

Urban retail fabric and the metro: A complex relationship. Lessons from middle-sized Spanish cities

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ARTICLE INFO

Article history:

Received 13 August 2008
Received in revised form 18 February 2009
Accepted 27 February 2009
Available online 1 April 2009

Keywords:

Urban transportation
Retail fabric
Urban revitalization
Censored regression model
Mall
Traditional independent retailers

ABSTRACT

In the last few decades, changes in consumer habits have been observed in household economies. These habits now focus on large retail chains and shopping centers out-of-town rather than independent retailers sited, for the most part, in shopping districts or in the town center. One factor in this trend is the retailer's accessibility to the customer. Because of this relationship, the retail market share is affected by the development of an efficient transport system, such as the Metro. This paper examines both short- and long-term positive and negative interactions between the retail sector and the introduction of the Metro using empirical evidence from three middle-sized Spanish cities (Bilbao, Málaga and Seville). It also analyzes how retailers assess the influence of a nearby Metro station on their business. Finally, the conclusion is drawn that a new planning model for urban transportation infrastructure works is beginning to prevail with the backing of smallbusiness association lobbies. This model seeks to minimize the effect of works-related negative externalities on urban retail fabrics but can never guarantee a happy ending for independent stores.

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Introduction

There is abundant literature on changes in the retail sector during the last few decades, as well as on future trends (Peterson and Balasubramanian, 2002). Several factors influence the definition of the retail sector's new competitive framework. The following are worth mentioning: standardization of consumer tastes as a result of economic globalization (Flavian et al., 2002); development of superstore and megastore chains, located mainly in the city suburbs, which seek economies of scale (Guy et al., 2005) and agglomeration (Peterson and Balasubramanian, 2002), greater consumer price awareness with consumers demanding elaborate retail pricing practices that are generally available only for large chains (Levy et al., 2004); and, finally, difficulties in recruiting a qualified work force because of the sector's lack of appeal, especially in the case of small independent retailers where career prospects are more limited (Rhoads et al., 2002).

These and other trends and factors are benefiting the large distribution and production chains in a number of national markets which are becoming more concentrated (Amato and Amato,

2004). These trends could also influence urban landscapes spatially (Tokatli and Boyaci, 1998). In contrast to this new paradigm, one finds traditional independent businesses with multi-brand sales, primarily family-owned and located in the inner cities.¹ These are constantly losing ground—and market share—in all developed countries, albeit at different speeds (see Gable et al., 1995 [USA] and Flavian et al., 2002 [EU]). Decline in the small independent retail sector is currently one of the more intractable issues in retail research (Coca-Stefaniak et al., 2005). The reasons why it is common for people to shop at stores in out-of-town malls rather than those nearest their places of residence are examined in this literature (Cheng et al., 2007).

The outcome of the confrontation between these two opposing retail models, small traditional independent retailers and retail chains, will, nevertheless, depend on the legal barriers that exist in different cities (see Gable et al., 1995) regarding timing of sales, licenses for new malls, and store opening hours, especially on

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¹ According to Runyan and Droge (2008), several terms are used to signify small retailers, including small, independent, mom-and-pop, single store and sole-proprietor. Franchises are therefore not included in this category because they generally operate as part of a large corporation or chain.

Sundays and holidays, for example.² Thus, it is not surprising that in countries with an interventionist tradition, such as Mediterranean countries, retailing activity is not so concentrated into a small number of big retail chains than in northern European countries, which are traditionally more liberal (Flavian et al., 2002).³ Nonetheless, as Mediterranean cities approach the suburban North American model (see Munoz, 2003), new out-of-town commercial developments come to affect traditional independent retailers in city centers (Lopes Balsas, 2000).⁴

A key issue for both retailers in malls on the city outskirts and retailers in the different districts or the old town is accessibility by private or public transportation (Geuens et al., 2003). Thus, poor access to the city center plus frequent parking difficulties (“[P]eople really hate looking for a parking spot,” Geuens et al., 2003) will benefit malls or megastores over urban retail on shopping streets because the former own private parking areas that are generally free of charge.⁵ This situation will again contribute to concentrating power in large chains since malls and megastores are a fertile environment⁶ for this kind of retail shopping because the high rent on retail premises in malls are an obstacle to the influx of independent stores (Gable et al., 1995), which will instead seek shopping streets with lower rents (Coca-Stefaniak et al., 2005). There may even be a mall management policy that favors the implementation of large chains to the detriment of independent stores (Shaw, 1987), whereby it should come as no surprise that the proliferation of malls and the decline of independent stores are trends that coincide in time (Cheng et al., 2007).

However, the proportion of independent retailers in shopping streets where there are no malls increases, even in Anglo-Saxon countries (see Crewe and Beaverstock (1998) on Nottingham and Larson (1998) on Los Angeles), contributing directly to the commercial viability of town center streets (Page and Hardyman, 1996). The proliferation of out-of-town or edge-of-town malls can thus be regarded as a threat both to city center retailing and to small local stores (see Marjanen (1995), in general, and Coca-Stefaniak et al. (2009), for examples of European cities).

In this context, the development of a good transit system making access from the suburbs to the city center easier can considerably alter the rules of the game in a city by changing the living environment (Loo, 2009).

² During the nineteen-nineties, a raft of national and regional legislation led to a progressive liberalization of business hours on both weekdays and holidays that should have been completed by 2005. But this process was brought to a halt by National Law 1/2004 regarding business hours, enacted on 21st December, 2004. Said law had the backing of powerful lobbies of small-business associations, as was the case in other Mediterranean countries (see Lopes Balsas, 2000, on the case in Portugal). Law 1/2004 granted the freedom to establish opening hours only to independent stores (those not belonging to chains or franchises) of under 300 square meters (3230 sq.ft.), while other stores are able open for a limited number of Sundays and holidays (at least eight per year) after approval by the regional government. Currently, 14 of the 17 regional governments allow the minimum of eight, the Canary Islands allow nine, and Murcia allows ten. Only Madrid allows something approaching complete freedom of business hours; businesses can open on 22 Sundays or holidays per year and remain open 24 hours on weekdays.

³ Notwithstanding, the trend towards the cannibalization of the small independent retailer by the retail chains is the same in both cases. For example, despite regulations favoring independent retailers and high economic growth in Spain during the 1999–2007 period, the number of individual retailers decreased at an average annual rate of 1.47%, and retail businesses with 0–20 employees grew at a rate of 0.37%. Meanwhile, large retailers with over 100 employees grew at a rate of 6.37% annually while the growth rate for firms with over 1000 employees was 8.66%.

⁴ However, there are some Mediterranean cities where new retail areas, such as malls, do not replace traditional ones, such as regular informal markets (see Dokmeci et al., 2006, regarding Istanbul).

⁵ Sometimes proof of a mall purchase is required to validate parking in Spanish mall parking lots; in some cases, only a limited period of time (2–3 h) is covered.

⁶ For megastores and superstores (a store with a sales area of over 2500 sqm (26,900 sq.ft.), malls or retail parks out-of town are almost the only possible location (Guy et al., 2005).

There is currently some consensus on an efficient rail-based public transportation system alone being able to compete with private transportation (Cullinane, 2003), that is, an underground system, light train and/or tram. The latter must circulate within exclusive lanes to avoid the congestion that buses generally experience.

The high cost of these new transportation systems—especially the subway and light rail—has justified their frequent evaluation, starting with the now-traditional paper on the San Francisco Bay Area BART by Nobel-prize-winner McFadden (see Train, 2003) and including more recent research on the new Athens Metro for the 2004 Olympic games (Golias, 2002) and the new Copenhagen Metro (Vuk, 2005). The goal has been to measure changes in urban transportation habits resulting from the new Metro or light train. However, there is a lack of work analyzing their effects on citizens’ perceptions, including those of retail managers, and their behavioral responses (Loo, 2009).

In recent years, work on urban transportation has widened in scope to include aspects closer to the retail sector, such as the effects of these transportation systems on the property market (Du and Mulley, 2007), including commercial properties. Sometimes these studies focused on analyzing ways that public administration, including city halls, can benefit from land value increases around Metro or light train stations, in order to co-finance the enormous investments they require. Given that one of the trends affecting transportation around the world will be low public financing for new transportation infrastructure development (Kenworthy, 2002), this line of research is promising despite the few results to date (Du and Mulley, 2007).

Our paper analyzes the effects of a Metro system’s construction on a city’s various retailer categories and on urban planning. It is structured as follows. Section 2 describes the positive and negative effects that the creation of an efficient transportation system might have on the retail sector, based on empirical evidence from various studies, especially those concerning three middle-sized Spanish cities that have recently built (Bilbao) or are building (Málaga and Seville) a Metro system that links suburbs with the city center. Section 3 analyzes the perceptions that Seville’s retailers have of this phenomenon as a function of their attributes. Finally, we draw conclusions from the data.

Analysis of the effects of metro network construction on the retail sector

This section describes the positive and negative effects that the construction of a new Metro or light train line has on a city’s retail sector. These include both temporary and short-term effects during construction, as well as permanent or long-term impacts after the new Metro line has come into operation.

Short-term effects during construction

Negative externalities due to construction work and accessibility problems

The focal point for these effects is the area around where the Metro is being constructed. During Metro line and station construction, nearby retailers will suffer from accessibility problems as streets and sidewalks are closed and from a loss of their appeal due to the dirtiness and the poor image caused by the construction work. This last negative externality will be greater for retailers located on business streets than for those located within malls. Obviously, these externalities will lead to a decrease in demand due to fewer visits from customers, whether they come from other nearby districts or cities or from the neighborhood itself.

In the case of the city of Málaga (Molinillo, 2007), the estimated demand decrease for retailers in the vicinity of Metro stations ranged from 14% in the most optimistic construction duration scenario

Table 1
Economic impact generated by construction of the Bilbao and Seville Metros.

Variables	Bilbao Metro (1987–2006)	Seville Metro (2004–2007)
Expenditure ^a	1901.08	396.76
Total impact ^a (1)	1415.05	234.77
Annual employment ^b	1222.00	1926.28
% Impact/expenditure	74.43%	59.17%

Source: prepared by the authors based on data from Castillo-Manzano et al. (2008) and Metro Bilbao (2007).

(1) Total impact in GDP for the Bilbao Metro and in Gross Added Value (GAV) for the Seville Metro.

^a Expenditure and impact are in constant millions of Euros (2006).

^b Employment is measured in numbers of jobs annually (average).

to a little under 37% for the mid-point scenario and 49% in the most pessimistic scenario, which was rated at 60% probability.

Any demand decrease is significant and, when construction runs longer than expected, could result in the weakest retailers closing. According to Molinillo (2007), these would be those with less experience in time terms (between one and three years of activity), who rent their premises and do not belong to a chain or business group, that is, independent retailers.

Keynesian effects on urban economy in general and on retail in particular

Metro- or light train-based transportation systems were reserved for country capitals and large cities up to recent decades because of their high congestion problems and high construction costs. Other cities, which generally had very deficient transportation and communications infrastructure, could have felt poorly treated (see Ortúzar (1983), with regard to the equity issues that arose over public investment in the Santiago Metro system compared to other Chilean cities). Today, especially in developed economies, congestion levels are common in middle-sized cities as car dependency has increased (Steg and Gifford, 2005), and it is not surprising to see new Metro and light train networks developed there. Spain is a good example: there only used to be a Metro system in large cities (Madrid and Barcelona) but in the last ten years, systems have been built in Bilbao and Valencia, and operations are now commencing in Granada, Málaga, Seville, and Zaragoza.

In these middle-sized cities, just building a Metro has an important economic impact on all economic sectors including retail, due to linkage effects, that is, the Keynesian effects that derive from it. Usually, the linkage effects of an investment on an industry are measured using an input–output analysis. This allows the sector interdependencies that such an investment or industry would generate in the economy to be analyzed while there is also sufficient flexibility for the model to be adapted to meet the needs of the researcher. See Fletcher (1989) for advantages and disadvantages of the input–output technique applied to impact studies. This methodology has recently been applied in a range of contexts, from the maritime industry (Kwak et al., 2005) to Olympics-related investments (Zhang and Zhao, 2007).

This methodology has also been applied to quantify economic effects of Metro construction in Seville (Castillo-Manzano et al., 2008) and Bilbao (Metro Bilbao, 2007). Table 1 shows some of the results from those studies. Two differences must be noted between both studies. Firstly, the Bilbao Metro study calculates global impact over a twenty year period (1986–2006), much longer than that considered for the Seville Metro (2004–2007⁷); secondly, the impact of the Bilbao Metro has been calculated at

a regional level (the Basque country), while that of the Seville Metro refers to the city of Seville and its area of economic influence.

A significant part of this impact is on the retail sector. In particular, 17% of the employment generated by the linkage effects of Metro construction benefited the retail sector and the hospitality industry according to the Seville study. The same can be said of 13% of the GAV generated by Metro construction effects.

However, because these Keynesian effects are geographically diffuse, they cannot be seen as compensation to retailers affected by the negative externalities of construction.

Long-term effects after the Metro has come into operation

Significant accessibility improvements and possible changes in consumption behavior

The new transportation system makes access easier for customers, especially in downtown retail areas where pedestrian streets rule out private transportation and parking is scarce. Revitalizing these areas is a goal of city governments in many European cities, regardless of their size (Page and Hardyman, 1996; Lopes Balsas, 2000). According to Loo (2009), the main reason for using new Metro systems is shopping.

We find a good measurement of these effects in Metro Bilbao (2007). The study surveys 577 metro users in the two years following the inauguration of Line 2 in 2003. Thirty-four percent acknowledged that the Metro had an influence on their shopping habits, taking them to other shopping areas.⁸ Of the 36 Metro stations then in the network, the station located in the historical city center was the most-valued for purchases followed by the two stations adjacent to it. Together, these stations received the majority (68%) of the responses. Furthermore, all these percentages were significantly higher among inhabitants of outlying towns than among residents of Bilbao itself, as the former now had much easier access to the city center. Thus, it seems that the Metro became a tool for the development of the downtown Bilbao retail sector.

Creation of exogenous barriers to entry due to changes in the property market

Traditionally, the retail sector has been considered a “contestable market,” to use Baumol and Panzer (1982) term, because it has few entry barriers. However, according to Gable et al. (1995), entry barriers—especially exogenous ones—have increased as chain stores have developed in recent decades.

According to said author, the need for high capital requirements is one of the exogenous barriers of note. One fundamental item is initial expenses, which includes the investment needed to open the store. These expenses are higher for stores in high-traffic locations as rent is higher. These barriers are likely to be most burdensome for smaller-sized, undercapitalized retailers, that is, for independent retailers, while it is easier for store chains to finance these costs (Gable et al., 1995).

According to Du and Mulley (2007), there is empirical evidence to demonstrate that rail-based transit systems produce significant increases in property values in surrounding areas. They set out evidence ranging from a 25% increase in US cities to a 57% increase in commercial properties located within 50 meters of the new Tokyo Metro stations.

Thus, as property values increase near stations, the Metro will generate exogenous barriers, facilitating the replacement of the smaller-sized independent store model by the chain store model. This phenomenon is not exclusive to the Metro. Generally, any successful historical center regeneration policy that increases its

⁷ The study on the Seville Metro only takes into account the impact generated up to 2007, although it is anticipated that construction of all the stations on the first line will finalise in June, 2009.

⁸ A new 2006 survey concluded that this percentage had not decreased, but rather increased to 41% of the users polled.

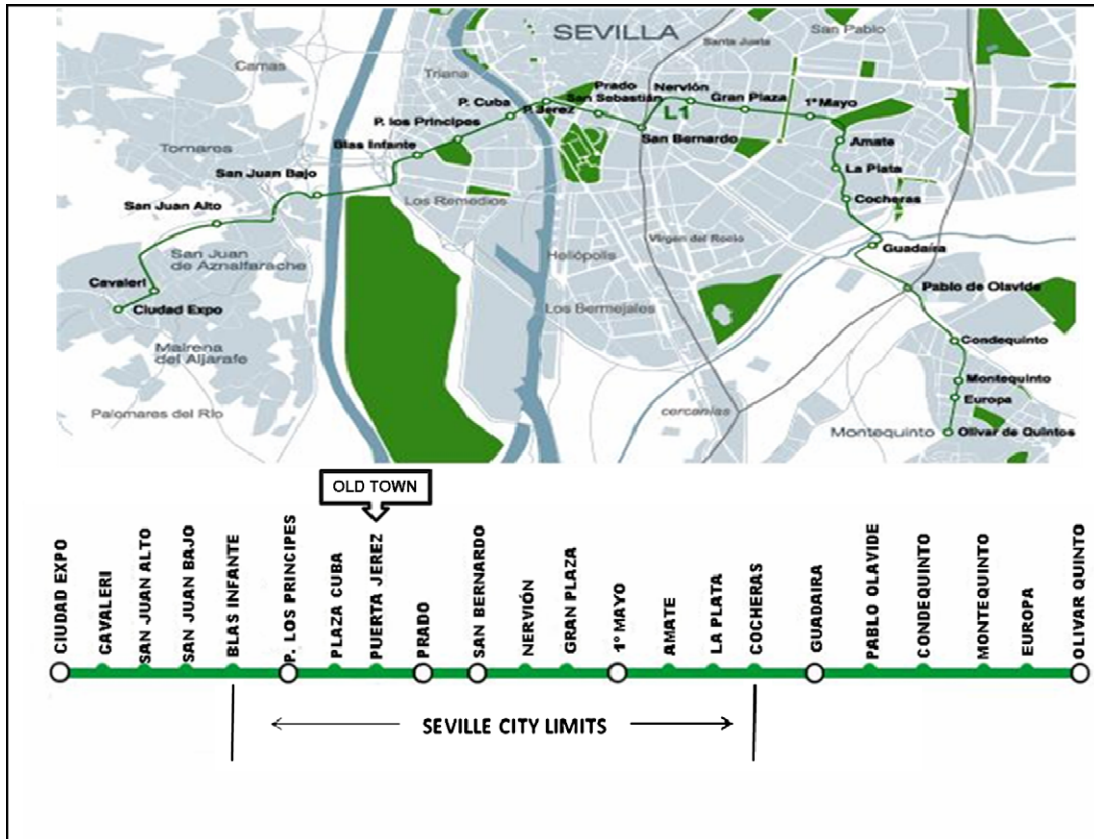


Illustration 1. Map of Seville Metro Line 1.

appeal will favor model substitution.⁹ Thus, the Metro may herald another reverse for the traditional retail model.

How retailers value the metro

The model and data

As shown in the previous section, the possible effects of a new Metro development on the retail sector in the vicinity of stations are diverse and may be favorable or unfavorable, depending on the characteristics of the retailers. To validate this theoretical view by contrasting it with that of professional retailers, we surveyed 258 store managers by personal interview. The stores were located in four main retail areas and three malls in the vicinity of seven stations on the new Seville Metro Line 1. To be specific, the four main retail areas were in the proximity of the Plaza de Cuba, Puerta de Jerez (Seville’s old town), San Bernardo and Gran Plaza stations, and the three malls were near the Ciudad Expo, Nervión and Europa stations (see Illustration 1). The interviews were conducted some months before the line was to open and once any inconveniences caused by construction work had concluded for most stations. Table 2 shows the technical data for this survey.

As was explained in the introduction, the lack of literature analyzing the effects of a new transportation system on citizens’ perceptions in general (Loo, 2009), and on retail managers’, in particular, complicated the design of the questionnaire and the

⁹ Seville has experienced an example of this over the last ten years. The pedestrianization of Tetuán Street—and its continuation, Velázquez Street—has triggered the mass entry of large international chains, such as H&M and other Spanish multinational chains. Thus, the ZARA-INDITEX group and its various retail brands, which had four stores before reurbanization, now have nine stores within only 400 meters of each other, the sum of the length of both streets.

Table 2
Survey technical data.^a

Information gathering	Information gathering technique	Personal interview
	Questionnaire	8 questions with closed answers
Sampling	Universe	Managers of stores close to a Metro station in a relevant retail shopping area or mall 647–258
	Population size and sample size	
	Sampling method	Random routes in retail areas
	Sampling error ^b	±4.83%
Field work	Number of waves	3
	Time period	November 2007 through February 2008 excluding Christmas holidays
	Place	Store
	Timetable	Shopping area or mall business hours, Monday through Thursday, and Friday mornings, preferably at times when there were fewer shoppers

Source: Prepared by the authors.

^a A full explanation of the survey campaign is available from the authors upon request.

^b $\pm Error = k\sqrt{(N-n)/(N-1)}\sqrt{pq/n}$, where N = population size; n = sample size; $p = q = 0.5$ complementary probabilities of the answer to an event at the point of greatest indeterminacy; k = parameter for the level of answer to an event, where $k = 2$ for a 95.45% confidence level.

choice of variables for the model. We counted on the assistance of mall managers and retail association representatives, both from the districts under study and from the Seville retailers’ umbrella association, to overcome shortcomings in questionnaire design.

This also allowed us to adapt the variables more closely to the economic reality of Sevillian retailers. For example, in a tourist city like Seville, the tourist brochure is an attractive “Marketing

instrument”; likewise, one of the measures Seville City Hall uses to improve the retail fabric is a program of grants to improve stores and purchase capital goods, which is why it is included under the “Requests to the public sector” variable. Finally, a number of control variables were included with the aim of detecting any possible bias in a retailer’s opinion, whether due to business location (*Competitive problems* and *Difficulties in business advertising*) or even to a possible political bias (*Public sector support*). This latter could result from the fact that the Seville Metro project was jointly promoted by a number of public administrations, from Seville City Hall to the Central Government, all of which were, at that moment in time, under the control by the same political party.

Using the survey results we estimated the following econometric model, which seeks to explain how retail managers evaluate the effects of the Metro on their economic activity, depending on the features of each store and the shopping area where it is located.

The independent variable (y_i) is the manager’s appraisal of the usefulness of his/her business being located near a metro station. The answer was an integer value of between 1 and 5, with 1 indicating least usefulness or indifference towards Metro existence and 5 indicating that the retailer expects the maximum usefulness. This specification suggests using a censored regression model¹⁰ starting with the following latent variable regression model:

$$y_i^* = \beta_0 + \beta_1 SML_i + \beta_2 SCH_i + \beta_3 DTC_i + \beta_4 CA_i + \beta_5 EHA_i + \beta_6 MI_i + \beta_7 PV_i + \beta_8 CP_i + \beta_9 DBA_i + \beta_{10} CR_i + \beta_{11} NEX_i + \beta_{12} CWE_i + \beta_{13} RPS_i + \beta_{14} PSS_i + \sigma \varepsilon_i \quad (1)$$

$$y_i = \begin{cases} 1 & \text{if } y_i^* \leq 1 \\ y_i^* & \text{if } 5 \leq y_i^* \leq 1 \\ 5 & \text{if } 5 \leq y_i^* \end{cases} \quad (2)$$

where the explanatory variables are:

(a) Store characteristics and location

1. SML_i = *Store mall location*. This binary variable is given a value of 1 if store i is within an enclosed mall and 0 if store i is on a business street.
2. SCH_i = *Store belongs to a chain*. This binary variable is given a value of 1 if store i belongs to a chain of stores and 0 if it is an independent retailer.
3. DTC_i = *Distance from city center*. This variable is given a value of 0 when store i is in Seville’s old town; 1 when it is within walking distance of the old town; 2 if it is on the outskirts of Seville but within city limits; and 3 if it is outside Seville city limits.
4. CA_i = *Clothing and accessories*. This binary variable has a value of 1 if the retailer sells clothing and accessories; otherwise, the value is 0.
5. EHA_i = *Electronics and household appliances*. This binary variable has a value of 1 if the retailer sells electronics and household appliances; otherwise, the value is 0.
6. MI_i = *Marketing instruments*. This refers to instruments and channels used by retailers to advertise their business: mail-boxes; tourist brochures; press; radio; local television and websites. This value ranges between 0, when no instrument is used, and 7, when all are used.
7. PV_i = *Parking valuation*. Managers had to assess the usefulness of nearby surface and underground parking facilities with a value from 1 to 5. A value of 2 would indicate that the manager is indifferent to the parking facilities and 10

would indicate that s/he considers parking facilities to be essential.

(b) Store managerial situation:

8. CP_i = *Competitive problems*. Managers were asked to rate the following competitive problems for their businesses (with 5 being the most problematic): difficulty finding an adequate labor force; problems related to economic and administrative management; supply difficulties; and obstacles in business advertising. Thus, the value of CP_i can range from 4, if a store has no problems, to 20 if the situation is intolerable.
9. DBA_i = *Difficulties in business advertising*. Managers were asked to specify the obstacles to advertising his/her retail business, assigning values of 1–5 to each of two obstacles: lack of efficient promotion channels, and customer accessibility and parking difficulties. Thus, the DBA_i values range from 2, when the store has no obstacles, to 10, where advertising difficulties are greatest.
10. CR_i = *Collaboration requests*. We asked managers to assign a value between 1 and 5 to possible collaboration with neighboring retailers. They were told that any partnership would require co-financing by the store. Areas considered were: drawing up a joint development plan for the shopping area; organizing private security; establishing a loyalty card program; improving signs in the neighborhood or shopping center; giving free taxi-ride vouchers to the best customers (to make transportation less expensive); contributing to street decoration (during the Christmas season, for example). CR_i will range between 6 (all collaboration is rejected) and 30 (maximum collaboration is sought).

(c) Effects of Metro construction work on the store:

11. NEX_i = *Negative externalities due to construction work*. This variable seeks to measure negative externalities affecting the store caused by Metro construction work. Its value is the duration (in months) of construction work around the Metro station that is near the store. The maximum value is 42 months.
12. CWE_i = *Construction work ended*. This binary variable has a value of 1 if construction work around the store had already finished by the time of the interview; otherwise, the value is 0.

(d) Relationship with the public sector:

13. RPS_i = *Requests to the public sector*. We asked managers to assign a value from 1 to 5 to the need for the City Hall to make improvements to the store’s surroundings, based on the potential usefulness of these improvements for the development of their business. Such improvements include street furnishings; public transportation; security; street cleaning; plans to boost the retail business; hosting cultural and leisure street events; and grants to improve stores and purchase capital goods. This variable ranges in value from 7, when the manager does not request any improvements, to 35 when the maximum level of help is requested.
14. PSS_i = *Public sector support*. Managers were asked to assess the work and support they receive from the five public government institutions relevant to the retail sector, ranging from the City Hall to the European Union. Four of these are involved in the development or co-financing of the Seville Metro. Values for this variable will range from 5, when activities of all five public administrations are considered highly deficient, to 25, when all are performing well.

Finally, σ is a scale parameter that will be estimated along with the β ’s, and ε is the latent error term, which can match various distributions, such as standard normal, logistic or extreme value.

¹⁰ We have preferred a censored regression model to other methodological options, such as ordered regression models, because some managers used non-integer numbers in their answers.

Results

Model (1) estimation by maximizing the log likelihood function led to the results in Table 3 (robust standard deviations are shown in brackets):

We have chosen a logistic distribution¹¹ for the latent error term (ε). This is because the logistic distribution minimizes all the information criteria.¹²

Table 3 shows that the view that retailers near Metro stations have of the Metro seems to follow a well-defined pattern. Firstly, the lack of significance for the variable *Store belongs to a chain* indicates that the usefulness of being located near a Metro station depends on the specific problems each store may face, from its labor force to its advertising choices, and not on its business category (independent versus chain). Thus, the greater these problems (higher values of *Competition problems* and *Difficulties in business advertising* variables, both are significant at the 95% level), the more they look forward to the influx of customers the Metro might provide. In addition, retailers that place greater demands on the various public administrations (from greater street safety to subsidies), that is, retailers with a higher value for the *Requests to the public sector* variable (99% significant level), are those that place greater importance on the opportunity the Metro will provide for their businesses.¹³

Furthermore, the high value of the *Distance from city center* variable (2.279, with a minus sign and 95% significance level) indicates that the further the retail business is from the city center, the less desirable the metro becomes. Another relevant aspect is the high negative value of the *Store Mall Location* coefficient (−4.424 and 99% significance level), close to 89% of the maximum value that the dependent variable can admit. Thus, the perception that the retail sector has of the usefulness of an efficient public transportation system is completely different for retailers within or near a mall compared to those on shopping streets. It would seem the former have defined their target customer as one who uses his/her own vehicle and the mall's own parking area. Note that we have taken eighty stores in three different malls located at three different Metro stations into consideration; one in inner Seville (Nervión station), and two on the edge of the city (Ciudad Expo and Europa stations), which makes these results quite robust.

Regarding parking, there is a logical correlation with *Parking valuation*, namely at a 95% significance level; that is, managers with customers with accessibility problems value the Metro on the same level as public policies that lead to decisions to construct both surface and underground parking lots.

As expected, the Metro is assigned less value when its construction near a store requires a long period of time; thus, the coefficient for the *Negative externalities* variable is negative and highly significant (99%).

The lack of significance of *Construction works ended* could be explained by the short time between work completion and interview time, which was never greater than six months. Moreover, it seems that manager rationality when appraising the Metro is free from political prejudices, as it bears no relationship to how they value public administrations (*Public sector support*).

Table 3
Equation estimates.

Variables	$\hat{\beta}$
$\hat{\beta}_0$	5.990 (2.914)**
Store mall location	−4.424(1.307)***
Store belongs to a chain	0.400(0.561)
Distance from city center	−2.279(0.936)**
Retailer sells clothing and accessories	−1.048(0.622)*
Retailer sells electronics and household appliances.	−1.216(1.227)
Marketing instruments	0.149(0.205)
Parking valuation	0.223(0.110)**
Competitive problems	0.196(0.090)**
Difficulties in business advertising	0.285(0.129)**
Collaboration requests	0.040(0.054)
Negative externalities due to construction work	−0.278(0.069)***
Construction work ended	0.211(1.129)
Requests to the public sector	0.188(0.054)***
Public sector support	0.018(0.077)
$\hat{\sigma}$	2.239(0.232)***
Number of observations	258
Log likelihood	−355.638
Akaike information criterion	2.881
Schwarz criterion	3.101

* Indicates significance at 10% level.

** Indicates significance at 5% level.

*** Indicates significance at 1% level.

Finally, the *Collaboration requests* variable is not significant, either. This would seem to indicate that there is no correlation between the manager's spirit of collaboration with other stores and the perception of the Metro's usefulness s/he has.

Conclusions

Mediterranean cities have become economic battlefields where independent retail businesses are endeavoring to survive as they are pressed by new models (malls and chain stores). In this context, developing a public transportation system like the Metro that can compete with the private system may alter the status quo. The Metro will have a range of effects on the local retail sector, both while it is being built and after it comes into operation. The first of these, negative externalities caused by construction work and accessibility problems for stores, results in a sharp fall in commercial activity in areas around stations (the drop in sales may reach 49% according to the Málaga study). It should therefore not seem strange that the model (1) for retailers in Seville should conclude that the Metro's usefulness decreases for managers, even becoming negative, as construction time becomes more protracted. The point-of-view of affected retailers is that, although the Keynesian effects derived from the construction of Metros are important (as demonstrated by studies on the Seville and Bilbao Metros), they are so diffuse that they can never compensate for the unfavorable effects of the actual construction work.

Notwithstanding, when the Metro comes into operation it becomes an important instrument for revitalizing retail commerce in historical city districts as it improves access to these from peripheral neighborhoods. As the Bilbao study shows, this changes inhabitant's shopping habits and reduces their dependence on suburban malls. In the case of Seville, this explains why it is those retailers who are nearest the city center who most value the Metro, whilst it is the managers of businesses located in malls, and who therefore benefit from their private car parks, who least value the proximity of a Metro station. The way a Sevillian retailer values the Metro is therefore closely linked to his/her business location (city center or mall) and other factors, such as management problems (*Competition problems* and/or *Difficulties in business*

¹¹ So $E(\varepsilon) = 0$ and $\text{Var}(\varepsilon) = \pi^2/3$.

¹² Results are available from the authors upon request.

¹³ One might think that managers with problems are not very objective when valuing the Metro, as they would value any initiative from the public sector equally high. If this hypothesis were true, in the following censored regression model $RPS_i^* = \alpha_0 + \alpha_1 CP_i + \alpha_2 DBA_i + \sigma \varepsilon_i$, both $\hat{\alpha}_1$ and $\hat{\alpha}_2$ would have to be positive and significantly different from 0. However, only $\hat{\alpha}_2$ fulfils both conditions. Thus, a manager of a store with competitiveness problems considers the Metro to be the optimal solution, rather than better street cleaning, for instance. Estimated results are available from the authors upon request.

advertising) whereas their retail format (chain or independent store) has no effect on his/her valuation.

The experience of the Metros in Málaga and Seville has led the Public Works and Transportation Department of the Andalusian Regional Government to develop a protocol of collaboration with retailers for public transport works (Metro, light train and tram) to minimize the negative effects on the urban retail fabric. Said protocol has already been implemented for public works in Málaga, Granada and the Bay of Cádiz. Actions included in the protocol are: a permanent communications channel used to give retailers sufficient (over three months') prior notice of periods when work will be done in order that they might plan their orders and labor requirements; the position of a mediator has been created who is to visit stores in the area around the works and get first hand reports from managers about the difficulties that customers have for accessing their stores and also about the degree of dirtiness caused by the works; free toy libraries and child-care facilities have been set up in shopping areas near the works over Christmas allowing families to do their Christmas shopping; lighted signs have also been put up to indicate the location of stores most affected by access problems and a lack of visibility while the works are going on. It is hoped that in this way the rejection of the Metro by retailers in the vicinity of the stations will be avoided, as has been the case for some stations in Seville which, a priori, would benefit most from the Metro.

In short, the powerful small-business association lobbies are succeeding in having a new focus in the planning of all urban transportation infrastructures accepted. With this focus the urban retail fabric is to be considered almost on the same plane as the environment. This means that when construction works is being planned, actions are required equivalent to the now compulsory Environmental Impact Assessments and corrective measure plans for said impacts.

There is, however, no guarantee of a happy ending for stores that survive the Metro's construction, as the greater its success in regenerating shopping districts, the more property values of premises near its stations will rise, and so the greater the probability that the smaller-sized independent store model will be replaced by the chain store model.

Acknowledgements

The authors would like to thank the Public Works and Transportation Department of the Andalusian Regional Government for their financial support of this research.

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