

Wage rate effects on australias mining industry economics essay

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1. 0Introduction

Australia produces around 17% of the world's current iron ore output and a significant amount of gold and other minerals, with Western Australia accounts for nearly 97% of the total iron ore production (Australia's Identified Mineral Resources 2010). Recent trends show that there have been booms of the mining industry in Western Australia due to surging demand from China market. Rapid economic growth and increasing rate of urbanisation from fast growing population in China had driven the mineral resources demand, especially iron ores (Western Australian Mineral and Petroleum Statistics Digest 2010). As a result, there is a large demand for workers in mining industry in order to support the numerous iron ore project expansions carried out in Western Australia. This paper is going to examine the various impacts of mining boom on Western Australian economy. Two parts are being organised throughout this paper: part one particularly discussing about demand and production for iron ores, demand of labor market; another part is about the effect of changes in wages rate on supply of labor market.

2. 0Part 1

Demand and production for iron ores

Demand refers to the entire relationship between the price and quantity demanded of the good. When supply keeps constant, an increase in demand would bring a rise in price which eventually also would increase equilibrium quantity (Goodwin et al. 2009, 85). This is explained through Figure 1 where a shift of demand curve of iron ores was shown as it was affected by a non-

price determinant. Demand curve D_0 shifts rightwards to D_1 due to an increase demand from China market. Therefore, it leads to an increase in price from P_0 to P_1 and a rise in equilibrium quantity from Q_0 to Q_1 . Besides, the production of iron ores increases as the producers can earn higher revenues from higher prices due to increasing demands. It was reported that there was a significant 5% increase in iron ore production to 115 million tonnes in December quarter 2010 compared to September quarter, mainly contributed by the increased production from operations owned by BHP Billiton, Rio Tinto and Fortescue Metals Group. Export volumes for that quarter were increased by 10% as a reflection of the increased production. Iron ore production increased by 10% to 432 million tonnes in year 2010, largely produced from the Pilbara region in Western Australia. In addition, export earnings from iron ore increased by 57% to \$47 billion as a result of average increase of iron ore contract prices (Australian mineral statistics 2011).

Demand of ‘ inputs’

Isoquant is the production function that represents output which a firm can produce for every specified combination of inputs comprising capital and labor (Pindyck and Rubinfeld 2009, 208). An example of isoquant or production is shown as figure 2: When firms in the mining industry want to increase the production where it has a higher isoquant, higher input combinations are needed. This is shown in figure 3 in which the possible input combinations lie on Q_1 such as D, E or F have to be used instead of points A, B or C in order to increase its production from Q_0 to Q_1 . In short run, firms in mining industry face capacity constraints and need time to

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expand capacity by building new production facilities and hiring more workers. As a result, the firms will achieve the higher isoquant by increasing more of its labor input by hiring extra workers and extending current workers' working hours. Figure 4 where the capital set at fixed point k^* , and the firm can only choose input combinations such as E or F that comprised of more labor units. Australian Bureau of Statistics stated that employment within mining sector has grown by 56% within the last 6 years (Roxby Media Pty Ltd 2011). Moreover, Australia's mining industry had driven an increase in job advertisements in the past 6 months, with job ads in the sector almost up to 30% in the industry (Hayman 2010). However, in long run, firms will be able to expand more output after time is given to develop their facilities and infrastructure. For instance, the three giant mining companies BHP Billiton, Rio Tinto and Fortescue Metals had planned to increase capital expenditure through expanding infrastructure capacity across Western Australia in order to boost their iron ore productions (Australia Mining Report Q2-2011 2011). Reserve Bank of Australia reported that 4% of Australia's \$1.3 trillion of GDP consists of mining investment, and 5.5% of rising is predicted for the coming years (Australia Wages Pick Up Amid Mining Boom 2011). Hence, firms would need to attract larger permanent workforces or import skilled mining workers. In the long run, more workers will be employed in the production process until productivities of both inputs are being maximized.

Price of inputs

A firm's demand for inputs is referred as derived demand. This means that a firm requires inputs to produce goods or services wherever there is a demand. As a result, the demand for inputs is derived from the demand for

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outputs (Arnold 2008, 295). Marginal revenue product of labor (MRPL) determines how much the firms willing to pay in hiring an additional unit of labor. Thus, MRPL curve can represent a firm's labor demand curve. MRPL is the product result of marginal revenue and marginal product of labor. If either of these changes, labor demand curve will shift. Figure 5 explained the situation where DF1 supposedly is the original labor demand curve of mining industry. When the prices of iron ores increased due to increased demand from China, the curve would shift from DF1 to DF2 after the marginal revenue for iron ores sales rose. Figure 6 explained what happened to prices of labor when labor demand increases. As the individual labor demand curve shifts out, the wages rate in labor market increases. This is evidenced in significant increase of mining wages that grown from 3.5% in 2009 to 4.6% in 2010. Overall, the government's main estimation of wage costs rose 1% last quarter and boosted the annual growth in 2010 to 3.9%, which is the fastest pace since 1st quarter in 2009 (Mining boom drives wages growth 2011). However, when two or more inputs are variable or means input substitution is possible in the near future, a firm's demand for one input then depends on the marginal revenue product of both inputs. The individual firm's labor demand curve would not equal to the MRPL curve anymore. When wage rate falls, overall costs of production would drop and the firm can substitute labor for capital. From figure 7, the short run labor demand curve (MRPSR) shown to be more inelastic than the long run labor demand curve (MRPLR); long run labor demand curve is flatter.

3. 0Part 2

Effects of changes in wages rate

Currently, there is only a very few dominant firms in mining industry of Australia such as BHP Billiton, Rio Tinto, Fortescue Metals which have 'buying power' of labor since their purchases account for a large portion of the market (Australia Mining Report Q2-2011 2011). Thus, they are considered monopsonists of mining workers in which their hiring rate affects the market wage rate. However, the monopsony power of mining firms may be limited because they would compete to some extent for skilled labor (Pindyck and Rubinfeld 2009, 539-540). First of all, average wage per annum in mining industry, \$A108, 009 is rank as the highest among all sectors in Australia (Bryant 2011). This lucrative wages offer would affect the labor supply to mining and other industries. From upward slopping curve in figure 8, the quantity supply of labor increases along with the increasing wages because higher wage rate would be able to attract more workers to join their industry. Moreover, earning more would encourage current workers to work overtime. The short run supply curve was fairly inelastic, which caused the curve looks steeper, because mining jobs required certain amount of specialized education and professional skills that can't be obtained within short period (Goodwin et al. 2009, 338). Figure 9 shows changes in the wage rate of mining industry would change the quantity supplied of labor units, which only caused movements along the supply curve of labor. However, the high wage rate offered in mining industry can cause the supply curve of labor market in other industries to shift due to monetary incentives. When the wage rate of mining industry increases, the workers at other industries

with essential skills or qualifications for mining industry would be attracted and enter into this industry. Thus, causing supply curve of the labor of other industries shift to the left as shown in figure 10. An upward pressure on wages would be created as their current employers need to pay higher salaries to retain their skilled labor (Heath and Scott 2011). Moreover, shortage of skilled labor might be happened in other industries if their wages rate has not increased and relatively lower when compare with the wages rate from mining industry (Miller 2011). This is explained in figure 11: Meanwhile, the non-monetary aspect of job at mining industry such as the importance of workers' preferences of living in city areas and other features of jobs in the sector will also cause shifts in supply curve of labor market in mining industry. With other things being equal, people tend to avoid heavy, dirty, dangerous work in regional areas with unfavorable climates (Arnold 2008, 308). Most of the mining sites were situated in remote location and having harsh environments (Mills 2011). The job in mining industry would become less attractive when there is an increase of the overall unpleasantness causing decrease of labor supply in the industry and thus labor supply curve shifts to the left as shown in Figure 12.

4. 0Conclusion

In conclusion, this paper has analyzed the various aspects on Western Australian economy that impacted by the mining boom in this few years. Microeconomics theories and concepts, particularly in production market and factors market, were being applied and most of them were assumed ceteris paribus. Hence, it may not truly reflect the real market situations, and

further considerations might need to be included in order to estimate the real effects.

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