

PROFIT RATE OF TURKISH MANUFACTURING SECTOR IN A MARXIAN PERSPECTIVE

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ABSTRACT

The article evaluates the Turkish manufacturing sector from 1950 to 2011 with Marxist tools. Using national income data, we estimate capital stock data to generate profit rate in disaggregate level of Turkish economy. Profit rate in Turkish manufacturing sector has a main long-wave which contains the depression phase before 1980 and the recovery phase after 1980. Another aspect we gained from our study is that the exogenous events and capital productivity are the main determinants of profit rate in Turkish manufacturing sector.

Key words: Manufacturing sector, profit rate, business cycle, capital stock

ÖZET

Bu çalışma Türkiye ekonomisinde 1950 ve 2011 yılları arasındaki dönemi Marksist araçlarla ele almaktadır. Öncelikle kar oranlarını oluşturmak için gerekli olan sermaye stoku verileri milli gelir verilerinden yararlanarak oluşturulmuştur. Çalışmada elde edilen bulgulara göre, imalat sanayinde kar oranları 1980 öncesinde çöküntü ve 1980 sonrasında genişlemeden oluşan bir uzun dalgaya sahiptir. Elde edilen bir diğer sonuç ise imalat sanayinde kar oranlarındaki temel belirleyicilerin birisi dışsal şoklar iken bir diğerinin sermayenin verimliliği olduğudur.

Anahtar Kelimeler: İmalat Sanayi, Kâr Oranları, İş Çevrimleri, Sermaye Stoku.

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I. INTRODUCTION

Among economists, the debate on the business cycle is based on the neo-classical approaches those argue that only exogenous shocks, called “impulse mechanism”, lead an economy to deviate from a normal path of steady-state growth. In addition, the “propagation mechanisms” enlarge these shocks throughout the fluctuations of general economic activity. In contrast, Marxist approach describes the business cycle through an endogenous mechanism. While explaining the business cycles, Marx especially concentrates on the endogenous mechanisms and argues that cycles arise from these factors. In analysis, Marx refers exogenous mechanisms as an accidental event. In other words, his approach does not require an “impulse mechanism” to explain the business cycle on the growth level of economic activity.

Marx was one of the first economists to recognize the existence of business cycles (Mandel, 2008, p. 67-78). Marx’s main aim was to analyze the laws of motion of the capitalist mode of production. Although Marx occasionally used the term “crisis cycle” or “crisis” to refer to business cycles, in his approach, the crisis is an endemic feature of accumulation (Evans, 2004). According to Marx crisis is a phase in the cyclical mechanism through which the system adjusts to disequilibria by the system’s laws of motion (Howard and King, 2002). Moreover, “crises occur in conditions of disrupted reproduction and represent processes of adjustment leading to reestablishment of stabilized conditions of reproduction (Howard and King, 2002, p.343-344).

Despite the fact that Marxian theory of business cycle has constituted a huge literature, a majority of this literature has emphasized only one aspect of Marx’s approach in explaining business cycle and crisis. Although there are several classifications of these theories in the literature, most widely used classifications are theories of crisis arising from organic composition of capital, under-consumption theories, profit squeeze theories, theories of crisis as a consequence of falling rate of profit, disproportional growth theories, over-production theories, over-competition and over-investment theories, etc.

II. Profit Squeeze and Business Cycle

The “profit squeeze” approach had become the dominant explanation of stagnation, from the late 1960s till early 1980s. Glyn and Sutcliffe are pioneers of this approach, which is based on the analysis of accumulation developed in the first volume of *Capital*, (Glyn, and Sutcliffe, 1972; *Capital*, vol.1, chapter 25).

Profit squeeze theorists argue that accumulation involves an increase of workers employed during the expansionary phase. With the decline of unemployment, workers’ bargaining power gains strength, making it possible to increase their wages. Consequently, an increase in the level of wages leads to a decline in the amount of surplus value. Hence, the falling rate of profit induces the capitalists for further accumulation (Evans T. 2004).

However the profits squeeze theories have been criticized by several Marxian theorists (Yaffe, 1973, Shaikh, 1978). In Shaikh words, “... it is certainly true that a reduction in wages, other things being equal, will raise profits. But it does not follow that a given decline in profits is necessarily due to excessive wages” (Shaikh, 1978, p, 237).

There are several explanations of the profit squeeze approach, one of which is based on a non-labor cost-induced decline in profits plus a cyclical under-consumption theory, called the nutcracker theory (Goldstein, 1999). It could, also, be asserted that increases in the demand on primary commodities exported from Third World countries to advanced ones, leads to increase in those commodities’ price level. This would squeeze the profits of firms in the advanced capitalist countries (Kawakami T., 1980).

III. Under-Consumption Theories and Business Cycle

This approach, based on insufficient aggregate demand, has been analyzed by Marxists influenced from Keynesian economics. Although there is no evidence in Keynesian literature that the main characteristic of business cycle is the tendency for under-consumption demand, there has been such as misunderstanding in general Marxian literature. In this field,

while classical studies belong to Rosa Luxemburg (1986), Steindl (1952), Baran and Sweezy (1966), Foster and Szlajfer (1984), many varieties of underconsumptionism has been advocated by left wing groups or parties. In U.S.A, for example, Democratic Party liberals, Monthly Review School, and some Communist Parties in the world can be signed as passionate advocate of this approach (Laibman, 2000).

One of the most important tools of this approach is Keynes' effective demand and the other tool is based on the second volume of Capital. In this volume, Marx introduces reproduction schema which consists of two departments. In the first one means of production is produced, and in the second one means of consumption is produced. Thus the underconsumptionists assert that reproduction is limited by the final demand for means of consumption. In other words, according to the underconsumption theory, "capitalism lacks any internal mechanism to generate total demand sufficient to buy-back a growing total supply"(Post C., 2008).

In order to explain both the profit squeeze and Sherman's under-consumption approach, called *nutcracker theory*, includes underconsumption cycle and non labor cost induced decline in profits, we should use Weiskopf's decomposition (Goldstein, 1999).

$$\text{PIR} = \Pi/K = (\Pi/Y)(Y/K_u)(K_u/K) \dots \dots \dots (I)$$

In equation (I), K stands for the capital stock and K_u represents the potential output at full capacity. Profit squeeze theorists assume that capacity utilization rate (Y/K_u) and output-capital ratio (K_u/K) are fixed over the cycle. The arguments of fixed capacity utilization rate (K_u/K), is very doubtful because the short run impacts of demand via capacity utilization (Y/K_u) is not considered over the period. Due to depending on long term technological factors and these factors are remained fixed in the short run, the other assumption, being fixed of capacity utilization rate can be acceptable in the long run analyze. Moreover the link from the demand is established through an income share-weighted consumption function (Goldstein, 1999);

$$C = A + \text{MPCL} + (1 - (\Pi/Y))Y + \text{MPCK}(\Pi/Y)Y \dots \dots \dots (2)$$

$$C/Y = A/Y + \text{MPCL} + (1 - (\Pi/Y)) + \text{MPCK}(\Pi/Y) \dots \dots \dots (3)$$

where C is consumption, MPCL and MPCK are respectively the marginal propensity to consume of labor and capital, (A) is constant and $\text{MPCL} < \text{MPCK}$. Thus this equation (2) implies that (C/Y) declines as (Π/Y) rises.

In analyzing the business cycle, with the linkage capacity utilization (Y/K_u) and (C/Y) as demand factors, under-consumptionists argue that capacity utilization rate (Y/K_u) has a tendency to decline during the mid-late expansion resulted from the investment earlier in the expansion (Goldstein, 1999).

The under-consumption theories do not exactly fit Marx's arguments. First of all, under-consumption theories assert that the "effective demand" works as the limiting factor in accumulation process. However, the profitability, not the effective demand, is the only motivation factor throughout capitalist accumulation in Marxian theory. Moreover, accumulation process internally reduces profitability. Thus declining profitability leads to declining rates of accumulation, rised competition among capitalist, attacking the wages to minimize costs etc. In this manner, under-consumption problem has to be interpreted as a result of accumulation process, rather than a reason. This can be summarized in Marx's words, "the real barrier of capitalist production is capital itself" (Capital vol III.p.250, (from) Shaikh, 1978).

The other important difference between Marxian and under-consumptionist arguments depends on the assumption about the reproduction schema. Under-consumptionist theories assume that all capitalists produce only consumer goods and workers are employed only in consumer goods sector. However, in Marxian theory,

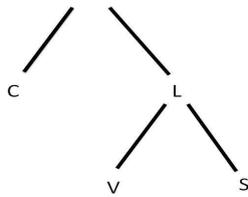
"Workers employed in the consumer and capital goods sector can earn enough to buy the output of consumer goods sector, while capitalists in both the consumer and capital goods sector can spend enough to buy the output of the capital goods sector. So long as capitalists in both the capital and consumer goods sectors are investing, supply and demand can be balanced" (Post, 2008 p.27).

IV. Tendency of Falling Profit Rate and the Limitation of Capitalist Accumulation

This subject is presented in the third volume of Capital, which involves the analysis of reasons and effects of the competition between capitalists in an accumulation process. Besides, many of the Marxian theorists argue that the tendency of falling profit rate is the key to explain the capitalist cycles and crisis (Yaffe, 1973, Maniatis, 2005).

Although Marx explains the tendency of the falling profit rate in the third volume of Capital, there is a strong linkage with the other explanations of Marx. First of all, total labor time for the finished product is a very important concept in explaining the process of the tendency of falling profit rate. The components of total labor time for the finished product are as follows (Shaikh, 1978);

Total Labor Time for the Finished Product



The letters in this demonstration are as follows;

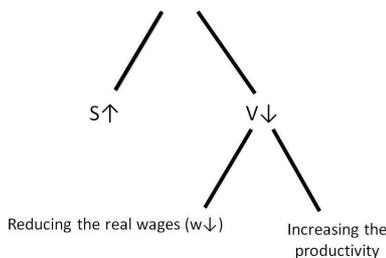
C=Constant capital, the labor time used up in the means production (materials, plant and equipment)

L= Value added by living labor

V= The labor value of the workers' consumption requirements

S = The labor value of surplus product

The conditions of increasing the profit



Hence the real profit and the ratio of the surplus value will be $S=L-V$ and S/V , respectively. Thus, a capitalist expecting to increase the profit has two op-

tions: lengthening the working day which implies the increase of the surplus ($S\uparrow$), and decreasing the necessary labor time ($V\downarrow$). Decreasing the necessary labor time, also, requires either reducing the real wages or increasing the productivity, or both.

Due to the limits of lengthening the working day and reducing the real wages, the only base method to raise surplus is increasing the productivity. Competition among the capitalists forces the capitalist firms to invest in plant and equipment in order to raise productivity. Marx refers this process as the *tendency for the organic composition of capital* and considers this tendency as a major contradiction for accumulation process. In summary, while accumulation keeps going, the constant capital tends to rise (C/V). Hence mechanization or raising *the organic composition of capital* lowers the unit costs.

According to Marxian approach, there are certain laws of motion and countervailing tendencies. Despite the adverse tendencies and laws of motion, "Marx's analysis emphasizes the existence of certain laws of motion that manifest themselves as dominant trends over any possible countervailing (barriers) tendencies (Maniatis, 2005).

Although the Marxian theory of business cycle has generated an enormous body of literature, some Marxian theorists criticized this situation, for example, Ernest Mandel calls this as *mono-causal* explanations (Evans, 2004).

Despite the *mono-causal* explanations of Marxian arguments, there are some study which aggregate some of these mono-causal explanations. David Laibman, in his work; Capitalism as History: A Taxonomy of Crisis Potentials aims to create a framework encompassing these Marxist explanations. He also outlines the Marxian theory with its certain laws of motion and countervailing, or barrier (Laibman, 2000).

As well as the huge theoretical Marxian literature, there are, also, remarkable works on the empirical side of Marxian approach (Shaikh and Tonak, 1994 and Mohun, 2002). This is, at the same time, a necessity for some Marxian theorists. For example Mandel asserts that "...from the standpoint of historical materialism

tendencies which do not manifest themselves materially and empirically are not tendencies at all” (Mandel, 2008, p.42). Similarly Mohun noted that “..... without informed empirical analysis, Marxian theory is of no interest” (Mohun,2002, p.206)

In this study we will present an analysis of structure of profit rate in Turkish manufacturing by employing Weiskopf’s model.

V. Analyzing Profit Rate in Manufacturing Industry

Estimates of profit rates of in Marxian economic literature are usually based on either input output tables or national income accounts (Weiskopf 1979, Wolf 2001, 2003, Moseley 1991 and 1988, Dumeniel and Levy 2002). The literature based on profit rates, also, investigates the economy on aggregate and disaggregate level. In this manner, the analysis of the economy based on profit rate has some obstacles. The most important one of these obstacles is the lack of consistent and official data on this field, including aggregate and disaggregate levels. Especially the capital stock data is essential and has a vital importance to estimate the profit rate. Because of the lack of the consistent official data on capital stocks at the aggregate and disaggregate levels, there is no adequate study analyzing the profit rates in Turkish economy (Memiş, 2007, and Karahanoğulları 2009).

Thus, any researcher working on profit rates, based on national accounts system, has to generate capital stocks data, primarily. In this study we arrange the capital stock data in manufacturing sector between 1950 and 2011.

VI. Measurement of Capital Stock in Turkish Manufacturing Sector

In order to overcome of the data problem, some techniques have been employed to generate capital stock data. One of the most used methods is Organization for Economic Co-operation and Development’s “*perpetual inventory model*”. In our study we will apply this method to compose capital stock data (Ünlü and Saygılı, 2001).

Perpetual inventory model can be expressed as follows;

$$CS = \sum_j j g_j$$

CS= Gross capital stock with constant price

I=Gross capital investment with constant price

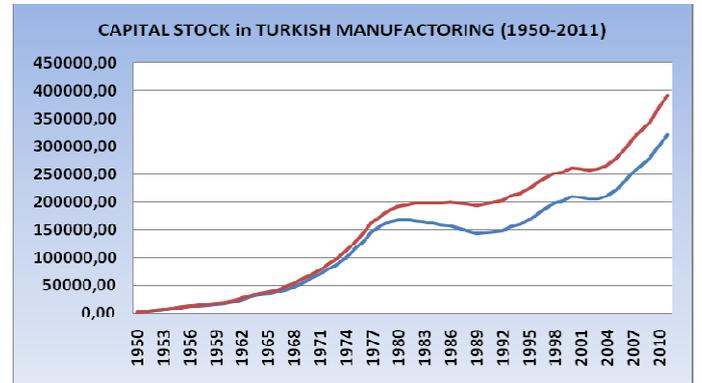
g= The coefficient of maturity period

j=time operator

In this model, “the capital stock for each year is calculated as the sum of investments on different fixed assets, making corrections based on the survival coefficient of the corresponding assets” (Memiş, 2007). Moreover, we took the average maturity period as both nineteen and twenty-six years, similar to Maraşlıoğlu, Tıktık (1991) and Saygılı, Cihan and Yurtoğlu (2002), respectively.

Figure I demonstrate the development of capital stocks manufacturing sector between 1950 and 2011.

FIGURE I



As observed the Graph (I), capital stock generally increases during the base year 1950 and 2011. Also, different assumptions on average maturity period do not change the evolution of the trend. Surprisingly, quantity of accumulation in thirty years including the period 1950 and 1980 is quite equal to following thirty years. In other words, while capital stock increases two fold in the period 1950-1980, the period 1980 and 2010 has the equal quantity.

VII. Measurement of Profit Rate in Turkish Manufacturing Sector

In our estimates, general rates of profits is based on national income accounts. In this method, profit rate is defined as the ratio of profits to capital stock. This definition can be demonstrated as follows;

$$r = \Pi / K$$

where Π is income on capital (or net profits) and K is a measure of capital stock, all expressed in current prices. It can then be decomposed into

$$r = (\Pi / Y)(Y / K)$$

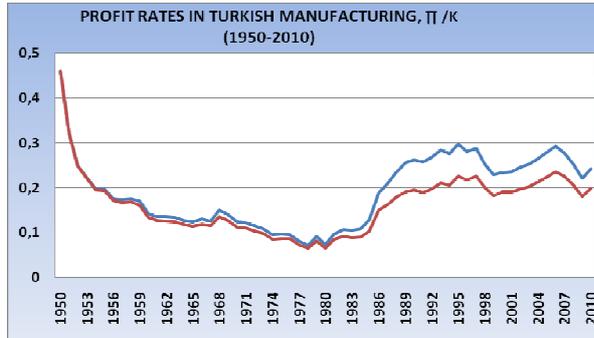
where Y is nominal GDP. Also, (Π / Y) is the share of profits in GDP and this ratio refers to labor exploitation. The other expression is the output-capital ratio, (Y / K) . This can be decomposed into two parts.

$$r = (\Pi / Y)(Y / K_u)(K_u / K)$$

where (K_u) refers to the utilized capital stock. Also, (Π / Y) is the share of profits in GDP and K_u / K is the capacity utilization ratio and (K_u / K) is capacity utilization ratio.

Our estimation of the profit rate in Turkey during the period 1950-2008 is displayed in Figure II.

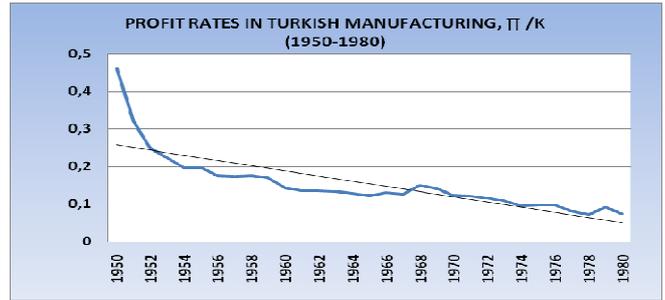
FIGURE II



An important aspect that we gain from our study is about the long-wave of profit rates in manufacturing sector. Although there is lack of data for empirical proof, such an approximately 45 year cycle is observed in profit rates. It is clearly concluded from graph that in the first thirty year of phase of contraction the profit rates decline smoothly while in the second fifteen year they tend to rise. Taking into account the fact of technological achievement, liberalisation processes and political regime shifts. It might be identified as an

evidence showing the depression phase of long wave before 1980 and the recovery phase of long wave after 1980. The graph (GRAPH III) shows the contraction phase of profit rate cycle.

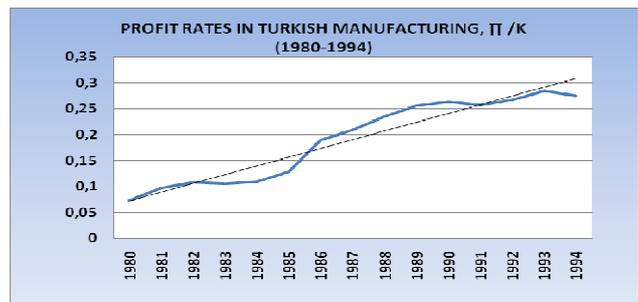
FIGURE III



In the first subperiod, decrease in the profit rate is around 17 %. The other country examples in this field has quite similar results with our study. For example; Spain profit rate cyclical evolution has the same tendency. In Spain the profit rate cycle decreases 17.6 % from its peak level to its lowest level in the subperiod 1963-1979 (Izquierdo, 2005). The other example can be given from the Greek economy where the profit rate decreases around 14% at the period 1958-1980 (Maniatis, 2004).

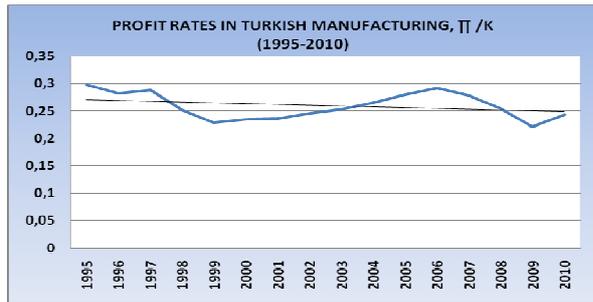
Profit rate rises from 7 % to 29 % between 1980-1995 in Turkish manufacturing sector. The difference which means the increase in the profit rate is 22 % . While the profit cycle evolution in this period is roughly the same with Spanish economy, profit rate keeps on decreasing in Greek economy (Izquierdo, 2005 and Maniatis, 2004). This phase is shown as follows;

FIGURE IV



In the period between 1994-2010 crisis took place all over the world with the effect of financial liberalization. In this manner, Asian crisis in 1997, Russian crisis in 1998 and global crisis in 2008 have important effects on Turkish economy. Moreover, some policy application in the fast capital account liberalization without fiscal adjustment caused the economic crisis in Turkish economy in 1994. Alongside the financial liberalization and misapplication of economic policy, some other political and natural events such as Gulf Crisis in 1990 and Iraq War in 1991 and earthquake in 1999 affected the Turkish economy deeply. However, profit rates appear to be relatively stable at around 5% level in the period between 1994-2010 as it is shown as follows.

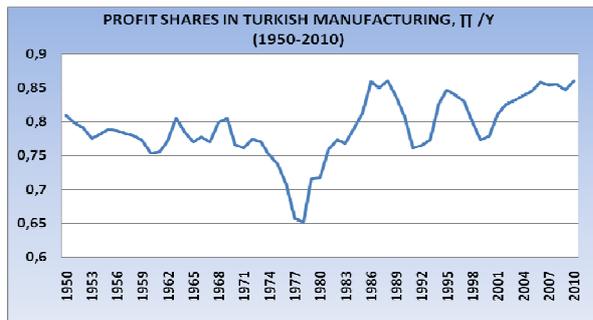
FIGURE V



IX. Components of Profit Rate in Turkish Manufacturing Sector

The Π/Y component of profit rate, which is the share of profit in GDP, indirectly externalizes the labor exploitation. While in the literature this rate is handled as profits in GDP or profits in value added, we use it as the share of profits in GDP in our study. In the following graph one can observe the trend of profit share.

FIGURE VI



The profit share indicator has been demonstrated in Figure III. As the graph clearly shows, share of profits has three sharp slumps in the period 1970-1980. Due to the intensification workers movement during 1970s, profit share declines sharply until military intervention in 1980. As it is shown on the graph there is considerable increase in profit share after 1980s. Similarly, the other decline begins in 1989 because of raising class struggle, called as “spring actions”. Moreover, another decreasing path at the late of 1990s can be identified as the result of political disturbances and the earthquake in 1999.

Although in some studies on business cycle the other components of profit rate, (Y/K_u) and (K_u/K) , is fixed over the cycle due to its dependence on the long run technological factors, in this study, we use these ratios to analyze its effects. However, capacity utilization ratios data is available only for after 1978. Thus we use this data only for the period between 1978-2010.

FIGURE VII

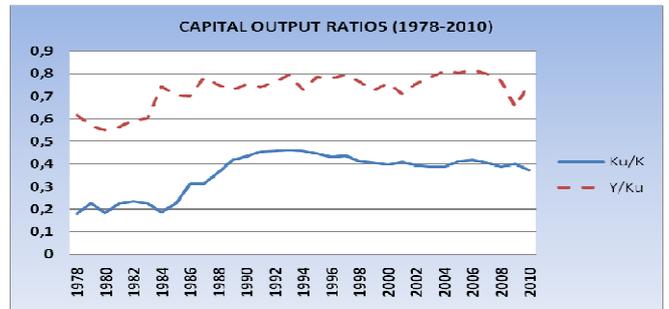
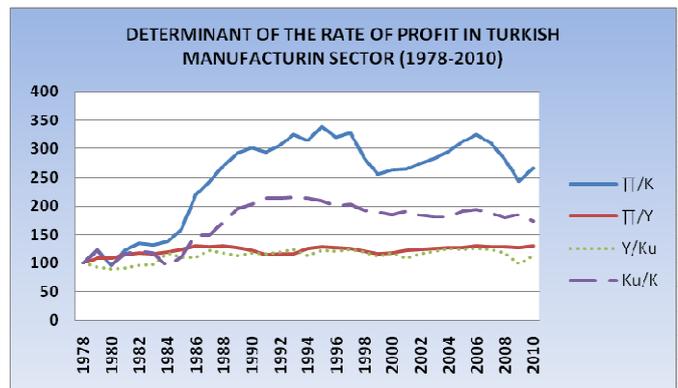


FIGURE IIX



It can be seen that during the period, fluctuations in the rate of profit in the Turkish manufacturing sector closely follows the capacity-capital ratio (K_u/K).

Actually in each cycle, by definition, profit rate has an expansion phase and it begins to fall in the late stages of its expansion phase. Marxian business cycle literature has different explanations of this fall of profit rates. In this manner, Erdoğan Bakır and Al Campbell (2006) have clustered these explanations. In their cluster; rising organic composition variant suggests changes in the capacity capital ratio K_u/K will be dominant; rising strength of labor variant suggests changes in the profit share Π/Y will be dominant and realization failure variant suggests changes in the capacity utilization factor Y/K_u will be dominant in the fall of profit rate² (Bakır and Campbell 2006).

In our analysis, capacity utilization factor (Y/K_u) is dominant in the phase II and IV. Profit share (Π/Y) is dominant in the phase I and capacity-capital (K_u/K) factor is dominant in the phase II. Also, in the phase IV, all factors have just about equal effect on decline of profit rate. However capacity capital (K_u/K) ratio is dominant only in the phase II. This ratio has very big impact on each phase of decline in profit rate cycle, except the phase II³.

TABLE I

Rates of Growth of Profit Rates and its Component: Phase of Decline in Each Cycle (%)

	I	II	III	IV	V
R	-0.02324	-0.03173	-0.055	-0.23232	-0.276
Π/Y	-0.05634	0.066676	-0.00824	-0.07088	-0.01347
Y/K_u	-0.01609	-0.08793	-0.00766	-0.09229	-0.22314
K_u/K	0.049178	-0.01048	-0.0391	-0.06915	-0.03938

² While Bakır and Campbell analysis the cycle which the output expand and profit rate begins to fall, we only consider the decline of profit rate.

³ Phase of decline in each cycle are 1991, 1994, 1996, 1998-1999, and 2007-2009.

As it is specified before, the profit share, (Π/Y), reflects the effects of distribution between capital and labor on the profit rate, whereas capital productivity, (Y/K) and its component (Y/K_u), (K_u/K) reflect the effect of technology. In this manner, it could be argued that capital productivity is the main determinant of profit rate in Turkish manufacturing sector.

IX. Conclusion

There are several Marxian approaches to explain the mode of capitalist production. However, despite of a huge literature, majority of them emphasized only one aspect of Marx's approach in explaining the mode of production. All these *mono-causal* explanations of Marxian arguments are inadequate to explain the whole economic evolution.

Empirical analysis in Marxist theory has two ways to analyze the economy which is based on either input output tables and national income accounts. However both technics has some obstructions. The lack of data is the biggest obstructions of using Marxian tools.

In our analysis, first of all we generated the capital stock data by using "*perpetual inventory model*". After going beyond the data problem, we obtained profit rate data. When we investigate the profit rates during the period between 1950-2008, we concluded two subperiod which consist of period 1950-1980 and 1980-2008.

Moreover we applied profit rate data in Weiskopf's decomposition method. Profit rates and its components have handled in our analysis of the Turkish manufacturing sector. The important finding of our study is about the long-wave in Turkish manufacturing sector. Although there is insufficient data in order to prove the existence of such a forty-five year cycle in profit rates empirically, it is clearly observed from the related graphs that profit rates decline smoothly in the first thirty years phase of contraction, while in the second fifteen years phase they have a tendency to rise.

Another important finding is that the capital productivity and exogenous mechanisms are the main determinants of profit rate in Turkish manufacturing

sector. In other words, exogenous shocks lead to decrease in capital productivity that causes the fall of profit rates in Turkish manufacturing sector.

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