Miracle on the Han River: A Regression Analysis of the Effect of Chaebol Dominance on South Korea's Economic Growth

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Abstract

How did Korea, one of the poorest countries in the world in the 1960s, become a model of success for developing economies just five decades later? This paper analyzes the role that chaebols, large Korean conglomerates, played in bringing about robust economic growth to the country since the conclusion of the Korean War. The broad research question was: **What is the effect of chaebols' dominance in the Korean economy on Korea's growth rate?** I argue that chaebols have had a positive impact on Korea's growth rate by being the main drivers of Korea's export-oriented industrialization, achieved through economies of scale. I also discuss two most prominent features of chaebols—diversification and vertical integration—and how they enabled chaebols to achieve overall efficiency in production. Using cross-sectional and time-series data, I perform regression analysis to examine the effect of chaebols' dominance on Korea's growth rate, compared with the average growth rate of the rest of the world and with Korea's own long-term average growth rate. The results show that, holding constant exports, education, savings rate, population growth, regime type, and natural resources, the effect of chaebols' dominance on Korea's average growth rate was statistically significantly positive when compared with the average growth rate of the rest of the world, but statistically insignificant when compared with Korea's own average growth rate. The findings of this study present a new perspective on the isolated effect of chaebol dominance on Korea's economic growth, and lay a foundation for several avenues for future research.

List of Tables and Figures

I. Introduction

After a devastating civil war that left the country in ruins, South Korea showed remarkable economic recovery in the following decades. Indeed, from the early 1960s to the mid-1990s, the Korean economy experienced the highest average rate of growth in the world—roughly 9%.[1] Scholars later dubbed this phenomenon the "Miracle on the Han River," referring to Korea's rapid postwar export-fueled growth, accompanied by industrialization, technological breakthroughs, an education boom, and a large increase in living standards all across the country. One of the poorest countries in the world at the beginning of the 1960s, Korea joined the ranks of industrial democracies within a single generation, becoming a member of the Organization for Economic Cooperation and Development (OECD) in 1996.[2] Today, Korea is the 15th largest economy in the world, is a G-20 member economy, has been appropriately called an "Asian tiger" nation along with three others, and boasts large automobile and electronics industries, some of which (e.g. Samsung, LG, Hyundai) have become household names in the United States. What explains this complete transformation? Some have argued that it primarily comes down to the export-led growth strategy adopted by Korea, often grouping Korea with several other Asian economies that also grew robustly by using the same strategy. However, this overly general explanation is neither sufficient nor satisfactory. Indeed, one scholar aptly emphasizes that development strategy for any country is a complex, multidimensional problem involving wide-ranging areas such as the establishment of long-term targets for growth and structural change, and that development strategy should not be reduced to the dichotomy between export-oriented growth and import-substitution industrialization.[3] The general consensus in the current literature

[1] Peter M. Beck, "Revitalizing Korea's Chaebol," *Asian Survey* 38 (1998): 1018.
[2] Wonhyuk Lim, "*Chaebol* and Industrial Policy in Korea," *Asian Economic Policy Review* 7 (2012): 69.
[3] Ha-Joon Chang, "The Political Economy of Industrial Policy in Korea," *Cambridge Journal of Economics* 17 (1993): 153.

is that a form of organizing the structure of companies unique to South Korea—called the *chaebol*—played an instrumental role in developing a highly versatile economy that was able to adapt to the changing international demands over time.

There has been ample literature dealing with different factors that served as impetus for Korea's economic growth. Much of it has focused on Korea's exports-driven growth strategy, while some have also examined the effect of other variables, such as democratization, emphasis on education, and population growth. The linkage between export performance and economic growth has been studied widely and there is a clear positive relationship between the two. Scholars explain that, both in general and specifically for Korea, an export-oriented industrialization strategy tends to exert a positive effect on growth through increases in saving and investment, technology, and possibility of structural change stemming from opening industries to world markets.[4] There also appears to be a mutually reinforcing relationship between democracy and economic growth, as suggested by economist John F. Helliwell. He asserts that income has a positive effect on democracy because increases in income levels are likely to increase people's demands for political and civil freedoms, and that democracy also has a positive effect on growth via education and investment.[5] Population growth, too, has a non-negligible positive effect on growth by encouraging the development of industries that are labor-intensive.[6]

While, as mentioned, there is a consensus in the literature that chaebols had an important role in growing and developing the South Korean economy, most lack a definitive focus of specific aspects of chaebols that enabled them to have a positive effect on growth. For instance,

[4] Rudiger Dornbusch et al., "Korean Growth Policy," *Brookings Paper on Economic Activity* 2 (1987): 404.
[5] John F. Helliwell, "Empirical Linkages Between Democracy and Economic Growth," *British Journal of Political Science* 24 (1994), 225.
[6] Wong Hock Tsen and Fumitaka Furuoka, "The Relationship between Population and Economic Growth in Asian Economies," *ASEAN Economic Bulletin* 22 (2005): 314-330.

many scholars have placed a lot of emphasis on the emergence and development of chaebols, tracing their evolution from the 1960s to the 1990s.[7] They focus on the role of state intervention and the state-business cooperation, mentioning such government policies as the Five-Year Economic Development Plans.[8] Some even go into the cultural and political foundations for chaebol, discussing such factors as characteristics of Korean employees and behavioral patterns of Korean people in general.[9] While these authors certainly do examine the unique features of chaebols, such as family ownership and management, diversification into different industries, and vertical integration, they do not specifically delve into the effect of these features on Korea's economic growth.

Given this review of the current literature, the central question of my research is as follows: **What is the effect of chaebols' dominance in the Korean economy on Korea's growth rate?** The purpose of this paper is to examine the link between chaebol dominance in Korea and Korea's economic growth. The aforementioned features of chaebols enabled them to grow quickly and establish a dominant position in the Korean economy. I contend that this dominant presence of chaebols, or the chaebol-centered growth strategy, played a crucial role in promoting Korea's growth between the 1960s and the 1990s. In an attempt to establish the statistical significance of this relationship, I conduct multivariate regression analysis. Separately, I also offer insights into the key characteristics of chaebols, and how these characteristics contributed to their dominance in Korea's economy. This combination of regressions analysis and qualitative discussion cannot easily be found in the current literature. Thus, by discussing chaebol dominance as a specific variable that contributed to Korea's growth, I hope to fill in the gap in the existing set of explanations.

[7] Haggard, Lim, and Kim 2003; Chang 2003; Kim 1997; Chang and Chang 1994; Jwa 2002.
[8] Jwa 2002; Kim 1997; Chang 2003.
[9] Chang and Chang 1994.

This paper explains that chaebols' dominance has had a positive impact on growth through their superior operation of economies of scale. After their creation and initial development in the 1960s, chaebols quickly and firmly established their dominant position in Korea's economy with stellar export performance. In the process, chaebols gradually became what they are today—huge multi-industry conglomerates run by specific families. Government policy at the time helped form chaebols' special structural features, the two most prominent of which are vertical integration and diversification. The former essentially refers to a process of indigenizing inputs for different stages of production, and the latter to the expansion of production into different, sometimes unrelated, industries. After chaebols became the cornerstone of Korea's export-driven growth strategy by the mid- to late-1960s, they were considered, both by the government and private actors like banks, to be in an advantageous position to operate economies of scale to maximize profits. Faced with the increasing demands from the growing world markets, the Korean government pushed chaebols, who had the necessary capital base, into new industries, rather than subsidizing non-chaebol firms specializing in such industries. While this further widened the gap between chaebol firms and non-chaebol firms, this system of exclusive support for the large, established chaebol firms helped attain economies of scale more efficiently, thereby maximizing profits and promoting economic growth.

In addition to an investigation of the mechanism through which chaebol dominance has affected Korea's economic growth, I present findings from regression analysis to confirm the statistical significance of the effect. Using time-series/cross-sectional data obtained from extant literature, the World Bank's *World Development Indicators* and the Quality of Government Institute, I perform a series of multivariate regressions. The results suggest that, holding constant

export performance, education, savings rate, population growth, regime type, and availability of natural resources, chaebol dominance, measured by top 10 chaebols' share of Korea's GNP, has a statistically significant effect on Korea's GDP growth.

Finally, I explore how chaebol features such as diversification and high degree of vertical integration helped chaebols operate economies of scale and overall efficiency of production. To this end, I look closely at how and why chaebols decided to diversify and vertically integrate in the first place, citing specific examples of chaebols engaging in this practice.

II. Background: Chaebol Origins and Characteristics

What, then, is the **chaebol**? Many scholars define it in different ways. Most simply, a chaebol is a Korean business group that encompasses many subsidiary firms under the same name.[10] There are many Korean companies with more than two subsidiaries that are controlled by one family, but the Korean government and media typically use "chaebols" to denote thirty largest business groups.[11] Every year, the Korean government identifies the thirty largest business groups and publishes a listing of their affiliates under the "Monopoly Regulation and Fair Trade Act" to block any anticompetitive behaviors. The act defines chaebols' affiliates as those for which "either more than 30% of whose issued shares are owned by one person, his relatives, or a company controlled by him, or whose management such as appointing its officers is substantially affected."[12] There are numerous chaebol groups in Korea, the biggest and most prominent of which include companies like Samsung, Hyundai Motor, SK, and LG. It is important to note a few key characteristics that describe how chaebols are structured and designed to operate. First, many chaebols are family-run; often, the chairmanship is inherited from father to son. The current chairmen of Samsung and Hyundai, for example, have their respective sons in the company's vice president positions, and they are expected to become chairmen after their fathers retire. Similarly, the current leaders of SK Group and LG also inherited their positions from family-member founders. Moreover, the rest of the founding family members virtually control chaebol firms through cross-holding of equity.[13]

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[10] Sea-Jin Chang, *Financial Crisis and Transformation of Korean Business Groups: The Rise and Fall of Chaebols* (Cambridge: Cambridge University Press, 2003), 9.
[11] Ibid., 10.
[12] Ibid.
[13] Seung-Rok Park and Ky-hyang Yuhn, "Has the Korean *chaebol* model succeeded?" *Journal of Economic Studies* 39 (2012): 261.

Second, chaebols typically consist of a large number of affiliate companies that are engaged in different businesses, all operating under a single corporate group. This is called diversification, which essentially means that big chaebols are not simply engaged in one type of business, but instead in numerous different types of businesses that are often unrelated. For instance, the general American public perception of Samsung, the biggest chaebol in Korea, seems to be that it is a company focused primarily on producing electronic devices such as TVs, computers and mobile phones, but its corporate reach goes far beyond consumer electronics. Other industries in which Samsung subsidiaries are engaged include shipbuilding, construction, life insurance, surveillance and defense, and advertising. Although not as extensive as Samsung, other big chaebols in Korea are engaged in businesses they are not primarily known for. The average number of subsidiaries of the top 30 chaebols hovered around 22 for the 1990s,[14] up from around 15 for the previous decade.

Third, chaebol firms exhibit a high degree of vertical integration. Highly vertically integrated firms seek to "indigenize intermediate inputs imported from foreign upstream industries," and Korean firms that would later emerge as big chaebols showed early efforts in the 1960s by trying to vertically integrate through technology acquisition, human resource development, and construction of optimal-scale plants aimed for the global market.[15] Samsung Electronics, for instance, makes most of the components that go into its own phones. This is in stark contrast with Apple, which does its own operating system and designs but contracts out all of the underlying hardware. The result is that it takes significantly less time for Samsung to go from contriving an idea to bringing a final product to markets, because it does most of the production process itself.

[14] Sung Hee Jwa, *The Evolution of Large Corporations in Korea: A New Institutional Economics Perspective of the Chaebol* (Cheltenham: Edward Elgar Publishing, Ltd., 2002), 45.
[15] Lim, 74.

Given their sizes and the extent of their diversification and vertical integration, the chaebol firms' contribution to Korean economy has recently been more significant than ever before. In 2011, the sales of Korea's ten largest companies were equal to about 80% of the country's GDP that year.[16] Even more surprising is the fact that among all the chaebols that exist in Korea, the top firms are by far the biggest contributors. According to the Korea Fair Trade Commission, in 2013, South Korea's top four conglomerates generated some 90% of the total net profit earned by the top 30 conglomerates.[17] In the following sections, I discuss how chaebols became such big conglomerates, as well as how they established a dominant presence in Korea's economy.

[16] Eun-jung Kwon, "Top ten chaebol now almost 80% of Korean economy," *The Hankyoreh*, August 28, 2012, accessed December 9, 2014, http://www.hani.co.kr/arti/english_edition/e_business/549028.html.
[17] Koichi Kato, "Top four chaebol generate 90% of South Korean conglomerate profits," *Nikkei Asian Review*, April 10, 2014, accessed December 9, 2014, http://asia.nikkei.com/magazine/20140410-Growth-Central/Business/Top-four-chaebol-generate-90-of-South-Korean-conglomerate-profits.

III. Research Question

As mentioned earlier, there has been plenty of literature that explores sources for Korea's economic miracle. While much of it has examined Korea's export promotion and its effect on growth, some have also analyzed the effect of other variables, including regime type, emphasis on education, and population growth.

Exports, for one, are a key component of gross domestic product, so an increase in exports is an important source for GDP growth. Unlike many Latin American countries that adopted import substitution industrialization (ISI) as their principal method of achieving economic growth throughout the post-WWII era,[18] Korea quickly adopted an export-driven growth strategy. Korea started with an import substitution strategy in the early 1950s, with foreign aid financing the trade gap.[19] By around 1960, however, it had "virtually exhausted the possibility of rapid growth through import substitution of nondurable consumer goods and intermediate inputs."[20] Additional import substitution of machinery, consumer durables, and their intermediate inputs was rejected because the domestic market was too small.[21] Thus, faced with implied negative consequences of a continued ISI strategy, the Korean government intervened in order to promote exports-oriented industrialization. Intervention in the form of trade restrictions, subsidies, and credit allocation was pervasive.[22] Scholars have noted that this type of outward-oriented strategy is supported by the efficiency of freer trade over a restrictive trade regime.[23] Because export promotion is more closely related to free trade than is import substitution, Korea's export-driven growth strategy has had a positive effect on saving and

[18] Werner Baer, "Import Substitution and Industrialization in Latin America: Experiences and Interpretations," *Latin American Research Review* 7 (1972), 95.
[19] Dornbusch et al., 405.
[20] Ibid.
[21] Ibid.
[22] Ibid., 403.
[23] Ibid., 404.

investment, technology, and the possibility of structural change coming from opening industries to world markets.[24] In summary, the high positive linkage between export performance and economic growth is "an accepted fact in development economics."[25]

On the relationship between regime type and economic growth, Helliwell explains that there is a two-way reinforcing linkage between democracy and economic growth.[26] The effects of income on democracy, he notes, are found to be robust and positive. This positive effect is also theoretically supported because increasing levels of education and income are "likely to increase citizen demands for many things, including the range of political and civil freedoms that characterizes democratic systems."[27] Democracy also exerts a positive effect on growth via investment and education.[28] This two-way strengthening relationship has held true for Korea. One scholar notes that the improvements in the quality of democracy contributed to sustaining high economic growth after the democratic transition in Korea, arguing essentially that an authoritarian Korea would likely have "failed to adjust to the changes in the economic environment caused by the end of the Cold War, the IT revolution, and the spread of globalization."[29]

Education, too, has served as a key determinant of industrialization—and in turn of economic growth—in Korea. Amsden asserts that while the role played by education in economic development in Korea ought not to be deified, a well-educated population in general

[24] Ibid.
[25] Ibid.
[26] Helliwell, 225-248.
[27] Ibid., 225.
[28] Ibid.
[29] Hyung Baeg Im, "Better democracy, better economic growth? South Korea," *International Political Science Review* 32 (2011): 596.

and a plentiful supply of trained engineers in particular have been critical inputs in the industrialization process.[30]

Population growth also has a non-negligible effect on growth. Tsen and Furuoka, through statistical analysis, have established bidirectional Granger causality between population and economic growth for Korea.[31] They explain the rationale with a discussion about minimum wage:

> The issue of population and economic growth is […] closely related to the issue of minimum wage. Population growth enlarges labour force and, therefore, will push wage down. The standard economic labour demand model predicts that low wage will raise the demand for labour. As a result, the welfare of the economy is likely to increase. Moreover, low wage would encourage industries that are labour intensive. Low wage is said to be an important factor that has contributed to the industrialization of Asian newly industrialized economies (NIEs), namely Korea, Hong Kong, Taiwan, and Singapore.[32]

While, as mentioned, there is plenty of literature examining the emergence, development and success of chaebols, most neglect a discussion about the specific aspects of chaebols that enabled them to have a positive effect on growth. For instance, many scholars have placed a lot of emphasis on the creation of chaebols and have traced their evolution from the 1960s to the 1990s.[33] They focus on the role of state intervention and the state-business cooperation, mentioning such government policies as the Five-Year Economic Development Plans.[34] Some even go into the cultural and political foundations for chaebol, discussing such factors as characteristics of Korean employees and behavioral patterns of Korean people in general.[35] While these authors certainly do examine the unique features of chaebols, such as family ownership and management, diversification into different industries, and vertical integration,

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[30] Alice H. Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (New York: Oxford University Press, Inc., 1989), 238-9.
[31] Tsen and Furuoka, 314-330.
[32] Ibid., 315.
[33] Haggard, Lim, and Kim 2003; Chang 2003; Kim 1997; Chang and Chang 1994; Jwa 2002.
[34] Jwa 2002; Kim 1997; Chang 2003.
[35] Chang and Chang 1994.

they fail to delve into the effects of these features on Korea's economic growth. Given this gap in the current literature, the central question of my research is as follows: **What is the effect of chaebols' dominance in the Korean economy on Korea's growth rate?**

Through this paper I hope to fill in an existing gap in the literature about the effects of chaebols' dominance—or growing importance and influence—on Korea's economic growth. But while my hypothesis links chaebol dominance with growth, I also consider what caused chaebols to dominate the Korean economy in the first place. In this paper I present multivariate regression analysis and comparative perspective, neither of which can easily be seen from the current literature. In addition to the regression analysis, I offer a qualitative discussion, explaining how and why top chaebol firms diversified and integrated vertically, the effect of diversification and vertical integration on efficiency and, by extension, on growth. Examining the pattern of chaebol expansion is important, as it helps further our understanding of the regression analysis by providing insight into the extended mechanism by which chaebols' share of Korea's output increased so significantly, thus complementing the results of regressions.

IV. Theory

States in which government-business collusion prevails can be effective in promoting domestic economic growth. The mechanism involved starts with a discussion about identifying the interests of the actors involved—namely, national government and corporations. A chief interest of government officials is to stay in power. The means to achieve maintenance of power can vary depending on the type of government, but a common way to secure power seems to be increasing prosperity and delivering economic growth. On the other hand, it is well known that all firms have a core interest in maximizing profit. To this end, firms strive to operate economies of scale to bring down production costs, and the government seeks out a strategy that can help the country grow. The result of interaction between growth-pursuing government and profit-maximizing firms is a collaborative policy that can serve to further both ends.

On the basis of the above logic, I generate my two-part hypothesis for this paper. **The proposed argument expects an increase in chaebols' dominance in Korea to increase Korea's economic growth rate, (a) relative to the world's average growth rate and (b) relative to its own growth rate over time.** The primary mechanism through which chaebols' dominance affects Korea's economic growth is economies of scale and export promotion through government support and incentives. Chaebols, like all firms, have a core objective of maximizing profit. The Korean government's key concern in the late 1950s and early 1960s was delivering economic growth. Thus, the Korean government, in order to deliver economic growth to its people, selected a few firms based on family relations and essentially made them more productive by providing various types of economic support, including subsidies and tax breaks contingent on strong performance. In the 1960s, Korea also chose to promote growth through export-oriented industrialization, given its lack of natural resources and its relatively small

domestic market. With this directive, the government provided subsidies and tax breaks to chaebol firms for export promotion, helping them grow in size, market share, and overall contribution to the economy. Further, exporters have a productivity advantage even before they start exporting;[36] on balance, exporters are more productive, not as a result of exporting, but because only the most productive firms are able to overcome the costs of entering export markets.[37] In the case of Korea, the most productive firms have been chosen and nurtured by the government.

Initially, a set of policies by the Korean government designed to identify and support certain firms based on family relations led to chaebol formation. Because of the incentives—such as tax breaks, subsidies and allocation of foreign capital at low interest rates—provided by the government, chaebols began to diversify into various, sometimes unrelated, industries. The Park regime's astute analysis of international economic demands during its reign enabled Korea to focus on key strategic industries that changed from decade to decade. Beginning with the advent of the heavy and chemical industrial (HCI) drive in the 1970s, and fueled by continued support from the government, chaebols were able to achieve economies of scale and increase profits. This, coupled with robust export markets provided by Japan and the United States, ultimately helped Korea produce export-led economic growth. Jae-Seung Shim and Moosung Lee explain that the government determined that chaebols were more suited to taking advantage of economies of scale:

> Big businesses were seen by government to be in a better position than small firms in the efficient use of resources and in strengthening competitiveness through economies of scale.[38] [Government] measures resulted in a rapid increase in production and export capacity since business success for firms depended to a large extent on their export

[36] Bernard, et.al, "Firms in International Trade," *Journal of Economic Perspectives* 21 (2007): 106.
[37] Ibid.
[38] Jae-Seung Shim and Moosung Lee, *The Korean Economic System: Governments, Big Business and Financial Institutions* (Hampshire: Ashgate Publishing, Ltd., 2008), 50.

> performance. Chaebol were in a much better position than small firms in benefiting from economies of scale as well as in expanding production capacity. The government, too, favored a small number of large firms over a large number of small firms, since it was convenient for them to focus government attention in this way. Moreover, in allocating loans, banks preferred chaebol to small firms.[39]

Thanks to the size they have achieved by the start of the HCI drive in the early 1970s, chaebols were in an advantageous position to attain economies of scale through large-scale production. This, along with Korea's export-driven growth strategy, caused the importance of exports in Korea's economy to increase dramatically throughout the decade. Indeed, to achieve scale economies, the government allocated export licenses to only a few companies, furthering the rise of chaebols. For instance, it chose Hyundai and Daewoo to develop power plant facilities and Hyundai, Samsung, and Daewoo to build ships.[40] As a result, from 1971 to 1979, the proportion of exports to GNP increased from 16% to 36%.[41] Thus, we can infer that chaebols' attainment of scale economies—along with continued government support in the form of subsidies and tax breaks—helped them achieve better export performance, which in turn contributed directly to economic growth.

[39] Ibid., 82.
[40] Sea-Jin Chang, *Financial Crisis and Transformation of Korean Business Groups: The Rise and Fall of Chaebols* (Cambridge: Cambridge University Press, 2003), 54.
[41] Ibid.

V. Analysis

A. Methodology

Conducting regression analysis for the effect of chaebol dominance on Korea's economic growth first requires operationalizing the independent and dependent variables. The independent variable, chaebol dominance, can be appropriately measured by looking at the ***value added*** share of Korean GNP by top chaebol firms. I chose the chaebols' value added share of GNP rather than sales share of GNP, since the latter gives "an inflated estimate of the importance of the chaebol […] because transactions of semi-finished goods between firms within a group are included."[42] On the other hand, value added is defined as "new value created by the producer during the production process," and since GNP represents the sum of value added produced within a country from the production activity of all economic actors (plus overseas income earned by domestic residents minus domestic income earned by overseas residents), the total value added for a company can be considered a strong indicator of the importance that company holds in the national economy.[43] In this sense, the value added measure is a much more reasonable and accurate measure of chaebols' influence. This measure also makes intuitive sense because as chaebols become a more dominant influence in the Korean economy, their share of the country's total output also increase—and vice versa. The dependent variable, economic growth, is expressed using the standard measure of annual GDP growth rate.

In an attempt to reduce omitted variable bias, or bias produced by leaving out variables that also have an effect on economic growth, I have included in my regressions a list of variables that scholars agree affect economic growth: savings rate, population growth, exports, education,

[42] Robert C. Feenstra, Tzu-Han Yang and Gary G. Hamilton, "Business Groups and Product Variety in Trade: Evidence from South Korea, Taiwan and Japan," *Journal of International Economics* 48 (1999): 74.
[43] Jung-ae Lee, "Top four chaebol's value added accounts for nearly 10% of GDP," *The Hankyoreh*, September 18, 2014, http://www.hani.co.kr/arti/english_edition/e_business/655761.html.

natural resources, and regime type. Although this is not a comprehensive list, including these variables in the regressions helps to isolate the effect of chaebol dominance. Table 1 below summarizes the operationalization of the variables.

Table 1. Operationalization of Variables

Variables	***Measures***
Chaebol dominance	Top 10 chaebols' share of Korean GNP
Economic growth	GDP growth (annual %)
Exports	Exports of goods and services (% of GDP)
Education	Gross enrollment ratio for tertiary (ISCED 5 and 6)
Savings rate	Gross savings (% of GDP)
Population growth	Population growth (annual %)
Regime type	Democracy (dichotomous; 1 if democracy, 0 otherwise)
Natural resources	Total natural resources rents (% of GDP)

Source: World Bank World Development Indicators; Quality of Government Institute; Lim (2003); Hattori (1997); Jwa (2002).

Three points are worth clarifying with regard to the operationalization of the variables listed in Table 1. First, in operationalizing the *education* variable, I selected gross enrollment for tertiary education from a number of variables that could also serve as viable measures of education because the enrollment ratio variable most widely covered the countries and years included in my sample. Second, again for the *education* variable's measure, ISCED refers to the International Standard Classification of Education, constructed by the United Nations as a result

of international agreement and adopted formally by UNESCO member states.[44] The U.S. equivalents of ISCED level 5 (*short-cycle tertiary education)* and level 6 (*Bachelor's or equivalent level*) are completion of an Associate's degree and completion of a Bachelor's degree, respectively.[45] Third, total natural resources rents as a share of GDP can be calculated by taking the difference between the price at which the output from natural resources is sold and the costs of extraction and production. An increasing share of natural resources rents thus essentially represents a higher contribution of natural resources to GDP. Therefore, the resource rents share variable is hereafter referred to as the contribution of natural resources to GDP.

Because of the limited availability of data for chaebols' share of GNP for Korea, the initial table of regressions without sample restrictions showed a decrease in the number of observations each time a new control variable was added. Thus, in order to keep the sample consistent, the final multivariate regression with all of the controls included, which produced the smallest number of observations, effectively determined the sample for the entire regression analysis.

First, using a T-test, I establish that the difference in the average GDP growth rate between Korea and other countries in the sample is statistically significant—that is, the growth rate differential observed between Korea and the other countries is consistent and **not** due to chance.

Second, I run a simple bivariate regression—i.e. a regression of growth on chaebol dominance—in order to see if there is any association between the two variables. A statistically significant result here would then provide the basis for further multivariate regression analysis.

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[44] UNESCO Institute for Statistics, *International Standard Classification of Education: ISCED 2011*, UIS/2012/INS/10/REV (2012), http://www.uis.unesco.org/Education/Documents/isced-2011-en.pdf.
[45] National Center for Education Statistics, *Comparative Indicators of Education in the United States and Other G-8 Countries: 2011*, NCES 2012-007 (October 2011), http://nces.ed.gov/pubs2012/2012007.pdf.

Third, provided that the bivariate regression yields statistically significant results, I proceed to run a series of multivariate regression, including the other aforementioned variables to reduce omitted variable bias. If the regression coefficient on the chaebol share of GNP is still statistically significant after controlling for omitted variables, then we can conclude that chaebols' dominance in the Korean economy is a factor that causally contributed to Korea's rapid economic growth in the decades following the conclusion of the Korean War.

Finally, to supplement the empirical findings for the regression analysis, I incorporate a qualitative discussion on the mechanism by which chaebols were able to attain a dominant position in the Korean economy, explaining how and why chaebols diversified and integrated vertically.

B. Data Sources, Coding, and Coverage

Data for the main explanatory variable, top 10 chaebols' value added share of GNP, were procured from three different authors. Lim (2003) and Hattori (1997) provide data points for the years 1973-1978[46] and 1983[47], respectively, and Jwa (2002) gives data points for 1985-1995.[48] Due to the lack of availability of data for this measure for 1979-1982 and 1984, in coding this variable I repeated the value for 1978 for 1979-1982 and the value for 1983 for 1984. Data for one of the control variables, regime type, were collected from the Quality of Government Institute database. Data for the main dependent variable, annual GDP growth rate, were obtained from the World Bank collection of development indicators. Data for the dependent variable,

[46] Stephan Haggard, Wonhyuk Lim and Euysung Kim, *Economic Crisis and Corporate Restructuring in Korea: Reforming the Chaebol* (New York: Cambridge University Press, 2003), 47.
[47] Tamio Hattori, "*Chaebol*-style Enterprise Development in Korea," *The Developing Economies* 35 (1997): 466.
[48] Jwa, 33.

annual GDP growth rate, as well as remaining control variables—exports as share of GDP, tertiary enrollment ratio, savings rate, population growth, and contribution of natural resources to GDP—have all been obtained from World Bank's *World Development Indicators* online database. The final dataset includes 2,999 observations stretched across 163 countries for the years 1970-2008. A table listing all the countries and the years in the restricted sample for regressions is included in the appendix.

C. Model

My hypothesis stated that higher chaebol dominance, as measured by top 10 chaebols' share of Korea's GNP, would lead to higher economic growth. The basic linear bivariate regression model therefore included economic growth as the dependent variable and chaebol dominance as the independent variable. In order to account for the effects of other factors on economic growth, I controlled for six additional variables: 1) exports, measured by the total share of exports in GDP; 2) education, measured by the gross enrollment ratio for tertiary education; 3) savings rate, measured by the gross savings as a share of GDP; 4) population growth measured in annual percentage; 5) regime type, a dichotomous variable that indicates whether a country is democratic or autocratic; and 6) natural resources, measured by the contribution natural resources to GDP.

***Model*:** *Change in GDP growth* $= \alpha + \beta_1$ *(Top 10 chaebols' share of Korea's GNP)* $+ \beta_2$ *(Exports as share of GDP)* $+ \beta_3$ *(Gross tertiary enrollment ratio)* $+ \beta_4$ *(Savings rate as share of GDP)* $+ \beta_5$ *(Population growth rate)* $+ \beta_6$ *(Regime type)* $+ \beta_7$ *(Contribution of natural resources to GDP)* $+ \varepsilon$

The tables of regressions in the results section show that one "full" multivarirate regression—regression of GDP growth on chaebol dominance with all six control variables included—was run for each table. The model above describes the initial regression with no dummy variables. Subsequent regressions included year dummy variables to control for year-specific idiosyncratic effects, country dummy variables to control for country-specific idiosyncratic effects, and both country and year dummy variables to control for both effects.

D. Descriptive Statistics

After their creation in the early 1960s, chaebols quickly became an important influence on the state of the Korean economy. Supported by the government's trade policies and financial resources, such as subsidies and tax breaks, select chaebols grew especially rapidly and were essentially prevented from ever failing. Indeed, active government intervention can be found in every stage of the chaebol creation process. Entry barriers, erected by the government, allowed for only a handful of firms to dominate certain industries, and policies designed to support these firms allowed them to become chaebols. If these firms found themselves in trouble, government-led industrial and corporate restructuring awaited. Thus, this cycle created the perfect environment for chaebol creation and retention.[49]

[49] Sung-Hee Jwa, *The Evolution of Large Corporations in Korea: A New Institutional Economics Perspective of the Chaebol* (Cheltenham: Edward Elgar Publishing, Ltd., 2002), 17.

Figure 1. Top 10 Chaebols' Share of Korea's GNP vs. Korea's GDP Growth, 1973-1995

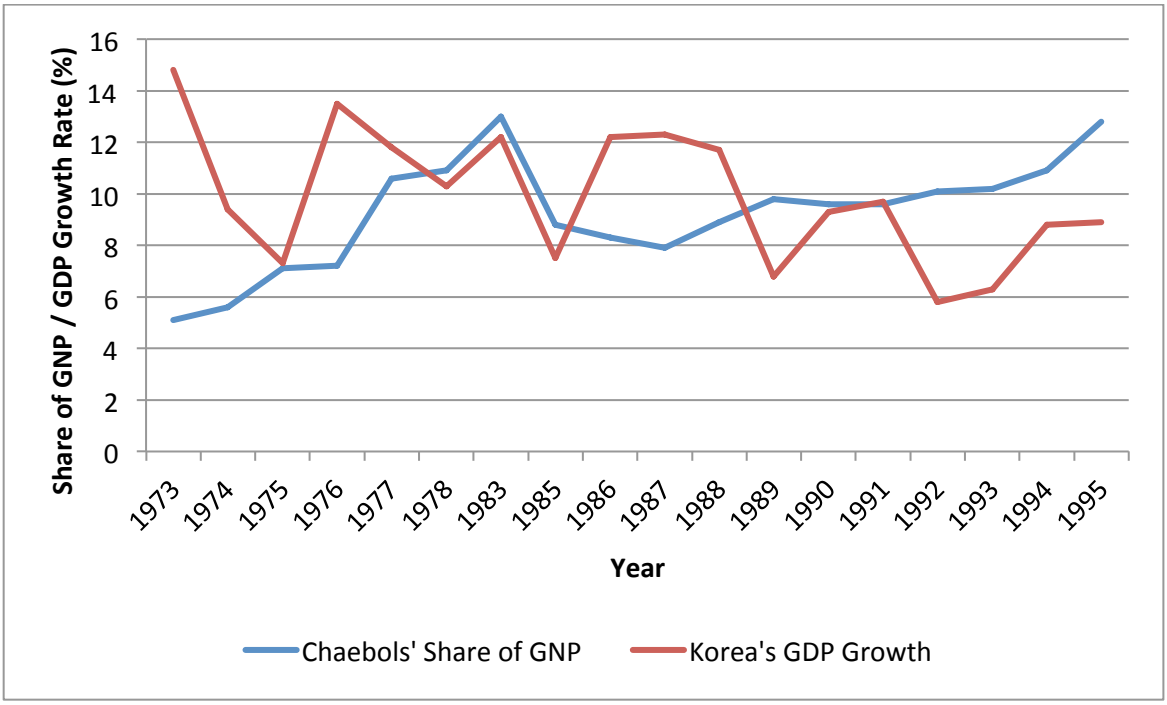


Table 2. Top 10 Chaebols' Share of Korean GNP and Korea's GDP Growth

Year	*Top 10 chaebols' share (%)*	*Korea's GDP growth (%)*
1973	5.1	14.8
1974	5.6	9.4
1975	7.1	7.3
1976	7.2	13.5
1977	10.6	11.8
1978	10.9	10.3
1983	13	12.2
1985	8.8	7.5
1986	8.3	12.2
1987	7.9	12.3
1988	8.9	11.7
1989	9.8	6.8
1990	9.6	9.3
1991	9.6	9.7
1992	10.1	5.8
1993	10.2	6.3
1994	10.9	8.8
1995	12.8	8.9
N	18	18

Source: Adapted from Lim (2003); Hattori (1997); Jwa (2002); World Bank *World Development Indicators*.

Figure 1 and Table 2 capture the variation in top 10 chaebols' share of Korea's GNP and in GDP growth over roughly two decades. Given such robust government support, one would expect chaebols' share of Korea's GNP to increase steadily without much deviation. However, after reaching an astounding 13% in the early 1980s, the chaebols' share plummeted down to 7% in the span of only about five years before starting to increase again. Several explanations can account for this sudden drop. First, because of its economic success in the two preceding decades, Korea became a target of U.S. trade wars in the early 1980s.[50] Faced with great pressure from the United States, Korea had to open up its barriers to imports and foreign direct investment.[51] With newly introduced foreign competition, chaebols' export performance likely suffered, thus decreasing their relative share of Korea's production. Second, the labor movement, which had been suppressed during the two decades before, became more militant in the 1980s. While it helped break the authoritarian state (a direct presidential election was held in 1987), the movement also "eroded the low-wage advantage of Korean products and forced Korea firms to introduce more innovative products to create another source of competitive advantage."[52] Thus, in 1980, the government came up with a new policy directive that emphasized liberalization and privatization. In the process, it drastically decreased direct financing to business, eliminated export subsidies, and shifted its attention to welfare issues.[53] This marked the beginning of the souring of the once-prosperous government-chaebol relationship, and although chaebols

[50] Chang, 57.
[51] Ibid.
[52] Ibid., 57-8.
[53] Ibid., 58.

continued to grow even without government support, the cessation of subsidies likely hurt some chaebol firms.

One additional inference can be drawn that have not been explicitly extrapolated. We can reasonably speculate that, as chaebols diversified into the information technology (IT) industry at the beginning of the 1980s,[54] they could not initially operate economies of scale to achieve maximum profits, which explains the decline in their share of Korea's GNP. However, as time went on, they were able to achieve scale economies and start to increase their share once again.

In order to make meaningful claims about the economic significance of regression results, I present below a table of descriptive statistics (see Table 3) that summarizes the mean and standard deviation of all variables included in the regressions, with the exception of the chaebol dominance variable, for which the change over time has already been noted through Figure 1.

Table 3. Summary Statistics

Variables	***Mean***	***SD***
GDP growth	3.76	5.00
Exports as share of GDP	34.72	20.84
Gross tertiary enrollment ratio	21.93	20.77
Savings rate as share of GDP	20.93	10.49
Population growth rate	1.61	1.33
Regime type	0.57	0.49
Contribution of natural resources to GDP	8.03	12.33
N	2,999	

[54] Lim, 80.

E. Results

The t-test returned statistically significant results. The null hypothesis was that Korea's average growth rate between 1961 and 2013 is equal to the average growth rate of the rest of the world during the same period. I can safely reject this null hypothesis because the difference between Korea's average GDP growth and the average GDP growth of the rest of the world is statistically significantly larger than zero (p-value <0.0001). In other words, Korea had a statistically significantly higher mean growth rate than the mean growth rate of the rest of the world.

Figure 2. Chaebols' Share of GNP and GDP Growth (Entire Sample)

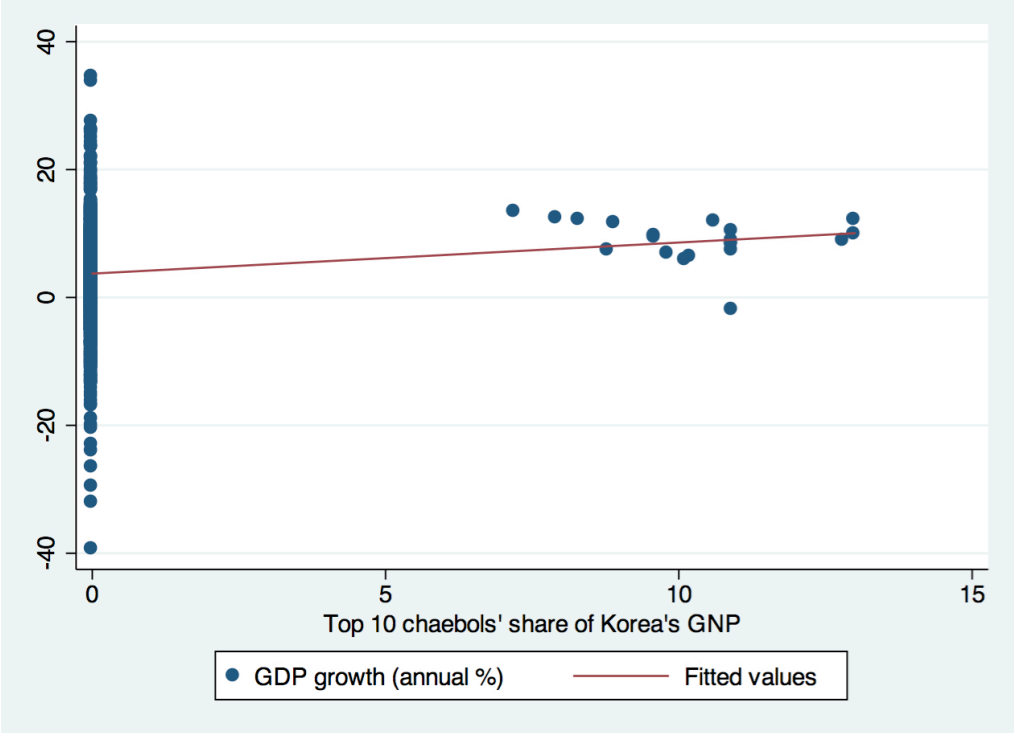
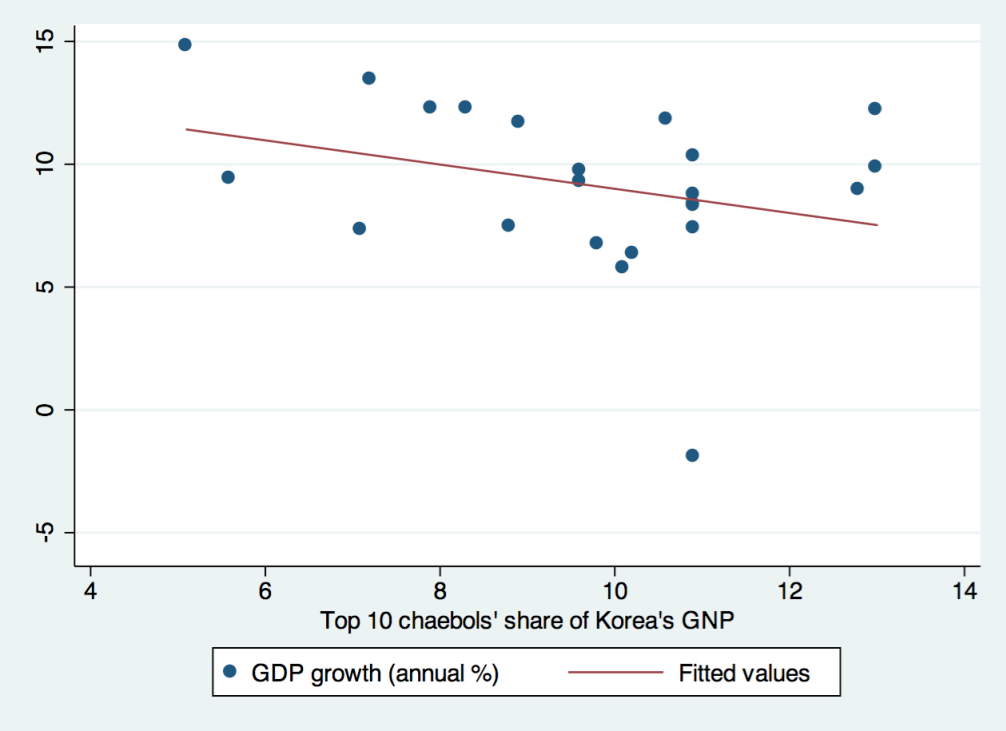


Figure 2 displays a scatter plot of the 2,999-observation sample with annual GDP growth on the *y*-axis and top 10 chaebols' share of Korea's GNP on the *x*-axis, with a fitted line going through the data points. The vast majority of data points have a value of zero for the chaebol

share variable, because no other country in the dataset has the chaebol system. Scattered to the right are data points for Korea. The *y*-intercept is the mean of GDP growth rates for all countries except for Korea. The slope of the line indicates the change in growth rate of Korea, ***away from the mean growth rate for all countries except for Korea (y-intercept)***, per one percentage point change in chaebols' share of Korea's GNP. This figure also shows that most of Korea's data points for GDP growth are above the world average, which gives the line of best fit the observed upward slope.

Figure 3. Chaebols' Share of GNP and GDP Growth (Korea Only)



Because the mean growth rate of the rest of the world in in Figure 2 heavily influenced the slope of the line of best fit, it was necessary to try to determine the relationship between chaebols' share of GNP and GDP growth only for Korea. Figure 3 isolates the data points for Korea. The slope of the fitted line becomes negative, possibly because of the outlier, the data

point that marks a negative growth rate for Korea in the late 1990s when the Asian financial crisis struck. Both Figure 2 and Figure 3 provide a helpful preview for the series of regression tables below; whereas chaebol dominance seems to increase Korea's average growth rate from the world's average, it seems to decrease Korea's growth rate from its own average.

Table 4. Multivariate Regression – No Dummy Variables

VARIABLES	GDP growth (annual %)
Top 10 chaebols' share of Korea's GNP	0.434***
	(0.0728)
Exports of goods and services (% of GDP)	0.0117**
	(0.00455)
Gross enrollment ratio, tertiary (ISCED 5 and 6)	-0.000861
	(0.00466)
Gross savings (% of GDP)	0.0794***
	(0.0128)
Population growth (annual %)	0.300***
	(0.108)
Regime type	-0.349
	(0.238)
Contribution of natural resources to GDP	-0.0182
	(0.0132)
Constant	1.547***
	(0.445)
Observations	2,999
R-squared	0.043

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The first regression was run without any control variables for year or country dummy variables in place (see Table 4). Not controlling for these dummy variables is problematic, since every observation for the growth variable is compared with ***every other*** observation in the sample regardless of the year or the country. Accordingly, the coefficient of 0.434 for the

chaebol dominance variable for the above regression can be interpreted as follows: holding constant the six aforementioned control variables, a one percentage point increase in top 10 chaebols' share of Korea's GNP increases Korea's growth rate by 0.434 percentage points away from the mean of ***all other values for the GDP growth variable***. Therefore, the resulting coefficient on the chaebol dominance variable, although statistically significant, does not hold any meaningful interpretation.

Table 5. Multivariate Regression – Year Dummy Variables Only

VARIABLES	GDP growth (annual %)
Top 10 chaebols' share of Korea's GNP	0.514***
	(0.0729)
Exports of goods and services (% of GDP)	0.00462
	(0.00476)
Gross enrollment ratio, tertiary (ISCED 5 and 6)	-0.0200***
	(0.00490)
Gross savings (% of GDP)	0.0774***
	(0.0122)
Population growth (annual %)	0.328***
	(0.104)
Regime type	-0.223
	(0.233)
Contribution of natural resources to GDP	-0.0238*
	(0.0127)
Constant	4.238***
	(0.698)
Observations	2,999
R-squared	0.120

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The second regression included only the year dummy variables, the purpose of which was to isolate the comparison of the chaebol dominance variable's effect on growth for specific years

(see Table 5). Instead of comparing an observation to all other observations in the sample regardless of what year the observations belong to, we can now compare the growth differentials resulting from increases in chaebols' share of GNP for observations in the ***same year***. Therefore, the coefficient for the chaebol dominance variable in this regression is interpreted as follows: holding constant the six control variables, ***each year***, a one percentage point increase in top 10 chaebols' share of Korea's GNP increases Korea's growth rate by 0.514 away from the mean growth rate of all other countries in the sample. The coefficient displays strong statistical significance, adding support for the first part of my hypothesis.

Table 6. Multivariate Regression – Country Dummy Variables Only

VARIABLES	GDP growth (annual %)
Top 10 chaebols' share of Korea's GNP	-0.432
	(0.523)
Exports of goods and services (% of GDP)	0.0111
	(0.0176)
Gross enrollment ratio, tertiary (ISCED 5 and 6)	0.0273***
	(0.00923)
Gross savings (% of GDP)	0.117***
	(0.0198)
Population growth (annual %)	0.333**
	(0.167)
Regime type	0.859**
	(0.407)
Contribution of natural resources to GDP	0.0143
	(0.0310)
Constant	-0.483
	(1.861)
Observations	2,997
R-squared	0.179

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The third regression included only the country dummy variables in order to control for within-country effects (see Table 6). I wanted to see whether higher chaebol share increases Korea's growth rate away from its own average growth rate. In other words, does Korea grow faster than it usually does when chaebols' share of GNP is higher? As can be seen from Table 6 above, the coefficient for the chaebol dominance variable becomes negative after country dummy variables are added. The coefficient for chaebol dominance variable here can thus be interpreted this way: holding constant the six control variables, a one percentage point increase in top 10 chaebols' share of Korea's GNP ***decreases*** Korea's growth rate by 0.432 percentage points away from Korea's mean growth rate. Essentially, this means that during the years when chaebols' share of output was higher, Korea's GDP growth rate was lower than its average growth rate by 0.432 percentage points. However, the chaebol dominance coefficient is not statistically significant, which implies that Korea's deviation from its own mean growth rate could have well been due to natural fluctuations in growth rates that all countries experience.

Table 7. Multivariate Regression – Year and Country Dummy Variables

VARIABLES	GDP growth (annual %)
Top 10 chaebols' share of Korea's GNP	-0.198
	(0.466)
Exports of goods and services (% of GDP)	0.00559
	(0.0172)
Gross enrollment ratio, tertiary (ISCED 5 and 6)	0.0182
	(0.0116)
Gross savings (% of GDP)	0.0957***
	(0.0193)
Population growth (annual %)	0.401**
	(0.177)
Regime type	0.910**
	(0.420)
Contribution of natural resources to GDP	0.00941

	(0.0309)
Constant	3.646*
	(1.927)
Observations	2,997
R-squared	0.231

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The final regression controlled for both country and year dummy variables (see Table 7). The coefficient for the chaebol dominance variable for this regression can be interpreted as follows: holding constant the six control variables, for every one percentage point increase in top 10 chaebols' share of Korea's GNP, Korea's deviation from its mean growth rate was about 0.2 percentage points smaller than the average deviation of all other countries from their own mean growth rates. Again, however, the coefficient is not statistically significant, so this difference could have been due to chance.

Thus, the sole viable conclusion to be drawn here is with regard to the table with only the year dummy variables: when chaebols' share of GNP is higher, Korea's average growth rate is statistically significantly higher than the average growth rate of the rest of the world.

F. Qualitative Discussion: Diversification and Vertical Integration

Previous sections of this paper mentioned characteristics shared by chaebols, such as family ownership, diversification and vertical integration. This section analyzes how diversification and vertical integration helped chaebols achieve economies of scale and increased export performance, using both theoretical explanations and empirical data. In explaining the mechanism through which chaebols' dominance in Korea's economy affected the country's

growth, this paper discussed operation of economies of scale and export promotion. Why did chaebols decide to diversify and integrate vertically, and what have been the effects of this decision?

Chaebols diversified into different, and sometimes unrelated, industries for two main reasons. The first reason had to do with risk aversion; chaebols diversified to reduce the risk of their founding families, which invested all their assets into affiliates.[55] The second reason involves economies of scope, or efficiency derived from increased variety. A chaebol's affiliates freely share technology with each other.[56] This could help newly acquired or established subsidiaries by providing production and technology-related know-how, even to those that are involved in somewhat unrelated industries. To facilitate groupwide technical support for affiliates, chaebols established group-level R&D centers, organized "along broadly defined business lines such as automobiles and electronics to meet these affiliates' common needs."[57] For instance, Samsung Group established the Samsung Advanced Technology Institute, which offers sophisticated technological information to all affiliates.[58] Several of these affiliates finance their joint R&D ventures and share any technological innovations gained from this research.[59] Data on composition of sales for Samsung indicates that the group "grew more by diversifying into new businesses than by expanding existing ones."[60] This pattern held true for other chaebols as well: groups like Hyundai, LG and SK diversified into the strategic industries chosen by the government by decade, first going into heavy (machinery and shipbuilding) and chemical

[55] Chang, 86.
[56] Ibid., 87.
[57] Ibid.
[58] Ibid.
[59] Ibid.
[60] Ibid., 86.

industries, and later into IT. Table 8 below highlights the change in the average number of subsidiaries for top 30 chaebol firms.

Table 8. Diversification Patterns of Top 30 Chaebols

Year	87	88	89	90	91	92	93	94	95	96	97	98	99
Average number of businesses	-	-	-	-	-	17.9	18.3	19.1	18.5	18.8	19.9	-	-
Average number of subsidiaries	16.7	17.2	17.7	19.1	19.8	20.3	20.1	20.5	20.8	22.3	27.4	26.8	22.9

Diversification can thus be viewed as the perfect method for chaebols for growth and profit. First, diversification reduced risk for founding family members by spreading it over a number of different industries. Second, chaebols were able to create synergies through active know-how, technology, and human resource management sharing among affiliates, making them more efficient and thus more competitive. Third, chaebols that diversified into new industries received economic support from the government in the form of subsidies, tax breaks and protection from foreign competition—at least initially. Thanks to both intragroup support and government help, chaebols that diversified into new industries prospered. And as their scale of production increased in these new industries, they were able to achieve economies of scale and bring down the average cost of production.

Vertical integration, as mentioned briefly in an earlier part of this paper, refers to an indigenization of inputs for final products.[61] There is thus a lot of "internal transfer of goods and

[61] Lim, 74.

services within a firm."[62] For chaebols, then, this means that affiliates supply other affiliates with parts, resulting in a high intragroup sales and purchase ratios.

Unlike diversification, however, vertical integration does not appear to have clear reasons for chaebols to pursue. Yet the fact that essentially all chaebols did begs the question: why did chaebols integrate vertically? Chang (2003) explains that, during the era of Five-Year Economic Development Plans, the Korean government "forced chaebols into […] industries without building any infrastructure of parts suppliers or supporting services."[63] And since the chaebols found it difficult to secure necessary parts, but the government still pushed them to industrialize, vertical integration was a seemingly inevitable choice.

Table 9. The Pattern of Chaebol Expansion

Decade	**Related diversification**	**Unrelated diversification**	**Vertical integration**	**Sub-total**
1940s				
n	1	2		3
%	33.33	66.67		
1950s				
n	8	23	3	34
%	23.53	67.65	8.82	
1960s				
n	21	44	24	89
%	23.60	49.44	26.97	
1970s				
n	83	105	42	230
%	36.09	45.65	18.26	
1980s				
n	106	100	35	241
%	43.98	41.19	14.52	

[62] Chang, 113.
[63] Ibid., 118.

1990s				
n	175	117	46	338
%	51.78	34.62	13.61	
Total				
n	394	391	150	935
%	42.14	41.82	16.04	

Source: Haggard, Lim and Kim (2003).

Table 9 shows the pattern of business expansion for twenty-two chaebols since their founding years. As can be seen, there has been an upward trend in the extent of vertical integration by chaebols as a whole over time. Vertical integration remained a ***necessary*** part of diversification, since venturing into new industries required having some kind of input supplier, which the chaebols lacked. This was especially true for unrelated diversification (e.g. Hyundai, which started as a construction company, going into electronics), because inputs differed from industry to industry.

Given that vertical integration follows diversification, many chaebol firms have established and maintained backward vertical integration with "very extensive and intricate networks of smaller affiliates that supply intermediary goods and parts to them."[64] For instance, Hyundai Pipe deliver construction pipes to Hyundai Construction, Hyundai Group's construction company for overseas projects, and to Hyundai Industrial Development, Hyundai's construction company focused on domestic needs. Hyundai Livart supplies furniture and interior decoration materials to Hyundai Construction and Hyundai Industrial Development. Hyundai Elevator distributes elevators to these core construction companies. Hyundai Group also engages in forward vertical integration. Hyundai Corporation, set up in the 1970s in accordance with the Korean government's export drive, is a general trading company that serves as an intermediary of its affiliates' exports and imports. Hyundai Corporation imports raw materials and equipment

[64] Ibid., 114.

and sells them to its affiliates on their behalf, which accounted for about 43% of its total revenue in 1997.[65] It also purchases finished products from the affiliates and sells them in foreign markets, and this represents about 52% of the company's total revenue.[66]

Vertical integration is also not specific to heavy machinery and construction industries, but instead can be seen in other types of industries as well. For example, Samsung Electronics is closely interlinked with Samsung SDI, a manufacturer of television tubes, which in turn relies on Samsung Corning, which produces glass bulbs for the tubes.[67] Samsung Corning derives a whopping 61% of its total revenue from its sales to Samsung SDI, which in turns supplies 52% of its products to Samsung electronics.[68] In fact, such vertical integration is not unique to Hyundai and Samsung; similar patterns are found in a lot of other chaebols, including SK and LG.[69] Chang (2003) adds that this type of extensive vertical integration is "unique to chaebols with respect to business groups in other countries."[70] As can be seen, although the extent of vertical integration may vary from company to company and from industry to industry, it was a crucial part of chaebols' growth.

Although vertical integration was somewhat forced on chaebols because of the government's failure to provide parts supplier infrastructure, it brought chaebols some key benefits. First, a vertically integrated structure let chaebols' core affiliates control the quality of important parts and delivery schedules, and allowed them to carry lower inventories.[71] Second, similar to diversification, vertical integration had a positive spillover effect whereby the fruits of R&D were more likely to be shared with the other stages, increasing the overall competitiveness

[65] Ibid., 115.
[66] Ibid.
[67] Ibid., 118-9.
[68] Ibid., 119.
[69] Ibid., 115.
[70] Ibid., 115-7.
[71] Ibid., 121.

of final products.[72] Third, vertical integration reduces marketing and sales-related expenses.[73] The rationale for this is quite intuitive; sales often requires marketing of product lines, but because there is so much intragroup sales- and purchases-related activity for chaebol affiliates, the affiliate companies can spend less money on advertising their products to potential buyers.

To summarize, chaebols' diversified business structure and high degree of vertical integration contributed significantly to their growth in size and increases in profit. Through intragroup resource sharing, chaebol affiliates were able to reap benefits of shared advances in technology and achieve economies of scope when affiliates entered new industries. Through government subsidies secured by entering into government-designated strategic industries, combined with an export-driven growth paradigm, chaebols were able to increase their scale of production and achieve economies of scale. Through vertical integration, chaebols were able to exercise control over the quality of important parts and delivery schedules, which in turn allowed them to bring products to the market much faster than comparable non-chaebol firms. Vertical integration also helped chaebols reduce marketing- and sales-related costs, because a large intragroup sales ratio allowed chaebol affiliates to spend less on using advertising to secure customers. Overall, diversification and vertical integration helped chaebols increase efficiency and cut costs, helping them rise to the forefront of the Korean economy.

[72] Ibid.
[73] Ibid.

VI. Conclusion

Korea's economic growth between the early 1960s and mid-1990s was unprecedented. Achieving an average annual growth rate of 9%, Korea maintained the title of the fastest growing country in the world for those three and a half decades. Left in ruins in the aftermath of a devastating civil war, Korea, one of the poorest countries in the world at the beginning of the 1960s, went on to establish itself as a so-called "Asian Tiger" for its robust growth and economic development. Scholars have identified a variety of factors in an attempt to explain this remarkable transformation. They pointed to such factors as export-oriented industrialization, emphasis on education, and high national savings rate, in an attempt to come up with a general explanation that could not only explain South Korea's economic growth but also apply more broadly to other developing economies with a distinct lack of natural resources. Other scholars have examined a corporate structure unique to Korea—the chaebol system.

Although there is a consensus in the extant literature about the positive effect of chaebols on Korea's growth, scholars have not isolated the effect of chaebols' dominance in Korea on growth by holding other factors constant. The argument that I proposed in this paper—that an increase in chaebols' dominance will increase Korea's economic growth rate relative to the rest of the world's average and relative to its own average—is based on the concept of economies of scale achieved by a combination of two most prominent features of chaebols: diversification and vertical integration. In order to support my hypothesis quantitatively, I have used regression analysis to show the isolated effect of chaebols' share of Korea's output on Korea's growth. The results showed that, after controlling for exports, education, savings rate, population growth, regime type, and natural resources, chaebols' dominance had a statistically significant effect on Korea's GDP growth rate as compared with the growth rates of other countries. However, when

a series of regressions were run to test if Korea's growth rate was higher than its own long-term average when chaebols' share of output increased, the results came out statistically insignificant, meaning that chaebol dominance is not a statistically significant factor in explaining the within-Korea variation in growth rate.

This paper examined the contribution of chaebols' dominance in Korea on Korea's growth rate, with a focus on the mechanism of economies of scale attained by diversification and vertical integration. This narrow focus suggests numerous avenues for future research. I highlight four. First, this paper asserted that chaebol dominance had an effect on growth through economies of scale, but other mechanisms, if any, through which chaebol dominance affected growth rate should be identified and explored. Chaebols are tightly integrated not only into Korea's economy but also its society and culture. Thus, examining how chaebols affect such things as labor supply or labor demand, work hours, and productivity would be helpful in further understanding what kind of other effects chaebol dominance generates. Second, more attention should be paid to exactly how chaebols contributed to the 1997 Asian Financial Crisis. This discussion is especially interesting because the same system that so successfully led Korea to economic prosperity for three decades also became one of the major culprits for a major (albeit relatively short-term) financial crisis. Third, while this paper focuses on the years 1970-1995 for the purposes of regression analysis due to the lack of availability of data for chaebols' share of GNP, subsequent research should attempt to procure data from the late 1990s onward and perform similar regression analysis. The purpose of this would be to see if chaebols still have an impact—whether positive or negative—on growth after chaebol-related reforms implemented at the end of the 1997 Asian financial crisis. Fourth, while this paper examines the difference in growth rates between Korea and the rest of the world, future research could be more specific in

comparison. For instance, same multivariate regressions of growth on the dominance of a particular type of firm can be run for different countries. Specifically, Japan, the country from which chaebols are derived, and Taiwan, where small and mediums enterprises (SMEs) led economic growth, would be interesting cases for comparison to Korea.

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Appendix

A-1. Full List of Countries and Years in the Sample

Country	Frequency	Year	Frequency
Albania	25	1970	3
Algeria	7	1971	14
Angola	12	1972	14
Argentina	24	1973	14
Armenia	16	1974	19
Australia	39	1975	38
Austria	38	1976	51
Azerbaijan	6	1977	67
Bahamas, The	12	1978	70
Bahrain	17	1979	73
Bangladesh	25	1980	74
Barbados	17	1981	83
Belarus	16	1982	84
Belgium	7	1983	83
Belize	8	1984	90
Benin	32	1985	90
Bhutan	3	1986	88
Bolivia	10	1987	89
Bosnia and Herzegovina	9	1988	82
Botswana	26	1989	86
Brazil	19	1990	86
Brunei Darussalam	8	1991	89
Bulgaria	27	1992	83
Burkina Faso	28	1993	84
Burundi	20	1994	80

Cabo Verde	4	1995	92
Cambodia	13	1996	90
Cameroon	22	1997	72
Canada	13	1998	73
Central African Republic	16	1999	96
Chad	3	2000	96
Chile	30	2001	97
China	25	2002	111
Colombia	39	2003	117
Comoros	3	2004	109
Congo, Rep.	21	2005	110
Costa Rica	17	2006	103
Cote d'Ivoire	17	2007	98
Croatia	12	2008	101
Cyprus	30		
Czech Republic	16	**Total**	**2,999**
Denmark	33		
Djibouti	12		
Dominica	7		
Dominican Republic	7		
Ecuador	15		
Egypt, Arab Rep.	24		
El Salvador	26		
Equatorial Guinea	1		
Eritrea	5		
Estonia	9		
Ethiopia	21		
Fiji	11		
Finland	34		
France	33		
Gabon	12		
Gambia, The	3		
Georgia	11		
Germany	7		
Ghana	11		
Greece	31		
Grenada	1		
Guatemala	12		
Guinea	18		
Guinea-Bissau	1		
Guyana	14		
Honduras	30		
Hungary	16		

Iceland	31
India	28
Indonesia	28
Iran, Islamic Rep.	7
Iraq	1
Ireland	35
Israel	32
Italy	37
Jamaica	7
Japan	29
Jordan	30
Kazakhstan	12
Kenya	16
Korea, Rep.	20
Kuwait	22
Kyrgyz Republic	16
Lao PDR	12
Latvia	17
Lebanon	7
Lesotho	29
Liberia	1
Libya	2
Lithuania	16
Luxembourg	11
Macedonia, FYR	13
Madagascar	30
Malawi	29
Malaysia	27
Maldives	1
Mali	26
Malta	37
Mauritania	15
Mauritius	30
Mexico	28
Moldova	13
Mongolia	27
Montenegro	2
Morocco	31
Mozambique	15
Namibia	11
Nepal	29
Netherlands	36
New Zealand	28

Nicaragua	16
Niger	22
Nigeria	12
Norway	34
Oman	28
Pakistan	16
Panama	28
Papua New Guinea	9
Paraguay	11
Peru	27
Philippines	27
Poland	18
Portugal	31
Russian Federation	15
Rwanda	23
Saudi Arabia	37
Senegal	17
Serbia	2
Sierra Leone	13
Slovak Republic	13
Slovenia	13
Somalia	1
South Africa	9
Spain	34
Sri Lanka	11
St. Kitts and Nevis	8
St. Lucia	14
St. Vincent and the Grenadines	4
Suriname	11
Swaziland	14
Sweden	38
Switzerland	27
Syrian Arab Republic	25
Tajikistan	7
Tanzania	15
Thailand	29
Togo	24
Tonga	5
Trinidad and Tobago	24
Tunisia	33
Turkey	33
Uganda	20

Ukraine	14
United Kingdom	38
United States	37
Uruguay	21
Vanuatu	6
Venezuela, RB	26
Vietnam	12
Yemen, Rep.	8
Zambia	14
Zimbabwe	14
Total	**2,999**