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The Ways of Creating New Paths for Financial Organizations within the Framework of Spatial Dependency

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Abstract

Spatial dependence of financial organizations has been examined by economic geography, clustering and institutionalist approaches. In literature, there has been many studies which investigate how spatial dependency occurs and which factors effect spatial dependency but none of them link spatial dependency with dimensions of financial system. Within the framework of spatial dependency, our study focuses on the notions that financial depth, financial effectiveness, financial stability and financial accessibility as financial system dimensions that effect spatial dependence of financial organizations. To test the propositions, we collected data from financial databases for chosen 25 countries endowed with financial centers between the years of 2007-2011. We aim to identify the factors that affect spatial dependencies and the ways of creating new paths for financial centers. The obtained data from databases are analyzed through the STATA statistical packaged software. After the validation of measures a series of panel data analysis was conducted to test the hypotheses and to define how financial system dimensions create a spatial dependency on financial centers. Analyses results highlighted the notions that competitiveness power, capital based financial system, external shocks such as financial crisis and knowledge asymmetry to create new paths for financial centers.

Keywords: spatial dependency, financial system, path creation, financial centers

Introduction

Financial centers as a best representation of finance organizations clusters still should reside spatially in certain regions despite technological improvements and digitalization, because complex information such as merger/acquisition agreements, know-how, non-written rules and social embeddedness can't be transferred to electronic media (Grote, 2009). Unlike O'Brien (1992), movements of capital and trade are facilitated by the attractiveness of factors such as reducing transaction costs, liquidity and increasing efficiency. Financial centers always exist spatially and their differentiated roles and performances in the financial system only change their spatial pathways (Martin, 1994). When we analyze the factors underlying the evolution of clusters at different levels of analysis, it is seen that the effects of spatial density dependence on location choice of new firms are stronger at the regional level (Greeve, 2000). Arthur's (1988) spatial dependence theory claims that new firms make their location choices randomly at the beginning. This means that it is not predicted which region have become more advantageous at the beginning but it is certain that existence regions are more advantageous than other regions for new organizations because of scale economies and positive externalities. This create a geographic lock in for financial organizations. Beside cluster economics, financial organizations

make their location choices according to their information gathering, processing and transcription functions. When economic factors and spatial structures are considered together, financial markets structure, financial institutions' activities, finance sector management, legal framework, personal and corporate tax, financial information dissemination mechanisms, qualified labor and technological/physical infrastructure constitute the spatial dependency factors of financial centers (Thakor, 1996; Z/Yen, 2011). In path dependency literature, aggregation effect and centrifugal-centripetal forces on financial centers cause lock-in and despite external shocks (the formation of other highly competitive financial centers, low transaction and transportation cost) financial institutions resist change of location (depending upon knowledge asymmetry, backward and forward linkages, qualified labor, prestige, established infrastructure and business culture) through centers that have more advantageous conditions. Over time, financial centers become self-

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reinforcing and spatially dependent structures (Fujita et al., 1999; Schmutzler, 1999). This provides information on the reasons for new spatial pathways chosen by rising and falling financial centers (Martin, 2009; Grote, 2002). In case New Economic Geography, the distribution of financial clusters depends on initial conditions and historical events (Fujita et al. 1999). Financial centers survive or die under the effect of small historical events (Ottaviano and Thessie, 2004), structure of clusters and government policy (Bosker et al., 2007). New Economic Geographical Models claim that the success rate of financial clusters is related to external economics such as specialized local labor input, access of financial markets and scale effect, information dissemination, etc. (Krugman, 2011). Finally, spatial pathways of financial firms can sometimes be determined by historical accidents. Historical accidents are unexpected events that affect the output of any activity (such as the formation and persistence of ineffective technological standards) of financial firms (Ottaviano and Thessie, 2004). Small but cumulative historical accidents can create large regional imbalances even in homogeneous regions. In the theories of financial centers, it can be seen how the historical accidents shaped the financial geography and the small changes that took place cumulatively created a discontinuous change in the space (Krugman, 1998). As a result, financial firms which do not have the mobility of resources and labor prefer to locate in centers where market is deep and transportation costs are low and prices are stability in financial markets (Ottaviano and Thessie, 2004). The clusters formed in these regions have been self-reinforce over time. The spatial paths of main financial center in Germany from Berlin to Frankfurt between the years 1949-2006 can be given example for historical accidents. After the establishment of the Central Bank in Frankfurt, the concentration of foreign banks in Frankfurt increased steadily and Berlin lost its importance as a main financial center. However, after the 1980s, when foreign banks were shifting to global markets such as London, the intensity of foreign banks in Frankfurt gradually decreased. Therefore, the concentration of foreign banks in Frankfurt has developed in the form of reverse U (Grote, 2002). The need for the presence of a financial center in Dubai was first spoken by the state, then a tourism-oriented and new airline company was set up for this need. The arising tourism-based economic clusters provided the necessary environment for the establishment of the DIFC (Hvidt, 2009). Therefore, infrastructure investments carried out by the state in transportation, technology and physical areas can also be considered as historical accidents for financial centers to develop new spatial pathways. For example, infrastructural studies carried out in the transportation sector in Istanbul have caused the financial clusters to shift from Galata to Levent-Maslak as a historical accident. In this context, the study begins by a literature review of financial system dimensions that translate path dependence of financial centers to spatial dependence and the effects of orientation of financial centers as bank based or capital based on creating new spatial paths, then will go on to development of hypotheses. Research methodology, analyses results and research model will take place at second section. The results of the analyses will be discussed and recommendation will be provided for countries.

Literature Review and Theoretical Framework

Financial Depth

Financial depth means financial size. Financial size of finance centers depends on credits given by commercial banks and other financial institutions to private sector and transactions in capital markets. The credits given by commercial banks and other financial institutions to the private sector measure the activities of the banks (Levine, 1997). High liquidity at financial centers provide to lower transaction costs and in a result of this, large financial transactions can take place quickly in markets. The reliability of financial systems is determined by the liquidity and credibility. Crocco, Calvente and Castro (2006) argue that financial institutions, especially foreign banks, make their location choices according to financial depth of markets to meet their financial needs (Wong, 2012). Liquid markets offer low capital cost

opportunities to firms. According to economies of scale, liquid markets prefer to take place in financial centers that perform large financial transactions and whose financial size is at a certain level. On the other hand, it is a prestige for firms to be listed on the stock exchanges of leading financial centers (Karreman and Knaap, 2007; Karreman, 2010). The financial systems of the developing countries should be bank-based because they can't compete with stock exchanges which have high financial depth as in developed countries (Claessens et al., 2002). Liu and Strange (1997) used the ratio of total value of stocks traded on Stock Exchange to the GDP to measure the depth (size and performance) of stock exchanges in financial centers. Besides, information in deep financial markets creates sectoral positive externalities. Clustering effect prevents financial sector from becoming a fragmented structure spatially by creating a depth for financial centres. Unless expansion of knowledge hinterland, financial depth only creates short-term or medium-term path dependence for financial sectors (Porteous, 1995; Park, 2012). Financial depth does not occur randomly in financial system. Financial depth ensues with small historical events by following an evolutionary process. Innovations in financial institutions, tools and markets, the development of institutional control mechanisms and the increase of public banks deepens the financial system structure (Fratanni and Spinelli, 2006).

Financial Efficiency

Financial efficiency implies efficient financial resource use and easy implementation of financial transactions (at the same time minimizing transaction costs) (Cihak et al., 2012). Financial efficiency is about the costs that financial centers face (Zhao et al., 2004). Bank efficiency score and stock turnover ratio of stock exchanges (Porteous, 1995; Donaubaueer et al., 2014; Cihak et al., 2012) can be used to measure financial efficiency. The bank efficiency score is calculated as the ratio of the total personnel expenses and general expenses to total assets and the average of the net interest margin. The ratio of general expenses to total assets is the share of operating expenses of banks in all assets. Total assets represent total income assets, bank cash assets, bank deposits, fixed assets other than real estate, value of brands, other tangible assets, current tax assets, deferred tax, discontinued operations and other assets. Low overhead costs can be used as a measure of efficiency. But very low overheads can also be interpreted as inefficient competitiveness. Therefore, overheads alone can't be used directly to measure bank activity. Interest margin is a measure of the intermediary costs of banks. It is used as a measure of the effectiveness of the banking system. The growth of interest margins push-off investors from the banking system and affects the development of the financial system negatively. The activity expenses of banks are calculated as the ratio of average interest margins and overheads to total assets. Low bank efficiency score points to effective banking system (Allen and Gale, 2004). Total stock turnover rate of stock exchanges which is the ratio of stock traded on stock exchanges to the market value of stocks and used as liquidity of stock markets, is not a direct measure of stocks trading costs (Demirgüç-Kunt and Levine, 1999). Nevertheless, Kerr (1965) and Porteous (1999) used this indicator to how liquidity is important for spatial dependence in financial centers. Active small stock exchanges have a high turnover rate. On the contrary, the inactive big stock market where liquidity is low has a low turnover rate. The increase in the efficiency of the financial system structure in parallel with the economic development also increases the number of transactions on financial markets and the diversity of financial instruments (Liu and Strange, 2013). In terms of location selection, financial institutions select only a certain region, despite the advantages of other places in terms of cost because of the influence of factors such as quality control, speed, security and confidentiality in information-based transactions and the influence of centrifugal and centripetal forces. This create a lock in and then a spatial dependence for financial centers. For example, because of the lock-in effects, insurance firms prefer to locate in Zurich instead of Ireland which is more advantageous in terms of low costs. Lock-in effects usually mean that the financial institutions can't be separated from the inefficiency regions and thus a region is preferable than the other regions (Porteous, 1995; Porteous, 1999). Therefore, financial clusters provide their efficiency by increasing financial firms' geographical proximity to each other and firm density. The geographical proximity has a positive effect on gaining non-transferable competitive power, information and resources. Advantage of face to face communication among firms, being close information technology and media clusters in financial clusters are also one each a contributing factor in attracting skilled workers to the cluster and increasing the reputation of the financial center (Kuah, 2008). From the view point of location choice, efficiency of financial centres depends on chance in the first place that they are founded (Liebowitz and Margolis, 1999). Over time, increasing returns of financial centers may cause inertia (or lock-in) and irreversibility and potential path inefficiency by small historical accidents. Financial clusters provide their efficiency slowly by making their future choices depending on learning process. In the long term, if firms give up to move other advantageous places, then their transactions costs gradually decrease with the help of learning process (Arthur, 1994). On the other side, financial systems tend to converge to the most efficient system. Therefore, the convergence of financial systems can be conceptualized by path dependency. Bank and capital market development complement each other. Changes in a financial system (from a bank-focused financial system to a capital-based financial system, or

vice versa) are not easy. Due to the interdependence of the components of the financial system, a change in composition systematically creates inefficiency in other components. Therefore, inefficient financial systems which has changed its focus tend to return to their old systems where they can be efficient. In a radical change in the financial system, the system can only survive if the increasing of productivity is greater than the social costs (Hölz, 2003).

Financial Stability

The globalization has brought with it the integration of financial systems. In this way, the increase in capital circulation and the increase of innovations in financial products has brought risks such as the deterioration of financial stability. Therefore, depending on the hierarchical levels of financial systems, the dynamics that compete each other have become dynamics that complements each other. In short, financial systems have been become interdependent. The continual change of finance geography under these influences have been increased the pressure of competition on financial centers. Therefore, more flexible rules and forms of governance have been emerged (Kruse, 2003). Financial stability and currency stability are most needed factors by the markets during the globalization phase (Grote, 2002). Financial integration has risks of increasing instability, of the rapid spread of financial crises among countries especially in the financial system. The way to be protected from these risks isn't only just isolation. Isolated financial centers trigger a stable but poor financial systems (Young et al., 2009). Especially in uncertain environments where there is economic instability, firms which need high liquidity in rural tend to move center. Financial systems shift towards from peripheral to center and tend to cluster at the center because of the advantages of the center that provide (Klagge and Martin, 2005). During a crisis, it is not important whether the financial system is bank-oriented or capital oriented. A stable financial system is more resistant to those financial crises. Bank-oriented system is more complicate rather than to capital based financial system because of firm-bank-worker relations and their learning process. This makes difficult to provide stability and weakens reflex towards external shocks. Thus, less complex and consistent financial systems are more resistant to crises despite they are less efficient (Hölz, 2003). Financial instability is an important indicator because it destroys the flow of capital in financial centers. The Bank Z-score is often used to measure the financial stability of the banking sector. This indicator is determined by the probability that a banking system in a country defaults (does not fulfill its obligations) in terms of basic accounting and auditing. $Z = (k + \mu) / \sigma$. The capital asset rate in the formula represents the standard deviation of the profitability of assets, and the profitability of assets (proxy) in place of the variance of σ (Cihak et al., 2013). Bank Z-Score expressed as the risk of failure of the banks. High Z-Score means that banks are at risk of low failure. There is a negative relationship between the increase in competitiveness and the probability of banks failing. In other words, when the competition between the banks increases, the risk of failing the banks is decreasing. Another point of view on the financial stability of banks is that the incentives they will have for increasing the credibility of banks with more market forces will increase. Therefore, managers are more cautious to improve the quality of their assets. Monitoring of such institutions is also easier. Successful banks are generally regarded as stable. Bank failures can be solved through mergers, capital increases and other support mechanisms. As for capital markets, financial stability can be measured by price fluctuations of shares on stock exchange market (Schaeck, 2009).

Financial Accessibility

Financial centers which have the high-level of global accessibility deliver their innovative financial services and products developed with their accumulation of finance and experience to customers using extensive information networks (Kruse, 2003). It is seen that international financial market accessibility is the third important factor affecting the competitiveness level of financial centers in the Global Financial Centers Index (Z/Yen, 2015). The increasing of the number of listed firms on the stock exchange has caused increasing of the information asymmetry on the market. However, firms that have specific areas of expertise, which wants to change this situation to an advantage prefer to locate in places close to knowledge resources (Karreman and van der Knaap, 2007; Karreman, 2010). Therefore, financial accessibility creates spatial dependence for financial institutions. Financial accessibility was measured by the number of banks and bank branches per 100,000 people and the number of firms listed on the stock exchange per 1,000,000 people at the end of the year. This indicator does not include investment companies, mutual funds and other common investment instruments. The number of companies in the financial system and the number of firms listed on the stock exchange is related to the creation of spatial dependency in information networks, in terms of proximity to the markets, customers and information resource. At the same time, financial accessibility is effective in achieving a certain level of scale economics for financial centers. Porteous (1995) points out that the financial sector has the most reliable and valuable information (information hinterland and asymmetric information). For example, in China, Beijing's main financial institutions prefer to establish their headquarters close to central government buildings, which are a source of

non-standard information policies. Besides, Hong Kong prefers to stay close to financial information sources and Shanghai to trade information sources (Zhao, Smith and Sit, 2003).

In the light of the literature, we argue that four dimensions of financial system create spatial dependency for financial centers through the positive externalities of clusters, geographical proximity and knowledge asymmetry and propose the hypotheses following:

H1: Financial system depth doesn't have a significant effect on the spatial dependence of financial centers.

H2: Financial system efficiency doesn't have a significant effect on the spatial dependence of financial centers.

H3: Financial system stability doesn't have a significant effect on the spatial dependence of financial centers.

H4: Financial system accessibility doesn't have a significant effect on the spatial dependence of financial centers.

Research Method

Sample and Data Collection

In the study, a dataset was created from secondary sources as The Global Financial Center Index by Z- Yen, have started to be published since 2007 and The Global Financial Development Database with contains 203 comparative indicators of the system structure of the economy. In the study, the financial system structure of the countries was used as proxy because of the lack of comparable time series databases of the cities where the finance centers are located. Panel Balanced Data obtained from 25 countries between years 2007-2011 were analyzed through the STATA 11 statistical packet program and four hypotheses were tested through panel data analyses.

Analyses

In the study, 25 Financial Centers were ranked according to the indexes (September Period) of Globalization Center Index of Financial Centers between 2007 and 2011. The first 9 global centers (London, New York, Hong Kong, Singapore, Tokyo, Zurich, Toronto, Sydney, Frankfurt) were compared with the next 10 regional centers (Paris, Dubai, Seoul, Dublin, Amsterdam, Stockholm, Brussels, Qatar, Madrid, Vienna) and the last 6 national centers (Sao Paulo, Wellington, Helsinki, Johannesburg, Rome, Lisbon). Two ANOVA tests were used to test whether the spatial dependencies of financial centers differed significantly according to the degree of globalization of financial centers and whether the spatial dependencies of financial centers differed significantly according to their being banking or capital market oriented. The structure of the financial system of countries is focused on banking or capital markets has been determined by considering the previous studies made by looking at the literature. The financial centers at London, New York, Hong Kong, Singapore, Zurich, Toronto, Sydney, Paris, Seoul, Amsterdam have capital based financial systems. The rest of 15 financial centers, analyzed have bank based financial systems. As a result, when the globalization degree shift from national to global the financial systems converge to capital oriented market structure. Besides, the spatial dependencies of financial centers differed significantly according to the degree of globalization of financial centers.

The empirical model of the study is grounded by research of Demirgüç-Kunt et al. (1999). Panel data analysis was used to analyze the effect of the financial system structure on the spatial dependence of financial centers. In the panel data analysis, it was decided that Driscoll Kraay Model was used according to the annually data structure (unit and time lengths) and the models had fixed effects. The time effect in the model was expressed by i_{year} . Competitiveness scores representing spatial dependencies of financial centers were dependent variable in the models. Four dimensions of financial system structure as financial depth, financial efficiency, financial stability and financial accessibility are independent variables. In models the effect of each dimension on spatial dependence was evaluated separately considering the globalization degree of the finance centers and their structure of capital markets and the banking sector. GDP per person and inflation rate data affecting the financial system of countries are also added as control variables in each model. The models are included two dummy variables (global and regional), in order to avoid falling into the dummy variable trap. Finally, a time invariant variable is added to each model to show whether the financial centers are bank-oriented or capital-oriented. Panel data analysis is conducted after all data are made stationary. Total value of stocks traded on Stock Exchange to the GDP, the number of firms listed on the stock exchange per 1,000,000 people, the number of banks and bank branches per 100,000 people and logarithm of GDP per person are stationary at the first difference. The ratio of commercial banks and other financial institutions to private sector to the GDP, the bank efficiency score, stock turnover ratio on stock exchanges, Bank Z Score, price fluctuations of shares on stock exchange market and inflation rate are stationary at 0 level. We conduct unit root tests according to Harris Tzavalis.

Findings

In this study, panel data analysis is also conducted to test the hypotheses and to define the direction of relations. In two ways, fixed effect panel data analysis, Driscoll - Kraay Method corrects assumption deviations such as autocorrelation, heteroscedasticity and correlation between units. But despite ANOVA test shows that the financial centers differ in terms of market-orientation (bank-based vs. capital-based) and internationalization degree, Driscoll - Kraay Method omits dummy variables because of multiple linear dependence. Therefore, we can't see in which direction they effect spatial dependence of financial centers in the model. When we examined the effect of financial depth of banking and capital markets on the spatial dependence of financial centers in the Table 1, it is seen that the ratio of commercial banks and other financial institutions to private sector to the GDP (credit) parameter has a positive effect ($\beta_1 = 0.9336$) on the spatial dependency of finance centers. This variable was statistically significant at the 5% level of significance ($p = 0,000$). It is seen that the ratio of total value of stocks traded on Stock Exchange to the GDP (stock_traded) is a positive effect ($\beta_2 = 0,1291$) on the spatial dependence of the financial centers. At 5% significance level, this variable was statistically significant ($p = 0.002$). When the time effect is examined, it can be said that financial depth has increased spatial dependency for financial centers over time. As a result, Hypothesis 1 was rejected.

[Table 1. Panel Data Analysis Results on the Financial Depth on Spatial Dependence of Financial Centers]

Panel Data Model	Independent Variables	Depended Variables	β	Sig.	R2	Model Sig.
1	credit	Skor	0,9336	0,000	0,6892	0,000
	First Difference of stock_traded		0,1291	0,002		
	inflation		1,4109	0,000		
	First Difference of log GDP		30,1517	0,445		
	i_year 2008		468,7952	0,000		
	i_year 2009		500,0881	0,002		
	i_year 2010		514,5387	0,000		
	i_year 2011		537,1381	0,000		

When we examined the effect of financial efficiency on spatial dependence of financial centers in the Table 2, the bank efficiency score (bank_efficiency) positively affects ($\beta_1 = 5,544,698$) spatially dependence on financial centers but it is not statistically significant at the 5% level of significance ($p = 0.259$). Stock turnover ratio on stock exchanges (stock_turnover) affects the spatial dependency of financial centers in the positive direction ($\beta_2 = 0.3532193$). At the 5% level of significance, this variable was statistically significant ($p = 0,000$). Therefore, as the stock turnover ratio on stock exchanges increases, the spatial dependence of financial centers also increases. When the time effect is examined, it can be said that the financial efficiency has increased spatial dependency for financial centers over time. As a result, Hypothesis 2 was partially rejected.

[Table 2. Panel Data Analysis Results on the Financial System Efficiency on Spatial Dependence of Financial Centers]

Panel Data Model	Independent Variables	Depended	B	Sig.	R2	Model Sig.
2	constant	Skor	531,1804	0,000	0,6892	0,000
	bank_efficiency		5,544698	0,259		
	stock_turnover		0,3532193	0,000		
	inflation		0,482238	0,161		
	First Difference of Log GDP		-57,14116	0,000		
	i_year 2009		32,82129	0,000		
	i_year 2010		514,5387	0,000		
	i_year 2011		537,1381	0,000		

When we examined the effect of financial stability on spatial dependence of financial centers in the Table 3, the bank Z score (z_score) negatively affects ($\beta_1 = -2,3810$) spatially dependence on financial centers and it is statistically significant at the 5% level of significance ($p = 0.018$). Price fluctuations of shares on stock exchange market

(price_fluctuation) affects the spatial dependency of financial centers in the positive direction ($\beta_2 = 0.4329$) but at the 5% level of significance, this variable was not statistically significant ($p = 0,464$). When the time effect is examined, it can be said that the financial stability has increased spatial dependency for financial centers over time. As a result, Hypothesis 3 was partially rejected.

[Table 3. Panel Data Analysis Results on the Financial System Stability on Spatial Dependence of Financial Centers]

Panel Data Model	Independent Variables	Depended Variables	B	Sig.	R2	Model Sig.
3	z_score	Skor	-2,3810	0,018	0,6060	0,000
	price_fluctuation		0,4329	0,464		
	inflation		0,9546	0,004		
	First Difference of Log GDP		-19,1296	0,675		
	i_year 2008		605,7266	0,000		
	i_year 2009		635,31	0,000		
	i_year 2010		654,6829	0,000		
	i_year 2011		680,4405	0,000		

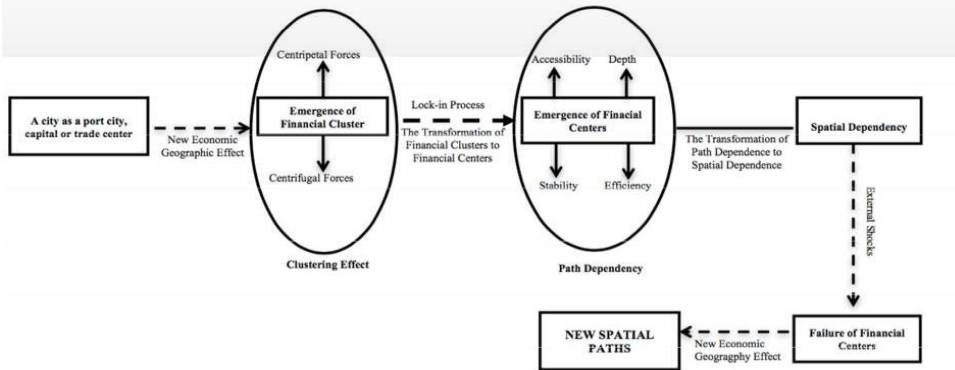
When we examined the effect of financial accessibility on spatial dependence of financial centers in the Table 4, the number of banks and bank branches per 100,000 people (bank_branch) positively affects (β_1

$= 0,6935$) spatially dependence on financial centers and but it is not statistically significant at the 5% level of significance ($p = 0.208$). the number of firms listed on the stock exchange per 1,000,000 people (listed_firm) affects the spatial dependency of financial centers in the negative direction ($\beta_2 = -2,017032$) but at the 5% level of significance, this variable was not statistically significant ($p = 0,139$). When the time effect is examined, it can be said that the financial accessibility has increased spatial dependency for financial centers over time. As a result, Hypothesis 4 was accepted.

[Table 4. Panel Data Analysis Results on the Financial System Accessibility on Spatial Dependence of Financial Centers]

Panel Data Model	Independent Variables	Depended Variables	B	Sig.	R2	Model Sig.
4	constant	Skor	583,7038	0,000	0,5943	0,000
	First Difference of bank_branch		0,6935219	0,208		
	First Difference of listed_firm		-2,017032	0,139		
	inflation		0,9785195	0,000		
	First Difference of Log GDP		-13,28406	0,824		
	i_year 2009		28,1813	0,000		
	i_year 2010		42,06522	0,000		
	i_year 2011		68,04861	0,000		

The research model is being shaped as it has been shown at Figure 1 below:



[Fig 01. Final Research Model]

Conclusion and Discussions

Financial centres determine their spatial paths according to their financial products, transactions and information flow direction. When we look at their evolution, they emerge in cities where international competitive is high. They need places where they have physical capital, financial development, institutional efficiency, social-cultural character, workforce, global attraction, profitable investment opportunities, confidential and wide knowledge hinterland. Competitive power of financial centers has forced their institutional capacities over time. When they reach natural boundary at one location, their competitive environment has affected their success adversely and let them develop new spatial paths. Many of global financial centers form multi-centered clusters over time, because they have enough financial depth and liquidity to create new attractive clusters which have low capital investment cost opportunity in some other place. Unlike global financial centers, it is not very easy to change locations for natural financial centers because of their strong spatial dependency. Hence, they can create new spatial paths only through historical accidents such as government policies or incentives. Government investments and incentives, technological changes, new sectors that demand new and specific financial products/service, replace of knowledge suppliers such as exchange stock, public enterprises and headquarters of big financial enterprises etc. and destructive external shocks such as natural disasters, financial crises, terrorism and wars are strong reasons to break a path dependence and create new spatial paths for financial centers. Especially changing their locations get easy for financial centers when the value of knowledge decrease in the location. On the other side, financial centers create new spatial paths to them changing in their financial functions and roles in terms of financial systems and proximity to customers that they service.

Financial centres create their new spatial ways by a planned way or randomly (Arthur, 1994). If financial centres follow a planned new spatial way, strategists should search new opportunities and provide reallocation of resources or they move towards another location depends on the constraints of their old location based on their collective learning processes (Hassink, 2005). If new spatial paths are chosen randomly, external shocks which can't be predicted by looking historical small events broke path dependencies and create another one (Martin and Sunley, 2006, Martin, 2010). In multiple centered financial clusters, location choice is also random but their spatial diffusion follows a cumulative but indeterminate process in the long-term (Wang, 2005; Krugman, 1998; Boschma and van der Knaap, 1997). New spatial paths can be created by expanding of knowledge hinterland, revising legal and organizational regulations for creating innovative technologic areas and new products and reallocation of resources (Garud and Karnoe, 2000; Martin, 2010; Martin and Sunley, 2006b).

This research show us that a way to break spatial dependence of financial centers is shifting of bank based financial system to capital based financial system. Financial centers that need to create new spatial paths should develop innovative products and tools in capital markets and widen their hinterlands enough strong to destroy the influence of their centripetal forces. Variety of financial products required differentiated places. While the liquidity degree and size of financial markets determine in which stock exchange that firms should list, the locations of the listed firms on stock exchange determine the boundaries of financial centers. While number of listed firms increase on stock exchanges, the information asymmetry is increasing in stock exchanges too. Therefore, this reduces spatial dependence and allows the

creation of new spatial paths. High turnover ratio of stock market indicates more liquid financial centers. On the other hand, there is a negative relationship between spatial dependence and financial stability. Financial system stability concerns financial centres' minimizing the risks created by financial integration. Generally financial instability increases the risk of financial crisis. Financial crisis as a dynamic external shock creates new spatial paths for financial centers by directing government policies and remodeling financial markets. A high Z-score implies that banks have low bankruptcy probability and high financial stability. Independence banks can move more easily towards places where have more advantageous conditions.

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