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DETERMINANTS OF INVESTMENT IN THE MANUFACTURING
SECTOR IN TURKEY

DISSERTATION

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SECTOR IN TURKEY

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"I, Ömer Tuğsal Doruk, confirm that the work presented in this dissertation is my own. Where information has been derived from other sources, I confirm that this has been indicated in the dissertation."



ÖMER TUĞSAL DORUK

ABSTRACT

DETERMINANTS OF INVESTMENT IN THE MANUFACTURING SECTOR

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Doctor of Philosophy in Economics

Advisor: Assoc.Prof.Dr. Özgür Orhangazi

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This dissertation focuses on the determinants of investment in Turkish manufacturing sector. It gives a detailed framework and complementary analysis of the determinants of investment in Turkish manufacturing sector. First, I examine the financing constraints hypothesis for the manufacturing sector. The financing constraints have a controversial place in the current literature, and for Turkey, there has been a limited literature in this field, even-though the relation between financing constraints and investment has traditionally had a special place in investment studies. Second, I analyze the relation between cash holding or staying liquidity and investment as well as the effect of cash holdings on investment. Third, I examine the effect of profitability on investment for Turkish manufacturing sector. Fourth, I review the effect of free cash flow on investment. I use free cash flows to examine the relationship between underinvestment and financing constraints. I also investigate the effect of different institutional aspects of investment such as holding structures and TUSIAD membership.

This dissertation offers a detailed contribution to the understanding of investment behavior of publicly held firms, in the manufacturing sector, in Turkey. Moreover, this dissertation gives a comprehensive framework for measuring financing constraints for investment decisions. Finally, this dissertation makes a significant contribution to linking the conditions of financing constraints and underinvestment.

Keywords: Investment, Financing constraints, Free cash flow, Political economy, Profitability, Underinvestment, Cash holding

ÖZET

TÜRKİYE İMALAT SANAYİSİNDE YATIRIMLARIN BELİRLEYİCİLERİNİN

TESPİT EDİLMESİ

Ömer Tuğsal Doruk

Ekonomi, Doktora

Danışman: Doç.Dr. Özgür Orhangazi

Kasım, 2017

Bu doktora tezi, Türkiye imalat sanayisinde yatırımların belirleyicilerine odaklanmaktadır. Bu doktora tezi Türkiye imalat sanayisinde yatırımların belirleyicileri hakkında detaylı bir çerçeve ve tamamlayıcı bir analiz sunmaktadır. İlk olarak, imalat sanayi için finansman kısıtları hipotezi test edilmektedir. Finansman kısıtları mevcut literatürde tartışmalı bir yere sahiptir ve Türkiye için geniş bir literatür bulunmamaktadır. İkinci olarak ise; yatırımlar ile nakit tutma davranışı ya da likit kalma arasındaki ilişki araştırılmıştır. Türkiye gibi ülkelerde dışsal şoklar firmaların likit varlık tutmaları için bir hassasiyet oluşturabilmektedir. Nakit tutmanın yatırıma olan etkisi araştırılmaktadır. Üçüncü olarak karlılığın yatırımlara olan etkisi Türk imalat sanayisi için araştırılmaktadır. Dördüncü olarak serbest nakit akışlarının yatırımlara olan etkisi araştırılmaktadır. Bu analiz içsel nakit kaynağı hakkında (fazla nakit tutma ya da içsel fon ihtiyacı) detaylı bilgi vermektedir. Son olarak bu çalışmada serbest nakit akışı vasıtasıyla potansiyel yatırımdan daha az yatırım yapma sorunu ve finansal kısıtlar ilişkisini sınanmaktadır. Aynı zamanda holding yapısı ve TUSİAD üyeliği gibi farklı kurumsal etkenlerin yatırıma olan etkisi bu doktora tezinde sınanmaktadır.

Bu doktora tezi imalat sanayide yer alan, halka açık şirketlerin yatırım davranışları hakkında literatüre detaylı bir katkı sunmayı amaçlamaktadır. Aynı zamanda bu doktora tezi, imalat sanayide yer alan bu firmalar için finansal kısıtların yatırım üzerindeki etkisini ölçme noktasında detaylı bir çerçeve sunmaktadır. Son olarak, bu doktora tezi eksik yatırım ve finansal kısıtlar arasındaki ilişki için Türkiye imalat sanayisi için erken düzeyde bir katkı sunmaktadır.

Anahtar Kelimeler: Yatırım, Finansal kısıtlar, Kapasite kullanım oranı, Serbest nakit akışı, Politik iktisat, Karlılık, Potansiyelden az yatırım yapma, Nakit tutma

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in my life, my mother Ümmühan, my wife Büşra, and my daughter Karen Mina. In addition, I dedicate also this dissertation to whom passed away during my graduate studies, For Abdurrahman, my grandfather, for İbrahim, my father in law, and for Özkan, my uncle.

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CHAPTER 1.

INTRODUCTION

In this thesis, I argue that despite financial market liberalization, financial reforms and financial deepening, financing constraints are still an important impediment for investment in Turkey.

I find that for a group of firms, financing constraints are negatively correlated with investment. Furthermore, for these firms, investment is more closely correlated with internal finance. They have negative free cash flow, and no cash holding. For cash holding, financially unconstrained firms hoard cash as a stock variable for investment. I show that these effects are significant across holding vs. non-holding firms, and TUSIAD members vs. non-TUSIAD members.

As such, I contribute to the literature on the determinants of the firm's investment in Turkey (Gezici (2007), Eser Özen (2014), Kaya (2011), Egimbaeva (2013), Günay and Kılıç (2011), Demir (2008), Yeşiltaş (2009), Çetenak and Vural (2015)). My findings are in line with all the studies above, who conclude that financing constraints play a significant role on investment. I show that this effect is larger for non-holding and non-TUSIAD members. Furthermore, I show the links between financing constraints and investment by using alternative stock and flow variables, such cash flow, cash holding, profitability, and free cash flow variables. I also test the relationship between financing constraints and underinvestment for those firms.

I use a dataset that contains 135 firms that are in the manufacturing sector. The time span is between 2005 and 2015. The firms in the dataset are listed firms in the Borsa

Istanbul Stock Exchange (henceforth, BIST). I use fixed effects OLS and Difference Generalized Method of Moments (Diff-GMM) panel data econometric methods for testing the hypotheses of this thesis.

This dissertation is composed of 5 chapters. In the Chapter 2, I provide a detailed overview of macroeconomic changes in the 1950s. In this part of the thesis, I give a comprehensive synopsis of macroeconomic policies and capital accumulation regimes within a political economic context. I put these ad hoc policies at the center of capital accumulation decisions and this chapter tries to find an answer to the importance of macroeconomic conditions for investment since the early 1950s. In Chapter 2, the political economic analysis of investment policies are investigated within a historical context (which is essential for capital accumulation regimes) for the Turkish economy since the early 1950s. This chapter gives a detailed review of transformational structure of the Turkish economy as well as its macroeconomic and industrial policies. In Chapter 3, I make a detailed examination of the literature review for investment studies that have a link to the evolution of investment functions within different economic thoughts in a comparative and meticulous way. Chapter 4 deals with data and empirical models and offers an estimation of results. In this chapter, the main hypothesis, the main features of the data, the main regression models and the econometric estimations are extrapolated. Chapter 5 gives the main conclusions of the dissertation and highlights the key implications of the findings and finally findings limitations are proposed.

CHAPTER 2.

POLITICAL ECONOMY OF MACROECONOMIC POLICIES FOR THE TURKISH MANUFACTURING SECTOR

In this chapter, I will explore macroeconomic policies and its effects on the capital accumulation structure of the manufacturing sector in Turkey. Furthermore, these will be investigated within a political economic framework. I will endeavour to give a detailed framework in order to better understand the evolution of capital accumulation since the early 1950s in Turkey (which reveals the extent to which it was unsustainable) and how the relation between capital accumulation and macroeconomic policies affected capital accumulation.

These macroeconomic policies are discussed in two parts: first in the pre-1980 period, and then in the post-1980 period so as to understand the structure and then the effects of structural transformation on the manufacturing sector. I focus especially on both these periods as I consider them to be crucial to our understanding of this subject due to the fact that structural policies on investment had changed after the 1980s. The main question of this chapter is “Did the changing nature of industrial policies as well as macroeconomic policies under the different political and accumulation regimes in the interperiods, have a direct affect on investment in the economy?” All the capital accumulation regimes are based on ad hoc development strategies whilst the capital accumulation regimes are based on the management of

governments. Moreover, the economic policies are mainly based on ad hoc economic policies too.

This chapter has two aims. First, it is to discuss how the link between ad hoc industrial policies and ad hoc macroeconomic policies which led to failure in the resolution of the capital accumulation problem in Turkey. The second aim, is to show how changing structures as well as political and economic instability led to this capital accumulation problem. This is as a result, mainly from the inflexibility of these structures and from the fact that there were ineffective *ad hoc* industrial policies under changing political economic regimes that had impacted the Turkish economy over a long period.

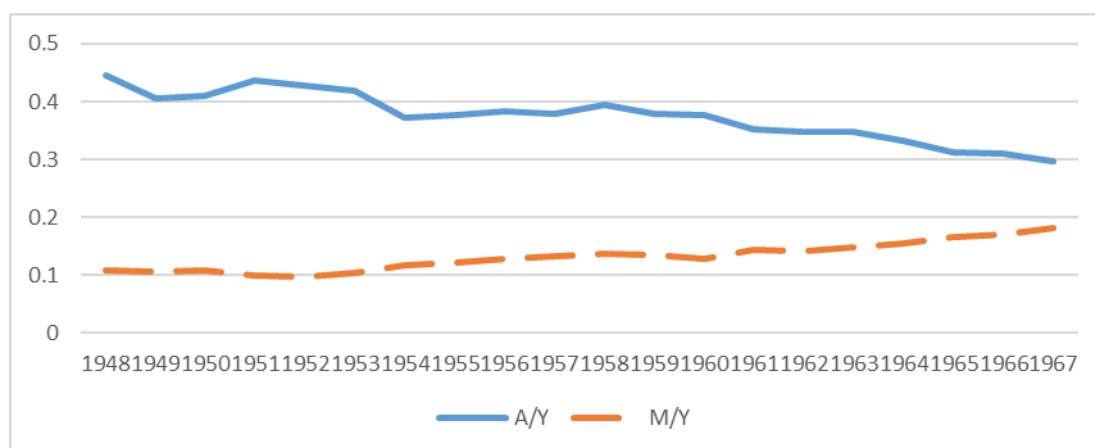
2.1. Macroeconomic Policies in Turkey pre-1980 era

In the pre-1980 era, the capital accumulation process was dependent on import substitution policies, especially in the post Second World War Period. For Turkey, import substitution-led industry policies dates back to 1954, with the enactment of new laws for this import substitution policy (henceforth ISI) and which became the springboard for a new development strategy for Turkey at the time. (Pamuk, 1984; Boratav, 2015).

Turkey's Five Year Development Reports were aiming at 'industry-led growth' and that is indeed since the first of such reports, in 1963 (TEPAV, 2015). Officially, it is since this date that development policies aimed at implementing an ISI-led industrialization policies started and thus the creation of new economic growth for the country.

ISI-led industrialization policies are based on three actions. First of all, establishing import quotas for the protection of selected industry sub-sectors was a priority.

However, these import quotas were not levied on the intermediate goods that the selected sub-sectors imported. Secondly, it was necessary to put in place a low interest rate policy for the selected sub-sectors of the Turkish manufacturing sector. This low or cheap interest rate policy was necessary to generate funds for the industry to spend on investment. The final requirement was to create a highly appreciated exchange rate policy. The exchange rate was either not revalued nor devalued in the market and thus the government allocated foreign currency inputs into these selected industries (Pamuk, 1984). Moreover, the government did infrastructure investments and purchased the necessary intermediate goods that were needed for high capital accumulation in the industry in this period. Indeed in the same period, the profit share of the private sector increased under this kind of high protection government intervention and fixed exchange rates were at a high currency level.

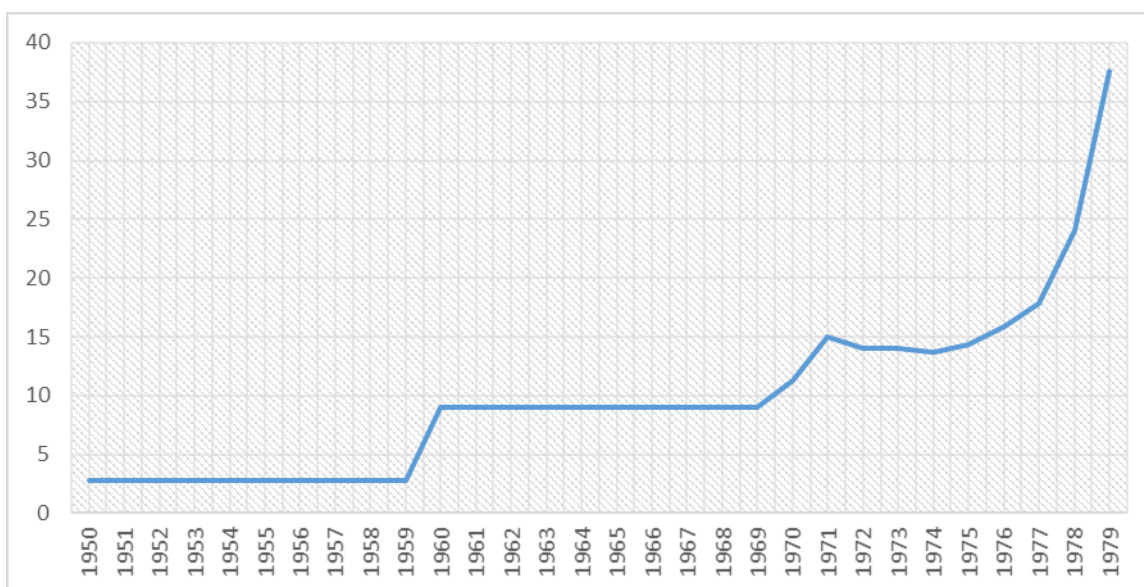


Source: The Ministry of Development, 2016

Note: A/Y denotes the share of agricultural sector as of GDP, M/Y denotes the share of manufacturing sector as of GDP

Figure 2.1. GNP by Sectors at 1968 Prices, between 1948 and 1967, as of GDP

In Figure 2.1, the GNP share of agricultural sector and of industrial sector is depicted between 1948 and 1967. During this period as shown in this diagram, the agricultural sector was the more prolific sector compared to the industrial sector. Yet, the share of the industrial sector in GNP had been increasing especially after the early 1960s.



Source: TurkStat, 2016

Figure 2.2. Average exchange rate, in terms of \$=TL, between 1950 and 1979

In this ISI-led industrialization era, the fixed interest rate ensured that imports became cheap, while exports became more expensive than imports due to the appreciated exchange rate. And in the beginning of this period, the agricultural sector generated the necessary foreign currency funds for the industry sector. Because the agricultural sector was more substantial than industry between 1947 and 1953, as is seen in Figure 2.2, and as Pamuk (1984) indicates, the ratio of exports of the agriculture sector to Gross National Product was more than 7%. Under the fixed exchange rate, as is seen in Figure 2.2, the exchange rate revalued after the 1958 crisis, due to the devaluation of currency against US dollar. Before 1958, as we see in Figure 2.2 when 1 \$ equaled 2.80 TL and the with the devaluation of 1958 when 1

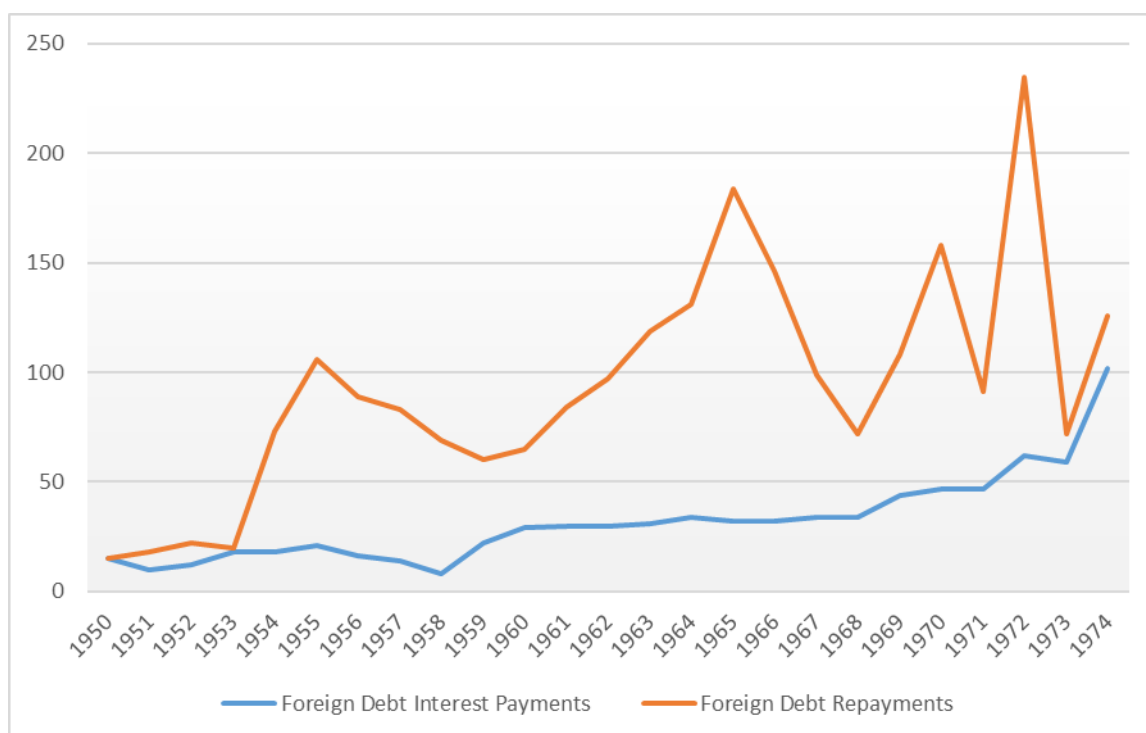
\$ equaled to 9 TL (Kazgan, 2008). The devaluation is also called the *de facto* devaluation due to the fact that there was no formal devaluation agreement taken by the government.

Before the 1958 crisis, in the Democratic Party era, government expenditures had increased, real interest rates were at negative levels, low interest policy was managed by the Ziraat Bank, the agricultural state controlled entities were established and efficient subsidy policies for farmers were operated by the government between 1950 and 1960 (Kazgan, 2008: 109). However, short term external debts had increased and they were 30% more than exports and the due date of most of external debts had already passed before the 1958 crisis. After the 1958 crisis, under the IMF-led economic policies, these policies were imposed due to the Stand by Agreement with the IMF. After this crisis, foreign trade and export needed to be improved and the quota policies were executed and the quota was divided partly with 40% for intermediate goods and with 20% for consumption goods (Kazgan, 2008 cited in Ekzen, 1980).

With this Stand by Agreement, interest rates and exchange rates increased, the monetary policy was tightened and price controls were removed whilst the credit ceiling policy of the Central Bank was put in place. All of these policies caused economic stagnation in the early 1960s and in the period which followed the 1960 coup d'état and inflation decreased from 5.4% in 1960 to 2.7% in 1961 ~~and~~ thus planned economic policies were taken (Kazgan, 2008). In this period, Keynesian policies were adopted by the government.

Under the ISI-led industrialization policies and the International Monetary Fund's (henceforth IMF) stand-by agreements that were signed by the IMF with Turkey in

1961, 1962 and 1963, new export and monetary policies were designated and industrial growth rates increased more than, that of the agricultural sector, in the early 1960s. However, this growth rate was clearly not stable due to the financing of external debts eventhough this was not due to one source nor one policy.



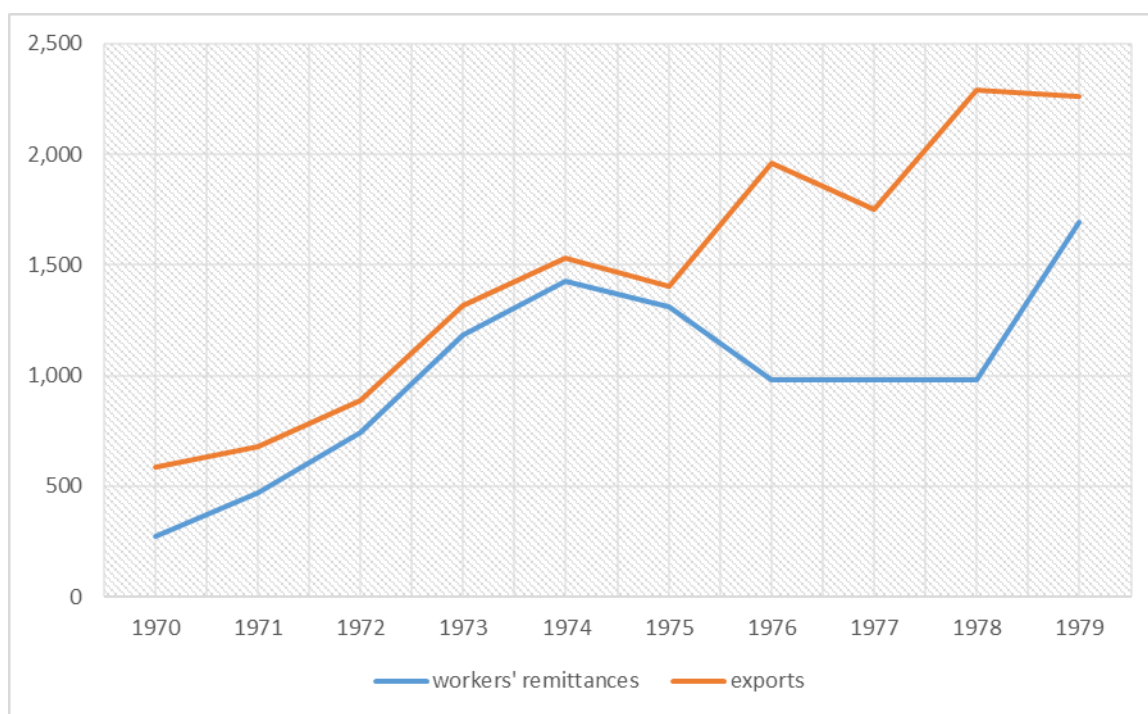
Note: All the series were taken from Current Accounts data, and all the data are multiplied by -1 to obtain the positive flow data

Source: The Ministry of Development, 2016

Figure 2.3. The Foreign Debt Interest and Repayments, million \$, between 1950 and 1974

In Figure 2.3, the foreign debt interest and repayments between 1950 and 1974 are represented. In this graph, foreign debts and interest payments had been increasing in the early 1960s and after the 1958 crisis, the payments can be considered as an important debt burden for the government/public sector. The debts were their main

expenditure, way ahead of making public investments stimuli, incentive policies or other macroeconomic policies.



Source: World Bank, 2016 for workers' remittances series; Turkstat, 2016 for exports series

Figure 2.4. Workers' remittances and exports relation, between 1970 and 1979, million TL

Just after the 1970 devaluation, workers' remittances had been increasing close to the level of exports as Pamuk (1984) pointed out. Indeed in Figure 2.4, this relation between workers' remittances and exports between 1970 and 1979 is shown. As we see in figure 2.4, the workers' remittances were one of the main sources of economic growth, which were closer to exports trends between 1970 and 1975. It was clear that workers' remittances generated the 'illusion sphere' for economic growth, while the economic policies themselves were weak or incomplete. However, the sustainability of the workers' remittances was not possible after the pressure of the first and second

oil crises on the Turkish economy, which created a widening gap between exports and imports.

In the early 1960s, labor unions had an increasing role for wage bargaining in industry. Real wages are adjusted to inflation and had been increasing since the early 1960s. For Keyder (1987), real wages of unionized labor increased by between 5% and 7% between 1963 and 1971. The Unionization Law, which was passed on the 24th July 1963, allowed workers to have labor agreements and strikes. Özşuca (1995: 119-120) emphasized that during the military administration period that banned strikes from 1971, real wages decreased, however real wages would increase again after 1974. Indeed, real wages in the manufacturing sector increased by 5.4% per annum between 1970 and 1977.

These real wages increased the cost of the manufacturing sector. However, the increased real wages also pushed domestic demand upwards, especially for consumption goods. Increasing domestic demand and keeping fixed exchange rates at a high level generated a domestic market-oriented manufacturing sector. This led to other high profit opportunities with cheaper imports. Therefore, the manufacturing sector was not incentivized for and did not aim at export-oriented strategies.

In the pre-1980 era, the government made necessary infrastructure investments for sustainable capital accumulation. Moreover, government policies called for cheaper imports rather than exports under their fixed exchange rate regime. And the unionization of labor caused an increase in real wages increased the domestic demand further.

To understand the radical transformation of capital accumulation in industry, the points that were emphasized by Boratav (2015) are very significant. For Boratav

(2015: 126-127), we need to examine two parts of the ‘5 year’ developing plans in Turkey between 1962 and 1976 to appropriately understand these economic policies for the capital accumulation process. The first ‘5-year’ plan needs to be evaluated separately since its aims are different to those of the second or the third ‘5 year’ plans. The first Five-year plan was conducted immediately after the 27th May 1960 Coup in Turkey. It was considered a sustainable source of economic growth directed by the government. Government expenditures and government based industrial expenditures with ISI-led industrialization policies were the main themes of this plan. The second and the third Five year plans aimed at creating private capital accumulation with incentive and subsidy based policies. And, in these plans, the role of government was limited to that of only a supporting role for markets via incentives and subsidies.

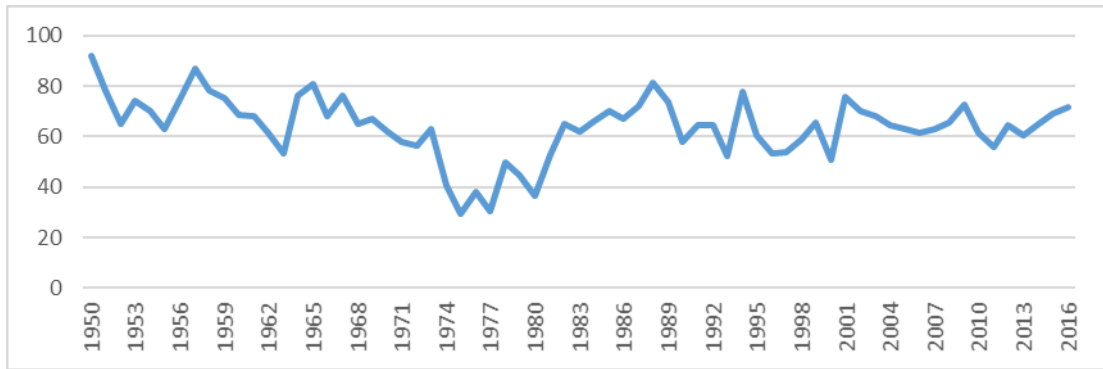
According to Boratav (2015)’s criticism, the 5 year development plans after the third 5 year plans, led to no change at all for capital accumulation in the country. The contradictions between the capital accumulation objectives and political aims had been increasing constantly especially in the post 1980 era.¹

Taymaz and Suiçmez (2005) emphasized that in the post-1960 era, import substitution policies became the industry strategy as was written in various 5 year development plans and the GDP growth rate was around 3-4% which was a growth rate considered to be a progress and higher than before.

Yet, in the midst-1970s, the current account deficit and the pressure of increasing oil prices became more of a priority ahead of the imports and investment in intermediate goods. This led to the Turkish economy being faced with the 1978 crisis.

¹ The main aims of the 5 year development plans are given in the Appendix A.

Şenses and Kırım (1991:364) underlines that the sub-sectors like the textile industry, the glass industry or the iron and steel industry were the main pillars for the import substitution policies and they played an important role for these policies. It is to be noted that the roots of these sectors are in the early 1930s and we thus consider them to be mature sectors in the pre-1980 era. However, in this period especially in 1978 and 1979, import bottlenecks caused idle capacity utilization. Indeed in this period, the capacity utilization of these sectors was below that of the desired rate of capacity utilization.



Source: TurkStat, 2016

Figure 2.5. Proportion of imports covered by exports, %

In Figure 2.5, the proportion of imports covered by exports of the Turkish economy is depicted between 1950 and 1974. As we can see in Figure 2.5, exports were lower than imports in that period. It shows that one of the main problematic aspect of the Turkish economy in ISI-led industrialization period, was the economy's dependence on imports for production and the economy was not necessarily prone to exports as intended but rather tended to sell to the domestic market.

According to Öniş (2010: 52), the economic crises and political breakdowns had a significant effect on the Turkish economy since the late 1950s. In the pre-1980 era, in 1958, the fiscal and balance of payment crisis that followed an IMF stabilization

program had played an important role for the political breakdown. The political breakdown of this period was the 1960 coup d'état that linked the resulting economic crisis with the IMF program and this led to the collapse of democracy in that period.

In sum, the ISI-led industrialization policies failed due to dependence on excessive levels of foreign exchange to procure capital goods, excessive fiscal deficits with different social groups and the state, and the role of oil crisis spelt the end of ISI-led industrialization policies (Sönmez, 2011: 106). In that period, the Turkish economy had experienced surges in political and economic tensions. The changing nature of the political and economic regimes, in that period, are indeed the key source of the unsustainable capital accumulation process of that time.

2.1.2. Capital Accumulation in the pre-1980 period

In Turkey, between 1950 and 1959, the liberalization and agriculture-based strategy was the main anchor for capital accumulation in the Turkish economy. In this period, the Turkish economy was faced with the 1958 crisis and then the military coup in 1960. The double effects of the political and economic instability in the early 1950s had a significant impact on the economic policies and future economic downturns. In line with this, there has not been sustainable capital accumulation due to these political and economic troubles. In the subsequent period, between 1960 and 1979, the ISI-led industrialization under government protection was the main cause for capital accumulation. The ISI-led industrialization and capital accumulation phase ended with the 1978 and the 1979 fiscal and balance of payment crises. The main failure of the ISI-led industrialization policies for sustainability of the capital accumulation comes from different channels. These channels were dependent on workers' remittances for financing the government expenditures, whilst the se

instability in the foreign exchange market, even if it was fixed, were protecting only some specific industries that generated increases in profit share. So, there was a domestic demand orientation of these protected firms. However, this was not export markets increasing demand that would have catalysed high wage increases in that period.

Due to the aforementioned reasons, ISI-led industrialization policies generated unsustainability of the capital accumulation regime. ISI-led industrialization policies were generally successfully organized in the developed countries due to the fact that they produced the 'imported' goods in the domestic markets. Under the political instability and high instability of the economic markets, Turkey was not a successful economy in terms of implementing ISI-led industrialization policies for the sustainable capital accumulation in the pre-1980 period.

2.2. The Missing Link between Macroeconomic Policies and Investment in the post-1980 era

Following the 1978 Crisis, and the coup d'état in September 1980, the capital accumulation process and structure were re-established and it was the reversal of ISI-led industrialization policies and the capital accumulation process based on the ISI-led industrialization policies. The coup led to the longest military administration of government between 1980 and 1983 and this administration executed the 24th January Decisions. These decisions provided new principles for the transformation of structure of capital accumulation in Turkey. With the help of these decisions, the Turkish economy entered into a new phase of neo-liberalism.

Yeldan (2006) divided the post-1980 periods into two phases so as to better understand the pathways of the Turkish economy in the post-1980 period. In the first

phase (1981-1988), was called '*structural adjustment within a export promotion period*' whereby the foreign exchange and FDIs were controlled. The main instruments for export promotion and macroeconomic stability were the foreign exchange system and export subsidies/incentives. Real wages were increased by 90% in cumulative terms between 1989 and 1991 under the populist policies, as Yeldan (2006) highlights. Yet, wage income decreased in this period under organized labor policies.

In the first stage of the post 1980s periods, capital accumulation was based on export incentive subsidies and other incentive systems.

In the second phase (1989-2003), as we saw clearly in the Five Year Development Plans above, public investments were devoted to socially desirable outcome-based infrastructure projects. For Yeldan (2006), a more fair tax system, improved living standards, problematic private tax evasions due to a under-developed tax system-led to weak capital accumulation, in that period². In the second phase of the post 1980 period, investment incentives were removed due to the full membership to the Customs Unions, and the fragile economic framework may have dampened the capital accumulation in that period too.

Another feature of the post-1980 period is the post -1980s adjustments that generated an oligopolistic manufacturing sector as Yeldan and Boratav (2001) demonstrated, is in large part due to low labor costs via low real wages. In that period, profit shares in the manufacturing sector increased, while the labor share decreased.

² Arikboğa (2015) gives the review of tax system under the financialization process in the post 1980 period, which the tax system was unfair and the cost burdens of financial crisis has been paid by the labor due to the unfairness of the tax system.

After the early 1980s, the Turkish economy had experienced a neo-liberal transformation process until the 2001 financial crisis in which the Turkish economy experienced costly bankruptcies due to the widening of the current account deficit, 'hot' money outflows under lax regulations and the monitoring scheme (Öniş,2010: 50) . Exports and finance-led the capital accumulation regime in the post-1980 era.

Under the shadow of the coup d'état of the 1980, the political climate seemed unstable between 1980 and 1990. After the military intervention years, there were many administration changes (Koska, 2005). From all these political changes, the Turkish economy underwent a transformation period after the so called '1978 bottleneck' which (as mentioned above) was mainly caused by huge foreign debts as well as two oil crises.

After the military government period, the Turgut Özal administration years started after the 1983 elections. For Öniş (2004: 114), this era was characterised by trade liberalization and the transformation of the Turkish manufacturing sector was done in order to make this sector more competitive in international markets. This became known as the early years of the export liberalization transformation process. Indeed, between 1980 and 1983, subsidies on exports were the main component of the export promotion tools (Taymaz and Yılmaz, 2007: 5). Between 1980 and 1987, export subsidies over export value reached record levels at almost 23-25%. On the other hand, import barriers were removed after 1994. Quantitative barriers were drastically removed and radical restrictions were made on imports, as Togan (1994) highlights. In the late 1980s and the early 1990s, tariff rates were reduced significantly and import allowances for commodities were removed especially on capital goods and

intermediate goods.³ In the post 1980 period, the major financial liberalization process was characterized by the removal of exchange controls, the expansion of export incentives and subsidies, FDI oriented policies, liberalization of interest rates, privatization and the shift from income transfers to price mechanisms as well as the deregulation of goods and labor markets (Yalta,2006; Onaran, 2007).

One of the major steps of the financial liberalization policy was the removal of all the controls on bank interest rates by the government on July 1, 1980. Another major and huge step was allowing new capital flows, in the late 1980s. Under the decree no. 32, the Turkish economy had been entering a new phase of neoliberal restructuring since the 1989 and this period is called a financial liberalization period and the main aim of this period was to support financial institutions in order to create economic growth and thus capital accumulation.

Öniş (2010) explains that coalition governments and a single party administration had different roles and impacts for the economic instability that followed. In the single party administrations, for example that of: the Democrat Party (between 1950 and 1960); the Justice Party (between 1965 and 1971), the Motherland Party (between 1983 and 1991) and the Justice and Development Party (since 2002), Turkey had experienced good economic growth periods. However, for short periods of coalition governments between 1973 and 1980 in which four governments had been elected, and between 1991 and 2002, in which seven governments had been elected, these periods were examples of weak economic growth performance and economic instability. Hence, coalition governments had been short lived as political and economic instability rose during these coalition government periods. The single

³ The quantitative restrictions pushed the wedge between the domestic and international price of imports was 50% in 1980, and that it declined by 10% every year, finally to zero by 1986 (Krueger and Aktan, 1992).

government periods had ended when economic growth or economic performance declined and the fate of the all the single governments' (except that of the Justice and Development Party) external debts or other economic policies were unsustainable and these were also the cause of their eventual downfall, as with many similar other governments.

Öniş (2006) emphasized that under the underpinnings of Washington Consensus, which was the main drive behind the neo-liberal transformation of the Turkish economy, the following outcomes ensued: the weakness of state's capacity, the premature transition to full capital account openness without the necessary regulations, fiscal and monetary discipline originating from the macroeconomic unstable economy, the fragile and lop-sided economic development pattern and the economy was heavily dependent on short-term speculative capital inflows.

For Balcılar and Tuna (2009: 614); in the pre-1980 period, there were short term policies and programs that were designed for economic stability, while in the post-1980 period, long term policies and programs were jointly designed by the IMF and the World Bank. The main goals of the post-1980 long term policies were: price stability and sustainable economic growth. Moreover the programs involved financial liberalization and outward oriented policies. The program was completed in August 1989.

In the post 1980 period, the expected and actual growth rate of industry, agriculture or services and the GDP are to be seen in Table 2.1. In this table, the industry growth was more than ex ante growth rates only in 1984 and 2006. In the 1986 and 2006 programs which are specific development programs, the growth of the service sector was more than the expected growth rates in the same years. For agricultural growth,

this was more than the ex ante growth rate just in the 2006 program alone. The mismatch between ex ante and ex post growth rates of the industry reflect some of the misconnections in these industrial policies. Regarding the development plans which are to be scrutinized in the following chapters of the thesis, these have not reflected the industrial structures and needs of that time.

As we can see in Table 2.1, the growth rate of industry, according to the development plans and programs, have been problematic in Turkey. And if we carefully review Table 2.1, we can see that when the ex ante growth rate of industry is above ex post growth rate of industry whilst the ex post economic growth rate is above the ex ante economic growth rate.

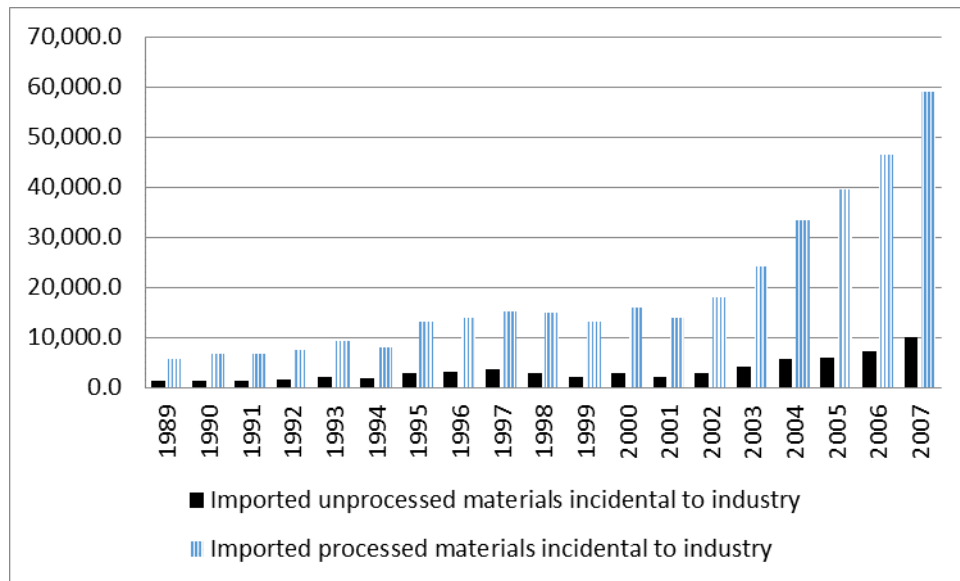
The imported intermediate goods for industrial use between 1989 and 2007, are identified according to their type and are depicted in Figure 2.6. Mostly processed materials incidental to industry, have been imported for industrial use in this period.

Table 2.1. The Development Plans, The Expected Growth Rates, and Actual growth rates

Development Plan Name	IV. PLAN 1984 PROGRAM		V. PLAN		VI. PLAN		VIII. PLAN		2006 PROGRAM		IX. PLAN			
Date	1979-1983		1985-1989		1990-1994		2001-2005		2006		2007-2013			
	T	R	T	R	T	R	T	R	T	R	T	R		
Agriculture	5.3	0.3	3.5	0.5	3.6	0.8	4.1	1.6	2.1	1.0	1.5	2.9	3.6	2.2
Industry	9.9	2.4	6.6	9.9	7.5	6.5	8.1	3.8	7.0	4.9	5.1	7.6	7.8	3.7
Services	8.5	2.6	4.5	7.9	6.5	5.0	6.7	4.1	7.5	4.8	5.7	5.8	7.3	4.2
GDP (At factor cost)	-	2.2	4.9	6.0	-	4.6	-	-	-	-	-	-	-	-
GDP (At market prices)	8.2	2.0	5.0	6.7	6.3	4.6	6.8	3.6	6.5	4.3	5.0	6.1	7.0	3.4
GNP (At market prices)	8.0	1.7	6.1	7.1	6.3	4.7	7.0	3.5	6.7	4.1	5.0	6.0	-	-

Note: T and R show target and realization, respectively.

Source: The Ministry of Development, 2016



Note: Due to the 2008 data not being available; the time span is selected between 1989 and 2007.

Source: The Ministry of Development, 2016

Figure 2.6. The Imported Intermediate Goods for Industrial Use, Million \$, 1989-2007

In the post-1980 period, the political downturns had rarely been noticed compared to the pre-1980 period. However, the Turkish economy had experienced the first major crisis of this neoliberal era in 1994 with a ‘postmodern coup’ in 1997 that was a reaction to the Welfare Party’s dominant role in the coalition government as Öniş (2010: 52) highlighted. Following the economic and political breakdowns between 1994 and 1997, the Turkish economy experienced a second and then a third economic crises of the post-1980 neoliberal era with the help of the IMF, the WB, and the EU directed restructuring policies. In that period, 1999 and 2001 were the major economic downturns for the economy. However, in that period, the political breakdown came from the EU membership process and related major democratization reforms, as Öniş (2010: 52) also indicated.

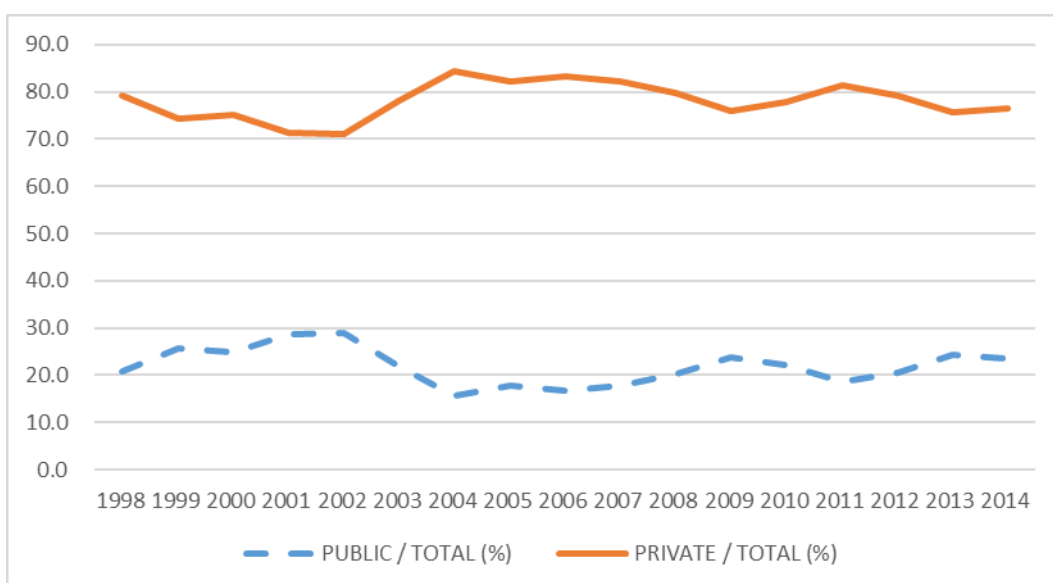
Table 2. 2. Selected Indicators for Turkish economy, between 2002 and 2014

year	Imported Investment goods/ Total imports, % ^a	Imported Intermediate goods/Total imports, % ^a	Imported Capital and intermediate goods/Total imports, % ^a	GDP growth rate, % ^a	RER, 2003=100 ^a	Real interest rate, %	CBRT discount rate, % ^a	Wholesale price index, % change, average annually at December ^a	Industry production index, average, annual, 2010=100 ^a	Net credits volume as of GDP, % ^a	Domestic credit to private sector as of GDP, % ^b
2002	16.29	73.04	89.34	6.16	-	18.80	55.00	50.10	72.92	10.42	14.52
2003	16.33	71.73	88.06	5.27	100.05	19.70	43.00	25.60	70.51	12.96	14.55
2004	17.84	69.25	87.09	9.36	103.23	15.10	38.00	11.10	73.34	15.78	17.28
2005	17.44	70.11	87.55	8.40	112.90	6.80	23.00	8.24	80.40	21.04	22.25
2006	16.73	71.36	88.09	6.89	111.17	8.60	27.00	9.34	86.49	25.17	25.94
2007	15.91	72.70	88.61	4.67	119.14	10.00	25.00	6.31	93.54	28.96	29.50
2008	13.87	75.14	89.01	0.66	118.45	8.80	25.00	12.72	101.24	31.77	35.21
2009	15.23	70.61	85.84	-4.83	110.35	6.40	15.00	1.23	100.40	35.62	39.18
2010	15.53	70.84	86.37	9.16	120.71	-0.10	14.00	8.52	100.00	44.01	47.14
2011	15.48	71.89	87.36	8.77	106.43	2.30	17.00	11.09	106.59	49.48	53.11
2012	14.34	73.95	88.29	2.13	109.21	-0.10	13.50	6.09	108.84	54.22	57.86
2013	14.61	73.04	87.65	4.19	107.51	0.20	10.25	4.48	104.90	65.86	70.10
2014	14.86	72.97	87.84	2.87	102.31	0.90	9.00	10.25	112.70	68.15	74.60

Source: for a, The Ministry of Development, 2017; for b; Central Bank of Turkey EDDS,2017; for c; The World Bank, 2017

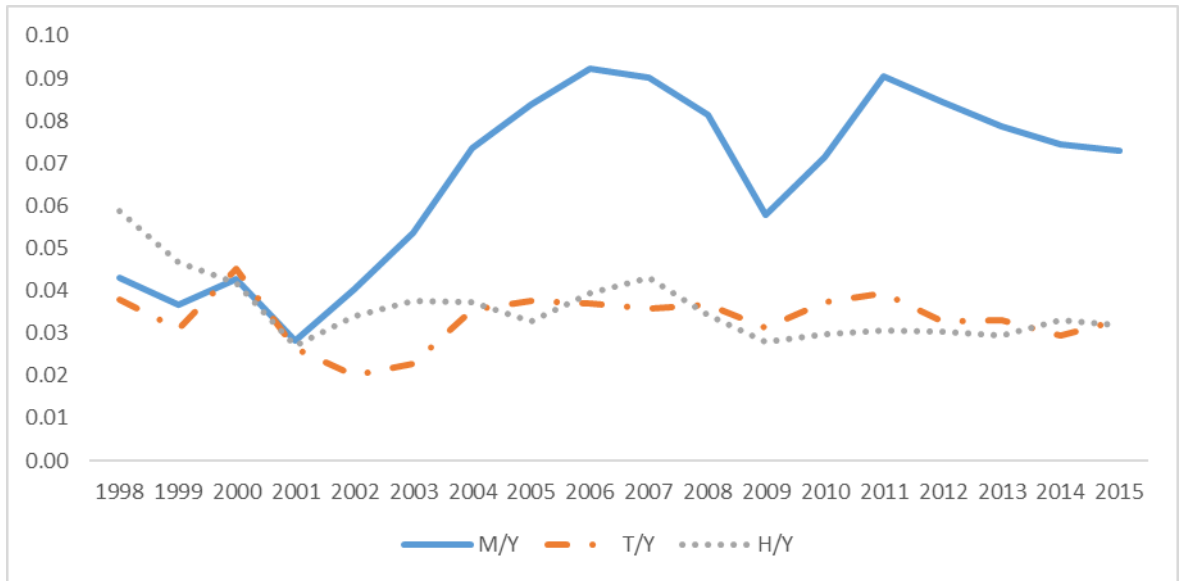
The selected indicators for the Turkish economy in the post 2001 crisis period are depicted in Table 2.2. According to Table 2.2, the Turkish economy had experienced an unstable economic growth period with low interest rates, which generated a credit driven private sector. Furthermore, imported capital and intermediate goods had an important share of the total imports. Production was mainly based on imported capital and intermediate goods in Turkey. In parallel, the pattern of inflation (production based) did not have a stable path in the economy.

The investment path of the aggregate economy is seen in figure Figure 2. 7. As in Figure 2. 7, the private sector investment had been more than that of the public sector between 1998 and 2014. Moreover, private investment had the biggest portion of the investment in that period.



Source: Ministry of Development, 2017

Figure 2. 7. Public vs. Private fixed investment as share of total investment in Turkish economy, between 1998 and 2014.

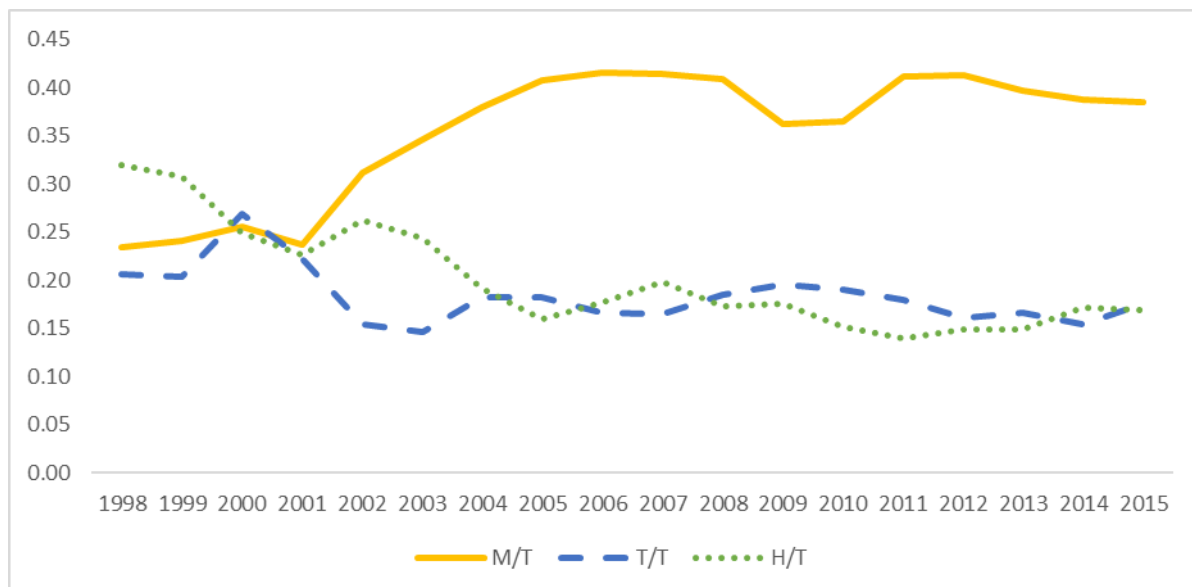


Note: M/Y, T/Y, and H/Y denote manufacturing sector investment as of GDP, transportation investment as of GDP, and housing sector investment as of GDP.

Source: Ministry of Development, 2017

Figure 2.8. Gross Fixed Investments by Sectors (Private), 1998-2014, At 1998 Prices, as of GDP, Top 3 Sectors

In Figure 2.8, gross fixed investments by the top three sectors is shown between 1998 and 2014. According to Figure 2.8, after the early 2000s, the investment in the manufacturing sector is more than that of the transportation sector or the housing sector.

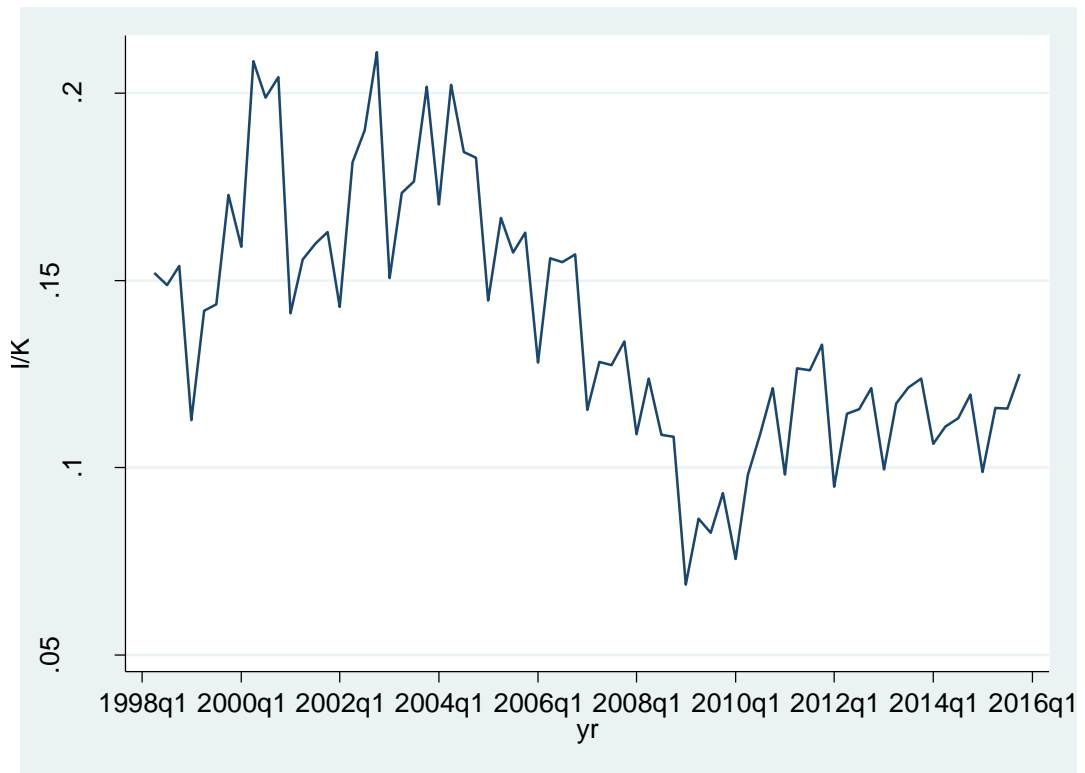


Note: M/T, T/T, and H/T denote manufacturing sector investment as of the total of the private sector investment, transportation investment as of the total private sector investment, and housing sector investment as of the total private sector investment

Source: Ministry of Development, 2017

Figure 2.9. Gross Fixed Investments by Sectors (Private), 1963-2014, At 1998 Prices, Percentage Share, Top 3 Sectors

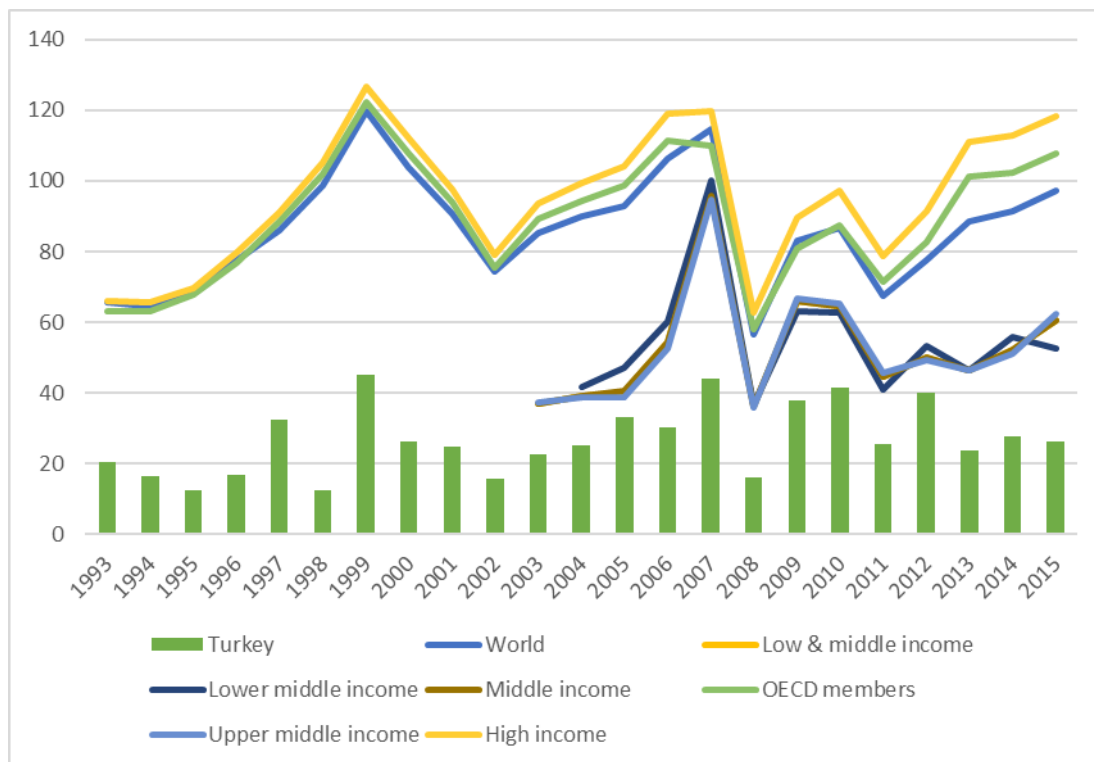
In Figure 2.9, the biggest portion of private gross fixed investment belongs to the manufacturing sector. The second is the housing sector, and the third one is transportation and then the communication sector. The share of transportation and communication investments and of the housing sector investment have also been rising in the private sector investments since the late 1990s. However, investment in both sectors have declined after the early 2000s. From that period, the share of the manufacturing sector investment has been increasing since the early 2000s.



Note: K is estimated by using the perpetual inventory method by which the depreciation rate is taken as 7% according to Yilmaz (2015). Investment is scaled by lagged capital stock. The investment data is taken from CBRT EVDS Database.

Figure 2.10. Investment to Capital Ratio in the Economy between 1998q1 and 2015q4, Realized

In Figure 2.10, investment to capital ratio is seen between 1998q1 and 2015q4. In Figure 2.10, the investment ratio is on a stagnant path between the early 2000s and 2016.



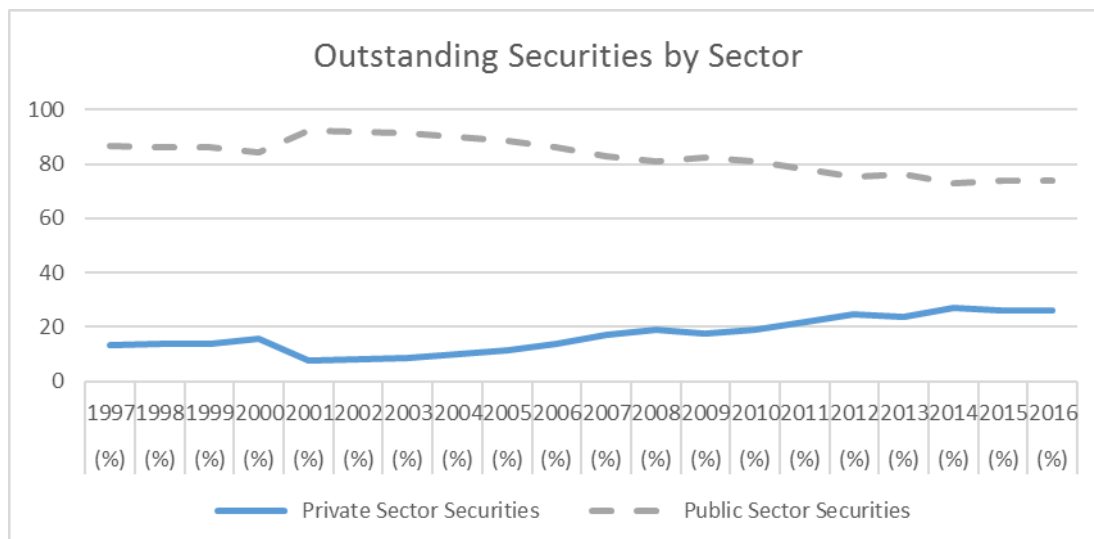
Note: Before 2003, there is no available data for the upper middle income, lower middle income, and middle income series

Source: The World Bank, 2017

Figure 2.11. Market capitalization of listed companies, as of GDP, %

In Figure 2. 11, market capitalization of listed companies as of GDP⁴ is given, again in a comparative approach. It is clearly seen that the market capitalization of listed companies in Turkey is below that of most income levels and the world average level.

⁴ In World Bank (2017)'s definition, the market capitalization shows the financial development of capital markets. URL: <http://databank.worldbank.org/data/reports.aspx?source=2&type=metadata&series=CM.MKT.LCAP.GD.ZS#> (Retrieved on 11.04.2017)"



Source: Turkish Capital Market Board, 2017

Figure 2.12. Outstanding Securities by Sector, %, 1997-2016

The capital market deepening has not been developing, as shown in Figure 2.12. This is due to the fact that, most of the outstanding securities belonged to the public sector between 1997 and 2016.

2.3. Industrial Policies and Institutional Framework in the Turkish Manufacturing Sector

Leading to this investment climate in the Turkish manufacturing sector, ad-hoc strategies were given emphasis due to the importance of the need of an economic and political framework for investment. The ad-hoc policies changed the path of industrial policies as well as the direction of capital accumulation.

In the planned era, such as under the Democrat Party government, investment reductions were made in 1963, with the amendment of the Income Tax Law and the “Regions with Priority in Development” (RPD-KÖY in Turkish: Kalkınmada Öncelikli Yörelere) that was introduced in 1968, as outlined by Atiyas and Bakış (2015).

During the export-led growth policy era, between 1980 and 1989, the exports had been rising due to government policies. The main aim of industrial policies was to promote exports through investment incentives, which were applied directly to specific sectors or regions as well as industrial zones, in the 1980s. During that period, export incentives were mostly given, in terms of, export tax rebates for certain goods. Even up to 20% of export earnings could be deductible from taxable income and there were also subsidized credit options for exporters in the 1980s and in the early 1990s (Atiyas and Bakış, 2015).

In the export oriented growth period, there were five export incentives to promote export-led growth, which were tax rebates, export credits, foreign exchange and duty free import, RUSF (Resource Utilization Support Fund) and a drawback from indirect taxes (Arslan and van Wijnbergen, 1993: 130). For tax rebates on manufactured and some other goods, 20% of export earnings was deducted from taxable income if the annual export of the firm exceeded \$ 250,000, while 5% of export allowance was an available option for traders who did not produce exported goods. With indirect taxes, large exporters started benefiting from global drawbacks which were based on annual net foreign currency. However, this incentive was abolished in 1986 due to unrelated rebates to actual taxes paid and due to regulatory laxness. For foreign exchange allocations and duty-free import allowances, the duty-free imports were between 40% and 60% of the exported amount. For RUSF, which can be considered as the most efficient subsidy for export-led growth, this provided a cash based export subsidy that was based on the export value.

Eser (2011) emphasized that RUSF established in 1984 under the Decision 85/10011 provided export grants in terms of cash which were around 50% of investments. For Atiyas and Bakış (2015), RUSF was one of the few cases in which the government

provided cash support for investments and RUSF generated substantial investments.

Due to over-invoicing of exports, the Support and Price Stabilization Fund (henceforth SPSF) succeeded the RUSF scheme and this SPSF provided export subsidies based on export volume.

Eser (2011:79) argued that the main point of establishing RUSF was following the fiscally and relatively comfortable years of the 1980s but later conditions became tighter. The RUSF however was eventually removed in 1991 and cash transfer based subsidies were later removed in 1995.

Export credits, under the export-credit-rediscout scheme, caused some problematic issues as Arslan and van Wijnbergen (1993: 130) explain below:

Under the export-credit-rediscout scheme, exporters holding certificates and reaching minimum levels of exports can obtain preferential credit for up to 25% of their export commitment at an interest rate of 38%, far below market lending rates over the entire period. The measure of export subsidies used below incorporates the last four categories of subsidies, converted into ad-valorem equivalents. Deductions from taxable corporate income were not included; it cannot be converted into a general measure, as its value depends on the tax situation of each individual firm.

Moreover, Özler and Yılmaz (2009: 342) explain that there had been some changes in tariffs and export incentives. Not only the RUSF but also the role of tariffs had decreased for foreign trade and tariffs had reduced significantly and it was 20.7% in terms of output weighted tariffs, while the rate was 75.8% in 1983.

However, for Atiyas and Bakış (2015), the Customs Union is the milestone for the industrial policy development in the Turkish manufacturing sector in 1995 due to Turkey becoming a member of WTO (World Trade Organization) in February of that year. In March also of that year, the Customs Union with the European Union (EU) was established and this clearly changed the direction of industrial policies. For Eser

(2011), under the WTO Agreement on Subsidies and Countervailing Measures (SCM), the export incentives could not be adopted and this had a direct impact on domestic markets. Eser (2011) underlined that the incentives or subsidies that targeted specific sectors were also banned according to the WTO SCM. In the WTO SCM, the subsidies are described in the Article 1 as follows (WTO, 2016: 229) ;

.....a subsidy shall be deemed to exist if: (a)(1) there is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as "government"), i.e. where: (i) a government practice involves a direct transfer of funds (e.g. grants, loans, and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees); (ii) government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits)¹ ; (iii) a government provides goods or services other than general infrastructure, or purchases goods; (iv) a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments; or (a)(2) there is any form of income or price support in the sense of Article XVI of GATT 1994; and (b) a benefit is thereby conferred.

However, the WTO SCM approved subsidies to specific regions, which is described under the Article 2, on 2.2, as follows (WTO, 2016: 230);

A subsidy which is limited to certain enterprises located within a designated geographical region within the jurisdiction of the granting authority shall be specific. It is understood that the setting or change of generally applicable tax rates by all levels of government entitled to do so shall not be deemed to be a specific subsidy for the purposes of this Agreement.

For Sykes (2003:9) the WTO SCM operated within the scheme that was applied during the Uruguay Round and is an extended version of GATT (General Agreement on Taxes and Tariffs) and banned export subsidies as follows;

First..... market access expectations can be upset not only when an importing nation introduces a new subsidy to domestic firms, but also when third countries introduce subsidies that result in a diversion of business to their exporters. A relatively inexpensive way for third countries to divert trade toward their exporters is through the use of export subsidies, and history

teaches that nations will employ them in the absence of legal constraint. Second, even if an export subsidy would do nothing to frustrate the market access expectations of other trading nations (as where it is longstanding and fully anticipated), it is almost certainly a source of economic distortion. ... economic theory suggests that subsidies can at times serve as a device for remedying market failure. In general, a subsidy to correct a market failure should be made contingent on the activity that is undersupplied because of the market failure.

As WTO SCM shows, and Atiyas and Bakış (2015), and Eser (2011) emphasized there are indeed (under this WTO SCM framework) no allowances regarding vertical subsidies thus for horizontal ones (which means for regional development), research and development or environmental protection for example, these would be out of the scope of the WTO SCM directives. Apart from the WTO's SCM scheme, the entrance into the Customs Union with the EU requires the removal of export subsidies in the country and that economic zone. Indeed the EU Law bans subsidies and also considers them to be among the major threats to its common market policy. Eser (2011:43) emphasized that the EU Agreement, the 107th article with number 1, bans the subsidies under the following conditions;

- From using government funds/sources
- In providing an economic advantage
- Be destructive to competition or have the potential to obstruct competition
- Protect specific entities and/or specific products

However, the EU Agreement allows regional subsidies under specific conditions, such as:

- For regional development,
- For the adoption of industrial, environmental or new technology-led investments or R&D investments,

- For SME (Small and Medium Sized Enterprises) investment-based subsidies
- For General Economic Purpose based subsidies such as the 4 categories that are allowed by the EU (Eser, 2011: 44).

Export incentives are allocated on a regional basis and after RUSF and other related cash subsidies have been removed or banned by the WTO or the EU, under the Customs Union and so the scheme for capital accumulation had changed in Turkey. Following the Decree no. 32, foreign direct investment had a renewed importance for the economy, especially for financing the current account deficits. However, in the early 2000s, foreign direct investment had been given special importance for capital accumulation as well as for industrial policies.

In the early 2000s period, the industrial policies aimed at foreign direct investment, as stated in Enactment no. 4875 ‘Foreign Direct Investment Law’ and that was established in June 2003. This law reassures foreign investors with the the following increased advantages:

- I. Protection from direct expropriation
- II. Make foreign key personnel employment easier
- III. International Arbitration
- IV. Discount guarantee for real estate property
- V. Protection from amendment of legislation
- VI. Free exit right from the market

At this point, as Türel (2008) and Baydur (2015) criticized this law ~~for~~, for becoming the alternative to domestic investment. In fact, the Turkish manufacturing sector had become the new center of the FDI with this law.

For industrial policies, Türel (2008:6) highlights that the micro reforms, which were new tools of industry policies, were aimed at two main pillars for industry policy. One of the pillars is strategic coordination which is needed for the integration of the manufacturing industry to the global economy and which will allow it to have a place within the global value chain. For this mission, there are two tools that the Turkish government can use to transform the investment incentive system. And, the second tool is foreign direct investment for speeding up the integration of the manufacturing sector into global economy. The second pillar is determining the main framework of policy so as to remove barriers for investment and/or production for the manufacturing sector. The second pillar aims to remove barriers of entry and exit; to motivate firms to increase their scale; to remove informal procedures; enhance technological developments and innovation; to decrease costs of input (especially in the energy and telecommunication sectors); to improve the qualifications of labor and finally to extend the infrastructure of testing and quality in the manufacturing sector (cited in Türel, 2008: 7 from TEPAV-DPT, 2007).

For Yülek (2016), the decoupling of the international markets and market information, generated a problematic structure for industrial policies due to the focus on domestic demand. And sectoral specialization was not suitable to the global economy's future trends. The upstream and downstream policies were not taken seriously for these industrial policies, i.e. to become a large producer of the textile industry. Indeed, the manufacturing of textile machinery was not considered a future target. And yet, the chronic problem of the Turkish economy which is its import dependence was not considered more of a priority ahead of this industrial transformation and industrial policy.

For Yılmaz (2011) the non selective industrial policies which are consistent with neoliberal policies demonstrate the failure of structural transformation in the Turkish economy since 1980. For Yılmaz (2011) industrial policies should be selective, especially for industrial development. That is, for example, in its selection of industries according to their technological and economic capacities. For industrial policy this is a major challenge. However, we could not see any selective policy of this sort in the industrial policies in the Turkish economy. Atiyas and Bakış (2015) highlights that this major problem of sector selectivity and the industrial policy became neutralised in the 2000s. However, for Atiyas and Bakış (2015), in the 2009 and especially in the 2012 incentive systems, strategic investment may have overcome the selectivity or neutrality problem for industrial policy in terms of the selectivity of investments. The strategic investment selectivity criteria was based on high import levels and thus one that leads to the private sector making their own selection of products or industries they wished to invest in.

In Turkey since the early 2000s, consecutive investment incentive regulations have been increasing (see Table 2.3). Whether the investment incentives are improving for domestic investment is researched by Ay (2005), Erden and Karaçay-Çakmak (2005), Karaçay-Çakmak and Erden (2004) and Yavan (2012). The investment incentives are found to be useful for investment in terms of gross fixed capital formation between 1980 and 2003 by Ay (2005). Erden and Karaçay-Çakmak (2005) also researched the impact of investment incentives on the manufacturing sector between 1992 and 1999 in 24 cities in Turkey. These public support policies are investment incentives, credits and public investment for investment. However, only the public investment had positive effects on manufacturing investment, while

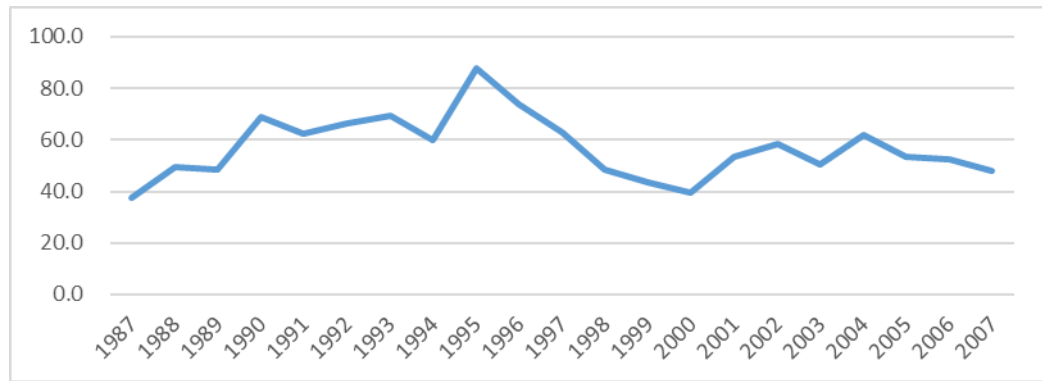
investment incentives and credits had no positive effects on manufacturing investment, in that same period.

Karaçay-Çakmak and Erden (2004) investigated the impact of investment incentives on manufacturing investment for 12 by using the same dataset which was also used in the study of Erden and Karaçay-Çakmak (2005). They concluded that there was no positive or negative effect on investment incentives on the private manufacturing investment in those regions. I can therefore conclude, that in the investment incentive literature about Turkey, we see that there is no consensus about the relation between investment incentives and investment.

Arslan and Ay (2008) researched the relation between investment incentives and investment in the Southeastern Anatolian Region in Turkey and they found no positive or negative relation between the investment incentives and investment either. Akan and Arslan (2008) found that the increase in investment incentives caused an increase in employment levels in the East Anatolian Region.

In the 7th Five Year Plan, investment incentive certificates were revised and in the plan the previous investment period is explained as follows (DPT, 2001: 33);

...a decrease was observed in investments with incentive certificate. The number and the total value of incentive certificates issued in 1995, 1996, 1997, 1998 and 1999 were realised as 4.955 certificates corresponding to 48.9 billion dollars, 5.023 certificates corresponding to 24.6 billion dollars, 5.144 certificates corresponding to 21.5 billion dollars, 4291 certificates corresponding to 15.4 billion dollars and 2.967 certificates corresponding to 11.2 billion dollars, respectively. In sectoral basis, in the period of 1995-99, while the share of manufacturing industry in total investment value of incentive certificates given fell from 87.6 percent to 43.4 percent....



Note: After 2007, the data reporting style was changed. Therefore, for sake of data availability, I use the data up to 2007.

Source: The Ministry of Development, 2009

Figure 2.13. Investment Incentives between 1987 and 2007, Share of Investment Incentive Certificates of the Manufacturing Sector (Percentage)

The investment incentives between 1987 and 2007 are depicted in Figure 2.13. In Figure 2.13, investment incentive certificates have peaked in the early 1990s. After the effects of the EU Customs Union membership, it decreased sharply. During the late 1980s, the RUSF had effects on investment incentives yet these effects were temporary due to the finance-led growth regime and the changing structure of the RUSF (after the 1989, the SPSF succeeded to the RUSF). These also had negative effects on the investment incentives. In the early 2000s, the share of the manufacturing sector increased but it did not lead to a stable path for investment incentives of the manufacturing sector in the post 2001 crisis era.

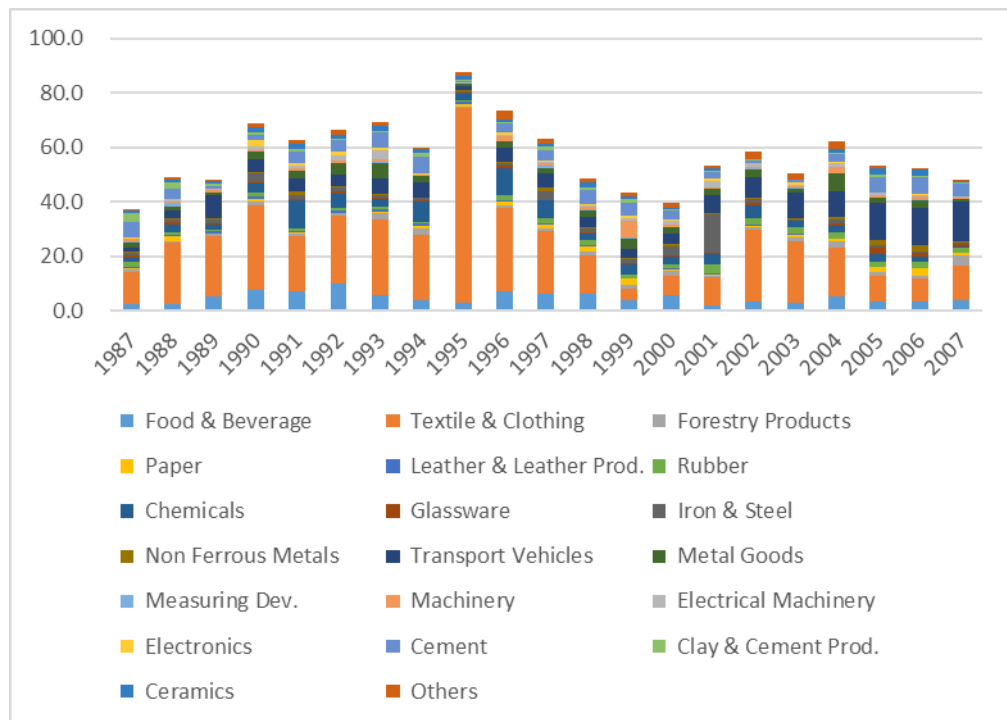


Figure 2.14. Investment incentives, by year, cumulative, by sectors, between 1987 and 2007, percentage

In Figure 2.14, investment incentives in cumulative terms, as a share of the manufacturing sector investment incentives, are depicted. Note that the total percentage gives the share of the manufacturing sector in the total investment incentives. Between late 1980s and pre-Customs Union membership era, the textile and clothing sector was a major sector for investment incentives. However, in the post Customs Union membership period, the total share of the investment incentives of the textile and clothing sector in the manufacturing sector investment incentives has been decreasing. In that period, the transport vehicles sector has taken the position of investment incentive flagship in the manufacturing sector.

For the investment incentive laws, which are depicted in Table 2.3, all the incentive laws are regionally oriented investments. However, it is the 2012 Act which outlines

the regional based investment incentives with sector selection through to strategic investments as well as the cluster based support.

Table 2.3. The Legal Enactments that operated between 2004 and 2012 for Investment Incentives

Law/Regulation	Regional Concept	Incentive Tools	Are incentives different at regional level?	Sector selection	Cross areas	Huge volume investments	Clustering Support
No.5084 Enactment, (acted in 2004)	36 cities	*Tax deductions, and employer's social security Premium support *Energy support * Land allocation	-	-	-	-	-
No. 5035 Enactment (acted in 2003)	36 cities + 13 cities = 49 cities	*Tax deductions, and employer's social security Premium support *Energy support * Land allocation	-	-	-	-	-
The 2009 System	4 Regions are based on IBBS Subsector 2 digits,	*Tax deduction, and employer's social insurance premium support *Land allocation *Customs duty exemption *Interest support *VAT exemption	×	-	×	×	-
The 2012 System	Economy wide, 6 Regions are based on IBBS Subsectors 3 digits	*VAT Exemption *Land allocation *Tax deduction, and employee's social insurance premium support (based on minimum wages), employer's social security premium support *Interest support *VAT Refund *Income tax withholding support *Customs duty exemption	×	×	×	×	×

Source: Acar and Çağlar, 2012: 10, Deloitte, 2014

In the post 1980 period, major government subsidies fueled the investment for the capital accumulation process, especially in the export prone sectors, i.e. RUSF was the main catalyst for investment in the export intensive sectors. However, the Customs Union pushed regional incentive based subsidies in the early 1980s. The changing nature of these government incentives may have created an unbalanced capital accumulation scheme. In the second part of the 1980s, with the full capital account liberalization, the short-term capital flow based speculative growth regime was established. In this period, the fragile economic framework due to a sudden stop risk, led to regional leapfrogging investment incentives. Hence, the role of the government is only seen as a provider of government investments in infrastructure projects and instead had negative effects on the sustainability of the capital accumulation regime in the inter-periods, in the late 1980s. With the help of sudden changes in interest rates, exchange rates and growth regime, this period led to stagnant investments in the private sector.

2.4. Summary

In Turkey, the transformation of industrial and macroeconomic policies seemed to lead far from a desired sustainable outcome. The pre-1980 period was shaped by ISI-led industrialization policies, of which, the main aims were important especially for the protection of industry. However, the unsustainability of foreign debt and the import bias in the pre-1980 period destroyed the ISI-led industrialization policies. Besides these various policies, political instability had been rising before export-led growth and any industrial strategy. The production tendency of the industrial sector was based on domestic demand while the ISI-led industrialization was aimed at a high technology intensive production. Nonetheless, the ISI-led industrialization

generated a domestic demand oriented industrial production with the help of government protection via interest rates and exchange rate allocations, policy instruments, cheap imports and high domestic demand, which also increased with the help of real wages.

In the post-1980 period, investment incentives were the main tools for export-led growth, and this period had two terms which was an export-led growth term between 1980 and 1989, and an finance-led growth term after 1989 financial liberalization period. Between 1980 and 1989, the investment incentives had aims for enhancing exports and in improving the export performance of the manufacturing sector, in particular. The incentives were mainly direct cash-based deductions but under the integration of the Customs Union process, the WTO and EU laws prohibiting direct incentives for exports negatively affected the previous successful period of the export incentives that then this ended in the late 1980s. In the financial liberalization period, FDI-led policies was the source of a more fragile and unstable economy due to the economy becoming dependent on short term capital inflows. ‘The sudden stop’ risk hit the economy three times in the 1990s. During that period, investment incentives were transformed and the key export incentives were removed and thus investment incentives were not as useful as before. In the 1990s, under the EU and WTO rules, investment incentives were transformed to become based on regional development criteria. The transformed regional oriented investment incentives became ‘leap frogging’ incentive instruments in the economy, as Atiyas and Bakış (2015) underlined.

With regards to the relationship between industrial policy or investment incentives and the Five year development plans, it was clearly demonstrated that there had been misconnections or misfits between them. The plans were based on contemporary

manufacturing needs, and unfortunately industrial policy was not often reflected in those plans. The misconnection thus generated unsustainable industrial policies. At this point, İyidoğan (2012) argued that the neoliberal movement that was under the Post Washington Consensus was the main reason for these industrial policies which were not actually adopted by government policies in that period. Indeed in that period, FDIs were also taken as a basis for industrial development as Türel(2008) pointed out.

Under these conditions, industrial policy and incentive systems had no common mechanism and this led to capital accumulation in the Turkish manufacturing industry. On the other hand, the Turkish economy was dependent on the external forces due to the import incentive nature of the manufacturing production and thus the industrial policies had been under the shadow of foreign institutions, as elucidated above.

CHAPTER 3.

INVESTMENT LITERATURE

This chapter gives a detailed review of investment models and of the existing literature related to applied research studies.

3.1. Investment Models

The investment models are explained in this chapter with the reference to theoretical underpinnings, and these models are divided into accelerator models, that of Neo Classical models (User costs of capital, and Tobin's Q), and that of New Keynesian models, as well as the Option Value Based models, which are among the standard investment models. As regards the heterodox models, these are Classical Keynesian and Post Keynesian Models (i.e Kaleckian, Bhaduri and Marglin, Rowthorn, Wood and Kenyon, Harrodian, and Robinsonian models) and I explain these briefly. In sum, in this chapter, I underline the difference between mainstream investment models and heterodox investment models.

3.1.1. Standard Models

In this part of the thesis, I give a brief explanation of the standard models of investment.

3.1.1.1. Accelerator Models

Investment is determined by output according to accelerator models. The accelerator models on investment date back to Clark (1917) according to Chirinko (1993). The Simple Accelerator Model which is based on Clark (1917)'s seminal work is further developed by Chenery (1952) and Koyck (1954).

The Simple Accelerator Model is based on the assumption that the desired capital stock has a linear relation with the output. In other words, the investment is dependent on sales and thus, sales has an accelerator effect on investment. Therefore, the model assumes that capital goods contribute to investment under the constant capital goods price. If we add capital goods to the current capital stock, we have a desired capital stock amount without making any additional payments for the capital goods in the model.

The criticisms for accelerator model are that there are a few assumptions on the investment behavior of firms. Clark's model, which represents a Simple Accelerator Model, assumes that the determinants of policies of fixed investment are its interest rate, and the procyclical behavior of the investment in the short term. While the accelerator models are classified as Keynesian, they are inadequate in modelling the effects of the Keynesian instability on expectations (Mohamed, 2017). They do not have an explicit modelling feature or assumption on how expectations change to become investment decisions.

Klein (1974) emphasized that the simple accelerator model is a long term model and it is not valid when the capacity utilization is not full. Moreover, as it is not working with full capacity, it is not among the assumptions of the model.

Upon the criticisms for simple accelerator models, the flexible accelerator model was developed. When the adjustment cost is added to the Simple Accelerator Model, the model becomes a *Flexible Accelerator Model*. In the Flexible Accelerator Model, firms have capital stock which is different from the desired capital stock and these firms need to pay a penalty fee. In this situation, the adjustment cost can be called a penalty fee for firms of capital stock which is different from desired capital stock as mentioned above. The Flexible Accelerator Model is developed by Chenery (1952), Koyck (1954) and Jorgenson (1971). Flexible accelerator model accounts for the lag(s) of capital stock into the investment function and thus the function/model becomes the an autoregressive model with distributed lags. In current literature, the flexible accelerator models use autoregressive distributed lags in economic modelling, due to their emphasis of the adjustment mechanism, that is between investment decision and sales realization . For Jorgenson (1971: 1111), the Flexible Accelerator Model assumes the time structure of investment.

However, Klein (1974) pointed out that the theoretical underpinnings, except for the empirical side of the model of Flexible Accelerator Model, is based on the business cycle theorists such as Kaldor, Goodwin or Hicks.

The one of the main criticisms for the flexible accelerator model comes from Bourneuf (1964). Bourneuf (1964) pointed out that the capacity utilization rate needs to be calculated in the Flexible Accelerator model and if the capacity utilization rate is close to full capacity or is in excess capacity, there is a need for investment. For Bourneuf (1964), the growth of output directly affects investment and indirectly affects capacity utilization. Thus, if the capacity utilization is either in excess or near full capacity, the investment decision is to be taken by the entrepreneur.

The other version of simple accelerator model is Cash Flow Augmented Accelerator Model. *The Cash Flow Augmented Accelerator Model is based on* Eisner (1978) and the model accounts for cash flows into the main model equation for which the firm can foresee its future probability of investment and thus its desired capital stock (Clark, 1979: 81).

In cash flow augmented models, profitability has a special emphasis on investment due to profitability models and the pathway of optimal capital stock in the future. Profitability and/or profit rates, which is the form of profitability deflated by capital stock, is used as proxy for future probability. If either profitability or cash flow is high, internal financing is a better option for the entrepreneur instead of external financial sources. Moreover, the external finance option has transaction costs, information asymmetry, interest rate risk etc. or other related risks, which means that external financing is more costly than internal financing for the entrepreneur.

Another feature of cash flow adjusted accelerator models is the distributed lags that are included in the model and the previous cash flows play a determinant role for investment decisions. The main point of the cash flow adjusted model is that by favouring internal finance rather than external finance it has a crowding-out effect of this internal finance compared to external finance.

3.1.1.2. Jorgenson's User Cost of Capital Model

The user cost of the capital model assumes that the investment decision is affected by expected interest rates, prices, taxes, adjustment costs that are user costs of capital and furthermore, these are assumed as exogenous.

The User Cost of the Capital model is based on Jorgenson (1963), Jorgenson and Hall (1967). This model is counted as *user cost of capital* model due to the fact that

the model is based on user costs when the entrepreneur makes an investment decisions. The User Cost of the Capital model has an investment function in which expected interest rates, prices, taxes, adjustment costs determine optimal net investment, and these factors determine the user cost of capital and are taken as exogenous.

Jorgenson (1963) and Jorgenson and Hall (1967) assume that entrepreneurs who take investment decisions are rational and the markets in which they operate are perfect, work with rational expectations and have access to perfect information assumptions. Therefore, one of the biggest difference between the neo-classical models and the heterodox models is that they are able to model uncertainty in the investment functions or models. Neo-classical models are based on the probability of risk, which is a good proxy for modelling uncertainty, as shown in Hahn (1973, 1985). The uncertainty is based on microeconomic uncertainty in the neo-classical investment model.

The most important innovation of the neo-classical investment model in the literature is the fact that it includes the user cost of capital in the investment models, while there is no room for cost of capital in the accelerator models. The user cost of capital model assumes that entrepreneurs make investment decision in order to increase their current capital stock to a desired capital stock level, which is the same assumption of the accelerator models. However, Bischoff (1971) emphasizes that the most important difference between the accelerator models and the user cost of capital models is that the desired capital stock does not depend on planned output and the relative price of output does not depend on the implicit rent price of capital goods.

The criticisms for user cost of capital model are mainly regarding the assumptions of the model. Indeed, Nerlove (1972) pointed out that in the cost of capital models; the demand for capital stock, determine long term output which is taken as exogenous. The Neo-Classical Investment Model uses Cobb-Douglas production function and thus output is only a scale measure in the model. The difference between demand of desired capital stock and of replacement capital is not clear and the model has no room for time in investment decisions or in the penalty costs (if the investment decision is not taken when the entrepreneur needs to).⁵

Another criticism comes from the assumptions in the model. In the neo-classical investment models (both for Tobin's q and the user cost of capital models), uncertainty is measured by the probability of risk at the micro level as in Hahn (1973, 1985). And the uncertainty can spread from this micro level to a macro level in the economy. In the neo-classical investment theory, agents are rational with access to full information data and the theoretical underpinnings of theory is based on the neo-classical paradigm. In the Modigliani and Miller (1958) Theorem, external finance is the same as internal finance under perfect capital markets and there is no information asymmetries between the parties in terms of external finance. There is no difference between internal finance and external finance in the neo-classical paradigm and thus there is no financial constraint or any financial obligation or credit rationing problems for the 'rational' firm.

3.1.1.3. Q Theory: Tobin's Q

In the Q investment model, the investment decision is based on the ratio of market value to replacement value of the firm or simply stock price of the firm. The ratio is measured as Q ratio. The Q Ratio is defined as the firm's value over the replacement

⁵ For details, see Nerlove (1972).

cost of its existing capital stock. And the Q ratio is measured by dividing the market value of assets to the replacement cost of assets in the empirical models. The model is based on Tobin (1969), and is modelled by Hayashi (1982) for the empirical work. The theoretical underpinnings of the Q Theory is based on Keynes (1936). For Chirinko (1993) these Keynesian foundations are revitalized and elaborated by Brainard and Tobin (1968), Tobin (1969,1978). In this theory, investment expenditures are positively related to the *Q ratio*.

For the Q ratio >1; there is a need for investment but for a Q ratio <1; there is a need for decrement/decrease in capital stock and no need for investment.

The criticisms for Q model comes mainly from measuring the Q ratio due to it being unobservable. In the current literature, Q ratio is mainly referred to as a marginal Q because it is unobservable. Q ratio is unobservable due to the fact that the Q model is straightforward and is based on the forward looking function of future expectations, as Blundell et al. (1992: 234) underlined. For this reason, the shadow value of the Q ratio is estimated and is called ‘marginal Q’. Instead of Q, the empirical literature concentrates on marginal Q, which is also known as the ‘average Q’⁶. For Hayashi (1982) there is no room for calculating this marginal Q. However, the average Q can be calculated for analysis of investment decisions. On the one hand, Hayashi (1982) points out that average q equals marginal q.⁷ However, Hayashi (1982)’s q estimations are only validated if the conditions exist under the production function and the adjustment costs are homogenous in degree 1.

⁶ In the literature, most of the papers use marginal Q, they follow the estimation of Hayashi (1982). Hayashi (1982) demonstrated the measurement of Tobin’s Q ratio.

⁷ Hayashi (1982) generates the investment function of which theoretical underpinnings based on Uzawa (1969) is as follows; $\Delta K = \psi(I, K, t) - \delta K$, where ψ denotes installation cost; I denotes gross investment that is not transformed to capital stock; K denotes capital stock; δ denotes depreciation and t denotes the time.

Tobin's Q is widely used in the empirical literature of the investment. Tobin's Q is used to estimate to the marginal value of the capital. However, under the restricted assumptions which are aforementioned made, Tobin's Q is unrealistic due to these assumptions, especially the homogeneity assumptions which poorly fit the data at the firm's level, as Gala (2014) highlights.

3.1.1.4. DSGE Investment Models

The investment decisions are taken as a stochastic variable in the DSGE models. DSGE model that has a workhorse of monetary economics, and is widely used by the central banks around the world. In these models, capital and investment are an integral part of the environment and the models are based on real business cycle tradition (Rupert and Sustek, 2016). Investment has an importance in the DSGE models for its real world observations, especially for capital adjustment costs and that is linked to asset pricing literature for the equilibrium in the model.

Dynamic Stochastic General Equilibrium (henceforth DSGE) models are defined as;

- **Dynamic** : time is an important factor for decisions (pre, current, and post period) and the nature of these agents is forward looking.
- **Stochastic**: stochastic shocks are essential roots of business cycles.
- **General Equilibrium**: The model has the assumption of simultaneous determination of endogenous variables as well as (based on Neo Classical Theory), having the market clearing assumption and the Walras Law.

(Lopez, 2017: 3)

DSGE is used in the literature due to several advantages. The main advantage of the DSGE modelling is in its dealing with the Lucas (1976) Critique⁸. It has flexibility for dealing with poorly defined economic variables and has deep structural parameters for economic modelling (Cucho-Curti et al., 2009).

DSGE models are inspired from Real Business Cycle (Henceforth RBC) models, but the DSGE models have some assumptions that the RBC Theories do not have. These assumptions are nominal rigidities, or non-market clearing and money, as Fernández-Villaverde (2010) identifies.

3.1.1.5. Euler Equations Investment Models

In the Euler equation investment models, firms choose optimal investment path under the equation of marginal costs and marginal benefits. Euler models mostly used for estimating investment decision of the firm under first order dynamic optimization assumptions.

The Euler equation is based on dynamic optimization methods and the Euler equation based investment models are based on the work of Hansen and Singleton (1982). For Oliner et al. (1996), following the Lucas Critique⁹, the studies that used the Euler equation are based on estimations for investment, especially for firm level investment and these estimations are in the first order conditions of the intertemporal optimization problem. In the Euler equation based investment models, there are deep

⁸ *Lucas Critique* is counted as a crucial turning point for macroeconomic modelling due to Lucas (1976) emphasized that macroeconomic policies are not based on aggregate data due to micro behavior of economic agents is not aggregated, and the macroeconomic policy prediction needs to be based on microeconomic behavior of economic agents. Lucas Critique is counted as milestone for the beginning of micro foundations of macroeconomic modelling.

⁹ In the investment modelling, the Lucas Critique has an important place for modelling the investment behavior of the firm. In the Lucas Critique, rational agents based macroeconometric modelling has an important place in the macroeconomics literature as well as investment modelling literature.

technological parameters as Oliner et al. (1996) point out, and there is a convex adjustment cost as Crnigoj and Verbic (2014), Parker (2007) underline. In sum, the main assumptions of the Euler equation based investment models are dynamic optimization under certainty in the presence of cost of adjustment, as Gezici (2007: 32) states.

The main advantage of the Euler equation based investment models, as Whited (1998) highlights, is that the Euler Equation of an intertemporal investment model tries to avoid the inefficiencies and problems that are associated with measuring the marginal Q.

The empirical performance of the Euler equation based investment models has not been investigated in the literature, as emphasized by Oliner et al. (1996). As Whited (1998) states, the Euler equation based investment models have a potential for overcoming the marginal Q estimations' flaws, while most studies, according to Whited (1992), and Bond and Meghir (1994), prove the efficiencies of the Euler Equation for financial constraints and external finance constraints for the intertemporal substitution issue for the firm.

On the contrary, the criticisms of the Euler equation models, Gomes et al. (2006) prove the Euler Equation has some flaws and that this Euler based equation is a fragile structural model which leads to an empirical rejection of the some assumptions that are thus more relaxed. Euler equation based GMM models mostly rely on Hansen (1982)'s J Test for diagnostic of the analysis (Oliner et al., 1996) yet it is also subject to empirical criticism.

According to Gezici (2007), Euler equations are used mainly by New Keynesian Theorists. Euler Equation based investment models have an essential importance for

financing constraints (FC) literature and they are widely used in this literature. To conclude, the Euler equation has a key importance for investment decisions in this field of investment literature.

3.1.1.6. Uncertainty and Option Value Investment Models

In the uncertainty and option value models, the relation between uncertainty and investment is linked with option value based investment modelling in the orthodox investment models. The relation between uncertainty and investment is mostly found as either positive or non-negative, and in current terms, firms use the ‘wait and see’ option for investment.

Hartman (1972), Abel (1983) and Abel (1985) found that uncertainty is positive or non-negative for investment. The positive or non-negative effect of uncertainty on investment comes from perfect competition, constant returns to scale in production, symmetric capital-adjustment costs, which give the marginal profitability of capital is convex in stochastic variable and marginal profitability of capital increases (Gil, 2004). On the other hand, Bernanke (1983), Mc Donald and Siegel (1986), Pindyck (1988) show that the evolution of demand reduces investment due to monopolistic and stochastic conditions when there is an increase in uncertainty.

The investment decisions are based on the irreversibility assumption in the models. In the literature, irreversibility has an important place for investment as Dixit and Pindyck (1994) demonstrate. The central assumption is that when the initial investment has been taken once, the cost of investment is irreversible. The assumption is called as *irreversibility of investment*. McDonald and Siegel (1986), Dixit and Pindyck (1994) and Abel and Eberly (1994), investment and uncertainty relation is linked to the real option theory in which firms face uncertainty and due to this irreversibility of investment, firms prefer to take a ‘wait’ option. Such studies,

such as those of Dixit and Pindyck (1994), show that under high uncertain demand conditions, firms prefer to wait and thus investment is curbed. Morikawa (2016) point out that the firm's 'wait and see' preference, so as to avoid taking any action since conditions are uncertain, is called as *option value of waiting*.

3.1.2. Heterodox Models

3.1.2.1. Classical Keynesian Model

In the Keynesian investment model, as Keynes (1936) himself highlighted, the demand price for capital or marginal efficiency of capital (henceforth MEC) has an essential importance for investment decisions. An investment decision is based on MEC and output, in the Keynesian investment model.

For Courvisanos (1996: 160), Keynes took the neoclassical or Marshallian theory of firm as micro-foundations for his MEC, for showing why market capitalist economy does not necessarily achieve a full employment equilibrium in the General Theory.

For Sardoni (1987: 111), MEC is an essential determinant for an underemployment equilibrium position and thus investment plays an important role for instability, as Keynes pointed out in the Chapter 22 of the General Theory.

Keynes (1936:88)' defined the MEC as follows;

...I define the marginal efficiency of capital as being equal to that rate of discount which would make the present value of the series of annuities given by the returns expected from the capital-asset during its life just equal to its supply price. This gives us the marginal efficiencies of particular types of capital-assets. The greatest of these marginal efficiencies can then be regarded as the marginal efficiency of capital in general...."

And also Keynes (1936: 88) stated that;

"...the marginal efficiency of capital is here defined in terms of the expectation of yield and of the current supply price of the capital-asset. It depends on the rate of return expected to be obtainable on money if it were invested in a newly produced asset; not on the historical result of what an investment has yielded on its original cost if we look back on its record after its life is over..."

In the General Theory under the Chapter 11, the Keynesian investment model is linked with the demand price for capital or MEC. The demand price for capital is defined as present value of profit flows that a firm expects to earn after deducting financing costs, and thus the level of investment, in the Keynesian sense, settles down to where price of capital equals to price of supply (Fazzari and Mott, 1986-1987: 173).

Fazzari and Mott (1986-1987: 173) emphasize that the importance of output demand for investment decision in the Keynesian framework. For the relation between output and investment, the Keynesian models have the implicit assumption that, investment is driven by output, which shows that the Keynesian models are demand driven. If the firm is working under excess capacity, the excess capacity problem decreases the profit rate and due to decreasing profit conditions, investment decisions are not taken, or are forgone, or divestment decisions are taken instead. Therefore, capacity utilization is closely linked to investment, in the Keynesian notion. Capacity utilization has an essential importance for the demand price for capital or MEC due to the reasons aforementioned above.

Gordon (1992) emphasizes that the Keynesian investment model is based on the behavior of entrepreneur and thus the entrepreneur determines the income level in country level or its GDP. Price of demand for capital goods also depends on financial conditions due to entrepreneurs use of profitability as a safety margin to protect themselves from uncertainty in the future (Crotty, 1990; Kalecki, 1971).

As Crotty (1990: 492) pointed out, the safety margin for meeting the financial commitments and the growth of the firm as capital accumulation is simultaneously dangerous and necessary for the firm due to the firm's need to have a balance for the

expected profits and to fulfill its financial commitments and in financing of its illiquid assets, in this Keynesian world with uncertainty.

Due to the uncertainty in the Keynesian investment model, internal finance is one of the essential determinants of investment in this framework. The main reason behind this assumption is that under uncertainty conditions, internal finance is therefore more reliable than external finance for financing an entrepreneur's investment so as to fulfill his/her financial commitments and gain sustainability of his/her firm's growth.

In sum, the Keynesian investment model is based on the equivalence of demand price and supply price. The demand price for capital is based on internal finance, and demand conditions. Supply price for capital is simply defined as the amount that the firm pays a net marginal investment.

Criticisms in the Classical Keynesian model, according to Arestis et al. (2010), are related to two conflicting theories of investment in the General Theory. For Arestis et al. (2010), Keynes defines MEC that gives pre-eminence to interest rates in the way presented by Irving Fisher (1930) and other neoclassical economists. However, in chapter 12, Keynes underlined that the key determinant of investment is the state of long-term expectations which are formed in an atmosphere of uncertainty. New terms, like 'animal spirits', 'states of confidence' and 'conventions', come to the stage for the first time, displacing the traditional interest rate variable.

3.1.2.2. Kaleckian Investment Model

In the Kaleckian investment model, the profit rate and capacity utilization have an important effect on investment. The Kaleckian investment function is based on the profit rate and capacity utilization which has discrepancy between the actual and the

desired/natural rate of capacity utilization. The Kaleckian investment model is based on Kalecki (1937).

The Kaleckian investment model assumes that there is a low sensitivity between capital accumulation and variations in capacity utilization. The Kaleckian model treats the capacity utilization as an accommodating variable in the short and long run, according to Skott (2012).

For Kalecki (1937), profitability is the key determinant for the investment decision. Similarly, for the Kaleckian investment model, profitability is the key determinant of internal finance, as confirmed by Kalecki (1937). He considered that under the oligopolistic markets, the mark-up rate is essential for internal finance and thus internal finance is safe comparing to the external finance option. These assumptions are reviewed in *the Principle of Increasing Risk* of Kalecki (1937). The Principle of Increasing Risk, which is based on Kalecki (1937) and Steindl (1952), assumes that retained earnings¹⁰ play a significant role for the capital accumulation process and the principle has an important place for this Kaleckian Investment Model. For Courvisanos (2007), profitability, increasing risk, and excess capacity determine investment in this Kaleckian framework.

The Kaleckian investment model can be considered as the cornerstone of Post Keynesian economics investment models. There are some vital parts which differentiate the Kaleckian Investment Model from the Classic Keynesian Investment Model.

¹⁰ The retained earnings are results of profits/mark-ups.

Chick (2004) indicated that Kalecki (1936) is the first study to show the deficiencies of Keynes' investment theory. Chick (2004) outlines the four key points for Kalecki's interpretation of Keynesian investment model, below;

- 1) There is no distinction between investment decision and investment activity.
- 2) In the MEC formulation, the supply price of capital was given by Keynes
However, for Kalecki the supply price of capital is only known in the ex post form. Therefore, MEC is not the demand object for ex ante investment function.
- 3) The limits of constraints for increasing supply prices are not known by entrepreneur, and thus there is no certain limit for investment according to Kalecki (1936).
- 4) For Kalecki (1937) Keynes did not take into account the increase in income, prices, and profit into for investment decision.

The main points which are aforementioned make the Kaleckian investment model different from the traditional Keynesian investment model. For the *causality relation between savings and investment*, the Kaleckian investment model, especially Kalecki's main notion for this relation, is an important assumption. Chick (2004), Kalecki (1936:250) define savings as not determining investment, but rather investment generating savings. And Chick (2004) underlines that, for Kalecki (1936), the demand of capital goods and the supply of capital goods always determine interest rates. However, this assumption does not confirm Keynes' Liquidity Preference Theory in which interest rates are determined by money demand under a given money supply condition. At this intersection point, the money demand is the money demand for transactions, according to Keynes.

The main difference between the Kaleckian investment model and the Harrodian and Robinsonian models come from the effect of demand on capacity utilization. The Harrodian and Robinsonian models assume that there exists a steady state growth value of capacity utilization and that this has a determined desired rate. However, in the Kaleckian model, demand shocks have permanent and large effect on capacity utilization.

Skott (2009) gives an overview of the Kaleckian investment function especially regarding its shortcomings. In the simple Kaleckian model, a potential capacity utilization is given which is determined by aggregate demand that is taken as exogenous, as it is an unobservable phenomenon for the investment model. To understand the main mechanism of the simple Kaleckian models, Schoder (2012: 542) emphasized that the models assume that long run inconsistency between realized rate of capacity utilization and the normal rate of capacity utilization and therefore the target rate of capacity utilization is independent from the realized rate. For Kaleckian models, the main criticism comes from this assumption.

In response to the criticisms for the basic Kaleckian model, the basic Kaleckian model is extended and modified by Lima and Setterfield (2008), Blecker (1989), Blecker (1999), Lavoie and Godley (2001), Dos Santos and Zezza (2008), Hein and Van Treeck (2007) under different assumptions, i.e. that of the government sector or that of open economy related issues (cited in Skott, 2009:3). However, in the literature, the canonical Kaleckian model which is a modified version of basic Kaleckian model, is mostly used. *The canonical Kaleckian model* is based on capital accumulation and is a function of capacity utilization and the profit rate (Skott, 2009:3).

In the Canonical Kaleckian model, investment is a function of capacity utilization, and of profit share under the investment and saving of the private sector equilibrium. Profit rate is also assumed as a function of this profit rate.

The Kaleckian model, in terms of effective demand, ex ante investment is independent of savings and effective demand determines the output and employment level in the short run, which is what almost every heterodox economist agrees with. However, in the long run, the realized utilization rate cannot deviate from the normal rate which is given as exogenous and for Schoder (2012: 546), as for most economists, he does not agree that the long run behavior of the economy is based on these assumptions.

However, for Schoder (2011), the Kaleckians or generally speaking the Post Keynesians argue that “there is no mechanism driving the economy in the long term other than those operating in the short run” (Schoder, 2011: 2). Other heterodox economics schools’ based investment models assume that the Say’s Law is not valid in the short run. Yet, it is valid in the long run and the capacity utilization follows its ‘normal path’ only in the long run, and thus in a steady state situation in the economy.

3.2.2.3. Other Investment Models

3.2.2.3.1. Wood’s Investment Model

In Wood (1975)’s investment model, profit rate/mark-up has an essential importance for the entrepreneur’s investment decisions. In Wood (1975)’s approach, effective demand is assumed as exogenous and firms concentrate on costs and sales for surviving in the markets and for gaining profitability. At this point, for the firm, the

mark-up rate is the key object for profitability and it becomes the price setter in the market and is an essential object for investment decisions.

The theoretical underpinnings of Wood (1975)'s investment model is based on Marxian assumptions whereby the model has finance and opportunity frontiers and concentrates on increases in sales income and profitability of the firm. While Kaleckian investment theory and its modified versions have important places in the Post Keynesian investment theory, there exist other investment approaches in the Post Keynesian Economic Thought. Wood (1975)'s investment theory, for example, still has an important place in the Post Keynesian investment approach. Both Wood (1975) and the Kaleckian investment models greatly emphasize the role of mark-ups for investment decisions.

3.2.2.3.2. Harcourt and Kenyon's Investment Models

Investment decisions in the Harcourt and Kenyon (1976) and Harcourt (1982)'s investment models are based on three different conditions. There are three different conditions for the firm in determining its investment project. First, it is the extra capacity which is established in every period; second it is a technical decision, and the third is a type of financing. However, Harcourt and Kenyon (1976), Harcourt (1982) assume that firms are typical Kaldorian firms which prefer to with mark-up pricing, use internal finance rather than external finance and increase profit through sales growth under the minimization of profit constraints conditions, which are similar to Wood (1975)'s assumptions of the firm.

Harcourt and Kenyon (1976), and Harcourt (1982)'s contributions regarding Post Keynesian investment models are also considered very significant to the Post

Keynesian firm theory as well as to the investment determinant in the Post Keynesian Economic Thought.

3.2.2.3.3. Rowthorn's Investment Model

In Rowthorn's (1981) model, investment is a function of profits and capacity utilization. The logic behind the assumptions that profits give information about future probability and generate internal funds for capital accumulation, while capacity utilization has indirect effects on profits, and direct effects on the future demand's unused capacity margin as well as unforeseen rapid demand shocks. In academic literature Rowthorn's (1981) model is considered as the core of simple Kaleckian models.

Rowthorn (1981) generates the Keynesian investment model whereby savings equals investment and also capacity utilization and profits are essential determinants for investment in the private sector.

3.2.2.3.4. The Bhaduri and Marglin Model

In the Bhaduri and Marglin model, investment decision is a function of profit share and capacity utilization. The model is based on Bhaduri and Marglin (1990). Their investment model assumes profitability to be the key determinant for investment and π and u are main determinants of expected profitability¹¹.

For Bhaduri and Marglin (1990), entering the profit rate in investment equation is a problematic issue and they defend the situation in a very interesting and unusual way in academic literature on investment. For Blecker (2015) and for Bhaduri and Marglin (1990), there are some criticisms that the investment function has profit rate and capacity utilization aspects. For Bhaduri and Marglin(1990), using profit rate

with capacity utilization in the investment models may lead to a mistake in the estimation of investment. The profit rate is expressed as $r = \pi u/v$; where π is profit share of income v is capital-output ratio at full capacity utilization, and thus $I/K = f(\pi u/v, u)$ leads to the doubling of utilization as recounted by Blecker (2015).

Furthermore, another criticism is put forward, this time from Bhaduri and Marglin, with the assumption that $f_u = \partial (I/K) / \partial u > 0$ of the investment function is under the holding profit rate and it is constant. For these authors, there is no need for the desired investment to be more, under this assumption. In Bhaduri and Marglin (1990) investment model, $I/K = g(\pi, u)$ ¹² where g_u and $g_\pi > 0$ and $g_u = \partial (I/K) / \partial u > 0$ holding π is constant.

Capital accumulation is possible in the different regimes, which are exhilarationist or stagnationist regimes, in the Bhaduri and Marglin model. In the Bhaduri and Marglin model, the reaction of the investment to profit share is larger than the reaction of savings. The demand regime is called exhilarationist, when the higher profit share leads to higher capacity utilization, while higher profit share leads to lower capacity utilization and this regime is called stagnationist.

The Bhaduri and Marglin Model is categorised as a post-Kaleckian Model and is based on Marglin and Bhaduri (1990). The Bhaduri and Marglin Model is considered as a 'milestone' in investment studies due to the fact that they allow the effect of income distribution on capital accumulation, while capital accumulation is assumed as supply-led in the Neo Classical Capital Accumulation.¹³

¹² The core equation of the Bhaduri and Marglin model is as follows; $S = sR = s(R/Y)(Y/Y^*)Y^*$, where S denotes savings, s is the marginal propensity to save; R denotes profit; Y denotes income/output; Y^* denotes full capacity potential output/income. Marglin and Bhaduri (1990) assume that Y^* is constant in each short period, and they normalize value of saving; $S = shz$, $Y^* = 1$ where $H = R/Y$ denotes share of profit; $z = Y/Y^*$ denotes degree of capacity utilization under the conditions are $1 > h > 0$ and $1 > z > 0$.

¹³ The Solow Growth Model is an essential example for this assumption.

For Hartwig (2014:419), the Neoclassic economists assume that economic growth is an issue of capital, labor and technical progress, while the Kaleckians *turns the table* towards demand and growth relations. There exists demand regimes with either wage-led or high wage increases and where consumption or marginal propensity to consume over wage is greater than the marginal propensity to consume over profits. When the marginal propensity to consume out of wages is less than the marginal propensity to consume out of profit, the demand regime is thus called profit-led. In both regimes, output is fed by wages or profits (Hartwig,2014).

3.2.2.3.5.The Robinsonian Investment Model

Investment decisions are based on the profit rate in the Joan Robinson's investment model. Robinson (1952)'s capital accumulation model is based on the assumption that there is a difference between actual and real rates of profit. In the short run, even if there is a low rate of accumulation or if the accumulation generates profit to maintain a general level, there may be an equilibrium in the short run in this Robinson model (Besomi,2005). However, in the long run, there may be disruptive factors affecting the equilibrium such as technology, expenditure of rentiers/capitalists, capital stock changes etc. For Robinson (1952), there is no possibility for an optimum desired level of accumulation. If the accumulation is lower than the profit rate, then an investment decision is taken. Otherwise, if the profit expectations are questionable for the entrepreneur, no investment decision is taken (Besomi, 2005).

Bhaduri (2005: 195) defines that, in Robinson's model, there is a significant difference between Keynesian animal spirits and Robinsonian profit expectations in her capital accumulation model. The Keynesian animal spirit is exogenously given,

however, in her model, there is an endogenous profit expectations and this assumption is clearly elucidated in Robinson's work (1956).

In Robinson's model, savings comes from profit, and the yield comes from plausible assumptions of the economy as Bhaduri (2005: 195) emphasized;

This new assumption combines with the classical savings function, whereby the savings come exclusively from profit and yields under plausible assumptions about the state of expectations in the economy, require a two-way relation between the rate of accumulation and the profit rate. Because, a higher rate of accumulation or investment generates more savings through more profit, so that for a given book-value of capital, the realized profit rate is also higher. At the same time, the higher realized profit rate raises expectation about the future rate of profit, which stimulates accumulation to a still higher level.

The features, aforementioned above, explain the main differences of the Robinsonian capital accumulation model. The core assumptions of the Robinson's model have a significant difference with those of the Keynesian or Neo classical theories of capital accumulation. In Joan Robinson (1952)'s model, there is a *double sided relation* between capital accumulation and profits. Capital accumulation generates profits and the profits generate capital accumulation.

3.2.2.4.Financing Constraints Investment Models

In the Post Keynesian investment models, internal finance has a special place for the modeling of the investment behavior of firms. As Gezici (2007) points out, financing constraints are widely accepted among New Keynesian models. However, Post Keynesians also consider financing constraints for the modeling of investment behavior of firms even if they have a number of different assumptions.

In the Post Keynesian investment analysis, financing constraints or internal finance has a special place in investment decisions due to Post Keynesians' assumption that there exists a number of financial frictions and there is no Modigliani-Miller

financial world in the real world. This means, there is always a risk premium that the entrepreneur needs to pay, in order to obtain external finance. In other words, there is a wedge between internal and external finance for the entrepreneur. For Gezici (2007), financing constraints have a fundamental importance for the Post Keynesian investment model; even-though these are different compared to the financing constraints approach in New Keynesian investment models.

Gezici (2007: 49) states that, the role of internal finance has a different meaning in Post Keynesian terms due to the fact that, internal finance is the safest financing option for the firm. Thus, investment is always positively related to internal finance, in the Post Keynesian terms.

The internal finance needs of firms come from a number of different reasons and do not come from financing constraints. As Gezici (2007: 46) states, the internal finance preference is based on fundamental uncertainty, as follows:

Clearly, the crucial assumption that allows this different interpretation of finance constraints is the combination of fundamental uncertainty irreversibility prevailing in the decision-making environment. Under fundamental uncertainty, the individual is either ignorant of the available courses of action or of the future states of the world or both. Regarding investment decisions, future financial commitments to creditors are relatively certain, while expected profits are not. The unknown aspect of future cash flows, make managers cautious about their reliance on financial markets and lead them to a preference for internal funds.

In these terms, future predictability or a state of confidence, is linked to future profitability or expected returns. In Post Keynesian investment models, the expectation of managers is, therefore linked to their degree of confidence and their perception of future profitability. For Gezici (2007: 47); “A relevant factor in the Post Keynesian theory is the quality and relative quantity of information which has led to estimates of outcomes and probabilities.”

In short, the internal finance preference of firms, is based on, different assumptions in Post Keynesian investment models. Financing constraints come from the information that managers or entrepreneurs have. And the internal finance preference, is also based, on the fundamental uncertainty assumption in Post Keynesian investment modeling.

In the New Keynesian models, financing constraints mostly modeled by using the Euler Equation are investment-based models. Nevertheless, in the Post Keynesian models; financing constraints are mostly based on cash based investment models.

For key comparisons of these investment models, please refer to the categorisation by the economic schools of thought, depicted in Table 3.1 below:-

Table 3.1. The Investment Functions and The Economic Thoughts & Links: A Brief Summary of the Literature

The Economic Thought	The Scope of Investment Theory	Investment function variables or Investment function definition
Standard Models	<ul style="list-style-type: none"> Accelerator Models, output is essential determinant of investment. 	<ul style="list-style-type: none"> Y, Y/K; Y_{t-1}, S where Y denotes output, Y/K denotes output which is scaled by K, Y_{t-1} denotes lagged level of output, and S denotes sales.
	<ul style="list-style-type: none"> The User Cost of Capital 	<ul style="list-style-type: none"> Interest rate, costs, depreciation, all of which show the cost of capital. Rational expectations, and full market information based models, and cost of capital plays essential role for the investment models.
	<ul style="list-style-type: none"> Tobin's Q Model 	<ul style="list-style-type: none"> Various Q measures, Q often represents the ratio of the replacement cost to market value
	<ul style="list-style-type: none"> DSGE and Euler equation investment models 	<ul style="list-style-type: none"> DSGE models use capital accumulation for ex ante modeling monetary policy. Euler model uses dynamic optimization for investment decisions of the firm
Heterodox Models	<ul style="list-style-type: none"> Keynesian investment model 	<ul style="list-style-type: none"> Price of supply for capital, and price of demand for capital or MEC. Price of demand is based on internal finance, and demand for investment decision. The equivalence between price of supply for demand and price of supply for capital is a must for investment decision.
	<ul style="list-style-type: none"> Kaleckian investment model 	<ul style="list-style-type: none"> Capacity utilization and profit rate have importance for investment. However, in the classical Kaleckian model, capacity utilization is an accommodation variable for investment in the short run.
	<ul style="list-style-type: none"> Bhaduri and Margin model 	<ul style="list-style-type: none"> Profit share and capacity utilization
	<ul style="list-style-type: none"> Wood's investment model 	<ul style="list-style-type: none"> Costs, and sales
	<ul style="list-style-type: none"> Harcourt's and Harcourt and Kenyon's investment model 	<ul style="list-style-type: none"> Mark-up, and sales growth
	<ul style="list-style-type: none"> Rowthorn's investment model 	<ul style="list-style-type: none"> Profits, and capacity utilization
	<ul style="list-style-type: none"> Robinson's investment model 	<ul style="list-style-type: none"> The difference between ex ante profits and ex post profits is important for capital accumulation. There is a double sided relation between profit rate and capital accumulation. Profit rate generates investment, investment generates profits.

The New Keynesians	Imperfect market information, price rigidity, contract based economy, rational as well as identical agents. In the New Keynesian investment models, internal finance,i.e financing constraints models in which internal financing sources are playing important roles for finance as well as frictions in the capital markets/financial markets.	The New Keynesians emphasizes that imperfect markets. We can count that internal finance (i.e cash flow), imperfect market based investment modeling (i.e Euler equation based financial constraints modeling) can be counted for New Keynesian investment modelling. Mostly Dynamic Stochastic General Equilibrium models are used in the New Keynesian investment models.
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3.2. Applied Literature on Investment

The empirical literature review is divided to two sections. The first section is the review of the general literature on investment, while the second section will include the review of the literature on investment in the Turkish manufacturing sector.

3.2.1. Applied Literature on Investment: General Literature

Early investment literature is dominated by accelerator models as well as user cost of capital investment models. The most important findings among those early, more rudimentary papers are the accelerator based investment models that mostly use distributed lag based investment models in which sales or growth rates of sales are used (see Eisner, 1964; and the detailed review of the accelerator models, see Jorgenson (1971)).

The applied investment literature has been changing its direction after the early 1960s with Jorgenson's user cost of capital and Tobin's Q models. Tobin's Q model has been a dominant influence also due to its simplicity in its application, thanks to Hayashi (1982). The Q based investment models are in the existing literature and their aims are to model future growth possibilities under perfect competition. The papers that use Tobin's Q in the existing literature are those for example of Hoshi, Kashyap and Scharfstein (1991), Whited (2006) , Kaplan and Zingales (1997), Carpenter and Guariglia (2008). Most of the papers that use Tobin's Q into investment function are the New Keynesians for modeling financing constraints with the Euler Equation. In the New Keynesian investment functions, Tobin's Q is used as a complementary variable to cash flow in different ways, either in the Euler equation or as linear investment functions.

In financing constraints literature, the seminal work of Fazzari, Hubbard and Petersen (1988) has a special place. Cash flow-investment sensitivity is linked to financing constraints in the literature and there has been a vast literature on financial constraints and investment.

There exists a huge literature on the empirical studies on the relationship between financing constraints and investment. Fazzari, Hubbard and Petersen (1988)'s publication is considered as a seminal paper in the financial constraints literature. Fazzari et al. (1988) examine the effect of cash flow on investment for the US economy by using annual firm level data (they split the periods are 1970 and 1975, 1970 and 1979, and 1970 and 1984). They found that there is a significant effect of cash flow on investment for financially constrained firms. Fazzari and Mott (1986-1987) use an annual firm level dataset between 1970 and 1982 for the US economy, and they find that internal finance has a significant importance on investment decision and it shows up the financing constraints of the firm. Fazzari and Petersen (1993) expanded the scope of the Fazzari and Mott (1986-1987)'s work as they use working capital, and Tobin's Q for detecting the effect of financing constraints on investment for the US economy by using annual firm level data between 1970 and 1979. They found that, the importance of cash flow for investment for financially constrained firms, still existed. However, in the financing constraints literature, there is no consensus for detecting the financing constraints of firms and its effects on investment. Kaplan and Zingales (1997) find that there is a positive effect of cash flow on investment for the financially unconstrained firms by using annual firm level data between 1970 and 1984 in the US economy. Apart from the US economy, Carpenter and Guariglia (2008) Hoshi, Kashyap, and Scharfstein (1991), Bhaumik et al. (2012), Ding et al. (2013), George et al. (2011), Shin and Park (1999), Guariglia

(2008), Guariglia et al. (2012), Devereux and Schiantarelli (1990), Kumar et al. (2001), Lensink et al. (2003), Lin and Bo (2012) studied the financing constraints hypothesis for firms that operate outside the US and they found that there was a positive effect on the cash flow on investment in firms that operate outside of the US. Carpenter and Guariglia (2008) reviewed the financing constraints for UK firms by using panel annual firm level dataset, in the time span between 1982 and 1999, for the first two models and between 1983 and 1999 for the last two models. They also found there was a positive effect of cash flow on investment in the UK. Hoshi, Kashyap and Scharfstein (1991) examined the financing constraints for Japanese firms by concentrating on the relation between special business group relationships on investment.

Whited (2006) used a different framework for testing the effect of external finance constraints on investment. Whited (2006) took a hazard model, a simulation model, and the Euler Equation based GMM for firms that operate in the US economy by using 1983 to 1997 annual firm level data. Whited (2006) found that external finance constraints had negative effect on investment.

Raising questions about the financing constraints in the literature starts with a definition of financing constraints. However according to Carrera and Silva (2010), there is no consensus about the sensitivity between cash flow and investment that highlight financing constraints of the firms. The classical definition of financing constraints is when firms use internal funds, which is mostly measured by using cash flow, instead of external finance for investment. However, Kaplan and Zingales (1997: 172) point out that:

The most precise (but also broadest) definition classifies firms as financially constrained if they face a wedge between the internal and external costs of funds. By this definition, all firms are likely to be classified as constrained. A

small transaction cost of raising external funds would be sufficient to put a firm into this category.

Another dimension of financing constraints literature, is the cash flow and investment link which is essential for investment in developed countries. This relation between cash flow and investment shows the financing constraints of firms as identified by Crisóstomo et al. (2014). Furthermore, Cull et al. (2015) underlined that firms in developing countries tend to face more severe financial constraints than those in developed countries, and their owners typically say financial constraints are one of their primary obstacles to investment (Dethier et al. 2011). Moreover, governments in the developing countries tend to play a larger role in directing financial resources, which is more so than in the developed countries. (Ayyagari et al. 2012).

For financing constraints, apart from the definition of financially constrained firms, determining firms via financing constraints or not is another challenge in the literature. As Carreira and Silva (2010: 732-733) emphasize that:

....Defining financial constraints as the inability of a firm or a group of firms to raise the necessary amounts (usually due to external finance shortage) to finance their optimal path of growth will carry us to a higher level of abstraction. Accordingly, researchers have devoted their time to trying to find consistent measures of the degree of financial constraints.

Determining that firms are financially constrained or not is important as well as whether or not cash flow and investment sensitivity is high for these a priori classified firms under investigation in the relevant literature. For this a priori classification, different measures are used in financing constraints literature, such as size, age, political interconnectedness, ownership structure, block ownership, merger and acquisitions, irreversibility, state or government ownership, dividend payout ratio (low or high), all of which are mostly used in this relevant literature.

In the financing constraints literature, there are some differences between the financing constraints approach in developed countries and the financing constraints approach in developing countries. In the developing countries based studies, financing constraints are considered as scarce in their relevant literature and indeed most of the papers on this subject are related to developed countries, i.e. Audretsch and Elston (2002), Bond and Meghir (1994), Bond et al. (2003), Fazzari et al. (1988), Whited and Wu (2006).

For cash holdings, the applied literature consists of corporate finance and Keynesian economics based papers. The relation between cash holdings and investment is, barely investigated, in the existing literature. Most studies are divided into the precautionary demand for cash for hedging and financial constraints and the lack of the opportunities from internal capital markets.

Firms want to accumulate their excess cash reserves in case of precautionary demand for cash when future possible cash flow shortfalls and unexpected investment opportunities as found, according to Bates et al. (2009), and Opler et al. (1999).

Bates et al. (2009) found that demand for cash had more than doubled between 1980 and 2006 in the US, while Opler et al. (1999) found that when firms have strong growth options and cash flow risks, cash holdings are the main action which is taken by the firms between 1971 and 1994 in the US. Furthermore, Opler et al. (1999) also found that if firms have easy access to capital markets, they hold less cash than the firms which have no easy access to capital markets.

Opler et al. (1999: 7-8) emphasize that cash holdings have an importance for when there is a transaction cost for a firm;

In particular, let us assume that there is a cost in raising outside funds that takes the form of a fixed cost, plus a variable cost which is proportional to the amount raised. In this case, a firm short of liquid assets has to raise funds in the

capital markets, liquidate existing assets, reduce dividends and investment, renegotiate existing financial contracts, or some combination of these actions. Unless the firm has assets that can be liquidated at low cost, it prefers to use capital markets. However, it is costly to raise funds, regardless of whether the firm does so by selling assets or using the capital markets. The fixed costs of accessing outside markets induce the firm to raise funds infrequently, and to use cash and liquid asset holdings as a buffer. As a result, for a given amount of net debt, there is an optimal amount of cash, and cash is not simply negative debt.

For financially constrained and unconstrained firms for cash holding, the results in the existing literature are mixed. In this literature, studies such as those of Almeida, Campello, and Weisbach (2004), and Denis and Sibilikov (2011) show that the precautionary motive for cash is important for financially constrained firms.

For Amess et al. (2015), the cash holding literature is mainly based on US firms. And the studies outside the US have mixed results due to the differences between capital market deepening or financial liberalization. At this point, if we look at the international scene, evidence provided by Khurana, Martin, and Perreira (2006) show that financial development has a significant importance for lowering the cash demand of firms and thus it mitigates the financing constraints of the firm in the India, for example. Kusnadi and Wei (2011) give international evidence for the relation between cash holdings and financing constraints by using cross country data and they find that the country's legal system may be effective for lowering cash holdings.

For the relation between demand conditions and investment, the effects of demand on investment are mixed too, in the existing literature. The sales-to-capital ratio is mostly used as proxy for calculating the demand cyclicality. For the uncertainty and investment relation, the Keynesian models have the implicit assumption that investment is driven by output which shows that the Keynesian models are demand

driven. Demand constrained frameworks may hamper investment decisions in the manufacturing sector. Capacity utilization has an important effect on investment and the relation between capacity utilization and investment has a fundamental importance in the economics literature. When the capacity utilization is close to full capacity, the relation between capacity utilization and investment is low or has a negative sign. However, against full capacity or when firms work within idle capacity conditions, capacity utilization has a positive effect on investment or the sign between capacity utilization and investment is positive since the space for capacity expanding. If the coefficient or effect of capacity utilization on investment is negative or weak (or close to zero), the effect of capacity utilization on investment is based on demand cycles. The uncertain demand conditions are seen in capacity utilization as being near zero, or close to zero. When the firm faces cyclical demand conditions, in the Keynesian sense, the firm forgoes its investment decision.

For Baddeley (2008), the positive relation between demand uncertainty and investment is found as positive by Orthodox economic models. However, I can clearly say that the Orthodox models have difficulty in modelling real world based transactions. In fact, they only reflect the theoretical arguments of uncertainty.

Alexiou (2010), Falls and Natke (2007), Fazzari and Mott, (1986-1987), Charles (2010) use sales-to-capital ratio to proxy the demand cyclicity. The other models, which are either Neo-Classical models or New Keynesian models use different applied methodology, such as GARCH models, residual based models for measuring demand uncertainty or demand cyclicity in the investment models.

However, for profit rates and investment relation, which is an earlier topic for investment, this has continued to be a debate between researchers in current literature.

It is important to say that this specific literature is mainly related to case studies of developed countries, as Basu and Das (2017) emphasized. In applied literature, the Post Keynesians assume that profit rates are the main source for financing investments due to the degree of the confidence argument that is postulated by the Post Keynesians (Arestis, 1996).

Profitability is the main motivator of entrepreneurs. In applied literature, Weisskopf's (1979) seminal work is significant and demonstrates how the profit rate is important in economies. The following studies: Shaikh (1987), Duménil and Lévy (1993), Orhangazi (2008), Marquetti et al. (2010), Basu and Das (2017), Alexiou (2010), Clévenot et al. (2010), Schoder (2012), Bond and Meghir (1994), Ogawa and Suzuki (2000), Pattillo (1983), use the profit rate in the investment function to reflect the expectations of the entrepreneur on investment.

The traditional Post Keynesian investment models, profit rates and investment have positive inter-relationships as is emphasized by Kalecki (1937, 1954). In chapter 9 of Kalecki's book *Theory of Economic Dynamics* (1954), entitled 'Determinants of investments', Clévenot et al. (2010) clearly argue that the investment and profit relation is essential in their assumptions. For Toporowski (1999), the core line of Kaleckian business cycle is based on the profit rate¹⁴.

As for the relation between free cash flow and investment, there does not seem to be much literature for this subject in the applied and theoretical literature. Free cash

¹⁴ Bakır and Al-Campbell (2016) give the macroeconomic evidence of Kalecki's assumptions in the macroeconomic level for the US economy.

flow is mostly used for measuring internal finance possibilities via overinvestment or underinvestment estimations. Therefore, Jensen (1986), Richardson (2006), and Guariglia and Yang (2016) use free cash flow for measuring its impact on underinvestment or overinvestment problems. All the researchers found that there is a positive impact of free cash flow on over-investment when free cash flow is positive. Whilst, there is a positive relationship between free cash flow and underinvestment, when free cash flow is negative.

3.2.2. The Literature on Investment in Turkey

For the Turkish manufacturing sector, relevant investment literature is mainly based on the effects of financial development, export related problems or uncertainty on investment. The financing constraints literature is known to be scarce in this field regarding Turkey.¹⁵

Indeed existing literature focusses on investment in Turkey with regards to very specific topics. These studies are mainly based on macroeconomic country level analysis and their findings are related to various results such as: the detrimental effect of macroeconomic instability (see İsmihan et al. (2005)), of capital flight (Yalta (2010)), and of interest rate (Rittenberg (1991) on investment. The effect of internal factors is more important for investment (Günçavdı and Küçük (2013), Karaçay-Çakmak (2004)), demand constraints, availability of financial resources, and accelerator have significant effects on investment (see Günçavdı and Küçük (2013), Günçavdı and McKay (2003), and İsmihan et al. (2005),) consider that the positive effect of financial liberalization on investment (Günçavdı et al. (1998))¹⁶, the negative effect of user costs on investment (see Günçavdı and Küçük (2013) all have

¹⁵ Actually, the classifications are used here for testing the *a priori* classification is appropriate for alleviating the capital market frictions.

¹⁶ However, there is a significant effect of credit constraints on investment despite financial liberalization.

significant effects on investment in Turkey. Some of the papers however do aim at estimating the Bhaduri-Marglin based wage or profit led growth regime for Turkey, such as those of Yılmaz (2015), and Onaran and Yentürk (2001), and Onaran and Stockhammer (2005). All the papers confirm that the effect of wage on investment is positive, while there is no consensus about the degree of this effect.

Firm level studies in Turkey have concluded that there are different outcomes for investment decision. Some studies such as that of Jensen (2009) found that by using Q model, the effect of political and financial uncertainty on investment is detrimental in the Turkish manufacturing sector. The effect of capital structure on investment is found that internal finance is preferable for BIST listed firms by Kiracı (2009), and internal finance is preferable for investment decision under the trade-off structure for ISO listed firms that was found by Okuyan and Taşçı (2010)). By using Q investment models, Akkaya (2008) discovered that there is a positive and significant effect of Tobin's Q on investment for BIST listed firms. Yılgör and Yücel also identified that exchange risk, inflation risk, interest rate risk, operation risk, and political risk have detrimental effects on investment projection evaluation. Metin-Özcan et al. (2002) considered that the effect of openness on investment is insignificant, while the effect of wages and of mark-ups are positive for the manufacturing sector. And finally, Demir (2009) found that short term capital inflows have negative effects on investment for BIST listed firms.

In sum therefore, in the current literature, the studies that aim to investigate the determinants of investment in Turkey or the financing constraints hypothesis for Turkey are limited. Çetenek and Vural (2015), Eser Özen (2014), Gezici (2007), Kaya (2011), Egimbaeva (2013), Demir (2008), Yeşiltaş (2009), Günay and Kılınc (2011) are the studies that do address the financing constraints hypothesis for

Turkey. But all the aforementioned papers research financing constraints hypothesis for non-financial firms nor manufacturing firms. These papers that have researched the financing constraints hypothesis have different conclusions for Turkey. While Gezici (2007), Eser Özen (2014), Günay and Kılınç (2011), Yeşiltaş (2009), Egimbaeva (2013), Çetenak and Vural (2015)¹⁷ found that the financially constrained firms depend on cash flow or internal finance, Demir (2008) found that, on the contrary, evidence that financially constrained firms and financially unconstrained firms have internal finance dependence for investment.

For the relationship between cash holding, free cash flow and investment, there has not been much literature that directly researched this relation for Turkey. This research/ dissertation therefore is a very early attempt for this research into the relation between cash holding, free cash flow and investment.

Regarding the relation between the profit rate and investment, not all the papers use profitability in their investment functions to examine the past profit realization of entrepreneurs. Such studies like that of Onaran and Yentürk (2001), do use profit share but this is different to profit rate and they use it only as they had some data limitations in order to estimate the effect of profit share on investment. They found that investment is not responsive to profit share. Metin-Özcan et al. (2002) concluded that the effect of mark-up on investment is positive and strong.

For the relation between free cash flow and underinvestment with a special emphasis on financing constraints, there has not been much literature applied to Turkey.

¹⁷ Çetenak and Vural (2015) used the holding related firms that were publicly held in BIST in their study and they found that holding firms or financially unconstrained firms do not prefer to use internal finance for investment whilst the others do. However, they used firms that have holding affiliation for up to six holding groups.

CHAPTER 4.

MODEL, DATA AND FINDINGS

4.1. Hypothesis

In this chapter, I examine whether financing constraints impede investment for a sample of manufacturing firms. In order to empirically test for financing constraints, I will focus on the relationship between investment and cash flow. This is an important question as Turkey has completed its process of financial liberalization for some time and indeed since the early 2000s, a series of financial market reforms have been undertaken which recorded an increase in financial deepening. For example, Gezici (2007) argues that financial liberalization and deepening occurred but may have not decreased the importance of internal funds for firms. I use the cash flow variable to test for financing constraints but I do not limit the analysis to this and I also use alternative measures. One alternative measure I use is the cash holding variable. I expect that there will be a positive relationship between investment and cash holdings for financially constrained firms. Cash holdings may be chosen as a cheaper source of financing for investment and also act as a shock absorber against external shocks. I also look at the relationship between investment and the profit rate variable. As discussed above, past profits are seen as a significant determinant of investment as they may act as proxy for either future profitability or for the availability of internal funds. Finally, I also look at the relationship between the free cash flow variable and investment. Free cash flow is defined as the amount of funds left after investment expenditures, according to Richardson (2006), and Guariglia

and Yang (2016). Richardson (2006) uses free cash flow to test the firms' underinvestment and overinvestment problems. Guariglia and Yang (2016: 113) uses free cash flow to test for the link between financial constraints and underinvestment in China.

In empirical estimations, I divide firms according to their holding affiliation and TUSIAD membership for determining a priori financially constrained firms. I examine whether the relationship between investment and the financing constraint variables differ across different groups of firms. Holding affiliation may give firms easier access to finance. Çetenak and Vural (2015) used business group affiliations but they only concentrated on six major holdings affiliation of these firms. In my case, I use all the holding affiliations for the firms. Bayer and Öniş (2010) note that TUSIAD is major association of large business groups that actively participates in economic policy decisions. Barlas Yılmaz (2013) argue that TUSIAD is an active interest group in the Turkish economy that aims at-gaining acceptance for their interests from the government, especially as they have short term based rent-seeking activities since its establishment. Buğra (1998) emphasizes that TUSIAD represents large-scale firms that are located or have headquarters in İstanbul. Barlas Yılmaz (2013) suggest that TUSIAD members have benefited from the financial liberalization process of the economy since the early 1980s and some of the members also have affiliated banks. Given these, TUSIAD membership may also give firms specific network opportunities and ease financing constraints.

4.2. Data Set

The dataset consists of firms that are publicly trading in the Borsa Istanbul Stock Exchange (henceforth BIST) and it is taken from Finnet (2016). Annual data is used. The period covered is 2005-2015. All variables are deflated by the annual inflation rate of which the base year is 2005 and these are scaled by the lagged capital stock, except the sales growth rate. If the firm has zero or missing sales, assets and /or capital stock observations, which reflect unrealistic situations and it may most probably come from poor accounting practices and these firms are excluded from the sample. In order to clear out outliers, observations in the 1% and 99% of the distribution for each variable is deleted. The final sample has 135 firms with 10 years of observations, which includes most of large firms in the Turkish manufacturing sector. The final sample covers the period between 2006-2015. These firms undertook-around 10% of total private investment. The advantage of using this data set is to be able to classify firms according to their TUSIAD membership or holding group affiliation. Table 4.1 presents the industries that the firms in the sample represent.

Table 4.2 and 4.3, respectively show the number of holding group affiliations and TUSIAD member firms. Out of 135 firms, 66 belong to a holding group and 50 are TUSIAD members.

Table 4. 1. The firms in the manufacturing industry and their subindustries

MANUFACTURING INDUSTRY
*FOOD, BEVERAGE AND TOBACCO
FOOD
BEVERAGE
*TEXTILE, WEARING APPAREL AND LEATHER
TEXTILE
WEARING APPAREL (EXCEPT SHOE)
LEATHER AND FUR GOODS
*WOOD PRODUCTS INCLUDING FURNITURE
WOOD FURNITURE AND UPHOLSTERY
*PAPER AND PAPER PRODUCTS, PRINTING AND PUBLISHING
PAPER AND PAPER PRODUCTS
PRINTING AND PUBLISHING
*CHEMICALS, PETROLEUM RUBBER AND PLASTIC PRODUCTS
CHEMICALS
OTHER CHEMICAL PRODUCTS
OIL RAFINERY
VARIOUS VARIANTS OF OIL AND COAL
RUBBER PRODUCTS
RUBBER PRODUCTS NOT CATEGORIZED IN AN OTHER PLACE
*NON-METALLIC MINERAL PRODUCTS
DISH, CLAY, TILE, PORCELAIN AND SIMILAR
GLASS AND GLASS PRODUCTS
OTHER NON-METALLIC PRODUCTS
*BASIC METAL INDUSTRIES
IRON AND STEEL
OTHER BASIC METAL INDUSTRY
*FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT
METAL PRODUCTS (EXCEPT MACHINERY AND TOOLS)
MACHINERY (EXCEPT ELECTRICAL MACHINERY)
ELECTRICAL MACHINES AND DEVICES
VEHICLES
*OTHER MANUFACTURING INDUSTRY

Source: Public Disclosure Platform, 2017

Table 4.2. Holding affiliations of the sample

Firm status	N
Not affiliated with holdings	69
Affiliated with holdings	66
Total	135

Table 4.3. TUSIAD members

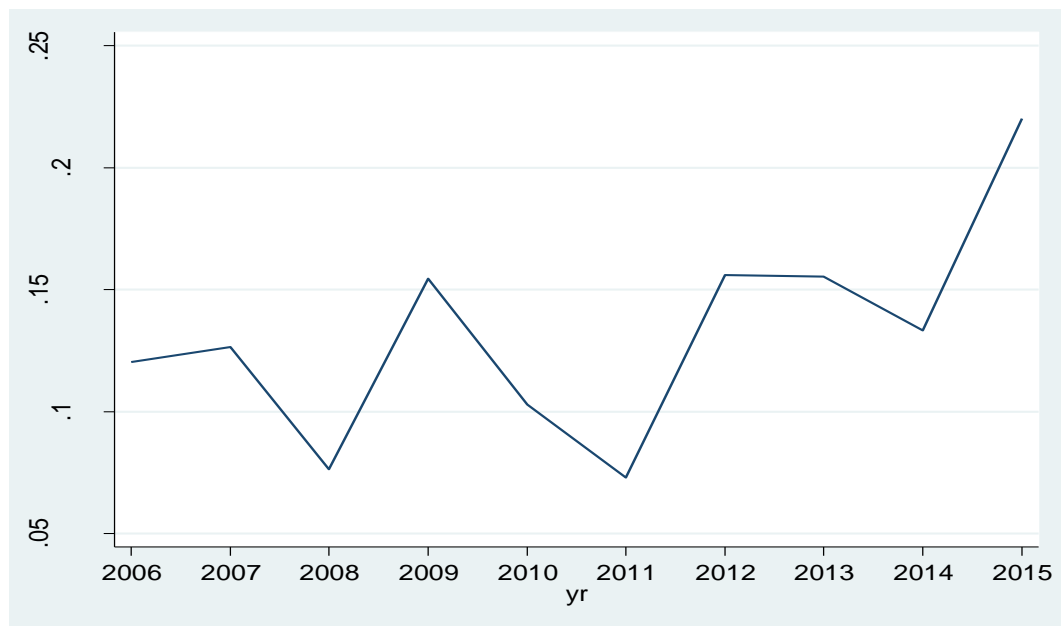
Firm status	N
Not affiliated with TUSIAD	85
Affiliated with TUSIAD	50
Total	135

I depict all the variables that use in the model and their calculation method in Table 4.4.

Table 4.4. Variables in the model and their calculation method

Variable	Calculation Method
Investment rate (I/K)	subtracting lagged capital stock/intangible assets from current capital stock/intangible assets plus depreciation and amortization, scaled by the beginning of period capital stock/intangible assets
Growth rate of sales (Gs)	the logarithmic difference between current sales and last period's sales.
Long term debt rate (Ltd/K)	Long term debts, scaled by the beginning of period capital stock
Cash holding to capital rate (CCE/K)	cash and cash equivalents item, scaled by the beginning of period capital stock
Cash flow to capital rate (CF/K)	Net operational profit plus depreciation and amortization, scaled by the beginning of period capital stock
Profit rate (π /K)	Net operational profit, scaled by the beginning of period capital stock
Free cash flow rate (FCF/K)	FCF calculated as cash flow-total investment expenditures, scaled by the beginning of period capital stock
Underinvestment rate (Ui/K)	underinvestment variable following Bates (2009): I calculate the median investment rate in the industry and if the firm's investment rate is below the median investment rate of the industry, the observation is picked as underinvestment.

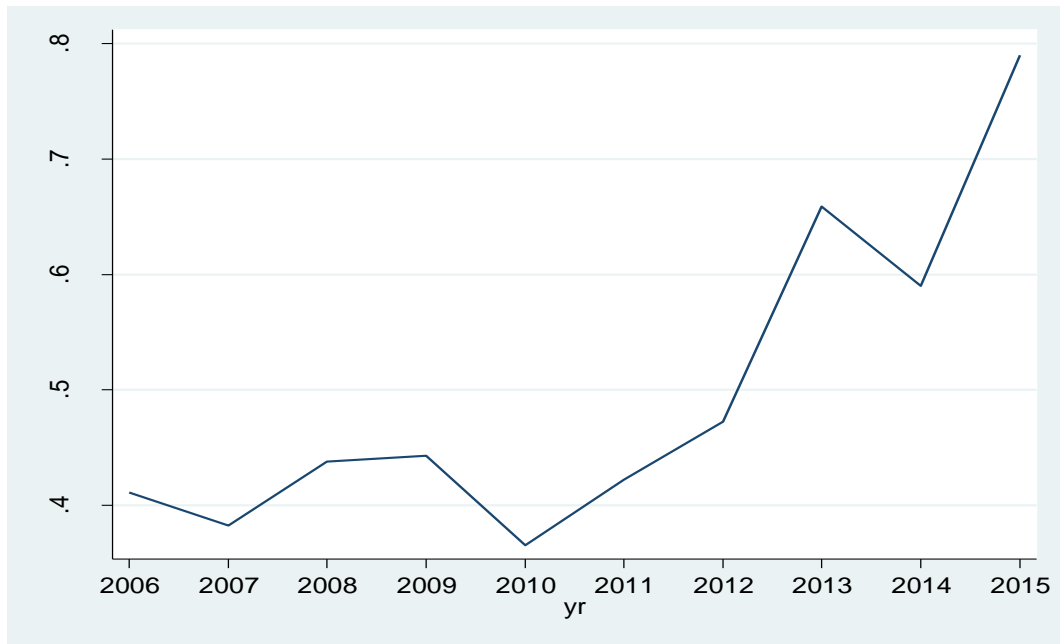
The mean investment, sales growth, leverage, long term debt, cash flow, cash, and free cash flow are depicted in Figure 4.1, Figure 4.2, Figure 4.3, Figure 4.4, Figure 4.5, and Figure 4.6. Figure 4.1 shows that the average investment rate in the manufacturing sector has not had a stable path in that period. The average long term debt ratio has a slower path in the pre-2008 era, however after that period, it has been increasing, which is clearly seen in Figure 4.2. In Figure 4.3, the average cash holding rate in the manufacturing sector has not a stable behavior either and the trends in the cash holding are not stable between 2006 and 2015. In Figure 4.4, the average growth rate of sales has sharply declined in that period. Figure 4.4 clearly shows that there is a demand cyclicality in the manufacturing firms between 2006 and 2015. The average profit rate has a peak period in 2008 and after this date, the mean profit rate was around 0.2 and it has had a stable trend in that period.



Source: Author's calculation from Finnet (2016)

Note: : The average Investment rate refers to the investment rate of the firms in the sample, by year.

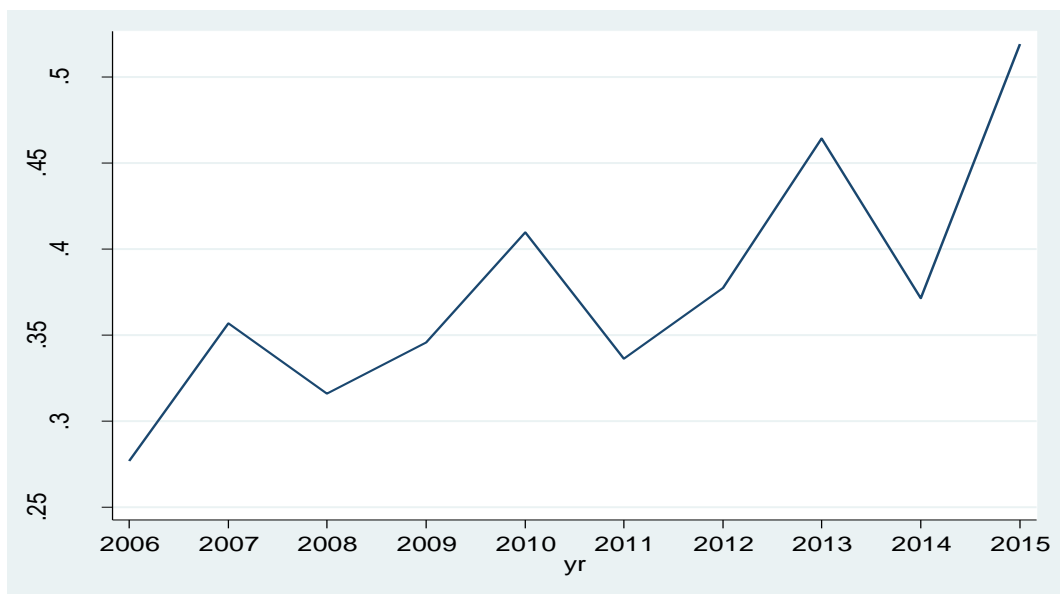
Figure 4.1. Average investment rate in the manufacturing sector



Source: Author's calculation from Finnet (2016)

Note: The average long term debt refers to the ratio of long term debt linked to lagged capital of the firms in the sample, by year.

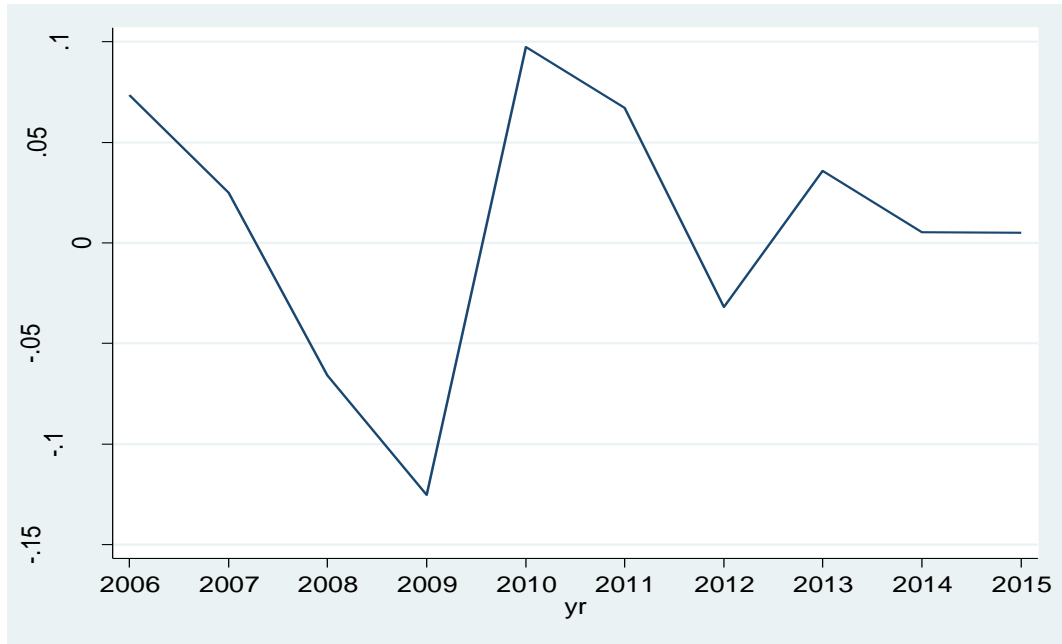
Figure 4. 2. Average long term debt in the manufacturing sector



Source: Author's calculation from Finnet (2016)

Note: The average cash holding rate refers to the ratio of cash and cash equivalents to lagged capital of the firms in the sample, by year.

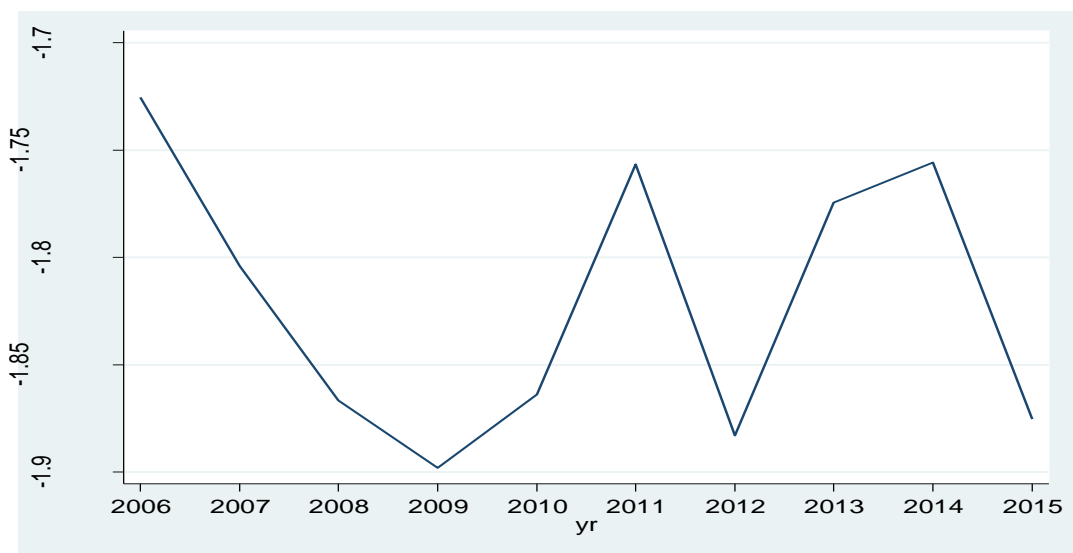
Figure 4.3. Average cash holding rate in the manufacturing sector



Source: Author's calculation from Finnet (2016)

Note: The average sales growth refers to the sales growth of the firms in the sample, by year.

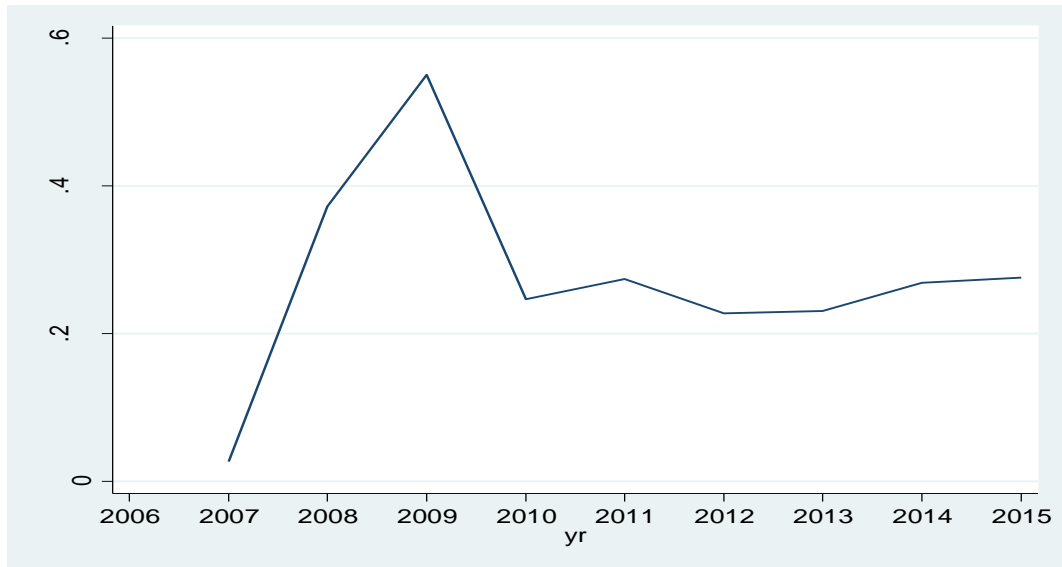
Figure 4.4. Average sales growth rate in the manufacturing sector



Source: Author's calculation from Finnet (2016)

Note: The average free cash flow refers to the ratio of free cash flow to lagged capital of the firms in the sample, by year.

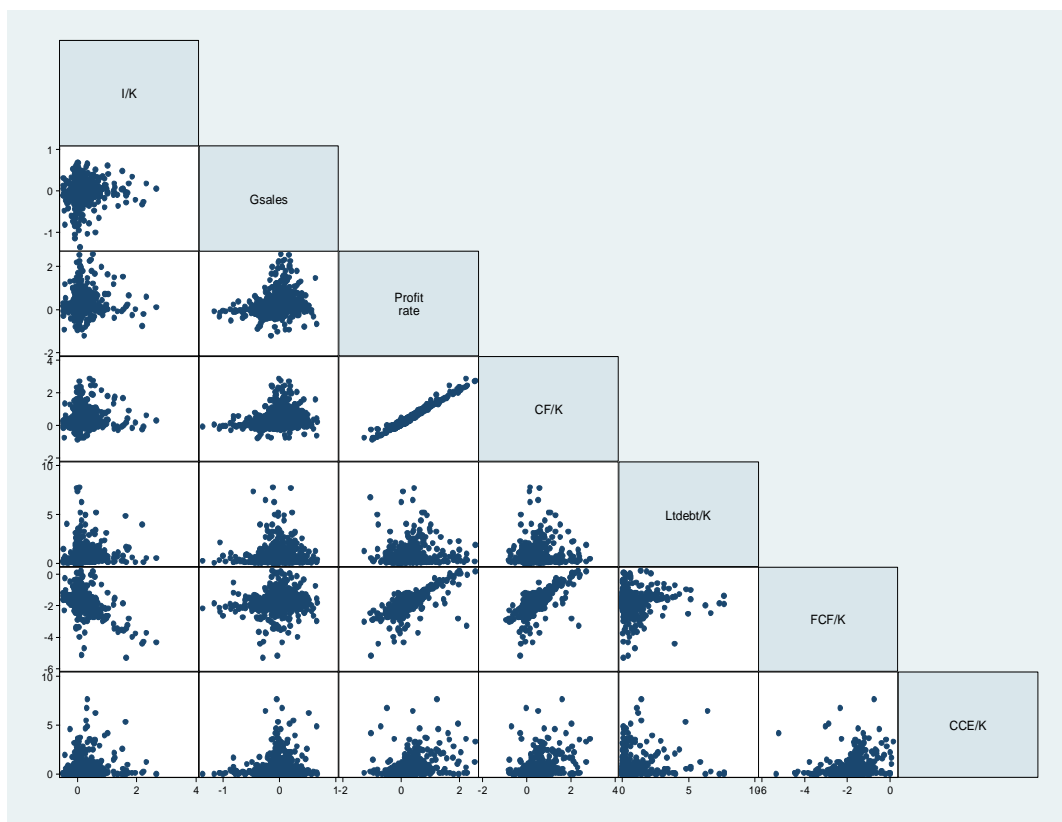
Figure 4.5. Average free cash flow in the manufacturing sector



Source: Author's calculation from Finnet (2016)

Note: The average profit rate refers to the ratio of profits to lagged capital of the firms in the sample by year.

Figure 4.6. Average profit rate in the manufacturing sector



Note: This scatter matrix includes all the firms' level and year observations.

Figure 4.7. The Scatter Matrix of All the Variables

Figure 4.7 presents scatter matrices of all the variables used in the regression analyses below and Table 4.4 presents the correlation matrix for these variables. Figure 4.7 shows that the correlation between investment and internal finance is high for the sample. Figure 4.7 also shows the negative correlation between debt variables and internal finance variables, while growth rate of sales has a positive effect on internal finance variables. In Table 4.5, correlation between the lagged form of the variables shows that there is no multicollinearity problem between the independent variables in the econometric sense. On the other hand, the lagged correlation between the variables shows that there is a positive effect on sales, on internal finance and debt on investment.

Table 4.5. Correlation Matrix

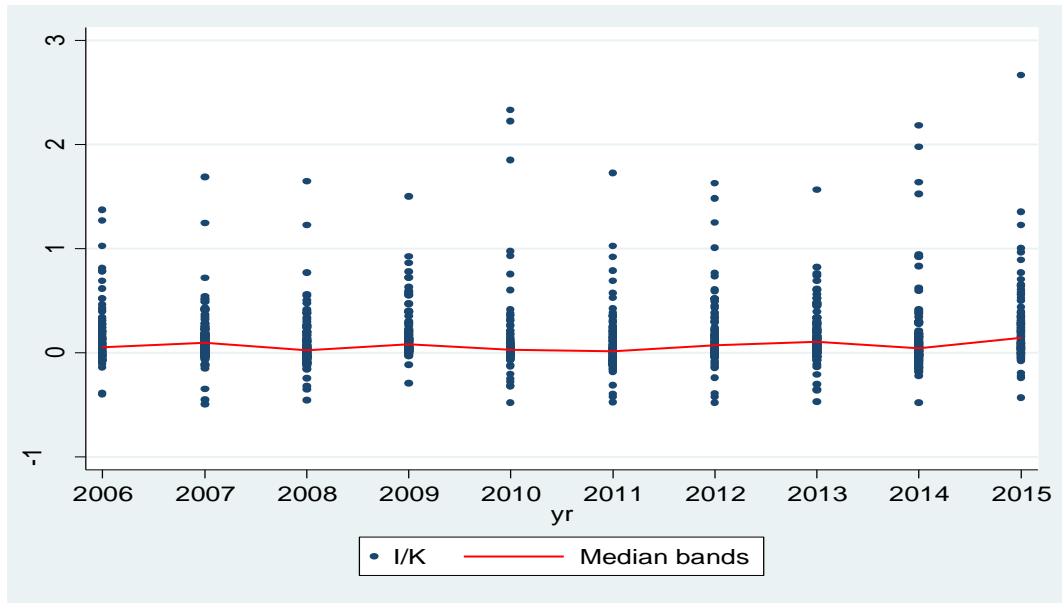
	$I/K_{i,t}$	$I/K_{i,t-1}$	$Gsales_{i,t-1}$	$\pi /K_{i,t-1}$	$CF/K_{i,t-1}$	$Ltdebt/K_{i,t-1}$	$FC/K_{i,t-1}$	$CCE/K_{i,t-1}$
$I/K_{i,t}$	1							
$I/K_{i,t-1}$	0.05	1						
$Gsales_{i,t-1}$	0.06	0.05	1					
$\pi /K_{i,t-1}$	0.12	0.11	0.23	1				
$CF/K_{i,t-1}$	0.14	0.15	0.23	0.98	1			
$Ltdebt/K_{i,t-1}$	0.16	0.24	0.005	0.11	0.16	1		
$FC/K_{i,t-1}$	0.09	-0.51	0.16	0.77	0.76	-0.01	1	
$CCE/K_{i,t-1}$	0.11	0.09	0.03	0.37	0.40	0.12	0.29	1

I present descriptive statistics for all the variables used in regression analyses in Table 4.6. According to the Table 4.6, the average investment rate, and the average growth rate of sales are extremely weak in the sample. The average free cash flow rate shows that the firms do investment expenditure by using debt and thus the average long term debt to capital rate is 0.49 in this given sample. The average cash flow, cash holding and profit rate to capital ratio is between 0.21 and 0.37. However, the standard deviation of the variables shows that there is a huge difference among firms in the given sample.

Table 4.6. Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
I/K	Overall	0.13	0.29	-0.49	2.66	N = 1323
	Between		0.11	-0.05	0.59	n = 135
	Within		0.27	-0.57	2.38	T-bar = 9.80
Gsales	overall	0.008	0.20	-1.35	0.67	N = 1323
	between		0.07	-0.30	0.14	n = 135
	within		0.19	-1.36	0.81	T-bar = 9.80
CF/K	overall	0.32	0.41	-0.91	2.86	N = 1324
	between		0.32	-0.32	1.83	n = 135
	within		0.27	-1.37	2.10	T-bar = 9.80
CCE/K	overall	0.37	0.74	0.001	7.61	N = 1323
	between		0.51	0.006	2.96	n = 135
	within		0.55	-2.03	6.33	T-bar = 9.80
Ltdebt/K	overall	0.49	0.78	0.01	7.72	N = 1324
	between		0.52	0.03	3.92	n = 135
	within		0.58	-3.36	6.27	T-bar = 9.80
FC/K	overall	-1.82	0.49	-5.30	0.22	N = 1323
	between		0.31	-3.38	-0.47	n = 135
	within		0.39	-4.96	1.00	T-bar = 9.80
π/K	overall	0.21	0.39	-1.25	2.53	N= 1324
	between		0.29	-0.40	1.64	n = 135
	within		0.26	-1.41	1.95	T-bar =9.80

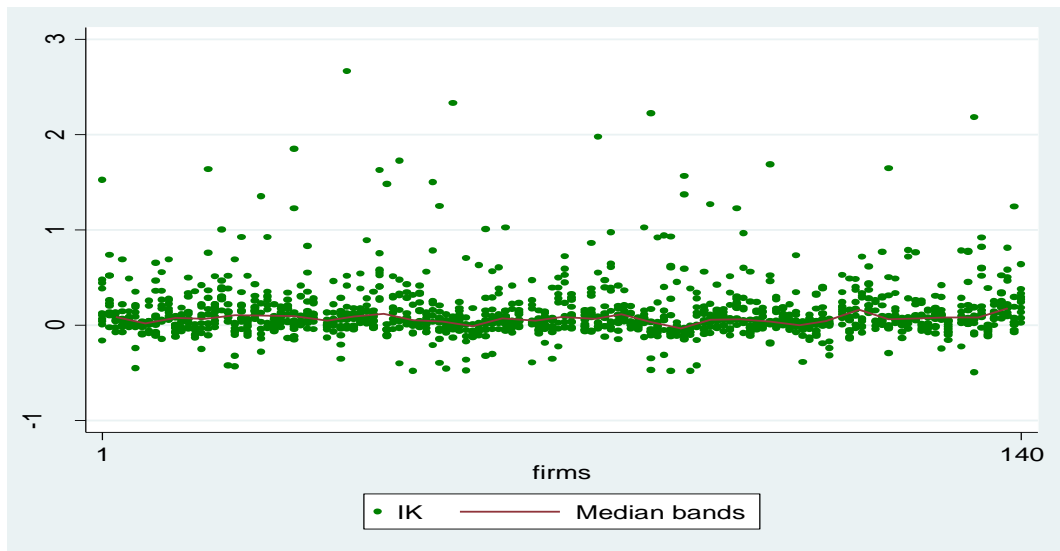
The scatter graphs of all the variables that used in the analysis for investment are given in Figure 4.8, Figure 4.9, Figure 4.10, Figure 4.11, Figure 4.12, and Figure 4.13.



Source: Author's calculation from Finnet (2016)

Note: The investment rate refers to the average investment rate of the sample, by year.

Figure 4.8. Investment rate and median level of the sample by years



Source: Author's calculation from Finnet (2016)

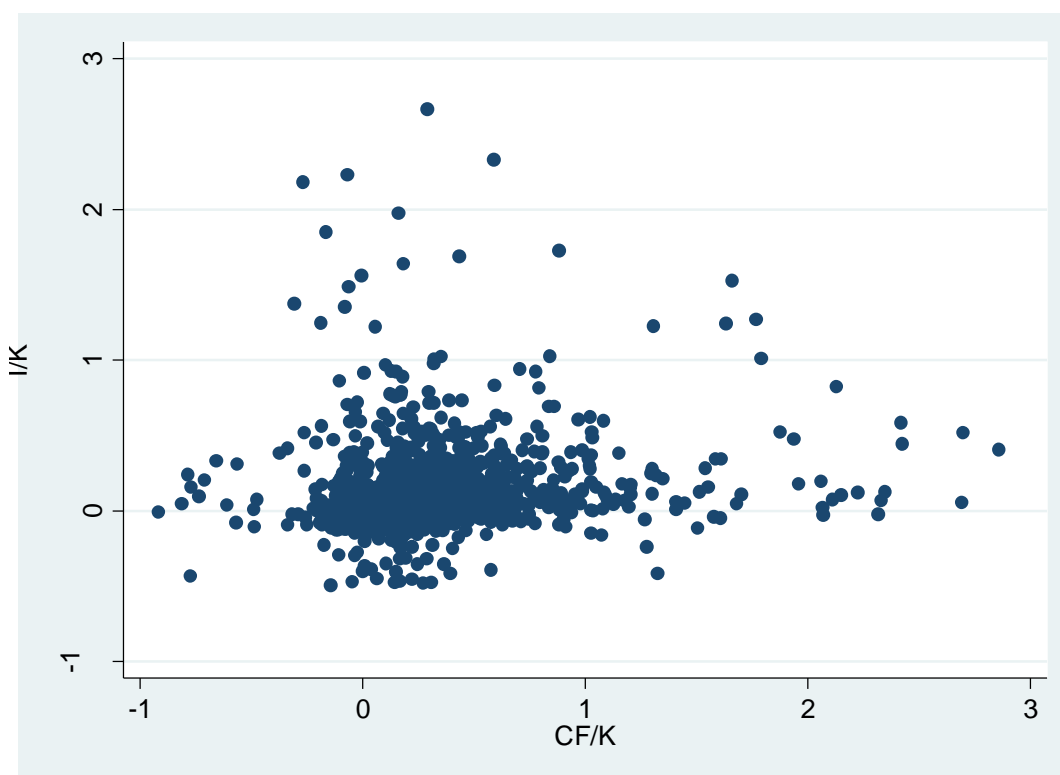
Note: The investment rate refers to the investment rate of the firms in the sample between 2006 and 2015.

Figure 4.9. Investment rate by firms and median level of the sample

Figure 4.8 shows that the investment rate, by years with median bands, by years.

Figure 4.8 shows that the investment rate has had a stagnant path in that period.

Figure 4.9 shows the investment rate by firms with median bands. In that period, the investment rate by firms shows that the investment rate has had a stagnant path, except for some extreme bounds.

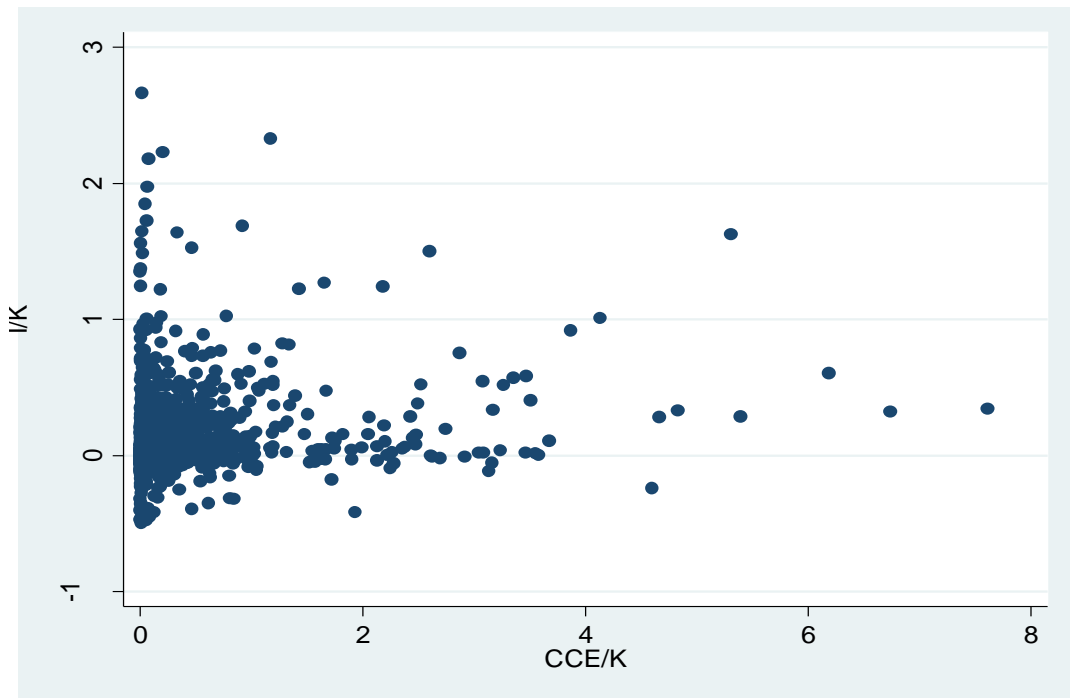


Note: This figure includes all the years and firms' level observations in the sample

Figure 4.10. Investment rate and cash flow rate relation in the sample

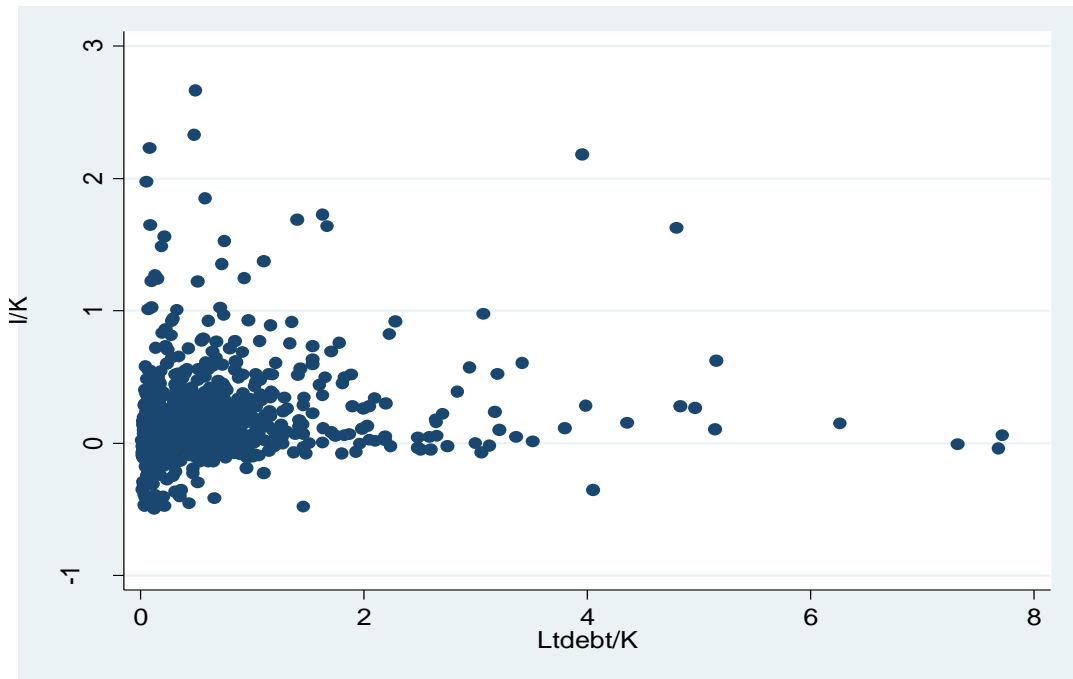
Figure 4.10 shows that the relationship between cash flow and investment is positive overall in the whole sample. Again, in Figure 4.11, the relationship between cash and investment is mostly positive in the whole sample. For the relationship between long term debt and investment, Figure 4.12 shows that this relationship is also mostly positive in the whole sample. The relationship between the growth rate of sales and investment is positive, which is clearly seen in Figure 4.13 and it shows that investment is the main demand driver in the manufacturing sector. Figure 4.14

shows that the relationship between the profit rate and investment is positive, which means that the firms in the given sample had a positive profit rate from their investment. In Figure 4.15, the firms in the given sample had negative free cash flows on the whole and thus the negative free cash flow may have caused a decrease in investment rate, which clearly is shown in Figure 4.15.



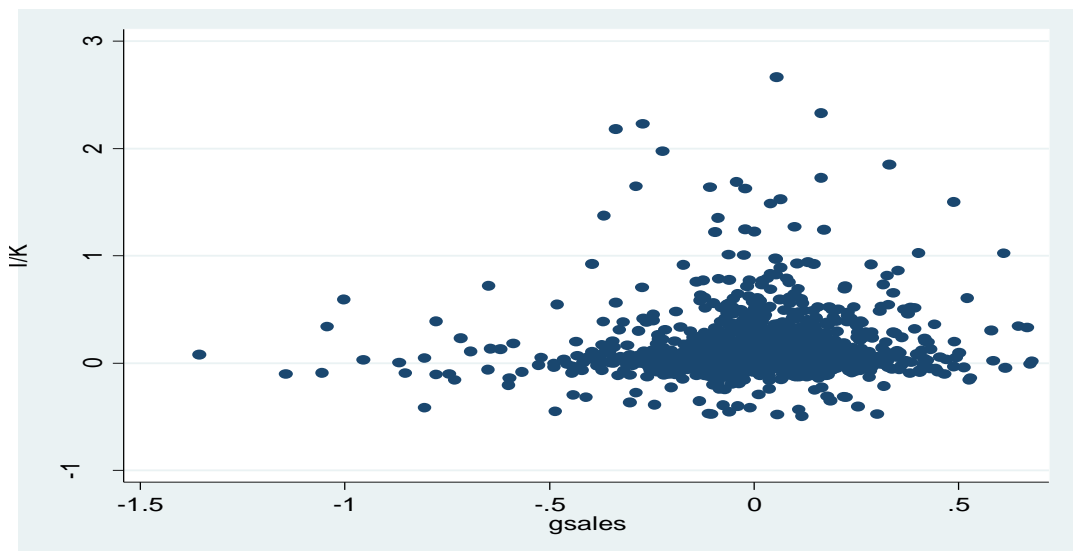
Note: This figure includes all the years and the firms' level observations in the sample.

Figure 4.11. Investment rate and cash to capital ratio relation in the sample



Note: This figure includes all the years and the firms' level observations in the sample.

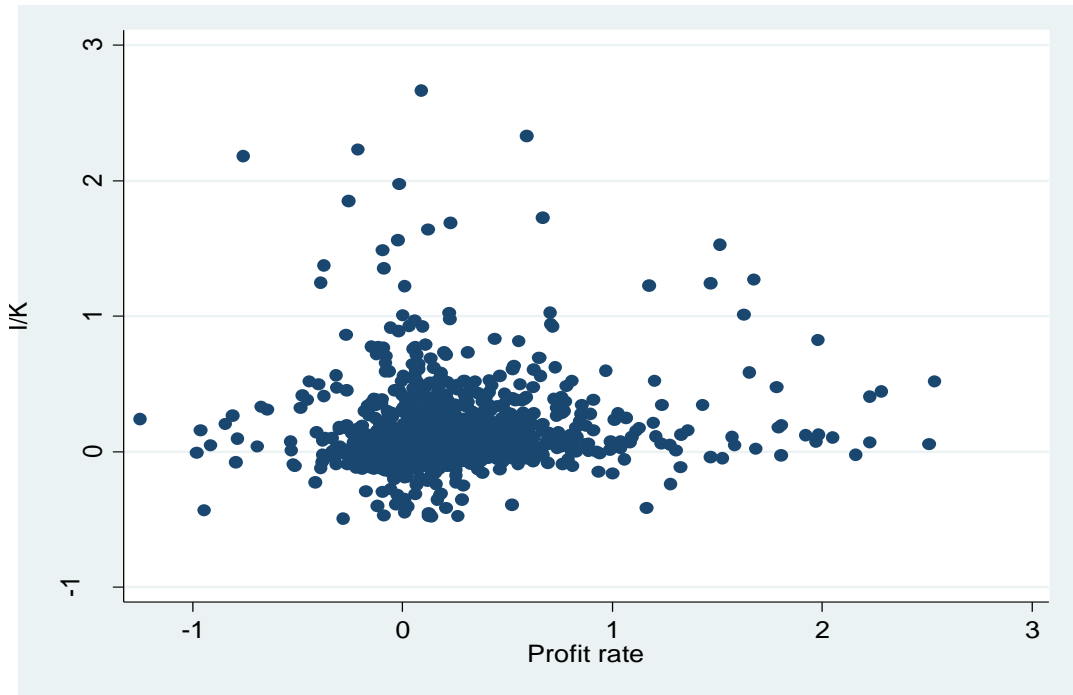
Figure 4.12. Investment rate and long term debt ratio relation in the sample



Note: This figure includes all the years and the firms' level observations in the sample.

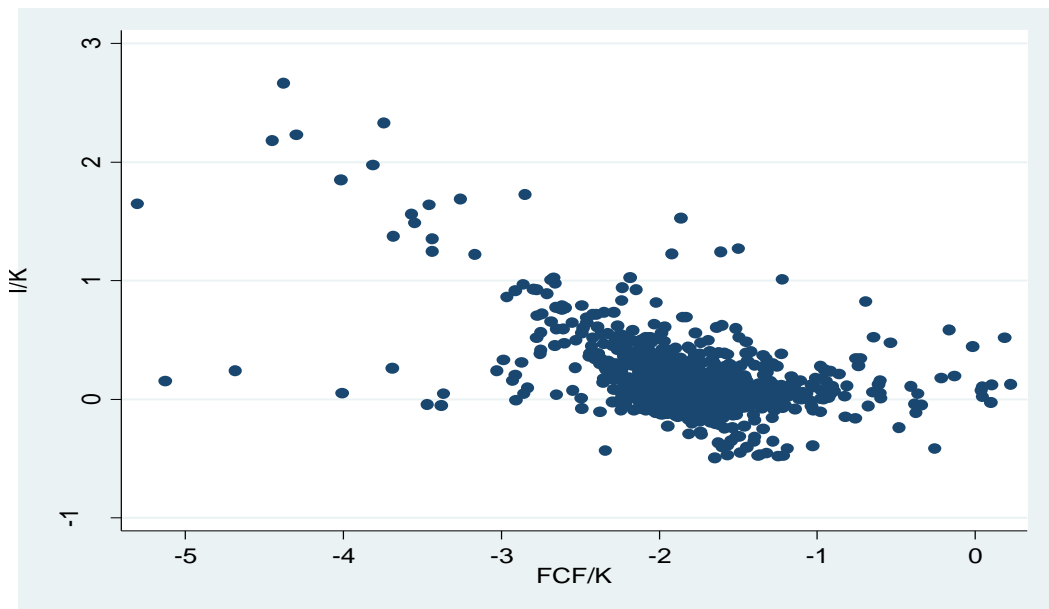
This figure includes all the years and firm level observations in the sample.

Figure 4.13. Investment rate and growth rate of sales relation in the sample



Note: This figure includes all the years and the firms' level observations in the sample.

Figure 4.14. Investment rate and profit rate relation in the sample



Note: This figure includes all the years and the firms' level observations in the sample.

Figure 4.15. Investment rate and free cash flow rate relation in the sample

4.2. Base Model and Hypotheses Variables

In this section, I first define the base model to be used and then discuss the variables to be used for hypotheses testing. The base model to be used in the analyses is as follows

$$\frac{I_{i,t}}{K_{i,t-1}} = \beta_0 + \beta_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_2 gsales_{i,t-1} + \beta_3 \frac{Ltdebt_{i,t-1}}{K_{i,t-2}} + \varepsilon_{i,t} \quad (4.1)$$

where I is investment, K is the beginning of period capital stock, $gsales$ is the growth of sales and $Ltdebt$ is the long term debt, i denotes the firm and t denotes the year.

The dependent variable is the rate of investment defined as capital expenditures, which is calculated subtracting lagged capital stock from current capital stock plus depreciation and amortization,¹⁸ scaled by the beginning of period capital stock.

Lagged investment ratio is used to account for the inertia and gestation lags in investment. Long-term debt is used to as a proxy for the level of safety debt perception by the management of the firms and the markets. If the debt level falls below the safety level, the expected sign between long-term debt and investment is positive, while if the debt level goes above the safety level, the relation between debt and investment is expected to be negative. However, there is a need for a safety level of debt and the current debt level measure, since the dataset has not any kind of variable which shows the safety level of debt. Indeed the cheap credit conditions

¹⁸ I use depreciation and amortization as it in the current literature due to the firm use depreciation and amortization for diverting cash for maintenance and repair investment. Amortization and depreciation may subject to criticism for manipulating the cash needs of the firms, however, there is only %20 amortization chance of the firm in 1 year period in Turkey, according to the regulatory framework of depreciation and amortization. Therefore, it may not a subject for any kind of accounting fraud in terms of recording amortization and depreciation. On the other hand, I use depreciation for investment estimates due to the oligopolistic nature of the manufacturing sector. If depreciation and amortization deducted from this measurement, the investment expenditures seem mostly negative due to the manufacturing firms that belong to TUSIAD or a part of holding structure use only the depreciation and amortization for covering their positions in the market, and consistent with the extant literature the firms are mature firms about capital accumulation. Moreover, the depreciation and amortization deducted models have huge outliers than expected, which confirms the investment conditions in the manufacturing sector.

offers extremely low real interest rates and the safety debt level of firms is based on the size of the firm. I expect that the relation between long term debt and investment is positive for the firms under low real interest rates/cheap credit conditions, and the level of debt perception in this period is lower than the safety debt level. The long term debt variable is the long term debt on the balance sheet scaled by the beginning of period capital stock.

Sales growth is used to account for growth possibilities of the firm and is calculated as the logarithmic difference between current sales and last period's sales.

In order to test the hypotheses stated above, I add each variable to this base model. I start with the cash flow variable, which is defined as earning before interest, taxes, depreciation, and amortization, scaled by the beginning of period capital stock:

$$\frac{I_{i,t}}{K_{i,t-1}} = \beta_0 + \beta_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_2 \frac{CF_{i,t-1}}{K_{i,t-2}} + \beta_3 gsales_{i,t-1} + \beta_4 \frac{Ltdebt_{i,t-1}}{K_{i,t-2}} + \varepsilon_{i,t} \quad (4.2)$$

where CF denotes the cash flow.

In order to look at the relationship between investment and cash holding, I add the cash holding variable defined as cash and cash equivalents item, scaled by the beginning of period capital stock:

$$\frac{I_{i,t}}{K_{i,t-1}} = \beta_0 + \beta_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_2 \frac{CCE_{i,t-1}}{K_{i,t-2}} + \beta_3 gsales_{i,t-1} + \beta_4 \frac{Ltdebt_{i,t-1}}{K_{i,t-2}} + \varepsilon_{i,t} \quad (4.3)$$

where CCE denotes the cash and cash equivalents.

In order to look at the link between profitability and investment, I add the profit rate variable defined as the net operational profitability, scaled by the beginning of period capital stock:

$$\frac{I_{i,t}}{K_{i,t-1}} = \beta_0 + \beta_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_2 \frac{\pi_{i,t-1}}{K_{i,t-2}} + \beta_3 gsales_{i,t-1} + \beta_4 \frac{Ltdebt_{i,t-1}}{K_{i,t-2}} + \varepsilon_{i,t} \quad (4.4)$$

where π denotes profits.

In order to look at the relationship between free cash flow and investment, I add the free cash flow variable defined as cash flow minus investment expenditures, scaled by the beginning of period capital stock:

$$\frac{I_{i,t}}{K_{i,t-1}} = \beta_0 + \beta_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_2 \frac{FCF_{i,t-1}}{K_{i,t-2}} + \beta_3 gsales_{i,t-1} + \beta_4 \frac{Ltdebt_{i,t-1}}{K_{i,t-2}} + \varepsilon_{i,t} \quad (4.5)$$

where FCF denotes free cash flow.

Finally, in order to look at the link between free cash flow and underinvestment I construct an underinvestment variable following Bates (2009): I calculate the median investment rate in the industry and if the firm's investment rate is below the median investment rate of the industry, the observation is picked as underinvestment. The underinvestment model is defined as follows:

$$\frac{Underinv_{i,t}}{K_{i,t-1}} = \beta_0 + \beta_1 \frac{Underinv_{i,t-1}}{K_{i,t-2}} + \beta_2 \frac{FCF_{i,t-1}}{K_{i,t-2}} + \beta_3 gsales_{i,t-1} + \beta_4 \frac{Ltdebt_{i,t-1}}{K_{i,t-2}} + \varepsilon_{i,t} \quad (4.6)$$

where Underinv denotes the underinvestment of the firm.

I use the interaction term of the main variables of interest and *a priori* firm specific affiliation dummy in the models for examining whether the non-holding affiliation and non-TUSIAD membership have direct effect on the relation between the main variables of interest (cash flow, cash holding, profit rate, free cash flow) and investment.

4.3. Econometric Estimations

I start with estimating the models using fixed effect regressions. The results are reported in Table 4.7. The obtained findings from the base model show that the inertia effect of investment and long term debt have a significant and positive effect on investment, while the growth rate of sales has a positive effect as expected, even

if it is insignificant. The second model that includes the cash flow variable and it shows a significant and positive effect on investment. The signs of the lagged investment ratio and long term debt ratio are positive and significant. The growth rate of sales also has a positive effect on investment, however, it is insignificant. The obtained findings from the third model in which cash and cash equivalents are taken as alternative internal finance regressor, show that the cash and cash equivalents have significant and positive effect on investment. The signs and coefficients of other regressors remain the same as base model. The obtained findings from the fourth model in which profit rate is taken as an alternative regressor of internal finance show that profit rate has significant and positive effect on investment. The signs and coefficients of other regressors remain the same as the base model. The obtained findings from the investment model in which free cash flow is taken as internal financing source, which is an alternative to other internal finance variables in the previous models, show that free cash flow has a positive and significant effect on investment. The sign of the lagged investment is positive, even if it is insignificant. Growth rate of sales has a positive effect on investment, even if its sign is insignificant. The effect of lagged long term debt is positive and significant on investment.

In sum, the results of the estimated models show that the internal finance has a significant effect on investment when leverage or financial leverage and future growth options and inertia effect of investment controlled in the Turkish manufacturing sector.

Table 4.7. Fixed Effects Panel OLS Estimation Results

	(1)	(2)	(3)	(4)	(5)
	I/K_{i,t} : Base Model	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}
I/K _{i,t-1}	-0.09** (-2.95)	-0.10** (-3.15)	-0.11** (-3.26)	-0.09*** (-2.97)	0.07 (1.47)
Ltdebt/K _{i,t-1}	0.06* (2.42)	0.05* (2.03)	0.05* (1.99)	0.06* (1.96)	0.05* (1.99)
Gsales _{i,t-1}	0.06 (1.65)	0.0001 (0.00)	0.06 (1.80)	0.00 (0.90)	0.001 (0.04)
CF/K _{i,t-1}		0.18*** (4.19)			
CCE/K _{i,t-1}			0.06** (3.14)		
π /K _{i,t-1}				0.16*** (3.84)	
FCF/K _{i,t-1}					0.18*** (4.03)
B ₀		0.05*** (3.53)	0.10*** (7.07)	0.08*** (5.60)	0.42*** (5.27)
<i>N</i>	1145	1135	1132	1135	1135
<i>R</i> ² within	0.02	0.04	0.03	0.03	0.04
<i>F</i> stats <i>p</i> value	0.00	0.00	0.00	0.00	0.00

Note: All the fixed effect regressions are estimated with robust standard errors. *t* statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.10$

Next, in order to control for potential endogeneity problems, I repeat the same estimations using Generalized Method of Moments (GMM). The results of these estimations are presented in Table 4.8. For limiting the instruments, the most common way is limiting the lags between t-2 and t-4. Thus, I reported the Diff-GMM models with t-2 to t-4 lags as instruments¹⁹.

The Diff-GMM base model estimations are almost the same as the base model with fixed effect OLS estimations. The lagged investment and lagged long term debt have a significant effect on investment, and their signs are negative and positive, respectively. According to the Diff GMM results, which depicted in Table 4.8 and, the estimation results show that the effect of cash flow on investment is significant and positive. And the relation between cash holding and investment is positive as expected and is significant. In other words, the effect of cash holding on investment is positive. The profit rate also has positive effect on investment, while the coefficient of the variables are expected, even if they are insignificant at %5 statistical significance level yet it is significant, at % 10, at a statistical significance level. The relation between free cash flow and investment is found as positive according to the Diff-GMM results. All the models are valid, and there is no autocorrelation problem in the second differenced residuals, and there is no overidentification problem in the models according to the Hansen J Test²⁰.

Controlling the endogeneity in the models, the effect of cash flow on investment is positive and significant in both Diff-GMM and fixed effects OLS models results.

However, the coefficient or impact of the cash flow on investment in Diff-GMM model is more than in fixed effect OLS model. In the cash holding model, the effect

¹⁹ The deeper lags may not be useful for the firms for investment decision.

²⁰ Hansen J Test is more robust than Sargan Test when robust standard errors in the One Step Diff GMM model are used according to the Roodman (2006). The Hansen J Test is based on Two Step Diff GMM according to Roodman (2006).

and significance of the cash holding on investment is positive and significant, however, the impact of cash holding on investment in Diff-GMM model is more than in fixed effects OLS model. The effect of profit rate on investment is positive in both fixed effect OLS and Diff-GMM models, however, its coefficient is more in the Diff-GMM model than in the fixed effects OLS model, however, its significance level decreased. The effect of free cash flow on investment in the Diff-GMM model is more than in the fixed effects OLS model. In sum, to avoid endogeneity, the Diff-GMM models have better results for investment decisions in the manufacturing sector.

Table 4.8. Diff-GMM Estimation Results

	(6)	(7)	(8)	(9)	(10)
	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$
Base model					
$I/K_{i,t-1}$	0.009 (0.78)	-0.03 (-0.78)	-0.03 (-0.98)	0.18* (2.13)	-0.01 (-0.40)
$Ltdebt/K_{i,t-1}$	0.06 (1.56)	0.04 (1.57)	0.04 (1.20)	0.06 (1.58)	0.05 (1.65)
$Gsales_{i,t-1}$	0.08* (2.05)	0.02 (0.54)	0.06 (1.47)	0.03 (0.73)	0.03 (0.69)
$CF/K_{i,t-1}$		0.25* (2.06)			
$CCE/K_{i,t-1}$			0.07* (2.00)		
$FCF/K_{i,t-1}$				0.22* (2.24)	
$\pi/K_{i,t-1}$					0.21**** (1.73)
N	994	980	978	979	980
$AR(1)$	0.00	0.00	0.00	0.00	0.00
$AR(2)$	0.71	0.93	0.96	0.66	0.97
$J Test$	0.22	0.32	0.21	0.32	0.35

Note: Time dummies are not reported. The Diff-GMM is based on one step estimation with robust standard errors.

Then I introduce interaction variables to look at the potential impact of holding group affiliation. The econometric estimations of the models for holding group affiliation are depicted in Table 4.9. The obtained findings from the models show that the flow variables have no significant impact on investment for the firms with holding group affiliation. The effect of cash holding on investment is positive for the firms with holding group affiliation. In the model 11, the effect of cash flow on investment is negative and insignificant. In the model 12, the effect of cash holding has significant and positive effect on investment for those firms with holding affiliation. In the model 13, the effect of past/lagged profits have negative and insignificant effect on investment for holding affiliated firms. In model 14, the effect of free cash flow on investment is positive and insignificant. The Diff-GMM results for holding affiliated firms show that the financially unconstrained firms use the internal finance option for investment by holding cash. In all the estimated models, the estimated coefficients of the variables that are based on the base model or control variables that are insignificant however, they are insignificant excluding the model 13 in which lagged growth rate of sales have significant and positive on investment.

Table 4.9. Diff-GMM Estimation Results for Holding Affiliations and the Main Variables Interaction on Investment

	(11)	(12)	(13)	(14)
	$I/K_{i,t-1}$	$I/K_{i,t-1}$	$I/K_{i,t-1}$	$I/K_{i,t-1}$
$I/K_{i,t-1}$	0.02 (0.58)	-0.01 (-0.43)	0.002 (0.65)	0.02 (0.60)
$Ltdebt/K_{i,t-1}$	0.06 (1.56)	0.06 (1.43)	0.06 (1.54)	0.06 (1.56)
$Gsales_{i,t-1}$	0.08 (1.92)	0.06 (1.57)	0.09* (2.01)	0.06 (1.69)
$Hol*CF/K_{i,t-1}$	-0.01 (-0.08)			
$Hol*CCE/K_{i,t-1}$		0.07* (2.00)		
$Hol*\pi/K_{i,t-1}$			-0.07 (-0.48)	
$Hol*FCF/K_{i,t-1}$				0.04 (0.59)
N	980	978	980	980
$AR(1)$	0.00	0.00	0.00	0.00
$AR(2)$	0.60	0.75	0.58	0.68
J	0.38	0.35	0.42	0.34

For non-holding firms, according to the Diff-GMM results which are depicted in Table 4.10, all the variables have significant effects on investment. The results show that non-holding affiliated firms use internal finance for hedging the wedge between internal and external finance costs. According to the obtained findings from model 15, cash flow has a positive and significant effect on investment for non-holding affiliated firms. In the model 16, non-holding affiliated firms are not prone to excess cash holdings, while the estimated coefficient is positive, even if it is insignificant. In the model 17, the effect of past profits is positive and significant for non-holding affiliated firms according to the obtained findings. In the model 18, free cash flow has a positive and significant effect on investment. For all the estimated models, the effect of growth rate of sales and of long term debt on investment is positive, even if it is insignificant. Except model 18, the inertia effect of investment rate is expected, even if it is insignificant. In the model 18, the effect of lagged investment rate on investment is positive. The findings clearly show that there is a positive link between financing constraints and investment via internal finance channel. However, the internal finance option is based on flow variables for financially constrained firms due to there is no cash stock option for the financially constrained firms.

Table 4.10. Diff-GMM Estimation Results for Non-Holding Affiliations and the Main Variables

Interaction on Investment

	(15)	(16)	(17)	(18)
	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$
$I/K_{i,t-1}$	-0.04 (-0.97)	-0.02 (-0.57)	-0.02 (-0.65)	0.14* (2.53)
$Ltdebt/K_{i,t-1}$	0.04 (1.41)	0.03 (1.11)	0.05 (1.58)	0.04 (1.33)
$Gsales_{i,t-1}$	0.04 (1.00)	0.08 (1.77)	0.04 (1.03)	0.05 (1.23)
$Non-Hol*CF/K_{i,t-1}$	0.42** (2.96)			
$Non-Hol*CCE/K_{i,t-1}$		0.15 (1.52)		
$Non-Hol*\pi/K_{i,t-1}$			0.43* (3.03)	
$Non-Hol*FCF/K_{i,t-1}$				0.26** (2.89)
N	980	978	980	980
$AR(1)$	0.00	0.00	0.00	0.00
$AR(2)$	0.96	0.76	0.88	0.99
J	0.30	0.61	0.36	0.29

According to the estimation results, which are depicted in Table 4.11, firms with TUSIAD membership are holding cash for any external shock in the economy. We assume that the firms are not financially constrained, and they have necessary fund generation ability due to their structure and institutional background.

The obtained findings from Diff-GMM models, there is no positive link between cash flow and investment according to the results of model 19. In the model 20, the effect of cash holding on investment is positive, which clearly shows that those firms use internal finance option as stock variable due to their fund generation ability. The obtained findings from model 21, and model 22 indicate that there is no significant effect of profit rate and free cash flow on investment, respectively.

The results from the estimated Diff-GMM models, which are depicted in Table 4.12, for non-TUSIAD members, the cash flow and investment sensitivity is high as well as the link between free cash flow and investment that is found as positive and significant for investment according to the obtained findings from model 23 and model 24, respectively.

Table 4.11. Diff-GMM Estimation Results for TUSIAD membership and the Main Variables Interaction on Investment

	(19)	(20)	(21)	(22)
	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$	$I/K_{i,t}$
$I/K_{i,t-1}$	-0.01 (-0.37)	-0.03 (-0.87)	-0.00 (-0.19)	-0.00 (-0.03)
$Gsales_{i,t-1}$	0.07 (1.74)	0.06 (1.44)	0.07 (1.79)	0.07 (1.83)
$Ltdebt/K_{i,t-1}$	0.05 (1.54)	0.05 (1.34)	0.06 (1.57)	0.06 (1.55)
$TUSIAD*CF/K_{i,t-1}$	0.15 (1.09)			
$TUSIAD*CCE/K_{i,t-1}$		0.15** (2.64)		
$TUSIAD*S/K_{i,t-1}$				
$TUSIAD*\pi/K_{i,t-1}$			0.10 (0.71)	
$TUSIAD*FCF/K_{i,t-1}$				-0.00 (-0.03)
N	980	978	980	979
$AR(1)$	0.00	0.00	0.00	0.00
$AR(2)$	0.92	0.83	0.87	0.92
J	0.32	0.22	0.30	0.36

For further investigation, Table 4.12 depicts whether the financial constraints caused investments or not has an essential importance for the relation between financing constraints and investment. I use non-TUSIAD membership for *a priori* classification of the firms as financially constrained and thus, the obtained findings from the regressions have an importance for showing the link between financing constraints and investment.

In Table 4.12, model 23 shows that cash flow has a positive and significant effect on investment for those firms. In model 24, the effect of cash holding has no significant effect on investment for those firms. Profit rate and free cash flow has a significant and positive effect on investment according to the results of the model 25 and model 26, respectively. The effects of long term debt and growth rate of sales on investment are as expected in the models, however, are insignificant. The inertia effect is not shown in the estimated models, the sign of the lagged investment in the models are positive, except in model 26, are insignificant.

In the results for non-TUSIAD member firms, there is a clear difference between TUSIAD member firms and non-TUSIAD member firms for the internal finance option for investment. The results show that the TUSIAD member firms are not financially constrained as expected, being a member of the specific organization network gives better access to financial markets or gives the ability of avoiding financial frictions. On the other hand, non-TUSIAD members are financially constrained firms and they use flow variables for investment, according to the results obtained.

Table 4.12. Diff- GMM Estimation Results for Non-TUSIAD membership and the Main Variables Interaction on Investment

	(23)	(24)	(25)	(26)
	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}
I/K _{i,t-1}	0.00 (0.16)	0.00 (0.15)	0.01 (0.37)	0.18* (2.03)
Gsales _{i,t-1}	0.04 (1.02)	0.08 (1.83)	0.04 (1.11)	0.03 (0.89)
Ltdebt/K _{i,t-1}	0.04 (1.48)	0.03 (0.96)	0.04 (1.52)	0.04 (1.44)
Non-TUSIAD*CF/K _{i,t-1}	0.26* (2.00)			
Non-TUSIAD*CCE/K _{i,t-1}		0.04 (1.37)		
Non-TUSIAD*π/K _{i,t-1}			0.24**** (1.75)	
Non-TUSIAD*FCF/K _{i,t-1}				0.26* (2.36)
<i>N</i>	980	978	980	979
<i>AR(1)</i>	0.00	0.00	0.00	0.00
<i>AR(2)</i>	0.70	0.63	0.72	0.69
<i>J</i>	0.48	0.65	0.40	0.24

Table 4.13 gives the results for the relation between underinvestment and financing constraints. According to the estimation results, the non-holding affiliated firms have suffered from underinvestment problems. Moreover, their free cash flow constraint cause to the underinvestment problem is at %5 which is a significant level. For the TUSIAD non-membership has a positive link with underinvestment at a %5 statistical significance level. I can clearly confirm that there is a high and sensitive relation between financing constraints and underinvestment problem in Turkish manufacturing sector with the given sample of the firms.

The obtained findings from model 27, and model 28 show that there is a dependent effect of lagged underinvestment on current underinvestment, which shows the path dependency of the underinvestment problem of the firms, however, the sign of the lagged underinvestment is insignificant. The effect of long term debt on underinvestment is negative, which shows that long term debt may help to escape from the underinvestment problem for the firm. The demand conditions of the firms may be cyclical due to the coefficient of growth rate of sales that is positive for underinvestment. Both the non-TUSIAD membership and non-holding affiliation have positive links to underinvestment. The estimated coefficients show that the effect of non-holding affiliation is more than non-TUSIAD members for underinvestment in the model 29 and model 30.

In Table 4.14, the results for the underinvestment and financing constraints are depicted with the firms with negative free cash flow, which is usually tested in the current literature while the findings obtained from the main equation, do not alter. The obtained findings from the model 29 and model 30, show that the effect of financing constraints have a positive and significant effect on underinvestment in

manufacturing firms within this given sample even if I take negative free cash flows in the lagged term, into account, for underinvestment.

Table 4.13. The Underinvestment and Financing Constraints Relation: Diff-GMM Estimations

	(27)	(28)
	Underinv _{i,t}	Underinv _{i,t}
Underinv _{i,t-1}	0.02 (0.23)	0.13 (1.35)
Ltdebt/K _{i,t-1}	-0.01 (-0.30)	-0.02 (-0.68)
Gsales _{i,t-1}	0.07 (1.28)	0.06 (1.24)
Non-Holding*FCF/K _{i,t-1}		0.37** (2.94)
Non-TUSIAD*FCF/K _{i,t-1}	0.18* (2.02)	
<i>N</i>	490	488
<i>AR(1)</i>	0.12	0.19
<i>AR(2)</i>	0.57	0.52
<i>J</i>	0.40	0.28

Table 4.14. The Underinvestment and Financing Constraints Relation: The Sample Consisted of all the Observations with Negative Free Cash Flow, Diff-GMM Estimations

	(29)	(30)
	Underinv _{i,t}	Underinv _{i,t}
Underinv _{i,t-1}	0.08 (0.98)	0.02 (0.22)
Gsales _{i,t-1}	0.09 (1.82)	0.07 (1.29)
Ltdebt/K _{i,t-1}	-0.00 (-0.25)	-0.01 (-0.30)
NegFCF/K* Nonhold _{i,t-1}	0.27** (2.64)	
NegFCF/K* Non-TUSIAD _{i,t-1}		0.18* (2.01)
<i>N</i>	490	490
<i>AR(1)</i>	0.10	0.12
<i>AR(2)</i>	0.46	0.57
<i>J</i>	0.26	0.40

4.4. General Findings

In this chapter, I presented empirical estimations on the relationships between investment and potential financing constraints variables.

For the linkage between findings and the main hypothesis and alternative interpretations of the main hypothesis, I give a detailed snapshot as follows.

For the main hypothesis, the relation between cash flow and investment, the findings from the econometric models which are based on the OLS and Diff-GMM estimations, confirm the relationship between internal finance and investment to be positive for the whole sample.

In this chapter, I give the empirical findings of investment behavior of the firms, which are mostly large scaled, according to the different scales (i.e holding affiliations, and TUSIAD membership) for estimating the effect of internal finance by using different alternative variables.

For the cash flow variable, the results from the whole sample suggest that the link between cash flow and investment is positive. However, for the econometric investigation of a priori classified firms, the results show that the financially constrained firms use cash flow for investment. The estimation results from the regressions, in which I classify the holding affiliated firms and TUSIAD member firms as financially unconstrained firms, are not prone to cash flow for investment. In the regression models that include non-holding member and non-TUSIAD member firms as financially constrained, the relation between cash flow and investment is positive and significant. The relation between financing constraints and investment is positive when I use the cash flow variable in the regression models.

For cash holding variable, the results from the whole sample show that the relation between cash holding and investment is positive and significant. Non-holding and

non-TUSIAD member firms which are financially constrained firms, are also not prone to cash holding for investment, due to they have not fund generation possibility. However, the results from holding affiliated and TUSIAD member firms show that the relation between cash holding and investment is positive and significant. The results show that financially unconstrained firms use internal finance by holding cash. Their investment decisions are not dependent on internal finance flows but on internal finance stocks.

For the profit rate variable, the obtained findings from the whole sample show that the relation between profit rate and investment is positive and significant. The results from the regression models, in which I use non-holding affiliated firms and non-TUSIAD member firms as financially constrained firms, show that the relation between the profit rate and investment is positive and significant, which shows that the realized past profits are a source of internal finance for financially constrained firms. The results from holding affiliated and TUSIAD member firms based regression models, show that the relation between the profit rate or realized past profits and investment is insignificant. The results show that financially constrained firms use the profit rate as an internal finance source for investment, while financially unconstrained firms do not use the profit rate as an internal finance source for investment.

For the free cash flow variable, the estimation results from the whole sample show that the relation between free cash flow and investment is positive. For non-holding affiliated and non-TUSIAD member firms, the relation between free cash flow and investment is also positive, while the relation between free cash flow and investment is insignificant for holding affiliated firms and TUSIAD member firms. The results show that financially constrained firms use free cash flow as an internal finance

source for investment, while financially unconstrained firms do not use free cash flow as an internal finance source for investment.

The obtained findings are consistent with the applied literature on Turkey in terms of the relation between internal finance and investment, such as in studies by:

Egimbaeva (2013), Kaya (2011), Eser Özen (2014), Demir (2008), Gezici (2007), Yeşiltaş (2009), Çetenak and Vural (2015). Although the Turkish economy has experienced a financial liberalization leading to financial reforms for increasing the financial deepening level, there is a positive link between internal finance and investment for the firms in the manufacturing sector. In addition, for Turkey, financial liberalization could not have caused capital market deepening.²¹ The internal finance options have been like a ‘safe harbor’ for investment-for firms.

However, the findings based on cash holding and free cash flow are not consistent with the empirical literature on Turkey. The financially unconstrained firms use cash for investment as a stock variable. The findings from cash holding regression, show that the relation between internal finance and investment is significant for financially unconstrained firms when they do not prefer to use the flow variable for investment but prefer to hold cash for investment. These findings open up a new discussion in the current literature on Turkey. Although Demir (2008) finds that the relation between internal finance and investment is positive, it used as a flow variable for measuring this relationship. For using a different variable for internal finance, the relation between free cash flow and investment is positive for financially constrained firms, which shows that the free cash flow is an important alternative internal finance source for investment for these firms. In addition, free cash flow is an important

²¹ As of 2016, the openness ratio of the all firms in the BIST are approximately %40. For detailed information, see Turkish Capital Market Board (2017) monthly bulletins, and for disaggregated firm level ownership structure, see Public Disclosure Platform (www.kap.gov.tr).

reason for the underinvestment problem in the manufacturing sector. The results from free cash flow based econometric investigations also give an important contribution on the current literature on Turkey. On the other hand, the results also contribute to the literature by using a different set of alternative internal finance variables for providing a complete picture of the link between financial constraints and internal finance.

In econometric investigations, as indicated in the current literature, firm specific classifications have importance for the internal finance options for investment expenditure. I use both non-holding and non-TUSIAD affiliation for *a priori* financially constrained firms. Thus, the obtained findings show that there is a strong and positive relation between cash flow and investment for those firms, as expected. The determination of the firms are as financially constrained firms that are based on their holding affiliation, and TUSIAD membership is also different on this from the current literature on Turkey.

Apart from the current literature on Turkey, the findings regarding holdings, and TUSIAD affiliated firms are compatible with the current literature. For the relation between business group affiliations and investment, studies such as Hoshi et al. (1991), Shin and Park (1999). Hoshi et al. (1991) found that investment by Japanese firms that belong to a Keiretsu (corporate group) is less sensitive to cash flow than investment by independent firms. Shin and Park (1999) found that internal finance is not a major determinant for investment of the Chaebol affiliated firms.

The findings from cash holding based regressions are in line with Chang et al. (2016), Liu et al. (2015), and Megginson et al. (2014)²². Those studies emphasize

²² On the other hand, most of the firms with TUSIAD membership, and holding affiliation are family owned firms in the sample, and the literature that concentrates on the relation between cash holding and family ownership of the firms is mainly indicates that the sign of the relation is positive. Liu et al.

that financially unconstrained firms may hold cash for hedging. In addition, the findings are in line with Dittmar et al. (2003), and Ferreira and Vilela (2004) if the capital market development is assumed as a major barrier for external financing. Dittmar et al. (2003) found that firms are eager to hold more cash when capital market development is weak while Ferreira and Vilela (2004) found that capital market development has a negative effect on cash holding.

For another alternative internal finance variable, the relationship between profit rate and investment is significant and positive for the whole sample²³. The findings from the profit rate based regressions are consistent with the Keynesian and Kaleckian models in which the profit rate has an important effect on investment. In addition, the profit rate is used as a internal finance variable (see Demir (2008))²⁴ and the findings here are in line with the financing constraints hypothesis.

The findings for free cash flow, which is used as another alternative internal finance variable, show that the relationship between free cash flow and investment is significant for the whole sample. For financially constrained firms (or both TUSIAD and holding affiliated firms), there is a significant relationship between free cash flow and investment. The firms that are not financially constrained (or both non-TUSIAD and non-holding affiliated firms), did not have any free cash flow-investment sensitivity. The findings are also consistent with financing constraints hypothesis.

Lastly, the findings about the relationship between underinvestment and free cash flow show that the relation between underinvestment and free cash flow is significant

(2015), Megginson et al. (2014) found that family owned firms in China , which mainly have political connection with the government, hold excess cash, while Boubaker et al. (2015) found that the family firms hold less cash in France. The findings of the econometric investigation are also consistent with family owned business and cash holding literature in China.

²³ The significance at %10 statistical significance level, it may be assumed as weak for full sample.

²⁴ However, the findings are opposite to Demir (2008)'s findings.

for financially constrained firms. In the current literature, there has not been a vast literature on the relation between financing constraints and underinvestment nor on the relation between free cash flow and investment. The obtained findings from the econometric estimations are consistent with Guariglia and Yang (2016). For Turkey, there is no research publication which is directly linked with the relation between free cash flow and investment²⁵. The obtained findings from econometric investigation show that the relation between financing constraints and underinvestment is positive and significant.

²⁵ As of May 2017, there has been a series of papers which aims at corporate debt structure, which are Kandır et al. (2009), and Kadioğlu and Yılmaz (2017)'s papers. However, both the papers are related with the relation between free cash flow and leverage. Therefore, there has not been any paper that focusses on the relation between free cash flow and investment relation in terms of internal cash reserves option for the firms.

CHAPTER 5.

CONCLUSION

In this thesis, I explored financing constraints and found it to be a key impediment for investment in Turkey. I did so by using BIST listed manufacturing firm dataset between 2005 and 2015.

By examining the determinants of investment, four main variables were used in this dissertation for testing the link between internal finance and investment. The four main variables are cash flow, cash holding, profit rate or realized profitability, and free cash flow. I also tested the relationship between underinvestment and financing constraints. In this analysis, I classified firms as *a priori* financially constrained according to their non-TUSIAD membership, and non-holding affiliation status.

Regarding the findings of this thesis, financing constraints, realized/past profits and free cash flow are in line with the results of the current financing constraints literature. For firms that have financing constraints, the links between free cash flow, cash flow and investment are positive. For the cash holding hypothesis, the findings of this dissertation show that the firms that do not have financing constraints are eager to hold cash to hedge external shocks. For the underinvestment and financing constraints hypothesis, the findings are in line with Richardson (2006), and Guariglia and Yang (2016), whereby the results indicate that there is an underinvestment problem of the financially constrained firms in the manufacturing sector.

Statistical evidence of the model support the Post Keynesian model of investment in which internal finance plays an important role for investment in the Turkish manufacturing sector. In addition, the results are consistent with Gezici (2007)²⁶, financing constraints matter for investment decisions despite financial liberalization in the Turkish economy. I use TUSIAD, and the holding membership of the firm for estimating financing constraints in the sample, and I found that the relationship between financing constraints and investment is positive and significant despite financial liberalization, financial deepening, and financial reforms that have been pursued since the late 1980s for the Turkish economy.

In the second chapter of this thesis, I undertook a detailed review of the historical context of investment climate with a special emphasis on the political economy of the macroeconomic policies in Turkey since the early 1950s. In the third chapter of this thesis, I gave a detailed applied and theoretical literature analysis of the modeling investment function and furthermore in this chapter I presented a detailed framework setting out the evolution of the investment functions and the assumptions that reflect different economic thoughts. The literature review of this dissertation has uncovered different assumptions of the various investment models in terms of different paradigms. In Chapter Four, I try to give a sensible answer to the determinants of investment as well as the role of financing constraints, which are measured by using holding affiliations and TUSIAD membership relating to investment in the manufacturing sector. The last chapter of this dissertation gives general conclusions, limitations, and potential contributions of this dissertation to the existing literature.

²⁶ Gezici (2007) also uses a BIST database, however, the time span of the study is 1985-2003.

This dissertation had the purpose to contribute to developing country related investment literature. In this thesis, I examined the determinants of investment with a special emphasis on financing constraints by using a priori classification of the firms that have no holding and special rent seeking business group affiliations, like TUSIAD.

The main limitation of the dissertation comes from the available data. The data used in the dissertation is based on publicly held companies. Therefore, the findings of the dissertation are limited to publicly firms held in the BIST and those operating in the manufacturing sector.

However, the advantage of this sample is that they are special business group affiliations, these are not rent seeking industrialists groups and these are measured via the TUSIAD membership of firms. These firms have a clear advantage for industry-related issues by being a member of the special business group.

For further research, I recommend that case studies be done on the relationship between investment and financing constraints. Moreover, that fieldwork should done with further analysis compared to standard datasets to better understand investment behavior of the large firms in the manufacturing sector.

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Appendix A. Free Cash flow Measurement in the Existing Literature

Table A1. The Measurement of Free Cash Flow in the Existing Literature

Authors and year	FCF definition used
Lehn and Poulsen (1989)	$RCFit = (INCit - TAXit - INTEXPit - PSDIVit - CSDIVit) / TAit_1$ RCF is the retained cash flow; INC is the operating income before depreciation; TAX is the total taxes; INTEXP is the interest expense; PSDIV is the preferred stock dividends; CSDIV is the common stock dividends; and TA is the total assets at the beginning of the fiscal year.
Lang et al. (1991)	The same as Lehn and Poulsen (1989) and supplemented by cash flow measures proxied by, (1) net income plus depreciation plus adjustments for 'other' elements in income that do not affect working capital, (2) OCF, (3) OCF without adjustment for changes in 'other' current assets and liabilities, (4) two-year average of OCF, (6) operating income, (7) operating income plus change in inventory, and (8) net income plus depreciation.
Gul and Tsui (1998)	$FCFBEO = (INC - TAX - INTEXP - PREDIV - ORDIV) / BEQ$, $FCFBA = (INC - TAX - INTEXP - PREDIV - ORDIV) / BA$, INC is the operating income before depreciation; TAX is the total taxes; INTEXP is the gross interest expenses on short- and long-term debt; PREDIV is the total dividend on preferred shares; ORDIV is the total dividend on ordinary shares; BEQ is the total book value of equity in the previous year and BA is the total assets in the previous year.
Hackel et al. (2000)	Two definitions of FCF. One is the traditional one that subtracts cash investments (CAPEX) from OCF. The second definition adds discretionary cash outlays (DCO) and discretionary CAPEX (DCAPEX) to the traditional FCF.
Chung et al. (2005)	$RCFit = (INCit - TAXit - INTEXPit - PSDIVit - CSDIVit) / TAit_1$ RCF is the retained cash flow; INC is the operating income before depreciation; TAX is the total taxes; INTEXP is the interest expense; PSDIV is the preferred stock dividends; CSDIV is the common stock dividends; and TA is the total assets at the beginning of the fiscal year.
Richardson (2006)	$FCF = CFAIP - I * NEW$ CFAIP = Net Cash flow from Operating Activities - Maintenance Investment Expenditure (MAINTENANCE) + Research and Development Expenditure (RD) - I * NEW (Expected Investment on New Projects).
Penman and Yehuda (2009)	C-I = Cash flow from operations minus the cash component of the investment
Fresard and Salva (2010)	Excess cash is defined as the cash that is not needed for operations or investments. Specifically, excess cash is the cash held above a predicted "normal" (or "optimal") level. To compute the normal level, total cash is regressed on variables that serve as proxies for genuine motives to hold cash such as hedging needs, growth options, or financing restrictions.
Zerni et al. (2010)	$FCF = OCF - \text{dividends on preferred} - \text{common dividends} - \text{CAPEX}$

Source: Habib, 2011: 122

Appendix B. Investment Policies in the Five Year Development Plans

When we look at the five years development plans, we can clearly see that there has been some clashes about industrial policy and investment incentives due to the changing framework of industry as well as macroeconomic conditions. Therefore, in this part of the thesis, I focus briefly on the development plans for understanding the *ex ante* (planning era) conditions of investment incentives and industrial policy.

In the First 5 year Development Plan (1963-1967); the industrial policy was aimed at domestic demand and import policy. The investment was carried out by the government, in the plan. The main principles of the plan are given as follows;

- Import policy is based on industry protection, and the import applications (i.e quota, tariffs) are based on economic development goals.
- If the domestic protection in any good is enough for domestic demand, the import of the good will be banned or restricted according to the economic development goals.
- The administrative and law disruptions that enable domestic goods are inappropriate against imported goods, the disruptions will be removed.
- When the domestic price of goods more than the world price, the import quota will be designed for equalizing the domestic price to world price under the government control.
- The government restricts and restrain the monopoly from price destruction and gaining excessive rents.
- There is no room for excess capacity, if the industry is working on excess capacity level, the excess capacity will be used in other sectors.

- Production in the sectors which have comparative advantage is aimed, there is no production in the all sectors and all goods are aimed by the government.
- Industry is the main component of economic development.
- In the newly established manufacturing industry, prices are set in the world price level by the government due to demand level and required learning time.

In the second five-year development plan (1968-1972), the investment policy is public investment oriented. In the plan, the government directed private sector investments and invested in the areas which the private sector cannot invest in, i.e. strategic investment and the long term development based investment. And in the second five-year plan, it emphasizes that the great portion of the population is living in the rural areas, and there is no selection between agricultural sector and industrial sector. In the plan, there is a need for marginal adjustment instead of all or no principle for the investment in either of the industries. In the plan, investment is long term based, the pace of development level of country based on capital accumulation, is emphasized. On the other hand, the investment is equally weighted amongst the regions and incentives are based on the regional development level for investment. The government gives priority for investment in capital goods due to the capital accumulation process that is limited to imported capital goods. And the other things that are underlined in the plan are the benefits from advanced level technology for investments and the incentives that aimed at the advanced technological level (DPT, 1963: 527).

In the *Third Five Year Development Plan (1973-1977)*, industrialization was defined as a long term goal of development and under the entrance into the European Union, the transformation in the industry should be done before 1995 when Turkey is

the member of Customs Union was clearly underlined. The main lines for industrial policy are given as follows:

- Recycle of the products on the used paper, glass, Iron and Steel, aluminum, and plastics are incentivized by the government. The Ministry of Industry and Technology will make the necessary law amendments/arrangements and organization.
- The intermediate and capital goods produced manufacturing sectors need to advanced level technology for production is protected by the government against imports, and the sectors are incentivized.
- For evaluation to the new investment projects, the capacity is given priority. If the decision generates the monopoly in the industry, the government avoid the negative effects of the monopoly by using imports (if necessary), price and quality control ways.
- R&D investments are emphasized as important catalizor for industrialization. Thus, R&D policies are revised, the collaboration between R&D based institutions and industry are done by the government for adoption of newly transferred technology. And the large sized industry corporations establish the R&D departments.
- Tax system is revised for tax will be levied on the final goods instead of on raw materials and intermediate goods.
- The Ministry of Industry is reorganized according to the development and industry needs.
- The industries which need intra industry trade, for using to subsidiary products, the production units are established as integrated and complementary units.

- Quality control is given emphasis in the plan.
- The government monitors the current situation in the industry, especially in technology level and its obligations.
- For providing the goods and services are in the world price level, the government takes the necessary precautions, and if the precautions are not enough the government can use fiscal policy.

In the Fourth Five Year Investment Plan (1979-1983), the government gave priority to investment in the manufacturing sector such as investment in the machinery, metallurgical industry, electronic, and the chemistry sectors. The priorities of the investment in the manufacturing subsectors which produce consumption goods are given based on avoiding the bottlenecks in the production and exports. For the manufacturing subsectors which produce intermediate goods, the priority for investment is given to investment projects that are using natural resources, and are optimum capacity based projects and the advanced level technology used projects. The establishment and initiation of production of electro-mechanics and the energy sector production, transport, and control industries are provided by the government (DPT, 1979: 275).

In the Fifth Five Year Development Plan (1985-1989); Due to the monopoly in the tobacco and tea industry, the new program for quality tobacco production is established, and the investment in the tobacco industry will be done by the government (i.e establishment and the opening of Tokat Tobacco Factory). The investments which aim at warehousing, packaging, cold chain in the food industry are incentivized by the government. Paper industry based excess capacity will need to export the excess products, thus, the industry will be revised, and ameliorated. The leather industry will be ameliorated, and the incentives for the industry will be given.

The workers' remittances will be used in the chemistry sector due to fact that chemistry sector can be available for establishing different economies of scale with the small investments. Petroleum chemistry sector, revision of the current situation, and R&D based improvements are given priority for decreasing the foreign dependency in the petroleum chemistry and electronic industries. Imports are planned for Iron and Steel Industry with raw materials, semi-finished raw materials, or products due to the importance of the sector for sustainable development of export of investment goods. The investments in the Iron and Steel Industry are supported by the government.

For all the industry subsectors, the priority is given to expanding the current capacity, and the producer credit system will be developed for incentivizing the investment goods. The domestic demand for non-iron metals and its products is met by domestic productions. Investment good production industry subsectors are supported by the government (DPT, 1984: 66-67).

The priority for investment incentives is given for the investment projects, as follows;

- Labor intensive investment projects for solving the unemployment problem,
- The investment projects that meet regional needs, especially the location of potential factory near to the raw material sources and has advantage in terms of transportation costs
- The industrial investment projects that increase the foreign exchange receipts
- Especially, marketing for durable consumer goods and investment goods in the foreign markets, for providing sustainability of after-sales service warehousing, bureau/agency, commercial agents, franchising, and

representative agent related investment projects are supported by the government.

- The financing of investment is equity-based funding which is incentivized by the government

DPT (1984:32-33)

The investment incentive system is the regional basis, organized industrial zones and the priority regions for development (PRFD, in Turkish KÖY-Kalkınmada Öncelikli Yöreler) with investment is done by the citizens who are living abroad. Export-led investment projects are also a basis for additional incentives. The plan is aimed at the subsectors in the manufacturing sector, and the sectoral targets are divided into three categories which are the consumption good producing sectors, intermediate good producing sectors, and investment good producing sectors. DPT(1984,30-31)

In the 6th Five Year Development Plan (1990-1994), (DPT, 1989: 84-85), the manufacturing sector is one of the core sectors for economic growth, especially for a target rate of economic growth. Sustainability and variability of export, flexibility which is especially for changing market conditions, are the main determinant of industrial policy and new investment in the plan. The production of intermediate goods is aimed to be decreased, while the production of investment goods is aimed to be increased in the plan. It is aimed to be improved the export and competitive led structural transformation with sustainable and variable export structure. Investment projects which have optimal scales are supported by the government. The private sector is supported for industrialization progress in the economy. Tariffs for imported goods are revised, and the main policy the import goods that necessary for industrial production will be imported into world prices.

The transformation of industry and modernization process is based on the adoption of the EU process. Long-term technology-based investments are compatible with the EU policies that are aimed and emphasized in the plan.

R&D, high technology intensive, environmental protection, energy saving, and natural resources based investments are aimed at incentive policy in the plan.

DPT (1989: 30-31)

In the 7th Development Plan (1996-2000), private investments are allocated to infrastructure projects as well as the share and volume of public investment will be decreased. The build-operate-and transfer system is used for the investment projects which need to advance technology level as well as high investment resources.

Moreover, the investment projects which are finished before by the government can be taken over to the private sector, for operation.

The investment policy is based on the increase in production, productivity, competitive power of industry, for the purpose of increasing the employment, and exports, and the decrease in inflation. The main purpose of the investment policy is based on economic and social development. And for public investment strategy, public investments are devoted to the short-term investment projects which generate value added for the whole economy (DPT, 1995: 196-197)

The investment projects that generate employment possibilities, and long-term social utility with economic profitability in the PRFDs, are supported by the government.

Public investment share in the total investment will be decreased while private investment share in total investment will be increased in the manufacturing sector.

Government business enterprises (henceforth GBS) (in Turkish, KİT-Kamu İktisadi Teşebbüsleri) will be privatized, and the privatization process will be accelerated.

The investment plans of privatized enterprises are compatible with privatization strategies. The aim of privatization of GBS generates funds for public infrastructure investments.

Incentive policies are based on the development of new employment possibilities, and also support small and medium-sized enterprises, environment protection, development of PRFDs, and structural transformation of the Customs Union. On the other hand, providing, producing and adoption of the new advanced level technology, R&D investments are also supported. The liberalization policies of FDI (foreign direct investment) are still supported. FDI regulation will be expanded comprising all the FDI related capital movements. The constitutional amendment is planned for build-operate-transfer model.

In the 8th 5 Year Development Plan Period (2001-2005), public investment is devoted to the necessary fields, and the privatization process is still continuing in the public sector. Moreover, production and extension of information are supported in the investment areas, which is emphasized in the plan.

In the plan, the main obligations in front of the public investment are underlined as follows (DPT 2000: 31):

High interest rates arising from persistent public deficits that increased borrowing requirements caused by public deficit affected investments adversely....The massive volume of the project portfolio, rationed resources allocation, lack of compliance to technical, economic and social criteria and priorities in project selection, and prolongation in important projects prevail to be the main problems regarding public investments.

In the plan, the public investments mainly devoted to infrastructure fields. For private investments, in the plan, the role of private sector is emphasized as follows (DPT, 2000: 31);

...Main consideration is to direct public and private sector resources into rational and complementary investment areas. In line with this policy, public sector investments will be intensified mainly on economic and social infrastructure fields. Private sector shall be encouraged to carry on its activities while increasingly investing in areas where public sector withdrawn. It is of great importance that private sector give emphasis to investments towards attaining productive power to create high value added, enhancing competitiveness of the economy, increasing employment, productivity and exports and development and/or transfer of appropriate technologies.

In the 8th 5 Year Development Plan; the main reason for failure in the incentive certificates in the 7th development plan is emphasized as follows;

In 7th Plan period, additional support was provided for SMEs, investments in the State of Emergency Regions, Development Priority Regions and also for very large- scale industrial investments. Financial resources allocated for incentives were put into budget, however, problems such as the insufficiency of resources, frequent changes in the legislation, excessive bureaucratic procedures and lack of coordination among institutions providing the state aids maintained their significance.

(DPT, 2000: 33)

In the 8th Development Plan, the aim of investment incentive system is to global integration, information led policies, and information led transformation, and FDI based policies. Thus, R&D expenditures, development of technology, and Built operate transfer, environment protection, qualified labor provision, foreign exchange acquiring based, and employment oriented investment projects. In addition, SME improvement is one of the main objects of the investment incentive system.

Furthermore, as indicated in the previous development plans, regional disparities are important for the investment incentive system in the plan.

In the 9th Development Plan (2007-2013) (DPT,2006:.92-94)

The plan emphasized that the competitiveness and export share in the world exports are the main objectives for increasing the production and high value-added goods

production. The manufacturing sector is the core sector, which is the key for the export-oriented economy is emphasizing in the plan, for economic growth. For this purpose, the EU technical legislation process will be accelerated and market monitoring will be revised and strengthened.

In order to increase the competitiveness, there are some points that are emphasized in the plan as follows;

- Trade policy measures based on import transactions and effective protection of the producers will be aimed.
- The government provided the quality certifications.
- The advisory mechanism is established for monitoring and improving the manufacturing industry's goals.
- R&D policies in textiles, iron and steel industry, clothing and leather sectors will be encouraged for multifunctional products of which production used advanced level technology.
- For improving the skilled labor force industry, in the sectors, such as textiles, clothing, leather, ceramics, glass, furniture, jewellery, designing original consumption goods are encouraged with training qualified designers.
- Creation of national and international trademarks will be supported.
- For exporters, advertising and marketing expenditures will be supported/improved for exporters' needs.
- In the plan, for manufacturing sector for production of medium and high technology sectors, such as automotive, white goods, machinery, and electronic sectors is given emphasis.

- For the automotive industry, the development of the R&D capacity, exporting primarily to developed markets, sustainable competitiveness, technology development, and collaboration are paid attention.

High value-added products and activities are supported in traditional sectors. In the machinery and white goods manufacturing subsectors, design, engineering, and innovative capabilities will be supported. R&D led investments in the chemicals, materials subsectors, as well as electrical machinery industry and electronic subsectors, will be supported. On the other hand, so as to support the traditional sectors for coping with international competition, and for preventing unfair competition, some actions will be taken as public procurements.

For the manufacturing sector, there are several important points in the plan, which show the relation between investment incentives' aim and the subsectors of manufacturing industry;

- For the chemical industry, the establishment of specialized organized industrial zones, and production of new chemicals with increasing participation to European Union (henceforth EU) programs.
- The export incentives policy shows that the export strategy of the manufacturing industry is based on non-EU countries. In the plan, for export incentives; Eximbank funds increased and thus maturity of the loans which primarily aimed for export project loans will be extended. And the specific regions are underlined in the plan for the loans, which the regions are the Middle East, and African, Non-EU, and Turkish Republic countries.

Measurement techniques for medium and high technology based exports will be revised and developed.

The R&D investments and the establishment of industrial zones are emphasized in the plan. Business Development Centers (İŞGEM) are established in order to increase the efficiency in the SMEs, and its development, high skilled workers need, and competitiveness.

In the 10th 5 Year Development Plan (2014-2018), (The Ministry of Development, 2013:80-87), public investment policies are devoted mostly to the transportation sector, and the average completion time of public investments reduce to 3.7 years in 2013.

The PRFDs for investment are given priority by the government. Public investment in PRFDs may have a burden for the government budget. Thus the public investments in PRFDs are planned carefully. The capacity of public institutions is developed in terms of planning and realization of investment projects. Public investments will be devoted to economic and social infrastructure areas and the areas in which private sector could not invest. There is no crowding out between private and public investment. The private and public investment relation is expected and planned as crowding in for sustainable economic growth in the plan. Therefore, the main purposes of public investments are supporting private sectors, and expanding the capacity of public investments for regional level development, increasing employment, and welfare. The public investments focus on the productive operations of the private sector, and thus the public investments are mainly infrastructure investments for this reason.

For public investment, investment projects will be done via the public-private partnership (PPP) (in Turkish: KÖİ-Kamu-Özel Ortaklığı) projects. In addition, an efficient monitoring and evaluation system will be established for the PPP projects, and the structure of the PPP will be improved in terms of coordination and

applications of the PPP projects. Completion time of public investments will be improved. In the plan, it is also emphasized that the public investments mainly focus on maximum efficiency of current capital stock with a concentration on a replacement, maintenance and repair, and rehabilitation expenditures.

The aim of investment incentive system is supporting the investment projects which have high added value, and are R&D led investment projects. Also, the investment incentive policies are aimed at employment generation potential with having high export and production potential. The share of private investment as of GDP is expected to increase (as of 2018, the share is %19.3 of GDP). The data gathering and monitoring system for investment incentives will be developed. And the macroeconomic and microeconomic (as regional and sectoral) impacts of investment incentives will be measured. The development of institutional capacity will be given priority for investment incentives. Investment incentives will be given for the projects which are potential for increase in employment, and exports.

Public investments are still complementary for private investments, which are support objects for incentivizing the strategically important private investment. For problematic areas of both public and private investments, the Coordination Council for the Improvement of Investment Environment in Turkey (YOIKK-in Turkish; Yatırım Ortamını İyileştirme Koordinasyon Kurulu) continue to research of which focus on general problematic areas. Based on the YOIKK research, public and private investments will be made more efficient, and result oriented. Furthermore, the land allocation will be made efficiently for investors.

Regional development is taken consideration for investment incentives. Via development agencies, which owned their own investment supporting offices, the regional potential will be developed. Domestic and foreign investments will be also

evaluated in the regional basis investment. The activities of the Investment Support and Promotion Agency (ISPA, in Turkish; Yatırım Destek ve Tanıtım Ajansı) are regional oriented and are complementary in the regional level.

The manufacturing sector will be integrated with the urbanization process so that production and export capacity of the manufacturing sector are expanded in smart buildings, and smart building materials, public transport vehicles and signalization systems. And for export incentives, credit and warranty programs will be used for the exported goods which are produced by using advanced level technology and investment goods.

Appendix C. Additional Econometric Estimation Results

Table C1. Fixed Effect OLS Results for Holding and Non-Holding Interaction for the Main Interested Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}
I/K _{i,t-1}	-0.10** (-3.17)	-0.10** (-3.13)	0.04 (1.08)	-0.09** (-3.03)	-0.09** (-2.70)	-0.10** (-3.13)	-0.08* (-2.30)	-0.0891** (-2.65)
Gsales _{i,t-1}	0.01 (0.29)	0.06* (2.06)	0.01 (0.27)	0.01 (0.40)	0.04 (1.06)	0.06 (1.85)	0.05 (1.38)	0.0419 (1.07)
NonHold*CF/K _{i,t-1}	0.23*** (3.66)							
Ltdebt/K _{i,t-1}	0.06* (2.11)	0.06* (2.08)	0.05* (2.02)	0.06* (2.19)	0.06* (2.15)	0.06* (2.10)	0.06* (2.27)	0.0638* (2.17)
NonHold*CCE/K _{i,t-1}		0.09 (1.90)						
NonHold*FCF/K _{i,t-1}			0.23*** (4.71)					
NonHold*π/K _{i,t-1}				0.21*** (3.48)				
Hold*CF/K _{i,t-1}					0.11* (2.09)			
Hold*CCE/K _{i,t-1}						0.05** (2.84)		
Hold*FCF/K _{i,t-1}							0.02	

							(0.44)	
Hold* $\pi/K_{i,t-1}$								0.112 (1.88)
β_0	0.08*** (5.62)	0.10*** (7.14)	0.05** (3.03)	0.09*** (7.05)	0.09*** (6.45)	0.11*** (8.32)	0.10*** (6.95)	0.101*** (7.51)
<i>N</i>	1135	1132	1134	1135	1135	1132	1134	1135
<i>R</i> ² within	0.03	0.02	0.05	0.03	0.02	0.02	0.01	0.02
<i>F p value</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table C2. Fixed Effect OLS Results for TUSIAD and Non-TUSIAD Membership Interaction for the Main Interested Variables

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}	I/K _{i,t}
I/K _{i,t-1}	-0.10** (-3.12)	-0.11*** (-3.40)	-0.10** (-3.06)	-0.07* (-1.98)	-0.08** (-2.66)	-0.10** (-3.01)	0.01 (0.28)	-0.08* (-2.57)
Gsales _{i,t-1}	0.03 (0.87)	0.06 (1.80)	0.03 (0.87)	0.04 (1.24)	0.02 (0.58)	0.06* (2.00)	0.02 (0.57)	0.02 (0.71)
TUSIAD*CF/K _{i,t-1}	0.18** (3.30)							
Ltdebt/K _{i,t-1}	0.06* (2.14)	0.06* (2.04)	0.06* (2.21)	0.06* (2.24)	0.06* (2.11)	0.06* (2.16)	0.06* (2.12)	0.06* (2.14)
TUSIAD*CCE/K _{i,t-1}		0.08** (3.06)						
TUSIAD*π/K _{i,t-1}			0.18** (3.16)					
TUSIAD*FCF/K _{i,t-1}				0.11* (2.39)				
Non-TUSIAD*CF/K _{i,t-1}					0.17** (2.64)			
Non-TUSIAD*CCE/K _{i,t-1}						0.03 (1.36)		
Non-TUSIAD*FCF/K _{i,t-1}							0.14** (2.99)	

Non-TUSIAD* $\pi_{Ki,t-1}$								0.14* (2.27)
β_0	0.0853*** (5.37)	0.10*** (7.67)	0.09*** (6.33)	0.18*** (5.50)	0.08*** (6.57)	0.11*** (8.34)	0.27*** (4.78)	0.10*** (8.14)
N	1135	1132	1135	1135	1135	1132	1135	1135
R^2 within	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.02
F p value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table C3. Free Cash Flow and the Underinvestment Diff-GMM Results

	(17) Underinv _{i,t}
Underinv _{i,t-1}	0.02 (0.37)
FCF/K _{i,t-1}	0.17* (2.28)
Gsales _{i,t-1}	0.05 (0.89)
Ltd/K _{i,t-1}	-0.00 (-0.16)
<i>N</i>	490
<i>AR(1)</i>	0.13
<i>AR(2)</i>	0.44
<i>Hansen J</i>	0.27