Consumer preference and the landscape of coffee shops

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Introduction

Increasing numbers of international chain stores are found in the city, which Ritzer (1983) famously warned as Mcdonaldisation of society. In particular, the domination of the coffee industry in the UK is conspicuous, where three international coffee chains, namely Costa Coffee, Starbucks Coffee Company, and Caffè Nero, occupy 52.9 % of the marketplace (Allegra Strategies, 2018). Meanwhile, despite their popularity, a survey has revealed that some consumers grow antipathy toward such hegemony of international coffee chains and persistently choose local artisan coffee shops (Thompson and Arsel, 2004). This work aims to investigate the impact of such preferences of consumers on the distribution of coffee shops in the city.

Preferences of consumers on brands have been investigated with computational models (Bass and Talarzyk, 1972). Especially, agent based model has been extensively used to model the relationships between consumers and retailers as it enables us to model individual consumers. Vanhaverbeke and Macharis (2011) explored emergent spatial patterns of retail locations by considering commuting behaviours of consumers. The model also takes into account cognitive maps and social interactions of consumers. Schenk, Löffler, and Rauh (2007) estimated profits of actual retail stores in northern Sweden based on the attributes of stores and consumers.

Those attributes are based on the census and survey data, which include the location of stores, the price of products and preferences of consumers. Finally, Chen and Liu (2018) employed various pricing strategies for retail stores, and the difference in cumulative profits are observed. In their model, while the consumers select stores based on the distance, quality, and price, retail stores adjust their prices according to their pricing strategies.

With the aim to model the emergent spatial patterns of coffee stores, this work also employs agent based model where the interplay of consumers with different preferences and coffee stores are observed. The detailed description of the model can be found in the attached Netlogo file in the form of ODD.

Discussion of the results

The resulted spatial patterns of the coffee shops based on the consumers' preferences in the area is demonstrated in this section. Figure 1 illustrates the initial environment of the city where 4 local artisan coffee shops (pink) and 4 international chain coffee shops (blue) exist. The first scenario assumed that the equal numbers of people prefer to buy coffee at local artisan shops and at international chain coffee shops. The population types in the area is shown in Figure 2, and the area is populated with the population as illustrated in Figure 3.
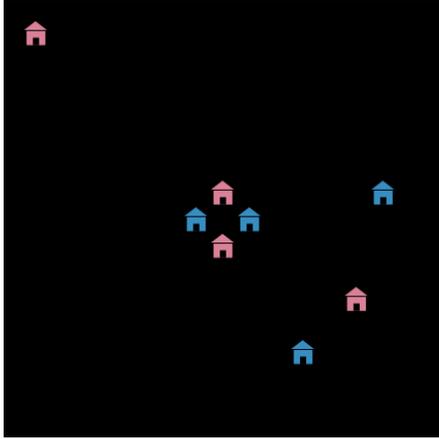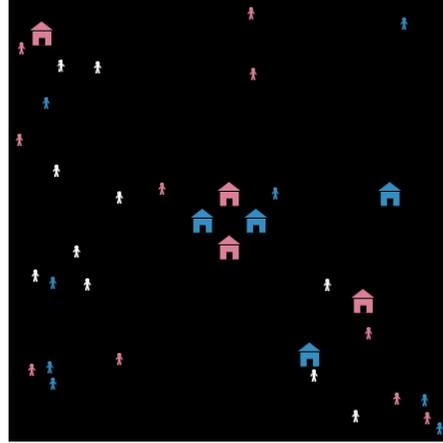
Figure 1: Initial environment

Figure 3: Scenario1 set-up

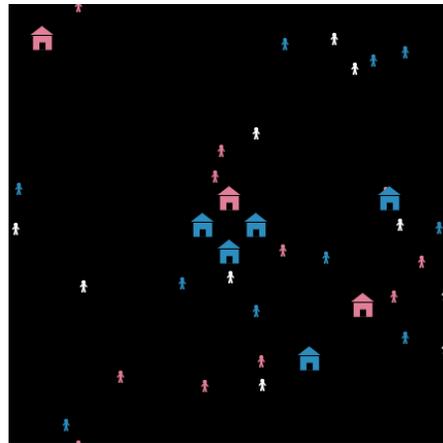| Type of Consumer	Population
Consumer 1: Purchase coffee at local artisan shop for 90 % and international chain shop for 10 %. (pink)	10
Consumer 2: Purchase coffee at local artisan shop for 10 % and international chain shop for 90 %. (blue)	10
Consumer 3: Purchase coffee merely based on the proximity to the shop. (white)	10

Figure 2: Scenario 1 population

Figure 4: Scenario 1 result

The simulation is conducted for 10 times to ensure the repeatability of the simulation result. For all the 10 times of the simulation, one local coffee shop was replaced by international chain shop. The location of the replaced local coffee shop were different in each simulation run. An example image of the emergent spatial patterns of coffee shops is illustrated in Figure 4.

The result gives an interesting insight that international coffee chains can replace a local coffee shop even when there are the same amount of people prefer local shops and chain shops. This is caused because the model assumes that the performance of international coffee chains are measured by the average of associated stores. As such, even if a performance of a local coffee shop is better than that of an international chain store, the local store can potentially be replaced when compared to the average performance of chain stores. Next scenario models the city where more people prefer international chain

coffee shops. The population of the area is shown in Figure 5, and the initial setting of the city is illustrated in Figure 6.

Type of Consumer	Population
Consumer 1: Purchase coffee at local artisan shop for 90 % and international chain shop for 10 %. (pink)	5
Consumer 2: Purchase coffee at local artisan shop for 10 % and international chain shop for 90 %. (blue)	20
Consumer 3: Purchase coffee merely based on the proximity to the shop. (white)	5

Figure 5: Scenario 2 population

In the same way as the first scenario, the simulation is executed for 10 times. In this scenario, three local coffee shops are replaced for all the 10 simulation run. Similarly to the first scenario, the replaced local coffee shops are varied for each simulation. An example of the resulted landscape of coffee shops is shown in Figure 7. This result implies that in the world where more people prefer international coffee chains, while seemingly obvious, large numbers of local coffee shops are replaced. Interestingly, though, the last remained local coffee shop was very unlikely to be replaced as Figure 8 illustrates. Shop-1 in Figure 8 corresponds to the survived local
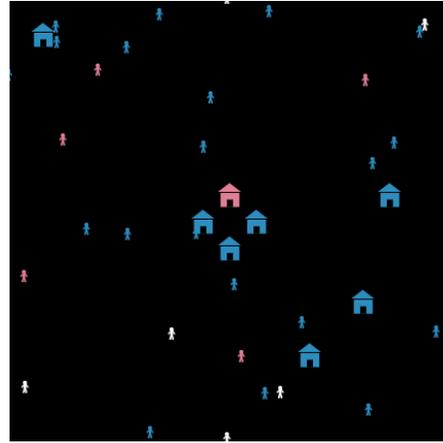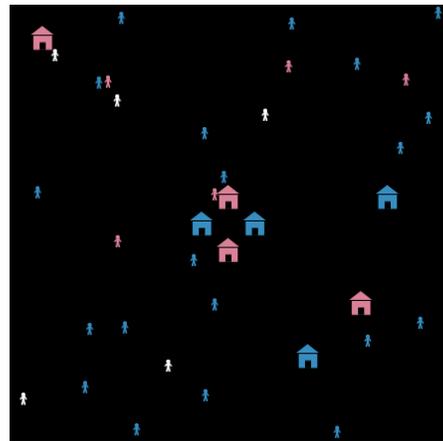

Figure 6: Scenario 2 set-up

Figure 7: Scenario2 result

coffee shop in the Figure 8. As it can be seen, after other local coffee shops are replaced, the profit of shop-1 largely surpasses the profits of other international chain shops, which makes it very difficult for international coffee shops to replace local coffee shop-1. This is because all the consumers who prefer local coffee shops choose shop-1 regardless of the distance.
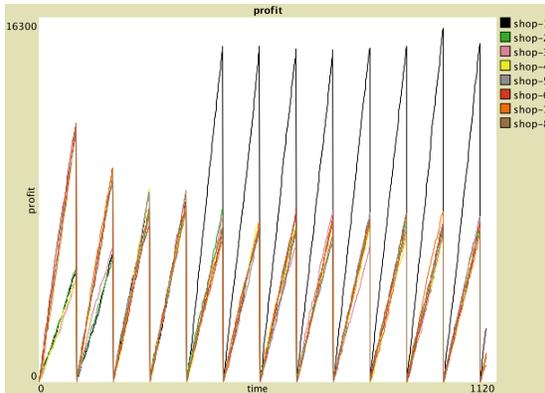
Figure 8: Transition of profits in each store

While the results are insightful in both scenarios, this is certainly an oversimplified model. Firstly, the model assumes that the consumers are equally distributed in the city, which is unlikely the case in the real world. Secondly, international coffee chains can only replace the local stores in the model. In the real world, coffee shops can open in a new location. Especially, for the less competitive area such as the top-left corner in the model can perhaps be a lucrative target and more chain stores are likely to open in the real world. Thirdly, the model distinguished coffee shops merely based on the types of coffee shops, and the price and the quality of the coffee are not varied in local and international coffee shops.

Conclusion

This work attempted to model the relationship of consumers preferences of coffee shop types and the emergent spatial patterns of the coffee shops landscapes in the city. Despite the limitation of the model, the result illustrated interesting interplays between consumers preferences and emerging distributions of coffee shops: (1) local coffee shops are prone to be replaced even though the consumers preferences are not toward international coffee chains, and (2) after the replacement of large numbers of local coffee shops, the remained local coffee shop exhibit strong resisting power. While the international coffee chains, of course, has a various merits, and this work is not intended to blame consumers' certain preferences, it is important for consumers to be aware of the implication of their preferences as it can potentially lead our society to a "bleak and uninteresting" (Ritzer, 1983, p.106) place.

Reference

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