Economic Policy and Microeconomic Volatility

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Chapter 1. Introduction

1. Formulating the Problem

The economic policies of countries are often geared toward stimulating and promoting economic growth by mitigating the volatile influences of macroeconomic variables, such as inflation, foreign exchange rates, and interest rates. However, policies that pursue economic growth do not affect microeconomic variables, such as the behavior of firms, households, and individuals, in the same way and to the same extent as they do macroeconomic ones. Aside from the differences in how microeconomic and macroeconomic variables respond to the given policy, significant differences can be observed at even the same microeconomic level, depending on how specific economic agents respond to such policy. It is therefore important to analyze and understand how a given country's

economic policy affects macroeconomic and microeconomic variables, as well as how it influences households and firms' expectations of economic stability or volatility.

To analyze the correlation between economic policy and microeconomic variables, we need to consider two possibilities. First, a trade-off of sorts may take place between a given country's economic growth policy and the freedom of microeconomic agents. The implementation of a growth-oriented economic policy may help reduce macroeconomic uncertainty, but may also simultaneously aggravate microeconomic volatility, thus increasing uncertainty for households, individuals, and firms. Second, microeconomic agents may respond to, and be affected by, the same given economic policy quite differently. This has to do with the growing income inequality and polarization among households, individuals, and firms.

In this study, we examine the extent to which the changing economic policy of South Korea affects microeconomic volatility for households, individuals, and firms, and what factors are driving the changes in microeconomic volatility facing these agents. The data we use to analyze economic volatility facing firms and individuals are not wholly consistent, and thus impose some limitations on the implications of our findings. Nevertheless, the findings of our analysis shed light upon which factors serve to minimize microeconomic volatility for these actors and the differences in the ways the same policy affects these different microeconomic agents.

2. Research Purpose and Structure

The overarching purpose of this study is to analyze how the

Korean government's economic policy influences the economic stability or volatility facing Korean microeconomic agents, such as households and firms. The goal is to understand what policy measures are needed to mitigate microeconomic volatility. Toward this end, this study identified two main tasks. The first is the identification of economic policy measures capable of influencing microeconomic situations, and the analysis of the respective influences of these policy measures using an empirical analysis model. The World Bank Group (WBG)'s Doing Business is used as a substitute variable for the Korean government's economic policy, while Statistics Korea's Business Activity Survey is used to measure changes in the amounts of revenue, value-added, and number of people employed by firms. Second, among microeconomic agents, this study distinguishes between firms and individuals, and examines whether and how the same economic policies affect these agents differently, depending on the industries involved and other idiosyncrasies. To determine the influence of Korea's economic policy on fluctuations in personal income, the personal income data of the Korean Labor and Income Panel Studies (KLIPSs) and the Organization for Economic Cooperation and Development (OECD)'s Policy Index data are used.

Following the introductory chapter, Chapter II examines the correlation between Korea's economic policy and microeconomic volatility and considers the typical patterns identified in the established literature. Next, Chapter III uses objective data to provide an empirical analysis of the influence of Korea's economic policy on the volatility of firms' behavior, while Chapter IV analyzes how Korea's economic policy affects volatility in personal income. Finally,

Chapter V summarizes the findings of the analysis and the implications for policy measures that seek to enhance microeconomic stability for firms and individuals.

Chapter 2. Economic Policy and Microeconomic Volatility

1. Paths of Influence

The economic policy measures that can significantly affect households and firms include policy measures concerning economic liberalization, regulation or deregulation, firms' management, the labor market, and wages. Figure 2-3 illustrates how these policy measures affect microeconomic volatility for households and firms by causing changes in the levels of output, employment, income, and consumption.

First, diverse macroeconomic measures reflecting changes in the domestic and external market environments, such as policy decisions related to liberalization and regulation or deregulation, have an effect on the production process of firms (1). Change in this production process, coupled with changing policy measures on insolvency and the labor market, serve to significantly alter the market entry and exit prospects for firms (2). The change in the level of output resulting from the change in the production process can also affect workers' wage levels (3) and influence the number of employees hired by firms (4). Firms' entry into or exit from the market can not only cause changes in employment levels (5), but also facilitate the efficient reallocation of resources across the economy (6).

Volatility in employment is what makes it possible for workers to move to other jobs or find opportunities for reassignment, but we should not ignore the possible hysteresis effect that could be at play (7). Increasing employment volatility has the potential to set off a chain reaction of increasing volatility in income (8). The rise in income volatility resulting from growing employment volatility strengthens households' propensity to save, and may thus induce increases in earnings in the long term (9). This increase in earnings, in turn, may stimulate consumption (10), while the rise in households' propensity to save, in the face of income uncertainty, could serve to dampen consumption-type spending in the short term (11). Income volatility could decrease through the smoothing effect of consumption (12). It is through these channels that diverse economic policy measures on the business activities of firms (including market entry and exit), wage levels, taxes, and labor and financial markets tend to spread.

The rates and directions of the spread of microeconomic volatility illustrated in Figure 2-3 are dependent upon the goals and targets of the given policy measures. Whether microeconomic volatility grows or subsides therefore depends on which paths the given policy measures target and prioritize.

2. Literature Review

Most of the literature on the effects of economic policy focuses on how such policy affects macroeconomic variables. However, with several more recent studies having been conducted on how economic policy aggravates volatility in household consumption

and income and firms' revenue, researchers are beginning to turn their attention to the unforeseen repercussions of economic policy on microeconomic volatility. These studies focus particularly on the side effects of growth-promoting economic policy measures at the microeconomic level. These studies provide theoretical and empirical analyses on how the changes in the government's pro-growth policy raises microeconomic volatility, which, in turn, discourages firms from investing, causes household consumption to shrink, and, when coupled with hysteresis effects, influences entrepreneurial innovation, the unemployment rate, and the welfare of microeconomic actors. This study provides a review and summary of six main studies on these effects, published both in Korea and abroad.

Chapter 3. Economic Policy and Firms' Volatility

1. Economic Policy and Firms' Volatility

Governments worldwide employ diverse economic policy measures to directly and indirectly influence firms' behavior. Economic policy changes often have significant impacts on firms, causing changes in their output levels, altering their hiring environment, and leading to fluctuations in firms' revenue and value-added and their employees' job security. Minimizing volatility in the economic environment facing firms is key to encouraging firms to invest more actively. Increasing volatility, on the other hand, leads firms to behave in more conservative ways, causing them to refrain from investing aggressively or hiring significant numbers of new em-

ployees.

In this chapter, we measure the extent to which the Korean economic policy affects the output of firms, wages of workers, and incomes of households, and analyze how the policy affects the volatility facing firms using an empirical analysis model.

2. Data and Method

The WBG's Doing Business is used here as the policy variable. The WBG assesses and ranks the business environments of various countries, in terms of the conditions for starting a business, dealing with construction permits, registering properties, securing credit, protecting investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency. The rankings are determined by measuring the difference between the frontier economy, with an ideal business environment, and each given country. The closer the measurement is to zero, the larger the gap is between the frontier economy and the given country. The closer the measurement is to 100, the smaller the gap is between the frontier economy and the given country.

In addition, this study uses the data provided by Statistics Korea's Business Activity Surveys spanning the years 2006 through 2014. The surveys provide information on the performance of many firms. The extent of the economic policy's effect on firms' output is measured in terms of the amounts of revenue and value-added, while the varying volatility of the wage and income levels is analyzed indirectly via the changes in the number of employees.

Equation 3-1 summarizes the effects of the economic policy on

the volatility in firms' revenue, amounts of value-added, and numbers of employees.

$$\sigma_{it} = \alpha + \beta_i X_{it} + \delta_i Reg_t + \varepsilon_{it} \qquad \text{Equation (3-1)}$$

Here, the dependent variable, σ_{it}, measures the volatility in the amounts of revenue (value-added) or numbers of employees. The volatility is measured as the standard deviation of the rolling window measures of the growth rates over three-year periods. The control variable vector, X_i, which is used to control for the idiosyncrasies of firms, includes the natural logarithms of the value of tangible assets per capita, debt ratio (liabilities/assets), net profit ratio (net profit/revenue), foreign investor dummy variables, firm size dummy variables (fewer than 100 workers, 100 to 299 workers, and 300 or more workers), location dummy variables (16 metropolitan cities and provinces), and industrial subcategory dummy variables.

The explanatory variable, Reg_t, represents Korea's index on the WBG's Doing Business. More specifically, it combines Korea's overall index with its index in terms of starting businesses, dealing with construction permits, protecting properties, securing credit, protecting investors, enforcing contracts, resolving insolvency, paying taxes, and trading across borders. Korea's overall index has been available since 2010, while its individual indices have been available since 2006.

Because the results obtained by applying the pooled ordinary least square (OLS) model, represented by Equation 3-1, do not reflect the unobserved heterogeneity of individual firms, they are susceptible to bias. To control for such unobserved heterogeneity,

a panel analysis model was set up, taking into account both fixed and random effects.

3. Findings

First, the analysis of all industries shows us that, when the economic policy improves the overall business environment, the volatility in revenue, value-added, and number of employees decreases in general. This decrease in volatility in these major factors of business management suggests that the reduced uncertainty concerning the domestic and international markets enables firms to make more active plans for investing and hiring additional employees. This, in turn, enhances the stability of the overall economy. However, the improvement of the environment for cross-border trade tends to increase volatility in the number of employees, indicating that improvements in the trading environment do not necessarily increase job security for workers. This finding confirms the real-world phenomenon of offshoring serving to reduce the domestic employment rate. Note, also, that the sizes and directions of the estimation coefficients for all sectors, including the manufacturing and service sectors, vary significantly, suggesting that improvements in the trading environment may influence employment levels in different industries asymmetrically. However, cross-border trade itself is influenced by multiple factors, and the model of analysis used in this study is not equipped to produce a decisive conclusion regarding the causes of volatility in the number of employees for each sector.

Second, different sectors or industries also show different levels

of volatility in response to the economic policy. The same policy may have different effects in terms of improving the business environments for manufacturing and service sectors. Improvements in the business environment for manufacturing, for example, show a strong, statistically significant downward influence on the volatility in those businesses' revenue, value-added, and number of employees. In the service sector, however, the volatility-reducing effect is either considerably less or nonexistent. Considering that much of the improvement in the business environment stems from removing regulatory measures, the fact that the volatility-reducing effect of such improvement is significantly less in the service sector may suggest that this sector has been facing far more excessive regulation than the manufacturing sector. The same policy for improving the business environment also had very different effects in different service industries. The heterogeneity that is inherent to service industries and the resulting differences in the value chains and employment structures seem to be the causes of such differences in the effects of the policy.

Third, the number of employees responds particularly sensitively to policy-induced changes in the business environment. This study uses the amounts of firms' revenue and value-added as proxy variables for the output of firms and the number of employees as the proxy variable for the earnings or income of employees. While policy-induced changes have significant impacts on the level of volatility in the output of manufacturing, the number of employees responds in a statistically significant manner to such policy-induced changes across all industries and sectors. For instance, tax reform that increases firms' revenue has the effect of encouraging

firms to invest more, thereby increasing and stabilizing the number of employees they hire in the long term. New policy measures developed to support entrepreneurship also serve to reduce volatility in the number of employees across almost all industries, thereby helping stabilize the labor market. The reason for this is presumably that improvement in the entrepreneurial environment increases the demand for labor and improves the working conditions for employees, thus raising employees' overall earnings and income levels and enhancing their welfare.

Chapter 4. Economic Policy and Income Volatility

1. Economic Policy and Income Volatility

In modern society, individuals' welfare and happiness are largely dependent on the quality of their jobs. For most people, except those able to live self-sufficient lives or who possess sufficient accumulated wealth, work is the main source of income necessary for consumption and ensuring their wellbeing. Earned income is therefore indispensable to personal happiness. For most individuals to support themselves and make preparations for the future, it is also critical to secure jobs that not only provide sufficient wages, but are also secure and stable. The stability of earned income at the personal level is subject to the direct and indirect influences of multiple factors, including firms' management and employment policies, the circumstances of the labor market, the government's policies, and the global market environment. The focus of this study is how the government's economic policy affects individu-

als' economic wellbeing—more specifically, the stability of their earned income.

This chapter draws upon data available in Korea and empirically analyzes how product market regulation and employment protection policies for regular contract workers affect the volatility of earned income for individuals. These policies were chosen in consideration of the availability of data, their impact and significance, and their relevance to the purpose of this study. Because individuals' earned income is determined based on hourly wages and total number of hours worked, we analyze how the chosen policies influence the volatility of hourly wages and total number of hours worked.

2. Data and Method

The analysis in this chapter draws upon the personal-level data provided by the KLIPSs from 1998 through 2013 and the OECD's Policy Index data on member states. As the available OECD data spanned the years through 2013 only, the data from only the first 16 KLIPSs (1998 through 2013) were used. Confining our analysis to people aged 25 to 59, the final analysis sample included only individuals for whom hourly wages or total number of hours worked annually were available across consecutive years. Of the OECD Policy Index data, only those included in the product market regulation (PMR) index and employment protection for regular contract workers (EPRC) index were used.

As the dependent variable, i.e., volatility in personal income, is determined by the hourly wages and total number of hours

worked, we sought to determine how the government policy measures affect the two aspects of personal income, i.e., hourly wages and total number of hours worked annually. As Table 4-1 shows, the volatility of these two factors was measured using two different techniques: the rolling window measure (RWM) and the incidence of large changes (ICL). The rolling window measure is applied to track the changes in year-to-year volatility over three-year periods. As measured by this technique, volatility equals the standard deviation of the margins of change observed in year *t* and year *t-1*. The incidence of large changes, on the other hand, measures volatility by tracking major changes over two-year periods (*t-1* and *t*). If the observed value of the given change is greater or less than the previous year's value by 20 percent or more, the resulting value is one. If the margin of change is less than 20 percent, the resulting value is zero.

Equation 4-1 is used to analyze how the government's PMR and EPRC policies affect the volatility of personal earned income.

$$y_{i,t} = \alpha_i + P_t^{'}\beta + Z_{i,t}^{'}\gamma + \epsilon_{i,t} \qquad \text{Equation (4-1)}$$

Here, $y_{i,t}$ represents the volatility in either the hourly wages or total number of hours worked annually for individual i in year t. The volatility in the hourly wages and total number of hours worked annually is measured using the RWM and ILC, respectively. P_t stands for the policy variable, i.e., the relative strength index of the PMR and EPRC in Korea in year t. $Z_{i,t}$ represents the vector of individual i's idiosyncrasy in year t and accounts for the differences in age, education, income, marital status, industry and occupation,

job status, area of residence, and terms of interaction between education, income, and the policy index (P_t). Based on the established literature's conclusion that the government's policy may affect individuals differently depending on individual idiosyncrasies, such as education and income levels, we included the terms of interaction between these idiosyncratic factors and the policy index. α_i was added to the equation to prevent any possible bias resulting from the unobserved heterogeneity of individuals not captured by the fixed effects. Because the dependent variable used in the RWM analysis is a continuous variable, the pooled OLS and fixed-effect panel analysis is used. On the other hand, the dependent variable in the ILC analysis is a categorical variable, and was therefore analyzed using the probit and panel probit analysis techniques.

3. Findings

First, the reinforcement of the PMR policy increased volatility in personal hourly wages. The government's increasing intervention in the product market raises barriers to entrepreneurship, trade, and investment, thus making it more difficult for people to start or manage firms. This, in turn, decreases the stability of employment and income for workers. This much has already been confirmed by our earlier analysis on the volatility facing firms. As Figure 2-3 has already shown, the deterioration of the business environment (or deregulation of the market, from the perspective of individuals) increases the volatility in the number of employees and ultimately has a negative effect on the stability of workers' income. The data used in our analysis on firms' volatility are different from the data

we used to analyze the volatility in personal income, but certain parts of these data do overlap, supporting the consistency of our conclusions.

Second, the PMR policy affects individuals differently depending on idiosyncratic factors, such as income and education. As the results of the panel model analysis listed in Table 4-13 show, the higher one's income level, the more the PMR policy increased the volatility of one's hourly wages and number of hours worked. On the contrary, education was found to be a significant factor with respect to only volatility in the total number of hours worked annually. Whereas the PMR policy has no significant effect on the number of working hours of employees with less than high school education, the increasing rigor of the policy reduces the volatility in working hours for workers with high school education or above. This is likely because unskilled and uneducated workers with less than high school education tend to be concentrated in unskilled day or service jobs, which are relatively immune to the effects of the PMR policy on firms' market entry, trade, and pricing.

Third, the increasing rigor of the EPRC policy has led to reduced volatility in personal hourly wages and number of hours worked. This inverse correlation remains irrespective of individual idiosyncrasies, such as income and education. Reinforcing regulations on the dismissal of individuals and layoffs reduces unemployment and enhances job security. The EPRC policy, however, entails a trade-off of sorts. Although the policy may protect workers that have already been hired, it could also serve as an additional barrier for firms seeking to enter or expand in the market, thus having an adverse effect on the employment prospects of unemployed peo-

ple. In other words, the EPRC policy catering exclusively to regular contract workers may reduce unemployed workers' chances of entering the job market and thus reduce the overall level of social welfare.

Fourth, the volatility-reducing effect of the EPRC policy tends to increase in proportion to the income levels of individuals. This suggests that deregulating the product market and reinforcing employment protection could ultimately maximize the welfare of individual workers by minimizing volatility in hourly wages and numbers of hours worked. These policies, however, affect individuals differently depending on other factors such as income and education. It is therefore necessary to fine-tune policy measures if policymakers intend to enhance the benefit and welfare of certain marginalized groups, such as the poor.

Chapter 5. Policy Implications: Minimizing Microeconomic Volatility

The findings of our empirical analysis present two important policy implications for minimizing microeconomic volatility. First, policymakers should deregulate the product market and provide attractive investment incentives to encourage businesses to maximize their profits by investing and hiring more. Second, policymakers need to find the right balance of policy measures to mitigate polarization in the labor market.

To encourage firms to be active in the product market, policymakers should deregulate the market, but only to the extent that such regulatory changes do not distort the market's natural equi-

librium. Although there are no universal or monolithic rules that can be applied to all situations to find such market equilibrium, the market equilibrium forms the basis or starting point for deciding whether to increase or decrease the rigor of a regulatory regime. Our analyses carry the following implications for minimizing volatility facing firms. First, policymakers should be mindful of how a policy can have different effects on different industries or sectors. Chapter III explains that the same economic policy does not affect volatility in firms' revenue, value-added, and number of employees in the same way across all industries. This difference stems mainly from the structural differences between manufacturing and services. Therefore, applying the same policy measures across the board without considering these structural differences will only increase the asymmetry of policy effects on volatility facing different industries, further distorting the market order.

Second, policymakers should adjust and update their policy stance in consideration of the shifts in the market paradigm. Demographic changes and technological innovation accelerate the pace at which paradigms shift. Insisting on the same old pro-growth policy will likely deepen a given economy's structural failure in adapting to societal and institutional changes. Such failure, in turn, will expose economic actors to greater microeconomic volatility.

Finally, policymakers need to consider and find ways of mitigating the growing polarization in the labor market. Labor regulation differs from product market regulation in an important way. If the wage level in the labor market could be determined purely as a function of labor supply and demand, no societal friction cost would arise. In reality, however, a significant gap exists between

the bargaining power of the firms demanding labor and the individual workers supplying labor. The labor market itself is also divided into regular contract workers and non-regular workers. Policy measures intended to enhance the efficiency of the labor market should therefore abandon any simplistic understanding of labor supply and demand, and seek to take a more complex and nonlinear approach to addressing the issue. Given the complexity of the labor market, labor market reform aiming to minimize polarization and maximize income stability for workers should naturally start with readjusting the balance of labor supply and demand and management-labor relations. To this end, policymakers need to first identify the obstacles that prevent unemployed workers from entering the job market and minimize the abuse of the employment protection policy. Next, policymakers should come up with incentives that ensure fairness in the relationship between firms and workers, so as to reduce the rigidity of the dual structure of the labor market.