The Effects of Basic Macroeconomic Prices on Manufacturing Industry Production in Turkey

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Abstract

In this research; the effects of macroeconomic prices, such as interest rate, exchange rate, energy prices and wages, on Turkish manufacture industry production in the period 1992-2008 are investigated. The aim of the research is to bring current macroeconomic policies in Turkey up for discussion once more. In this framework, the economic policies implemented in Turkey since 1980 are elaborated in the first place in order to interpret the economic trends between the years 1992 and 2008 ideally. Then for the purpose of analyzing the mentioned relations, various econometric methods are used. First of all, ARDL Bound Test is applied to series in order to investigate the long run relationship among them. Secondly, causality relationships are questioned by using Granger Causality Test based on Hsiao Approach; and impulse-response functions and variance decomposition tables obtained from Vector Autoregressive Model (VAR) are elaborated. At last, findings are evaluated within the economic framework drawn beforehand and the research is concluded by policy proposals. Accordingly, long run relationship among variables cannot be found, however at the end of causality tests all the variables except real wages are found to be "Granger cause of production". Moreover, the impulse-response functions put forward that the production reacted negatively to real interest rate, positively to real effective exchange rate and negatively to real energy prices. The coefficient derived for real wages, on the other hand, is discovered to be insignificant. This can be explained by the export orientation policy that has targeted foreign demand instead of domestic. Above all, it should not be neglected that real wage level deserves considerable interest since it determines wealth of the majority of society. As a result of the analyses and assessments in the research, it can be concluded that these variables can and should be utilized as efficient and essential policy tools.

1.INTRODUCTION

The question of whether development is succeeded by the hands of state or market mechanism (state vs. market) takes a central place in development economics literature. Although the answers include theoretical and ideological aspects, historical experiences enlighten these questions. Besides the West European countries, the experiences of South Eastern countries are elaborated again and again in this context. Although both sides underlined the elements that support their arguments, there is little evidence pointing out that only the market mechanism provides sufficient instruments for development. Rather, it seems that industrialization could not be achieved without control and supervision of the state at specific time and situations.

As for the dominant paradigm, Neoclassical Economics claims that free market economy creates the best conditions for all countries and prices are directive in case of deviances from equilibrium. The equilibrium price of a commodity/factor is said to illustrate the point where the supply and demand become equal and thus demanded production also equals demanded consumption. In summary, according to the Neoclassical model, prices should be determined under free market conditions and the actors would behave rationally with respect to these prices which could not be affected by individual actors under "perfect competition". At this point, the general price level is determined in national market, energy prices in its own market, exchange rate and interest rate in the money market and lastly wages in the labor market in real world.

Beyond these assumptions of Neoclassical Economics, price is not only an endogenous value determined by the associated demand and supply but also effective on them. As Keynes pointed out after 1929 Great Depression, interest rate is, ceteris paribus, effective on investment and exchange rate, ceteris paribus, on balance of payments. As for other prices from a supply side viewpoint, energy prices contribute directly to production cost and wage level is distinctive for production level by its functions both as a cost item and as a main component of demand. In fact, this study is based on the view arguing that utilizing those prices as policy tools in controlling the related variables (investment, import, export, production) are another choice among different economic policies.

Multidimensional policy choices are significant since real economic relations are much more complicated than those in free markets idealized by Neoclassical Economics. In fact in real world, all prices are intervened to be held within boundaries determined by certain macroeconomic policies. For instance the main policy in Turkey since 2001 has been to control inflation by intervening interest rate while leaving the exchange rate to fluctuation. This is a policy choice among many others. This choice depends on policy makers' priorities determined in the framework of current targets and economic relations.

In this framework, this article aims to reevaluate the macroeconomic policies implemented in Turkey. For this reason, the effects of variables like interest rate, exchange rate, energy prices and wages on manufacture production are investigated by using various econometric methods. First of all, the series are put to cointegration test in order to investigate long term relation between them. Then causal relations are analyzed by using Granger Causality Test with Hsiao Approach. At last, Vector Autoregressive Model (VAR) is applied to see the effects of variables on production and impulse-response functions and variance decomposition tables are examined. Meanwhile the study is limited by the years between 1992 and 2008 for which continuous time series data for all of these variables are available.

Since the policies after 1980 constitute a persistent framework, the second section of this study is devoted to an overview of Turkey's late economic history for the sake of better evaluation of economic developments in the period 1992-2008. In the third section, data set and method are explained and in the forth, findings are presented. In the fifth section, the results of the application are presented with their economic implications and the study is concluded by a general assessment.

2.Main Milestones of Turkish Economy after 1980

The similarities of macroeconomic policies implemented in developing/peripheral economies are said to be surprising. This can be explained by the close relation of these countries with developed ones, or the centre. Öniş and Şenses (2007) defined this situation with "reactive

state" concept and exemplified it for Turkey. Accordingly, even if the policy shifts are supported by domestic coalitions, the main factor behind this policy shifts has been external dynamics. In fact, like many other developing countries, policy-makers in Turkey have followed the major centers of international decision making like the World Bank (WB), International Monetary Fund (IMF), World Trade Organization (WTO) etc. In this direction, the post 1980 era can be summarized by Neoclassical dominance that promoted liberalization in all fields of the economy.

More clearly, by 24th January 1980 Decisions an inward looking industrial model, import substitution was replaced by an outward looking model, export orientation. This transformation created an environment where free market strengthened its dominance and the state interventions were restricted within the economic area. This atmosphere was spreading all around the world by the decline of the Cold War conditions. Korkut Boratav (2004: 149) defined the post 1980 policies in these words:

A foreign exchange policy worked in line with real devaluations; a more liberal import regime; export as a national priority supported by promotions and subsidies like expensive foreign currency49, cheap credit and tax return; abolition of price controls and subsidies on main commodities and macro policies towards the suppression of domestic demand are the key elements of 24th January Decisions.

The policies implemented after 1980 including liberalization of trade and capital movements, privatization of state enterprises and pointing private sector as the locomotive of growth have been the most long-termed ones among similar policies. Meanwhile, the dependence of exports to imports influenced the external deficit in a negative way (Boratav, 2004: 161). This structural defect was tried to be fixed by continuous and high capital flows from abroad. For this aim, foreign exchange regime is liberalized in 1984 and capital movements in 1989. İnsel et al. (2004) evaluated this situation as the effort to fill the gap created by infrastructural deficiencies with liberal financial system. In a parallel way, financial liberalization had become a determinant element for the whole economy especially after 1990. For this reason, studies analyzing the mentioned period could not ignore the impact of financial sector.

According to the study done by İnsel et al. (2004) the very first effects of financial liberalization in 1989 had been the increase in current account deficit and appreciation of TL. Therefore, external borrowing had increased by 223 % in the period 1989-1993. Likewise, the fact that the majority of capital flows were short termed and their outflows were not restricted or regulated paved the way for a series of financial crisis and resource transfer. As can be seen in Table 1 and 2, financial crises in 1994, 1999 and 2001 led reel growth decrease by values between 3 and 6 % according to the previous years.

Table 1: Real Growth, Net Capital Flows and Unemployment Rate (1992-1998)

Years	Real Growth (%)	Net Capital Flows (million $)	Unemployment Rate (%)
1992	6.0	3,648	8.5
1993	8.0	8,903	8.9

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49 This situation is changed in an opposite way by the effect of capital movement liberalization in 1989.

1994	-5.5	-4,257	8.5
1995	7.2	4,565	7.6
1996	7.0	5,483	6.6
1997	7.5	6,969	6.8
1998	3.1	-840	6.9

Source: Turkish Statistical Institute (www.tuik.gov.tr) and Central Bank of the Republic of Turkey (http://evds.tcmb.gov.tr/) Date Accessed: 02.11.2009.

Actually, the years after 1990 were differentiated in terms of commodity and capital flows from 1980s when some regulations somehow had been persisted (Kazgan, 1999: 175). In detail, the liberalization process controlled by the IMF and the WB at the beginning of 1980s was reinforced by new agreements signed in 1990s like General Agreement on Trade and Tariffs (GATT) and Customs Union. Both agreements aimed to decrease national protection in trade and increase the capacity of world trade. However, the abolishment of protection in industrializing countries like Turkey promoted the importation50 of industrial goods instead of producing them in the country. This was supported by concessions offered by Customs Union Agreement. Accordingly, while Turkey decreased its tariffs almost to zero for the third parties, the developed countries decreased tariffs in textile, leather goods and rubber shoes, which are exported by the developing world, in small amounts such as from 15.5% to 12.1% (Kazgan, 1999: 177-178). As a result, exports as percentage of imports in Turkey decreased51 day by day besides the capital flows appreciating the domestic currency and thus imports are promoted instead of exports.

Pamukçu and Yeldan (2005) emphasized two significant characteristics of the post-1990 era. Firstly, the growth after 1990 had been speculative-led, dependent on capital inflows and secondly, the growth could not create new employment, which is called jobless-growth. The reflections of the arguments can be observed in Table 1 where negative values in net capital flows represented capital outflows. It is acknowledged that in 1994 when capital outflows exceeded inflows, the growth rate had been – 5.5%. Similarly, in Table 2 it can be deducted that 2001 crisis was significant because of the big amount of net capital outflow compared to the net capital inflows or outflows in other years. Looking at these developments, it is not an exaggeration to claim that the high growth rates between 2002 and 2007 are compatible with continuous and big amounts of capital inflows. This can be deducted also from the fact that the slowdown of world capital in 2008 directly influenced the growth rate in Turkey. In other words, the contraction in 2008 created a decrease in net capital inflows which would continue in 2009 when the growth rates are negative.

Table 2: Real Growth, Net Capital Flows and Unemployment Rate (1999-2008)

Years	Real Growth (%) (%)	Net Capital Flows (million $)	Unemployment Rate (%)
1999	-3.4	4,829	7.7
2000	6.8	9,584	6.5

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50 As a result, nominal rate of protection decreased from 65 % in 1983 to 28.3 % in 1990 (Kazgan, 1999: 176).

51 While the value of exports as percentage of imports was 72.4 % between 1984 and 1989, this rate decreased to 55.8 % between 1993 and 1997 (Kazgan, 1999: 180).

2001	-5.7	-14,557	8.4
2002	6.2	1,172	10.3
2003	5.3	7,192	10.5
2004	9.4	17,702	10.3
2005	8.4	42,660	10.3
2006	6.9	42,689	9.9
2007	4.7	48,637	10.3
2008	0.9	33,636	11

Source: Turkish Statistical Institute (www.tuik.gov.tr) and Central Bank of the Republic of Turkey (http://evds.tcmb.gov.tr/) Date Accessed: 02.11.2009.

Another characteristic of the capital movements in this period has been that their inflows or outflows are random and volatile, which made the Turkish economy so fragile. Legislations aiming to promote long-term capital inflows instead of short-term or to set certain rules for capital outflows are some suggestions that could decrease the fragility and increase the stability. As mentioned before, the growth in this period was unable to create employment as much as the expected. The values in the 2nd and the 4th columns of the tables put forward the relationship between growth and unemployment. In detail, even in the years 2004 and 2005 when the Turkish economy grew by 9.4% and 8.4% respectively, the unemployment rates were above the 10% level. This situation set forth that the link between growth and physical investment which constitute the base for production has been weak. On the contrary, during the crisis years when the growth rates were below zero, the expected relation worked and the unemployment rates increased. For instance, the rate of unemployment increased from 6.5% in 2000 to 8.4% in 2001 and to 10.3% in 2002. Lastly, the increase in the rate to the level of 11% in 2008 due to global recession supported the expectation that this increase would continue in 2009.

As a subset of the period of focus, years between 1998 and 2008 was also special since the IMF was effective on macroeconomic policies through uninterrupted stand-by agreements during the period. In the 2006 Report prepared by Independent Social Scientists, the year of 1998 was evaluated as a cornerstone in the Turkish Economic History as well as 24th January 1980 or the year 1989 when the capital movements were liberalized. In fact, it was the first time that macro policies were tied to the persistent relation between Turkey and the IMF within this period. According to the items in the programs following each other, free movements of international and national financial capital would be allowed, no intervention would be needed in terms of over appreciated value of TL, labor markets would be more flexible, state enterprises would be privatized and the state would be restructured depending on neoliberal understanding (Independent Social Scientists, 2006).

3.Data Set and the Method

The data for wage "quarterly reel wage per hour worked in manufacture industry production" and for production "quarterly industrial production" were taken from Turkish Statistical Institute. For interest rate, "ex-post real interest rate" and for exchange rate "monthly real effective exchange rate" and for energy prices "electricity, gas and water" were used from the data set of the Central Bank of the Republic of Turkey. All the data were transformed to quarter data on the same base year 1997 and the price effect was cleared.

In the first place, the graphics of the variables were analyzed and production series were adjusted seasonally. Then the situations of whether they were stationary or not were tested with ADF Test (Unit Root Test). The series including unit root were also applied structural breaks test in order to analyze their being stationary. ARDL Bound Test was used to analyze the long-term relationship. Since cointegration was not valid, the analyses were continued with lagged variables. Granger Causality Test with Hsiao Approach (1982) was used in investigating the one way causal relation of other variables toward production and the results of impulse-response functions and variance decomposition by using VAR Analysis were discussed.

4.Findings

After required adjustments done mentioned above and Granger Causality Test is applied to variables, it is found that exchange rate, interest rate and energy prices Granger-cause manufacturing industry production in Turkey within the related period. As for wages, such a relation could not be identified for this term. Then application of VAR Analysis put forward the findings shown in Table 3 where "F" symbolized interest rate, "E" energy prices, "UC" wage level, "DK" exchange rate and "UR" production.

Table 3: Variance Decomposition Table for D(UR)

Period	S.E.	F	D(E)	D(UC)	D(DK)	D(UR)
1	0.041386	26.12569	10.43293	0.303792	1.880974	61.25661
2	0.045642	21.80958	17.90020	1.188303	8.713255	50.38867
3	0.049081	24.66460	17.76381	1.039880	9.024850	47.50686
4	0.050463	27.99220	17.17754	1.085908	8.758086	44.98626
5	0.050863	28.85729	16.90906	1.069230	8.706563	44.45786
6	0.051005	29.16273	16.85717	1.079802	8.685333	44.21496
7	0.051039	29.22121	16.85599	1.079802	8.684548	44.15845
8	0.051049	29.22451	16.87086	1.080577	8.682052	44.14200
9	0.051051	29.22371	16.87515	1.080618	8.681462	44.13907
10	0.051051	29.22310	16.87678	1.080656	8.681294	44.13817

As seen from Table 3, the change in production is mostly explained by itself, which was followed by interest rate (with 26.13%), energy prices (with 10.43%), exchange rate (with 1.88%) and wages (with 0.3%). It is obvious that the explanation level of wage level has been pretty low. These findings have been parallel to those of the Granger Causality. After using variance decomposition, impulse-response functions seen below have been analyzed. Accordingly, the response of production to interest rate was negative in the first period with significant coefficients. The coefficients have been insignificant in the following periods. In a similar way, production reacted negatively to energy prices in the first two periods and then the coefficients became insignificant. As for the response of production to exchange rate it seemed to be positive for the first two periods and the coefficients became again insignificant in the others. Again in line with the previous findings, the coefficients in terms of wage level have been insignificant for all periods.
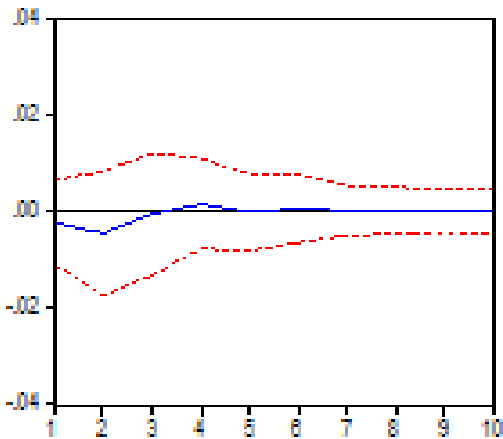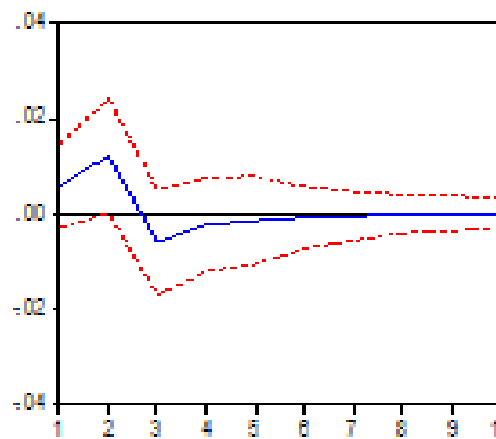
The Response of D(UR) to F
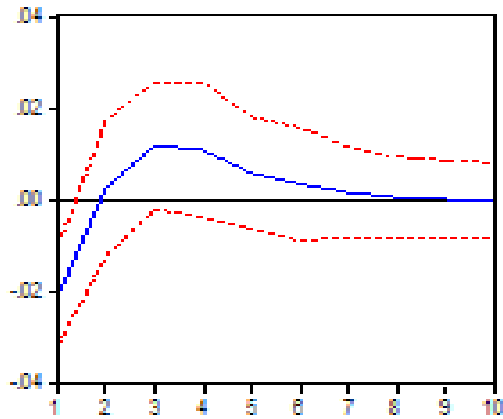
The Response of D(UR) to D(E)
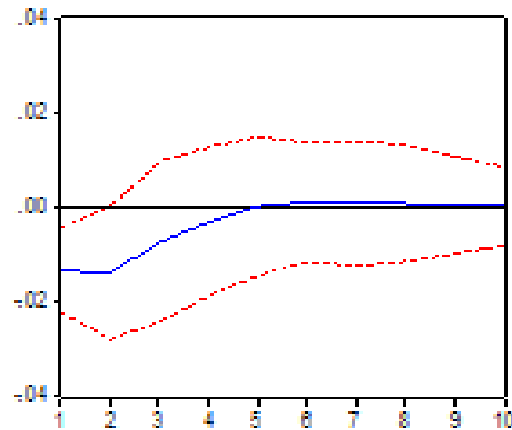
The Response of D(UR) to D(UC)

The Response of D(UR) to D(DK)

5. Conclusion and Remarks

In this study, the relationship between the movements of macroeconomic prices, which appeared to be effective on production between 1992 and 2008, and the progress of production has been researched. The macroeconomic prices undertaken at this point have been restricted with interest rate, exchange rate, energy prices and wages. The findings of the econometric analysis have been evaluated with dominant economic policies of the period, which means that the movements of the variables have been discussed in the light of enforced programs. As it has been stated in the study of İnsel and Sungur (2003) covering the years of 1989-1999, free capital movements increased volatility in real and financial indicators and brought short-term perspective on economic programs. As a result of the liberalization of capital movements, the pressures on exchange rate, interest rate and other prices have risen. Nonetheless, this tendency of short-term perspective handicapped both the formation of long-term perspective required for a stable economy and the rise of investments towards

production. The paragraph below (Doğruel and Doğruel, 2008) has been instructive in terms of stating the main features of the period.

In this long period exceeding 30 years since the second half of the 1970's, the governments have approached the real economy through the framework of export increase and financial capital inflow; the focus of the policies has been on the inflation control and resource creation for economic sustainability, in other words, on the achievement of macro stability. Turkey's long-term growth aim has lagged behind in this environment and a long-term action plan or approach for manufacturing industry could not have been formulated although considered from time to time.

In the same direction, the simultaneous planning custom of policies for industry and international trade, which characterizes the industrialization strategy of 1960s and 1970s, has been given up after 1980. Due to commitments made to European Union and World Trade Organization, Turkey's priorities have not been attached sufficient importance in international trade policies that could be used for supporting industrial development (Türel, 2007). Likewise, according to Şenses and Taymaz (2003), in the post 1980 era, external dynamics have been very effective on the formation of basic approaches and policies regarding industry. As a matter of fact, Turkey had been missed out the potential positive effects of national and international prices on production. This negative picture of Turkish economy has revealed the importance of this study, namely, the effect of changes in macroeconomic prices on manufacturing industry production. The general situation underlined as such has shown parallelism with objective findings of the study and has required an overview of enforced macroeconomic policies.

It has been seen that the empirical findings of the study have supported the opinions and observations discussed through the study. To remember, real effective exchange rate does Granger-cause manufacturing industry production. Thus, any change in this variable had been effective on the future values of manufacturing industry. In fact, this result has provided the satisfactory evidence for the suggestion of using exchange rate as an effective policy instrument. Furthermore, impulse-response functions have shown that production has given positive reaction to exchange rate in the first two periods. As a reminder, increase in the exchange rate serial used in this study has indicated the appreciation of TL. At first sight, there has been an expectation that appreciation of TL would show a negative impact on production by promoting imports rather than exports in international trade. However apparently, the structure of national production dependent on imported inputs has caused the realization of a reverse relationship between exchange rate and production different from the expected one in the economic theory.

That is to say, inputs and intermediate goods imported cheaply due to appreciated domestic currency have increased production between 1992 and 2008. Although this result could seem to be favorable at first, it should not be forgotten that the crucial point has been the increase in current account deficit. To put it another way, because of the production structure that is dependent on imports, Turkey's high growth rates have caused a widening current account deficit. This situation, which gives way to savings balance deterioration, has increased the need for capital inflow and therefore has played a role in supporting free capital movements. It is clear that this cycle has created pressure on interest and therefore it became difficult leave high interest rate policy that has secured the continuity of capital inflow.

If the findings in terms of interest rate have been analyzed, it is revealed that real interest rate does Granger-cause manufacturing industry production. This result, on its own, has shown that interest rate could and should be utilized positively for promoting production increases

besides inflation targeting. In addition, variance decomposition results have shown that the most effective variable on production has been interest rate and impulse-response functions showed that the reaction of interest rate to production was in negative direction in the first period.

A relationship in this direction has been in line with the expectations of economic theory. As known, an increase in interest rate would have a negative impact on production because of its deterrent effect on investments. Besides, this situation has influenced the level of employment indirectly. Indeed, employment problem has been one of the most urgent problems to be handled since the official unemployment rates have been in double digits in Turkey. Even so, interest rate has been kept high due to the current restrictions. As stated, high interest rates have caused to reach high growth rates in Turkish economy by warranting hot money flow between 2002 and 2007. Nonetheless, these high rates have both put Turkish economy on the spot in refunding internal and external liabilities and have influenced income distribution negatively because of the economic growth without creating employment. These outcomes have pointed out that the particular variable that policy makers, who wanted to be effective on production, had to take into account had been interest rate.

According to another result, energy prices which are taken into notice in terms of electricity, gas and water Granger-cause manufacturing industry production. Furthermore, variance decomposition results achieved by VAR Analysis have stressed that the second most distinctive variable on production has been energy prices after interest rate. In addition, when impulse-response functions were analyzed, it has been seen that production had given a negative reaction to increases in energy prices in the first two periods as expected.

At this point, it is noteworthy to assert that the price of electricity in Turkey, which is used intensively in industry, has been higher than almost all OECD countries. The price of natural gas, which is reasonable with respect to that of electricity, has been important both as a primary resource used in industry and as a resource used in electricity production. On the other hand, since the natural gas is dependent on foreign resources, it has been hard to control its supply and price. All these motives have illustrated the significance of following and controlling energy prices for policy makers willing to increase production and income. In other words, regulation of the energy prices to foster production has been crucial for Turkish industry. In this direction, it has been found worthwhile to revise the decision about privatization of energy sector as has been offered as a solution since 2001.

Last result of the study is that any change in real wages does not Granger-cause manufacturing industry production. Also, when impulse-response functions and variance decomposition results were analyzed, it was seen that coefficients determining the relationship between production and wages have been insignificant and the explanation level of wages in terms of understanding production has been significantly low. On the basis of this analysis, it could be concluded that the relationship between manufacturing industry sector and domestic demand has been weak. This finding seems to be neither surprising nor unreasonable for an economy that is based on export-led growth, dependent on foreign demand rather than the domestic. Above all, the social dimension of wages has to be taken into account rather than interpreting it solely as a macroeconomic price. This has been a considerable matter due to the fact that the number of people living in poverty in Turkey is increasing day by day. As a result of this situation that has taken its root from 1980 transformation, on the one hand the participation of economy to world trade has increased significantly, the structure of exports has shown an important change towards industrial products and on the other hand, the expected increases in production, employment, private

domestic and foreign investments have not been provided and real wage developments have shown an unstable outlook.

To sum up, as indicated clearly in report of TÜSİAD, the deepening tendency of integration in the world economy after 1990s has been forcing all countries to review their industrial policies. This process has carried the potential of creating a deindustrialization process for developed and developing countries (Doğruel and Doğruel, 2008). The policy making that has to be implemented against this dangerous situation is the use of national resources in a productive way and to allocate them for pre-determined targets. Acknowledging the significance of fiscal policy52, the economy should be managed by a state, responsible not only for regulation but also for direction. Such an increase in production would provide a general improvement in welfare by both preventing unproductive use of resources and by increasing employment through new investments.

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