THE U.S. PRODUCER PRICE INDEX FOR COURIERS (NAICS 492110)

Paul A. Stark*

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I. Abstract

Some of the challenges involved in creating and maintaining price indexes for couriers include reporter burden issues and dynamic industry pricing methods. This paper will discuss how economists at the U.S. Bureau of Labor Statistics have learned to manage these challenges in maintaining a continuous price index for couriers.

II. Introduction

This paper builds upon several previously written papers by economists at the U.S. Bureau of Labor Statistics. The following pages contain a detailed recount of the United States couriers industry. Topics of discussion include (1) output definition, (2) types of services, (3) sample design, (4) publication structure, (5) pricing methodology, (6) technical concerns, (7) analysis of time series data, and (8) changes in the industry.

Publishing price indexes for couriers involves several unique challenges. One of these challenges is defining the output as industry practices evolve. For example, extensive industry research revealed that time sensitivity is now the major factor in defining courier output. Another challenge in publishing price indexes for couriers is determining how to handle evolving price determining variables. With the most recent resampling, it became apparent that certain price determining variables had become more defined and other price variables had gained importance. Finally, maintaining a quality index in the face of heavy industry concentration in the courier industry must be addressed. Due to significant barriers to entry and economies of scale, this industry is composed of a small number of industry leaders and a large number of secondary players (many at the regional rather than national level). As a result, securing cooperation is imperative and item allocations must be adjusted accordingly. This paper will elaborate on these and other issues.

III. Definition of Industry Output/Types of Services

A. Definition of industry outputs

The primary output of the couriers industry is the facilitation of courier delivery services of parcels by means of air transportation, ground transportation, or a combination of the two. Establishments in the courier industry provide intercity and/ or local delivery of parcels. Parcels can be described as those that may be handled by one person without using special equipment. The restriction to small parcels partly distinguishes these establishments from those in the transportation industries. Couriers operate delivery services between metropolitan areas or urban centers, while the outputs of providers whose delivery scope are limited to a single metropolitan area are considered primary to Local messengers and local delivery, NAICS 492210. Couriers include establishments that perform intercity transportation as well as establishments that, under contract to them, perform local pickup and delivery.

The most important price determining characteristic of couriers is the time it takes for a package to be delivered to the recipient. The courier customer does not care what modes

of transportation are used, only that the package gets to its recipient in the allotted time. For example, an air shipment will almost certainly involve ground transportation at some point during the delivery process while a ground shipment may very well complete part of its route on an airplane. The PPI code 4921101, Standard courier services is equivalent to what the industry calls "ground" while the PPI code 4921102, Expedited courier services is equivalent to what the industry calls "air."

An important distinction is that providers must be able to provide end-to-end transportation, from origin to destination including local pickup (e.g. drop box, customer counter) and delivery. Local pickup and delivery is what distinguishes couriers from other industries such as NAICS 481112, Scheduled freight air transportation. In addition, providers must be capable of doing this in a time sensitive manner to qualify as couriers.

B. Types of services

The output of this industry can be further defined by the specific types of courier service provided. The major service lines are 4921101, Standard courier services (equivalent to what the industry calls "ground") and 4921102, Expedited courier services (equivalent to what the industry calls "air"). Expedited courier services include a domestic component (492110201) and international component (492110202) and can be further divided into the following lines of service, although the BLS does not publish indexes at these levels:

Air: Next day
Air: Second day
Air: Third day or later

Expedited courier services are the more time sensitive (and higher priced) delivery option while standard courier services are the slower (and lower priced) delivery option. Standard courier services will normally not contain any air component, and cannot be further divided into additional services or levels of priority. This is the case since couriers generally only offer a single ground option.

The PPI's Courier index conforms to the product groups developed under the North American Product Classification System (NAPCS). The NAPCS product groups, like the U.S. PPI, highlight the time sensitivity nature of the industry and include different product groups for domestic and international courier services. However, the NAPCS structure is more extensive than that published by the PPI.

IV. Business Model

A. Industry organization

The 2002 U.S. Census identified 7,485 establishments primary to the couriers industry. While comparatively small establishments make up the bulk of the industry by volume, revenue data tells a very different story. According to the 2002 Census, the top four establishments in this industry account for 91.4% of all revenue. In truth, this industry

has only two real players; one dominates air delivery and one dominates ground delivery (a third player recently increased in size significantly through a merger, yet still commands a very small market share).

The largest courier providers make extensive use of the hub-and-spoke system for both ground and air shipments. This system is based upon the structure of a spoked wheel. At the center is the "hub", a huge sorting facility through which all packages must pass. From the hub radiates "spokes" which are routes connecting the local/ regional sorting facilities. For larger companies, there are multiple hubs.

The huge capital investment required for a hub-and-spoke courier network restricts new entry. At the same time, a hub-and-spoke courier network gives the owner a huge economic advantage over the competition. The result is smaller establishments can never hope to compete directly with the dominate players on a national and international level, but have found their niche in providing specialized services, regional transport and contract work for the dominate players. Thus, the level of concentration in this industry is not surprising.

B. Identification of operating units

According to the 2002 U.S. Census, there are 7,485 establishments employing 523,018 individuals. These numbers are inclusive of profit maximizing centers and the hubs and regional facilities which operate under them. Industry groups Air Courier Conference of America (ACCA) and the Messenger Courier Association of the Americas (MCAA) were unable to verify these numbers as these groups are not organized in a way which corresponds with the Census definitions.

C. Government regulation

The way in which the two major players in this industry are regulated by the government is very different. Most employees of the pioneer and dominant provider of ground courier services are regulated by the National Labor Relations Act (traditionally governing labor relations in manufacturing, but also trucking and most other US industries). Covered employees are permitted to stage strikes and form unions with few barriers. In contrast, most employees of the pioneer and dominant provider of air courier services are covered by the Railway Labor Act (governing labor disputes for railroads and airlines) which makes staging strikes and forming unions extremely difficult. This distinction is starting to blur as each establishment makes headway in the sector traditionally dominated by the other. Regardless, these regulations in combination with other factors (e.g., a more nimble company structure) have allowed the comparatively much smaller dominant air provider to gain larger market share.

D. Public ownership/government subsidization

Providers in this industry are not directly owned or subsidized by the government. However, the relationship the largest and closest competing industry has with the

government does play an important role in this industry. The U.S. Postal service (USPS) provides services that strongly resemble “express” services provided by the courier industry. It has been argued by the couriers industry that the legal monopoly maintained by the USPS on first class mail delivery allows the USPS to charge below market rates on express delivery, thus depressing overall courier market prices. If this is true, then the relationship the USPS maintains with the government directly influences the bottom line of courier providers in a negative way.

V. Sample Design

A. Sample frames

The U.S. Business Registry is not compiled by the BLS, therefore the BLS does not have access to this data. The BLS Longitudal Database was used as the frame for this industry, with employment as the size variable. No known alternative frame exists. While the Air Courier Conference of America (ACCA) and the Messenger Courier Association of the Americas (MCAA) maintain membership lists, these list are neither comprehensive of the entire industry nor limited to the Census defined courier industry. The current sample is implicitly stratified by employment.

B. Identifying the sample unit

Sample units represent a single profit maximizing center. A profit maximizing center is the unit of a company within which prices are formed, products are marketed, and records are kept. These economic units may be single establishments or “clusters,” that is, more than one establishment. Units operating under a single profit maximizing center were combined into one unit. For example, if an establishment had numerous regional facilities (e.g. “hubs” in the hub-and-spoke system), these were combined to form a single sample unit.

Item allocation was done based on the size of an establishment, with employment as the size variable. However, the quantity of items the BLS could allocate to the larger establishments was limited by industry concentration and reporter burden issues.

C. Reporter burden issues

Due to the high level of concentration in this industry, significant reporter burden is an issue. This is the case during initiation, when establishment data is recorded and items are selected, as well as throughout the course of repricing. In general, less cooperative reporters have been willing to accept demands on their time at initiation in exchange for a reduction in repricing burden. This was accomplished through repricing less frequently (although monthly repricing is still the norm), the use of price calculators in lieu of sending forms to reporters (currently only used for one courier establishment), or some combination of the two. Price calculators are accessed by BLS analysts through specific company websites. This is generally done on the repricing date. Price determining variables such as origin and destination are entered, and from this a price for a service is

generated. The PPI rarely uses secondary source data. As is the case for one of the largest reporters in this industry, when secondary source data are used, periodic validations are done with respondents.

VI. Industry Recordkeeping Practices

A. Data availability

Pricing data can be obtained through each establishment's respective corporate headquarters. In addition, establishments must submit quarterly revenue reports with the U.S. Securities and Exchange Commission (SEC).

B. Composite goods and bundling of services

Both the air and ground portions of services in this industry are repriced as one transaction, thus measuring the entire service. In addition, pickup, transport and drop off are included in the transaction price. These individual services can not be separated out. While bundling occurs in this industry it does not create repricing difficulty as the service components can not be separated out and are thus repriced as a single service.

VII. Publication Structure and Relationship to CPC

A. Publication structure

This industry was recently converted from the Standard Industrial Classification System (SIC) to the North American Industry Classification System (NAICS). Under SIC, the air and ground components of this industry were published separately. The respective SIC publication structures are as follows:

4513 Air courier services
4513P Primary services
45132 Domestic air courier services
45133 International air courier services
4513SM Other receipts

4215 Courier services, except by air
4215P Primary services
42151 Local courier services
42152 Hub and spoke, intercity courier services
4215SM Other receipts

Under the NAICS conversion, Local courier services 42151 broke off to become the separate industry NAICS 492210, Local messengers and local delivery. Each of the remaining components is represented in the publication structure from the most recent industry resampling under NAICS. All ground services fall under Standard courier services while all air services fall under Expedited courier services, which is further

divided into Domestic expedited courier services and International expedited courier services. This is illustrated below:

492110 Couriers
492110P Primary services
4921101 Standard courier services
4921102 Expedited courier services
492110201 Domestic expedited courier services
492110202 International expedited courier services
492110SM Other receipts

B. Why the structure was chosen

Due to concentration in this industry, the BLS would be unable to maintain a more detailed publication structure while still maintaining confidentiality and an acceptable level of reporter burden. In addition, no weights were available either from the U.S. Census or other sources to support additional publication detail. The chosen structure reflects the major lines of service provided by companies in this industry. It also closely matches the categorization used by companies to report revenue and other financial data.

C. Relationship of the structure to the ISIC & CPC

The publication structure for Couriers directly corresponds to ISIC Rev. 3 code 6412, Courier activities other than national postal service. In addition, the publication structure for Couriers corresponds to the Central Product Classification (CPC) Ver.1.0 Group 7512.

7512 - Courier services

VIII. Pricing Methodology

A. Methodology chosen

Factors that serve to determine the price include; (1), the origin, (2), the destination, (3), the weight of a package, (4), a package's dimensions, (5), the level of priority and time of day delivered and (6) special handling. Thus, any pricing methodology must be able to take into account these factors. Prices in this industry consist of base rates plus any adjustments, most notably fuel surcharges, delivery area surcharges and pickup charges (pickup charges apply to how a package gets to a carrier, while delivery area surcharges apply to a package's destination). Other price variables (such as whether a package is going to a business or a residence, and if a purchase is billed to a business account or not) are normally bundled into the base rate.

Thus, the price can be expressed as:

Price = Base rate + fuel surcharge + other applicable surcharges (e.g. delivery area)

The BLS uses company-provided service line turnover data to statistically sample a company's output and select representative services and then reprices these services over time. This is the standard practice of disaggregation in the U.S. PPI. Net prices are collected, which include all discounts and surcharges. The BLS also makes an attempt to collect a proportional number of items which are "on contract", meaning a courier provider has negotiated lower rates with an establishment in exchange for a specified volume of business. As is the case in many other industries, these "negotiated" rates are held confidential by the couriers and are, often times, more difficult to obtain than non-contract delivery rates.

B. Alternative methodologies

An alternative methodology would be to collect average prices.

C. Limitations in chosen methodology

One of the limitations in the chosen methodology is that an extremely large number of transactions take place in this industry, while the item allocation is comparatively small. This is the case since concentration levels are high in this industry, and major providers account for the bulk of transactions. Expecting major service providers to reprice a quantity of items proportional to these transactions would create unreasonable reporter burden and jeopardize cooperation. Due to concentration, securing cooperation is imperative and item allocations must be adjusted accordingly.

IX. Technical Concerns

A. Quality adjustment

The services provided by couriers tend to be well defined. In order to determine a price for a service, providers need (at the minimum) an origin and destination, and defining size characteristics of a package. It is unlikely that delivery to an origin or destination will be discontinued, or that a courier will stop delivering a specific type of package. However, these characteristics may become further defined over time. If these changes take place, there are several ways the BLS is equipped to deal with them. First, we could substitute to a more specific service (e.g. a more detailed zip code). Secondly, we could use a weighted average when we substitute. This latter option is more theoretical and more difficult to perform. However, quality adjustment is not an issue in this industry as items can generally be directly compared when they are replaced.

B. New item bias

Services in this industry are generally well defined and change little over long periods of time. Thus, the services themselves remain representative over time. However, bias can exist in that the way establishments price services tends to change over time. Providers are becoming more proficient at segmenting the market based on costs and efficiencies.

Over the course of a sample that lasts approximately seven years, several pricing variables have become more defined and several new pricing variables have developed.

For example, how a package gets to a provider has gained increased importance. While in past samples there was no need to take into account how a package got to a provider, today there are a variety of options. For example, a buyer might opt to use a customer counter (a courier company storefront), a retail location (non-courier company store front), an authorized drop off location/ drop box, or arrange for the provider to pick up the package. Depending on which means a buyer selects the price can vary notably. This change was mostly brought about by an increased reliance on non-company store fronts, establishments which are able to accept shipments on behalf of a courier but are not the actual provider of the courier service.[1]

In addition to the above, the way a buyer communicates their intention to ship a package can produce different prices. Doing so by phone can carry a higher overall price than doing so over the internet, even when the service is otherwise identical. Providers may also discriminate by whether a package is going to a business or a residence, and if a purchase is billed to a business account or not. Shipments of packages going to business vs. residential address normally cost more, while shipments billed to account vs. off account normally cost less. To deal with new industry developments, the BLS selects substitutions throughout the life of a sample, so that item bias is not created when new items are added to a sample.

C. Impact of customization on the pricing methodology

The couriers industry has traditionally made most of its revenue by delivering a high volume of packages at reasonable rates, rather than from custom services. However, custom services are offered. Custom services would include packages that are extra heavy, oversized, or contain hazardous materials. Also, packages that require special handling due to high valued contents, are extremely time sensitivity, or need to be delivered outside of normal operating hours are considered custom in nature. Due to their limited revenue/ turnover, these items are generally not selected during sampling. In the event they are selected, we can reprice using hypothetical transactions in future months. A hypothetical transaction is when a respondent is asked to estimate what would have been charged, had a transaction reoccurred. When hypothetical transactions are used pricing variables from the original transaction are generally "fixed."

X. Survey Vehicles

A. Methods used to secure cooperation and survey data

[1] Some establishments have since acquired these entities, but they are not considered Couriers as this is not their primary function.

Field economists from the BLS regional offices obtain cooperation through personal visits to sampled courier companies. Using probability sampling techniques, field economists sample a company's output and select unique items for repricing.

B. Methods used to reprice

Once the field economist completes the item sample processing, the selected data is submitted by a designated company official via a mail or fax survey. Repricing is normally done on a monthly basis, but may be done less frequently to reduce reporter burden.

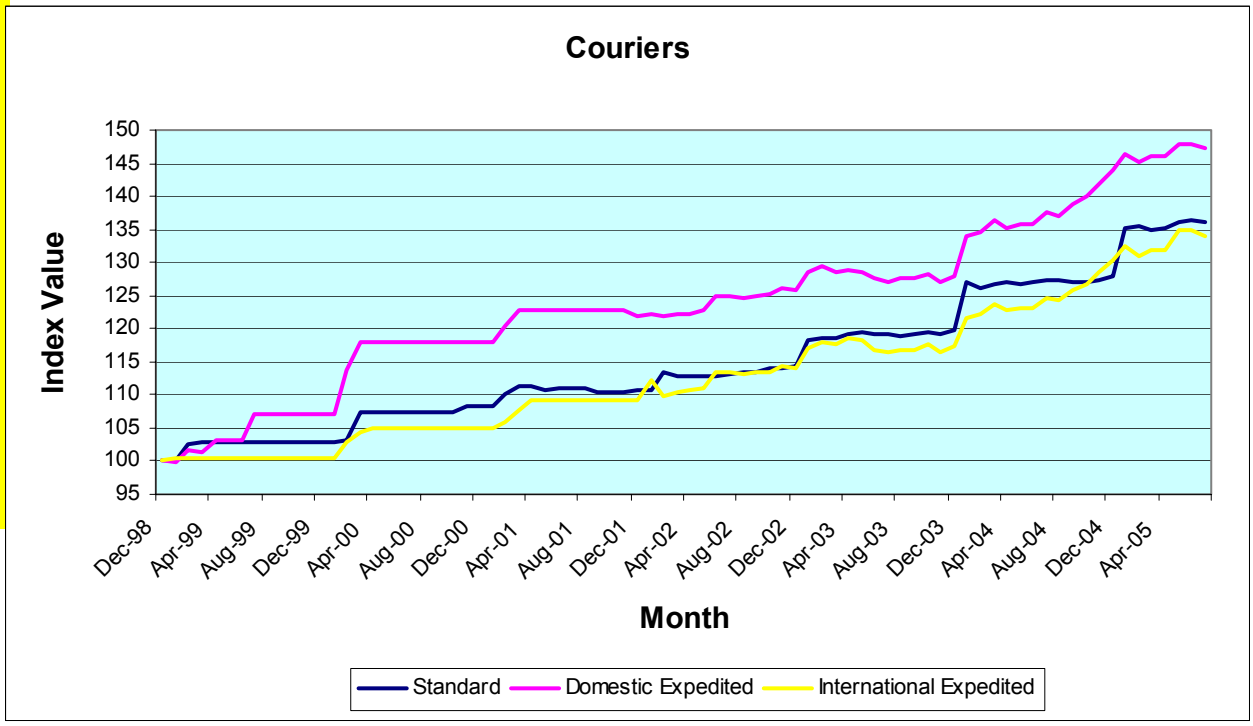
C. Strategies used to secure and maintain data quality

The BLS maintains confidentiality under the trade secret provision, which is exempt from the Freedom of Information laws in the United States. In addition, strict confidentiality guidelines are followed by the PPI economists who review the data.

The PPI economist is able to maintain the quality of the data by investigating any abnormalities that are reported. The economist will contact companies regarding any significant price change or change to the existing service.

XI. Time Series Data and Analysis of Published Indexes

Due to the SIC to NAICS conversion, the time series of NAICS 492110, Couriers is only continuous back to December 2003. However, the lower levels can be compared back to December 1998 and are illustrated below (Standard was rebased in December 1998 for comparison).



Prices in this industry are relatively stable and large increases generally take place only once per year. At the beginning of each year the dominant providers will institute their new rate structures, and the competition will closely mimic these changes. These price changes are evident in the "steps" of the above graph, while movement in between the yearly price updates are generally attributed to fluctuating fuel surcharges.

Because fuel is a major input for this industry, record high fuel prices have been a big concern for this industry of late. Fuel surcharges are tied to price indexes produced by the U.S. Department of Energy (DOE) and fuel surcharges on air shipments tend to be considerably higher than on ground shipments. Because providers have set a much greater range of fuel surcharges based on fuel costs for air shipments than ground shipments, the variance in fuel surcharges on air shipments is much greater than on ground shipments. This may relate to the different types of fuel used. The flatness of the ground index compared to the two air indices in 2004 is attributed to the fact that the major providers briefly experimented with removing the ground fuel surcharge (while keeping a fuel surcharge on air shipments), which they then reversed in 2005.[2]

XII. Evaluating Changes in the Industry

Consolidation is a factor in this industry. It is not unusual for smaller providers to merge in order to be more competitive. At the same time, the largest service providers have also seen some notable consolidation. The pioneer and dominant provider of air courier services acquired a large ground unit several years ago in order to compete in that segment of the market. Most recently, a very distant third place player was acquired by a branch of a large international institution in order to better compete in the U.S. market.

XIII. Conclusion

In conclusion, this paper demonstrates that the chosen methodology accurately reflects the conceptual model of couriers. In order to accomplish this level of index quality it is necessary for economists to follow index maintenance procedures and practice directed substitution when changes in industry pricing practices dictate. In doing so, end users (e.g. the BLS Office of Productivity and Technology, which is releasing productivity analysis related to the courier industry in the fall of 2005) and the general public can be assured they are using quality data.

[2] Index values for March –June 2005 are subject to revision