

## Questioning the Collaboration between Universities and Industry: The Case of Turkey

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### Abstract

*The industrialization that brings production come to the fore can be taken into account as the starting point of university and industry collaboration. The reason is that the traditional model of university concept that focuses solely on the production of knowledge has changed thoroughly. In other words, in modern age, knowledge production has turned into knowledge practicality particularly in industry. Therefore, industrial sector which does not use the universities' capability for knowledge production makes no sense while the universities which do not keep in touch with the industrial organizations on the basis of knowledge transfer are useless because of the fact that the practicality of knowledge is equally important with the production of knowledge itself which means that there is to be parallelism between two sides of this cycle, so to say, production of knowledge and practicality of knowledge regarding the changing paradigms of universities. The purpose of the study is to have a look at the university and industry collaboration process in Turkey by means of analyzing the main parameters of collaboration between industry and universities basically, the instruments that foster and contribute to this process in Turkey like TÜBİTAK (Scientific and Technological Research Council of Turkey), SANTEZ (Industry Oriented Thesis Support Program), Project, Innovation Project, Technopolis, and so forth. Via the interpretations on the current mechanism of university and industrial collaboration, some further suggestions will be made.*

**Keywords:** Industrialization, University-Industry Collaboration, Turkey

Just as castles provided the source of strength for medieval towns, and factories provided prosperity in the industrial age, universities are the source of strength in the knowledge-based economy of the twenty-first century.  
(Lord Dearing, September 2002)

### 1. Introduction

Industrialization that brings mass production by quitting manual way of work brings about a great many changes in the lives of human beings sociologically, culturally, economically, and politically. However, it is to be mentioned that the economic impacts of industrialization outweigh the others since factories and manufacture has become the ultimate dynamics of economy. Due to factories and unprecedented manufacture, industrial organization as well as labour class occurred. On the other hand, the class of employers formed the main strength that controlled the employers that resulted in the clash between employees and employers. The debate between the main dynamics of economy also contributed to the formation of unionism. More than that industrialization put the knowledge production and its practicality into the center of life. As a matter of fact, this process is the ultimate example of how knowledge production turned into knowledge practicality, in other words, the transfer of theoretical knowledge into practical one.

In the aftermath of knowledge age particularly, the significance of knowledge as a mechanism for its production as well as its usage has gained a very big momentum. Universities which are the fundamental producers of knowledge through academic and cultural activities and their relations with industrial sector become prominently important.

Universities, from now on, play a leading role for economic development providing that they work in collaboration with industrial organizations. It can be revealed that university and industry go hand in hand; at least, it should be so owing to the fact that these two items have become strategically important for sustainable development and competitive advantage of societies. Therefore, universities are theoretical backgrounds or sources for industrial practice.

In Turkey, university and industrial collaboration is more needed than in the past, development criteria of the states is closely related to production of knowledge and its applicability in real life. As for Turkey, the level of collaboration is far good compared with the past through the occurrence of research centers and projects like TÜBİTAK (Scientific and Technological Research Council of Turkey), universities, techno parks, and so on. However, the effectuality of these relations on industry and universities are still to be taken into account with all its ins and outs so as to come to a broader perspective for development. Therefore, the main objective of the study is to analyze the state of collaboration between universities and industry within the framework of problems and its solutions.

## 2. Literature Review

### 2.1. Industrialization as the Historical Background for University and Industry Collaboration

Industrialization associated with rapid as well as sustained growth in the life standards of humans in line with quick increase on the level of production can be defined as a process that focuses on mass production, in other words, professional ways of manufacture (Jones, 2001: 1). This means that the advent of industrialization in 19<sup>th</sup> century transformed the type of the goods manufacturing system with the usage of steam in the factories and so did the nature of the work as well (Golloboy, 2008: xi). The meaning of industrialization is stated differently in different sources as in the following:

**Table 1: Industrialization and its Connotations**

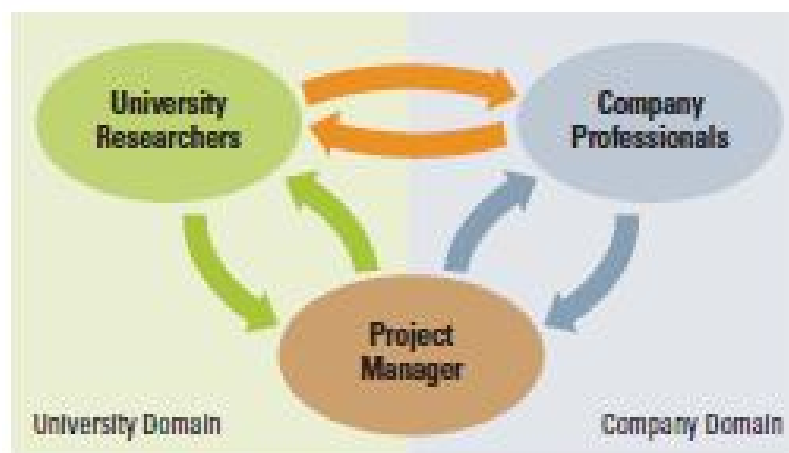
<b>The Meaning of Industrialization</b>	<b>Resource</b>
Industrialization that began in Great Britain as a revolutionary process “marked the end of people living in rural societies and making the things they needed by hand.”	(Housel, 2008: 4)
Industrialization is the name given to the capitalist investment for production of goods so as to get profit via the exchanges in the competition oriented markets and the division of the labour which is not available in peasant economies. All these continual processes resulted in the proletarianization of labour, and its conversion into a “class”.	(Langton, 2000: 32)
Renaissance is “the onset of modern history and to define its abiding characteristics, just as the Industrial Revolution marks the onset of industrial society and defines the key mechanisms of its progress.”	(Vries, 1994: 250)
Industrialization is an embedded term that entails a great way of understanding because of the fact that it is fragmented into some sub-disciplines such as “historical geography, gender history and historical sociology”. It is a movement that initially started in the cotton textile industry in the last two decades of the twentieth century.	(King and Timmins, 2001: 11, 12)
Industrialization as an implication for Industrial Revolution “that is both the absolute growth of industry, and its expansion relative to the other sectors of the economy, those being agriculture and services. Industry in this context covers manufacturing, mining and building as sub sectors.”	(More, 2000)
Industrialization is a sort of revolutionary process stemmed in the growth of output, capital stock, and labour force. It can be demonstrated that all these factors stated contribute to the productivity.	(Crafts, 2004: 522)
Industrialization is the rivalry between traditional sectors and the revolutionary sectors which can be interpreted that growth and the rates of productivity changed only after 1850 when the classic industrialization period ended. This illustrates that industrialization is exposed to several stages like textile first, coal, transportation and it goes on.	(Voth, 2003: 222)

More than anything else, the ultimate result of industrialization in collaboration with the economic growth is that innovation as an economic asset is of particularly important. This inclination, that is to say, the conversion of the economic activities into the innovational basics accelerates the relationships between academia and industrial organizations. The academies are something like the producers of theoretical knowledge while on the other hand, the industries are the practitioners of knowledge produced. Hence, these two segments of the production system have played a crucial role on the formation of the states that are economically sound due to the integration between industry and university.

## 2.2. General Overview on the Collaboration between University and Industry

As a partnership, university and industry collaboration which is a dual process is strategically important for contribution to global knowledge economy. The world class universities are one of the pioneers of such relationships owing to the fact that the level of the relationship is one of the great determinants of being a prestigious university or not (Belfield, 2012: 3). As stated before, the relationship between industry and university will provide an opportunity for these institutional fields. For industrial sectors, it is possible to obtain concrete outcomes in terms of technology development since research and research based activities are vitally important for them. As for universities, the collaboration will yield a field for their practical implementations. However, the important thing here is to form knowledge exchange paths for two sides or to form a platform that transfers the knowledge from university to industry and from industry to university which can be achieved through project managers (Pertuze, et al., 2010: 89).

**Figure 1: The Cycle of the Relationship between University and Industry**



**Source:** (Pertuze, et al., 2010: 89)

The effective communicational codes will enhance the relationship between university researchers and company professionals which will also foster the outcomes estimated to be reached. This communicational code consists of university researchers for the community of university and company professionals for the domain of industry. Here, the project managers play a mediating role between university and company officials. The green arrows represent the fact that the university researchers are in close contact with the project managers and so are the project managers. At the same time, company professionals are also in contact with the project manager as blue arrows indicates which is also the case for university researchers and company officials as shown with the orange arrows. All these things pave the way that knowledge transfer is mutual on the basis of its transfer between universities and companies (See Figure 1) since “the corporate world today is characterized by an intense interest in technologies and techniques which would allow managers to effectively manage the creation, transfer and dissemination of knowledge within their respective companies.” (Jacob and Ebrahimpur, 2001: 74). Anderson (2001) and Etzkowitz and Webster as cited by Anderson (2001) reveals the relationship between university and industry in this way (Etzkowitz and Stevens, 1998: 30; Anderson, 2001: 227):

“Academy-industry relations encompass a wide range of activities, structures, and concepts. In a general sense, they involve an exchange of resources, ideas, or influence between some unit within a university (possibly even an individual) and some for-profit entity or subunit thereof.”

“Etzkowitz and Webster (1998, p. 30) list thirty-three formal collaborations, all multiyear, multimillion-dollar programs that link a single company with a university, beginning with the famous arrangement between Harvard Medical School and Monsanto over a quarter century ago. Though such arrangements, usually in biotechnology or pharmacology, come to mind as major examples of AIRs, limiting a discussion of connections between higher education and the corporate sector to these major collaborations would do a serious disservice to the literature and the reality of AIRs, for several reasons.”

The partnership between universities and industrial organizations leave a great impact for quantity and the quality of the research since the value added is higher (Estanol, Stadler and Castrillo, 2011: 3). The need for partnership these mechanisms great proportion of the revenues that the universities have with their patents, licenses and their commercial activities with businesses taking place in various forms (Kleinmann and Vallas, 2001: 456). Universities, actually, have a critical position for the businesses support, so do the firms for the universities as well. For example, Wilson (2012) argues that “Universities are an integral part of the supply chain to business, a supply chain that has the capability to support business health and therefore economic prosperity. A thriving knowledge economy depends upon its universities in three critical dimensions: the application and exploitation of research capability; the enterprise and entrepreneurial culture that is developed amongst its students; and the applicability of the knowledge and skills of all its graduates.” World leading collaboration will yield to these ultimate results (Wilson, 2012: 13, 14).

- The partnership between the mechanisms of academia and business will yield an achievement at every level of progression and will provide a transition of knowledge from one source to the other.
- This collaboration will provide opportunity for employment for the new graduates of universities especially for those who would like to work as knowledge workers.
- As a result of the relationship, the students will integrate their theoretical knowledge with the practical one which ensures the connection between academia and employment practices.
- The business will update their theoretical knowledge and will find an opportunity to implement the newly introduced conceptual frameworks because the universities are the natural ways of being an expert.
- This relationship will prove the fact that the universities can be a leading one and so can the businesses by means of their integration of knowledge with practicality.

In recent years, the topic on the collaboration between universities and industry is much more concerned than in the past. In the past, the process about the UIC was regarded as a kind of “taboo” or a “cliche” and it was associated with the student unrest as well. For example, in 1970s, the discussion about this collaboration centered on the disadvantages, but later on, especially, for today, it is a sort of “sinequanon” which is accepted from all walks of the society (Cerych, 1989: 309). This means that the link between university and industry was only the concern of small elites and it did not turn into a government or a state policy in the second half of the twentieth century. Actually, there were two possible reasons for this scenario. The first was related to the skeptical perspectives between two sides. To put in another way, universities and the industrial sectors do not rely upon each other concerning the solidarity oriented relationships which can be explained only through trust problem. As for the second reason, industrial organizations and the academies thought that the link was unfeasible because of major difficulties. What can be the scope of the relationship that was seen as problematic well in advance but advantageous today since the universities would like to form an organizational system concerning the industrial liaisons while the industry would like to be get benefit from the universities (Cerych and Smith, 1985: 8, 9; Sato, 2013: 346).

- (a) “co-operation in research (joint research projects, specific goal-oriented research contracts awarded by industry to universities, general industrial grants to universities for purposes such as the setting up of a chair or the provision of facilities for general research activity);
- (b) university lecturers and researchers acting as industrial consultants;
- (c) industrial executives, engineers and researchers acting as part-time university lecturers;
- (d) work placement of students in industry. The aims of this may vary from simple initiation into industrial life to the preparation of doctoral theses based on research projects carried out in firms;
- (e) different types of lifelong or adult education organized by higher education institutions for industrial personnel;
- (f) the reduced-price sale or donation of equipment by industry to universities; (vii) regular mutual visits;
- (g) jointly organized meetings, conferences and seminars.

- (h) joint publications;
- (i) joint participation in exhibitions or fairs;
- (j) industrial support for student associations or activities like sport or travel;
- (k) industrial representation on the governing and consultative boards of higher education establishments”.

The linkage between universities and industrial liaisons is necessary as one needs basic research and the other needs commercialization which is also a sort of must for the innovational procedures that can be defined as the continuation that goes on for a particular period of time for new inventions for sustainable high profit of the companies (Elmquist, Fredberg and Ollila, 2009: 326; Drucker, 1988: 45-53; Christensen, 1997). For establishment of innovational procedures and their productivity, it is important that production of new knowledge and its transfer into the merchandized item and the systems that provide these services must be connected (Prager and Omenn, 1980: 379). The reason is that the collaboration is more productive than confrontation and partnering creates a trust between the sides of the collaboration (Philbin, 2008: 490, 491). The trust as the factor for the formation of the collaboration plays a crucial role as a carrier and outcome of collaboration itself. Otherwise, it is impossible for the relations to be reciprocal and sustainable (Bjerregaard, 2009: 163).

About innovation, the idea that knowledge flow from universities to the industrial areas are new. The level of the effect of academies on the innovational processes is closely related to the industrial activities and the policy developed for knowledge transfer. Additionally, the dependence between university and industry can be somewhat infertile due to the fact that the scientific knowledge does not mean anything for industry, and as for university, the knowledge does not have a peculiarity to be applied in somewhere, that is to say it is just like theory. Therefore, the linkage between universities and industrial organizations are not always the case because of the particular characteristics of knowledge (Gertner, Roberts and Charles, 2011: 626). Nevertheless, it is far good and practical for universities and industrial sectors to collaborate which is more intensified and productive compared with past, particularly before 1980 (Campell and Slaughter, 1999: 309). It is of great significance for these two interlocutors to form the required bases for sound, sustainable, and continual collaboration which is useful for both of them. The benefits of successful collaboration give positive results both for universities and for industrial sectors as stated below (Çelik and Tufan, 2007-2009: 669; Bell, 1996: 331; Harman, 1999: 83; Landry, Traore and Godin, 1996: 283; Cummings, 1994: 399).

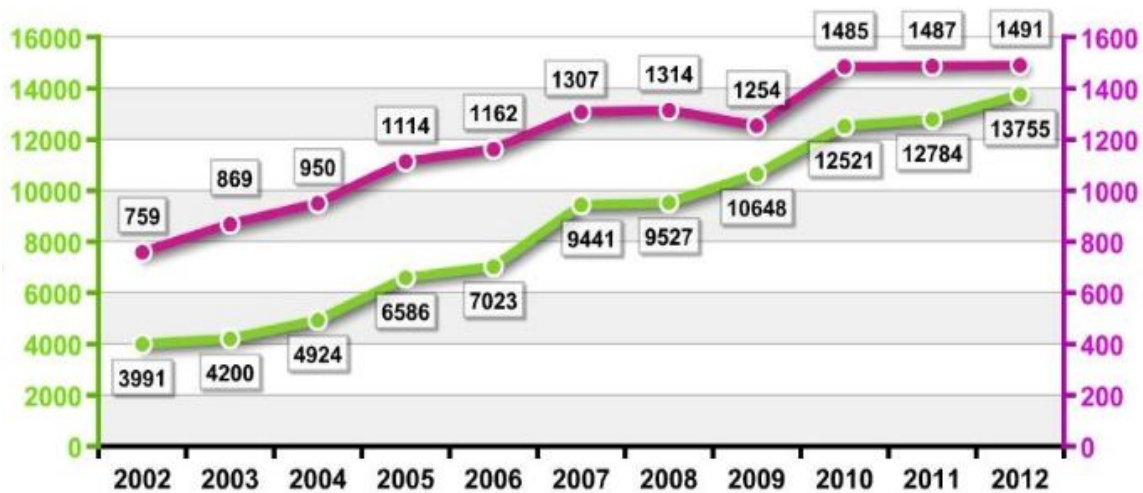
**Table 2. The Benefits of Collaboration for Universities and for Industry**

University	Industry	Resource
Universities find opportunity to implement the theoretical framework on industry via technology transfer.	The industry meets the needs of technology.	(Bell, 1996: 331)
The universities can find fund their research.	Industrial liaisons are technologically and scientifically backed up without paying much money.	(Harman, 1999: 83)
The linkage with industrial organizations enhances the research capacity and research willingness of the researchers and it will bring about scientific productivity for researchers. In other words the collaboration motivates the academicians to work harder.	Collaboration also plays an instrumental role for industrial organizations on the basis of motivation which means that the motivation is mutual, for researchers and for practitioners.	(Landry, Traore and Godin, 1996: 283)
The degree of the collaboration encourages other researchers abroad to move to the origin country which means that it fosters immigration flow.	Researchers' immigration to the origin country enhances the opportunities for research and innovation which will in return increase the profit rates o the firms.	(Cummings, 1994: 399)
Universities will find the opportunity for internships.	Industrial firms have the chance to have rich human resources who are skilled and who are purpose oriented.	(Çelik and Tufan, 2007-2009: 669)

### 2.3. Parameters of UIC in Turkey

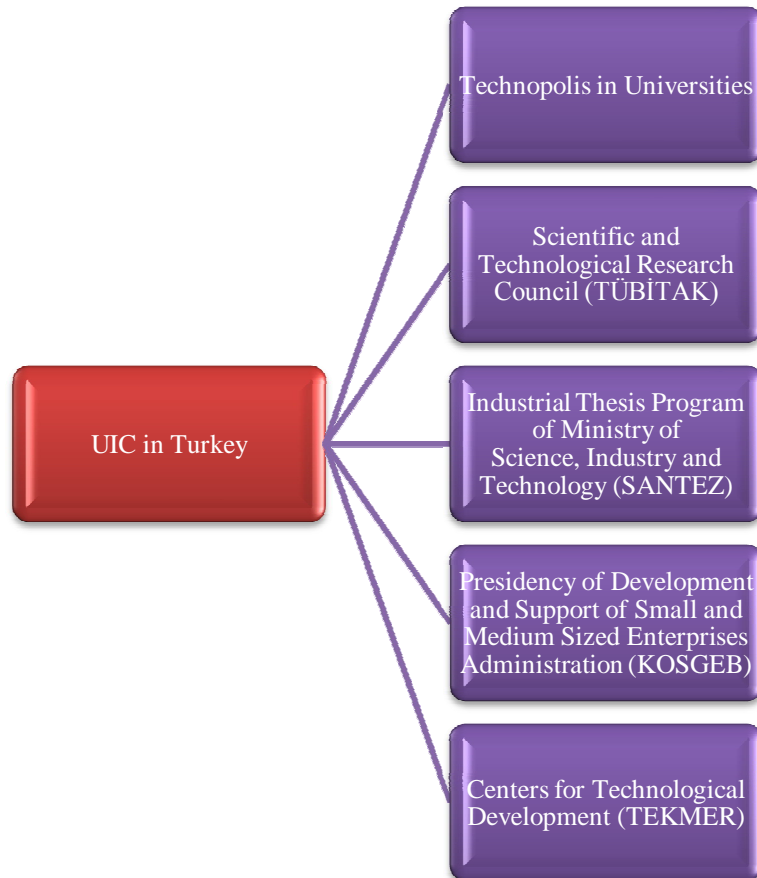
UIC is fairly important in Turkey because competitive advantage and investment for innovation have been increasing day by day. Particularly, in the aftermath of 2000s, the funds for innovation are increased. The pink line represents the expenditures of research and innovation of gross domestic product while the green line refers to the gross domestic product itself. As seen that, both the expenditures of research and innovation as well as the gross domestic product itself have gradually increased since 2002 which can be interpreted that Turkey lays a great emphasis on innovation and research projects in over the last few years (Figure 2) owing to the fact that Turkey would like to increase its competitive advantage by means of leading research and ensuring to take advantage of qualified graduates. This is a sort of must which can be succeeded through UIC which will pave the way that the academia will contribute to the industrial outcome with its theoretical knowledge by descending from their “ivory towers” and the industry will support the academia with its funds which will also contribute to the establishment of practical knowledge, all of which results in a synergy between university and industry (Novek, 1985: 180, 181). UIC is critically important for the commercialization of the knowledge produced in academia (Powers, 2003: 26) which is also the case in Turkey.

**Graphic 1: Investment for Innovation in Turkey (2002-2012)**



Source: [http://www.tubitak.gov.tr/sites/default/files/bty05\\_1.pdf](http://www.tubitak.gov.tr/sites/default/files/bty05_1.pdf) (29.04.2014)

The main paradigms of UIC in Turkey is to be analyzed within the framework of Technopolis in the universities, Scientific and Technological Research Council in Turkey (TÜBİTAK) as a big provider of knowledge embedded in practice, Ministry of Science, Industry and Technology particularly with Industrial Thesis Program (SANTEZ), Presidency of Development and Support of Small and Medium Sized Enterprises Administration (KOSGEB), Centers for Technological Development (TEKMER) which are crucially important for the acceleration of UIC in brief.

**Figure 2: The Main Dynamics of UIC in Turkey**

### 2.3.1. Technopolis within the Universities

Technopolis is the place which “imposes new social and economic objectives upon science and reinvents the scientist as an archetype of modern man.” (Wakeman, 2009: 256) Keller (1995) explains Technopolis in this way (Keller, 1995: 102):

“A technopolis is a geographic region that generates and sustains economic activity by creating and commercializing new knowledge (an awkward phrase that I assume means the generation of new ideas). Spawned by post World War II advances in technology, most notably the semiconductor and the microchip, the technopolis needs certain conditions in order to grow and thrive. First is the presence and participation of a world class “knowledge center,” usually a university or think tank with an entrepreneurial rather than an ivory tower bent, to stimulate both new ideas and new uses for them. It also needs a critical mass of white collar, non-union, interactive thinkers and doers whose labor is not constrained by the usual vertical and horizontal hierarchies of business organizations. To attract these people, the technopolis needs to be a nice place in which to live, with such amenities as good schools (from day care to doctorate), parks, and cultural institutions. The technopolis also needs a nearby market for its products. Given these conditions, the technopolis has the potential for exponential growth as new technologies inspire new processes and products which in turn inspire new enterprises.”

From here, it can be demonstrated that Technopolis is the center of science, and technology and the implementation oriented procedures which are carried out by researchers, thinkers, academicians or graduate students with industrial liaisons. In Turkey, there are 45 Technopolis or technology parks the majority of them are concentrated in the West, South or Mid of Turkey.

Namely with their dates of foundation and locations, Ankara University Technopolis (Ankara, 2006), Antalya Technopolis (Akdeniz University, Antalya, 2004), ASO Technopolis (TOBB Economy and Technology University, Ankara, 2008), Bilkent Cyberpark (Bilkent University, Ankara, 2002), Boğaziçi University Technopolis (İstanbul, 2009), Bolu Technopolis (Abant İzzet Baysal University, Bolu, 2009), Cumhuriyet Technopolis (Cumhuriyet University Technopolis, Sivas, 2007), Çanakkale Technopolis (Çanakkale Onsekiz Mart University, Çanakkale, 2011), Çukurova Technopolis (Çukurova University, Adana, 2004), Çorum Technopolis (Hitit University, Çorum, 2012), Dicle University Technopolis (Diyarbakır, 2007), Düzce Technopolis (Düzce University, Düzce, 2010), Erciyes University Technopolis (Kayseri, 2004), Erzurum Ata Technopolis (Erzurum Atatürk University, Erzurum, 2005), Eskişehir Technopolis (Anadolu University, Eskişehir, 2003), Fırat Technopolis (Fırat University, Elazığ, 2007), Gazi Technopolis (Gazi University, Ankara, 2007), Gaziantep University Techopolis (Gaziantep, 2006), GOSM Technopolis (Sabancı University, İstanbul, 2002), Hacettepe University Techopolis, (Ankara, 2003), Harran University Technopolis (Şanlıurfa, 2010), Tecknopark İstanbul (2010), İstanbul University Technopolis (İstanbul, 2003), İTÜ Arı Technopolis (İstanbul Technical University, İstanbul, 2003), İzmir Technopolis (İzmir Institute of Technology, İzmir, 2002), Kahramanmaraş Technopolis (Sütçü İmam University, Kahramanmaraş, 2011), Kocaeli University Techopolis (Kocaeli University, Kocaeli, 2003), Kütahya Dumlupınar Design Technopolis (Dumlupınar University, Kütahya, 2009), Lakes Region Technopolis (Süleyman Demirel University, Isparta, 2005), Malatya Technopolis (İnönü University, Malatya, 2009), Mersin University Technopolis (Mersin University, Mersin, 2005), Middle East Technical University Technopolis (Ankara, 2001), Muallimköy Technopolis (Gebze Institute of Technology, Kocaeli, 2011), Namık Kemal University Technopolis (Tekirdağ, 2011), Pamukkale University Technopolis (Denizli, 2007), Sakarya University Technopolis (Adapazarı, 2008), Samsun Technopolis (Ondokuzmayıs University, Samsun, 2009), Selçuk University Technopolis, Konya, 2003), Tokat Technopolis (Gaziosmanpaşa University, 2008), Trabzon Technopolis (Karadeniz Technical University, 2004), Trakya University Edirne Technopolis (Edirne, 2008), TÜBİTAK Marmara Research Center Technopolis (TÜBİTAK, TTGV, Kocaeli, 2000), Ulutek Technopolis (Uludağ University, Bursa, 2005), Yıldız Technical University Technopolis (İstanbul, 2003), Yüzüncü Yıl University Technopolis (Van, 2012). All these places which come to the agenda in Turkey at the beginning of 1990s and which are so common in all developed cities, are very effective tools for UIC all around Turkey (<http://www.sanayi.gov.tr/userfiles/file/TGB%20LİSTESİ123.doc>, 29.04.2014; <http://www.tgbd.org.tr/tr/turkiye-de-teknoparklar-18.html>, 29.04.2014).

### 2.3.2. Scientific and Technological Research Council (TÜBİTAK)

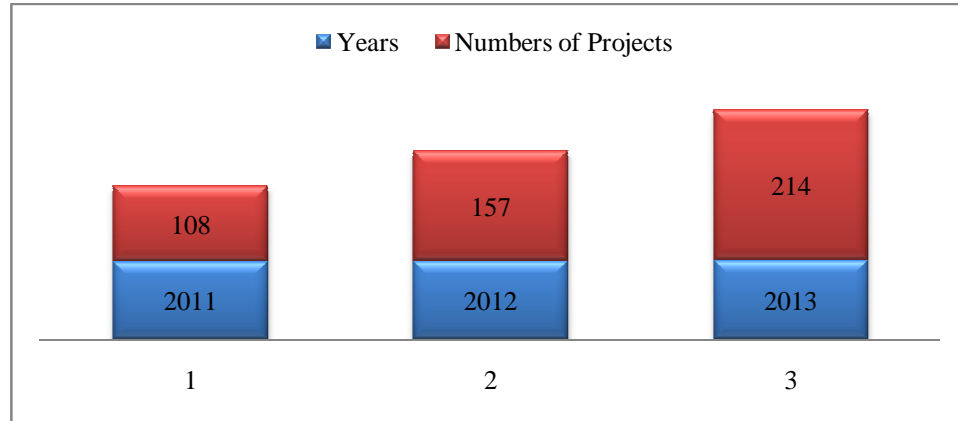
Scientific and Technological Research Council called as TÜBİTAK is one of the leading institutions that support the academic and industrial development projects and also governmental ones. TÜBİTAK plays a critical role in the development of scientific objectives of Turkey which is coordination with industry as well. Especially, the program of UIC numbered 1505, Industrial Innovation Projects, Scientific and Technological Innovation project, and Government Based Support Programs within the framework of TÜBİTAK is a very significant program of support that converts projects into products and processes ([www.tubitak.gov.tr](http://www.tubitak.gov.tr), 29.04.2014; Kiper, 2010: 81, 82). The main responsibility of TÜBİTAK is to conduct research in the scientific areas and support those who are planning to conduct research in those particular areas. Therefore, it can be mentioned that TÜBİTAK is one of the critical players and coordinators of UIC in Turkey ([http://tubitak.gov.tr/tubitak\\_content\\_files/faaliyet/2002/1\\_genel.pdf](http://tubitak.gov.tr/tubitak_content_files/faaliyet/2002/1_genel.pdf), 29.04.2014).

### 2.3.3. Industrial Thesis Program of Ministry of Science, Industry and Technology (SANTEZ Project)

SANTEZ Project which means Industrial Thesis Program and which aims to collaborate industry and university supported by Ministry of Science, Industry, and Technology in Turkey is a great mechanism for UIC as well. The ultimate objective of the program is to institutionalize UIC and to support MA and PhD Dissertations that enhance the added value of science and industry. Studies of dissertation can be turned into SANTEZ project which stems in the practicality of raw knowledge ([http://www.sanayi.gov.tr/userfiles/file/SanTez%20G%C3%BCncel%20D%C3%B6k%C3%BCmanlar/genel%20bilgiler\\_.pdf](http://www.sanayi.gov.tr/userfiles/file/SanTez%20G%C3%BCncel%20D%C3%B6k%C3%BCmanlar/genel%20bilgiler_.pdf), 29.04.2014) which plays an instrumental role for motivation of industry and university (The Impact on the Universty of Industry-University Relations, 1988: 9). For example, in the first and second term in 2013, 214 projects, in other words, thesis studies were supported by Ministry of Science, Industry and Technology (Graphic 2) (<http://www.sanayi.gov.tr/userfiles/file/2013-2%20desteklenen%20San-Tez%20Projeeri.pdf>, 29.04.2014).



**Graphic 2: The Numbers of the Projects Supported within SANTEZ**



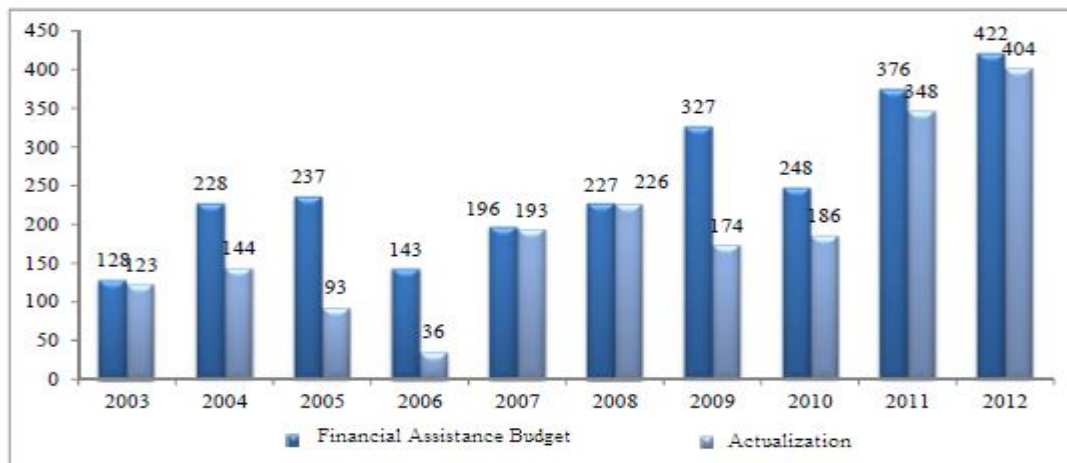
**Source:** The statistics were adapted from the web page of [www.sanayi.gov.tr](http://www.sanayi.gov.tr) (29.04.2014)

Graphic 2 indicates that the numbers of the project accepted within the framework of SANTEZ has been increasing day by day which can be taken into account as the fact that Turkish government is giving ultimate care to the idea of UIC as it plays the role of rejuvenation for Turkish industry and university which was once the case for American industry especially for General Motors (Mason, et al., 1984: 70).

**2.3.4. Presidency of Development and Support of Small and Medium Sized Enterprises Administration (KOSGEB)**

KOSGEB which stands for the Presidency of Development and Support of Small and Medium Sized Enterprises Administration in Turkish language and which is a type of mechanism for the development of Small and Medium Sized Enterprises (SMSE) in regards to the support of their projects. For example, SMSE’s Project Support Program, Thematic Project Support Program, Cooperation Support Program, Innovation and Industrial Application Support Program, General Support Program, Entrepreneurship Support Program, Business Development Support Program are the major support program suggested by KOSGEB actually. KOSGEB is a type of organizational structure that tries to give financial assistance to diversified projects including those of the industry, university as well as individual ones (Küçük ve Orta Ölçekli İşletmeleri Geliştirme ve Destekleme İdaresi Başkanlığı Faaliyet Raporu, 2012: 11-17).

**Graphic 3: Financial Assistance Budget and Its Actualization between 2003-2012 in KOSGEB (Million TL)**



**Source:** Küçük ve Orta Ölçekli İşletmeleri Geliştirme ve Destekleme İdaresi Başkanlığı Faaliyet Raporu, Ankara, 2012, p. 27

Concerning the financial assistance given by KOSGEB between the years of 2003-2012, it can be revealed that from 2003 to 2012, financial assistance to the projects increases in spite of the fact that there are some fluctuations. To illustrate, assistance to projects was 128 million TL, however, it reached 422 million TL in 2012 which was its peak.

On the other hand, the actualization of the projects particularly on the money spent possesses parallelism which is the same with financial assistance. To put in another way, actualization was 123 million TL in 2003, yet it was 404 million TL in 2012, that means it has increased gradually. At the same time, the gap between financial assistance budget and its actualization fluctuates, but in the last few years it was nearly closed. Therefore, KOSGEB is a big contributor of university and industry collaboration by means of institutions like Centers for Technological Development (TEKMER) (Graphic 3).

### **3. Concluding Remarks and Suggestions**

UIC is one of the most significant topics discussed over the last few decades. It is of crucially important that knowing theoretical knowledge is strikingly different from practicing it. Therefore, universities are the particular locations where knowledge is produced while industrial sectors are the ones that practice knowledge. For that reason, it can be demonstrated that university without industry is lame; and industry without university is blind. The main objective of the study is to analyze and cover the issue of UIC in Turkey.

In Turkey, UIC is OK and promising because most of the mechanisms concerning UIC is new and fresh, but not so adequate, so more integration between those institutions is needed in Turkey. UIC is achieved through various mechanisms like Technopolis, Scientific and Technological Research Council (TÜBİTAK), Industrial Thesis Program of Ministry of Science, Industry and Technology (SANTEZ Project), Presidency of Development and Support of Small and Medium Sized Enterprises Administration (KOSGEB), and so forth. Additionally, the investment for innovation and research has been increasing year by year and also that is considerable in gross domestic products. Perhaps, some fundamental generalizations, comments as well as suggestions can be done for the development of UIC in Turkey. That is:

- The outline of the collaboration and its practicality is to be drawn.
- Regular and constructive meetings are to be done which includes the representatives of university and industry.
- Internships directed by supervisors in the universities are to be strictly controlled by them.
- Some mechanisms like İŞKUR (Turkish Work Institution), KOSGEB (Presidency of Development and Support of Small and Medium Sized Enterprises Administration) etc. can be established for coordination of the relations between university and industry.
- University laboratories and industrial factories are to be opened to the researchers as well as to industrial liaisons.
- Lifelong learning as a principle for life is to be improved.
- Product oriented fund given by industrial pioneers are to be provided to the universities for particular goods to be produced.
- UIC strategic plan is to be developed for the continuation and sustainability of these relations.
- University students are to practice more and more rather than memorize. Hence practical knowledge is to be emphasized rather than theoretical knowledge.
- Industrial organizations and factories are to be established on the specific places of universities which means that university and industry is to be embedded as proximity is of great importance for the development of collaboration.

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