
Working Paper No. 2012-04

# Commercial Revitalization in Low-Income Urban Communities: General Tax Incentives vs. Direct Incentives to Developers

**Li Zhou**
**University of Alberta**

January 2012

# Commercial Revitalization in Low-Income Urban Communities: General Tax Incentives vs. Direct Incentives to Developers

Li Zhou*

University of Alberta

January 20, 2012

**Abstract**

This paper proposes a commercial development model, based on Fujita's (1988) monopolistic competition model of spatial agglomeration, to examine stores' decisions to enter urban communities. The model focuses on commercial developers and large stores, and identifies a potential holdup problem in the commercial development market arising because developers incur costs before negotiating with anchor tenants over profit sharing; the holdup problem is more likely to occur in low-income communities where the profitability of commercial projects is small. The model predicts that direct incentives to developers are preferred to general tax incentives for addressing this market failure.

JEL classification: R58, H50, H76

Key Words: urban redevelopment programs, economic agglomeration, holdup problem

## 1 Introduction

Commercial development is a popular urban revitalization strategy that has been implemented in many U.S. cities including New York, Chicago, and Boston. Its popularity is founded on the belief that low-income urban communities are under-served by stores. Residents in these communities spend a greater share of their income shopping outside of their own neighborhoods. For example, in 1996 Chicago residents living in the neighborhoods of Little Village and South Shore made about 62% and 70% of their purchases outside of their neighborhoods, while residents of the average Chicago neighborhood made 37% of purchases outside (Weissbourd and Berry (1999)). Lack of locally available commercial goods and services has a negative impact on the welfare of inner-city residents, usually poor people who rely on public transportation (Glaeser et al. (2008)).

*Department of Economics, University of Alberta. Email: li.zhou@ualberta.ca. Phone: (780) 492-4133. I thank James Rauch, Julie Cullen, Gordon Hanson, Brad Humphreys, Craig MacIntosh, Josh Graff Zivin and seminar participants at the University of California, San Diego, and the University of Alberta for comments and suggestions.

According to estimates in *New Markets: The Untapped Retail Buying Power In America's Inner Cities,* a report by the Department of Housing and Urban Development (HUD) (Cuomo (1999)), U.S. inner-city neighborhoods had an unmet retail demand of $8.7 billion. Despite this documented under-provision in low-income urban communities, we know very little about the nature of this problem. Why don't stores enter these communities to meet the excess demand? The answer to this question has important policy implications. If high crime rates in inner-city neighborhoods is what deters the entry of stores, then the government should put more resources to reduce crime. Consistent with recent commercial revitalization successes in urban low-income communities, this paper provides a model of commercial development to show that low-income communities may be under-served because of lack of economic agglomeration and policies should aim at generating necessary commercial agglomeration.

A well-known example is Harlem, New York, one of the six Round I federal urban Empowerment Zones. Before Harlem was designated as an Empowerment Zone in 1994, it had not had any large scale commercial development since the 1960s, and 70% of the shopping by Harlem residents was done outside of the neighborhood, which had not had any large. With public subsidy to developers, the community saw the opening of Harlem USA, a 275,000 square-foot retail and entertainment complex, in 2000 and the opening of East River Plaza, a 485,000 square-foot retail shopping center that is home to Costco, Target, Best Buy, Marshalls, Old Navy, PetSmart, Bob's Discount Furniture, and many other tenants, in 2009. In 2010, three developers[1] announced on the same day total planned investment of about $116 million in commercial development projects in Harlem.

The commercial development model in Section 2 builds on existing monopolistic competition models of spatial agglomeration (Fujita (1988)), in which consumers have a taste for different varieties of goods and services (Spence (1976), and Dixit and Stiglitz (1977)) and have to incur travel costs to the location where goods and services are provided. For a given travel cost, consumers are more likely to shop at a place with more varieties of goods and services; his consumption pattern creates positive demand externalities among commercial goods and services that agglomerate at the same location: more choices attract more consumers and lead to higher revenues (Arakawa (2006), Henkel et al. (2000)).

The first innovation of this model is to demonstrate the importance of demand externalities in stores' decision to enter a community, an aspect that, to my knowledge, has not been investigated in the literature. With fixed costs in commercial provision (e.g., rent paid to a landlord and wages paid to some minimum required number of workers), stores at a location with a very limited number of varieties may incur losses because of low consumer traffic and revenues. Without a proper coordination mechanism, the market may fail to achieve necessary commercial agglomeration and end up at an inefficient equilibrium with under-provision of commercial opportunities despite the existence of a more efficient and profitable alternative equilibrium.

The second innovation is to model the coordination mechanism in the commercial market and to investigate the nature of the under-provision problem in low-income communities. Current commercial develop-

[1] Janus Partners LLC and Monadnock Construction Inc. and Artimus

ments often involve two types of agents — commercial developers and large stores. A developer acts as the planner of a commercial development project and large stores serve as anchor tenants. This arrangement creates a synergy and is beneficial for both parties. Without a developer, a large store will have no mechanism to charge nearby specialized stores for the positive demand externalities they generate. Most likely, owners of the properties that are occupied by these specialized stores will capture the benefits through either an increase in rent or property value appreciation.[2] A developer, through lease contracts with all stores in a commercial center, will be able to internalize the demand externalities around a commercial center. However, a developer cannot start a project without anchor tenants, the large stores. The importance of anchor tenants to a commercial development project is a result of the need for economic agglomeration and the existence of significant coordination costs. Recruiting small specialized stores to achieve necessary agglomeration may be a bad option because of high coordination costs. According to the Urban Land Institution's (ULI) *Retail Development Handbook* (Kramer (2008), page 91), "as a rule, a shopping center will not be built until the developer has secured commitments from key or anchor tenants." Anchor tenants, aware of their importance in commercial development, will be able to negotiate with a developer for a share of profits. Evidence shows that anchor tenants usually pay much lower rents than small tenants. According to the estimate in Pashigan and Gould (1998), anchor stores receive a per foot rent subsidy of no less than 72 percent of the rent that non-anchor stores pay. Gould et al. (2005) point out that "the most striking feature of anchor contracts is that most anchors either do not pay any rent or pay only a trivial amount".

A successful commercial development requires the cooperation of two powerful parties, but one party, the developer, has to incur significant costs before negotiating over profit sharing. Before searching for suitable anchor tenants, a developer has to perform a market analysis, a site suitability analysis, and a regulatory review, which can easily cost half a million dollars (Kramer (2008)). More importantly, the search process can be costly in terms of time and money. Stores that can serve as anchors in a commercial center usually have their own expansion plans and market targets. For example, in 1998, Barnes & Noble decided not to sign a lease with Harlem USA, the first large-scale commercial development in Harlem, New York for half a century, whose developer had been trying to persuade the bookstore to open a shop in the center since 1992. Eventually, Harlem USA signed a bookseller, Hue Man Books in 2000. All costs incurred before the negotiation with anchor tenants are sunk to the developer. At the point of negotiation, anchor tenants have no incentive to share these costs. A developer must anticipate sharing the payoffs from a commercial development with anchor tenants, but bear the pre-negotiation costs alone. This represents a holdup problem that arises when one party must pay the cost while others share in the payoff.[3] A commercial project which generates positive profits may not be profitable for a developer and therefore no action will be taken. This situation is more likely to happen in low-income communities where the profitability of a commercial project

[2] This happens if there are more potential small commercial business owners than the spaces that are close enough to benefit from the large store's consumer base.

[3] Acemoglu and Shimer (1999) study this kind of holdup problem in the labor market. Proposed market solutions usually require the agents to take actions (e.g., forming joint ventures) before incurring costs. However, in the case of retail development, the costs must be sunk before the developer meets the anchor tenants.

is slim to start with.

The commercial market failure in low-income communities justifies government intervention. Section 3 analyzes how government policies help to solve the under-provision problem. The key is to induce actions by developers. Incentives provided directly to developers for projects in under-served communities, in the form of block grants, low-interest loans, or accelerated deductions, should work. General tax incentives to capital or labor may be less effective. In some communities, general tax incentives may not be big enough to trigger developers' actions. If, in some communities, they do induce developers to invest, they will also lead developers to over-supply shopping spaces and generate unnecessary revenue loss to anchor stores.

The policy analysis contributes to the growing literature on place based policies.[4] As Gottlieb and Glaeser (2008) and Kline (2010) point out, justification of place based policies requires better understanding of the structure of agglomeration economies. This paper shows that commercial revitalization incentives as place based policies are welfare enhancing. There will be more private investment, profits, permanent jobs, and sustainable economic activities in communities that successfully implement these policies.

Analysis of the welfare redistribution effect of commercial revitalization projects suggests that home owners and large stores that serve as anchor tenants of newly-developed commercial centers are sure winners. Existing community residents who rent their houses may not benefit if the increase in their consumer surplus from easier access to commercial goods and services drives up rents in the neighborhood.

# 2 A model of neighborhood commercial development

This section develops a model of commercial development to analyze the entry of stores in a community. Following Fujita (1988), I assume that each individual occupies a residence in the community and derives utility from the consumption of a variety of commercial goods and services. In order to purchase the goods and services, consumers have to incur a travel cost to get to the location where the goods and services are provided. The production of each variety of commercial goods and services is symmetric and requires a fixed cost.

The commercial market is composed of commercial developers, multi-variety stores (large stores), and single-variety stores (specialized stores).

## 2.1 Consumers

Consider a circular community. Housing is homogeneous and uniformly distributed along the circumference of a unit circle. Residents of the community earn identical income $y$ and consume a variety of goods and

[4] See Gottlieb and Glaeser (2008) for reviews.

services $x(j)$ along with housing services $h$. The utility function is

$$u(h, x(j)) = h\left[\int_0^n x(j)^{(\sigma-1)/\sigma} dj\right]^{\sigma/\sigma-1}$$

where $n$ is the number of varieties of goods and services available , and $\sigma > 1$ is the elasticity of substitution among varieties of goods and services. The larger the $\sigma$, the weaker the consumer preference for variety. For simplicity, I normalize the consumption of housing services $h$ to 1. To purchase any of these goods and services, consumers incur costly travel to the physical place where the varieties are offered.

Suppose there is a shopping center in the community (I will refer to it as "the community shopping center" (CSC)) that provides $n$ varieties of goods and services. For community residents, the travel cost $t$ to the CSC increases with the distance $z$ between their residence and the CSC.

Outside of the community there is a shopping center that provides $n_o$ varieties of goods and services (I will refer to this shopping center as "the outside shopping center" (OSC)). The travel cost to the OSC is $t_o$ for all community residents.

Assume that, for all community residents, it is always less costly to travel to the CSC than to the OSC. In other words, $t(z) < t_o$ for $z \in [0, 1/2]$; 2) the OSC offers weakly more varieties of goods and services than the CSC, i.e., $n_o \geqslant n$; and 3) the price of the same variety is the same in the OSC and the CSC.[5]

The consumption decision of residents consists of two steps: first they decide where to purchase goods and services, and second they decide how much of each variety to purchase. Because residents can buy more varieties at the OSC at the same price, residents who travel to the OSC have no incentive to make another trip to the CSC. Therefore, no consumer will travel to both the OSC and the CSC. A consumer either travels to the CSC at a lower travel cost but fewer varieties or travels to the OSC for more varieties but a higher travel cost.

The consumers' problem is solved by backward induction. Consider a resident who lives distance $z$ away from the CSC (I will call this consumer "consumer $z$"). Suppose she purchases goods and services at the CSC, the her budget constraint will be

$$p^h + \int_0^n x(j)p(j)dj + t(z) = y$$

where $p^h$ is the price of housing services and $p(j)$ is the price of variety $j$. Formally, her utility maximization problem is

$$\underset{x(j)}{Max}\left[\int_0^n x(j)^{(\sigma-1)/\sigma} dj\right]^{\sigma/\sigma-1} \quad s.t.\ p^h + \int_0^n x(j)p(j)dj + t(z) \leq y.$$

From the first order conditions of consumer $z$'s utility maximization problem, we get her demand for con-

[5] We can see from the next subsection, when production of the varieties are symmetric in the OSC and the CSC, the price of the varieties will be the same.

sumption of variety $j$

$$x(j,z) = \left[y - p^h - t(z)\right] p(j)^{-\sigma} P(n)^{\sigma-1},$$

where $P(n) = \left[\int_0^n p(j)^{1-\sigma} dj\right]^{\frac{1}{1-\sigma}}$ is the aggregate price index for goods and services available at the CSC. Consumer $z$'s indirect utility from purchasing goods and services at the CSC will be

$$U(z) = \frac{y - p^h - t(z)}{P(n)}.$$

The indirect utility that residents get from patronizing the OSC is

$$U_o = \frac{y - p^h - t_o}{P(n_o)},$$

where $P(n_o) = \left[\int_0^{n_o} p(j)^{1-\sigma} dj\right]^{\frac{1}{1-\sigma}}$ is the aggregate price index for goods and services available at the OSC.

Consumer $z$ will choose to purchase goods and services at the CSC if $U(z) \geqslant U_o$. He will choose the OSC if $U(z) < U_o$. Let $\widetilde{z}$ be the distance that makes a resident indifferent between the CSC and the OSC, i.e., $U(\widetilde{z}) = U_o$. Without loss of generality, assume that travel costs $t(z) = tz$ are a linear, increasing ($t > 0$) function in $z$, the distance between a consumer's residence and the CSC. We can solve $U(\widetilde{z}) = U_o$ to get

$$\widetilde{z} = \frac{y - p^h - \frac{P(n)}{P(n_o)}(y - p^h - t_o)}{t}.$$

The resident who lives $\widetilde{z}$ distance away from the CSC is the marginal customer at the CSC. Residents who live closer to the CSC than the marginal customer, $z \leq \widetilde{z}$, will patronize the CSC. Residents who live farther to the CSC than the marginal customer, $z > \widetilde{z}$ will patronize the OSC.

## 2.2 Production of commercial goods and services

The production of variety $j$ requires one unit of land and a fixed labor input $\alpha(j)$. In addition to these fixed inputs, each unit of variety $j$ requires $\beta(j)$ units of labor to produce. Assume the commercial market is small relative to the size of the local economy, so labor is supplied competitively at price $w$ and land is supplied competitively at price $r$. The profit function for producers of variety $j$ at the CSC is

$$\Pi(j) = q(j)[p(j) - \beta(j)w] - \alpha(j)w - r.$$

where $q(j)$ is the total demand for variety $j$ at the CSC, The varieties are assumed be produced under monopolistic competition: the supplier of variety $j$ takes $P(n)$ and $P(n_o)$ as given and chooses $p(j)$ to

maximize its profit. The first order condition for this the profit-maximization problem yields an expression for the price of variety $j$

$$p(j) = \frac{\sigma}{\sigma - 1}\beta(j)w.$$

Assuming that production of varieties is symmetric at both the OSC and the CSC, each variety will have the same price, $p(j) = p = \frac{\sigma}{\sigma-1}\beta w$. Therefore, $P(n) = n^{\frac{1}{1-\sigma}}p$, $P(n_o) = n_o^{\frac{1}{1-\sigma}}p$. The quantity of variety purchased by consumer $z$ is

$$\begin{aligned} x(j,z) &= x(z) \\ &= \left[y - p^h - tz\right] p^{-\sigma}(n^{\frac{1}{1-\sigma}}p)^{\sigma-1} \\ &= \frac{y - p^h - tz}{np} \\ &= \frac{y - p^h - tz}{n\beta w}\frac{\sigma - 1}{\sigma}. \end{aligned} \tag{1}$$

An increase in $n$ reduces $x(z)$, the quantity purchased by each consumer who shops at the CSC. When there are more varieties at the CSC, consumers who shop at the CSC buy more varieties but less of each variety.

The marginal customer $\widetilde{z}$ at the CSC is

$$\widetilde{z} = \frac{y - p^h - \frac{P(n)}{P(n_o)}(y - p^h - t_o)}{t} = \frac{y - p^h - (\frac{n}{n_o})^{\frac{1}{1-\sigma}}(y - p^h - t_o)}{t}. \tag{2}$$

Equation (2) implies that the weaker consumer preference for variety (the bigger the $\sigma$), the smaller the number of varieties the CSC needs to attract the same number of consumers, and that the more competitive the OSC (the bigger the $n_o$ or the smaller $t_o$), the larger the number of varieties the CSC needs to attract the same number of consumers.

Note that $\widetilde{z} = 0$ when $n < \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$. This means that a CSC needs to offer a minimum number of varieties $\left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$ in order to attract positive consumer traffic. Also, $\widetilde{z} = 1/2$ when $n > \left(\frac{y-p^h-t_o}{y-p^h-\frac{1}{2}t}\right)^{\sigma-1} n_o$. This means that increasing the number of varieties will not attract more consumers when all community residents shop at the CSC, which means that consumers who live outside low-income communities will not shop in these communities, a reasonable assumption for inner city communities. For $n \in [\left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o, \left(\frac{y-p^h-t_o}{y-p^h-\frac{1}{2}t}\right)^{\sigma-1} n_o]$, an increase in $n$ increases the mass of consumers who shop at the CSC because

$$\frac{\partial \widetilde{z}}{\partial n} = \frac{-\frac{1}{1-\sigma}(\frac{n}{n_o})^{(\frac{1}{1-\sigma}-1)}(y - p^h - t_o)\frac{1}{n_o}}{t} > 0.$$

The profit for producers of each variety at the CSC is

$$\Pi = \frac{\beta w}{\sigma - 1} q - \alpha w - r = \frac{\beta w}{\sigma - 1}[2\int_0^{\tilde{z}} x(z)dz] - \alpha w - r \tag{3}$$

The number of varieties at the CSC affects the profits generated by each variety at the CSC through its impact on the quantity purchased by each consumer and the number of consumers.

## 2.3 Commercial agglomeration and coordination

Commercial agglomeration of commercial goods and services means that the profit of each variety increases with the number of varieties in a commercial center. Equation (3) shows that the profit of a variety is an increasing function of the total demand for the variety. This means that the source of commercial agglomeration is demand externalities.

An increase in $n$ increases the consumer mass ($\frac{\partial \tilde{z}}{\partial n} \geqslant 0$) and reduces quantity demanded by each consumer ($\frac{\partial x(z)}{\partial n} < 0$). When the number of varieties is small, the positive impact on consumer mass dominates. Commercial goods and services producers all enjoy the positive demand externality they generate. When the number of varieties is large, the negative impact on per-consumer consumption dominates. For a specific community, there exists a number of varieties that maximizes the profit generated for producers of each variety.

Substitute equation (1) and (2) into equation (3), to get the profit of each variety provided at the CSC

$$\Pi = \begin{cases} -\alpha w - r, & n < \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o \\ \frac{(y-p^h)^2 - (\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn\sigma} - \alpha w - r, & \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o \leq n \leq \left(\frac{y-p^h-t_o}{y-p^h-\frac{1}{2}t}\right)^{\sigma-1} n_o \\ \frac{[(y-p^h)-\frac{1}{4}t]}{n\sigma} - \alpha w - r & n > \left(\frac{y-p^h-t_o}{y-p^h-\frac{1}{2}t}\right)^{\sigma-1} n_o \end{cases}.$$

I show, in Appendix A.3, that the profit of a single variety $\Pi$ is maximized at $n^* = \left(\frac{\sigma+1}{\sigma-1}\right)^{\frac{\sigma-1}{2}} \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$.[6] The agglomeration economies of commercial goods and services is illustrated in Proposition 1, which shows that before a CSC reaches $n^*$, the profit of each variety weakly increases with the number of varieties provided at this CSC:

**Proposition 1** $\frac{\partial \Pi(n)}{n} = 0$ *for* $n < \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$ *and* $\frac{\partial \Pi(n)}{n} > 0$ *for* $n \in [\left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o, n^*]$.

***Proof.*** *See Appendix A.1* ■

To understand the importance of economic agglomeration effects in stores' decision to enter a community, imagine a commercial market with only symmetric single-variety stores ("specialized stores" from now on). We can think of these stores as small businesses like candle stores, dry cleaners, bakeries, and other stores

[6] $n^*$ is the optimal commercial agglomeration for each variety and is different from the optimal commercial agglomeration for a commercial center.

that sell one type of product. I will focus on communities with $\Pi(n^*) \geqslant 0$. Communities with $\Pi(n^*) < 0$ are not an interesting case because entry of stores is not their only problem. These communities will not be able to sustain a shopping center without further government subsidy, even if the government built a CSC with $n^*$ varieties of goods and services.

We are more interested in understanding why stores do not enter communities with $\Pi(n^*) \geqslant 0$, where they can earn positive operating profits. Proposition 2 shows that an inefficient outcome can arise in these communities when the commercial market is composed of symmetric specialized stores:

**Proposition 2** *If a commercial market is composed of symmetric specialized stores, for a community with* $\Pi(n^*) \geqslant 0$*, no goods and services provided in the community,* $n = 0$*, is a Nash equilibrium outcome.*

**Proof.** See Appendix A.2. ■

The intuition is that a specialized store will not enter a community when there is no commercial agglomeration to generate positive profits. A market with only specialized stores will face a coordination problem, which leads to the inefficient equilibrium outcome of no CSC in communities with $\Pi(n^*) \geqslant 0$.

Successful commercial agglomeration of specialized stores with no explicit market coordination mechanism usually rely on the presence of natural amenities such as beaches or historical attractions. For communities without such natural amenities, this kind of commercial flourishing may not happen.

## 2.4 A commercial market with developers, multi-variety stores, and specialized stores

The existence of a profitable alternative equilibrium creates an opportunity for agents who have coordination ability.[7] In the commercial market, these agents are commercial developers and multi-variety stores (large stores). Commercial development processes in current market conditions usually requires the cooperation of a developer and one or more multi-variety stores. This arrangement is mutually beneficial because developers and multi-variety stores have different coordination abilities. A multi-variety store contains within-store agglomeration of varieties and will have more consumer visits. Commercial developers specialize in identifying a suitable locations, creating the right store mix, and managing lease contracts for a commercial project. It may be too costly for a multi-variety store to acquire the planning ability of a commercial developer[8] and for a developer to coordinate small business to the necessary commercial agglomeration.

The commercial development model is based commonly observed commercial development processes which involve developers, large stores, and specialized stores. A developer is the central planner of a commercial center, large stores are anchor tenants, and specialized stores fill shopping spaces that are not occupied by anchor tenants. A commercial center is assumed to last for infinite time periods once developed.

[7] Rauch (1993) demonstrates that developers of industrial parks can eliminate the inefficient city-industry location equilibrium when the profits are large enough.

[8] One exception is Wal-Mart, which has a division, Walmart Realty, specializing in commercial development located in or around Wal-Mart Stores.

All relevant decisions are made in period 0 in three stages:

- Stage 1: a developer makes the decision to enter a community or not. If the developer decides to enter, then he incurs a cost to identify a suitable site, choose the size of the commercial center, and searches for potential anchor tenants.
- Stage 2: the developer meets with large stores that are potential anchor tenants and negotiates the anchor tenant contracts.
- Stage 3: the developer purchases land, constructs the shopping center, and leases the rest of the retail spaces to specialized stores.

From period 1 on, the commercial center operates and the parties execute the contracts signed in period 0.[9]

The period 0 commercial development game is solved using backward induction. In the third stage, the developer interacts with specialized stores. Assume there are a large number of entrepreneurs who can manage a specialized store in a CSC. These potential small business owners compete for the limited retail spaces available in the shopping center. The competition allows the developer to offer leases that extract all the expected profits from specialized stores. According to the Kramer (2008), "for a retail center with major tenants, smaller tenants represent the largest income potential for the project. Although major tenants may be the primary generator of customer traffic and the financial foundation for attracting initial capital commitments, in-line shops pay higher rents and generate the greatest profits for the developer." Let $r_s$ be the rent that a specialized store pays for each period. Since no specialized store makes any profit, we solve $\Pi(n) + r - r_s = 0$ and get $r_s = \Pi(n) + r$, which is the maximum rent for a space.

Given the size of a shopping center, the developer would like to have more spaces leased to specialized stores. However, the developer has a constraint on the spaces leased to specialized stores. Suppose at the third stage, the developer let entrepreneurs bid for slots in the CSC that are not occupied by anchor stores. If the number of varieties committed to the shopping center is so small that no store makes positive "before-rent profit", $\Pi(n) + r < 0$, then no entrepreneur will be interested in bidding for one slot, assuming that there is no negative rent bid, i.e., $r_s > 0$. To start the bidding, a developer has to commit at least $n'$ varieties at the second stage such that $\Pi(n') + r = 0$. For $n \in (n', n^*]$, we know $\Pi(n) + r > 0$.

In the second stage, the developer and anchor stores negotiate over the total payoffs from the CSC, denoted by $V$.[10] For a CSC with $n$ varieties, the total profit each period equals $n\Pi(n)$. Let $i > 0$ be the interest rate. The discounted present value of total profits $V$ over the life of the CSC equals $\frac{1+i}{i} n\Pi(n)$. Assume the division of $V$ is characterized by a Nash bargaining solution. Let $\theta \in [0, 1]$ be the share that

[9] Renegotiation is not allowed in the model for simplicity. If we allow a positive probability of renegotiation after a developer incurs more site-specific investment, a developer will be more reluctant to invest in low-income communities because renegotiation allows anchor tenants to get larger payoffs.

[10] Bargaining over rents anchor tenants pay and over the total payoff are theoretically the same. There are cases that anchor tenants do not pay rents and also pay lower operation costs.

goes to anchor stores. A bigger $\theta$ means more bargaining power for the anchor tenants. The payoff to the developer is $(1-\theta)V$.

In the first stage, the developer incurs a cost $c$. The cost $c$ is sunk when the developer negotiates with anchor tenants in the second stage, so the developer would not be able to convince the anchor tenants to share the cost. The profit of the developer is $V_d = (1-\theta)V - c$. The developer chooses $n$ to maximize profit:

$$V_d = \frac{1+i}{i}(1-\theta)n\Pi(n) - c.$$

From the first-order condition of the developer's profit maximization problem, we get

$$n^{**} = [\frac{2(y-p^h-t_o)^2}{t\sigma(\sigma-1)(\alpha w+r)}]^{\frac{\sigma-1}{1+\sigma}} n_o^{\frac{2}{1+\sigma}}.$$

The developer's maximum profit is

$$V_d(n^{**}) = \frac{1+i}{i}(1-\theta)n^{**}[\frac{(y-p^h)^2 - (\frac{n^{**}}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn^{**}\sigma} - \alpha w - r] - c.$$

The derivation is in Appendix A.3. If $V_d(n^{**}) \geqslant 0$, the developer will incur the cost $c$ to initiate the development of a CSC. If $V_d(n^{**}) < 0$, the developer will not initiate the project.

Proposition 3 shows that a developer's maximum profit from a CSC increases with the average level of income in the community when consumers' preference for variety is not too weak.

**Proposition 3** $\frac{dV_d(n^{**})}{dy} = (1-\theta)\frac{dV(n^{**})}{dy} \geqslant 0$ *when* $\sigma \leq \frac{2(y-p^h)}{t_o} - 1$.

***Proof.*** *See Appendix A.4.* ■

In reality, income per square mile is an important determinant of project revenue and is frequently found in feasibility reports for commercial development projects (Kramer (2008)). Other things equal, a community with higher income per square mile will have larger purchasing power and a higher demand. It is not surprising that commercial developments in high-income communities are more profitable. This means that, if make simultaneous developments in all communities are impossible due to exogenous constraints, richer communities will have a higher priority and get commercial development earlier. This result alone does not imply that low-income communities will persistently be under-served by commercial goods and services suppliers.

Persistent under-provision may happen in low-income communities due to the holdup problem that arises when payoffs are shared while costs are not. In the commercial development game, the total payoffs from a CSC are shared by the developer and anchor stores but pre-negotiation costs are borne entirely by the developer. Proposition 4 shows that, in some communities, a CSC may be profitable but will not get built because the developer's share of the payoff will not cover the pre-negotiation costs:

**Proposition 4** *For $y \in [y_1, y_2)$ such that $V(y_1) - c = 0$ and $V_d(y_2) = (1-\theta)V(y_2) - c = 0$, $V(y) - c \geqslant 0$ and $V_d(y) < 0$.*

***Proof.*** *See Appendix A.5.* ■

Communities with income level between $y_1$ and $y_2$ will be under-served by stores because potentially profitable commercial developments are held up by anchor tenants, who will grab a share of the payoffs through anchor contracts and will not share the costs that are sunk to a developer before the negotiation. While this behavior will not deter a developer's decision to invest in communities with $y \geqslant y_2$, because a developer will still make positive profit ($V_d(y) \geqslant 0$ for $y \geqslant y_2$) on these projects, it will deter a developer's decision to invest in communities with $y \in [y_1, y_2)$ even though a CSC will be sustainable and profitable in these communities. This market failure can be addressed by government policies.

# 3 Urban development policies

## 3.1 Incentives to developers

The market failure in communities with income level between $y_1$ and $y_2$ justifies government intervention. Based on the model, the key to address this market failure is to increase the developer's returns to make the developer at least break even on the project. First, consider a lump-sum grant $g$ to a developer. The impact of a lump-sum grant is summarized in Proposition 5:

**Proposition 5** *For a community with $y \in [y_1, y_2)$, a lump-sum grant $g \geqslant -V_d(y)$ to a developer will induce the developer to build a CSC in this community and generate*

1. *private investment from the developer $\frac{1+i}{i} rn^{**} + c$;*
2. *permanent jobs $\beta n^{**} Q(n^{**}) + \alpha n^{**}$;*
3. *sales revenues $\frac{1+i}{i} \frac{\sigma}{\sigma-1} n^{**} Q(n^{**}) \beta w$;*
4. *net profits $V(n^{**}) - c > 0$;*
5. *an increase in consumer surplus each period $2\int_0^{z^*(n^{**})} [U(n^{**}, z) - U_o] dz > 0$.*[11]

***Proof.*** *See Appendix 5.* ■

Other incentives, for example low-interest loans and accelerated deductions, to a developer with a value equivalent to $g$ can also induce the developer to act in under-served communities, like a lump-sum grant. Once a CSC is established in a community with $y \in [y_1, y_2)$, it will operate profitably without further government subsidy, and generate permanent jobs and sustainable economic activity in this community.

[11] The increase in consumer surplus does not guarantee a welfare increase for existing community residents.

Proposition 5 suggests that providing incentives directly to a developer is welfare enhancing due to the positive net profits generated and the increase in consumer surplus. The developer's investment in land and the jobs created at the CSC are not considered net gains for a community. In reality, attracting private investment, creating jobs, and stimulating sustainable economic activities in distressed urban communities are important policy goals and included in empirical evaluation standards for local development programs, because low-income urban communities often suffer from high unemployment rates, deterioration of real property, and low levels of economic activity. Commercial revitalization through direct subsidy to developers has been used successfully in a number of US federal urban Empowerment Zones. As discussed in the introduction, commercial development spurred through grants from an Empowerment Zone has revived Harlem.

The success of commercial revitalization as a place-based policy, which emphasizes positive changes in a targeted location, does not guarantee its success as a people-based policy, which emphasizes welfare improvement for people living in a targeted location. A closer look at the welfare redistribution of the net profits generated by a CSC shows that owners of anchor stores of a CSC are sure winners because they get a positive profit of $\theta V(n^{**})$, and that the developer is likely to be a winner if the size of the block grant $g$ exceeds the loss $c-(1-\theta)V(n^{**})$. Owners of specialized stores make zero profit due to competition for the limited retail spaces in the CSC. Generally, owners of specialized stores are more likely to be residents of the community than owners of anchor stores and developers, which means the profit from commercial revitalization is more likely to go to people who are not residents of the community.

The distribution of the net gain from the increased consumer surplus depends on the ownership of local residential property and the local residential rental market. Residents who own their home keep the consumer surplus while they live in their houses and capitalize the consumer surplus into the price when they sell their homes. Residents who rent will be able to keep the increase in consumer surplus from shopping at the CSC, $U(n^{**},z)-U_o$, if there are enough vacant residential rental properties in the community. Otherwise, they may not benefit from the CSC because the increase in consumer surplus is location dependent, and can be extracted by property owners through an increase in rents.

The welfare of existing residents who rent can decrease if commercial revitalization induces gentrification and forces them to move out of the community.[12] In 2008, the black population in central Harlem was about 77,000, the lowest since the 1920s, while total population increased from about 109,000 in 2000 to 126,000 in 2008. The relationship between the decline of the black population and the commercial revitalization success in this community is an issue that warrants further investigation.

[12] The communities are assumed to be closed to immigration, so I cannot analyze gentrification in this model. I make the assumption of closed communities to investigate the impact of income-segregation on the provision of commercial goods and services. An alternative model includes a distribution of communities sorted by housing prices and an income distribution for residents. A CSC in a low income community can induce some residents of high-income high-housing-price communities to move to low income communities because of the lower housing prices, which will drive up the housing price in the low income community and force existing residents of the low income community in the lower tail of the community income distribution to move.

### 3.2 General tax incentives

Incentives provided directly to commercial developers have been used by spatially targeted economic development programs, such as the federal Community Renewal Initiative that was began in 1994. In addition to Employment Tax Credits, the six Round I federal urban Empowerment Zones that participated in the Community Renewal Initiative each received $100 million in the form of Title XX Social Services Block Grant (SSBG) Funds, some of which were used as incentives to commercial developers. In December 2000, the Community Renewal Tax Relief Act authorized 28 urban (and 12 rural) Renewal Communities. Each designated community may authorize up to $12 million in Commercial Revitalization Deduction (not more than $10 million per project) each year from December 31, 2001 to January 1, 2010.

General tax incentives are more commonly used incentives in spatially targeted economic development programs. Before the federal Community Renewal Initiative program began in 1994, 37 states and the District of Columbia had enacted Enterprise Zone programs. Each of these programs had elements unique to the states, but the most common elements included in these programs were general tax incentives.

Evaluation of the Round I federal urban Empowerment Zones (Hebert et al. (2001), Busso et al. (2010)) found more encouraging outcomes than assessments of state enterprise zones, which generally failed to find significant improvements. Busso et al. (2010) report evidence that some of the positive improvements in the Round I federal urban Empowerment Zones may be the result of block grants rather than tax credits, and emphasize that disentangling the effectiveness of block grants and employment tax credits is necessary to reconcile the assessment of the Round I federal Empowerment Zones and the state enterprise zones. The following analysis offers an explanation for the difference in the context of urban commercial revitalization projects.

Assume that employment tax abatements take the form of tax rebates, i.e., they effectively lower labor costs regardless of the profitability of a firm.[13] Let $s$ be an effective wage subsidy that is equivalent to the employment tax rebates. Under employment tax rebates, the effective labor costs of the stores are $w(1-s)$. The developer will choose

$$n^s = [\frac{2(y-p^h-t_o)^2}{t\sigma(\sigma-1)[\alpha w(1-s)+r]}]^{\frac{\sigma-1}{1+\sigma}} n_o^{\frac{2}{1+\sigma}} > n^{**},$$

and will enter this community if $V_d(n^s; w, r, y) \geqslant 0$.

In this context, employment tax abatements are inferior to incentives to developers for two reasons. First, conditioned on inducing commercial developments, the minimum revenue costs to government using employment tax incentives will be much larger than the equivalent minimum incentives to a developer, because, under employment tax incentives, the government will also lose tax revenue to anchor tenants and developers will over-supply retail spaces ($n^s > n^{**}$) in order to get more tax benefits.

[13] Employment tax credits in federal urban Empowerment Zones can only be claimed against taxable profits of a firm that employs workers. In this model, specialty stores do not make any profit and the developer does not employ any workers (once the commercial center is developed). None of them would be able to access the employment credit under the current market structure.

Second, and more importantly, if $s$ is not large enough, $V_d(n^s; w, r, y)$ will not be sufficiently positive and will not induce developers to invest in under-served communities. We can hardly expect such policies to work in under-served urban communities, because the size of the employment tax credits is determined at the federal level and is uniform across all empowerment zones. This one-size-fits-all federal policy is unlikely to be the right size for many under-served communities. If employment tax incentives induce developers to invest in some communities, these communities will likely have an income level close to $y_2$. This prediction is consistent with empirical evidence from the literature on the effectiveness of general tax incentives, which suggest that general tax incentives are most likely to work in areas with lower unemployment rates and higher income to begin with (Goss and Phillips (1999) and Goss and Phillips (2001)).

Although general tax incentives can induce commercial development in under-served communities, the model developed here predicts that policies based on incentives to developers may be more effective. This prediction explains observed outcomes in under-served urban communities based on the assessment of state and federal urban revitalization policies.

# 4 Conclusion

The commercial development model developed here takes into account the importance and costs of economic agglomeration in the entry decision of stores, and explains the documented under-provision of commercial goods and services in low-income urban communities in the U.S.. It has a number of important implications for commercial revitalization policy in urban communities. Clearly, if the problem facing low-income communities is that a developer's share of the payoffs generated by a commercial project cannot cover the pre-negotiation costs, an effective government policy is to provide incentives to a developer for projects in under-served communities. General tax incentives alone are less likely to trigger commercial developers' investment in low-income communities, and may induce a developer to over-supply retail shopping spaces if the tax incentives are large enough to induce the entry of a developer.

While the policy discussion here is based on commercial development, it also has implications for spatially targeted economic development programs. If the problem in distressed urban communities stems from difficulty achieving economic agglomeration, the existence of which has been generally accepted in the economic geography literature, the general tax incentives appear to be unlikely to spur sustainable economic development because of the non-linear nature of the agglomeration effect. Note that the failure of general tax incentives does not invalidate place based policies as a whole. Policy makers should adopt policies that trigger a non-linear increase in economic activities in order to generate the agglomeration economy needed to fight urban decline (GREENSTONE et al. (2010)) .

The literature on urban poverty (e.g., Kain (1968) and Wilson (1987)) has focused on the spatial mismatch between employment opportunities and housing options for urban residents, which leads to higher unemployment and lower income in inner city communities. This model shows that the welfare of inner

city residents may be further reduced due to the under-provision of commercial goods and services in their communities. The impact of the spatial mismatch between consumption opportunities and housing options faced by low-income urban residents may be significant[14] and is an area for further investigation.

[14] A growing public health literature (e.g., Larsen and Gilliland (2008) and Larson et al. (2009)) suggests that low-income urban residents have reduced access to supermarkets and tend to have less healthier diets and higher levels of obesity.

# References


Acemoglu, D. and Shimer, R. (1999). Holdups and efficiency with search frictions. *International Economic Review*, 40(4):827–849.

Arakawa, K. (2006). A model of shopping centers*. *Journal of Regional Science*, 46(5):969–990.

Busso, M., Gregory, J., and Kline, P. (2010). Assessing the incidence and efficiency of a prominent place based policy. Technical report, National Bureau of Economic Research.

Cuomo, A. (1999). New markets: The untapped retail buying power in americaŠs inner cities. *Washington, DC, Government Printing Office*, 495.

Dixit, A. and Stiglitz, J. (1977). Monopolistic competition and optimum product diversity. *The American Economic Review*, 67(3):297–308.

Fujita, M. (1988). A monopolistic competition model of spatial agglomeration* 1:: Differentiated product approach. *Regional Science and Urban Economics*, 18(1):87–124.

Glaeser, E., Kahn, M., and Rappaport, J. (2008). Why do the poor live in cities the role of public transportation. *Journal of Urban Economics*, 63(1):1–24.

Goss, E. and Phillips, J. (1999). Do business tax incentives contribute to a divergence in economic growth? *Economic Development Quarterly*, 13(3):217.

Goss, E. and Phillips, J. (2001). The impact of tax incentives: do initial economic conditions matter? *Growth and Change*, 32(2):236–250.

Gottlieb, J. and Glaeser, E. (2008). The economics of place-making policies. *Brookings Papers on Economic Activity*, 2008(1):155–239.

Gould, E., Pashigian, B., and Prendergast, C. (2005). Contracts, externalities, and incentives in shopping malls. *Review of Economics and Statistics*, 87(3):411–422.

GREENSTONE, M., HORNBECK, R., and MORETTI, E. (2010). Identifying agglomeration spillovers: Evidence from winners and losers of large plant openings. *Journal of political economy*, 118(3):536–598.

Hebert, S., of Housing, U. S. D., and Development, U. (2001). *Interim assessment of the empowerment zones and enterprise communities (EZ/EC) program: a progress report*. US Dept. of Housing and Urban Development, Office of Policy Development and Research.

Henkel, J., Stahl, K., and Walz, U. (2000). Coalition building in a spatial economy* 1. *Journal of Urban Economics*, 47(1):136–163.

Kain, J. (1968). Housing segregation, negro employment, and metropolitan decentralization. *The Quarterly Journal of Economics*, 82(2):175.

Kline, P. (2010). Place based policies, heterogeneity, and agglomeration. *American Economic Review*, 100(2):383–87.

Kramer, A. (2008). *Retail Development Handbook*. Urban Land Institute.

Larsen, K. and Gilliland, J. (2008). Mapping the evolution of'food deserts' in a canadian city: Supermarket accessibility in london, ontario, 1961–2005. *International Journal of Health Geographics*, 7(1):16.

Larson, N., Story, M., and Nelson, M. (2009). Neighborhood environments:: Disparities in access to healthy foods in the us. *American journal of preventive medicine*, 36(1):74–81.

Pashigan, B. and Gould, E. (1998). Internalizing externalities: the pricing of space in shopping malls. *JL & Econ.*, 41:115.

Rauch, J. (1993). Does history matter only when it matters little? the case of city-industry location. *The Quarterly Journal of Economics*, 108(3):843.

Spence, M. (1976). Product selection, fixed costs, and monopolistic competition. *The Review of Economic Studies*, 43(2):217–235.

Weissbourd, R. and Berry, C. (1999). The market potential of inner-city neighborhoods: Filling the information gap. Technical report, Washington, DC: Brookings Institution.

Wilson, W. (1987). The truly disadvantaged: The inner city, the underclass, and public policy. *Chicago, London*.

# A Appendix

## A.1 Proof of Proposition 1

When $n < \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$, $\frac{\partial \Pi}{\partial n} = 0$ and $\frac{\partial^2 \Pi}{\partial n^2} = 0$. When $n \geqslant \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$,

$$\begin{aligned}\frac{\partial \Pi}{\partial n} &= \frac{-\frac{2}{1-\sigma}\frac{1}{n_o}(\frac{n}{n_o})^{\frac{2}{1-\sigma}-1}(y-p^h-t_o)^2}{tn\sigma} - \frac{(y-p^h)^2-(\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn^2\sigma} \\ &= \frac{\frac{\sigma+1}{\sigma-1}(\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2-(y-p^h)^2}{tn^2\sigma}\end{aligned}$$

The first-order condition $\frac{\partial \Pi}{\partial n} = 0$ yields $n^* = \left(\frac{\sigma+1}{\sigma-1}\right)^{\frac{\sigma-1}{2}} \left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o$ and

$$\frac{\partial^2 \Pi}{\partial n^2}(n^*) = -\frac{2(y-p^h)^2}{tn^{*3}\sigma(\sigma-1)} < 0.$$

## A.2 Proof of Proposition 2

The decision facing a specialized store is to enter a CSC or not. A store will choose to enter if it makes a positive profit.

For communities with $\Pi(n^*) \geqslant 0$, there exists an $\widetilde{n} \in (\left(\frac{y-p^h-t_o}{y-p^h}\right)^{\sigma-1} n_o, n^*]$ such that $\Pi(\widetilde{n}) = 0$ and

$$\Pi(n) = \begin{cases} < 0, & \text{for } n < \widetilde{n} \\ \geqslant 0, & \text{for } \widetilde{n} \leq n \leq n^* \end{cases}$$

In order for the suppliers of variety to make positive profits, a CSC has to provide at least $\widetilde{n}$ varieties.

If $n < \widetilde{n}$, a specialized store will choose not to enter a CSC because $\Pi(n) < 0$. Therefore, $n = 0$ is a Nash equilibrium.

## A.3 The developer's profit maximization problem

The developer's profit is $V_d = \frac{1+i}{i}(1-\theta)n\Pi(n) - c$. Take the first derivative of $V_d$ with respect to $n$, we get

$$
\begin{aligned}
& \Pi(n) + n\frac{\partial \Pi(n)}{\partial n} \\
= \; & [\frac{(y-p^h)^2 - (\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn\sigma} - \alpha w - r] \\
& + n\frac{\frac{\sigma+1}{\sigma-1}(\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2 - (y-p^h)^2}{tn^2\sigma} \\
= \; & \frac{(y-p^h)^2 - (\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn\sigma} - \alpha w - r + \frac{\frac{\sigma+1}{\sigma-1}(\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2 - (y-p^h)^2}{tn\sigma} \\
= \; & \frac{\frac{2}{\sigma-1}(\frac{n}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn\sigma} - \alpha w - r.
\end{aligned}
$$

Solving the first-order condition, $\Pi(n) + n\frac{\partial \Pi(n)}{\partial n} = 0$, we get

$$
n^{**} = [\frac{2(y-p^h-t_o)^2}{t\sigma(\sigma-1)(\alpha w+r)}]^{\frac{\sigma-1}{1+\sigma}} n_o^{\frac{2}{1+\sigma}}
$$

The maximum profit of the developer from a CSC in this community is

$$
\begin{aligned}
V_d &= \frac{1+i}{i}(1-\theta)n^{**}[\frac{(y-p^h)^2 - (\frac{n^{**}}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{tn^{**}\sigma} - \alpha w - r] - c \\
&= \frac{1+i}{i}(1-\theta)\frac{(y-p^h)^2 - (\frac{n^{**}}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)^2}{t\sigma} - \frac{1+i}{i}(1-\theta)n^{**}(\alpha w+r) - c
\end{aligned}
$$

## A.4 Proof of Proposition 3

I use the envelope theorem to show that $\frac{dV_d}{dy} \geqslant 0$ when $\sigma \leq \frac{2(y-p^h)}{t_o} - 1$.

$$
\frac{dV_d}{dy} = \frac{\partial V_d(n^{**})}{\partial y} = \frac{1+i}{i}\frac{2(1-\theta)[(y-p^h) - (\frac{n^{**}}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o)]}{t\sigma}
$$

We know that $n^{**} > n^*$ because the developer chooses $n^{**}$ to maximize the total profits of $n$ varieties supplied, not the profit of one variety, therefore

$$
\begin{aligned}
& (y-p^h) - (\frac{n^{**}}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o) \\
> \; & (y-p^h) - (\frac{n^{*}}{n_o})^{\frac{2}{1-\sigma}}(y-p^h-t_o) \\
= \; & (y-p^h) - \frac{(y-p^h)^2}{(y-p^h-t_o)^2}\frac{\sigma-1}{\sigma+1}(y-p^h-t_o) \\
= \; & (y-p^h)[1 - \frac{y-p^h}{y-p^h-t_o}\frac{\sigma-1}{\sigma+1}] \\
> \; & 0 \text{ if } \sigma \leq \frac{2(y-p^h)}{t_o} - 1
\end{aligned}
$$

$\frac{dV_d}{dy} > 0$ when $\sigma \leq \frac{2(y-p^h)}{t_o} - 1$.

## A.5 Proof of Proposition 4

$V(y) - c \geqslant 0$ for $y \geqslant y_1$ because $\frac{dV}{dy} \geqslant 0$ and $V(y_1) - c = 0$.

$V_d(y) < 0$ for $y \leq y_2$ because $\frac{dV_d}{dy} = (1-\theta)\frac{dV}{dy} \geqslant 0$ and $V_d(y_2) = (1-\theta)V(y_2) - c$.

$y_1 = V^{-1}(c) < y_2 = V^{-1}(\frac{c}{1-\theta})$ because $\frac{dV}{dy} \geqslant 0$ and $c < \frac{c}{1-\theta}$.

## A.6 Proof of Proposition 5

If $y \in [y_1, y_2)$, with a subsidy $g \geqslant -V_d(y)$, the developer's profit will be $V_d(y) + g \geqslant 0$. Therefore, the developer will purchase land with a value of $\frac{1+i}{i} r n^{**}$ and incur cost $c$ to build a CSC that provides $n^{**}$ variety of goods and services.

Every period, the producer of each variety employs $\beta q(n^{**}) + \alpha$ workers and generates revenue $q(n^{**})p = \frac{\sigma}{\sigma-1} q(n^{**})\beta w$.

Since specialized stores do not make profit, we find the total profit by adding up the profit of the developer and the anchor tenants, which equals $V_d(n^{**}) + g + \theta V(n^{**}) = V(n^{**}) + g - c > g$.

Consumers $z \in [0, z^*(n^{**}]$ gain utility from patronizing the CSC, $U(n^{**}, z) - U_o > 0$. Every period, the aggregate consumer surplus due to the CSC is $2\int_0^{z^*(n^{**})} [U(n^{**}, z) - U_o] dz > 0$.

# Department of Economics, University of Alberta
# Working Paper Series

http://www.economics.ualberta.ca/en/WorkingPapers.aspx

| |
|---|
| **2012-03:** Native Students and the Gains from Exporting Higher Education: Evidence from Australia - **Zhou** |
| **2012-02:** The Overpricing Problem: Moral Hazard and Franchises – **Eckert, H, Hannweber, van Egteren** |
| **2012-01:** Institutional Factors, Sport Policy, and Individual Sport Participation: An International Comparison – **Humphreys,** Maresova, **Ruseski** |
| **2011-23:** The Supply and Demand Factors Behind the Relative Earnings Increases in Urban China at the Turn of the 21st Century – **Gao, Marchand, Song** |
| **2011-22:** Tariff Pass-Through and the Distributional Effects of Trade Liberalization – **Ural Marchand** |
| **2011-21:** The Effect of Parental Labor Supply on Child Schooling: Evidence from Trade Liberalization in India – **Ural Marchand**, Rees, Riezman |
| **2011-20:** Estimating the Value of Medal Success at the 2010 Winter Olympic Games – **Humphreys,** Johnson, Mason, Whitehead |
| **2011-19:** Riding the Yield Curve: A Spanning Analysis – **Galvani, Landon** |
| **2011-18:** The Effect of Gambling on Health: Evidence from Canada – **Humphreys,** Nyman, **Ruseski** |
| **2011-17:** Lottery Participants and Revenues: An International Survey of Economic Research on Lotteries – Perez, **Humphreys** |
| **2011-16:** The Belief in the "Hot Hand" in the NFL: Evidence from Betting Volume Data – Paul, Weinbach, **Humphreys** |
| **2011-15:** From Housing Bust to Credit Crunch: Evidence from Small Business Loans – **Huang, Stephens** |
| **2011-14:** CEO Turnover: More Evidence on the Role of Performance Expectations – **Humphreys,** Paul, Weinbach |
| **2011-13:** External Balance Adjustment: An Intra-National and International Comparison - **Smith** |
| **2011-12:** Prize Structure and Performance: Evidence from NASCAR – Frick, **Humphreys** |
| **2011-11:** Spatial Efficiency of Genetically Modified and Organic Crops – Ambec, **Langinier**, Marcoul |
| **2011-10:** Unit Root Testing with Stationary Covariates and a Structural Break in the Trend Function - **Fossati** |
| **2011-09:** CDS as Insurance: Leaky Lifeboats in Stormy Seas – **Stephens,** Thompson |
| **2011-08:** Game Attendance and Competitive Balance in the National Hockey League – Coates, **Humphreys** |
| **2011-07:** Rationalization in the Canadian Retail Gasoline Industry: The Role of Environmental Regulations – **Eckert, H; Eckert, A** |
| **2011-06:** Physical Activity and Health Outcome: Evidence from Canada – **Humphreys,** McLeod, **Ruseski** |
| **2011-05:** Dating U.S. Business Cycles with Macro Factors – **Fossati** |
| **2011-04:** Covariate Unit Root Tests with Good Size Power – **Fossati** |
| **2011-03:** New measures of the costs of unemployment: Evidence from the subjective well-being of 2.3 million Americans – Helliwell, **Huang** |

**Please see above working papers link for earlier papers**