**Capital Controversies**

**Re-switching and Capital Reversing and how the possibility of these occurring impacts the three parables.**

The Neo Classical economists made the big leap in Smith’s general principle of relative scarcity by using their one commodity production function model to explain all prices in the aggregate production function model, this included production as well as time. However, by formulating this one commodity model, where each good – created as a function of capital and labor (Q =f (K, L)) -can either be consumed for utility now or saved for future as a capital good (K), the neoclassicist model was able to demonstrate three key “parables”.

These parables included: 1. Real rate of return on capital is determined by the diminishing marginal productivity of capital 2. There exists an inverse monotonic relation between amount of capital and interest rates- the fall in marginal productivity because of excess capital leads to lower interest rates 3. Distribution of income between laborers and capitalists can be explained by looking at scarcities of labor and capital (interest rate) and their marginal productivities.

These parables were met with much skepticism from the English economists, namely Piero Sraffa, Joan Robinson, Luigi Pasinetti and Pierangelo Garegnani. The English pointed out that these parables were fundamentally flawed when tested with heterogeneous capital goods because they require capital valuation and must factor in time as well as interest rates. Since the price of capital depends on its relative scarcity (rate of interest), the neoclassical parables give rise to the Wicksell Effect - changes in the value of capital being held because of changing interest rates or changes in the stock of capital goods itself.

This Wicksell effect can be broken down into “re switching and capital-reversing”. Re switching basically occurs in production where a certain capital to labor ratio is preferred for a disjoint range of interest rates while another K/L ratio is picked for interest rates in between. Given two available techniques of production if a profit maximizing firm opts to shift from production method 1 to production method 2 as interest rates go higher and then back again to 1 after they pass a certain threshold, we can look upon that as re switching.

Likewise, capital reversing is a scenario where lower interest rates are associated with lower capital to labor ratios, which goes against the scarcity theory for pricing of capital because in capital-reversing lower interest rates occur when capital is scarcer.

Re switching, in effect has created a disjoint demand curve for capital and capital-reversing hints at multiple equilibriums as rate of interest now depends on endogenous variables such as nominal interest rates. Re switching can be seen to invalidate parable 1 and 2 because with two different interest rates for the same capital to labor ratio, one can no longer look at capital as having an inverse monotonic relation to interest rate; or, a downward sloping demand curve for capital. Furthermore, rate of return on capital cannot be determined by look at its diminishing marginal productivity.

Meanwhile, capital reversing brings parables 2 and 3 to question because, with the existence of multiple equilibriums as different prices of interest rates endogenously affect rate of interest and one can no longer accurately use parable 3 to explain distribution of income among laborers and capitalists. Since the difference in quantity does not correlate completely with price effects, capital reversing raises problems to the theory. Furthermore, like re switching, it also invalidates the downward sloping demand curve for capital because of the disjoint break it creates.

In this way, re switching and capital reversing that might occur in general models with heterogeneous capital goods brings the model proposed by Samuelson, Solow and Swan to question. What was not a problem in their one commodity model seems to entirely invalidate the parables in more complex models.

**Under what condition(s) will reswitching not be a possibility? From a history of economic thought perspective, why is this important?**

The simple one commodity model that the neo classical economists used to come up with their theory for prices was immune to re switching because the price effects and interest rate measurement problems were not possible within a one commodity model where relative prices were independent of changes in distribution in wages and profits across other sectors. If the labor and capital ratios are same in both production goods and capital goods, two production methods will be bound by a linear relationship between wage rate and interest rate. In such a case the downward sloping demand curve for capital would hold and the production methods will only switch once with respect to changing interest rates.

Joan Robinson argued that the effects of re switching were not as important because the very act of re switching changes the accumulation process and the equilibrium itself. For her, changes in the initial parameters of the equilibrium model and the subsequent immediate change versus effects in long run equilibrium were better left analyzed in terms of dynamic accumulation rather than a static equilibrium framework. Further down, Samuelson, in his third theoretical responses attempted to expand the one commodity model to include heterogeneous commodities by making a “surrogate production function” which tried to incorporate physically distinct capital goods. However, he was unable to do so without assuming equal capital to labor ratios across all industries.

From a historical point of view, the Neoclassicists have discredited Ricardo’s theory of prices, which stemmed from his labor theory of value, because it made the unrealistic simplification of equal capital to labor ratios across all industries. The neoclassicist believed that by not allowing different capital to labor ratios, Ricardo’s model was unable to capture the effect of changes in wages and interest rates on prices and production. However, when their model failed in cases other than the one commodity model (which has an underlying linear relationship between scarcity of capital and labor ratio), they found themselves in the same grounds with the classical theory they discredited. Samuelson’s attempt to expand the theory failed to do so without assuming a fixed capital to labor ratio across industries. This meant a failure for their aggregate production function model to properly capture the effects on prices with changes in ratios of factors and their scarcity prices (wages and interest rates) and the neoclassical theory being scrutinized over its accuracy and debated over its acceptance.

**Evaluate the significance of the capital controversy.**

The capital controversy of the 1950s was a stage where the American neoclassicists and the English classical economists battled out the accuracy of the neoclassical theory of capital to explain interest rates with respect to marginal productivity of capital. Both sides went out of their way to defend their Ideology and Mythology; the classical economists did so by pointing out specific flaws in empirical claims in the neoclassical theory, while, the neoclassicists sought to fix those pointed flaws by stubbornly trying to expand their theory. Even though the problem was never completely resolved, the controversies pointed out a significant amount of ideological bias on each side.

The neoclassical economists, for whom individual utility maximization was a driving force for the economy, held on to their empirical theory while the English classical school always pushed for a return to the classical political economic vision in which the tendency of capitalists to maximize profits was what drove distribution of income within society. The Neoclassical model, which marked a shift to the marginal view, was empirically dominant. Even though the Wicksell effect was theoretically possible and would invalidate the parables, the neoclassicists argued that it was the intuition their model provided which could be used in most scenarios was something they are going to hold on to. The controversy for them was a fight to defend, and they made several attempts at defending through secondary hypotheses as a well as newer assumptions but were unable to save the parables.

Meanwhile, the English school of thought’s only approach was to consistently point out the flaws in the neoclassical empirical theory. The classical such as Straffa were hell-bent on not accepting a theory unless it is absolutely precise. Their reluctance to accept anything that is less than perfect had let to division within the Cambridge school of thought itself. Moreover, they failed to provide a better alternative theory themselves; the result of which is that the neoclassical theory is still widely accepted today.

At the end of the day, Bliss’s conclusion that the theory of capital can be viewed as an extension rather than an alternative to the equilibrium theory and the production theory to include the role of time was met with consensus from both sides. Furthermore, looking deeper into the one commodity model, one could see that the classical theory was equally valid in this model. Rather than seeing the neo classical theory as an alternate, the controversies pointed out that it was simply a continuity of the classical work. The neoclassical theory survived because of its empirical correctness in explaining the relation between factor returns and their marginal productivities; despite the classical economists’ view that it was “not committed to a relative scarcity theory of distribution”.

**Piero Sraffa’s Work**

**If the wage increases and the profit rate falls, what does Sraffa say will happen to various prices? Briefly, how is Sraffa’s answer different from Ricardo’s?**

For the classical economist David Ricardo, a rise in wages was the same thing as a fall in profits because his labor theory of value dictates that it is the labor bestowed on the production of a commodity that gives it its value and therefore decides is exchangeable value/ price. His labor theory of value build on the baseless assumption that the difference between profits within a industries with a very high capital to labor ratio and one with a low ratio will, at the most, be 6-7 % as wages rise or fall. Then, Ricardo says that a rise in wages, which will almost always be accompanied by a fall in profits, affects capital-intensive industries differently than they affect labor-intensive industries in terms of their effect on prices. If a industry is capital intensive, a rise in wages will lead to a fall in price of the commodity because the machine owner who now enjoys above normal rates of profits will be obliged to do so or investment will flow into that sector and drive his profits down. Likewise, in labor-intensive means of production, if wages were to increase and profit rates subsequently fall, then the relative price of the commodity will fall.

On the other hand, neoclassical economist Sraffa, in his derivation of the theory of value, makes a contrasting claim that because surpluses/profits do not reinter into the production of other commodities and are not articles of subsistence for the labor, they do not affect price determination. He classifies these surpluses as “luxury” commodities and goes on to explain why they do not affect price determination. Sraffa’s theory takes a turn from Ricardo’s theory in a sense that he sees wages as being paid “post factum”- as a share of the annual product and not as ‘advanced’ capital. For Sraffa, wages are composed of necessaries, which reinter the production cycle among other means or production, and profits/surpluses that are variable.

By doing this, Sraffa’s theory of value doesn’t follow the classical labor theory in which he reduces relative values to prices. For Sraffa prices cannot be determined before we know the surplus rate, therefore the change in relative prices can be explained in terms of the varying proportion of labor and capital between industries. For Sraffa if the capital to labor ratio is equal, a change in wage will not result in a change in price because the change will simply go towards adjusting profits. However, for different capital to labor ratios ‘deficit’ and ‘surplus’ industries would occur because of varying rates of profits and therefore relative prices may rise or fall for either or both. One cannot without the knowing the technique of production, wage rate and output, accurately predict profits or price movements. Thus, Sraffa concludes that even though price changes might work in opposite direction within various industries, the overall result will always be that of rebalancing within the industry.

**In Section 22, Sraffa chooses to use the “value-ratio of net product to means of production” to define the balancing proportion. How does Sraffa use this ratio?**

To tackle the problem of price variations because of differences in distribution that we mentioned in section A, Sraffa looks for an industry which is between a ‘deficit’ and a ‘surplus’ industry, and, for which a change in wages exhibits a rebalancing between wages and profits. A commodity from this industry would remain unaffected by changes in rise or fall of other commodities in determining its price change relative to wage changes. Sraffa uses the value-ratio of net product to means of production in determining this ‘balancing’ proportion of capital and labor.

According to Sraffa, to obtain such a ratio which is invariant to changes in wage and recurs in all layers of the industry’s aggregate, we can set the wage as zero and the resulting rate of profit will be equal to the ‘balancing’ ratio that we are looking for. In other words, he describes this maximum rate of profit R that is obtained when wage is zero as being equal to balancing ratio.

Now, using this R, Sraffa is able to find the rate of profits r as being equal to R(1-w) where w is the proportion of the total product that goes to wages. Here, r can be seen as the actual rate of profit for the industry and this relation can be used to determine it. This helps find the Standard Commodity in the standard system and where the value-ratio of net product to means of production remains unaltered to changes in division of net product between wages and profits regardless of the change in prices.

**In a paragraph, explain what Sraffa’s standard commodity is and how he uses it.**

In his book, Sraffa looks for a way to convert the value system into price system using a profit rate in order to accurately correlate price movements and wage changes. The problem he is faced with arises because of the varying capital to labor ratios that does not allow him to tell with certainty how prices will reach to changes in wages. He solves this problem by finding a Standard commodity that is created of a composite of commodities, which in average, has a ‘balanced’ proportion of labor to means of production. This proportion is the average organic composition (or fixed to circulating ratio) of all the aggregate production techniques in that industry. This standard commodity is an invariable measure of value and can be used as an index for a real measure of GDP because its price will not change as wages change. He further derives the Standard wages and prices using this standard commodity, and is able to derive the Standard National Income. Using this standard, Sraffa says he can accurately look at price changes in other products with differing proportions as well because this Standard commodity would help isolate all other effects.

**Did Sraffa’s book provide a good historical interpretation of the “core” of Ricardo’s theory of prices and value, or was Blaug correct in his critique? Briefly explain.**

Mark Blaug, in his paper *Misunderstanding Classical Economics: The Sraffian Interpretation of the Surplus Approach,* expresses his critique of Sraffa’s reconstruction of the classical economists. Blaug claims that Sraffa starts out with historical reconstruction of the classical theories and adopts their work on value and distribution, but has grossly misinterpreted their theories to fit his analytical model. According to Blaug, Sraffa does a “classical revival” of the core values of Ricardo and the classical economists who first put forth the theory of a moving equilibrium on the foundations of the labor theory of value. Sraffa’s interpretation did not mention many of the core Ceteris Paribus conditions that the classical theories stated but Sraffa used them for the development of his theory of value nonetheless. This was something that infuriated Blaug, along with many other reasons, leading him to write his critique of Sraffa.

I believe that Sraffa’s book was never about the historical reconstruction of the classical theories. Blaug himself admits that full proof Historical reconstructions are impossible, as one can never completely forget everything that we have learned from modern economics. What Sraffa did was to focus on the analytical part of the classical theory to formulate his rational reconstruction, which attempted to patch up the classical core rather than reinvent it. Sraffa used the core of Ricardo’s idea and applied analytical methods to generalize the classical theories within their aspects to come up with a better theory of distribution and prices around that very classical framework. Blaug’s primary critique was that Sraffa misinterpreted Ricardo altogether when he took the proportions to be a constant in formulating his theory of production and reproduction.

Moreoever, I believe, Sraffa sought to answer the same questions as Ricardo did in his search for the Standard commodity, which can be used as an invariable measure of value that Ricardo sought to find. Sraffa formulated a dynamic theory from the rational reconstruction of the theory of distribution and prices, where he took the methods of production, current output, wage rate and available land/quantity as a given fixed over time. What the Sraffaians should have done was mention that they were merely ceteris paribus conditions that were required to study other effects.

All in all, I believe Blaug was simply looking at Sraffa’s rational reconstruction and trying to find the historical reconstruction and accuracy in it. If anything, Ricardo himself was in favor of analytical rigor and mathematical precision and would probably have agreed with Sraffa’s use of Ricardo’s classical ‘core’.

**Summarize Keynes’s theory of effective demand and how it determines the level of employment. Second, explain why, according to Keynes, the level of employment was not determined in the labor market.**

In his book *The General Theory of Employment, Interest and Money*, author John Maynard Keynes looks at how an entrepreneur, looks at the expected aggregate income for his produce to determine the amount of Labor to employ such that he maximizes his profits. Keynes, here formulates his theory of *effective demand* that determines the level of employment in an economy to incorporate the equilibrium between the aggregate demand function and the aggregate supply function. He then goes to critique the classical notion that the labor market determines the level of employment, arguing that the aggregate demand function cannot be neglected and it is not the tendency of wages to adjust towards full employment.

Keynes starts out by separating the expenses an entrepreneur incurs: Factor cost that goes towards factors of production (labor), and user cost which goes towards other entrepreneurs for buying and maintaining equipment. He dismisses user cost in his analysis mentioning that it depends on the level of integration of the industry and the dependence of entrepreneurs on one another, and if aggregate supply price is above the new user cost, to keep things simple, we can chose to ignore it. Therefore, it is the difference between the factor costs and the expected future proceeds, that an entrepreneur aims to maximize. This excess value is what are profit to the entrepreneur and can be termed as his *aggregate income* from employing labor. Likewise, the aggregate supply is simply the minimum amount out output where his expected proceeds will make that level of employment to generate aggregate income worthwhile.

Next, using these relations, Keynes formulates the aggregate Supply function, which the aggregate supply price of output (Z) as a function of number of employed men (N). The aggregate demand function then is the expected proceeds from the output (D) as a function of N. Hence, since increasing employment only makes sense if there is a worth while surplus (D – Z), it is the intersection between aggregate demand and supply functions where the level of employment (N) is decided and this equilibrium point occurs, where D is intersected by the supply function, is what Keynes calls the *effective demand*.

Entrepreneurs, who seek to maximize profits (or the difference between expected proceeds and supply price for the total output), it makes sense for them to increase the number of workers (N) only till the point where the D – Z is zero (D = Z). No further increases in employment will lead to higher profits and therefore this effective demand point is what determines the level of employment of the economy. It should also be noted that since the entrepreneur can only guess as to how much the consumption of his commodity will increase, he bases his decision on expected proceeds and hires labors to maximize surplus on those proceeds in making decisions.

Then, Keynes goes on to use this theory of effective demand and general theory of employment to question the classical view that ‘supply creates its own demand’ where aggregate demand price adjusts to the aggregate supply price for any level of employment to make D equal to Z. The classical economists saw no obstacle to full employment and employment simply keeps rising to the point where supply stops being elastic and output will be constant. Unlike the classical thought, Keynes argues that the increase in real income if employment increases will only increase aggregate consumption in par with the marginal propensity to consume, and therefore investment decisions are predicted based on the level of employment unless this propensity changes. The classical theory assumed nominal wages to follow real wages and the aggregate demand price is equal to supply price for an output, which can only occur at the level of full employment. When we look at any other levels of employment we assume this equilibrium between aggregate demand and supply and therefore the level of employment is not determined in the labor market because the economy will not always go towards full employment where real and nominal wages move together.

For Keynes, it was in fact real wages and nominal wages that were dependent on the volume of employment, which in turn will only go up when entrepreneurs predict an increase in consumption, which will be done by increasing new investment; and, the aggregate supply function. Thus, unless there is a change in the propensity to consume or the rate of new investment, the volume of employment will remain the same. Real wages then are simply a function of the volume of employment unlike the classical argument where the wages in the labor market dictate the demand and supply of labor and ultimately level of employment. Thus, Keynes makes the fundamental distinction that unless consumption is predicted to increase, employment does not increase in the economy and therefore the labor market is not the determinant of the level of employment.

**“Let us suppose that all commodities … the respective manufacturers of those commodities.”**

**[Ricardo, Principles, Ch. 4] Given the above quotation, explain how in The General Theory Keynes rejects that this classical adjustment mechanism works in the case of consumer goods and investment goods.**

In Ch. 4 of his book Principles of Political Economy and Taxation, author David Ricardo explains how investment of capital is reallocated to best meet the demand for a commodity. According to Ricardo, the capitalist class always seeks the highest available return for their investment and if they see an opportunity with rates of profits higher than the normal rates of profit, they will reallocate their investment to that sector. Ricardo’s theory suggests that discrepancies in market prices of a commodity are adjusted by this mechanism that syncs the value of exchangeable commodities such that the market prices are equal to the natural prices through reallocation of investment in the face of changing demands.

Keynes, however, argues that this “classical adjustment” mechanism is neither accurate nor this simple in its working. Keynes’s General theory of Investment looks at the psychology of an investor, and talks about the long term and short term expectation as well as the propensities in order to explain how these affect employment and the adjustment of prices. In chapter 5 of his book, Keynes puts for the notion that the entrepreneur/investor is guided by future expectations of demand and price for his supply of a product. These expectations too can be broken down into *short-term and long-term expectations* based on whether they are expectations on the cost of output or stream of returns from finished output. These expectations, Keynes believes will only effect employment gradually over a considerable period of time because capital takes some time to accumulate in order to be reallocated for new investment.

Furthermore, Keynes mentions that in the case of consumer goods, more specifically agricultural goods, where investment cannot be changed mid-season in response to speculated expectations; investment will modestly and gradually increase only in the subsequent periods. Moreover, short-term expectations are what decide employment and output (and investment) for the durable consumer goods sector. These expectations are always set on a course to meet the long term expectations but are subject to fluctuations since they are constantly adjusted in light to realized results. Therefore, for Keynes, unlike the classical view where adjustment occurs over a short period of time, consumer goods adjustment is liable to many gradual changes in investments and is constantly readjusted as they undershoot or overshoot expected sales proceeds.

Likewise, in chapter 10 of his book, Keynes looks at how this expectation for increase in investment is dependent on the marginal propensity to consume because increased investment only makes sense if there is going to be a demand for that additional output. Here, he makes the important distinction that the adjustment process for the capital-goods industries is subject to a time lag and only recalibrates after an interval. The expansion on capital-goods industries causes a “series of increments on aggregate investment occurring in successive periods over a interval of time”. These series, according to Keynes, cause a number to changes in both industries before they come to an adjusted equilibrium. If a significant amount of investment has been made in the capital goods industries (because of positive expectations) but, consumption good output is not increased accordingly, the prices of consumption goods will go up as a result of the temporary equilibrium because of increased unfulfilled demand. This equilibrium will adjust as the output of consumption goods is increased to meet the new demand and the change in employment will only take a permanent effect after a period of time.

Furthermore, chapter 11 discusses how the marginal efficiency of capital (MEC) decides the adjustment process for investments. Keynes defines MEC as the rate of discount, which would make the present value of the series of annuities given by returns expected from the capital asset during its life just equal to its supply price. Investment would only make sense if the expected future yield on capital were higher than the rate of interest; and as investment is increased, the MEC of each successive unit of capital invested will diminish because of increase in supply (in long run) and increase in supply price (in short run). Therefore, the main reason Keynes rejects the classical adjustment process is because it ignores analyzing the future and its equilibrium before making investment decisions to meet expected demands. The adjustment process works in different ways for both consumer goods and investment goods and is a dynamic process of expectations and errors that inch towards the long run equilibrium.