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# Home Production: Does It Matter for the Korean Macroeconomy during the COVID-19 Pandemic?

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**Abstract:** The COVID-19 pandemic has had a tremendous influence on many aspects of life in Korea. Some people have had to relocate their workplaces from factories or offices to their homes in order to stop the spread of the virus. This paper examines the effects of home production on the Korean macroeconomy during the COVID-19 pandemic. Then, the impulse response function is used to perform an empirical analysis. The results show that total output, market goods consumption, investment, capital, and market work hours all decline as a consequence of a home productivity shock, while home goods consumption, wages, transfer payments, and home work hours all increase. Moreover, using fiscal policies such as lowering the capital tax rate and increasing the fiscal deficit, the effect of the COVID-19 pandemic on the Korean macroeconomy can be improved. Robustness tests are carried out in light of the uneven economic development and different COVID-19 pandemic scenarios inside and outside the Seoul circle. The conclusions of this paper are accurate and reliable, as shown by the results of the robustness test.

**Keywords:** COVID-19 pandemic; Korean macroeconomy; impulse response function; home production; fiscal policies

**MSC:** 58E17; 91B72; 91B84



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## 1. Introduction

As the COVID-19 pandemic spread around the world, it not only claimed countless lives but also dealt significant damage to economic development. South Korea's economy, as one of the most developed economic entities, is facing another severe test after the global financial crisis in 1998. According to Bank of Korea data, gross domestic product in South Korea fell by the most in the previous 22 years during the time of the COVID-19 pandemic. Based on Korea's Central Daily, the pandemic has had a significant impact on employment in South Korea, with the number of employees declining for the past two years. Meanwhile, Korea's Ministry of Trade, Industry, and Energy reported that the effects of the COVID-19 pandemic had hindered inter-country mobility and raised uncertainty, worldwide direct foreign investment had declined, and Korea's investment had also decreased dramatically. Furthermore, according to a report by Korea Statistics, the COVID-19 pandemic has reduced household consumption, especially among the poor. Moreover, some Korean academics have investigated the influence of the COVID-19 pandemic on the Korean macroeconomy. He and Wang [1] studied the macroeconomic performance in response to the COVID-19 pandemic. They found that total demand in Korea had fallen as a result of the pandemic, mostly reflected in declining consumption and investment demand. Concurrently, this increased the pressures of inflation and unemployment. Park and Park [2] found that the COVID-19 pandemic negatively affected the growth of gross domestic product and consumption in Korea. Nam and Lee [3] found that the pandemic reduced employment by 0.82% while increasing unemployment by 0.29%.

The Korean government encourages citizens to work from home in order to slow the spread of the COVID-19 pandemic and save the economy from collapsing. According to a

survey conducted last year by the Korean General Association of Business Operators for the top 100 enterprises in domestic sales, 88.4% of the surveyed enterprises implemented the civilian home office system, 2.9% said it would be implemented soon, and 8.7% did not implement the home office system and had no plan to do so. Based on this context, this paper investigates the influence of home production on the South Korean macroeconomy during the COVID-19 pandemic period. This study reveals the following findings from empirical analysis using the dynamic stochastic general equilibrium model: (1) With the shock of home productivity, total output, market goods consumption, investment, capital, and market labor hours in South Korea all declined during the COVID-19 pandemic period, while home goods consumption, wages, transfer payments, and home labor hours grew. (2) The use of fiscal policy, such as lowering the capital tax rate and increasing the fiscal deficit in South Korea, may help to mitigate the effects of the COVID-19 pandemic on macroeconomic fluctuations. (3) In terms of the influence of home production on Korea's macroeconomy, the disparity between within and outside Seoul during the COVID-19 pandemic is minimal. The findings of this paper may provide some evidence for the resumption of regular economic activity in South Korea.

This paper makes three contributions to the current literature. First, this article explores the impacts of the COVID-19 pandemic on Korea's macroeconomy using an indirect method. To be more explicit, in order to slow the spread of the COVID-19 pandemic, many people were forced to shift their occupations from offices to their homes, and this paper investigates the impacts of home production on the Korean macroeconomy during the pandemic. Second, in this paper, the impact of the COVID-19 pandemic on the Korean macroeconomy is mitigated by decreasing the capital tax rate. Third, the impact of the COVID-19 pandemic on the Korean macroeconomy is investigated in this article by decreasing the capital tax rate and raising the fiscal deficit.

The remainder of this work is structured as follows: Section 2 provides the previous literature on this topic. Section 3 presents the model. Section 4 shows the findings and discussion. Section 5 draws the conclusions.

## 2. Literature Review

A large number of specialists have lately begun to investigate the economic implications of the COVID-19 pandemic. In this section, we evaluate past literature regarding research methodology, research aims, and research findings to provide the theoretical framework for this paper.

The COVID-19 pandemic has had a significant impact on Korea's economy. He and Wang [1] examine the macroeconomic impacts of the pandemic against this backdrop. The results from impulse response function analysis show that the COVID-19 pandemic had a significant short-term impact on Korea's key macroeconomic variables but no significant long-term effects. Total demand in Korea fell as a result of the pandemic, mostly reflected in the decreasing consumption and investment. McKibbin and Fernando [4] investigated seven probable COVID-19 situations and their macroeconomic implications using the dynamic stochastic general equilibrium model. They found that a confined COVID-19 pandemic might have a considerable effect on world economy in the short run. Meanwhile, Fornaro and Wolf [5] discovered that the spread of the COVID-19 pandemic might cause a demand-driven downturn, a supply–demand doom cycle, and stagnation traps created by pessimistic animal spirits. Moreover, Fernández-Villaverde and Jones [6] used United States country-level, individual-level, and key cities' data to investigate the effects of the COVID-19 pandemic on macroeconomic outcomes. They discovered that the pandemic resulted in significant macroeconomic losses, such as a fall in gross domestic product and a decline in employment. The above findings were also supported by Boissay and Rungcharoenkitkul [7], Addison et al. [8], and McKibbin and Fernando [9].

Aum et al. [10] used the approach of difference-in-differences to study the effects of the COVID-19 pandemic on employment. They discovered that job losses caused by

the COVID-19 pandemic were mostly the result of decreased hiring by small firms, with the largest effects seen by economically vulnerable individuals who were less educated, younger, in low-wage jobs, and on temporary contracts. Meanwhile, using many waves of a tailed survey with over 10,000 respondents, Coibion et al. [11] investigated how the varying timing of local lockdowns caused by the COVID-19 pandemic directly affected household expenditures and macroeconomic expectations. They found that around half of those who took part in the study reported income and wealth losses as a result of the pandemic, with average losses of USD 5,293, and USD 334,482. They also found that consumption expenditures as a whole fell by 31%. Primiceri and Tambalotti [12] found that the COVID-19 pandemic had a long-term detrimental effect on employment and consumption. With a sample in India, Nath [13] found that the COVID-19 pandemic resulted in a sharp decline in the Indian economy. In addition, Lee et al. [14] investigated the effects of the COVID-19 pandemic on Korean families. They found that Korean families' economic well-being was jeopardized as a result of the COVID-19 pandemic, which caused many family members to lose their jobs or earn lower wages. The pandemic significantly impacted the work environment as well. For instance, it created the impetus for the expansion of flexible work such as telecommuting, which was not generally in place before to the COVID-19 pandemic. The results presented above were backed by Ahamed [15], Guerrieri et al. [16], Bairoliya and Imrohoroglu [17], and Rungcharoenkitkul [18].

Based on our review of the literature, we discovered that the previous researchers were directly addressing the influence of COVID-19 on the macroeconomy. On the contrary, taking into account the current conditions in South Korea, this paper investigates the indirect influence of the COVID-19 pandemic on the Korean macroeconomy; that is, the purpose of this paper is to explore the effects of household production on the Korean macroeconomy. The findings of this paper may have some practical implications for Korea's speedy recovery from the shock of the COVID-19 pandemic.

## 3. Model

The COVID-19 pandemic in South Korea caused significant disruption to its usual operating patterns. To restrict the spread of COVID-19, outdoor activity decreased, stores closed early, and production slowed or even stopped. Following Lee [19] and Moro et al. [20], the economy became more dependent on household production, which increased in importance. To explore the effects of home production on the Korean macroeconomy during the COVID-19 pandemic, we study three sectors: households, firms, and the central government.

### *3.1. Households*

The representative household's welfare function is provided as follows:

$$E_0\left\{\sum_{t=0}^{\infty}\beta^t\cdot u_t(C_t, L_t)\right. \tag{1}$$

where $E_0$ denotes operator conditional expectations on time-t information; $\beta$ denotes discount factor; u denotes utility function; C denotes consumption; and L denotes labor (work hours). Assume that the representative household is infinite. Meanwhile, the representative household's preference can be separated in time. The utility function is shown as follows:

$$u_t(C_t, L_t) = \sum_{t=0}^{\infty}\beta^t\{\alpha\ln C_t + (1-\alpha)\ln(1-L_t)\} \tag{2}$$

where $\alpha$ denotes the proportion of consumption. According to home production theory, a household's total time available for use may be divided into three categories: market work, leisure, and home work. Furthermore, following Gronau [21], Gronau [22], and Beutler and Owen [23], home work is a kind of productive labor. Based on the ideas of Ramey [24] and

Kimmel and Connelly [25], we assume that total consumption consists of market product consumption and home product consumption. Therefore, total consumption can be shown as follows:

$$C_t = \left[\zeta C_t^{1\eta} + (1-\zeta)C_t^{2\eta}\right]^{\frac{1}{\eta}} \tag{3}$$

where $\zeta$ denotes the proportion of market product consumption; $\eta$ denotes substitution elasticity; $C_t^1$ denotes market product consumption; and $C_t^2$ denotes home product consumption. Similarly, household's work hours consist of market product work hours and home product work hours. Therefore, household's work hours can be shown as follows:

$$L_t = L_t^1 + L_t^2 \tag{4}$$

where $L_t^1$ denotes market product work hours and $L_t^2$ denotes home product work hours. As a result, the utility function can be rewritten as follows:

$$u_t(C_t, L_t) = \sum_{t=0}^{\infty} \beta^t \left\{ \frac{\alpha}{\eta} \ln\left[\zeta C_t^{1\eta} + (1-\zeta)C_t^{2\eta}\right] + (1-\alpha)\ln\left(1 - L_t^1 - L_t^2\right) \right\}, \tag{5}$$

Based on Equation (5), households will be confronted with two types of budget constraints, in the product market and in home production. The budget constraint is shown as follows:

$$\left(1+\tau_t^1\right)C_t + S_t = \left(1-\tau_t^2\right)W_t L_t^1 + \left(1-\tau_t^3\right)R_t K_t + T_t \tag{6}$$

where $\tau_t^1$ denotes consumption tax; $\tau_t^2$ denotes individual income tax; $\tau_t^3$ denotes capital income tax; $S_t$ denotes savings; $W_t$ denotes wage; $R_t$ denotes capital rent; $K_t$ denotes capital; and $T_t$ denotes transfer payment. Assume that savings can be fully transferred into investment. The law of capital movement is then shown as follows:

$$K_{t+1} = I_t + (1-\delta)K_t \tag{7}$$

where $I_t$ $(= S_t)$ denotes investment and $\delta$ denotes depreciation rate. Consequently, Equation (6) can be rewritten by adding Equation (7):

$$\left(1+\tau_t^1\right)C_t + K_{t+1} - (1-\delta)K_t = \left(1-\tau_t^2\right)W_t L_t^1 + \left(1-\tau_t^3\right)R_t K_t + T_t \tag{8}$$

Assume that the technological constraint of home production is shown as follows:

$$C_t^2 = H_t L_t^{2\xi} \tag{9}$$

where $H_t$ denotes the shock of home production and $\xi$ denotes the share of home work hours in the production. Meanwhile, we assume that home production is a labor-intensive mode, with decreasing returns to scale. Then, the shock of home production is shown as follows:

$$\log(H_t) = \rho_h \log(H_{t-1}) + \epsilon_t^h \tag{10}$$

where $\rho_h$ denotes the auto-regressive coefficient and $\epsilon_t^h$ denotes white noise, which obeys the independent identical distribution with mean of zero and standard deviation of $\sigma_h$.

The purpose of household is to maximize its utility based on time allocation:

$$\begin{aligned} \mathcal{L}_{\max} = \sum_{t=0}^{\infty} \beta^t \{ & \tfrac{\alpha}{\eta} \ln[\zeta C_t^{1\eta} + (1-\zeta)C_t^{2\eta}] + (1-\alpha)\ln(1 - L_t^1 - L_t^2) + \lambda_H[(1 \\ & +\tau_t^1)C_t + K_{t+1} - (1-\delta)K_t - (1-\tau_t^2)W_t L_t^1 - (1-\tau_t^3)R_t K_t \\ & -T_t] \} \end{aligned} \tag{11}$$

where $\lambda_H$ denotes the Lagrangian multiplier. The first-order conditions of Equation (11) represent the equilibrium condition of market product work hours' allocation and the

equilibrium condition of home product work hours' allocation. The equilibrium condition of market product work hours' allocation is shown as follows:

$$\left(1-\tau_t^2\right)\left(1-L_t^1-L_t^2\right)\alpha\zeta C_t^{1\eta-1}W_t=(1-\alpha)\left(1+\tau_t^1\right)\left[\zeta C_t^{1\eta}+(1-\zeta)C_t^{2\eta}\right] \tag{12}$$

and the equilibrium condition of home product work hours' allocation is shown as follows:

$$\alpha(1-\zeta)C_t^{2\eta-1}\left(1-L_t^1-L_t^2\right)H_t\xi L_t^{2\xi-1}=\left[\zeta C_t^{1\eta}+(1-\zeta)C_t^{2\eta}\right](1-\alpha) \tag{13}$$

Because the substitution rate of consumption is equal to the rate of return on investment, the optimal consumption path is shown as follows:

$$\begin{aligned}\alpha\zeta C_t^{1\eta-1}(1+\tau_t^1)(\zeta C_t^{1\eta}+(1-\zeta)C_t^{2\eta})&\\ =\beta[\zeta C_{t-1}^{1\eta}+(1-\zeta)C_{t-1}^{2\eta}](1-\tau_{t-1}^1)\alpha\zeta C_t^{1\eta-1}[(1-\tau_t^3)R_t+1&\\ -\delta],&\end{aligned} \tag{14}$$

*3.2. Firms*

The representative firm is the agent that produces the goods and services that will be either consumed or saved (and then transformed into capital) by households. Following Can et al. [26], a Cobb-Douglas production function is employed in this paper. We also assume that production technology is constant returns to scale. As a result, the output of firms is shown as follows:

$$Y_t=A_tK_t^{\gamma}L_t^{1(1-\gamma)} \tag{15}$$

where $A_t$ denotes total factor productivity and $\gamma$ denotes output elasticity of capital. Assume that total factor productivity follows the AR (1) process:

$$\log(A_t)=\rho_a\log(A_{t-1})+\epsilon_t^a \tag{16}$$

where $\rho_a$ denotes the auto-regressive coefficient, and $\epsilon_t^a$ denotes white noise, which obeys the independent identical distribution with mean value of zero and standard deviation of $\sigma_a$. Assume that the market product price is one, and the purpose of firms is to maximize the profits:

$$\mathcal{L}_{max}=A_tK_t^{\gamma}L_t^{1(1-\gamma)} \tag{17}$$

In terms of market work hours, the first-order condition is shown as follows:

$$W_t=(1-\gamma)A_tK_t^{\gamma}L_t^{1(-\gamma)} \tag{18}$$

In terms of capital, the first-order condition is shown as follows:

$$R_t=\gamma A_tK_t^{\gamma-1}L_t^{1(1-\gamma)} \tag{19}$$

*3.3. Central Government*

As the effect of COVID-19 pandemic spreads, the Korean government has implemented fiscal policies such as increasing the fiscal deficit and adjusting the tax rate in response. We assume that every dollar spent by the government is transferred to households (transfer payment). If the government's tax revenue is inadequate to cover its expenditure demands during the COVID-19 pandemic, the fiscal deficit might be increased to compensate this gap. As a result, the government budget constraint is shown as follows:

$$\tau_t^1C_t^1+\tau_t^2W_tL_t^1+\tau_t^3R_tK_t-\tau_t^3\delta K_t+\phi_tY_t=T_t \tag{20}$$

where $\phi_t$ denote fiscal deficit ratio.

### *3.4. Market Clearing*

For the goods market clearing condition to be met, the total amount of goods produced and the total amount of goods needed must match:

$$Y_t = C_t + I_t, \tag{21}$$

## 4. Results and Discussion

### *4.1. Parameter Calibration*

To identify the parameters to be estimated, this paper uses the parameter calibration approach. Follow Yie and Yoo [27], the discount factor ($\beta$) is 0.988. Following Kang and Suh [28], the capital share in production ($\gamma$) is 0.33. Following Hur and Rhee [29], the depreciation rate ($\delta$) is 0.025. Following Lee [19], the consumption and leisure preference parameter ($\alpha$) is 0.7. Following Hwang [30], the goods substitution elasticity is 0.75. Following McGrattan et al. [31], the share of goods market consumption in total consumption ($\eta$) is 0.45. Following Marto [32], home productivity ($\zeta$) is 0.8. Following Torres [33], the auto-regressive coefficient of home productivity ($\rho_h$) is 0.95 with a standard deviation of 0.01. Following Kim [34], Kang and Suh [28], and Hur and Lee [35], the consumption tax rate ($\tau_t^1$) is 0.1; the labor tax rate ($\tau_t^2$) is 0.095; and the capital tax rate ($\tau_t^3$) is 0.219. Following the South Korea Government Budget, the fiscal deficit ratio ($\phi_t$) is 0.061.

### *4.2. The Effects of Home Productivity Shock on Korean Key Macroeconomic Variables during the COVID-19 Pandemic*

The Korean government has implemented a number of regulations to restrict people's willingness to go out in order to minimize the spread of COVID-19. Some businesses were forced to limit their output or perhaps shut their doors altogether. As a result, the amount of time spent on home production activities such as the home office and housework inevitably increased. The purpose of this subsection is to explore how home productivity shock affects the Korean macroeconomy. The results are shown in Figure 1.

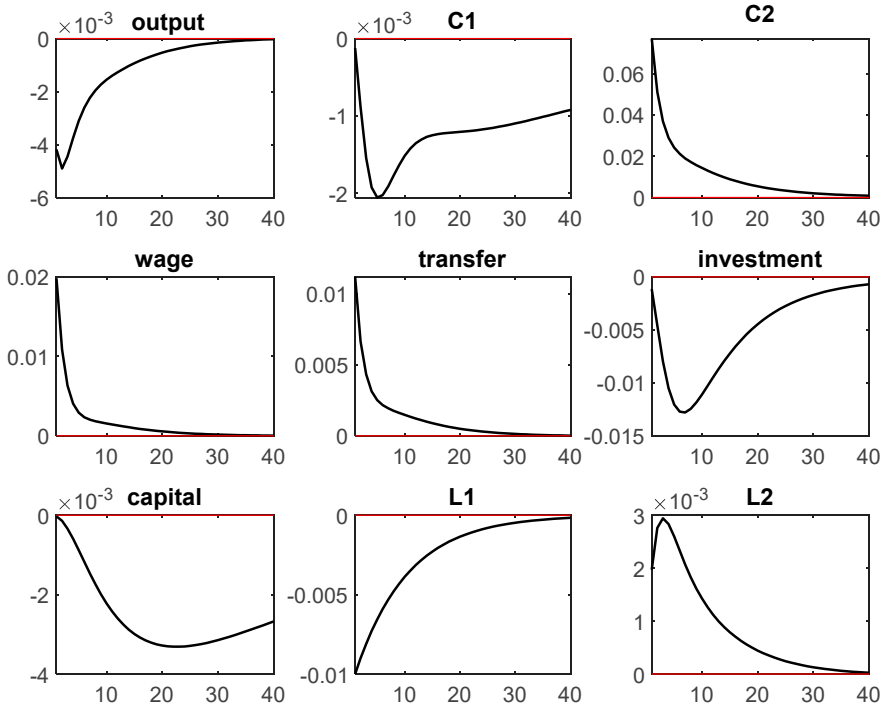


**Figure 1.** The effects of home productivity shock on key Korean macroeconomic variables.

As seen in Figure 1, key Korean macroeconomic variables fluctuate significantly as a consequence of the shock of home production. The total output falls. One probable explanation is that the losses from market goods production are larger than the gains

from home goods production as a result of the COVID-19 pandemic. The market goods consumption reduces while the home goods consumption increases. One possible explanation is that in order to battle the COVID-19 pandemic, factories are cutting down, restaurants are closing early, people are going out less, and gatherings are curtailed. The wages rise, and the transfer payments to households increase. One probable explanation is that the government uses transfer payments to compensate households and firms for losses incurred as a result of the COVID-19 pandemic. Both investment and capital fall. One possible reason is that because of the pandemic, some investment activities have been curtailed. As a result, a fall in investment leads to a decrease in capital stock. The market product work hours decrease, while the home product work hours increase. One possible reason is that due to the COVID-19 pandemic, fewer people are going out to work. Many occupations have been relocated to the house, such as for telecommuting. The outcomes are consistent with Nath [13], Fadinger and Schymik [36], and Adam et al. [37]. Moreover, actual macroeconomic fluctuations in Korea are consistent with the results reported in this subsection.

### *4.3. Fiscal Policies to Alleviate the Effect of the COVID-19 Pandemic*

The COVID-19 pandemic has wreaked havoc on Korea's economy. To restore the regular functioning of Korea's macroeconomic system, the Korean government has implemented a number of key fiscal policies. Following Dockery and Bawa [38], Bloom et al. [39], and Etheridge et al. [40], on the one hand, the COVID-19 pandemic has resulted in massive losses for firms, and the government has assisted them in weathering the storm by lowering the capital tax rate ($\tau_t^3$) from 0.219 to 0.200. On the other hand, the Korean government increased the fiscal deficit ratio ($\phi_t$) from 0.061 to 0.085 while decreasing the capital tax rate. Meanwhile, we increase home productivity ($\zeta$) from 0.8 to 0.95 to lower the degree of decreasing returns to home activities. The results are shown in Figures 2 and 3.

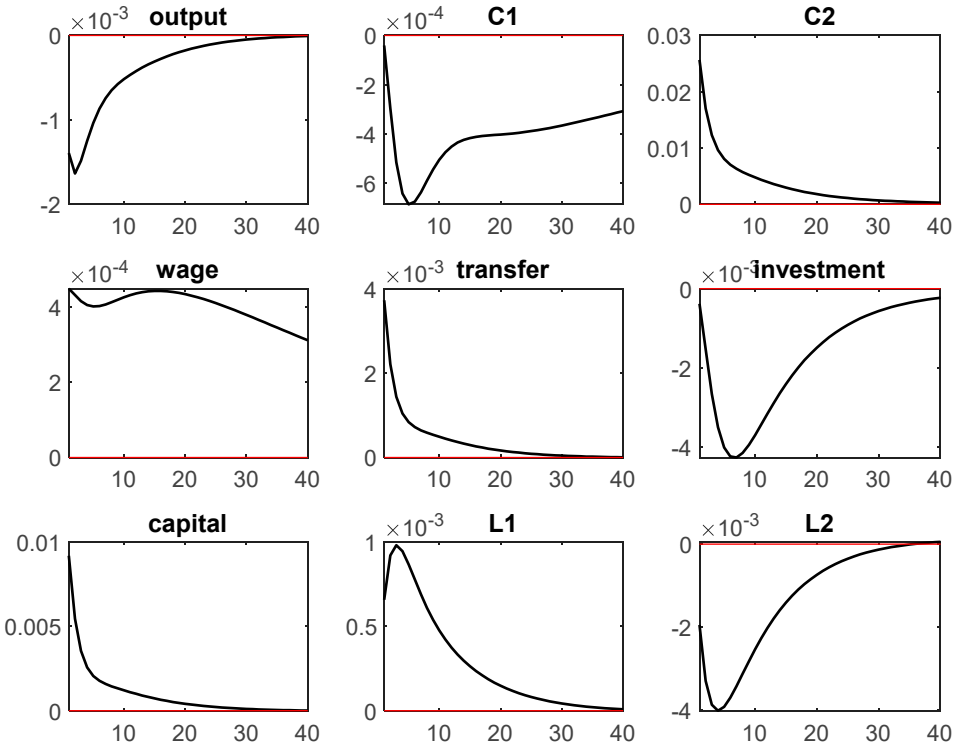


**Figure 2.** The effects of fiscal policy (capital tax rate reduction) on Korean key macroeconomic variables.

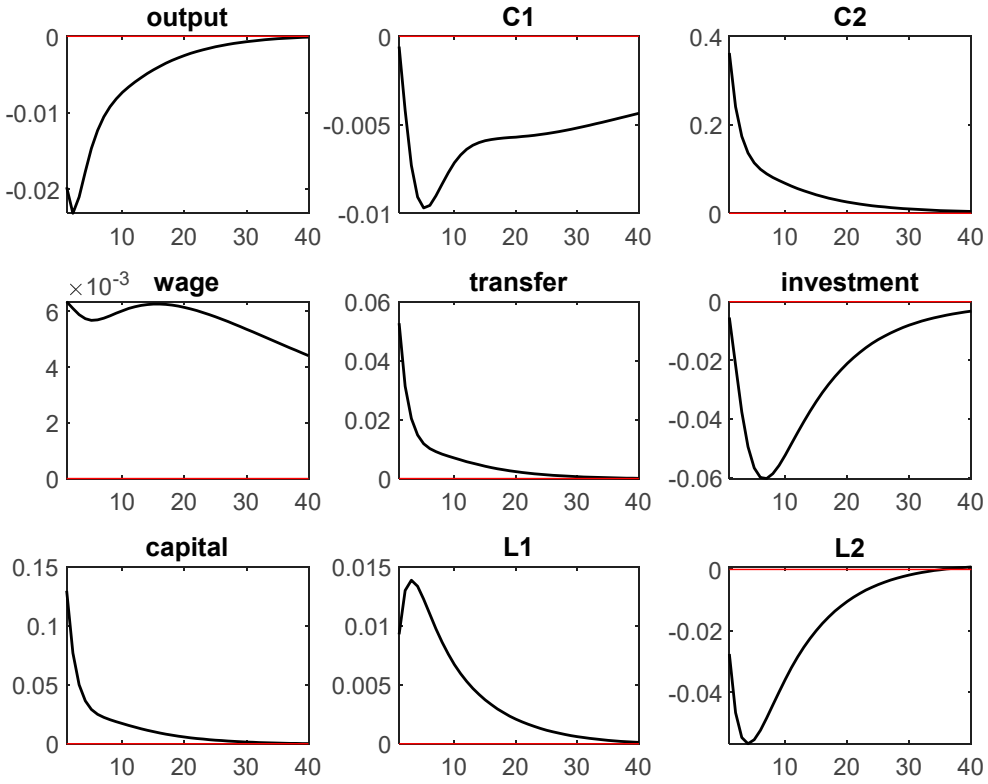


**Figure 3.** The effects of fiscal policy (capital tax rate reduction and fiscal deficit increase) on key Korean macroeconomic variables.

The results in Figure 2 indicate the effects of a capital tax rate reduction on key Korean macroeconomic variables. A lower capital tax rate has increased the prospects for economic returns. As a consequence, investment has progressively increased. As the reduction in capital tax rate raises the real income, households initially shift labor input into home production and the consumption of home production. With wage increases, households start to shift some of the labor initially allocated to leisure and home production to labor from the production market, resulting in a quick fall in home production labor supply and a matching rise in product market labor supply. Product market consumption drops due to economic feasibility constraints, which are influenced by investment changes. Then, as labor input increases in the wage and production market, the output increases. Transfer payments decline as a result of the reduction in the capital tax rate. These outcomes are supported by Azad et al. [41], who use a structural vector auto-regressive model to study the Canadian economy; Chen et al. [42], who study this topic with a cross-country comparative analysis; and Haroutunian et al. [43], who study this topic with a case of Euro area countries.

The results in Figure 3 indicate the effects of capital tax rate reduction and fiscal deficit increase on Korean key macroeconomic variables. Because a rise in government transfer payments by expanding Korea's fiscal deficit primarily affects households' budget restrictions, the effect on production market demand decreases greatly once investment is influenced by capital tax rate reduction. Domestic consumption remains essentially unchanged after the scale benefit of household production is enhanced, while work hours fluctuate slightly. Appropriately raising the fiscal deficit has relieved some of the strain on short-term income and spending while smoothing out transfer payments. Following the implementation of the fiscal policy, output falls significantly. Furthermore, these results are consistent with Bui et al. [44], who study this topic with the cases of Thailand and Vietnam; Dzigbede and Pathak [45], who study this topic with the case of Ghana; and Burger and Calitz [46], who study this topic with the case of South Africa.

### *4.4. Robustness Test*

The substitution elasticity of market goods consumption to home goods consumption varies due to unequal economic development and different COVID-19 pandemic situations inside and outside the Seoul circle. As a result, the share of market goods consumption in total consumption (η) changes from 0.45 to 0.6. The purpose is to lessen the substitution elasticity between market goods consumption and home goods consumption in order to see whether key Korean macroeconomic variables change when they suffer a shock. The results are shown in Figure 4.

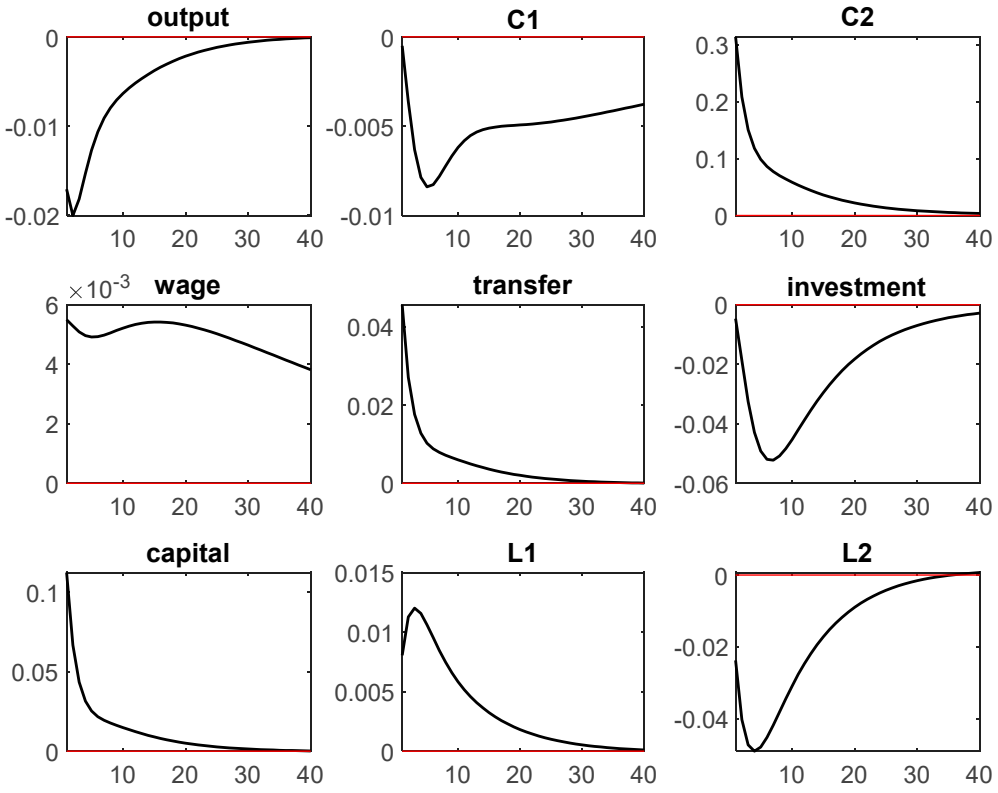


**Figure 4.** The results of the robustness test.

As the results in Figure 4 show, although the substitution elasticity of market goods consumption to home goods consumption changes from 0.45 to 0.6, the key Korean macroeconomic variables highlighted in this paper exhibit fairly minor variations. This confirms that the findings of this paper are accurate and reliable. Meanwhile, the results also imply that during the COVID-19 pandemic, the influence of home production on Korea's macroeconomy differed little between inside and outside of Seoul. This case study of Korea makes a new contribution to the literature.

## 5. Conclusions

The COVID-19 pandemic has slowed the pace of life and thrown the economy into disarray. Some people had to shift their duties from office buildings to their homes, which resulted in an unexpected boost in home production. The purpose of this paper is to explore the effects of home production on key Korean macroeconomic variables (total output, market goods consumption, home goods consumption, wages, transfer payments, investment, capital, market work hours, and home work hours) during the COVID-19 pandemic. The dynamic stochastic general equilibrium model is used to perform an empirical analysis. The results show that with a shock to home productivity, the total output, market goods consumption, investment, capital, and market work hours fall while home goods consumption, wages, transfer payments, and home work hours rise. This paper also examines the effects of the Korean government's initiatives such as

reducing the capital tax rate as well as increasing the budget deficit in order to minimize the impacts of COVID-19 on Korea's macroeconomic operations. The results show that the implementation of the two initiatives has significantly reduced the negative effects of the COVID-19 pandemic on Korea's macroeconomy. The robustness test results confirm that the findings in this paper reliable.

In contrast with the majority of previous studies, which directly examined the influence of the COVID-19 pandemic on Korea's macroeconomy, this paper makes the following contributions from an indirect approach. First, using an indirect approach, this paper investigates the influence of the COVID-19 pandemic on Korea's macroeconomy. To hinder the spread of COVID-19, many people had to relocate their jobs from offices to their homes. This paper studies the effects of home production on Korea's macroeconomy during the COVID-19 pandemic. Second, the paper established the effects of lowering the capital tax rate in response to COVID-19 on the Korean macroeconomy. Third, in this paper, we examine the effects of the COVID-19 pandemic on the Korean macroeconomy derived from lowering the capital tax rate and increasing the fiscal deficit.

Based on the results of the preceding empirical analysis, this paper presents some policy implications. First, people should return to factories or offices as soon as possible because the total output has dropped with the shock of home productivity. Second, the Korean government may continue to cut the capital tax rate since it can lessen the effect of the pandemic on Korea's macroeconomy. Third, the Korean government could implement two fiscal policies at the same time, decreasing the capital tax rate and increasing the fiscal deficit because implementing these two fiscal policies can reduce the effect of COVID-19 pandemic on the Korean macroeconomy.

Furthermore, the conclusions of this article may be applicable to other countries, such as China and Singapore. Because these countries have tight control over the COVID-19 pandemic, the influence of home production on the macroeconomy will be more prominent. Telecommuting and working at home have become more common, particularly in China, as a result of the COVID-19 pandemic's stringent management. Therefore, the Chinese government may also utilize the conclusions of this article as a reference to lessen the COVID-19 pandemic-induced fluctuations in China's macroeconomy via home production, particularly the rapid decline in economic growth and the sharp rise in the unemployment rate. In addition, the Chinese government may learn from this article's practice; that is, China can decrease the harmful effects of the COVID-19 pandemic on the Chinese macroeconomy by enacting fiscal policies. In fact, the findings of this paper are at least partially consistent with findings from earlier scholars.

This paper does have several limitations, as well as suggestions for future study. The first study limitation is that Korea's financial system was significantly influenced by the COVID-19 pandemic. Future researchers might study this topic with other financial sectors. Second, monetary policy is an effective tool for stabilizing macroeconomic activities, so future scholars might include the central bank in this study to re-analyze this topic. Third, other fiscal policies, such as a consumption tax or an individual income tax, are also available to the Korean government. Fourth, Korea is an import–export country, and its resistance to the effects of the COVID-19 pandemic is weak. Future researchers may add the import and export sectors to this article to reevaluate this issue, which may provide more engaging findings. Fifth, Korea is a small, advanced economy. During the COVID-19 pandemic, it was profoundly impacted by the economic volatility of other nations. In order to reevaluate this issue, future researchers might include external shocks in a model such as related to productivity, monetary policy, or finance. It is recommended that future scholars follow these measures to re-verify these findings. In summary, investigating all of these possibilities for study may provide additional fascinating outcomes.

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