# A System Dynamics Approach to Assessing the Effects of Electronic Commerce on Local Economy in Korea

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## Abstract

*The advent of nearly ubiquitous information infrastructures is raising two hypothetical questions conflicting each other in economic point of view. The one is that cyberspace, a parallel electronic world as a laboratory of new social and commercial practices will eventually resolve the problem of economic disparity by presenting equal opportunities to both the haves and the have-nots through the removal of barriers in terms of time and space. The other is that the problem of economic disparity will be amplified by the new rule, 'winner gets the most,' which would perhaps be unavoidable in digital economy. As an initial attempt to tackle the questions listed above, by introducing 'systems thinking' and adopting the systems dynamics simulation technique this paper puts an effort to find some tentative answers to the questions possibly raised about the impact of electronic commerce on local economy on which little research has been conducted so far. The general scheme for the dynamism of systems where two groups of electronic malls compete each other and the findings presented in the paper would perhaps provide some ideas and directions for further study*

*Key words: system dynamics, electronic commerce, online shopping mall, economic disparity*

# 1. Introduction

The explosive growth of information technologies in recent years, particularly the rise of the Internet and its related applications, has created unprecedented opportunities, but also threats for us. In most areas of our society, especially in commerce, the Internet is changing almost everything. Our economy is being transformed to the electronic-commerce economy in which a rapidly increasing number of consumer purchase transactions are being made via the Internet (Parker, 2000). The recent growth of consumer retailing over the Internet draws attention to the electronic economy. Some studies have tried to quantify the impact of EC at the macroeconomic level. For example, the Australian Department of Communication, Information Technology and Arts (1999) estimates that the net impact could be a 2.7 percent increase in the level of national output. Another study suggests that the rise of B2B e-commerce will in the long run increase the level of GDP by 5 percent (Goldman Sachs, 2000). The electronic economy is also expected to affect many important measures of economic performance. For example, investments in electronic business infrastructure and improved business practices (electronic business) are widely thought to be the driving force behind the current period of sustained U.S. economic growth with low inflation, low unemployment, and rising productivity (Atrostic et al, 2000). There is a substantial body of research evidences demonstrating significant improvements in the economies of regions resulting from the investment in electronic infrastructure. Furthermore, the payoffs are greater if the more rural is the location of the investment. This is not surprising because the two major barriers to rural economic growth are the distance and the lack of economies of scale (because of smaller market size). So there also is interest in assessing whether such impacts vary across firms, industries, regions, or sectors.

## 1.1 Two Conflicted Hypothetical Questions

The advent of nearly ubiquitous information infrastructures is raising two hypothetical questions conflicting each other in economic point of view. The one is that cyberspace, a parallel electronic world as a laboratory of new social and commercial practices will eventually resolve the problem of economic disparity by presenting equal opportunities to both the haves and the have-nots through the removal of barriers in terms of time and space (Carincross, 1997). The other is that the problem of economic disparity will be amplified by the new rule, ‘winner gets the most,’ which would perhaps be unavoidable in digital economy.

It might be predicted that the commerce in electronic manner will hold the potential for immense efficiency gains up and down industry value chains, and it has become a

general belief that the consumer is likely to gain access to a broad selection of lower-priced goods and there will be many opportunities to make possible consumers' direct access to the potentially vast amount of commerce through the Internet bypassing the intermediaries (Kim et al, 1999). The newly emerging practices in commerce as such are definitely a good opportunity to the end customers, the competitive business firms, and the regions with sufficient social and economic infrastructures.

On second thought, however, taking it into account that the rich becomes richer and the poor becomes poorer in digital economy, the electronic commerce may not always work positively to all of the economic entities (Arthur, 1996). Rather it may work even worse to the have-nots and the regions long been alienated in the process of gaining economic prosperity. The vicious cycle of reproduction on an enlarged scale residing in the new rules of digital economy will make more serious the problem of the disparity and unbalanced distribution of wealth in nation wide.

### 1.2 Questions about the Electronic Malls

Starting from the two competing hypothetical perspectives aforementioned, this paper attempts to answer to the generic question on the effects of new commercial practices, i.e., electronic commerce (EC) on the local economy in Korea which is facing a serious economic disparity between Seoul metropolitan area and the other regions of the nation. However, considering EC still remains at burgeoning stage and thus the empirical data are hardly available for this purpose, the scope of EC is narrowed down to B2C around electronic shopping malls and the research aims at assessing the effects of electronic shopping malls on local economy in Korea, with an attempt to find tentative answers to the consecutive questions as follows:

What is the generic structure of competition between the two groups of electronic malls – the one inside a certain region selected (‘in-region’ malls hereinafter) and the other whose head-office is located out of the region (‘out-region’ malls hereinafter); and is it possible to construct a conceptual model by some means?

What are the critical success factors for electronic malls; and is it possible to devise the formulas of measuring the magnitude of their attraction and retention of customers and include them in the model?

What would be the effects of electronic malls on local economy over a certain time horizon; is it positive or negative and what about the magnitude of the effects, if current situations sustain?

What are the major leverage points anticipated to promote the performance of regional electronic malls so that they can make positive contributions to local economy?

### 1.3 Overview of Research Framework

Prior researches (Lee, 1996, Park, 1997, Lee, 1997, Chu, 1998, Choi, 1998, Kim, 1999) concerning electronic shopping malls are mostly related to the development of strategies and classification frameworks, and the identification of the critical success factors in social and technical context, etc., whereas an investigation of their possible contributions to local economy as the front-end of EC has received little attention. As an initial attempt to tackle the questions listed above, this paper introduces some hypothetical situations and assumptions so as to simplify the problems to probe:

First, there are two groups of electronic malls competing each other: one group is physically stationed in Seoul metropolitan area where more than sixty percent of the national wealth is concentrated, and the other in Chungchong Province with Daejon metropolitan city included (about 120 kilometers south of Seoul), a region alienated in the process of economic growth in the past like the rest of the nation.

Second, the performance of electronic malls in terms of attracting and retaining customers is indifferent to the their types though they are generally classified into four categories such as 'online only' versus 'both online and offline' as storefronts of offline companies, and 'specialized' versus 'general.' Rather it is assumed more affected by the business-related aspects including the size of staff, investment in promotions, frequency of visit to the site by customers, etc., and some technical concerns like ease of access, interactivity of web site, all of which are measurable to an extent and thus inclusive in the formulas for assessing the average magnitude of attraction and retention of customers by each group of electronic malls.

Third, the contribution of electronic malls to local economy is determined by the size of spending in the region, which is resulting from on-going competitions between the two groups of malls – i.e., the 'in-region' malls (Chungchong Province) and the 'out-region' malls (Seoul area). If the average magnitude of 'in-region' malls is bigger than that of 'out-region' malls in terms of customer attraction and retention, then the total spending in the region will increase and the impact of electronic commerce on local economy could possibly be presumed positive. On the other hand, if the opposite situation is the case, the resident customers will be attracted and retained by 'out-region' malls, leading to the spending outflows from the regional standpoint, which means the impact of electronic commerce on local economy is negative and the problem of economic disparity will be worsened.

By introducing 'systems thinking' and adopting the systems dynamics (Forrester, 1961, Richardson et al, 1981, Goodman, 1989, Sterman, 2000) simulation technique, this paper puts an effort to find some tentative answers to the questions possibly raised about the impact of EC on local economy on which little research has been done so far.

## 2. Current Status in Korea

### 2.1 Field Survey

According to the prior research, 90% of electronic malls in Korea are located in Seoul area and 99% of total sales volume is concentrated in Seoul area (KNSO[1], 2000, NCA[2], 1999, KISDI[3], 2000). For this reason, previous statistical surveys and researches in this arena were concentrated on those in Seoul Metropolitan area, and unfortunately information on the status of electronic malls in local areas is not available.

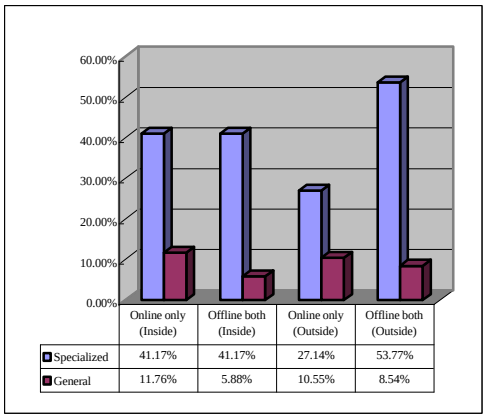
Therefore, a new survey on the status of electronic malls in local areas (Chungchong Province was selected for the survey) was found necessary to be conducted for the purpose of this study whose first step is to compare in several dimensions the two groups of online malls – i.e., the 'in-region' malls (Chungchong Province) and the 'out-region' malls (Seoul area).

The survey was conducted for six days (Nov. 20. 2000 ~ Nov. 26. 2000) using an instrument designed to identify the present state of electronic malls in local area (Chungchong Province). A total of twenty-five questions covering four dimensions were developed for the survey. Table 1 summarizes major items by dimension included in the questionnaire. A total of ninety-four malls were identified from the Internet search engine such as Hanmir, Yahoo, Naver, etc. Out of the ninety-four identified malls only eighty-one malls were used for the survey because the rest were found no longer active. However, the number of malls surveyed is believed enough to explain how the electronic malls in local area are situated.

Table 1. Major questionnaire items by dimension

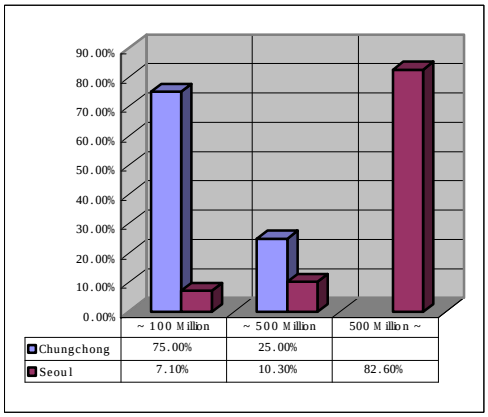
| Number | Dimension | Category Items |
|---|---|---|
| 1 ~ 8 | General Information | Foundation Year, Business Type, etc. |
| 9 ~ 12 | Business Performance | Revenues, Profit, Break-even Point, etc. |
| 13 ~ 16 | Carrying Goods & Commodities | Category of goods, Criteria of goods selection, etc. |
| 17 ~ 25 | Operation Status | Delivery system, The number of customers retained, etc. |

[1] Korea National Statistical Office
[2] Korea National Computerization Agency
[3] Korea Information Society Development Institute



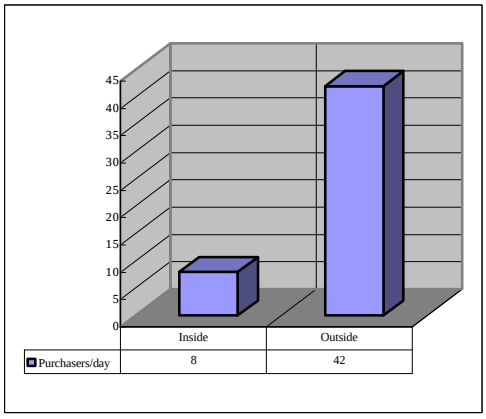

| | Online only (Inside) | Offline both (Inside) | Online only (Outside) | Offline both (Outside) |
|---|---|---|---|---|
| Specialized | 41.17% | 41.17% | 27.14% | 53.77% |
| General | 11.76% | 5.88% | 10.55% | 8.54% |

Figure 1. Business type



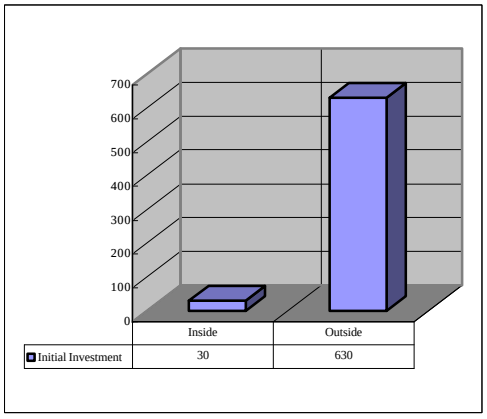

| | ~ 100 Million | ~ 500 Million | 500 Million ~ |
|---|---|---|---|
| Chungchong | 75.00% | 25.00% | |
| Seoul | 7.10% | 10.30% | 82.60% |

Figure 2. Revenues



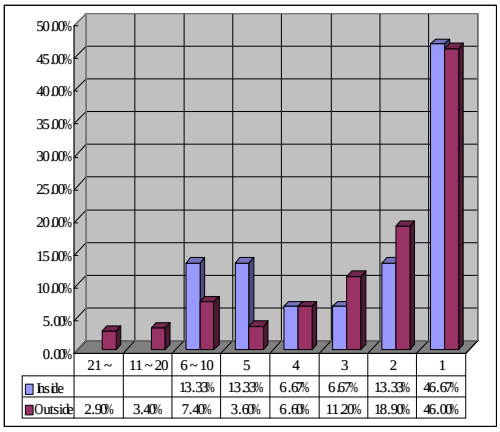

| | Inside | Outside |
|---|---|---|
| Purchasers/day | 8 | 42 |

Figure 3. Purchasers



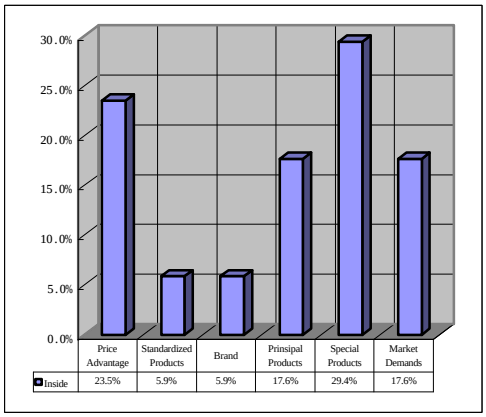

| | Inside | Outside |
|---|---|---|
| Initial Investment | 30 | 630 |

Figure 4. Initial investment




| | 21 ~ | 11 ~ 20 | 6 ~ 10 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| Inside | | | 13.33% | 13.33% | 6.67% | 6.67% | 13.33% | 46.67% |
| Outside | 2.90% | 3.40% | 7.40% | 3.60% | 6.60% | 11.20% | 18.90% | 46.00% |

Figure 5. Operating personnel




| | Price Advantage | Standardized Products | Brand | Prinsipal Products | Special Products | Market Demands |
|---|---|---|---|---|---|---|
| Inside | 23.5% | 5.9% | 5.9% | 17.6% | 29.4% | 17.6% |

Figure 6. Goods selection criteria

## 2.2 Implications from the Survey

Seventeen out of eighty-one malls participated for the survey, which in result shows 21% response rate. As anticipated most of all turned out very small in scale and sales volume. 82% of all opened in 2000 and 41% deal with the principal products having a specialty of the local.

The statistics concerned with the current status of the two groups of electronic malls – i.e., the 'in-region' (Chungchong Province) and the 'out-region' malls (Seoul area) - were compiled for the same categories and presented in graphs as shown in Figure 1 to Figure 6. The statistics of the former were compiled from the results of existing surveys and those of the latter from the new survey. In result, some significant differences between the two groups of online malls were identified in two aspects - external and internal.

### 1) External aspects

There is no comparison between 'in-region' and 'out-region' malls in terms of revenue, the number of purchasers, initial investment, operating personnel, etc. The annual average revenue of 'in-region' malls is about 49 million Wons. The portion of malls which have a total annual revenue under 20 million Wons is 63% of all, whereas the number of malls over 100 million Wons is only two. This implies that the online malls in local area ('in-region' malls) remains very sluggish in comparison with those in Seoul area ('out-region' malls). Especially, there is a remarkable disparity between the two groups in terms of initial investment and operation personnel. As time goes by, this disparity is expected amplified than now.

### 2) Internal aspects

If large malls (3.8% of all) which have a total annual revenue over 500 million Wons are excluded from the statistics, the overall sales performance of 'in-region' malls turns out better than that of 'out-region' malls as shown in Table 2. Besides, if large malls (4.4% of all) with operating personnel over twenty persons are not taken into account, the annual average revenue of 'in-region' malls is bigger that that of 'out-region' malls. Furthermore, most of 'in-region' malls expect that the break-even point will be in a year.

Some implications may be drawn from the results discussed above. First, the 'in-region' malls, even if they are small in every aspect, are competitive comparing with

‘out-region’ malls with similar scale. Second, major driving force behind their reasonable performance comes from the goods carried for sales. As shown in Figure 6, the goods selection by ‘in-region malls’ are mostly made on the criteria of ‘principal products of the local (17.6%),’ ‘special products of the companies (29.4%),’ and ‘the market demand goods (17.6%)’. This indicates that the niche strategy including operations of specialized malls is critical for ‘in-region’ malls to gain competitiveness

Table 2. Comparison of the two groups of online malls in sales volume

| Regions / Average Annual Revenue | In-region | Out-region |
|---|---|---|
| Average annual revenue of online malls (with those over 500 million Wons Excluded) | 49.1 Million Wons | 22.6 Million Wons |
| Average annual revenue of online malls (with those having operating personnel over 20 persons excluded) | 49.1 Million Wons | 39.1 Million Wons |

In reality, however, the absence of large-scaled companies leads to the outflow of customers from the region. As John Jasper Ong, co-founder of eAuctions Philippines says, it is easier for the conventional firms to do business because they have a proven track record. He says, “People can easily connect with the old economy brands. Anything that a top company releases in the press will easily get credibility, unlike a local startup that has yet to be fully recognized by the market.” Large-scaled companies particularly in Seoul area that have financial and human resources are attracting customers in the local. This means that the more customers would be detracted from the local market by the giants in the metropolitan areas like Seoul and the more spending outflow from the local is accelerated as electronic transactions are to be commercial practices. Definitely, the spending outflow from local area will make harmful influences on local economy. The dearth of capital is one of the challenges that a local startup runs into. Abby Molano, president and managing principal of VeturePath, a Silicon Valley-based venture capitalist say, “You may have a great idea but without sufficient financial resources, it won’t take off.” Many prior researches (Kim, 1999, Bae, 2000) agree that initial investment and operation personnel are the keys to the growth of electronic malls.

## 3. Introducing Systems Thinking

### 3.1 Feedback Structure

As mentioned before, the ultimate goal of this study is to develop a scheme for assessing the effects of electronic shopping malls on local economy, with an attempt to find tentative answers to the consecutive questions as follows:

What is the generic structure of competition between the two groups of electronic malls – the ‘in-region’ and the ‘out-region’; What about the factors influencing on the magnitude of their attraction and retention of customers; What would be the effects of electronic malls on local economy over a certain time horizon; and What are the major leverage points which are anticipated to promote the performance of regional electronic malls?

In probing the questions raised above, ‘systems thinking’ approach is adopted for this study. In the beginning, let’s take a look at the highly simplified feedback structure (see Figure 7) depicting the reciprocal transfer of customers between the potential and the online. In Figure 7, by ‘Potential Customers’ we mean the customers who purchase goods or services through offline at present but have an intention of purchasing through the Internet, while ‘Online Customers’ means those who obtain goods or services through the Internet. From the perspective of systems thinking, the increase in the number of online customers directly leads to the decrease of potential customers, and vise versa. Therefore the group of ‘Potential Customers’ is the initial resource for the growth of online malls.

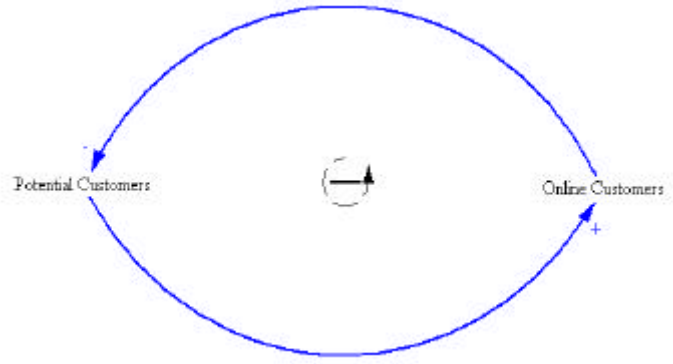



Figure 7. Reciprocity between the potential and the online customers

Taking it into account that there exist two groups of online malls competing each other to attract and retain online customers, Figure 7 is refined one step further as in Figure 8. Assuming that a total spending size in dollar amount remains constant at a

certain level, it would be also possible to assume that the increase of 'in-region' online customers means the decrease of 'out-region' online customers, and vise versa. As noted earlier, this study puts its focus on the transferability of the customers among the three sectors of malls – offline, 'in-region' online, and 'out-region' online. That's because the effects of electronic commerce on the local economy are assumed determined by the retention and/or attraction magnitude of 'in-region' malls.

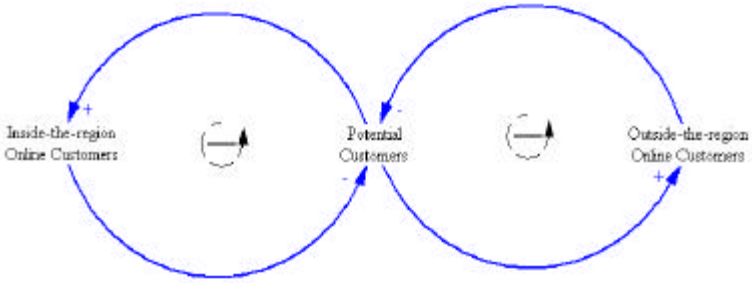



Figure 8. Causal relationship between the 'in-region' and
the 'out-region' online customers

As indicated in the survey results and the prior research, the initial investment and the size of the site operating personnel are the critical success factors for the attraction and/or the retention of customers. These two factors as exogenous variables are thus included in the model as shown in Figure 9.

Another important factor is 'word of mouth' effects. Not necessarily online malls but the market-oriented business firms in general often spend a lot of money in marketing and sales promotion in order to gain 'word of mouth' effects. If there were few competitors in the market, the business would grow very fast and then reach saturation soon. In reality, however, the Internet shopping mall business is highly competitive and thus the growth of malls depends on their relative attractiveness. During the initial stage of the market, companies concentrate the marketing through mass communications in order to get the attention of customers. As time goes by, the relative importance on the image of companies depends on the word-of-mouth effects. Moreover, as the market saturates, a company which has passed the point of critical mass of the customers and has entered into self-reinforcing feedback loop gains the word-of-mouth effects a lot greater than the others (Choi, 1996). The word-of-mouth effects are reflected in a feedback loop at the far left-hand corner of the Figure 9. Besides, customer switching from 'in-region to 'out-region,' and vise versa is reflected as 'loss fraction' that is mostly influenced by the size of site operating personnel.

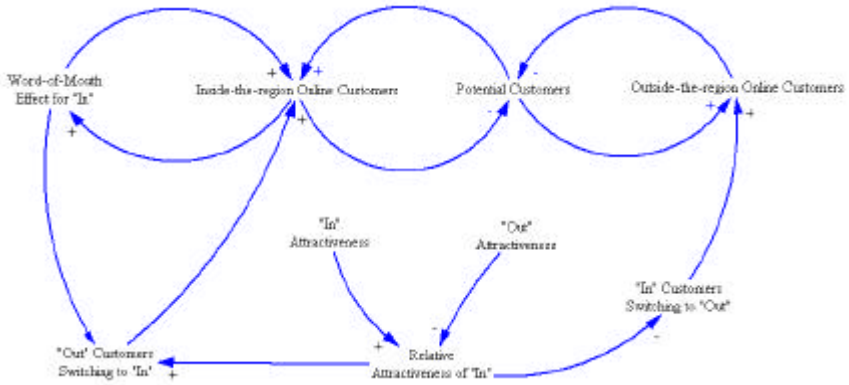



Figure 9. Causal relationship between online malls under competion

### 3.2 Reference Model

Prior to preparing a stock-flow diagram (SFD) as a basis for computer simulation model, it is necessary to refine the types of customers in relation to the types of malls because the number of customers will be a stock (or level) in SFD. Customers are generally classified in three types: one is 'offline,' another is 'online.' and the third 'potential.' However, as a dichotomy of customers into 'offline' and 'online' is simply in accordance with purchasing places, both 'offline' and 'online' are reasonably regarded as 'potential' customers.

What's more important than this for the study is to classify the customers according to the location where they live and to divide online malls, according to the place where their head-offices are located, into two types of malls: 'in-region' and 'out-region.' Therefore, a combination of customer types (resident and nonresident) and mall types ('in-region' and 'out-region') generates four different types of customers as shown in Figure 10:

| | (In-region) Head-office location | (Out-region) |
|---|---|---|
| (Resident) Customer status | Resident Customers of 'In-region' Online Malls | Resident Customers of 'Out-region' Online Malls |
| (Nonresident) | Nonresident Customers of 'In-region' Online Malls | Nonresident Customers of 'Out-region' Online Malls |

Figure 10. Classification of online customers

In order to answer to the core question for this study on what would be the effects of electronic malls on local economy over a certain time horizon if current situations sustain, a set of referential propositions are made as follows:

If the average magnitude of ‘in-region’ malls is bigger than that of ‘out-region’ malls in terms of customer attraction and retention, then the total spending in the region will increase and the impact of electronic commerce on local economy could possibly be presumed positive.

On the other hand, if the opposite situation is the case, the resident customers will be attracted and retained by ‘out-region’ malls, leading to the spending outflows from the regional standpoint, which means the impact of electronic commerce on local economy is negative and the problem of economic disparity will be amplified.

Based on the discussions thus far, a stock-flow diagram (SFD) as in Figure 11 is developed for the computer simulation runs. Up to now numerous computer programs for the system dynamics simulation have been introduced, and this paper used STELLA which has highly sophisticated functions including graphic generations, ease-to-use, and the facilities to compare the policy alternatives by regulating a variable among them.

## 3. Simulation and Implications

### 3.1 Factors and Variables

Variables identified and included in the simulation model are divided into four groups such as exogenous, level, and rate variables of marketing activities and word-of-mouth’ effects (see Table 3). Exogenous variables are those related to the investment amount and the size of operating personnel, which are identified as crucial factors for the success of online malls. They are set constant for the initial simulation runs.

Level variables are concerned with those identified from a combination of customer types (resident and nonresident) and mall types (‘in-region’ and ‘out-region’) as shown in Figure 10, and the customers – offline and potential.

Rate variables include those of marketing activity and of ‘word-of-mouth’ effects. The former means the rate of effects from marketing for inducing potential customers (resident and nonresident) to switch to the online malls (‘in-region’ and ‘out-region’), and the latter points to the switching rate of potential customers (resident and nonresident) to the online malls (‘in-region’ and ‘out-region’).

A set of equations for the variables involved in the model are formulated in accordance with structural characteristics identified and the statistics compiled for the study, though details about the equations are not presented in this paper.

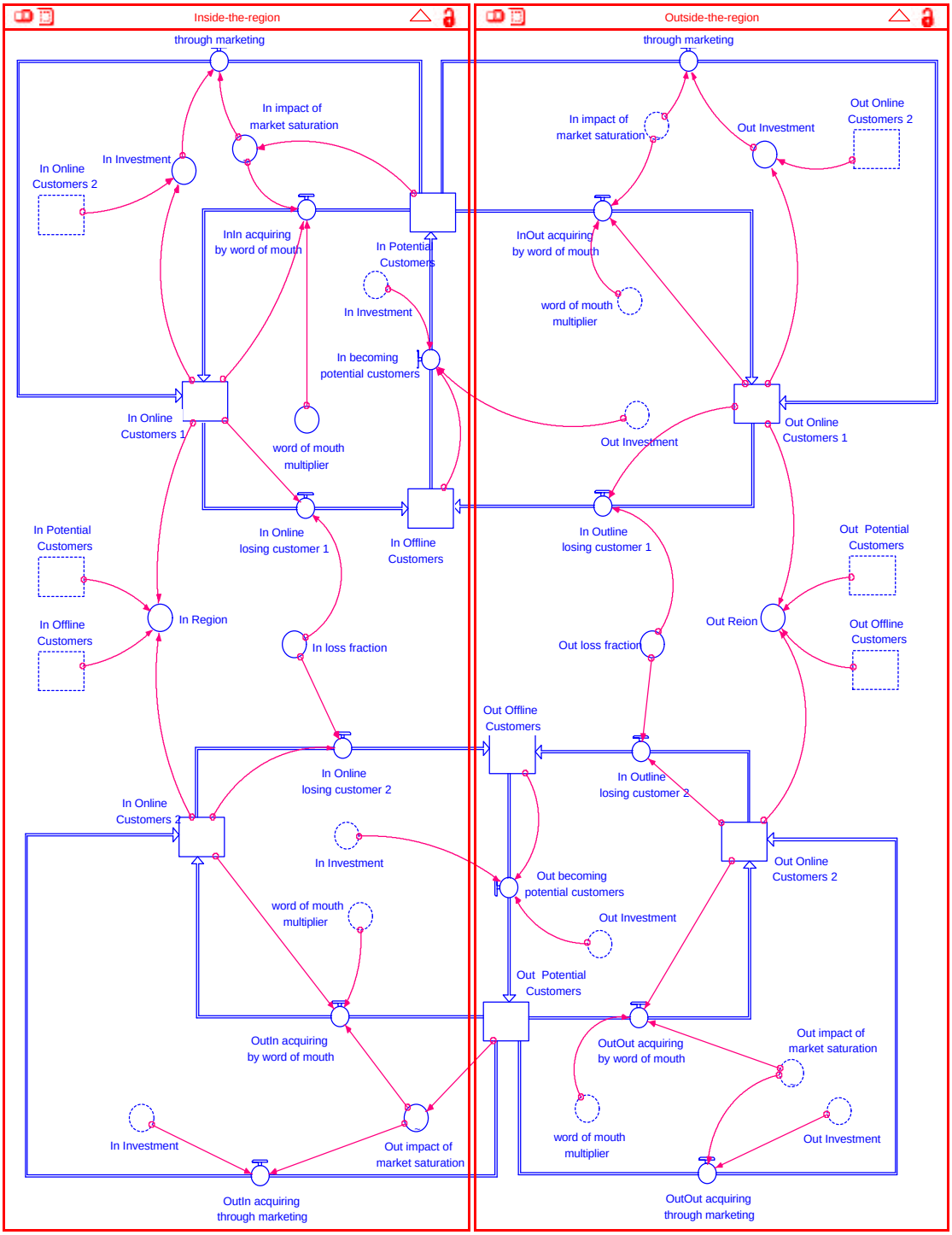



Figure 11. A Stock-Flow Diagram for the online shopping malls in competition

Table 3. Variables of the simulation model

**Exogenous Variables (Policy Variables)**

In(Out)_Investment: Investment in shopping malls, 'in-region,' and 'out-region'

In(Out)_Loss_Fraction: Loss fraction of losing Customers , 'in-region,' and 'out-region'

**Level Variables**

In_Online_Customers_1: Resident customers of 'in-region' online malls

In_Online_Customers _2: Nonresident customers of 'in-region' online malls

Out_Online_Customers _1: Resident customers of 'in-region' online malls

Out_Online_Customers_2: Nonresident customers of 'out-region' online malls

In-Out_Offline_Customers: Offline customers in and outside the region

In-Out_Potential_Customers: Potential customers in and outside the region

Total_Customers : Total customers of offline and online malls in and outside the region

**Rate Variables**

Offline2Potetial: Average conversion rate of offline customers to potential online customers

**Rate for marketing**

In2In_Attraction: Resident potential customers switching to 'in-region' online malls

Out2In_Attraction: Nonresident potential customers switching to 'in-region' online malls

In2Out_Attraction: Resident potential customers switching to 'out-region' online malls

Out2Out_Attraction: Nonresident potential customers switching to 'out-region' online malls

**Rate of 'word of mouth' effects**

In2In_Attraction_by_word_of_mouth: Resident potential customers switching to 'in-region' online malls

Out2In_Attraction_by_word_of_mouth: Nonresident potential customers switching to 'in-region' online malls

In2Out_Attraction_by_word_of_mouth: Resident potential customers switching to 'out-region' online malls

Out2Out_Attraction_by_word_of_mouth: Nonresident potential customers switching to 'out-region' online malls

### 3.2 Analysis of Simulation Results

There were four sessions of computer simulation tried under different situations by changing the values of policy leverages identified previously – i.e., the size of operating personnel and the initial investment. The initial simulation was run under the assumption that current situation – i.e., the size of operating personnel and the initial investment - remains constant (Scenario 1). The number of customers retained by 'in-region' online malls remains steady at the almost same level as that of the initial stage, whereas the change pattern in the number of customers retained by 'out-region' online malls follows an S-shaped curve over time horizon as shown in Figure 12.[4] This means that if current situation goes on 'out-region' malls will continue growing in S-shaped curve while 'in-region' malls show no sign of growth.

The second simulation in Figure 13 shows that 'in-region' malls make better performance, though not satisfactory, in case of increasing the operating personnel up to the level similar to that of 'out-region malls, with the initial investment personnel remaining at the present level (Scenario 2). Such improved performance is mainly due to the attraction of customers from outside.

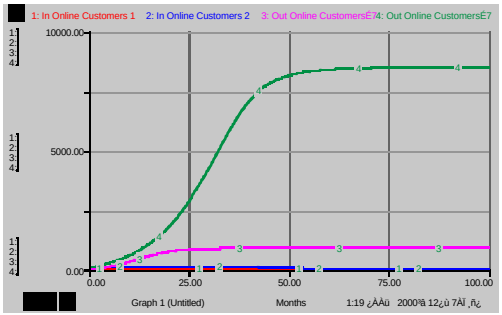



Figure 12. Initial run with current : situation remaining the same

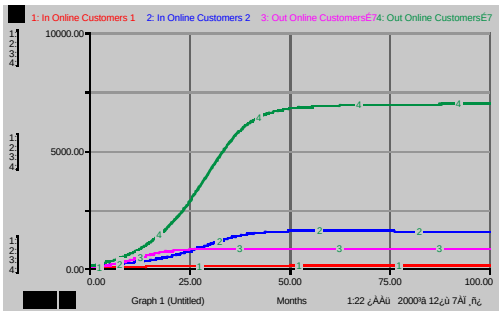



Figure 13. 2nd run with increase in op. personnel up to the level of 'out-region' malls

When the initial investment in 'in-region' malls increases up to two-thirds of the level of the 'out-region' with operating personnel remaining at present level (Scenario 3), the number of nonresident customers attracted by 'in-region' malls slightly increases at the initial stage and then declines soon near to zero. And overall performance of 'in-region' online malls turns out lower than that of the second simulation as in Figure 14.

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[4] Line 1: Resident customers of 'in-region' online malls
Line 2: Nonresident customers of 'in-region' online mall
Line 3: Resident customers of 'out-region' online malls'
Line 4: Nonresident customers of 'out-region' online malls

The fourth simulation run in Figure 15 shows that the overall performance in terms of the number of customers retained by 'in-region' malls turns out a lot better than those of the previous cases, when the initial investment and the operating personnel of 'in-region' malls increase up to two-thirds of and similar to the level of 'out-region' malls respectively (Scenario 4).

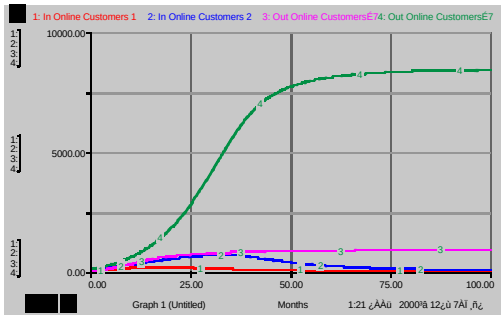


Figure 14. 3rd run with increase in the initial investment up to 2/3 of the level of 'out-region' malls

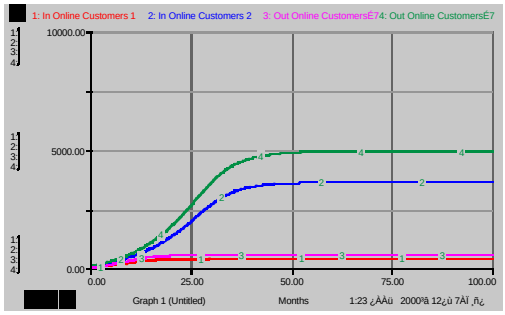


Figure 15. 2nd run with increase in the initial investment ad the op. personnel up to 2/3 of and similar to the level of 'out-region' malls

The four cases of computer simulation indicate that the size of operating personnel is more critical policy leverage for the better performance of online shopping malls than the initial investment. And they also demonstrate that combination of the sizable initial investment and the maintenance of operating personnel at reasonable level will give birth to a lot higher performance through their synergic effects. Figure 16 shows the impact of each policy alternative on the change in the number of customers (in percentage) detracted from the potential customers by 'out-region' online malls. Similar to the results from the previous simulations, 'Scenario 4' is the best and Scenario 2 better than Scenario 3, and Scenario 1 is the worst from the regional standpoint.

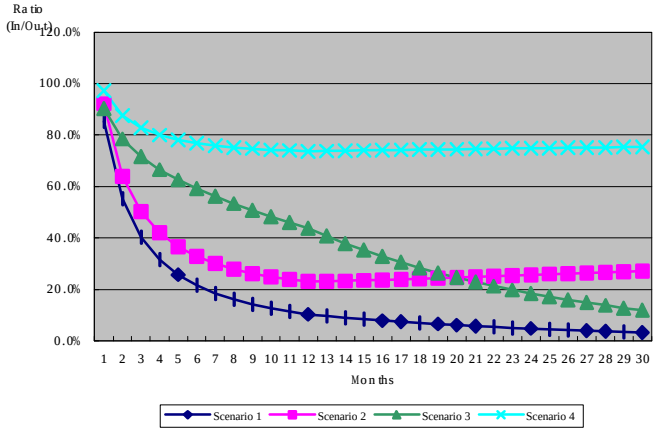


Figure 16. Changes in potential customers (%) detracted by 'out-region' malls

## 4. Conclusions and further research

An advent of digital economy with a proliferation of Internet is raising the two hypotheses likely to be widely applicable across the world. First, it is an opportunity for small regions through the removal of barriers in terms of time and space. Second, it is also a threat for small regions that the problem of economic disparity will be amplified by the new rule, ‘winner gets the most,’ which would perhaps be unavoidable in digital economy. The greater the participation and the connectivity, the greater the economic advantage for everyone.

Unfortunately, however, the latter seems the case in Korea. From the computer simulations, it is clear that the proliferation of electric commerce would not make a positive impact on the local economy, to say the least, unless circumstantial economic conditions are getting better. It is predicted that on line shopping malls in Seoul area will attract and retain more customers as time goes by and in result the spending on the online malls will flow out from the region’s point of view.

After all, the government of the region under poor conditions like Chongchong Province for example has to develop a set of policies to help ‘in-region’ online malls to grow, aligning to the following points:

First, all they needs is the proper guidance and the right business model such as carrying ‘principal products in local area,’ and ‘special products.’

Second, it needs to get enough operation personnel and use the advantage of being small such as flexibility and faster decision-making.

Third, a sufficient investment for more active marketing has to be financed by the local government and supported by ‘Electronic Commerce Resource Center’, ‘Internet Data Center’ in a way to share their human resource, computing resource and so on.

The general scheme for dynamism of systems where two groups of electronic malls compete each other and the findings presented in the paper would perhaps provide some ideas and directions for further study. Hopefully the information provided in this paper could be a useful initial clue, first to the policy makers who are interested in how the problem of economic disparity to be resolved via information and telecommunication technology and what leverage points to be considered for the better practices of electronic commerce, and second to the business professionals who are looking for the ways to make their electronic malls more competitive. However, it has to be admitted that the model is yet to be refined and expanded in greater detail by identifying more variables and factors and analyzing their related data in more rational manner.

## References


Arthur, B.(1996), Increasing Returns and the New World of Business, Harvard Business Review, July-August.

Atrostic, B. K., Gates, J., Jarmin R. (2000), Measuring the Electronic Economy: Current Status and Next Steps.

Bae, S. H. (2000), Large Distribution Company to enter online market actively, LG Economic Research Institute.

Cairncross, F. (2000), The death of distance, Harvard Business School Press, Boston.

Choi, T. S. (2000), Information Society, Bobmunsa Publishing Co.

Choi, W. Y. (1996), Customer Retention Strategy in slow growth phase, LG Economic Research Institute.

Chu, J. H. (1998), Internet Business : Electronic Commerce, Beebong Press.

Department of Communications (1999), Information Technology and Arts, E-commerce beyond 2000, Canbear, Austrian Government

Forrester, J. W. (1961), Industrial Dynamics, MIT Press: Cambridge, MA.

Goldman Sachs (2000), The shocking effects of B2B, Global Economics Paper no. 37.

Goodman, M. R. (1989), Study Notes in System Dynamics, Productivity Press.

Heng M. S. H. (2000), Understanding electronic commerce from a historical perspective, Research Memorandum 2000-38.

Kim, M. S. (1996), Suggestions and Strategies for the Expansion of Korean EC Markets: An Analysis of Factors Affecting Customer Oriented EC Success, Korea National Computerization Agency NCA I-RER-99014.

KNSO (2000), Electronic Commerce Statistical Survey, Korea National Statistical Office.

Lee, G. K. (1996), The Internet and Electronic Commerce, Information-oriented Society.

Lee, T. H. (1997), Internet Marketing, Youngjin Press.

Mallari, R. (2001), The big and the small of IT, Asian Business.

Parker, E. B. (2000), Closing the digital divide in rural America, Telecommunications Policy 24.

Park, S. K. (1997), Electronic Commerce in Korea: Current Status and Next Steps, Information-oriented Society.

Richardson, G., Pugh, A., (1981), Introduction to System Dynamics Modeling, Productivity Press.

Sterman, J. D. (2000), Business Dynamics: System Thinking and Modeling for a Complex World, Irwin McGraw-Hill.


Back to the Top