

Impacts of CBD Fare-Free Transit on Retail Sales

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Results of an analysis of changes in central business district (CBD) retail sales associated with the implementation of fare-free transit service in downtown Albany, New York, are presented. The analysis reported here was performed in conjunction with a broader evaluation effort under the Urban Mass Transportation Administration's Service and Methods Demonstration Program. In addition to examining changes in aggregate CBD retail sales, changes in sales by type of retail establishment and location relative to major bus lines were also considered. Results are based on a time-series analysis of retail sales tax receipts provided by the New York State Department of Taxation and Finance for a panel of 115 CBD retail establishments. In addition, total retail sales tax receipts for Albany County were used as a control for the CBD panel. The analysis results suggest that CBD fare-free service has had a positive impact on sales among downtown merchants, primarily during first quarters (December 1 through February 28), which correspond to holiday shopping seasons, and among miscellaneous sales establishments (i.e., specialty and gift shops). Also, retail establishments located in close proximity to major bus routes appear to have benefited most from the implementation of fare-free service.

Over the past decade a number of urban area transit operators have instituted programs involving some form of fare reduction on an experimental or, in some instances, permanent basis. One of the more popular variations of such programs has been the elimination of fares within the central business district (CBD), usually only during off-peak hours. Although this particular form of fare reduction has been implemented to serve a wide range of objectives, the focus of many such projects has been revitalization of the downtown area. For example, as a result of improved accessibility within the CBD brought about by the elimination of fares, downtown employees may find it more convenient to accomplish many of their shopping needs by patronizing downtown merchants. Similarly, for people already shopping in the CBD, the improved accessibility between various downtown retail opportunities could make it more convenient to do even more of their shopping within the CBD. This potential increase in retail activity could spark the revitalization of an otherwise declining retail core.

This paper presents results of an analysis of changes in retail sales associated with the implementation of a CBD fare-free zone in Albany, New York. The analysis, which is based on sales tax receipt data provided by the New York State Department of Taxation and Finance, addresses the following specific questions related to changes in retail sales:

1. Aggregate retail sales--To what extent does fare-free service lead to increased retail sales within the CBD?
2. Type of retail establishment--Are increases in sales uniform across all types of establishments within the CBD, or are increases greater for some retail activities than for others (e.g., restaurants versus clothing stores)?
3. Proximity to bus service--For a given type of retail activity, are increases in sales realized by all establishments within the fare-free zone, or are increases at those establishments located near major bus routes accompanied by decreases (or smaller increases) at more distantly located establishments?

BACKGROUND

In November 1978, the Capital District Transportation Authority (CDTA), in cooperation with the Urban Mass Transportation Administration (UMTA), estab-

lished a fare-free zone in downtown Albany, New York, as part of UMTA's Service and Methods Demonstration (SMD) Program. This project eliminated fares for trips within the 0.67-mile² fare-free zone during off-peak hours (9:00 a.m.-3:00 p.m.) during the week and from 9:00 a.m. to 5:00 p.m. on Saturdays.

The fare-free zone contains most of the downtown's retail activity, the Empire State Plaza (the state capital office complex), several large private office complexes, and residential neighborhoods. About 35 000 employees work in the fare-free zone, of whom approximately 21 000 are government employees. Population within the zone is about 8000, with an additional 4500 people residing within one block of the fare-free zone boundaries.

Retail activity within the Albany CBD had declined steadily during the decade prior to the implementation of fare-free service. In 1967, for example, there were a total of 284 retail establishments located in downtown Albany. In 1972, this number had decreased to 198; in 1977, only 133 retail establishments remained in the CBD. As shown in Figure 1, total retail sales in the CBD dropped by a factor of 3 between 1967 and 1977 in terms of constant 1967 dollars, while over the same period total standard metropolitan statistical area (SMSA) sales increased by 20 percent. As a percentage of total SMSA sales, CBD sales declined from 4.2 to 1.1 percent between 1967 and 1977.

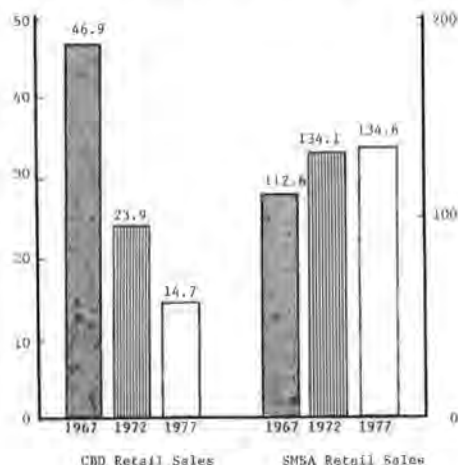
In addition to changes in the number of establishments, changes in the character of retail activity within the CBD have also occurred. In 1967, for example, two major department stores, four home furnishing stores, and eight appliance stores were located in downtown Albany. In 1977, both department stores, all four home furnishing stores, and all but two appliance stores had left the CBD. In contrast, although the number of eating places decreased in absolute terms from 69 to 45, the proportion of all retail establishments categorized as eating places increased by nearly 40 percent (i.e., from 24.3 to 33.8 percent) between 1967 and 1977. These shifts in the types of establishments forming the downtown retail core are evidence of a transformation of the CBD from a regional shopping area to one more oriented toward serving the increasing employee population located in the downtown area.

POTENTIAL CHANGES IN PURCHASE PATTERNS

There is little question that the elimination of fares in downtown Albany has increased accessibility within the CBD. After fare-free service was implemented, transit ridership within the downtown area tripled. Although this increase was attributable primarily to shifts in mode, average trip lengths were greater after fares were eliminated, indicating that changes in destination choice had occurred as well. However, while accessibility within the downtown area has been increased, the relation between this increased accessibility and increased retail activity is not totally understood.

In developing an understanding of this relation, it is probably best first to explore what changes in individual purchase patterns are likely to occur as a result of CBD fare-free service that would lead to increases in retail sales. In general, any increase

Figure 1. Albany CBD versus SMSA retail sales.



in sales among CBD retail establishments would be the result of either an increase in the total amount of purchases made by those individuals able to take advantage of fare-free service, or a diversion of purchases formerly made at retail establishments located outside the downtown area.

With respect to the former, substantial increases in total purchases would occur only if accompanied by corresponding increases in purchasing power. Since the increase in purchasing power of individuals in the downtown area as a result of the elimination of fares within the CBD, for all practical purposes, is negligible, an increase in total purchases, particularly for large-purchase items, would not be expected to be the primary mechanism by which CBD retail sales are increased. However, to the extent that the improved accessibility resulting from fare-free service exposes a greater number of people to more retail opportunities, one might expect an increase in impulse buying of small purchase items. In addition, the elimination of fares (or the need to pay for parking in those instances where an automobile was formerly used) could be considered as a reduction in purchase price, which in turn could lead to an increase in total purchase expenditures for small-purchase items and dining out for lunch.

However, while some increase in both sales of small purchase items and restaurant receipts may be the result of an increase in total purchases, any increase in the sales of more-costly items (e.g., clothing, appliances, etc.) would almost certainly be the result of the diversion of purchases from areas outside the CBD. The incidence of this redistribution of purchases would to some degree depend on the extent to which the increased accessibility within the CBD makes it more convenient to shop in the downtown area relative to other retail areas. For example, CBD employees may find it much easier to accomplish their shopping needs during their lunch hour rather than stopping off on their way home from work or making an additional trip either in the evening or during the weekend. Since much of their shopping was probably already done in the CBD prior to fare-free service, little diversion of purchases for downtown residents would be expected.

ANALYSIS APPROACH

The impact of fare-free service on retail sales in the Albany CBD was examined primarily by using retail sales tax receipts provided by the New York

State Department of Taxation and Finance (NYSSTF). The basic approach involved a time-series analysis of quarterly sales tax receipts over a 15-quarter period (from December 1976 through August 1980) for a panel of CBD retail establishments that were in business throughout the 15-quarter period. Quarterly sales tax receipts for all retail establishments in Albany County during the same period were also used in the analysis in an attempt to provide a control for exogenous economic factors in the region that could also influence retail sales.

The Albany CBD panel consisted of 115 retail establishments organized into the following seven groups based on type of sales:

1. Full-service restaurants,
2. Other restaurants,
3. Apparel,
4. Furniture and appliances,
5. Food stores,
6. Services (e.g., travel agencies, cleaners, tailors, etc.), and
7. Miscellaneous sales (e.g., sporting goods, books, hardware, gifts, liquor, etc.).

For three of these groups (i.e., other restaurants, apparel, and miscellaneous sales), establishments were further categorized by their proximity to bus service. Two categories were used: (a) near--defined as being located within one block of the Washington Avenue-State Street bus routes; and (b) far--defined as being located beyond one block of these bus routes. The number of establishments included in each category is shown in Table 1.

In establishing whether fare-free service has had an impact on CBD retail sales, the preferred analysis approach would involve some formal, statistical trend-analysis technique. For this study, however, the number of observations available (i.e., aggregate retail sales tax receipts for 15 quarters) was not sufficient to estimate a regression equation. Instead, reliance was placed on informal judgment about whether patterns in the data suggested that a change in retail sales had occurred as a result of fare-free service. Although this approach lacks the rigor of a formal statistical estimation procedure, it can provide valuable insights into the relation between the improved accessibility brought about by CBD fare-free service and increased retail activity.

The analysis approach, then, is essentially based on comparisons of trends in retail sales of the panel of CBD retail establishments with those observed countywide. Two points should be noted with respect to the use of this approach for assessing the impacts of CBD fare-free service on total CBD retail sales.

First, by restricting the analysis to a panel of retail establishments remaining in business over the 15-quarter period for which retail sales tax data were available, the opening or closing of other retail establishments within the CBD is not accounted for. This has two implications. First, results of the analysis will not necessarily represent the overall impact on total CBD sales resulting from fare-free service. For example, if results indicate that sales among establishments comprising the CBD panel remain unchanged as a result of fare-free service, total CBD sales still could have increased as the result of an increase in the number of retail establishments located in the CBD.

In addition, trends in retail sales observed for the CBD panel could be influenced by changes in the total number of establishments located in the CBD. For example, while a decrease in sales for a given retail category in the CBD panel could indicate an overall drop in retail activity within the CBD for

Table 1. Composition of CBD panel.

Type of Retail Establishment	Proximity to Bus Line		Total Establishments
	Near	Far	
Full-service restaurant	-	-	15
Other restaurant	12	8	20
Apparel	5	14	19
Furniture and appliances	-	-	7
Food store	-	-	12
Service	-	-	15
Miscellaneous sales	10	17	27
Total	27	39	115

that category, it could also reflect increased competition arising from a greater number of establishments in that category located within the CBD. For example, in such a situation it is conceivable that although reduced sales at individual retail establishments are observed, aggregate sales would actually increase because of the greater number of establishments.

Another concern is related to the suitability of countywide sales as a control in view of differences in the mix of aggregate retail sales between Albany County and the CBD panel. For example, the CBD panel had a much higher proportion of sales associated with apparel and eating and drinking establishments, while Albany County as a whole had a much higher proportion of automobile and food sales.

If the distributions of retail sales by type for the CBD panel and Albany County were similar, one could argue that sales in each group would be similarly affected by exogenous economic factors. Under these somewhat ideal conditions, the use of countywide sales tax receipts as a control for those observed for the CBD panel would be quite reasonable. Because these distributions of retail sales by type are different, consideration should be given to the differential impacts that changes in economic conditions would have on Albany County versus CBD panel sales. For example, the greater proportion of food sales (i.e., grocery stores, etc.) in Albany County would suggest that countywide sales would be somewhat less sensitive to any changes in economic conditions. Further, the lower proportion of sales by eating and drinking establishments would also suggest that countywide sales would be less sensitive, since these expenditures are likely to be much more discretionary in nature than those for groceries. On the other hand, the higher proportion of automobile sales would tend to make total countywide sales more vulnerable to downturns in the economy because people would tend to retain older cars rather than buy new ones during periods of recession.

Overall, then, it is not clear how the response of total countywide sales would differ from those of the CBD panel. However, to the extent that the responses hypothesized above would tend to cancel each other, the use of aggregate Albany County sales tax receipts as a control for those of the CBD panel is not unreasonable.

RESULTS

Trends in Retail Sales: CBD Panel Versus Albany County

Average quarterly sales tax receipts by year for Albany County and the CBD panel are presented in Table 2. As shown, retail sales in Albany County increased by 2.9 percent in 1978 relative to 1977 and an additional 0.9 percent in 1979. In 1980, sales

fell off markedly to 3.6 percent below their 1977 level. For the CBD panel, too, sales increased in 1978. In this case, the magnitude of this increase in percentage terms (11.5 percent) was nearly three times that observed for Albany County. Sales then increased in 1979 by an additional 0.4 percent and dropped off slightly in 1980. For the CBD panel, 1980 sales were still 9.7 percent greater than in 1977. These results indicate that relative to countywide sales, CBD sales were much more stable in 1980.

Retail Sales by Quarter: CBD Panel Versus Albany County

The relation between Albany County and CBD panel sales on a seasonal basis is presented in Figure 2. As shown, with the exception of first-quarter sales, trends in CBD panel sales are quite similar to those of countywide sales, particularly during the third quarter of each year. However, the trend in first-quarter sales of the CBD panel is quite different from that of Albany County. As shown in Figure 2, first-quarter sales for the CBD panel were declining prior to the implementation of fare-free service and reached their lowest point in the quarter ending February 28, 1978. Once CBD fare-free service was in effect, first-quarter sales increased sharply and reached a level in 1980 that was 25 percent greater than in 1978. Countywide first-quarter sales, on the other hand, increased slightly from 1978 to 1979, and then dropped off in 1980. During the two-year period over which CBD panel first-quarter sales increased by 25 percent (i.e., February 1978 to February 1980), countywide first-quarter sales declined by 5.6 percent.

It should be noted, however, that in the first quarter of 1978 sales had dropped to an extremely low level for certain types of establishments in the CBD panel (i.e., "far" miscellaneous sales establishments and "near" other restaurants). To a certain extent, then, the increase in first-quarter sales observed between 1978 and 1979 for the CBD panel can be attributed to the return to normal sales volumes in subsequent quarters of 1978. Furthermore, first-quarter sales countywide increased slightly between 1978 and 1979. To the extent that Albany County sales serve as an appropriate control, a similar increase would have been expected for the CBD panel.

The increase in CBD panel first-quarter sales between 1979 and 1980 cannot be explained by either a resurgence of CBD sales or a general upturn in retail activity in the Albany region. For both Albany County and the CBD panel, fourth-quarter sales between 1978 and 1979 and second- and third-quarter sales between 1979 and 1980 declined—most likely reflecting a change in economic conditions that had a similar effect on both CBD and countywide retail activity. This effect is also reflected in the decrease in first-quarter sales between 1979 and 1980 for Albany County. For the CBD panel, first-quarter sales increased between 1979 and 1980.

In view of the similarities of the decreases in second-, third-, and fourth-quarter sales tax receipts between the CBD panel and Albany County, a decline in CBD panel first-quarter sales between 1979 and 1980 similar to that observed for countywide sales also would have been expected. For example, first-quarter sales tax receipts in Albany County dropped by 6.2 percent between 1979 and 1980. Had CBD panel sales experienced the same percentage decrease, 1980 first-quarter sales tax receipts (in 1967 dollars) would have been \$203 100. Actual 1980 first-quarter sales tax receipts were \$230 200, which represent a 13.4 percent increase

over what would be expected if CBD sales had followed the same trend as countywide sales. With Albany County's 7 percent sales tax, this \$27 100 difference in sales tax receipts would translate into a \$387 100 difference in gross sales in 1967 dollars. In terms of 1980 dollars, this difference would be \$875 300.

The fact that CBD sales increased during this period suggest that there was some factor unique to the CBD that had a positive impact on first-quarter sales, the time period that includes most of the holiday shopping season (i.e., December). One pos-

sible explanation is that these increased sales were the result of an intense promotional effort on the part of downtown merchants during the holiday shopping season. However, discussions with the head of the downtown merchants' association indicated that this was not the case.

Another possible explanation, although certainly not the only one, is that the impact of CBD fare-free service is most pronounced during the holiday shopping season. During this period, people typically purchase a large number of items (i.e., gifts) in a relatively short period of time. As a result,

Table 2. Average quarterly sales tax receipts by year: Albany County versus CBD panel.

Year	CBD Panel			Albany County		
	Quarterly Sales Tax Receipts ^a (\$)	Change from Previous Year (%)	Change from 1977 (%)	Quarterly Sales Tax Receipts ^a (\$)	Change from Previous Year (%)	Change from 1977 (%)
1977	190 553	-	-	4 744 913	-	-
1978	212 386	+11.5	+11.5	4 882 453	+2.9	+2.9
1979	213 124	+0.4	+11.8	4 925 962	+0.9	+3.8
1980	209 091	-1.9	+9.7	4 574 780	-7.1	-3.6

^aSales tax receipts expressed in constant 1967 dollars.

Figure 2. CBD panel versus Albany County sales tax receipts by quarter.

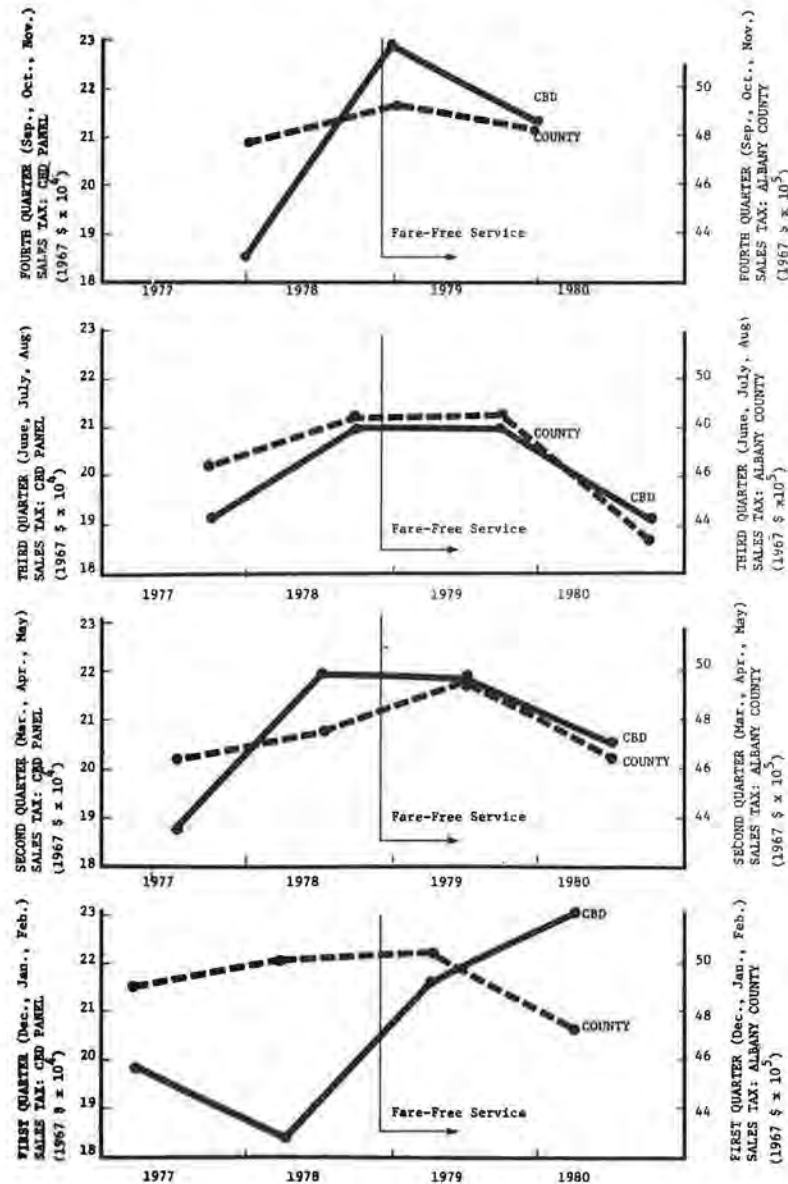
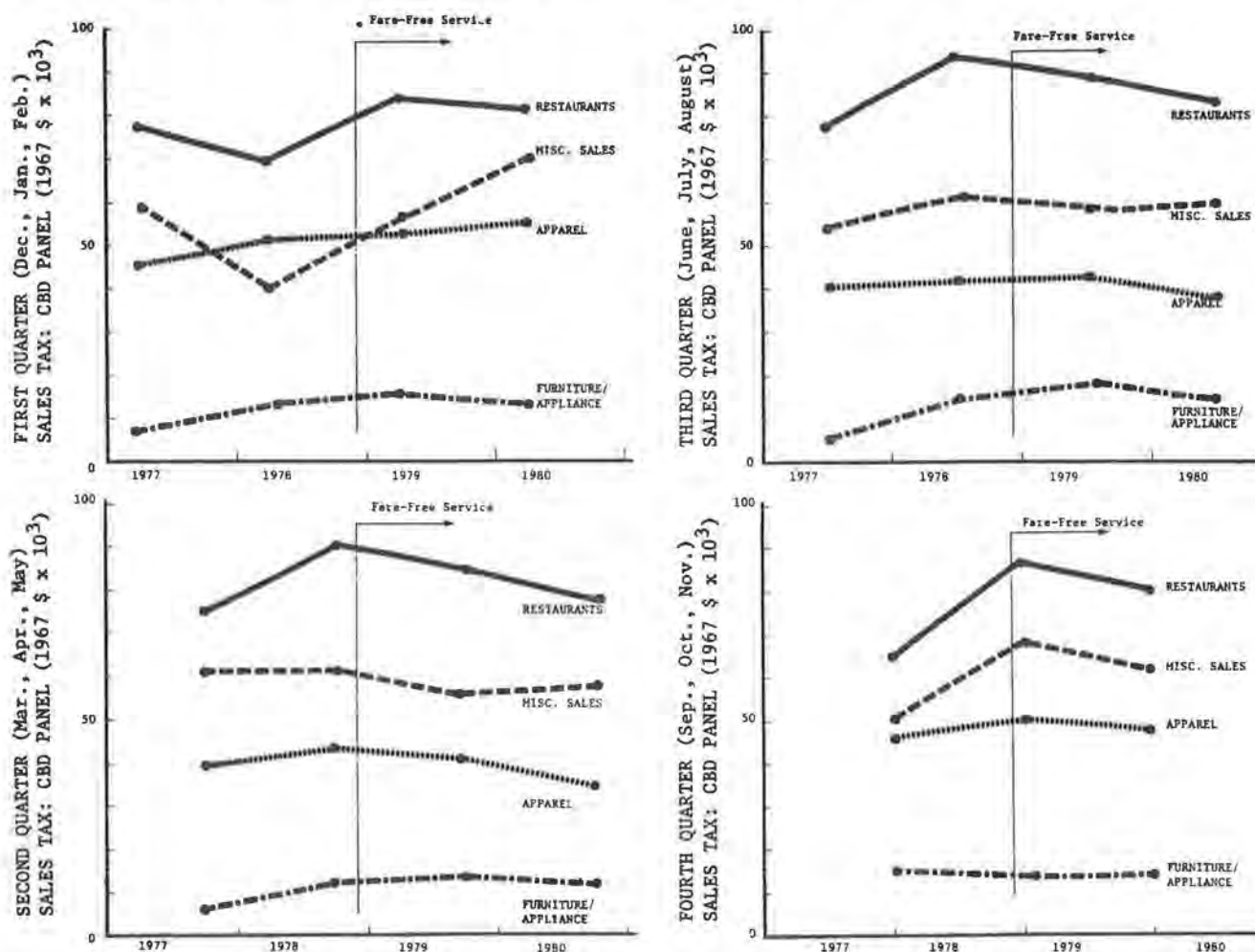


Figure 3. CBD panel sales tax receipts: restaurants, miscellaneous sales, apparel, furniture and appliance.



anything that makes shopping more convenient could have a fairly strong influence on where and when these purchases are made. In this case, for example, the elimination of fares in the CBD may have made downtown employees more inclined to accomplish their holiday shopping needs by patronizing downtown merchants during their lunch hour rather than by contending with crowds at suburban shopping locations during the evenings or on weekends.

To the extent that fare-free service has had an effect on CBD retail sales, these results suggest that the most significant impact occurs in December during the holiday shopping season. This would account for the increase in CBD panel first-quarter sales between 1979 and 1980, and, probably to a lesser extent, the increase in first-quarter sales between 1978 and 1979. Because total expenditures for holiday-related purchases appear to have decreased over this period, as evidenced by the decline in countywide first-quarter sales, these results would further suggest that the increase in CBD retail sales is primarily the result of a diversion of purchases from other shopping locations. In addition, to the extent that CBD residents did much of their shopping in the downtown area prior to the implementation of fare-free service, these increases are most likely attributable to CBD employees and other non-CBD residents in the downtown area during the day.

Type of Retail Establishment

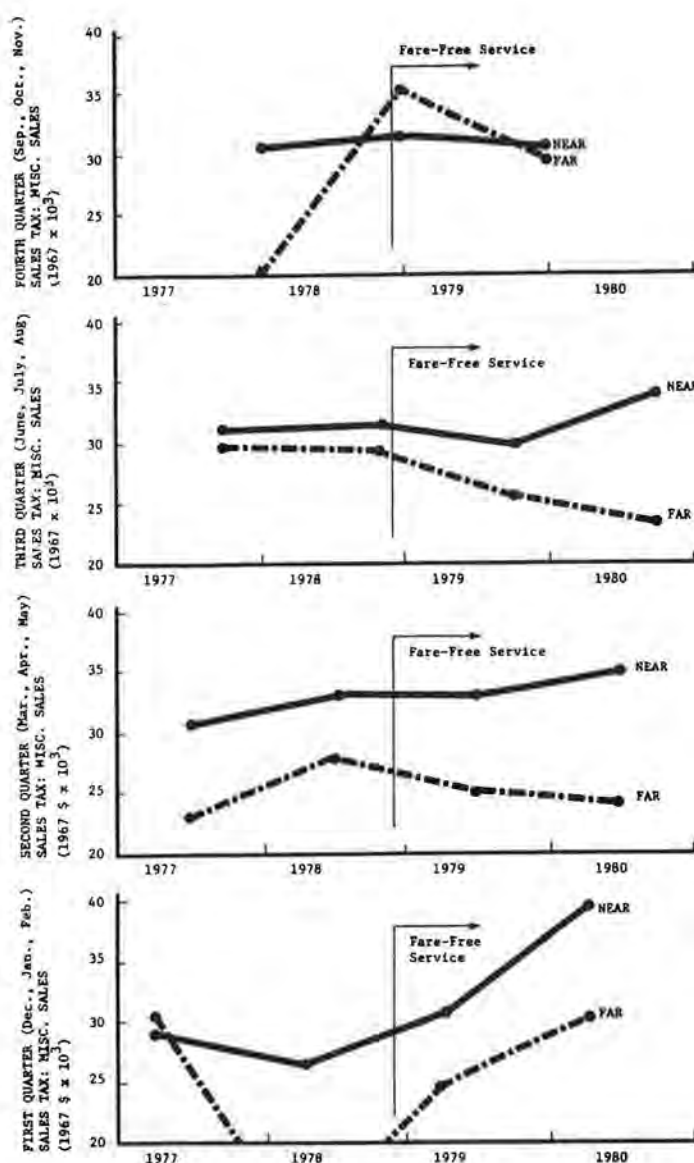
A second issue in the analysis of changes in retail sales is the extent to which these changes vary by type of establishment. This section discusses the distribution of aggregate quarterly sales tax receipts for the CBD panel among miscellaneous sales, apparel, restaurants, and furniture-appliance establishments.

Miscellaneous Sales

Quarterly sales tax receipts from miscellaneous sales establishments are presented in Figure 3. As shown, first-quarter miscellaneous sales have increased dramatically since the implementation of fare-free service. From a low of \$41 000 in 1978, sales tax receipts for these establishments increased to \$70 000 in 1980—a 71 percent increase over this two-year period. This increase accounts for 64 percent of the total increase in first-quarter sales tax receipts observed for the entire CBD panel during this same period. Second- and third-quarter sales tax receipts for miscellaneous sales have remained relatively stable, while fourth-quarter sales increased from 1977 to 1978, and then declined somewhat in 1979.

Overall, then, to the extent that fare-free service has had an effect on retail sales, it would ap-

Figure 4. Retail sales tax receipts versus proximity to bus lines: miscellaneous sales.



pear that miscellaneous sales have benefited most. Further, increased sales are observed only during the first-quarter periods, indicating that this increase is primarily the result of more purchases during the holiday shopping season. Since "miscellaneous sales" represents a wide range of specialty and gift shops, one would expect that the increase in holiday sales for the CBD panel noted earlier would occur to a great extent among establishments in this category.

Apparel

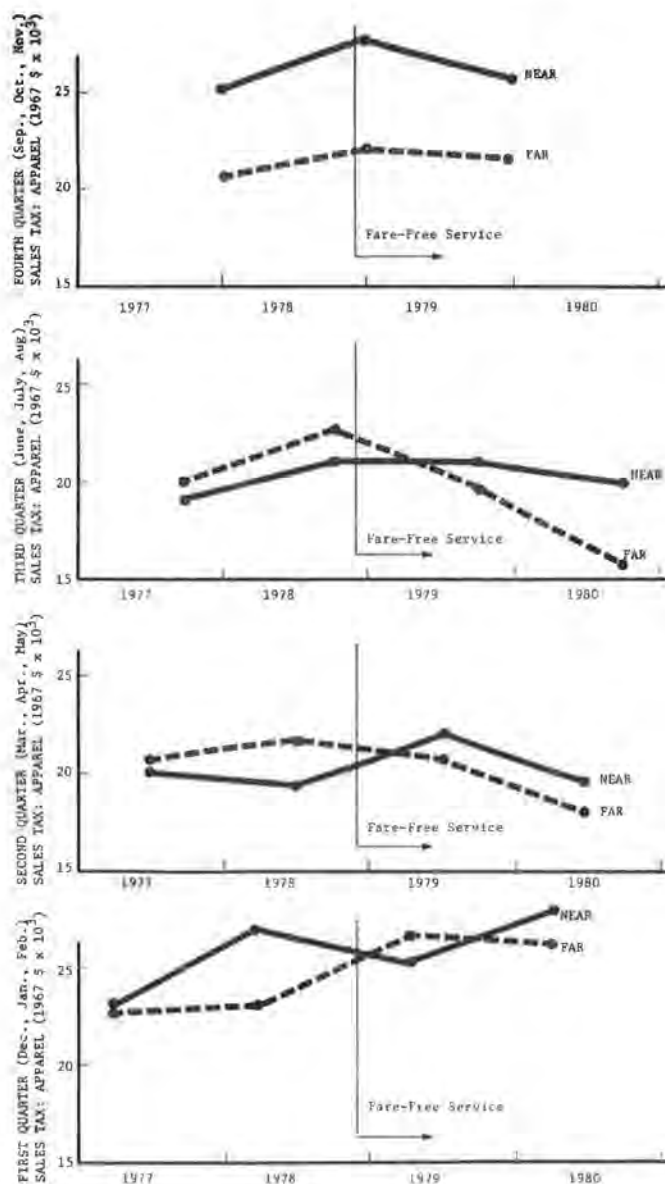
First-quarter tax receipts from apparel sales have increased steadily over the entire 15-quarter analysis period. As shown in Figure 3, first-quarter sales tax receipts increased from about \$46 000 in 1977 to \$54 000 in 1980—an increase of 17 percent. Since this increase occurs both prior to and after implementation of CBD fare-free service, it is not clear to what extent it can be attributed to the demonstration project. Apparel sales in second, third, and fourth quarters appear to have been relatively stable, showing slight decreases in second and third quarters and a slight increase in fourth quarters.

Restaurants

Between 1978 and 1980, first-quarter sales tax receipts from restaurants increased from \$70 000 to \$81 000—an increase of 16 percent. This increase represents 23.9 percent of the total increase in first-quarter retail sales tax receipts observed for the entire CBD panel during this two-year period. It is quite likely that there exists a strong relation between this increase in first-quarter restaurant sales and the similar increase noted earlier for miscellaneous sales. For example, if people have already decided to make a trip within the downtown area for shopping, they may be more inclined to eat lunch out as well.

In looking at the trends in tax receipts in other quarters, it appears that sales for restaurants included in the CBD panel reached a peak in late 1978 and have declined steadily since then. This general decline could indicate a decrease in expenditures for eating and drinking, which tend to be more discretionary, in response to a general downturn of the economy evidenced by the decrease in countywide sales over this period. On the other hand, if the total number of restaurants in the CBD increased during this period, the decline in sales for restau-

Figure 5. Retail sales tax receipts versus proximity to bus lines: apparel.



rants in the CBD panel could reflect increased competition.

Furniture and Appliances

Retail sales tax receipts from furniture and appliance establishments doubled between 1977 and 1978, and have remained relatively stable since. Sales appear to be highest during second quarters, and lowest during third quarters. Given the relative stability of sales from early in 1978 through 1980, it would not appear that fare-free service has had a significant impact on furniture and appliance sales within the CBD.

Proximity to Bus Lines

In addition to comparisons between retail sales tax receipts of Albany County and the CBD panel, further insight into the relation between retail sales and the improved accessibility brought about by CBD fare-free service can be gained by comparing sales among those establishments in the CBD panel located very near bus lines that have frequent service with

those establishments located at a greater distance from these bus lines.

Miscellaneous Sales

The impact of proximity to bus service on miscellaneous sales is presented in Figure 4. In general, these results indicate that retail sales of those establishments located near major bus lines have increased since the implementation of CBD fare-free service, while sales at more-distant establishments have either decreased or increased at a slower rate. For example, as shown in Figure 4, third-quarter retail sales tax receipts from "near" miscellaneous sales establishments were \$1970 greater than those from "far" establishments in 1978, just prior to fare-free service. One year later, this difference had increased to \$4200. In 1980, this difference had further increased to \$10 600. A similar trend is observed for second-quarter sales. Prior to fare-free service in 1978, second-quarter retail sales tax receipts from "near" establishments were \$5100 greater than those from "far" establishments. After fare-free service was implemented, this difference increased to \$8000 in 1979 and to

\$11 000 in 1980. For first-quarter sales, although retail sales tax receipts from "far" establishments increased sharply between 1978 and 1979, the rate of increase between 1979 and 1980 was less than that observed for "near" establishments. As shown in Figure 4, 1979 first-quarter retail sales tax receipts from "near" establishments were \$5700 greater than those from "far" establishments. In 1980, this difference had increased to \$9100.

These trends strongly suggest that establishments located along major bus routes have benefited from fare-free service to a greater extent than other CBD retail establishments. Further, these trends are not restricted to any particular quarter, but appear consistently throughout the year. This would indicate that in addition to the possible diversion of sales from establishments located outside the CBD as a result of fare-free service, there appears to be a redistribution of sales within the CBD as well. These results also provide further evidence of the linkage between fare-free service and increased retail sales.

Apparel

The relation between proximity to major bus lines and retail sales for apparel establishments is presented in Figure 5. As shown, this relation is similar to that observed for miscellaneous sales. For example, third-quarter retail sales tax receipts for "near" establishments were \$1600 less than those from "far" establishments in 1978 prior to fare-free service. One year later, receipts from "near" establishments were \$1000 more than from "far" establishments, with this difference increasing to \$3000 in 1980. Similarly, second-quarter retail sales tax receipts from "near" establishments were \$2400 less than those from "far" establishments in 1978. One year later, "near" establishment tax receipts were \$1200 greater. In 1980, this difference had increased to \$1500.

First-quarter results are somewhat mixed. In 1978, prior to fare-free service, receipts from "near" establishments were \$3900 greater than those from "far" establishments. One year later, "near" establishment tax receipts were less by \$1000. In 1980, this pattern reversed again, with "near" establishment receipts greater by only \$1900. Overall, these results tend to support those noted earlier for miscellaneous sales.

SUMMARY AND CONCLUSIONS

This paper analyzes changes in retail sales resulting from the implementation of CBD fare-free transit service in Albany, New York. The analysis, which is essentially based on comparisons of trends in retail sales of a panel of 115 CBD merchants with those observed for all retail establishments in Albany County, addresses the following specific issues related to changes in retail sales: (a) aggregate changes in retail sales resulting from CBD fare-free services, (b) changes in sales by type of retail establishment, and (c) the effect of proximity to bus service on retail sales.

The results of this analysis suggest that CBD fare-free service has had a positive impact on sales among downtown merchants. Average quarterly sales tax receipts for the CBD panel over the seven-quarter period following the implementation of fare-free service were 4.9 percent greater than those during the eight-quarter period immediately prior to the elimination of fares. Average quarterly sales tax receipts for all retail establishments in Albany County decreased by 0.8 percent.

This increase in sales among the CBD panel occurred primarily in first-quarter sales (December 1 through February 28), corresponding to the holiday shopping season, and among miscellaneous sales establishments (i.e., specialty and gift shops). Between 1978 and 1980, first-quarter sales tax receipts from the CBD panel increased by 25 percent, while countywide sales tax receipts decreased by 5.6 percent during the same period. Sales tax receipts from miscellaneous sales establishments accounted for 71 percent of this increase.

Although part of this increase in first-quarter sales among the CBD panel (i.e., that between 1978 and 1979) could be attributed to a general resurgence of sales occurring independently of the implementation of fare-free service and an overall increase in regionwide retail activity, these factors would not account for the increase in first-quarter sales occurring between 1979 and 1980. Nor can this increase be attributed to any sort of intense promotional effort on the part of downtown merchants during the holiday shopping season. This would suggest, then, that fare-free service was at least partially responsible for the increase in first-quarter sales of the CBD panel between 1979 and 1980 and, to a lesser extent, for the increase in first-quarter sales between 1978 and 1979 as well.

Further evidence of the linkage between CBD fare-free service and increased retail sales is provided by trends in retail sales for establishments located in close proximity to major bus routes relative to those for more distantly located establishments. Among the 27 "near" establishments in the CBD panel, average quarterly sales tax receipts for the seven quarters after the implementation of CBD fare-free service were 6.3 percent greater than for the eight quarters preceding the elimination of fares. Among the 39 "far" establishments, average quarterly sales tax receipts after fare-free service were 3.4 percent lower than before.

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