

## Introductory Macroeconomics

In-Tutorial #7  
Week Starting 26th April 2021

### Questions.

1. There has been a decline in the saving rate of Japanese households that began in the early 1990s. What potential factors do you think are responsible for this decline in the saving rate?
2. Figure 1 shows the long run behaviour of both mining investment and non-mining investment in Australia. In the early 2000s, Australia experienced a mining boom. During that time, there was a large increase in mining investment and a simultaneous decrease in investment in other non-mining industries. Would it be possible to explain an increase in mining investment and a simultaneous decrease in other (non-mining) investment in our model of savings and investment? Explain your reasoning.

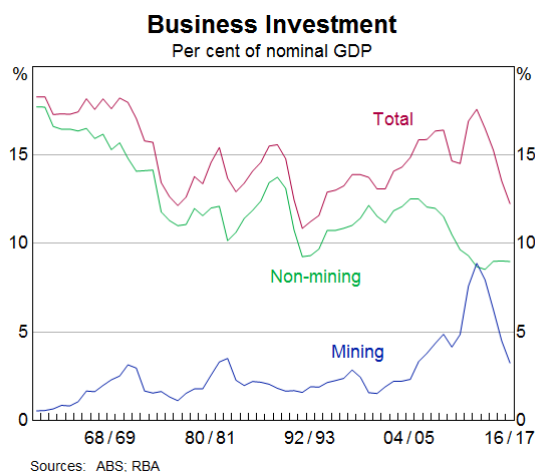


Figure 1: Business investment in Australia

## Solutions to In-Tutorial Work.

1. The lifecycle theory of consumption emphasises that income fluctuates over an individual's lifetime. But people prefer a relatively constant level of consumption over time. People can achieve relatively smooth consumption over time by accessing financial markets that allow them to borrow and save. During periods of high income, individuals will typically save and during periods of low income, individuals will typically dissave. Furthermore, individuals income tends to follow a predictable pattern. Income rise as individuals become more experienced in the workforce before falling with retirement. In the context of the lifecycle theory of consumption, this means that older individuals will be financing their consumption by dissaving.

Economists therefore think that one of the major factors responsible for the decline in Japanese saving rates is the aging of the population in Japan. There are fewer individuals in the economy in the prime-working age that are responsible for saving a lot and a relatively large number of elderly individuals that are dissaving. The net effect is a decline in the aggregate saving rate in the economy as the overall population ages.

Figure 2 outlines these patterns. Income has, on average, a fairly strong hump-shaped pattern. As people enter the labour market their incomes are typically fairly low. As they gain more experience their incomes rise, until in later years their income starts to decline as they retire from the workforce. On the other hand, consumption remains fairly constant throughout the lifecycle. If income exceeds consumption, then individuals are saving. If consumption exceeds income, then individuals are dissaving. As Japan's population has aged, more people are dissaving and this composition effect reduces overall saving.

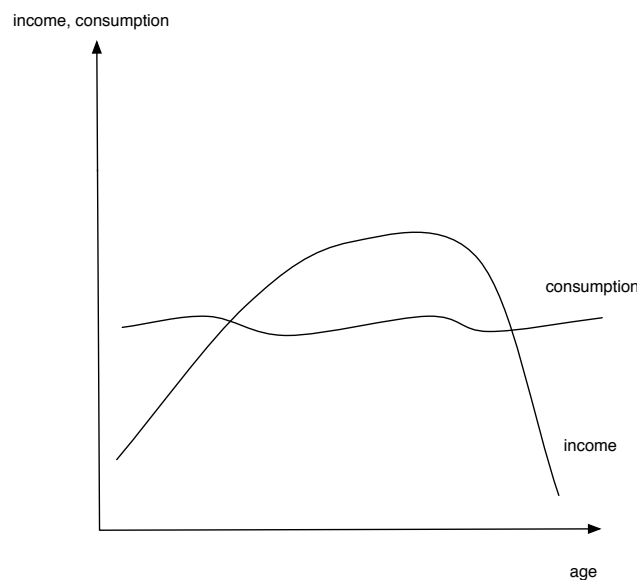


Figure 2: Income over the life cycle follows a hump-shaped pattern. Consumption over the life cycle does fluctuate a bit but is more constant than income.

2. There could be a number of potential solutions. I think a natural one would be to assume that there is a marginal revenue product of capital in the mining sector and this differs from the marginal revenue product of capital in the non-mining sector. The mining boom, due to an

increase in the international demand for mineral resources, raises the price of mineral resources and hence shifts out the marginal revenue product of capital in the mining sector. This causes an increase in capital and thus investment in the mining sector (from point  $A$  to point  $B$  in panel (a) of Figure 3). An increase in investment in the mining sector leads to an increase in overall investment, which is the sum of mining and non-mining investment. Therefore, the overall investment curve shifts out, raising the equilibrium real interest rate (from point  $C$  to point  $D$  in panel (b) of Figure 3).

The increase in the real interest rate in Australia raises the cost of one unit of capital in the non-mining sector, leading to a decrease in capital and thus investment in that sector (from point  $E$  to point  $F$  in panel (c) of Figure 3). In fact, real interest rates in Australia remained high relative to many other advanced OECD nations, which is consistent with our story.

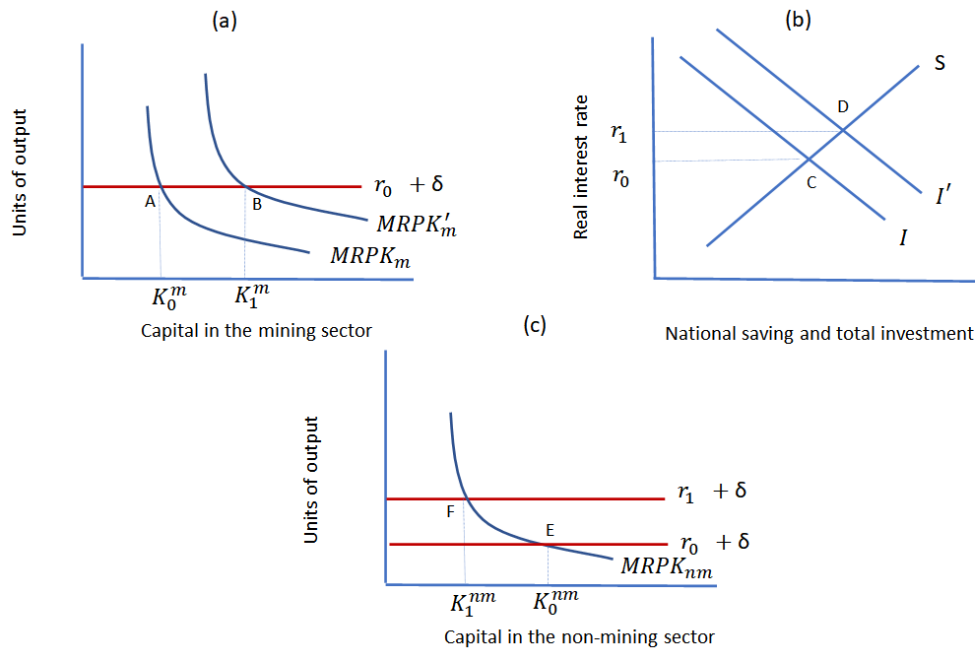


Figure 3: Effect of mining boom on business investment and the real interest rate

