**Labor Economics Relationships Synopsis – Marginality, Balance and Profit Maximizing Conditions[[1]](#footnote-1)
Instructional Primer[[2]](#footnote-2)**

Labor Economics is simply the labor market explained via microeconomic concepts. The foundation of labor economics then is based on a few important microeconomic relationships. The following is a simple review of a the more important of these concepts.

**Some marginalities:**

***Law of diminishing marginal productivity***: as the number of inputs increases, the marginal product declines (this is consistent with the law of diminishing marginal utility and diminishing marginal returns). Unstated, but important to this relation is that all other inputs are constant.

***Marginal Product of Labor***: $MP\_{L}=\frac{∆Q}{∆L}$ – where *Q* is the quantity of the good being produced and *L* is the number of labor units

***Marginal Revenue Product of Labor***: $MRP\_{L}=MP\_{L} x P=\frac{∆Q}{∆L} x P$ – where *P* is the price of the good being produced – the price for which it is sold to consumers

***Real wages***: $Real Wage= \frac{W}{P} = MP\_{l} $ - this is the result of 1) $MRP\_{L}=W$ (profit maximizing condition in competitive market) and 2) dividing each side of $MRP\_{L}$ by *P:* $\frac{MRP\_{L}}{P}=\frac{W}{P}=\frac{MP\_{L} x P}{P}=MP\_{L}$. Recall that the real wage is simply the nominal wage adjusted for inflation.

***Total Cost of labor***: $TC\_{L}=W x L$ - where *W* is the wage and *L* is the number of labor units

***Marginal Expense of Labor***: $ME\_{L}=\frac{∆TC\_{L}}{∆L}$

**Some Profit maximizing conditions**

$MRP\_{L} = ME\_{L}$ (general labor market conditions)

$ME\_{L} = W$ (competitive labor market conditions)

$W = MRP\_{L}$ (competitive labor market conditions)

$MR = MC$ : this is one of the most basic microeconomic conditions for profit maximization: marginal revenue = marginal cost. This condition applies to all markets, competitive or not. With respect to labor, we think about labor’s contribution to marginal revenue ($MRP\_{L}$) and marginal cost ($ME\_{L})$ in the relation $MRP\_{L} = ME\_{L}$. This is a more defined version of *MR = MC* and simply lets us know about labor’s contribution to marginal profits.

$\frac{MP\_{L}}{P\_{L}}= \frac{MP\_{K}}{P\_{K}}$ (balance condition) – where *K* = capital and $P\_{i}$ = price of input (*i*), which in this case is either *L* or *K*. If this presents as an inequality, such as $\frac{MP\_{L}}{P\_{L}}> \frac{MP\_{K}}{P\_{K}}$ it would suggest the producer (firm) isn’t using the optimal balance of *L* and *K* to achieve the maximum level of profits. It’s helpful to think about how a firm might correct this. In this case, we see want to either decrease the value of $\frac{MP\_{L}}{P\_{L}}$ or increase the value of $\frac{MP\_{K}}{P\_{K}}$. We have to think of this in short and long run situations recalling that the competitive market firm has no control over the prices of its inputs (*L* and *K*) and changing $MP\_{K}$ requires changing the quantity of capital used in production, which isn’t easily accomplished in the short run. Which leaves us with only one term in the equivilency that we might be able to change in the short run: $MP\_{L}$. Recall that as the number of labor units increases, holding all else constant, the marginal product of labor ($MP\_{L}$) declines. So… in order to correct the inequality $\left(\frac{MP\_{L}}{P\_{L}}> \frac{MP\_{K}}{P\_{K}}\right)$, we need to increase the number of labor units. This causes $MP\_{L}$ to fall and decreases the value of the entire term $\frac{MP\_{L}}{P\_{L}}$. Try to keep in mind that there’s a negative correlation between *L* and $MP\_{L}$; as *L* rises, $MP\_{L}$ falls (the law of diminishing marginal productivity).

Finally, ***as input costs rise producers manufacture fewer units of the output good***. This supposes that producers will choose to maintain a constant profit margin, so as the cost of production increases, the output price would also have to increase, which will cause the quantity demanded of the good to fall (think ab out downward sloped consumer demand curves).

1. This primer is intended to present an abbreviated discussion of the included economic concepts and is not intended to be a full or complete representation of them or the underlying economic foundations from which they are built. [↑](#footnote-ref-1)
2. This primer was developed by Rick Haskell (rick.haskell@utah.edu), Ph.D. Student, Department of Economics, College of Social and Behavioral Sciences, The University of Utah, Salt Lake City, Utah (2013) [↑](#footnote-ref-2)