ERF WORKING PAPER SERIES

THE EFFECT OF DISTRIBUTION ON ACCUMULATION, CAPACITY UTILIZATION AND EMPLOYMENT: TESTING THE WAGE-LED HYPOTHESIS FOR TURKEY

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Working Paper 0130

As of August 1998, financial support towards the ERF Working Papers Series from the Commission of the European Communities (through the FEMISE Program) is gratefully acknowledged. The views expressed in the Working Papers are those of the authors and do not necessarily reflect the views of the European Commission.

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Abstract.

This paper analyzes the impact of distribution on accumulation, capacity utilization and employment for Turkey by estimating a post-Keynesian open economy model in a structural vector autoregression form. The need for empirical analysis of the relationship between distribution and growth is particularly pronounced in the case of developing countries, where the pro-capital income policies of structural adjustment programs implemented in the last two decades is still far from fulfilling their promises in many cases. The aim of the paper is, to evaluate whether accumulation and employment are wage-led or profit-led. The results point out that accumulation, growth and employment are wage-led in Turkey.

1. Introduction

The impact of distribution on growth, accumulation and employment continues to be the focus of an ongoing debate within the discipline of macroeconomics. Does a pro-capital redistribution of income stimulate growth, accumulation and consequently employment? Post-Keynesian macroeconomics answers this question by pointing out the dual function of wages as a component of aggregate demand, as well as a cost item. Depending on the relative magnitude of these dual effects, Marglin and Bhaduri (1990) distinguish between profit-led and wage-led regimes, where the latter leads to a low rate of accumulation accompanied by a high profit share. This is a more general formulation of earlier neo-Kaleckian models analyzing the impact of distribution on growth by Rowthorn (1982), Dutt (1984), Taylor (1985) and Blecker (1989). However, the theoretical debate in the post-Keynesian tradition still needs to be supplemented by empirical research.

The lack of empirical research about the relationship between distribution and growth is even more pronounced in the case of developing countries, where the pro-capital incomes policies of structural adjustment programs implemented in the last two decades still have not brought much more than misery in many cases. This paper presents an empirical analysis of the impact of distribution on accumulation, capacity utilization and employment for the case of Turkey. Turkey, who has been a strict follower of the standard recipes of IMF and the World Bank, is an interesting case to illustrate the unexpected results in terms of accumulation and employment. The stylized facts of the country point out the inability of high profits to stimulate investments and employment.

The aim of the paper is, first, to evaluate whether accumulation and employment are wage-led or profit-led in Turkey. This is done by means of a post-Keynesian open economy model in a structural vector autoregression (SVAR) form. This estimation, which is a novel application within the post-Keynesian literature, is, implicitly, the second aim of the paper.

The paper is structured as follows: Ssection two summarizes the model to be estimated. Section three discusses the method of estimation. Section four focuses on data problems, and Ssection five presents the stylized facts about distribution, accumulation, capacity utilization and employment in Turkey. Section six specifies the model to be estimated, and Ssection seven discusses the results of the SVAR estimation based on this specification. Finally, Ssection eight derives the conclusions.

2. The Model

The model presented here is a post-Keynesian open economy model, based on Bhaduri and Marglin (1990). It consists of behavioral functions for investments, savings, and international trade defining the goods market; the producer's equilibrium curve, which relates capacity utilization and labor market pressures to the distribution of income; and as well as an employment equation. For the sake of simplicity, the public sector is left out of analysis .

The goods market part of the model is similar to that in Bhaduri and Marglin (1990). The two important extensions of the model presented here are employment and its effect on income distribution. Firstly, producer's equilibrium, that is income distribution, is determined not only by the pricing behavior of firms, but also by a reserve army effect, reflecting the bargaining power of the workers. Secondly, employment is explicitly modeled by a version of Okun's Law, as it is introduced by Stockhammer (2000b and 2000c). These two extensions incorporates the labor market into the analysis, allowing an interaction between distribution, accumulation, capacity utilization and employment, rather than implicitly defining labor demand as a passive outcome of the system. The table below presents a summary of the model.

Accumulation	$I/K=g^I(\pi, z)$ $+ \ +$	(1)
Private savings	$S_p/K=s\pi z$	(2)
Exports	$X/Y=x(\pi)$ $+$	(3)
Imports	$M/Y=m(\pi, z, I/K)$ $- \ + \ +$	(4)
Producer's equilibrium	$\pi=p(z, E/N)$ $+ \ -$	(5)
Employment (Okun's Law)	$\Delta E/N=e(I/K, \Delta z)$ $+ \ +$	(6)
Goods market equilibrium	$g^I=g^{St} \equiv s\pi z - (X/Y - M/Y)z$	(7a)
Capacity utilization implied by the goods market equilibrium	$z=z(\pi, I/K, (X/Y - M/Y))$ $- \ + \ +$	(7b)

Where: I/K=investment/capital stock; p=profit share; z=capacity utilization proxied by output/capital ratio (Y/K); Sp/K=Private savings/capital stock; s=marginal propensity to save out of profits; X/Y=Exports/output ; M/Y=Imports/output; E/N=employment rate (employment/working age population); gSt=growth rate of total savings (private and foreign).

Equation (1) defines the investment decision of private firms, such that the rate of accumulation (investment/capital stock) is a function of expected profitability,

which is proxied by profit share and capacity utilization[1]. Both capacity utilization and profit share are expected to have a positive effect on investment, other things being constant. This function separates the demand side effect of wages on investment from the cost effect, making the end result of a change in distribution ambiguous.

Equation (2) models private saving behavior, such that private domestic savings normalized by the capital stock is a positive function of profit share and capacity utilization. For simplification it is assumed that a constant fraction, s, of profit income is saved, whereas there is no saving out of wages.

Equation (3) and (4) incorporate international trade to the model by defining export intensity of production (exports/output) as a positive function of profit share; and import penetration (imports/output) as a negative function of profit share and a positive function of the level of domestic activity, which is determined by the rate of accumulation and capacity utilization, which are determined together. The profit share is taken as an indicator of competitiveness, in order to simplify the model[2].

Equation (5) represents the supply-side of the model, defining the producers equilibrium, such that profit share is a positive function of the rate of capacity utilization and a negative function of the rate of employment. The former is in common with the model in Marglin and Bhaduri (1990), and is derived from the assumption that firms use a mark-up over unit labor costs to set prices, and that the mark-up varies pro-cyclically with the rate of capacity utilization. The latter, that is the effect of employment rate represents the reserve army effect in a Marxist framework. This is an extension to the basic Marglin and Bhaduri model because it allows labor market outcomes to have a genuine feed back in distributional struggle. Marglin and Bhaduri (1990) like Bowles and Boyer (1995) assumed that employment moves in parallel with capacity utilization. Thus the modification of the producers' equilibrium only becomes important in conjunction with our different view of the labor market.

The labor market is portrayed by Equation (6). Different from Bhaduri and Marglin (1990), this equation defines the change in the rate of employment as a positive function of accumulation and the changes in capacity utilization, which is a variation of Okun's Law separating out the impact of accumulation and capacity utilization on employment rate. Bhaduri and Marglin (1990) take the short term view that employment depends on capacity utilization. Since we are interested in a medium term model, the creation of capacity, as well as capacity utilization will determine employment. Empirically this is an important point: Turkey witnessed the stagnation of employment in spite of high levels of capacity utilization[3].

Finally, equation (7a) represents the goods market equilibrium, where the growth rate of private capital stock equals the growth rate of total savings, where $s\pi z$ is the private domestic savings, and $-NX/Y.z = -(X/Y-M/Y).z$ is foreign savings, both normalized by the capital stock[4].

Solving equation (7a) for z gives the capacity utilization rate implied by the goods market equilibrium. Equation (7b) separates the relative impact of accumulation, distribution, and net foreign demand on capacity utilization rate. Accumulation is expected to have an immediate positive effect on capacity utilization, via increased demand, which dominates a negative effect via increased capital stock. An increase in the profit share, other things being constant, is expected to have a negative impact assuming that the propensity to consume out of profits is lower than that out of wages. An increase in net exports is expected to have a positive impact. Equation (7b) will substitute the goods market equilibrium condition in the SVAR analysis, which is discussed in Section six.

The final outcome about the relationship between capacity utilization and profit share distinguishes two types of growth regimes, namely stagnationist and exhilirationist. A stagnationist regime is defined as a regime where a lower profit share is associated with a higher level of capacity utilization. In contrast, when a higher profit share goes along with a higher capacity utilization the growth regime is defined as exhilarationist. The relationship between capacity utilization and profit share is ambiguous depending on the relative magnitudes of the domestic and international demand effects.

[1] By using the profit share rather than the profit rate as the measure of profitability in the investment function along with the rate of capacity utilization, Bhaduri and Marglin (1990) presents a more general formulation that includes the earlier stagnationist, neo-Kaleckian models as special cases.

[2] Bowles and Boyer (1995) use the profit rate as an indicator of international competitiveness. Thus prices are not modeled explicitly assuming that international prices are given. As the profit share is affected by unit labor costs, which is conventionally taken as an indicator of competitiveness, it can be assumed that profit share and exports will be positively related. However, an increase in the profit share caused by an increase in the mark-up would certainly not be an indicator of improved competitiveness. Yet, since it is widely argued that the stagnationist impact of a redistribution of income at the expense of wage earners is moderated in open economies via increased export competitiveness, estimating export performance as a function of distribution makes sense in a model relating accumulation, distribution, capacity utilization and employment. Nevertheless, the impact of distribution on import demand is ambiguous since a rise in the profit share might also have an additional impact of increasing the demand for imported consumption goods. Additionally, the real exchange rate, which is also effected by international capital flows and policy decisions of the public sector, is an important component of international competitiveness. Bearing these problems in mind, we proceed with our simple assumption.

[3] Bowles and Boyer (1995) differentiate between aggregate demand and aggregate employment regimes, but in their model, the rate of employment is taken as an indicator of capacity utilization, assuming a one-to-one and unchanging relationship between the two.

[4] In the empirical estimations, public savings are assumed to be captured by the constant term.

Finally, the relationship between accumulation and the profit share defines the regime of accumulation, such that when a higher rate of accumulation accompanies a lower profit share, the regime is defined as wage-led, and the opposite case is defined as profit-led. Depending on the relative magnitudes of the direct positive effect of profit share on accumulation (the partial derivative $\partial g^I/\partial \pi$) and its indirect effect via the positive international demand effect ($\partial g^I/\partial z \,.\, \partial z/\partial nx \,.\, \partial nx/\partial \pi$)[5] and the negative domestic consumption effect ($\partial g^I/\partial z.\, \partial z/\partial \pi$), the sign of the total derivative, $dg^I/d\pi$, is either positive or negative. If the direct profit effect and the international demand effect of a lower wage share is high enough to offset the decline in domestic consumption, then accumulation is profit-led, and otherwise it is wage-led[6].

So far the model has been presented without considering the dynamic structure. Following the discussion of the method of estimation in section three, we will discuss the data problems associated with estimating the model in section four, and section six will be devoted to the specification of the contemporaneous and inter-temporal relationships within the system.

3. Method of Estimation and Review of Previous Empirical Work

The significant theoretical contributions in the literature about wage-led vs. profit-led regimes of accumulation and growth has only slowly attracted empirical work. Bowles and Boyer (1995) estimate a similar model to the one presented here for advanced capitalist countries, and analyze the relative magnitudes of partial elasticities by means of a single equation approach for each component of the model, where the variables interact only through lags and contemporaneous interaction cannot be observed. Their analysis point out at a lower possibility of wage-led regimes once international trade is accounted for. Gordon (1995a and 1995b) analyzes the relationship between distribution, capacity utilization and investment by means of a single equation approach based on a "social structuralist" macro-model, as well as an atheoretical VAR model. Bhaskar and Glyn (1995) focus only on the response of investment to profit share and capacity utilization. Stockhammer (2000a) presents separate estimations for accumulation and employment for advanced capitalist countries. These studies support the argument that the relationship between distribution and accumulation and growth is an empirical question, varying among countries and among periods.

The major shortcoming of this literature, from a methodological point of view, is that the issue of simultaneity is not addressed. All the works quoted above use a single equation approach with lagged explanatory variables. While such an approach has its own merits, it fails to represent the system aspect that is crucial to the theoretical model.

In the case of developing countries, the need for applying post-Keynesian models is even more pronounced, given their experience throughout the structural adjustment episode, which raise significant questions that are central to the analytical model[7]. The main target of the orthodox structural adjustment programs that have been implemented in most developing countries starting from the late 1970s and 1980s onwards, was to manage the integration of the country to the global economy, shifting the source of effective demand from the home market to the foreign market. The income policy and a re-regulation of the labor market to achieve a pro-capital redistribution have been major components of this process, with the promise that greater openness and higher profits will stimulate growth, accumulation and consequently employment parallel with an export-oriented growth strategy. However, after years of implementing orthodox structural adjustment programs, many developing countries ended up being trapped in a vicious cycle of high profit shares accompanied by low accumulation rates and stagnant growth in employment, in spite of a massive increase in exports and ever higher degrees of flexibility in the labor market. Yentürk (1998) analyzes the relationship between profitability and investments for tradable and nontradable sectors, and Yentürk and Onaran (2001) analyze the response of investment to demand and profitability for Turkey, and provide evidence for a wage-led accumulation pattern. Sarkar (1992) questions the empirical validity of the stagnationist thesis for India, but does not present a formal test. Furthermore, these studies do not develop a complete macroeconometric analysis of the overall interaction between distribution, demand, accumulation and employment.

The main motivation behind this study is to model the dynamic relationship between distribution, accumulation, capacity utilization and employment considering both lagged and contemporaneous interactions within a systems approach, that goes beyond the limited framework of comparative statics. Consequently we employ a structural vector autoregression (SVAR) analysis.

The general form of a vector autoregression (VAR) model is:

$$B.y(t) = Dd(t) + A(i)y(t-i) + e(t) \qquad (8)$$

where y is a vector of variables, i=1,…,p denotes the number of lags to be used in the model, d(t) is a vector of deterministic variables, which may include a time trend as well as a constant. The $e_j(t)$'s are i.i.d. N(0, I) innovations. The matrix B

[5] $\partial nx/\partial \pi = \partial x/\partial \pi - \partial m/\partial \pi$

[6] See Bhaduri and Marglin (1990), Blecker (1989 and 1999), and Bowles and Boyer (1995) for an analytical discussion about the wage-led and profit-led regimes in open economies.

[7] See Taylor (1988), Amsden and Hoeven (1995), Akyüz (1995), Toye (1995), Boratav et al (1996) and Amadeo (1996) for a review of the growth patterns in developing countries during the implementation of structural adjustment policies.

represents the contemporaneous interaction among the variables. This general form cannot be estimated, since the matrix B is not known. Thus the form in which the VAR is in fact estimated is:

$$y(t) = B^{-1}Dd(t) + B^{-1}A(i)y(t-i) + u(t) \quad (9)$$

This formulation can readily be estimated, since it only relies on lagged values as explanatory variables. Intuitively, each variable is assumed to depend on lagged values of all other variables in the system. When referring to a VAR estimation in the empirical section below, we refer to an estimation of equation (9). It is crucial to note that in equation (9) contemporaneous interactions among variables are suppressed and surface in the properties of the error term.

The vector u(t) of the reduced form errors is related to the vector e(t) of innovations by the following system of structural equations:

$$u(t) = B^{-1}e(t) \quad (10)$$

$u_j(t)$ are assumed to have zero mean, constant variances, and are serially uncorrelated, but because of the matrix B^{-1} there has to be contemporaneous correlation between innovations.

The structure of matrix B distinguishes between two types of VAR models: standard VAR and structural VAR. In standard, nonstructural VAR, B^{-1} is a lower triangular matrix, according to the so-called standard Choleski decomposition (Sims, 1980). In structural VAR (SVAR), B is specified on the basis of economic theory, where without loss of generality the diagonal elements of B can be normalized to unity (Bernanke, 1986; Sims, 1986). The specification of B corresponds to specifying the zero off-diagonal elements[8]. The structural parameters are estimated by maximum likelihood.

SVAR allows for a richer model of interaction because it does not impose restrictions on the contemporaneous interaction between the variables by imposing a triangular structure on the covariance matrix of the error terms. Standard VARs are a special case of SVAR.

An alternative estimation technique could be to develop a system of simultaneous equations. However this comes together with the problem of defining proper instrumental variables to deal with endogeneity, and mostly ends up with using simply the lagged values of the endogenous variables. SVAR is superior in the sense that it not only encounters the lagged relationship, but also incorporates the contemporaneous interaction between the variables.

[8] The number of moment restrictions is equal to the number of nonzero parameters in B^{-1}. But even if the number of free parameters equals the number of nonzero elements of the matrix B^{-1}, identification is not guaranteed, due to the existence of simultaneity in the system.

Some more comments on VAR models are in place here. First, because of the systems approach, exogenous shift variables do have little meaning in VARs unless they have strong effect. In our case variables that are relevant to investment decisions such as the rate of return in financial markets, risk factors, cost of capital goods, and the real exchange rate to reflect the changes in the price competitiveness could be some of the exogenous variables to be included. However, since our focus is on the interaction of the endogenous variables, we do not include exogenous variables.

Second, VAR analysis is a systems approach. It traces effects through an entire system rather than looking at one equation at a time. Since VARs involve lagged values of all dependent variables, multicollinearity problems are inevitable. Therefore inference in a VAR model does not focus on t-values and their significance, but on impulse response functions. Impulse functions trace the dynamic impact of a shock to one of the variables on all other variables in the system.

4. The Data

This section concentrates on the data problems involved in testing the model outlined in Section 2. We will deal with problems arising from lack of proper data for certain variables, as well as choosing the best way of measuring some others. The definitions of variables and data sources are in Appendix A.

One major problem is the absence of data for capital stock in the national statistical sources. Therefore the analysis is made by using the ratio of private investment to GDP[9]. Consequently, growth rate of GDP is used as a proxy for capacity utilization instead of the output/capital ratio. In order to check for robustness, the ratio of GDP to potential GDP is also used. Potential GDP is estimated as a function of a constant term and a time trend. However, there are serious critiques about the concept of a "potential GDP", as well as the method to estimate it. Therefore, we will base our analysis on the results using GDP growth rate[10].

Another data restriction is related to two problems regarding the measurement of employment. Firstly, given the quite different nature of unpaid family worker

[9] Penn World Tables by International Comparisons Projects provide data about capital stock. But comparing the net change in capital stock (after depreciation) with the investment figures available in national data sources in terms of trend and correlations points out serious differences in the measurement of investment variable in this database. Yet, in order to check for robustness, the initial year of capital/ output ratio in Penn World Tables was used as a benchmark to construct the capital stock series. The main results of the estimations are quite robust to the use of rate of accumulation as opposed to investment/GDP ratio. Nevertheless, we prefer to base our analysis with the existing data on investment/GDP; the results of various other specifications are available upon request.

[10] The estimation results are robust to the use of gap as the measure of capacity utilization. The results are available upon request.

status and the significance of underemployment in the agricultural sector, particularly for the female labor force, as well as the male, we exclude the agricultural sector from our analysis. Secondly, the employment variable is defined as the rate of employment in the theoretical model, in order to capture the labor market pressure on profits via the reserve army effect, as well as to reflect the employment creation capacity of the economy. In this sense the share of employment in the total working age population in the non-agricultural sector is the appropriate variable, rather than the share of employment in the labor force, which is simply 1-unemployment rate. Taking the labor force as the denominator limits the pressure exerted on the bargaining power of labor to people, who are only actively looking for work. This ignors a significant portion of the population who are non-employed, but are not looking for a job actively either because they are discouraged or involved in non-market work. The distinction between non-employment and unemployment is particularly important in developing countries with declining levels of participation rates particularly for female working age population, following increased rates of urbanization. However, measuring the potential labor supply for the non-agricultural sector is a non-trivial problem. Although agricultural employment is almost totally a rural occupation, the opposite is not true. Almost 20 percent of non-agricultural employees reside in rural areas. Therefore the denominator cannot be limited to urban population. The alternative of using the whole working age population to measure the potential work force creates an additional problem. The ratio of non-agricultural employment to total working age population also reflects the sectoral transformation of employment from agriculture to industry. As a result, we use non-agricultural employment in level (in logarithms), abstracting from the demographic trends about the changes in the working age population, as well as the sectoral changes in employment. While the level of employment is not as good a measure of the labor market pressure as the employment rate, it can be a better measure to evaluate the employment creation capacity of the economy.

Parallel to our choice about measuring employment on the basis of non-agricultural employment, investment, profit share, growth and exports are also adjusted to exclude the agricultural sector. It is not possible to exclude imports of agricultural goods due to data limitations, however the share of agricultural imports in total imports is negligible.

Except for the logarithm of employment, our variables are already defined in ratios; and intuitively it is unlikely that these variables exhibit a unit root. Also since VAR is by nature an autoregressive distributed lag model (ADL), which has desirable properties even in the face of unit roots, spurious correlations between unit root variables are prevented.

5. Stylized Facts

Turkey experienced a major structural change in 1980 by shifting from an import substituting industrialization strategy to an export-led growth model via implementing an orthodox structural adjustment program, as it was typically prescribed by the IMF and the World Bank.

The period of import substitution was marked by the necessity of creating a mass-consumption market for national production under a protectionist trade regime. Given the improvements in productivity, wages could play the role of sustaining the level of effective demand while profits could also preserve a certain level high enough to maintain the level of investments. However, this inter-class consensus reached its limits slowly, when productivity increases slowed down, and current account deficits and industrial investments became increasingly harder to sustain.

In the years succeeding 1980, Turkey tried to overcome the severe foreign exchange crisis of 1977-79 through an export-led growth strategy based on a structural adjustment program[11]. The beginning of the period was characterized by a severe repression of labor rights, accompanied by a military coup and the new institutional setting was retained by the consequent civil administrations. Export oriented trade policies, import liberalization and deregulation of financial and product markets necessitated upward adjustments particularly in the prices of foreign exchange, energy and industrial goods. The change in the distribution of income at the expense of labor has made the adjustment of the capital to the consequences of the new trade regime possible without any deterioration in profitability.

The liberalization of capital movements marked the starting point of another phase of structural adjustment in 1989, which prepared the ground for real wage increases via increased public spending and an appreciated domestic currency, which led to a decline in non-labor input costs. However these unsustainable fiscal and monetary policies soon led to a significant increase in the twin deficits. When this process was interrupted by a severe crisis in 1994, the stabilization in the economy was again maintained through real wage declines, leading to an erosion in the real wage gains of the post-1989 period.

The "success" of the export led industrialization policy borrowed itself mainly to a shift of industrial capacity towards international markets via a significant contraction of real wages, excessive export subsidies and real devaluations. This strategy of export promotion proved to be unable to stimulate new productive investments in industry.

[11] See Şenses (1989), Boratav et al (1994), Yeldan (1995), Yentürk (1997), Onaran (1999), Yentürk and Onaran (2000), Metin-Özcan, Voyvoda and Yeldan (2000) for a discussion of the dynamics of macroeconomic adjustment in Turkey.

Table 1 shows the average figures for two sub-periods, namely 1965-79 and 1980-97. These figures point out some of the important issues that need to be addressed in terms of the links between distribution, accumulation and employment.

The share of profits in GDP increased from its level of 68.5 percent in the 1965-79 period, to 71.8 percent in the 1980-97 period, whereas the ratio of private investments to GDP in the non-agricultural sector declined from 18.5 percent to 17.7 percent. Average investment/GDP ratio in the non-agricultural sector was still as high as 19.4 percent during the crisis period of 1977-79, and after the sharp decline in the post-1980 period, investment ratio could reach the historically high levels of the import-substituting period only in the mid-1990s. The low and volatile investment ratios after years of implementation of structural adjustment policies in the post-1980 period are striking, given the substantial increases in profitability and major improvements in exports.

In the meantime, exports literally boomed in the post 1980 period with the ratio of exports of non-agricultural goods and services to GDP (non-agricultural) increasing from 3.3 percent in the 1965-79 period, to 16 percent during 1980-97. Imports also doubled in the same period. Consequently, on average the trade deficit as a ratio to GDP (net exports of goods and services/non-agricultural GDP) only declined from 7.8 percent to 6.9 percent.

In spite of the improvement in export performance, the average annual growth rate of non-agricultural GDP in the 1980-97 period was lower with a rate of 5.3 percent compared to a growth rate of 6.1 percent for the 1965-79 period. More importantly, the variation of growth rate is much higher in the post-1980 period, indicating problems in sustaining high growth rates for long periods. The average annual growth rate of non-agricultural employment has dropped even more steeply from a level of 4.8 percent in the 1965-79 period to 2.8 percent as of 1980-97.

The stylized facts provide important evidence that point out the likelihood of a wage-led regime. Investments have been stagnant in spite of rising profit share. The export boom has not been enough to carry the growth rates to higher levels compared with the import-substituting period. These facts highlight the demand aspect of wages. Finally the stagnation in accumulation can be an important factor behind the slow down in employment growth rates in a period of drastic declines in real wages and increased flexibility in the labor market during the1980s. Based on this evidence, there are three main questions that need to be addressed by the empirical analysis: What is the relative responsiveness of accumulation to distribution and growth? What is the impact of distribution on growth? How does the pro-capital redistribution effect employment?

6. Specification of the SVAR Model

Defining a SVAR model is a matter of specifying the contemporaneous relations between the variables, namely the B matrix. According to the theoretical model in Section 2, our matrix of endogenous variables, y, and the B matrix are defined as follows:

$$y = \begin{vmatrix} I/Y \\ \pi \\ X/Y \\ M/Y \\ z \\ E \end{vmatrix}; \qquad B = \begin{vmatrix} b_{11} & 0 & 0 & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 & b_{25} & b_{26} \\ 0 & b_{32} & b_{33} & 0 & 0 & 0 \\ 0 & b_{42} & 0 & b_{44} & b_{45} & 0 \\ b_{51} & b_{52} & b_{53} & 0 & b_{55} & 0 \\ 0 & 0 & 0 & 0 & b_{65} & b_{66} \end{vmatrix} \qquad (11)$$

with the expected signs being $b_{25}, b_{32}, b_{45}, b_{51}, b_{53}, b_{65}>0$; $b_{26}, b_{42}, b_{52}<0$. All the diagonal elements are positive by definition. Note that the zeros in the B matrix depict no contemporaneous interaction, but the lagged interaction between the variables will still be at work.

We assume that investment decisions respond both to profit share and capacity utilization with a lag, considering the time lag between investment decision and the expenditure. Also since our capacity utilization variable is the growth rate, imports are only a function of z, not of I/Y. The same is also true for the employment equation. In addition, employment variable (in logarithm) has to be introduced in difference form in the employment equation, whereas it has to be used in level form in the profit share equation in order to reflect the labor market pressures. Nevertheless, autoregressive distributed lag (ADL) specification of the VAR model is expected to make the necessary transformations, if the employment equation has to be specified in difference form. Finally, the equation for the contemporaneous interactions for z does not include imports. This equation reflects the components of demand, and the effect of imports is assumed to be captured via profit share, which is one of the determinants of imports. This modification has the additional advantage of decreasing the computational complexity by way of decreasing the number of simultaneous interactions in the system. Without imposing this restriction, the model was unsolvable.

The model includes two lags to control for the problems that might arise from autocorrelation and non-stationarities in the time series. VARs give consistent results even in the presence of unit roots (Sims, Stock and Watson, 1990) if more than one lag is employed. The employment of a higher number of lags is not considered because it will not add much in the case of annual data, and also it will further reduce the already low degrees of freedom due to the lack of sufficiently long time series data.

Consistent with the aim of the paper, which is to analyze the impact of distribution on accumulation, capacity utilization and employment, our main focus will be on the responses of investment, growth and employment to a one-time shock -an innovation- to the profit share. The impulse response functions offer an advantage in interpreting results within a systems approach. The response of a variable to an innovation to another variable in the system is not equivalent to the partial derivatives that are the outcomes of standard regression models. Different from comparative statics, the response to an innovation incorporates the combined response of the variable to all the changes created in the system following a shock to one of the variables. VAR models also help to trace the interaction through a time period.

7. Estimation Results

This section first discusses some key findings of the simple VAR results, then presents the SVAR estimations based on the contemporaneous interactions as defined in Section six, with some further modifications, and finally analyzes the impulse response functions.

The VAR results of OLS estimations are presented in Appendix B. VAR estimations, in general, tend to suffer from multicollinearity problems that lead to low t-statistics. This is why impulse responses are of particular interest. In our case, the VAR results are consistent with the model at acceptable levels of statistical significance.

According to VAR results, the accelerator term in the accumulation function is confirmed. Both the first and second lags of growth are significantly positive. The profit term is also statistically significant and positive, and the results suggest that it enters the accumulation equation in difference form.

The first lag of employment enters the profit function with a negative sign and is statistically significant, confirming the reserve army hypothesis. Growth also has the expected positive sign, indicating the pro-cyclical behavior of profit share.

There is a high degree of persistence in the employment function, though less than perfect persistence, with the coefficients of the lagged employment variables summing up to 0.82. The ADL structure has converted employment almost into difference form, consistent with Okun's law.

The greatest problems clearly are with the growth function, such that the lagged values of the components of demand usually do not have the expected sign. Nevertheless, if capacity utilization is expected to adjust fast, the contemporaneous interaction may be more pronounced. SVAR results below support this argument.

A trend is included in the VAR model to capture long-term effects such as structural shifts in trading relationships, or domestic and international financial markets that are not causally affected by variations in the system. The trend is significant in most equations. The models are also estimated without trend, and the results are fairly robust between estimations with and without trend. The exclusion of trend does not make any significant contribution, but rather adversely affects the impulse response functions resulting in higher standard errors. As a result, it is concluded that the trend is important in capturing some long-term effects that are not included in the system. The discussion below refers to the estimations with trend.

Table 2 presents the SVAR estimation results, namely the entries in matrix B^{-1} of contemporaneous correlations among error terms.

Model 1 shows the SVAR results according to the specification in Section 6. The contemporaneous effect of growth on the profit share has the expected positive sign, although not significant. The contemporaneous effect of employment is neither significant nor has the expected sign, verifying that the reserve army effect becomes operative only with a lag. However, in the case of growth, the insignificant sign may be a result of the inability of the model to capture simultaneity between growth and the profit share. The problems about the identification of the structural parameters may be limiting in modeling the contemporaneous effects. The standard errors of the model increase significantly in this specification[12]. An alternative model, where profits depend contemporaneously on growth, but not on employment, is also tested. However, in that alternative specification, growth not only is insignificant, but also has a negative sign[13]. In order to simplify the model, it is assumed that the profit share responds to growth, as well as employment with a lag.

Contemporaneous effects of the profit share and growth on investment were also tested, however they were both insignificant. Moreover, the sign of the profit share was negative. Although insignificant, a negative sign for the profit share, even when it is modeled as the only variable that has a contemporaneous effect on investment, point at different mechanisms, other than the demand effect, that lead to a low intention to invest in spite of high profits. This point is further discussed below.

In Model 2, b_{25} and b_{26} in B matrix are set to zero, thus in addition to investment, distribution is also contemporaneously exogenous. In this new specification, the

[12] Even some of the coefficients of the innovations to the variables itself have insignificant signs, indicating the significance of the problems regarding identification when simultaneity in the model increases.

[13] The correlation between the residuals of the OLS estimations also verify this result. The correlation coefficient between the profit share and growth is significantly negative, indicating the immediate negative effect of an increase in profit share on growth.

coefficients have the expected signs and are mostly quite significant[14]. The positive demand effect of investments and the negative consumption effect of profits on growth are confirmed. Exports also have a positive demand effect, though insignificant. The strong positive contemporaneous relationship between growth and employment is in line with Okun's law. The profit share has a highly significant positive contemporaneous effect on exports, capturing the degree of competitiveness of the exports. The equation for imports is the only one that doesn't perform well. The coefficient of growth isn't significant, and more importantly the coefficient of the profit share is positive, though insignificant. There may be various aspects behind this result. Firstly, profits might be unable to capture the price competitiveness of imports. Secondly, if the propensity of demand for imported goods out of profit income is higher than that out of wage income, the competitiveness effect of a higher profit share may be offset by the increase in the demand for luxurious imported goods. Finally the price elasticity of imports can be rather low in Turkey, which has a high degree of import dependency, not only for capital goods, but also for intermediate inputs. It may also be argued that lagged responses are more important, however the simple VAR results do not verify this argument. The positive, though insignificant, effect of profits on imports point at the relevance of introducing exports and imports as separate variables in the model, rather than aggregating them as net exports. Finally, imports were modeled as contemporaneously independent of the profit share, however this new specification didn't improve the results.

Next, we focus on the impulse response functions of Model 2, in order to make an overall evaluation of the wage-led hypothesis. The results of the impulse responses are suggestive, although the confidence intervals are large in many cases. Figure 1a and 1b show the impulse response functions of accumulation to the profit share and growth. The impulse response of accumulation to the profit share incorporates the direct profit effect, as well as the indirect effects of the change in profit share on the system via international and domestic demand.

An innovation to the profit share creates a negative response in accumulation in the next period, and the shock continues for another period, and then dies without leading to any significant improvement in accumulation. These results are in line with the empirical evidence about the stagnant accumulation rates in spite of an increasing profit share. However, the standard errors are high, and although the results clearly show that accumulation is not profit-led, they do not indicate a strong wage-led regime as well. On the other hand, the response of accumulation to growth is significantly positive, verifying the Keynesian emphasis on demand in determining the investment decisions.

The indirect effects of the profit share on accumulation become clearer when the impulse response function of growth to profit share in Figure 2 is explored. An increase in profit share is immediately transformed into a decline in growth, indicating a stagnationist regime. The effect is positive in the next period, however it takes three periods for the growth rate to return back to its initial level[15]. The recovery of the growth rate is due to the improvements in exports. Analyzing the overall impact of the profit share on growth in the impulse responses incorporates also the indirect impact of export demand on the system, which is expected to lead to a lower probability for a stagnationist regime. An increase in profit share creates a positive and persistent impact on exports as it can be seen in Figure 3, and exports eventually have a positive effect on demand. However, it is only in the medium run, when a higher profit share is capable of bringing out an increase in export demand high enough to compensate for the initial decline in consumption out of wages.

The immediate decline in growth due to an increase in the profit share explains the decline in accumulation in the second period, and the demand effect also has a persistence in the next periods offsetting the profit effect. Also investment decisions are highly path dependent; a slowdown in accumulation tends to be rather long lasting. Nevertheless, there clearly are other factors that lead to a stagnation in accumulation in spite of higher profits, different from the indirect effect of profit share via consumption out of wage income and lower capacity utilization. Increased rates of return in financial markets, higher volatility and uncertainty, and higher costs of capital goods have been the most widely referred factors behind the slowdown in accumulation in the 1980s, and particularly in the 1990s in both developed and developing countries[16]. The incorporation of the financial sector to the model could fill this gap. Unfortunately not only the limitations of SVAR, but also limitations regarding the data to measure these effects related with financial variables and expectations, leave these crucial aspects unexplored. Adding real interest rate[17] to the model did not lead to any significant improvement. Real interest rates were clearly unable to capture the full complexity of the structural change in the financial system. Another critical

[14] When the limiting effect of imports on growth is also modeled explicitly (including imports in the contemporaneous interaction equation for z), the model was unable to capture the simultaneity between growth and imports. The sign of growth in the import equation was negative, whereas that of imports in the growth equation was positive. Moreover, the sign of exports in the growth equation was also negative, which is counterintuitive.

[15] Note that the impulse response graphs shown here are not cumulative, rather they show the response to the initial shock in each period.

[16] See Akyüz (1991 and 1995) and Boratav et al (1996) for developing countries; and Davidson (1998); Dumenil and Levy (2000) and Stockhammer, (2000a) for advanced capitalist countries

[17] For the period before 1989 interest rate on one-year time deposit is used, after 1989 average annual compound interest rate on Government Debt Instruments is used, since after 1989 the interest rates on government debt instruments increase significantly compared with the deposit rates, becoming a more realistic measure of financial returns.

point is that the profit share variable that is used in the analysis is gross profits, which do not decompose the differences in the sources of capital income. Finally, our use of two lags may be unable to capture the dynamics behind the building up of profit expectations and business confidence.

As an expected consequence of the inability of profits to enhance growth and accumulation, the employment regime is also wage-led in the short-run. Figure 4a shows the impulse response of employment to the profit share. An increase in the profit share results in a significant decline in employment immediately, and the decline persists during the next period as well. The cumulative negative effect dies away only five periods later. The results show that a lower wage share does not necessarily stimulate employment. The initial decline in growth and accumulation provides a coherent explanation for the stagnation in employment in spite of the lower wage share. Figure 4b and 4c show the impulse response functions of employment to growth and accumulation. The results show that demand is the main driving force behind employment, and accumulation is an important component to enhance the job creation capacity of the economy.

An interesting finding about labor demand is the negative and persisting impact of exports on employment. Figure 4d shows the impulse response of employment to exports. The results provide counter-evidence to the expectations about an increase in labor intensity of production following an increase in export orientation. These findings verify the argument that it is increasingly harder for developing countries to increase their competitiveness by labor-intensive technologies in the global market. In spite of the fact that their exports may be more labor-intensive with respect to the advanced capitalist countries, the capital intensity of most export oriented sectors are increasing (Woods, 1997; Yentürk, 1997; Günçavdı and Küçükçiftçi, 1999). Another important consequence of this finding is that the increase in competitiveness, which is maintained by low wages, does not transform into higher employment.

A final point that needs to be highlighted is the response of distribution to growth and labor market pressures. Although distribution does not immediately adjust to changes in demand and balance of power relations, the lagged effects are significant. Profit share shows a significant pro-cyclical response following an innovation in growth in the next period, indicating the increased mark-up power of firms. The labor market pressures also become effective in the second period, as it is implied by a strong negative response of profit share to a change in employment.

8. Conclusion

This study presents an empirical analysis of the impact of distribution on accumulation, growth and employment based on a post-Keynesian open economy model for the case of Turkey. The first aim of the paper was to test the wage-led accumulation and employment hypothesis. Introducing a SVAR form for achieving this end was the second aim of the paper, in order to encounter the complex interaction between distribution, accumulation, growth and employment within a systems approach.

As to the first aim, the answer is rather unambiguously that in Turkey accumulation and employment are not profit led, and the growth regime is stagnationist, at least in the short run. Although, the results do not point out a strong wage-led regime of accumulation, a high profit share clearly does not enhance investments. In terms of growth, the results also indicate that a high profit share can only in the medium run create an increase in the export demand high enough to compensate for the decline in consumption out of wages. The inability of high profits in creating high growth rates explains part of the stagnation in accumulation in spite of increased profitability. However, the reasons behind the stagnation in accumulation clearly go beyond the indirect effect of profit share via lower consumption out of wage income. The inability to incorporate some significant exogenous variables within the SVAR framework, such as the rise in financial returns, and the increase in risk and uncertainty, limits the ability of the model to account for some other crucial sources of stagnation in accumulation.

As to the second aim of improving the empirical methods of analysis for the relationship between distribution and growth, the results are more modest. The SVAR results and the impulse responses correspond to the predictions, but with large confidence intervals. Accounting for the simultaneous interaction between distribution, accumulation, growth and employment is still a challenge that waits to be confronted within the field of empirical research. In this sense, going beyond aggregate and time series data may remove the veil that hides the incentives and disincentives behind investment decisions.

In spite of the fact that the method of estimation was not fully capable of capturing all the interactions within the system, the responses of accumulation, growth and employment to distribution are suggestive in explaining some crucial aspects of the mechanism behind the inability of higher profit levels of the export-led growth period to stimulate a higher rate of accumulation and employment when compared with the import-substituting industrialization era. Following this basic conclusion, a couple of policy implications need to be brought into discussion. Firstly, the results suggest that a pro-capital income policy is neither a necessary nor a sufficient condition to achieve higher accumulation and growth. On the contrary, the decline in domestic demand can have negative effects on growth if the improvements in international competitiveness are not strong and sustainable. Secondly, demand is the driving force behind employment, and wage suppression is unable to improve the growth rate of employment. The limits in creating employment via low wages and a growth regime based on the use of existing capacity rather than new investments,

point out the significance of active policies to stimulate accumulation. This alternative line of economic policy necessitates a different perspective of international competitiveness, which is based on enhancing productivity.

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Table 1: Summary of Period Averages

	I/Y	π	X/Y	M/Y	z*	ln(E)	Growth(E)**
1965-79	18.54	68.55	3.27	11.02	6.09	8.59	4.84
1980-97	17.70	71.79	15.98	22.86	5.33	9.17	2.83

Notes: * Growth rate of non-agricultural GDP; ** Growth rate of non-agricultural employment, memo item

Table 2: Structural VAR Results: The contemporaneous interaction between the error terms(1)
(The elements of B^{-1}, where $u=B^{-1}e$ (t))

		Model 1	Model 2
I/Y			
Innovation		1.526	0.927
		[0.82634]	[0.00000]
π			
z		117.123	-
		[0.99808]	
E		1185.438	-
		[0.98928]	
Innovation		175.669	1.843
		[0.99596]	[0.00000]
X/Y			
π		-3.385	0.323
		[0.00058]	[0.01171]
Innovation		2.821	1.068
		[0.00077]	[0.00000]
M/Y			
π		-0.705	0.320
		[0.90521]	[0.41630]
z		0.240	0.047
		[0.95145]	[0.82585]
Innovation		5.822	1.664
		[0.75589]	[0.00004]
z			
	I/Y	5.355	0.910
		[0.00000]	[0.11339]
π		-0.720	-0.940
		[0.00000]	[0.06098]
X/Y		0.994	0.111
		[0.00000]	[0.87742]
Innovation		0.706	2.397
		[0.00000]	[0.00001]
E			
z		0.167	0.002
		[0.99995]	[0.03836]
Innovation		1.325	0.010
		[0.99992]	[0.00000]

Notes: (1) p-values in parenthesis. A trend and a constant is added to VAR model. Estimation period is 1965-97 after adjusting for lags. Computations by Easyreg, Bierens (2000).

Appendix A: Definition of variables and data sources

Y: real GDP in nonagricultural sector, State Institute of Statistics (SIS), 1998.

I/Y: Private non-agricultural investment/Y, State Planning Organization (SPO), 2000.

π: Gross profits/Y in non-agricultural sector, Özmucur (1994) and Temel and Kelleci (1994)[18].

z: Annual growth rate of real GDP in nonagricultural sector (growth rate of Y).

X/Y: Exports of goods and services excluding agricultural exports /Y, SIS, (1998).

M/Y: Imports of goods and services /Y, SIS, (1998).

E: Non-agricultural employment in natural logarithms, SIS, 1997 and Bulutay, 1995.

[18] The data after 1994 and before 1968 do not exist in these studies, therefore the percentage increase in profit/value added ratio in the private manufacturing industry is used to extend the existing time series.

Appendix B: VAR Results (OLS estimations)

	I/Y_t	π_t	X/Y_t	M/Y_t	z_t	E_t
I/Y_{t-1}	0.462	-0.528	0.051	-0.495	0.368	0.001
	[0.01289]	[0.11715]	[0.84425]	[0.11795]	[0.52973]	[0.68861]
π_{t-1}	0.245	0.933	0.031	0.218	0.095	-0.001
	[0.02652]	[0.00000]	[0.83912]	[0.24690]	[0.78635]	[0.57583]
X/Y_{t-1}	-0.015	0.416	0.610	0.317	-0.212	-0.003
	[0.92081]	[0.11613]	[0.00283]	[0.20296]	[0.64615]	[0.10458]
M/Y_{t-1}	-0.370	-0.098	0.193	0.550	0.714	0.001
	[0.00130]	[0.63824]	[0.23048]	[0.00503]	[0.04923]	[0.57064]
z_{t-1}	0.331	0.314	0.208	0.142	-0.427	0.000
	[0.00001]	[0.02209]	[0.04919]	[0.27195]	[0.07380]	[0.97249]
E_{t-1}	6.946	-43.292	-51.656	-11.956	77.384	0.434
	[0.56117]	[0.04569]	[0.00198]	[0.55683]	[0.04006]	[0.00181]
I/Y_{t-2}	0.261	0.179	-0.292	0.439	-0.128	0.001
	[0.09986]	[0.53403]	[0.18880]	[0.10467]	[0.79864]	[0.77928]
π_{t-2}	-0.151	-0.390	0.059	-0.037	0.069	0.003
	[0.10457]	[0.02050]	[0.64969]	[0.81603]	[0.81363]	[0.01063]
X/Y_{t-2}	0.093	-0.499	-0.348	-0.330	0.306	0.000
	[0.45563]	[0.02703]	[0.04520]	[0.11952]	[0.43519]	[0.87985]
M/Y_{t-2}	-0.062	-0.230	-0.166	-0.250	0.129	0.002
	[0.63401]	[0.32954]	[0.36169]	[0.25796]	[0.75357]	[0.30460]
z_{t-2}	0.139	0.225	0.024	-0.027	-0.321	0.001
	[0.09010]	[0.12822]	[0.83654]	[0.84437]	[0.21284]	[0.32255]
E_{t-2}	-27.827	34.087	19.967	-15.600	-70.681	0.394
	[0.02295]	[0.12429]	[0.24291]	[0.45393]	[0.06696]	[0.00573]
constant	167.058	112.787	254.172	216.122	-67.216	1.300
	[0.00441]	[0.28889]	[0.00194]	[0.03049]	[0.71637]	[0.05689]
trend	1.032	0.600	1.641	1.457	-0.819	0.005
	[0.00511]	[0.36919]	[0.00143]	[0.02020]	[0.48085]	[0.22514]
s.e.	1.357	2.460	1.897	2.311	4.280	0.016
R-Square	0.899	0.754	0.964	0.938	0.407	0.998

Notes: p-values in parenthesis. A trend and a constant is added to VAR model. Estimation period is 1965-97 after adjusting for lags.