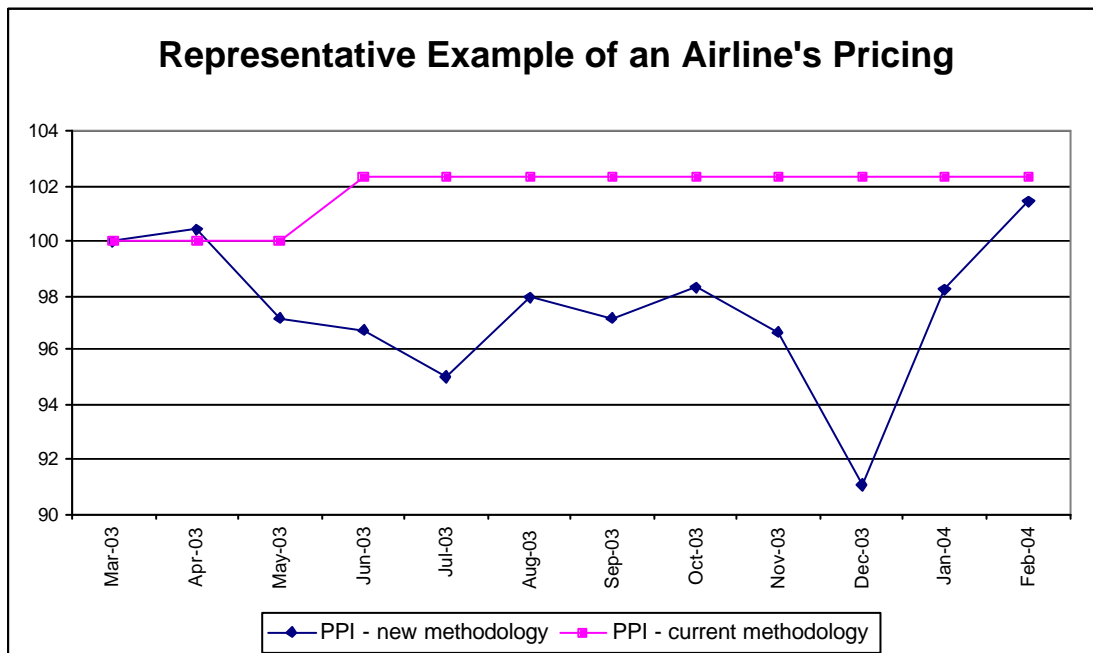
Below is a graph of the price movement for the PPI and ATA airline indexes (Graph 1). Since January 2001, the PPI has shown about five percent inflation. However, the PPI is approximately 28 percent higher than the ATA index. The other graph (Graph 2) is an example of an airline's pricing using the current methodology versus the new proposed methodology. This graph is an illustration of the shortcomings of the current PPI method of pricing.

GRAPH 1



Note: The ATA index aggregates monthly data reported by eight major U.S. airlines. Southwest is not included among their eight airlines. The results are based on 100 percent of scheduled service for the eight included carriers and reflect actual--full-fare, reduced-fare, and ze ro-fare prices (excluding taxes). Total revenue from paying passengers is divided by revenue passenger miles (RPM). This ratio is referred to as passenger yield. Their results are not adjusted for changes in average stage/trip length.

GRAPH 2



Note: This is an example of one airline's pricing using the new versus old PPI methodology.