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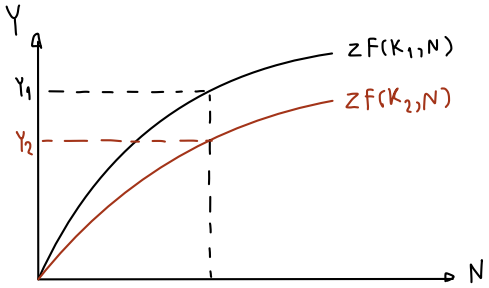
2011 Tohoku earthquake and tsunami with its impact on Japan economy

On March 11, 2011, a severe earthquake shook Tohoku, the northeastern part of Japan. The disaster started with a 9.0 magnitude earthquake on the coastline of Honshu, unleashing a deadliest 40-metre height tsunami wave that devastated the major area and led to the third crisis, the nuclear explosion at Fukushima Daiichi nuclear power plant. The results of these events are critically suffering for Japan, as the event caused loss of thousands of lives, massive property damage, and the shortage of power.

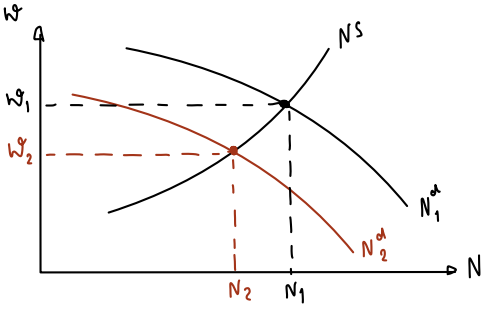
Many businesses were affected, such as Toyota, Nissan, Honda, which are the automotive companies, had to suspend their production line. Many companies discontinued their operation due to the demolition both on their plants and supplies. This means the decrease in current capital stock shock (K↓) in Japan, which I would like to analyse as follows.

<u>Effect on Output Supply (Ys)</u>

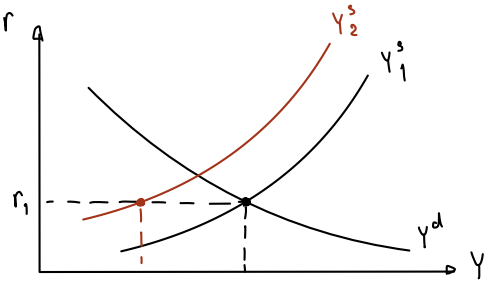
Firstly, the current capital stock decreases (K↓) at the same number of labor, causing a drop in Marginal Product of Labor (MPN↓), so the output decreases (zF(K1,N)→zF(K2,N)).



Then, the firm reduces its demand for labor due to the fall in MPN. The demand for labor shifts to the left (Nd1→Nd2).

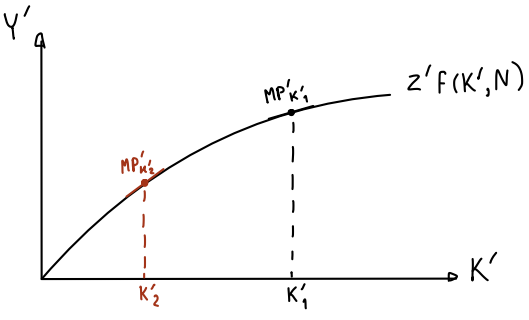


As a result, output supply decreases because of the fall in the number of labor. The output supply shifts left (Ys1→Ys2).



<u>Effect on Output Demand (Yd)</u>

On the other hand, a small current capital stock (K) means a smaller future capital stock (K'). This also means future marginal product of capital stock is higher (MP'K'1→MP'K'2).



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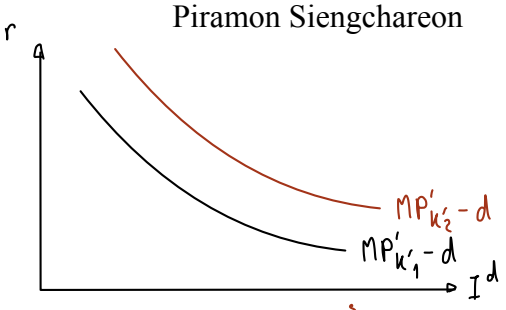
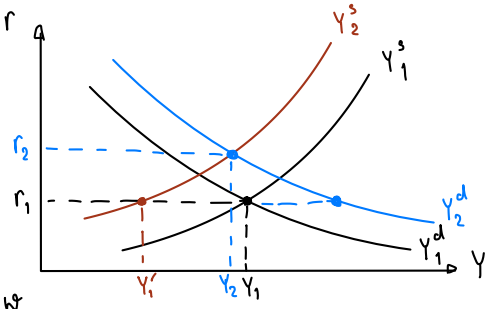
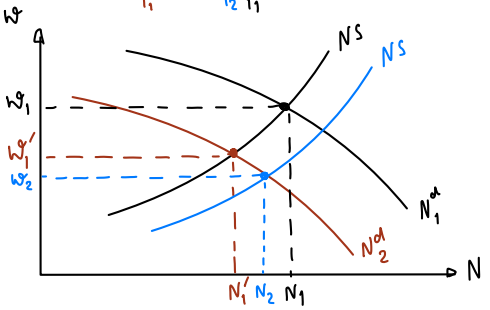
Respectively, the investment increases, given r. The optimal investment curve shifts right (MP'K'1-d→MP'K'2-d).



Thus, the output demand curve shifts right (Yd1→Yd2).

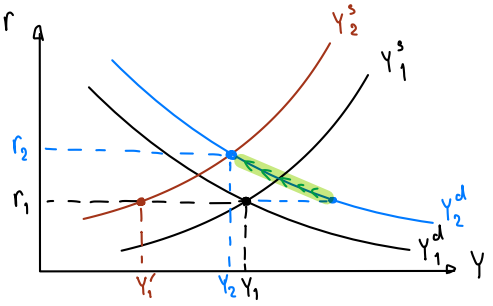


The higher interest rate reduces leisure (which equals to rising in labor supply), current consumption, and investment. So, the labor supply curve shifts right (Ns1→Ns2).



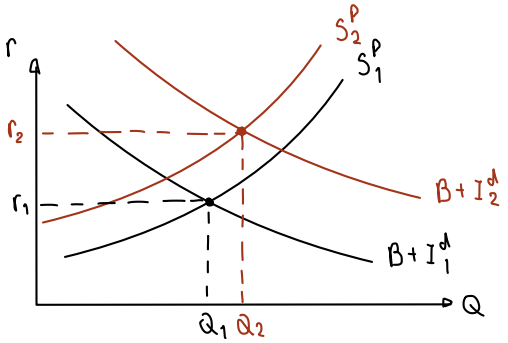
The investment increases to make up for the decline in capital stock, with the higher interest rate (higher r). (Move along on Yd2)

Higher r depresses investment but higher MP'K (due to fall in K) raises it



Effect on Credit Market

As consumption drops less than aggregate output, and we have consumption smoothing, so the private saving (= supply of credit) decreases, Sp shifts left (Sp1→Sp2). Correspondingly, optimal investment increases, and its curve shifts to the right (Id1→Id2), resulting in higher interest rate (r↑).



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