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## Social Network Analysis of Kuwait Publicly-Held Corporations

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### Abstract

Interlocking directorates is a major element in corporate governance system. Interlock occurs when a director of one company sits on the board of directors of other companies. This phenomenon has given rise to number of concerns in the economy. The relationships of some companies' attributes and corporate interlocks in Kuwait Stock Exchange among publically listed companies are investigated and uncovered for the first time. We explored the characteristics of the whole corporate network created by the directorship interlocks, and investigated the relationships of firms' characteristics and interlocking directorates, i.e. member and company interlocks. The findings of work will spur some focus on one of the main elements of corporate governance, i.e. outside directors' links, and contribute to the establishment of corporate governance codes and regulations in the context of Kuwait economy. Social network analysis shows clustering coefficients the financial companies are the highest degree centrality in the interlock network and hence the most influential actor in the network. The circle of influence stems from the high number of links with others. Another interesting observation elicited from the degree centrality analysis is the indirect interlocks companies can have. Companies can have indirect interlocks with companies having similar kind of business, which may facilitate collusion or anti-competition behaviors.

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*keywords:* Stock Exchange Market; Social Networks; Board of Directors; Interlocking Directorates; Kuwait Stock Exchange

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### 1. Introduction

Interlocking directorates is a major element in corporate governance system. Interlock occurs when a director of one company sits on the board of directors of other companies. This phenomenon has given rise to number of concerns in the economy [7] identified four concerns; first, there is a genuine concern

over the concentration of economic power in the hands of a few key players. Second, corporate interlocks can lead to conflict of interest of these interlocked directors. Third, interlock can also act as instrument for collusive and anti-competitive behaviour. Finally, directors with multiple directors are too busy to be effective.

What do interlocks “shared directors” signify? Do they unearth the features of the underworld of corporate network in any economy or are they just a mere window dressing as termed by Mace [24] or they represent friendship and social ties. We aim to explore the relationships of some characteristics of companies listed in Kuwait Stock Exchange (KSE) and corporate interlocks and also describe the characteristics of the network created by the interlocked directors.

Recently corporate governance has received extensive attention in the financial coverage [8] and in research articles covering the important roles of board of directors in steering the company’s course towards success especially in the midst of international financial crisis. Different boards are distinguished by the effectiveness of roles they engaged in. Board of directors has a multiple roles in companies they govern. The three main roles are control, service, and resource dependence [18]. The role of control stems from the agency theory that focuses on the separation of ownership (shareholders) and control (management). In the role of service, outside directors are in a better position to establish links with different sectors, to provide counsel to the management due to their diversified experience, and to help raise funds because of their connection and personal reputation [48]. As for the resource dependence role, the board is seen as facilitator to secure critical sources from the external environment to gain a competitive advantage [9]. To effectively perform their roles, board of directors needs to be more independent from the management which means that the majority of its directors need to be outsiders. This requirement has been introduced in the Sarbanes-Oxley Act in 2002 which is one of the most recent enforcement of good corporate governance in the United States.

Outside directors generate interlocks between firms. These interlocks can act as an important source of information in organizational environment [16]. Interlocks are also seen as a platform for companies to cooperate among themselves [6]. For financial institutions, interlocks allow them to co-opt, control, and monitor their investment with other corporations [28]. Interlocks also reflect the social ties in the inner circle of the corporate elites [44]. Moreover, interlocks trace interlocks stockholding relationships or customer-supplier links [25].

In this work we investigate and uncover the relationships of some companies’ attributes and corporate interlocks in KSE among publically listed companies. The premise of this work is also to describe the characteristics of the whole corporate network created by the directorship interlocks. Our work is a pioneering exploratory research on the field of interlocking directorates’ phenomenon in Kuwait. The findings of this research will hopefully spur some focus on one of main element of corporate governance, i.e. outside directors’ links, and contribute to the establishment of corporate governance codes and regulations in the context of Kuwait economy.

This research is of quantitative type. Stepwise regression analysis was applied to test the relationships between interlocks as dependent variable, and company size, board size, debt, and profitability as independent variables. Also, Chi-square and Mann Whitney tests were employed to measure the relationships of type of business, financial or nonfinancial, and interlocks. We select measures to represent the independent variables, viz. asset, and market capitalization, number of directors in a board, debt-to-asset ratio, net profit, return on asset, return on equity, and financial or nonfinancial type of business.

Social Network analysis (SNA) was used to identify some salient parameters in order to identify the major key actors and subgroup in the KSE market network, i.e. degree centrality and clustering coefficient. Data are collected from different publically available archival sources, such KSE’s website, companies’ website and annual reports.

## 2. Related Work and Background

In this section, we represent the literature survey of some related works and provide some background information. The section consists of the following subsections: Corporate governance, Board of Directors, Independence of Board of Directors, and Interlocking Directorates.

### 2.1. Corporate governance

There have been insurances at all levels on enforcing more corporate governance regulations to curb the flaws and scandals in the corporate arenas all over the world which led to financial catastrophes [39]. Corporate governance is always addressed as a strategic control having broader oversight of the firm's overall operation by triangulating the interest of the shareholders, and management led by the CEO, such as Enron, Arthur Anderson, and WorldCom to name a few. European Central Bank defines corporate governance as "procedures and processes according to which an organization is directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among the different participants in the organization – such as the board, managers, shareholders and other stakeholders – and lays down the rules and procedures for decision-making". The major player of corporate governance is the board of directors due to its function of monitoring the executive management, making decisions, and setting up long term strategies.

The corporate governance literature has extensively studied the multiple roles, responsibilities, premise of power, and consequences of corporate boards. However, one aspect of corporate governance that has not received more attention is the effect of selection of outside directors on the company's performance and value.

### 2.2. Board of directors

At the very core of corporate governance is the board of directors. Its important position stems from its decision making authority. The main element of board is the composition of the board of directors. It reveals the nature of the relationship between, on one side, corporate owners and managers, and on the other side, it reveals the firm's relationships with other firms through the appointment of outside directors. These relationships yield significant insights of the corporate behaviors. There are more than 20 measurements of board composition conducted in research, e.g. board size, proportion of inside directors, outside directors, affiliated directors, interdependent directors, and reciprocal CEO to name few [11].

The board of director consists of inside and outside directors. Inside directors are those who are usually include the firm's CEO, top executive officers, retired managers, officers or directors of subsidiaries or parent organizations, and retired officers of the corporation [35]. Outside directors are those who are not direct employees of the firms.

In the United States, approximately 85 percent of publicly held corporations combine the chairman of the board and the CEO positions [8], e.g. the chairman of Goldman Such and the CEO is the same. However, the combination of the two positions is not practiced in Europe.

Focusing on the inter-relationship among the board, management and shareholders, the three main roles of the board of directors are control, service, and resource dependence [18]. The control role requires directors to monitor managers and act as fiduciary of shareholders. Directors' responsibilities include hiring and firing the CEO and other top managers, determining executive pay, and monitoring manages to avoid expropriation of shareholders interest [31]. The service role entails directors to advise the management on administrative and management issues, as well as formulating strategies. The resource dependence role requires the directors as facilitators to acquire critical resources required for the success of the firm.

In general, directors are responsible for monitoring the management's performance to ensure the company is being run as envisioned for. Inside directors are seen as having a conflict of interest between management and shareholders as the agency theory suggests (see section 2.3 Independence of board of directors for elaboration on agency theory). Outside directors are seen as being in better position to effectively overlook the company due to the director's independence of the CEO and the firm as a function of their employment status, specifically lacking company's wage structure that allows the director to fulfill his or her fiduciary responsibilities [18].

Dwelling on the fact that the number of the outside directors has been increasing through interlocks, it is very important to pay more attention to the roles, responsibilities and implications of outside directors as interlockers to gain deeper insights of corporate performance and behavior.

### *2.3. Independence of board of directors*

There has been a continuous demand for the reform of board of directors both by business and the academic literature. The main theoretical approaches that address issues related to the nature and function of the board as board reform are based on the agency theory and resource dependence theory. The agency theory addresses the agency problems that occur when cooperating parties have different goals and interest. The theory states that one party (Principal) delegates work to another (Agent), who performs that work [13]. The other theory is resource dependence that emphasizes the appointment of representative of interdependent organizations as a way to acquire access to critical resource important to the success of the firm [38].

Logically, improvement in corporate board performance should yield to improvement in corporate performance. The more independent directors are, the more effectiveness of monitoring managers, thus reducing the agency cost arising from the separation of ownership (shareholders) and control (managers) [4]. Otherwise, the agency cost arising from the misalignment of the interest of principal and agent will be higher. Many empirical researches have been conducted to find and measure the correlation between board independence and corporate performance. Some of these studies found that there is no evidence of correlation [5]. Other studies have produced correlation ranging from positive [34] to negative [40]. Surprisingly, other researchers [23] failed to find a relationship between the proportion of non-executive directors and corporate performance.

### *2.4. Interlocking directorates*

One way to gain more independence of the boards is through directorship interlocks. The directorship interlock has been a focus interest for lawyer, economist, political scientists, sociologists, psychologists, business administration experts, cooperation executives, directors, educators, and Marxist scholars and they all have contributed to it [20].

By definition, directorship interlock occurs when an outside director of one firm sits on or affiliated with another firm's board of directors. If the same director serves on the board of other company, then the interlock is defined as multiple interlock. Usually, the multiple directorships are viewed as company interlock. The directorship and company interlocks are considered direct interlocks. Conversely, indirect interlock occurs when the companies are tied through a common director of the board of a third company [42]. Indirect interlocks sometimes are seen to distort information and thus questionable. The work in [35] noted that "the indirectly linked directors' attention is much more diffused than of a directly linked director".

Mutual, also known as double or dual interlock, occurs when two or more directors are also members of a different company's board [14]. The work in [14] also defined reciprocal interlocking as the CEO of one company is serving on the board of a second company, while the CEO of the second company is also

serving on the board of the first company. This is viewed as a form of mutual reciprocal interlocking of CEOs is more likely to occur in the firms having larger numbers of outside director directorship [47].

### 3. Kuwait Companies' Board of Directors Structure

The Kuwaiti commercial companies' law calls for the number of the directors appointed to the board to be a minimum number of 3 members as stipulated in Article 138 of the law. The law does not specify the maximum number of directors. In actual effect, the law effectively allows for each company to specify the number of directors as per the company's activities and requirements. Thus, the number of directors in the shareholding companies differs from company to company. Scanning some of the shareholding companies publicly listed in KSE, we can conclude that the number of the directors is around 7 to 12 directors [2]. Nevertheless, the law specifies three memberships as a maximum number of memberships a director can hold according to Article 140. Kuwait commercial law prohibits interlocking directorates among competing companies as stipulated in Article 151.

Not only the law prohibits such interlocks, but also it prohibits interlocks among companies having similar line of business [2]. By doing so, the law enforces the eradication of conflict of interest of directors sitting in competing or similar companies.

The stock market of the State of Kuwait was established on October 1962. However, the current Kuwait Stock Exchange (KSE) was organized in 1983 through the issuance of Amiri Decree issued on 14th August 1983. KSE consists of ten sectors namely banking, investment, insurance, real estate, industrial, services, food, non-Kuwaiti, mutual funds, and parallel market. The KSE consisted of 203 companies as of 31st December 2007 [17].

In this research, we focus on the overall interlocking pattern among the publically listed in KSE by the end of year 2007. Based on the information collected from various sources, we will examine some testable hypotheses to uncover the relationship between corporate interlocks and some characteristics of firms in Kuwait. Also, we will draw the whole interlocking network using Social Network Analysis (SNA) to describe some of the characteristics of Kuwait interlocks network.

This research will shed some light on the nature of corporate interlocks in Kuwait and can be used to provide valuable suggestions to policy-makers and regulators to develop corporate governance code and regulations specifically policies related to interlocking directorates.

The target population consists of all the companies that are publically listed on Kuwait Stock Exchange as of 31st December 2007. There are 201 listed companies included in total in this research. There are ten sectors of companies, namely banking, investment, insurance, real estate, industrial, services, food, non-Kuwaiti, and parallel market.

The overall finding characteristics of the boards of the KSE's companies showed that there are more services companies than others in the stock market followed by investment companies. We would expect a country such as Kuwait, whose economy is heavily depending on oil industries, would have more industrial companies to cater for oil industries which generate most of the country's income. It is worth noting that non-Kuwaiti sector is having more board members per company (9.4%) followed by banking (8.2%) and insurance (7.9) respectively. The percentage of directors serving in more than one board is 15.8 % compared to 16% for New Zealand and 12% for Australia (Roy al et., 1994).

### 4. Experimental Results and Analysis

This research aims to examine the corporate interlocks across listed companies in KSE. In particular, it investigates the impact of firm size, board size, debt, profitability, and financial ties on interlocking directorates in KSE. We used a quantitative approach to answer the major research question regarding Kuwait corporate interlocks whereby raw data, such as number and names of directors, assets, market

capitalization, debt, net profit, and profitability ratios, will be processed and then analyzed to turn them into useful information in describing and examining the relations of interlocking and trends in KSE's shareholding companies.

#### *4.1. Target population and sampling method*

The target population consists of all the companies that are publically listed on Kuwait Stock Exchange as of 31st December 2007. Thus, there is no need to take sample as it is possible and practicable to survey the entire population. The entire population data can be accessed through KSE's official website, companies' websites, and companies' financial reports. In total there are 203 listed companies as of end 2007. From the raw data, we removed two companies (Al-Enma'a Real Estate and Institute for Private Education) for which no information was available. Therefore, the total number of companies is 201. Selecting the population ensures that the entire corporate links network is captured for the analysis so no corporate linkage is missed.

The year 2007 was a bull market that took the Kuwait Stock Exchange index from its low of 9,548 points in February to its October high of 13,174. That bull market was interrupted by a correction, which took the index down to 11,931 in December. The index then resumed its climb to its all time high of 15,668 in June 2008. Despite the correction, the fact that the index resumed its climb, which continued through the majority of 2008, reflects the positive outlook of investors during that period, and it is for that positive outlook that the year 2007 was selected for this study. Investors tend to be less cautious during such atmospheres, and changes in company board members become minimal.

#### *4.2. Data collection instruments and source*

The initial task was compiling the names of all board members of nearly every listed company in Kuwait. This required downloading and processing data from KSE's investor guide for year 2007 for the 203 companies in order to collect the raw data which consists of 1039 names of individual board members occupying a total of 1290 board seats.

Most of the information sources we used in this research are self-explanatory. In almost all cases, we have used publically available information. There were a few inconsistencies and impurities in the raw data that would subsequently affect the analysis. Therefore, these impurities need to be corrected before processing the data. The main source of these impurities is arising from the names of the members of the board of directors. We used the Arabic names of the members to avoid the misspelling their corresponding names in English.

Further in cleaning the data, we noticed that some directors could be registered with titles and salutation, such as Dr. for a person that holds a Ph.D. from an academic institution, (.) for professor who is a college or university teacher, and sheik for a member of the royal families. This will pose a problem in processing the data when considering these two entries, one with such title and one without, as two different persons, thus having significant impact on the results as the same director would different name. Accordingly, titles and salutation in the data of directors' names were removed.

### **5. Social Network Analysis (SNA)**

The Social Network Analysis (SNA) involves the operationalization of the characteristics of corporate interlocks network within KSE by measuring major SNA parameters such as centrality degree and clustering (cliques or subgroups). Social Network Analysis (SNA) identifies the extent of corporate links generated by interlocks. Interlocks link companies together to form a network. The authors in [45] define a social network as actors (nodes) and the relations (ties) between these actors.

SNA is a quantitative technique developed by social scientists and used by sociologists and mathematicians to measure social networks and analyze social relations and inter-personal ties. The analysis has been developed into some computer software tools such as NetDraw, NetVis, and Pajek [19]. Pajek is used in this research. As discussed in this research, our interest is to study the characteristics of interlocking directorates' network and the social structure of corporate network in KSE. The main reason for applying SNA is to complement the statistical analysis, which excludes impact of social factors on interlocks. Explicit inclusion of social factors is a scope of another research. In this SNA analysis, we focus on two significant parameters, degree centrality (interlocks) and clustering (cliques).

### 5.1. Degree centrality

Degree centrality is defined as the number of links incident upon a node [45]. In KSE network case, degree centrality represents the number of ties (directors) that a node (company) has. The significance of degree centrality is that it measures the actor's, in our case the company, potential influence in a network. Companies with more degree centrality have more ties and therefore they have advantage over others for having a bigger circle of influence. In other words, a company with high degree centrality is expected to have more influence compared to a company with less degree centrality. Hence it allows them to have alternative ways to satisfy their needs. One counter argument is that the high degree centrality company may be prone to attack or be exploited and influenced as well through the interlocks. Either case, the degree of centrality is an indicative measure of such influential power. Furthermore, an inactive or not powerful socio-economic actor connected to so many nodes can be a sign of the stability of the social network. Examples include the presence of non full-fledged board members (links) invited by different companies due to their social status, e.g. a university president, physician, public figure. Such thing is not uncommon in the Kuwait market due to the social tightness of the Kuwaiti society.

The degree of centrality  $C_D(G)$  can be expressed mathematically [45] as following:

$$C_D(G) = \frac{\sum_{i=1}^{|V|} C_D(v^*) - C_D(v_i)}{n - 2} \quad (1)$$

Where G: graph, n: vertices, V: all nodes, v\*: node with highest degree centrality. The network degree centrality for companies varied from 0.0059 to 0.0654 ( $0.0059 < D < 0.0654$ ). The company with highest degree centrality is a financial company, i.e. Egypt Kuwait Holding Company. It is no surprise that the company with highest degree centrality is a financial company. This is in line with our statistical analysis where financial companies maintain higher interlocks than nonfinancial. The company has 11 interlocks. It has interlocks with 2 banks (Boubyan & National Bank of Kuwait), 2 investment companies (National Investment, KIPCO Asset Management, And Al-Mal Investment), 2 industrial companies (Cable & Electrical Industries, and National Industries Group), 2 services companies (Mobile Telecommunications, and Public Warehousing), and one real estate company (Grand Real Estate Projects).

### 5.2. Clustering coefficient

Clustering recognizes the groups and sub-groups in a network and their overlapping. It identifies the number, the size, and connections among the groups. These measures can be used to analyze the behavior of a network as a whole and most importantly it tells us how fast things and actions can move across the directors being the links from one company to another.

The formation of cohesive subgroups within the stock market companies is not unusual in most known stock markets. The work in [45] defined cohesive subgroups as subset of actors among whom there are relatively strong, direct, intense, frequent, or positive ties. Companies within the same sector tend to have diverse board members and links due to legal requirements and to avoid conflict of interest. Therefore, we

expect clustering to exist within several sectors. For example clusters of companies shared with interlock may exist among industrial, financial and service sectors. They are complementing each other in the supply chain. Tightly clustered companies represent a polarized market force. Furthermore, the presence of many clusters in the market enhances the economic cycles as well simply because of the backing and supporting a company may receive from companies within the clusters. Hence, an interlock exist to satisfy such requirement.

Clustering can be measured by clustering coefficient, which is defined as a measure of degree to which nodes in a graph tend to cluster together [46]. The clustering coefficient,  $C_i$  mathematically expressed as;

$$C_i = \frac{E_i}{E_{\max}} = \frac{2E_i}{K_i(K_i - 1)} \quad (2)$$

Where,  $i$ : node in the network;  $K_i$ : edges (links);  $E_i$  : the ratio between the number of edges  $k_i$  nodes and the total number of such links [ $E_{\max} = K_i(K_i - 1)/2$ ]. Our data shows there are 88 cliques or subgroups in total in the whole KSE interlock network. Eleven cliques are having the highest clustering coefficient of 2.

As expected, clustering exists between different sectors to integrate each other in the supply chain as a market strategy. For example, the industrial company, Kuwait Pipes Industries and Oil Services, interlocked with several financial firms and service companies. In the example above, the clustering is dominated by financial companies (1 bank, 4 investment companies, and 1 insurance company). It also has interlocks with 2 industrial companies, and 2 service companies.

## 6. Concluding Remarks

The Social Network Analysis (SNA) reveals that the financial companies are the highest degree centrality in the interlock network and hence the most influential actor in the network. The circle of influence stems from the high number of links with others. Another interesting observation elicited from the degree centrality analysis is the indirect interlocks companies can have. Companies can have indirect interlocks with companies having similar kind of business, which may facilitate collusion or anti-competition behaviors. However, the same can be an instrument for diffusion of information, new management practices, trading rules, and market trends among interlocked companies. For example, Egypt Kuwait Holding Company has two interlocks with banks. These banks can interact with each other in this company board without being interlocked directly.

The clustering analysis reveals that the cliques or sub-groups' formation tend to integrate and cement the stock market and it suggests the cliques' arrangement represents sources of inter-corporate unity and cohesion in the business market [25]. Since most of the cliques in KSE are relatively close to each other's, there are no few powerful cliques surpassing the others, which may dominate the market network. This leads to more stability of the market network in KSE. This result is in line with similar study of Lee (1998) when he examined interlocks in Taiwan between governmental and private sectors.

Another aspect of interest is that families in Kuwait dominantly constitute the business interest groups. Internationally, over 85% if EU and US businesses are family-run and they constitute about 40% of the US S&P 500 universe [43]. The power concentration by families in Kuwait is manifested by the family ownership in the stock market and hence ownership structure is concentrated in the hands of the controlling families. There are about 53 influential business families that dominate the board memberships in KSE with at least 5 representatives of each family [1]. The familial groups are also considered as active cliques or subgroups even though they don't appear as direct interlocks across companies in the network. Moreover, these family groups are main source of finance and this explain why there is no relationship between company's debt and interlocks as companies have another source of capital other than banks to turn to. This is supported by Stearns and Mizruchi's [42] findings that when



family-controlled firms appoint financial representative, they do it voluntarily which suggests that family-controlled firms do not necessary rely on banks for finance.

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