Effects of Hang Da market redevelopment in Hanoi city center viewed from consumers' shop-around behaviors

Graduate school of economics, Fukuoka University	Tran Ngoc Huy[#]
FQBIC[*]; Faculty of economics at Fukuoka University	Saburo Saito
FQBIC	Masakuni Iwami
Faculty of economics at Fukuoka University	Yasufumi Igarashi
Faculty of economics at Fukuoka University	Masakuni Kakoi

1. Introduction

As seen in big Asian cities, Hanoi also shows a typical image of its city center commercial district (CCCD) as lively scenes of daily hustle and bustle at big traditional markets such as Dong Xuan, Hang Be and Hang Da markets. But these traditional markets have been facing with various serious problems such as poor infrastructure system, which have created much inconvenience to customers for traveling, shopping, parking and so on. On the other hand, a number of new modern commercial facilities have been built at suburban areas or the areas neighboring to CCCD of Hanoi, for example, Vincom City Tower, Luxury Mall, Parkson Viet Tower, and Keangnam Complex to name a few.

Emergence of these new shopping complexes would reduce the attractiveness of the CCCD of Hanoi and may lead to its decline. Therefore, the People's Committee of Hanoi (PCH) has been trying to make a plan to implement projects to improve the city center retail environment (CCRE) of Hanoi. Purposes of these projects are to improve CCCD, to attract more consumers to the area, and to increase the effectiveness of the traditional markets. The redevelopment and modernization of the system of traditional markets is thought of as a first step towards this end. The first traditional market to be redeveloped in the CCCD is Hang Da market. The new Hang Da market was opened in October, 2010. To follow this redevelopment, the redevelopments of Dong Xuan and Hang Be markets have been scheduled as the next step.

By modernizing the current traditional market system, these redeveloped traditional markets are expected to keep the course of sustainable growth. While the spatial structure of CCRE is critical for assessing sustainability of these projects, little effort has been made to evaluate this matter. In order to achieve sustainable redevelopment, the redevelopment plan should be made based on cautious consideration of what kind and what size of facilities should be located in what places. These issues heavily depend on the evaluation of spatial structure of CCRE, particularly, on the consumer's shop-around movements within the CCCD. From this perspective, promising methods based on analyzing the information recorded from consumers' shop-around behaviors at CCCDs have been constructed by Fukuoka University of Quantitative Behavioral Informatics for City and Space (FQBIC). These methods estimate and forecast the economic effects of urban redevelopment projects by analyzing how they would change consumer shop-around behaviors which, in turn, would affect turnovers of retail facilities (Cf. [1], [2], [4], [8], [10], [14]).

In this paper, we try to evaluate the effects of Hang Da market redevelopment from the viewpoint of consumer shop-around behaviors. Our study estimates changes in consumer shop-around movements within the CCCD of Hanoi between two points of time, before and after redevelopment of the Hang Da market. For the purpose, in January, 2011, the second on-site survey on consumers' shop-around behaviors in the CCCD of Hanoi was conducted. Apart from the usual questionnaire items concerning the activities of respondents' shop-around behaviors, which are the same as those of the first survey in 2004, the questionnaire items in 2011 contain questions asking respondents about the changes of their shopping behaviors such as shopping frequency and expenditure per purchase after redevelopment of Hang Da market.

From analyzing these micro behavioral changes in consumer shopping behaviors, we estimate how the redevelopment of Hang Da Market has the influence on the aggregate changes of consumer shop-around behaviors.

2. On the consistent OD estimation for the on-site person trip survey

Saito, Nakashima, and Kakoi (2000) first indicated that the choice-based bias necessarily occurs if on-site trip chain data from different sampling points are pooled to be used to estimate shop-around movements among shopping sites. Saito, Nakashima, Kakoi (2001) first have shown the existence of a consistent estimation method to estimate the probability distribution over the shop-around routes. The method is formulated as equation (2.1).

[#] presenter

[*] Fukuoka University of Quantitative Information for City and Space Economy

$$\hat{f}_c(r) = \frac{\sum_{v>0}\sum_{s\in S}\sum_{t\in T}\delta_t^c(r|v,s)\frac{1}{l_S(r_t)}\frac{\tilde{f}_c(s_t|v_t)\,\tilde{\tilde{f}}_c(v_t)}{H(s_t)\,\tilde{\tilde{f}}_c(v_t|s_t)}}{\sum_{r\in R}\sum_{v>0}\sum_{s\in S}\sum_{t\in T}\delta_t^c(r|v,s)\frac{1}{l_S(r_t)}\frac{\tilde{f}_c(s_t|v_t)\,\tilde{\tilde{f}}_c(v_t)}{H(s_t)\,\tilde{\tilde{f}}_c(v_t|s_t)}} \tag{2.1}$$

R denotes the set of all shop-around routes (i.e., trip-chains or paths) and each route is represented by $r \in R$. The route $r \in R$ is represented as a sequence of the nodes such like *r=h132h*, which is also represented as a list: *{(h, 1, 3, 2, h}*. *S* is the set of sampling points and each sampling point is represented by $s \in S$, which also denotes a random variable (*rv*) to express the choice of *s*. Each sample was denoted by *t*. *T* denotes the set of all samples. *v* is a *rv* that represents the frequency of visits to CCCD. $l_S(r_t)$ is the length of route of sample *t*, which is defined as $l_S(r_t) = |\, r_t \cap S\,|$. *H(s)* is the proportion of the number of samples from sampling point *s* to the total number of all samples. The random variable $\delta_t^c(r|v,s)$ is defined as follows:

$$\delta_t^c(r|v,s) = \begin{cases} 1 & \text{if } r_t = r, v_t = v, s_t = s \\ 0 & \text{otherwise} \end{cases}$$

The function $f(r,v,s)$ denotes the joint density of random variables, *r, v, s*. As to the details of the method, readers are referred to the references of [3], [5], and [12].

3. Methodology and survey data

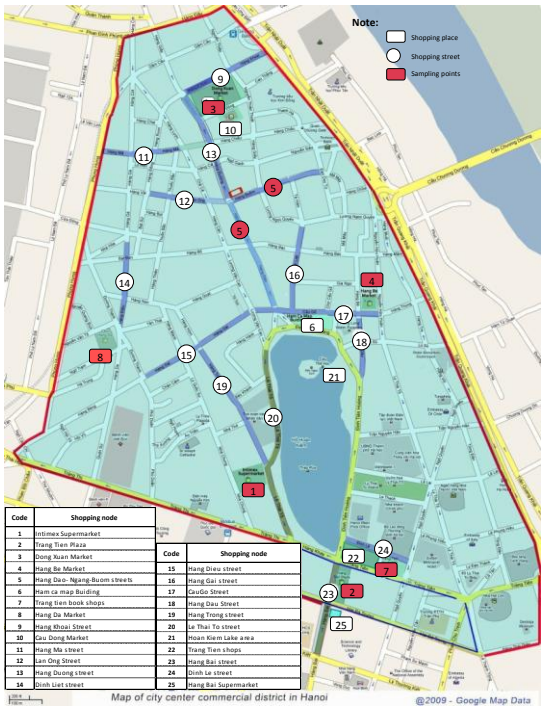
3.1 Methodology

We wish to estimate changes of actual numbers of consumer shop-around movements within the CCCD of Hanoi by using the above consistent estimation method.

According to equation (2.1), the probability distribution over all shop-around routes depends on the following characteristics of shop-around behavior of each consumer: (i) frequency of visit to CCCD; (ii) frequency of visit at different sampling points; (iii) number of stops at sampling points in each consumer's shopping route; (iv) proportion of samples from each sampling point.

As mentioned, in the survey in 2011, we have asked retrospectively the respondents about the changes of their shopping behaviors after the redevelopment of Hang Da Market. More specifically speaking, we obtained above two kinds of frequency data for each respondent retrospectively at two points of time. That is to say, (i) the frequency of visit at CCCD and (ii) that at sampling points are obtained at two points of time, i.e., before and after the redevelopment.

Based on the survey in 2011, we apply the consistent estimation method to shop-around routes obtained from the survey 2011 while using two different data of visit frequency obtained retrospectively at two points of time, i.e., before and after the redevelopment. Thus we get two kinds of density estimations that correspond to two points of time, i.e., present and before the redevelopment.



Code	Shopping node
1	Intimex Supermarket
2	Trang Tien Plaza
3	Dong Xuan Market
4	Hang Be Market
5	Hang Dao- Ngang-Buom streets
6	Ham ca map Building
7	Trang tien book shops
8	Hang Da Market
9	Hang Khoai Street
10	Cau Dong Market
11	Hang Ma street
12	Lan Ong Street
13	Hang Duong street
14	Dinh Liet street

Code	Shopping node
15	Hang Dieu street
16	Hang Gai street
17	CauGo Street
18	Hang Dau Street
19	Hang Trong street
20	Le Thai To street
21	Hoan Kiem Lake area
22	Trang Tien shops
23	Hang Bai street
24	Dinh Le street
25	Hang Bai Supermarket

Figure 3.1 Map of shopping nodes in the CCCD of Hanoi

To expand the density to obtain the actual numbers of shop-around movements, we need actual numbers of visitors at least for one sampling point. To do this, we use data of people counting surveys conducted in April of 2010 at Trangtien Plaza and in August of 2010 at Dong Xuan market area as already reported in [7]. We just use the data from Dong Xuan market area for the density expansion. Note that these two counting surveys are carried out before the new Hang Da market opened.

In this way, while using two different frequency data at two points of time, applying them to one shop-around route of 2011 to derive two density estimates, and expanding them by the actual number of visitors at Dong Xuan market area, we obtain two estimates of total in-migrants to CCCD of Hanoi that

correspond respectively to before and after the redevelopment of Hang Da Market. We regard the difference between these two estimates as the effect of the Hang Da Market redevelopment.

As for the definition of shopping nodes, each shopping street is defined as a shopping node. The shopping building or places also are defined as shopping nodes. As a result, we defined 25 shopping nodes as depicted in Figure 3.1.

3.2 Outline of the second on-site survey on consumer shop-around behaviors in Hanoi

The second survey on consumer's shop-around behaviors was carried out at the CCCD of Hanoi in January, 2011. It was conducted according to joint research agreement between FQBIC and Institute of Transport Planning and Management (ITPM) of University of Communication and Transport of Vietnam. The survey is a fifteen-minute interview survey asking respondents about their shop-around activities on that day. The respondents are chosen at random from visitors at CCCD of Hanoi.

Table 3.1 Outline of the on-site survey of consumers' shop around behaviors at Hanoi CCCD in 2011

Name of survey	On side survey on consumer's shop around behaviors at Hanoi CCCD
Date survey	On Saturday (2011.01.22) and Sunday (2011.01.23)
Survey time	10:00-18:00
Sampling points	7 points (see Figure 3.1) INTIMEX Supermarket; Trangtien Plaza; Inner Dong Xuan market; Hang Be market; Hang Buom-Hang Duong Streets; Bookshops on Trang Tien Street; Hang Da market.
No. of samples	600 samples
Survey method	1. Samples drawn randomly from visitors at Hanoi CCCD 2. Interview respondents with questionnaire for 15 to 20 minutes
Main questionnaire items	1. Personal profile (Resident; Age; gender; occupation…) 2. Places visited, purposes done there, and expenditure there 3. Frequency of visits to Hanoi CCCD and sampling points 4. Average expenditure at Hanoi CCCD and sampling points 5. Frequency of visits to Hanoi CCCD and sampling points before redeveloping Hang Da market 6. Average expenditure at Hanoi CCCD and sampling points before redeveloping Hang Da market

Table 3.2 Numbers of samples obtained from sampling points

No	Sampling points (S)	The number	Percent
1	Intimex Supermarket	60	10.0
2	Trang Tien Plaza	100	16.7
3	Inner Dong Xuan market	100	16.7
4	Hang Be market	80	13.3
5	Hang Ngang- Dao-Buom Streets	100	16.7
6	Trang Tien Bookshops	60	10.0
7	Hang Da Market	100	16.7
Total		**600**	**100.00**

The main questionnaire items, which are the same as the first survey in 2004, are items to record the shop-around history of respondents, that is, the sequence of triples composed of place visited, purpose done there, and expense spent there. Beside these items, the question items are included that ask the respondents about the changes of their shopping behaviors. We asked the respondent retrospectively about frequency of visit at CCCD and sampling points and about expenditure at shopping sites at two points of time, before and after the redevelopment of Hang Da market. Outline of the survey is shown in Table 3.1. The seven sampling points are listed in Table 3.2.

The result of the analysis of frequency of visit at CCCD at two points of time shows that only 23 % (138) of the respondents changed their frequency of visit at CCCD of Hanoi after the redevelopment of Hang Da Market. The average frequency of visit at CCCD of Hanoi at present is 6.17 times per month. The average frequency of visit at CCCD of Hanoi before the redevelopment of Hang Da Market is 5.91 times per month. For the reference, the average frequency of visit obtained in 2004 survey was 4.67 times per month.

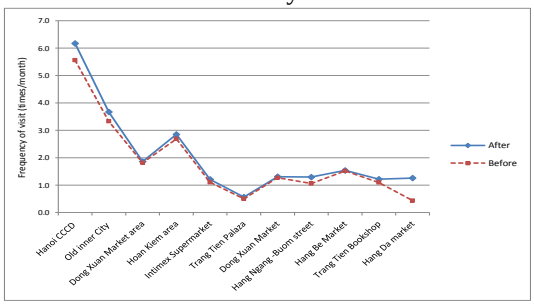


Figure 3.2 Comparison of frequency of visit to shopping sites

Figure 3.2 gives a comparison of frequency of visit between two points of time. From Figure 3.2, there seems to be not much difference in frequency of visit at most of shopping sites between before and after the redevelopment except Hang Da Market. After the redevelopment, the average frequency of visit to Hang Da Market is 2.2 times higher than before.

4. Estimating actual numbers of consumer shop-around movements within CCCD of Hanoi

Following the same method as Saito S. and Huy T. (2010) done in[7], we estimate the actual numbers of shop-around movements among the nodes within CCCD of Hanoi. Here we expanded the OD density matrix with the counted number of visitors at Dong Xuan Market area, which is equal to 12,940 visitors per day.

The estimated results for two cases are shown in Table 4.1. The table indicates that we can distinguish entry visits, shop-around visits, and sojourn visits. In other word, we can distinguish how many consumers visit shopping nodes from their home (entry-visits), how many consumers visit shopping nodes from other shopping nodes (shop-around visits), and how many consumers stay at the same shopping node between two consecutive stops among their shop-around route (sojourn visits). As a reference, Table 4.1 also gives the result using shop-around routes obtained from 2004 survey and the actual number of visitors at Dong Xuan Market area in August of 2010, (Cf [7]).

Table 4.1 Summary of the estimated numbers of consumers' entry visits and shop-around visits

Code	Shopping Nodes	After redeveloping Hang Da Market (After October, 2010)				Befor redeveloping Hang Da Market (before April, 2009)				Estimated results in 2004			
		Entry visit	Shop-around visit (B=b1+b2)		Total	Entry visit	Shop-around visit (B'=b'1+b'2)		Total	Entry visit	Shop-around visit (B"=b"1+b"2)		Total
		(A)	Around visit (b1)	Sojourn visit (b2)	C=A+B	(A')	Around visit (b'1)	Sojourn visit (b'2)	C'=A'+B'	(A")	Around visit (b"1)	Sojourn visit (b"2)	C"=A"+B"
1	Intimex Supermarket	9,186	10,089	18,022	**37,297**	8,826	9,876	17,285	**35,987**	10,385	2,359	14,541	**27,284**
2	Trang Tien Plaza	4,504	3,075	8,520	**16,099**	5,103	3,107	8,414	**16,625**	4,710	2,127	6,186	**13,023**
3	Dong Xuan Market	5,371	7,569	15,376	**28,316**	5,415	7,525	15,562	**28,502**	4,501	8,439	12,855	**25,795**
4	Hang Be Market	6,907	9,652	13,122	**29,681**	6,716	8,789	12,436	**27,941**	9,014	8,850	24,486	**42,350**
5	Hang Dao- Ngang-Buom street	23,440	13,137	27,066	**63,643**	22,894	13,298	26,915	**63,107**	27,437	1,799	56,492	**85,728**
6	Ham ca map Buiding	5,090	8,884	1,203	**15,176**	6,589	8,398	2,285	**17,272**	2,473	3,482	3,342	**9,297**
7	Trang tien book shop	6,099	13,315	5,667	**25,081**	6,586	11,347	7,150	**25,082**	10,622	6,286	12,264	**29,172**
8	***Hang Da Market***	*9,831*	*6,785*	*7,188*	***23,804***	*4,066*	*5,245*	*3,406*	***12,717***	*2,136*	*230*	*0*	***2,367***
9	Hang Khoai Street	2,217	4,321	83	**6,622**	2,286	3,783	81	**6,150**	1,094	2,640	0	**3,734**
10	Cau Dong Market	1,553	6,014	503	**8,070**	1,272	5,463	455	**7,189**	2,382	5,263	1,603	**9,247**
11	Hang Ma street	91	3,345	0	**3,436**	60	2,514	0	**2,574**	71	0	0	**71**
12	Lan Ong Street	78	380	34	**492**	127	167	30	**324**	65	27	0	**92**
13	Hang Duong street	1,117	3,597	416	**5,130**	1,350	4,658	390	**6,398**	3,952	35	633	**4,620**
14	Hang Dieu street	783	2,401	0	**3,184**	317	900	0	**1,217**	91	0	0	**91**
15	Hang Gai street	351	3,409	915	**4,675**	168	1,260	451	**1,878**	563	90	0	**653**
16	Dinh Liet street	1,369	66	0	**1,436**	1,272	35	0	**1,307**	447	436	0	**882**
17	CauGo Street	1,048	3,307	198	**4,554**	918	2,648	140	**3,706**	6,883	6,709	3,401	**16,993**
18	Hang Dau Street	19	2,852	0	**2,871**	15	3,569	0	**3,584**	1,304	2,450	0	**3,753**
19	Hang Trong street	206	1,369	0	**1,575**	105	787	0	**892**	591	0	0	**591**
20	Le Thai To street	2,397	4,554	0	**6,951**	1,715	3,512	0	**5,227**	1,290	141	234	**1,665**
21	Hoan Kiem Lake area	8,499	23,473	4,100	**36,073**	7,638	19,639	4,835	**32,112**	1,356	7,714	72	**9,141**
22	Trang Tien shops	3,527	8,448	3,151	**15,126**	2,043	7,665	1,737	**11,446**	650	6,152	817	**7,619**
23	Hang Bai street	301	0	0	**301**	146	0	0	**146**	418	522	0	**941**
24	Dinh Le street	4,137	1,545	5,687	**11,369**	3,905	1,224	4,432	**9,560**	1,421	4,427	385	**6,232**
25	Hang Bai Supermarket	2,351	1,919	2,140	**6,411**	1,653	1,804	1,120	**4,577**	1,584	1,351	0	**2,935**
Total		**100,473**	**143,506**	**113,392**	**357,371**	**91,186**	**127,212**	**107,121**	**325,519**	**95,440**	**71,527**	**137,310**	**304,277**

5. Effects of Hang Da market redevelopment viewed from consumer shop-around behaviors

5.1 Hang Da market redevelopment project

The old Hang Da market is a traditional indoor market. It is one of the three big traditional markets in the CCCD of Hanoi. Hang Da market was built in 1989 with shopping floor area of 3,716sqm, consisting of two main stories of wares. Before its reconstruction, the market is business place of 528 small retail shops and three state-owned enterprises. The merchandise includes food, wine, flower and clothing and other daily goods. The market is thus so popular to the locals. However, after a long time of use, infrastructure of the Hang Da market is mostly out of date and does not meet consumers' shopping demands as well as environment and fire safety requirements. These matters badly affect business of retailers in Hang Da Market as well as attraction of Hanoi CCCD to consumers. In order to solve this problem, the PCH decided to carry out the Hang Da Market redevelopment project on October 3, 2007.

The construction of new Hang Da Market started in April, 2009 and completed in October, 2010. New Hang Da Market is a 5-storey building and two basements with 17,530sqm total shopping floor area, comprising approximately 10,000sqm of modern retail space and 7,530sqm for a traditional market. The unique structure of the complex makes it distinguishable from other shopping sites. New Hang Da Market is expected to become an attractive shopping place not only for local consumers but also international tourists.

5.2 Effects of Hang Da market redevelopment viewed from consumer shop –around behaviors

The new Hang Da market increases not only the quality of shopping environment but also the shopping floor area. Its shop floor area becomes more than 4.5 times larger than the previous one.

From Table 4.1, we can evaluate the effects of Hang Da Market redevelopment from the changes of consumer shop-around movements within CCCD of Hanoi. From the table, we see that the net increase of in-migrants to CCCD, i.e., entry visits, is about 9,300 persons per day. This net increase of entry visits leads to the increase of total visits of about 25,600 persons per day due to their shop-around behaviors.

We summarize the result of comparisons in Table 5.1. It should be noted that the effects of the Hang Da Market redevelopment on shopping nodes near Hang Da market vary node by node. For instance, as for Hang Gai Street, Hang Dieu Street, Hang Trong and Lan Ong streets, the numbers of visits at these shopping nodes have increased by over 40%. The numbers of visits at most of shopping nodes have increased. But there are four shopping nodes that decrease the numbers of visits. They are Hang Duong Street, Ham Ca Map buiding, Hang Dau Street and Trang Tien plaza. The decreases of Hang Dau and Hang Duong Street are over 20%.

Now look at Table 5.1 to compare consumer shop-around movements between 2004 and 2011. From ΔC2 in Table 5.1 we see that the increase of the number of visits at CCCD from 2004 to 2011 becomes 77,012 persons per day. Note that beside the Hang Da Market redevelopment, there have been many other changes in CCCD such as developments of public transport system and openings of new shopping sites at suburban areas during 2004 to 2011. However, if we compare the above ΔC2 with ΔC1, the increase of the number of visits at CCCD which is regarded as caused by the Hang Da Market redevelopment, ΔC1 becomes 25,581 persons per day that accounts for 33% of ΔC2, 77,012 persons per day, the total changes of the number of visits from 2004 to 2011. Thus the change caused by the redevelopment of Hang Da Market may be thought of as a significant event having a relatively large impact on the total change of CCCD of Hanoi.

Table 5.1 The changes of numbers of visitors at shopping sites in CCCD of Hanoi

Code	Shopping Nodes	Changes of numbers of visits to shopping nodes after Hang Da redeveloping			Changes of numbers of visits to shopping nodes during the preriod from 2004 to 2011		
		Entry visit	Shop-around visit	Total	Entry visit	Shop-around visit	Total
		ΔA1= A-A'	Δb1= b1-b1'	ΔC1=ΔA1+ Δ b1	ΔA2= A-A"	Δb2= b1-b1"	ΔC2=ΔA2+ Δ b2
1	Intimex Supermarket	360	213	**572**	-1,199	7,730	**6,531**
2	Trang Tien Plaza	-599	-33	**-632**	-206	948	**742**
3	Dong Xuan Market	-44	44	**0**	870	-870	**0**
4	Hang Be Market	191	864	**1,054**	-2,107	802	**-1,305**
5	Hang Dao- Ngang-Buom street	546	-161	**385**	-3,997	11,338	**7,342**
6	Ham ca map Buiding	-1,499	486	**-1,013**	2,616	5,402	**8,019**
7	Trang tien book shop	-487	1,968	**1,481**	-4,522	7,029	**2,506**
8	***Hang Da Market***	*5,765*	*1,541*	***7,305***	*7,695*	*6,555*	***14,250***
9	Hang Khoai Street	-69	539	**470**	1,123	1,681	**2,804**
10	Cau Dong Market	281	552	**833**	-829	752	**-77**
11	Hang Ma street	31	831	**861**	19	3,345	**3,364**
12	Lan Ong Street	-49	213	**163**	13	353	**365**
13	Hang Duong street	-234	-1,060	**-1,294**	-2,836	3,562	**726**
14	Hang Dieu street	467	1,500	**1,967**	692	2,401	**3,093**
15	Hang Gai street	183	2,149	**2,332**	-212	3,319	**3,107**
16	Dinh Liet street	97	31	**128**	923	-370	**553**
17	CauGo Street	130	659	**789**	-5,835	-3,401	**-9,236**
18	Hang Dau Street	4	-717	**-712**	-1,285	403	**-882**
19	Hang Trong street	101	582	**683**	-385	1,369	**984**
20	Le Thai To street	682	1,042	**1,724**	1,107	4,413	**5,520**
21	Hoan Kiem Lake area	862	3,834	**4,695**	7,144	15,759	**22,903**
22	Trang Tien shops	1,483	783	**2,266**	2,877	2,296	**5,173**
23	Hang Bai street	155	0	**155**	-117	-522	**-639**
24	Dinh Le street	232	321	**553**	2,716	-2,882	**-166**
25	Hang Bai Supermarket	698	115	**813**	767	568	**1,335**
Total		**9,287**	**16,294**	**25,581**	**5,033**	**71,979**	**77,012**

6. Conclusion

Based on the micro behavior changes in consumer shopping behaviors, we try to assess the aggregate effects of Hang Da market redevelopment by employing the consistent OD estimation method to estimate shop-around patterns due to Saito, Nakashima, and Kakoi (2001, 2003).

The results of this research show that Hang Da redevelopment project have the positive effects on consumers' shop-around movements. It leads to a significant increase of the number of in-migrants to CCCD of Hanoi and also leads to some increase of the numbers of visitors at shopping nodes among CCCD of Hanoi due to their shop-around behaviors. More specifically speaking, not only the number of visitors at

Hang Da market increases strongly but also the numbers of visitors at shopping sites neighboring to Hang Da market also increase significantly.

Moreover, if we compare the change of the number of in-migrants to CCCD of Hanoi during the period from 2004 to 2011 and that from 2009, the time before the redevelopment of Hang Da Market to 2011, the time after the redevelopment, we find the fact that the change from 2004 to 2011 is not very large in comparison with that from 2009 to 2011. This fact seems to reflect quite accurately the transition of actual practical statuses of development in CCCD of Hanoi. There had been no big development project that aims to improve retail environment and to encourage consumers to go shopping at CCCD of Hanoi before the redevelopment project of Hang Da Market started.

The People's Committee of Hanoi (PCH) seems to have known this issue. They launched some plans to redevelop a series of shopping sites in CCCD of Hanoi such as Hang Da market, Hang Be Market, Trang Tien Palaza and Dong Xuan Market. Hang Da Market redevelopment project was the first of this plan. Our analytical result to demonstrate that the Hang Da market redevelopment project has made a significant contribution to CCCD of Hanoi gives a strong support for the city planners of Hanoi to pursue other on-going projects. Such projects would create such positive effects on consumer shop-around movements that increase their frequency of visit to CCCD and extend their shop-around route within CCCD.

Due to the limitation of resources, the date when the on-site shop-around survey was conducted is forced to become different from the date when the people counting surveys were conducted. The people counting surveys were carried out only in 2010. Apparently, it would be ideal if we could have conducted both the on-site survey of consumer shop-around and the people counting survey at the same time and if we could have conducted the people counting survey at two points of time as the on-site surveys were carried out.

Additionally, our study here has been confined to assessing the effects of Hang Da redevelopment based on the change of frequency of visits of consumers. Some other factors having the effects on consumer shop-around movements such as changes of shop-around routes are still untouched. Those topics are left for the future studies.

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