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The Effects of the IMF's Quota and Governance Reforms on Turkey

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ABSTRACT

Turkey became a member of the IMF in 1947 and has resorted to IMF sources many times since then. Turkey signed 19 Stand-By Arrangements with the IMF when faced with liquidity problems. Several studies have already provided detailed information about the history and evolution of the relationship between the IMF and Turkey. However, we have not come across studies about the reform efforts carried out by the IMF since 2006 and their effects on Turkey. The IMF reforms completed during the 2006-2016 period positively affected Turkey's voting power, the amount of potential financing it could use, and its representation at the Executive Board. Yet, the conditionality principle, which applies to all countries, remains valid for Turkey as well. Therefore, it would benefit Turkey to explore alternative ways in which it can obtain potential financing on more flexible terms than the IMF. The objectives of the study are to examine the reform efforts carried out by the IMF during the period 2006-2016 and their impact on Turkey and, to discuss the possibility of obtaining funds from other components of the Global Financial Safety Net for Turkey

Keywords
IMF, Global Financial Safety Net, conditionality

JEL Classification
F33, F36, F53

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1. Introduction

Since 1945, the International Monetary Fund (IMF) has played a key role in the functioning of the global economy. The IMF strives to stabilize the global financial system and extends funding to a number of countries. In particular, developing and least developed countries resort to IMF resources, mainly when they face difficulties related to balance of payments. Thanks to its unique role, the IMF still remains at the center of the international monetary system and the Global Financial Safety Net (GFSN). In 2006, the IMF started a reform process at its own initiative at the IMF Board of Governors meeting in Singapore. While these efforts were in progress, the 2008-2009 Global Financial Crisis (GFC) sparked calls for new reforms from 2008 on. The Quota and Governance Reform Program adopted in 2010 has led to significant changes in the IMF. Thanks to those reforms, IMF quotas have been doubled, and the structure of the Executive Board has been considerably changed.

Despite all the reform programs, the IMF remains loyal to the principle of conditionality in its financing facilities. The conditionality principle, often involving controversial austerity measures, has sometimes made developing countries reluctant to borrow money from the IMF. For this reason, some developing economies with balance of payments problems sometimes prefer to use other components of the GFSN rather than the IMF. These include international organizations such as the Arab Monetary Fund (AMF) and the Latin American Reserve Fund (Fondo Latinoamericano de Reservas, FLAR). Among the layers of the GFSN, bilateral swap agreements have also come to the forefront with the 2008-2009 GFC.

Turkey became a member of the IMF in 1947 and has resorted to IMF sources many times since then. Turkey signed 19 Stand-By Arrangements with the IMF when faced with liquidity problems. Several studies have already provided detailed information about the history and evolution of the relationship between the IMF and Turkey (Erdinc, 2007; Arpac & Bird, 2009; Arconian, 2013; Demircan & Ener, 2014). However, we have not come across studies about the reform efforts carried out by the IMF since 2006 and their effects on Turkey. The IMF reforms completed during the 2006-2016 period positively affected Turkey's voting power, the amount of potential financing it could use, and its representation at the Executive Board. Yet, the

conditionality principle, which applies to all countries, remains valid for Turkey as well. Therefore, it would benefit Turkey to explore alternative ways in which it can obtain potential financing on more flexible terms than the IMF. The objectives of the study are 1- to examine the reform efforts carried out by the IMF during the period 2006-2016 and their impact on Turkey and 2- to discuss the possibility of obtaining funds from other components of the GFSN for Turkey.

This study is organized as follows: In the second section, we have explained the IMF's reform programs carried out between 2006 and 2016. We have examined the impact of IMF reforms on Turkey in the third section. Then, we evaluated the international financial institutions complementary to the IMF, in other words the other components of the GFSN, which were established by the developing countries in the fourth section. In the end we have suggested a few policy options to Turkey.

2. IMF Reform Programs During the Period 2006-2016

2.1. The Foundations of the IMF as a Financial Institution

2.1.1. Governance

Board of Governors: It is the IMF's highest decision-making body. Among others, the most significant powers of the Board of Governors include the approval and cancellation of membership to the IMF, the allocation of quotas to the members, and the amendment of the Articles of Agreement. Each member country is represented by a governor (usually the minister of economy or finance) and an alternate governor (usually the governor of the central bank) who holds the authority to vote instead of the governor in his or her absence (Mountford, 2009).

Executive Board: The Executive Board is responsible for the administration of the IMF's daily operations and is a policy-making body. The Executive Board makes assessments on global and regional economic developments as well as developments in specific member states and also approves arrangements to extend financing facilities. As a result of the governance reforms that started in 2010, all 24 members of the board have to be elected by the constituencies. Eight

members are elected from the single-country constituencies while the remaining sixteen members from the multi-country constituencies. The IMF reviews the number of the executive directors every eight years. The voting power assigned to the constituencies differs according to the power of the individual members included in the constituencies (Mountford, 2009; IMF, 2016b).

Managing Director: The managing director is the chairperson elected by the Executive Board. However, the director does not have a right to vote in the Executive Board. The managing director carries out the administrative work assigned by the Executive Board. He or she is also responsible for the work done by the technical staff working at the IMF and for communicating the proposed policies to the Executive Board. Traditionally, the IMF chief must be a citizen of a Western European country. However, the US' opinion is also highly important in the election of the managing director (Mountford, 2009; Peretz, 2009).

2.1.2. IMF Quotas

The quotas are denominated in Special Drawing Rights (SDR) for all financial transactions carried out by the IMF. The SDR, which is an international reserve asset, was created in 1969 to support the then-used fixed exchange rate system. At the outset, the value of the SDR was set at 0.888671 grams of standard gold (at that time, the equivalent of USD 1.00 in terms of gold). After the collapse of the Bretton Woods system in 1973, it was recalculated as a currency basket in major currencies of advanced economies. The Executive Board decided to add the Chinese currency renminbi to the currency basket, which sets the value of the SDR, in November 2015. Since October 2016, the weights of the currencies in SDR are as follows: US dollar 41.73%, euro 30.93%, renminbi 10.92%, Japanese yen 8.33% and British pound sterling 8.09% (IMF, 2017a; Keeney, 2017).

The IMF allocates a quota to each member country, denominated in SDR, that is calculated according to a quota formula. The quota of a member is taken as the basis for all financial transactions made between the IMF and the member countries. Three functions attributed to the quotas are as follows.

1-Subscriptions: The maximum capital contribution of a member country is set according to its quota size. Member countries pay 25% of their quota to the IMF in SDR or widely used currencies such as US dollar, euro, and Japanese yen and 75% in their local currencies. The subscription payments constitute the main source for the credits extended by the IMF.

2-Voting power: The quota of a member also directly affects its voting power. A member's total number of votes is the sum of the number of basic votes and the number of votes dependent on its quota size. The number of basic votes allocated to the members has been increased as part of the reform efforts started in 2008. The relevant amendment to the Articles of Agreement introduced that 5.502% of the total votes would be equally distributed among the member countries. In this way, the weight of the basic votes in the total votes is fixed, no matter how the total size of the quotas would change in the future. Yet, the major part of a member's voting power usually comes from the quota-dependent part. A member is entitled to one vote for every SDR 100,000 in its allocated quota at the IMF. Thus, the larger the quota, the higher the member's voting power would be (IMF, 2011; IMF 2017b).

3-Access to IMF financing facilities: In principle, the upper limit of the funding that a member can obtain from the IMF is based on the quota allocated to that country. However, there have been a number of cases in which IMF provided such amounts of funds to some countries independent of their quota sizes for the sake of the stability of the global financial system (Copelovitch, 2010).

The Board of Governors reviews the quotas at regular intervals, usually every five years or when the Executive Board deems it necessary. To change the IMF quotas, the formal approval of three-fifths of the total number of members, which also hold at least 85% of the total voting power, is required. Under the 14th General Quota Review, completed in 2016, the total amount of the IMF quotas has been raised to approximately SDR 477 billion (IMF, 2017b).

2.2. The IMF's Quota and Governance Reforms between 2006 and 2016

In this section, we explain the 2008 and 2010 reform programs put into practice by the IMF. These sets of reforms have directly affected Turkey's position in the IMF. Since the 2009 reform program, which has dealt with the lending tools offered by the IMF, has not affected Turkey directly, we will not cover it in this study.

2.2.1. 2008 Reform Program

The decisions taken regarding quotas and governance at the annual meeting of the IMF Board of Governors in Singapore in 2006 lie at the heart of the 2008 reform package. As of 2006, the IMF considered that the distribution of quotas and voting power did not sufficiently reflect the relative weights of IMF members in the world economy. For this reason, the Board of Governors approved the quota and governance reforms recommended by the Executive Board at the annual meeting in Singapore in 2006. The reforms aimed at reflecting the changes in global economy in a better way in terms of quota distribution and strengthening the representation of low-income countries at the IMF. These reforms were scheduled to be completed before the IMF Board of Governors' annual meeting in 2008. The main components of the reform program are presented below (IMF, 2006a; IMF, 2006b; IMF, 2007).

- *ad hoc* increases in quotas allocated to China, South Korea, Mexico and Turkey, which are deemed to be the most under-represented countries at the IMF in terms of their relative weights in the global economy;
- agreement on a new and simple quota formula until the 2007 annual meeting of the IMF Board of Governors;
- as the quotas would be re-calculated according to the new formula, another round of *ad hoc* quota increases would be necessary;
- the Articles of Agreement would be amended to at least double the number of basic votes allocated to each member. Thus, the voting power of low-income countries would be protected; and

- creation of a second alternate executive director position, in such constituencies in which a large number of countries are included, through an amendment to the Articles of Agreement.

Ad hoc quota increases were made for four countries in line with the reform decisions taken in 2006 (see Table 1).

Table 1

The ad hoc quota increases recommended in Singapore 2006 and the corresponding voting powers

	Pre-Singapore 2006		Recommended in Singapore	
	Quota (SDR million)	Voting power (%)	New quota (SDR million)	New voting power (%)
China	6,369.2	2.93	8,090.1	3.65
S. Korea	1,633.6	1.20	2,927.3	1.43
Mexico	2,585.8	0.76	3,152.8	1.33
Turkey	964.0	0.45	1,191.3	0.55

Source: IMF, 2006a; Skala, Thimann, & Wölfinger, 2007.

Furthermore, the quota formula has been simplified, and the complex quota calculation method, which involved five formulae, was replaced with a single quota formula in 2008 (Skala, Thimann, & Wölfinger, 2007; IMF, 2008a). On the other hand, some of the reform resolutions adopted in 2006 were transferred to the 2008 reform program. The components of the reform package proposed by the Executive Board in March 2008 and adopted at the IMF Board of Governors meeting in April 2008 are as follows (IMF, 2008a; IMF, 2008b; IMF, 2008c; IMF, 2011).

- Introduction of the new quota formula: As we have mentioned, the complex quota calculation method with five formulae used before 2008 has been eliminated. The new quota formula was introduced in 2008 and included four variables with different weights. National income has 50%, the openness variable has 30%, the economic variability indicator has 15% and the international reserve variable has 5% weight in the quota calculation.[1] Additionally, a

[1] The national income variable in the formula is a three-year average of GDP (a blend GDP indicator calculated through GDP based on the current exchange rates with 60% weight and GDP based on purchasing power parity exchange rates with 40% weight), the openness variable is the five-year average of the ratio of trade volume to GDP, the variability indicator is the standard deviation of current transfers and net capital flows over the last 13

compression factor (0.95) is included in the formula to reduce dispersion across countries in terms of quota size.

• *Ad hoc* quota increases for 54 countries that are entitled to a stronger representation according to the new quota formula: *Ad hoc* changes have been estimated to increase the quotas of 54 countries with gains ranging from 12% to 106%. The sum of the increase in quotas has been expected to amount to SDR 20.8 billion (USD 32.7 billion) in absolute terms, and led to a rise of 4.9 percentage points in the total quota share of those 54 members. Although some developed countries such as Germany, Italy, Japan and the United States have been entitled to larger quotas according to the new formula, they have waived their rights to better serve the purposes of the reform package. A second round of quota increases of at least 15% has been envisaged for four countries (i.e., China, S. Korea, Mexico and Turkey), the quotas of which have been increased once already, following the 2006 resolutions. The countries that would receive the largest increases in voting power as a result of the reforms are Brazil, China, India, South Korea and Mexico.

• Tripling the number of basic votes and boosting the representation of low-income countries: Due to the quota increases completed since 1945, the share of basic votes in total votes has fallen to a level as low as 2.1%. This, in turn, especially negatively affected the voting power of low-income countries. The new arrangement regarding basic votes is expected to triple the number of basic votes by the amendment to the Articles of Agreement. This increase in the basic votes is the first one since the inception of the IMF. The amendment to the agreement has been expected to ensure that the share of the basic votes in the total votes was fixed at 5.502%. Therefore, future quota increases would not change the share of basic votes in total voting power. Basic votes will be equally distributed among member countries.

• Creation of the new alternate executive director positions for the constituencies in which a large number of countries are represented: As a result of the amendment to the Articles of Agreement under the reform program, a second alternate executive director position has been

years, and reserve variable is the 12-month average of international reserves.

established for constituencies with at least 19 countries. Accordingly, the second alternate executive director positions were planned to be established for the two constituencies in which African countries are represented. This change was expected to ease the burden of heavy workload in those constituencies. However, during the approval process of the 2008 reforms, the IMF Board of Governors decided that the second alternate executive director positions could be created for the constituencies in which at least seven countries were represented.

For these reforms to take effect, a few conditions should be met. For example, the quota increases proposed under the 2008 reform program have been tied to changes to be made in the Articles of Agreement. In addition, the countries that would benefit from the quota increases need to officially consent and pay the required subscriptions. The amendments to the Articles of Agreement enter into force with the approval of three-fifths of the member countries, which also held 85% of the total voting power. The 2008 reforms came into effect in March 2011 with the approval of 117 countries with more than 85% of the voting power (IMF, 2011).

In addition to the 2008 Quota and Governance Reforms, the IMF started to reform its lending instruments in 2009 as a consequence of the GFC. This reform aimed at reviewing the financing facilities provided by the IMF. We regard that the reform on lending instruments lies out of the scope of this study and it has not directly affected Turkey since it finalized the last Stand-By Arrangement in 2008 (IMF, 2009).

2.2.2. 2010 Reform Program

While the approval process of the 2008 reforms was in progress, the IMF has drafted a new reform program in 2010. Thus, the 2010 reform package, also known as the Quota and Governance Reform, can be regarded as a sequel to the 2008 reforms. In November 2010, the IMF Executive Board informed the Board of Governors regarding the reforms it proposed. At the December 2010 meeting of the IMF Board of Governors, this reform program was accepted by 95% majority. The main elements of the 2010 reform program are presented below (IMF, 2010a; IMF, 2010b; IMF, 2011; Lesage, Debaere, Dierckx, & Vermeiren, 2013).

- doubling the IMF's overall quota size under the 14th General Quota Review;
- comprehensive review of the quota formula;
- elimination of the appointed executive directors category and introduction of the all-elected IMF Executive Board; and
- reduction in representation of the advanced European countries at the Executive Board.

The first two components mentioned above are related to quotas, while the last two are related to governance of the IMF. At the outset, the 2010 reforms have been scheduled to be completed by the annual meeting of IMF Board of Governors in October 2012. We explain the 2010 reforms in detail in two separate sections below.

2.2.2.1. Quota-related Reforms

2.2.2.1.1. Doubling the IMF's overall quota size under the 14th General Quota Review.

The IMF's quota size has decayed over time compared to the global economic developments since the last general quota increase in 1998. Thus, the IMF, that sticked with the principle to keep the quotas as the main source of its finances, acknowledged that an overall quota increase has become a necessity by 2010. With the 2010 reform program, it was agreed that the total quota would be increased by 100%, from SDR 238.4 billion to SDR 476.8 billion (IMF, 2010a; IMF, 2011).

The conditions that had to be met for the quota increases to take effect are 1- the rises in quotas had to be approved by countries representing at least 70% of the total quotas as of November 5, 2010 and 2- the amendment to the Articles of Agreement regarding the structure of the Executive Board should come into force. This amendment could be effective once approved by at least 3/5 of the total number of members (i.e., 113 countries) that also represented at least 85% of the total voting power. This has meant that the implementation of the overall quota increase has been tied to the amendment to the Articles of Agreement (IMF, 2012a).

The first condition for the implementation of the quota reform was fulfilled by September 2012 (IMF, 2012b). 124 members that held 73.4% of the total voting power approved the overall quota increase in 2012. As regards the second condition, the approval procedure was complicated to some extent because it consisted of two parts. As of end-2012, 129 countries, well above the required 113, accepted the amendment to the Articles of Agreement. Hence, the first part of the second condition has been fulfilled quite quickly. However, the second part, that required the consent of at least 85% of the voting power, could not be met for about three years (see Table 2) because the US did not accept the amendments to the Articles of Agreement until December 2015. Holding more than 15% of the votes, the US exercised its veto power. Consequently, quota increases have not become effective until January 2016 (IMF, 2016b).

Table 2
Approval status of the 2010 Quota and Governance Reform

	Quota Reform		Governance Reform	
	Number of Countries	Voting Power (>= 70%)	Number of Countries (>= 113)	Voting Power (>= 85%)
Dec. 2011	53	35.9	38	30.0
Sept. 2012	124	73.4	105	66.1
Dec. 2012	145	77.1	129	70.2
Apr. 2013	148	77.4	136	71.3
Jan. 2014	157	78.6	141	76.1
Jan. 2015	163	79.6	146	77.1
Jan. 2016	183	99.8	149	94.0

Source: IMF
Note: Shaded cells represent the dates that the relevant conditions have been met.

To see the impact of quota reforms carried out between 2006 and 2016, we compare the quota distribution valid at the annual meeting in Singapore in 2006, with the new distribution in 2016. As of 2006, the US was at the top in terms of quota size and voting power. The top 10 countries consisted of all G-7 members and China, Saudi Arabia and Russia. The total voting power of the top 10 countries stood around 54.5%. Turkey with a quota of SDR 964 million had a voting power of 0.45% (see Table 3).

Table 3
Top 10 IMF members and Turkey by quota size and voting power, as of end-2006 (SDR million)

	Country	Quota size	Percentage share	Voting power	Percentage share
1	United States	37,149.3	17.40	371,743	17.08
2	Japan	13,312.8	6.24	133,378	6.13
3	Germany	13,008.2	6.09	130,332	5.99
4	France	10,738.5	5.03	107,635	4.95
5	United Kingdom	10,738.5	5.03	107,635	4.95
6	Italy	7,055.5	3.30	70,805	3.53
7	S. Arabia	6,985.5	3.27	70,105	3.22
8	Canada	6,369.2	2.98	63,942	2.94
9	China	6,369.2	2.98	63,942	2.94
10	Russia	5,945.4	2.79	59,704	2.74
	Turkey	964.0	0.45	9,890	0.45
	Other	94,842.3	44.44	986,234	45.08
	Total	213,478.4	100.00	2,175,345	100.00

Source: IMF annual reports.
Note: Shaded rows demonstrate the BRIC countries.

As of the end of April 2016, the US still ranks first in terms of quota size and voting power. In addition, the US retained its veto power over the changes to the IMF's Articles of Agreement since its voting power remained above 15% after the 2010 quota reform. By 2016 a G-7 member, namely Canada, has dropped out of the top 10, while all the BRIC countries (Brazil, Russia, India and China) had places among the top 10. However, the total voting power of the BRIC countries remained at 13.65%. Accordingly, BRIC countries have not been able to gain veto power in the aftermath of the 2010 reforms. As a result of the quota increases between 2006 and 2016, Turkey's quota and voting power jumped to SDR 4,658.6 million and 0.96%, respectively (Table 4).

Table 4
Top 10 IMF members and Turkey by quota size and voting power, as of April 2016 (SDR million)

	Country	Quota size	Percentage share	Voting power	Percentage share
1	United States	82,994.2	17.60	831,395	16.66
2	Japan	30,820.5	6.54	309,658	6.21
3	China	30,482.9	6.46	306,282	6.14
4	Germany	26,634.4	5.65	267,797	5.37
5	France	20,155.1	4.27	203,004	4.07
6	United Kingdom	20,155.1	4.27	203,004	4.07
7	Italy	15,070.0	3.20	152,153	3.05
8	India	13,114.4	2.78	132,597	2.66
9	Russia	12,903.7	2.74	130,490	2.61
10	Brazil	11,042.0	2.34	111,873	2.24
	Turkey	4,658.6	0.99	48,039	0.96
	Other	203,536.6	43.16	2,292,547	45.96
	Total	471,567.5	100.00	4,988,839	100.00

Source: IMF annual reports.
Note: Shaded rows demonstrate the BRIC countries.

2.2.2.1.2. Comprehensive review of the quota formula

Another major element of the reform package has been the revision of the quota formula. As we have mentioned earlier throughout the study, a change in the quota formula leads to changes in quota sizes of IMF members. The Executive Board started to work on a new quota formula in March 2012. It was agreed that the new formula would be simple and transparent, compatible with the functions of the quotas, and calculated easily with available data (IMF, 2012a). By 2013, the Executive Board stated that it would be better to address this review within the scope of the 15th General Quota Review in its report on the new quota formula. However, since the quota increases under the 14th General Quota Review did not go into effect until 2016, the 15th Review could not be initiated either. Thus, the IMF has been able start its work on the 15th General Quota Review, including the revision of the quota formula, in 2016. It has been targeted to finalize the review of the formula until the annual meeting to be held in 2019 (IMF, 2013; IMF, 2016b; IMF, 2016c).

2.2.2.2. Governance-related Reforms

2.2.2.2.1. Elimination of the appointed executive director category and introduction of the all-elected IMF Executive Board.

As noted above, the Executive Board consists of 24 members and the number of the seats is reviewed every eight years. Prior to the 2010 reform program, five member states with the largest voting shares in the IMF (US, Japan, Germany, France and UK) had the right to appoint their own executive directors. As the amendments to the Articles of Agreement entered into force in January 2016, the Executive Board was entirely formed of elected members. Thus, the category of appointed executive director has been eliminated. From 2016 on, the US, Japan, Germany, France and the UK, previously represented by appointment, have technically become eligible to be included in multi-country constituencies. However, as eight members (US, Japan, Germany, France, UK, Russia, China and Saudi Arabia) remained in the single-country constituencies, they will be directly represented at the Executive Board (IMF, 2010a; Lesage, Debaere, Dierckx, & Vermeiren, 2013; IMF, 2016b).

2.2.2.2.2. Reduction in representation of the advanced European countries at the Executive Board.

Prior to the 2010 reform program, advanced European countries had eight seats at the Executive Board. Under the 2010 reforms, it was foreseen that two seats allocated to the advanced European countries would be replaced with representatives from the developing European economies.[2] This process began with the Executive Board elections in November 2012. In 2012, Belgium joined the Dutch constituency. Thus, two full-time executive director positions, previously occupied by representatives from Belgium and the Netherlands, were combined in a single constituency, and the number of executive directors from the advanced European countries was reduced by one full seat. Furthermore, a new constituency has been formed, which included the Central and Eastern European Countries (i.e., Turkey, Austria, Belarus, Czech Republic, Hungary, Slovakia, Kosovo and Slovenia). The executive director of this constituency was agreed

[2] If a developing country representative is to serve in one of the two terms for which the executive director is expected to work, the period that is allocated to the executive director from the developing country is assumed to be a ½ seat at the Executive Board.

to be alternately elected from Turkey, the Czech Republic or Hungary according to the 2012-2022 constituency agreement. On the other hand, according the agreement in Swiss constituency, the executive director position would be rotated between Switzerland and Poland. Last but not the least, three years of 16 year rotation of the executive director position in the Nordic-Baltic Constituency would be left to the developing countries in the constituency. It is estimated that 1.64 of the two full-time executive director positions has been delivered to the developing European countries as of 2017 (Malkin & Momani, 2011; Lesage, Debaere, Dierckx, & Vermeiren, 2013; IMF, 2013; Keeney, 2017).

To summarize, the IMF planned and implemented many reforms during the period 2006-2016. However, reform programs have not always been implemented in line with the formal reform resolutions. For example, the work on the new quota formula could not be finalized since 2010. In the next section, we discuss the effects of the 2008 and 2010 reform programs on Turkey.

3. The Effects of the IMF's Quota and Governance Reforms between 2006 and 2016 on Turkey

3.1. The Effects of the 2008 Reform Program on Turkey

As a result of the 2006 Singapore annual meeting and the 2008 reform program, Turkey's IMF quota and voting power increased. As we have noted in the previous section, the IMF Board of Governors granted *ad hoc* quota increases to China, South Korea, Mexico, and Turkey at the annual meeting in Singapore in 2006. Thanks to this decision, Turkey's quota rose from SDR 964 million to approximately SDR 1,191 million. Later on, with the 2008 reform program Turkey experienced another round of rise in its quota size and voting power. A few reasons underlied this increase. The first reason was related to the re-calculation of quota sizes according to the simplified quota formula. The new quota formula has better taken into account Turkey's relative weight in the world economy. Another factor that affected Turkey's voting power was the rise in the share of basic votes in total votes. These arrangements under the 2008 reforms came into effect in 2011. As of April 2012, Turkey's quota size and number of votes increased to approximately SDR 1,456 million and 15,295, respectively. Accordingly, Turkey's share in total

quotas and total votes rose from 0.45% to 0.61% in April 2012, with respect to 2006 (see Table 5).

3.2. The Effects of the 2010 Reform Program on Turkey

The IMF's 2010 reform program influenced Turkey in terms of representation at the Executive Board as well as quota size and voting power. The 14th the General Quota Review envisaged an increase in the IMF's total quota by 100%. However during this revision Turkey's quota rose by around 220%, and climbed up approximately to SDR 4,659 million. Therefore, Turkey obtained a relatively higher quota increase than the average rate. Turkey has also benefited from the 2010 reforms in terms of voting power. Turkey's number of votes has jumped from 15,295 to 48,039 thanks to the 2010 reforms. The voting power is consisted of 1,453 basic votes and 46,586 quota-based votes. Accordingly, Turkey's relative voting share increased from 0.61% to 0.96% as of 2016 compared to 2012 (see Table 5).

Table 5

Turkey's quota and voting power at the IMF (2006-2016)

	Turkey's quota size (SDR million)	Total quota (SDR million)	Percentage share (%)	Turkey's votes	Total votes	Percentage share (%)
2006	964.0	213,478.4	0.45	9,890	2,175,345	0.45
2007	1,191.3	216,747.8	0.55	12,163	2,207,764	0.55
2008	1,191.3	217,372.7	0.55	12,163	2,214,976	0.55
2009	1,191.3	217,372.7	0.55	12,163	2,214,607	0.55
2010	1,191.3	217,431.7	0.55	12,163	2,214,607	0.55
2011	1,191.3	237,355.7	0.50	12,163	2,506,798	0.49
2012	1,455.8	238,116.4	0.61	15,295	2,512,807	0.61
2013	1,455.8	238,118.0	0.61	15,295	2,515,719	0.61
2014	1,455.8	238,120.6	0.61	15,295	2,515,745	0.61
2015	1,455.8	238,182.7	0.61	15,295	2,520,571	0.61
2016	4,658.6	471,567.5	0.99	48,039	4,988,839	0.96

Source: IMF annual reports.
Note: As of end-financial year.

Within the scope of the 2010 governance reforms, a new constituency has been created with a voting power of 3.22%, in which Central and Eastern European Countries are involved.

The countries in this group have signed a constituency agreement for the period 2012-2022. According to the eight-year rotation program (2014-2022) set by the agreement, it has been agreed that the executive director of this constituency would alternately be elected from Turkey, the Czech Republic, or Hungary. The executive director of this constituency would be elected from Turkey for two terms, namely for 2014-2016 and 2018-2020. Therefore, with the 2010 Reform Program, Turkey was entitled to take a chair at the Executive Board for the first time (Government of the Slovak Republic, 2017). With the 2008 and 2010 reform programs, the potential amount of the funds that Turkey could obtain from the IMF rose significantly. For example, the cumulative funding amount that Turkey could draw through a Stand-By Arrangement (SBA) was approximately SDR 2.9 billion as of 2006. Following the reforms, this figure increased to SDR 20.3 billion by 2017.

Although Turkey has clearly benefited from the reforms during the period 2006-2016, under the current circumstances, Turkey cannot resort to any alternative international organization in the face of a balance of payments problem other than the IMF. It is a well-known fact that, in the case of IMF financing, the IMF's conditionality principle often requires austerity policies. At this point, we suggest that Turkey can have more flexibility in its economic policies if it can create an alternative to the IMF for balance of payments financing. Thus, Turkey would be able to use external financing without being bound by the IMF's rigid conditionality principle. We analyze the potential alternative international funding sources that can be extended to developing countries in the next section.

4. The Layers of the Global Financial Safety Net Complementary to the IMF

Developing countries that want to use other sources of finance in addition to the IMF when balance of payments problems arise have established a number of international organizations. However, these institutions have not matured enough to provide an alternative to the IMF in terms of both operational capacity and available funds. We presume the underlying reasons for this situation are 1) the IMF still protects its dominant role as a global institution in the GFSN and 2) the other international organizations consider themselves complementary to the IMF rather than alternatives. Nonetheless, these organizations can be regarded as a good starting

point for Turkey to seek additional policy options. In this section, we give brief information on the Arab Monetary Fund (AMF), the Latin American Reserve Fund (Fondo Latinoamericano de Reservas, FLAR), the Chiang Mai Initiative Multilateralization (CMIM) and the Contingent Reserve Arrangement (CRA) in the order of their inception dates. Finally, we analyze bilateral swap arrangements (BSA) signed between the central banks. These institutions are also referred to as layers of the GFSN (IMF, 2016d).

4.1. Arab Monetary Fund (AMF)

The AMF, which has currently 22 members, was created in 1976 for financing the balance of payments needs of Arab countries. The headquarters of the AMF is located in the United Arab Emirates. The AMF's highest decision-making body is the Council of Governors. Daily work is carried out by the Board of Executive Directors, which has eight members. The assets and liabilities of the fund are denominated in its own currency, the Arab accounting dinar (AAD), which is assumed to be equivalent to three SDRs. Subscriptions and AMF reserves constitute the main source of the financial facilities that member countries can obtain from the AMF. In 2013, the AMF Council of Governors decided to increase the capital of the fund from AAD 300 million to AAD 900 million. The member countries' participation process in the capital increase is still ongoing. By 2016, the available funds offered by the AMF amounted to around AAD 1.2 billion (USD 4.8 billion). The AMF's purposes for extending funds to member countries are 1) financing balance of payments difficulties and 2) supporting reforms in various sectors. The AMF offers nine financing vehicles. Recipients must commit to take fiscal policy measures or make structural reforms to benefit from most of such financing instruments. The AMF provided AAF 2.1 billion (USD 8.4 billion) of funds through 177 credit agreements to member countries from 1978 to 2016. Structural adjustment facilities, extended loans and automatic loans were first three largest categories of loans extended by the AMF over the entire period. It is important to note that there is no conditionality to use automatic loans from those facilities (AMF, 2017).

The financial resources available at the AMF are significantly lower than those of the IMF for the countries that are members of both the AMF and the IMF. AMF members had a total quota of SDR 24.8 billion (USD 35 billion) at the IMF as of 2016. The total size of the resources

that these countries can use with Stand-By Arrangements (SBA) is cumulatively SDR 107.9 billion (USD 152 billion). This figure is much higher than the amount that is available at the AMF. As of 2016, some AMF countries have standing loan agreements with the IMF, and their total debt is SDR 3.5 billion (USD 4.9 billion). Hence, we conclude that the AMF members admitted to taking harder policy actions to draw larger loans from the IMF (IMF, 2016b; AMF, 2017).

4.2. Latin American Reserve Fund (Fondo Latinoamericano de Reservas, FLAR)

FLAR was established in 1989 to provide financial support to Latin American countries in the face of balance of payments problems.[3] The organization has currently eight members (Venezuela, Colombia, Costa Rica, Ecuador, Peru, Bolivia, Uruguay and Paraguay). The administrative office of the FLAR is in Colombia. The subscriptions that have been collected from the member countries are used for extending loans to members. As of 2017, the total capital commitment of FLAR members is USD 3.9 billion. In 2003 and 2006, FLAR also issued bonds of USD 400 million to improve its financial capacity. The size of the financial facilities that FLAR can extend to a member is set according to its capital share. As of 2017, the total amount of resources that the FLAR can offer to its members is around USD 7 billion. Up until 2017, all members except Uruguay and Paraguay have borrowed from FLAR. The members are loyal to the terms of the loans that they have obtained. Peru and Ecuador are especially impressive examples of loyalty. Both countries have paid back their loans to FLAR even during such periods when they could not pay their other creditors. So far, the countries that used funds from FLAR have never defaulted. FLAR has committed a total of USD 13 billion in loans to its members from its inception till the end of 2016. Balance of payments loans constitute around 52% of the loan agreements, whereas liquidity loans represent 40% of the total amount. FLAR has approved the credit facilities within a month on average, and the loans have not been subject to any conditionality. These features of the loans imply that the requirements for borrowing from FLAR are quite flexible (Ocampo & Titelman, 2012; Titelman, Vera, Carvallo, & Perez Caldentey, 2013; Ocampo, 2015; FLAR, 2017a; FLAR, 2017b).

[3] The Andean Reserve Fund (FondoAndino de Reservas, FAR), which was established in 1978 for financial cooperation between Venezuela, Bolivia, Colombia, Ecuador and Peru, has been converted into FLAR.

Financial sources of FLAR are relatively low compared to those the member countries can borrow from the IMF. However, we presume that those two figures are relatively closer to one another for Costa Rica, Bolivia and Paraguay. For example, Paraguay can obtain a potential loan from the IMF through an SBA of USD 1.2 billion, and it can borrow up to USD 600 million from FLAR. Therefore, FLAR, which offers financial facilities with more flexible terms, can be considered an alternative to the IMF for these countries. As of 2016, FLAR members have a total IMF quota of around SDR 9 billion (USD 12.8 billion). The total amount that these countries can obtain from the IMF through SBAs is about SDR 39.3 billion (USD 55.5 billion) cumulatively. Countries that are willing to engage in relatively large credit agreements have to apply to the IMF. For example, Colombia signed a precautionary Flexible Credit Line (FCL) agreement with the IMF for SDR 8.2 billion (USD 11.5 billion) in 2016 against global risks. Therefore, we presume that FLAR cannot be an alternative to the IMF in the current situation, but might be a good complement to it (Ocampo, 2015; IMF, 2016a; IMF, 2016b).

4.3. Chiang Mai Initiative Multilateralization (CMIM)

The Chiang Mai Initiative (CMI[4]), which was established by China, Japan and South Korea[5] in addition to the Association of Southeast Asian Nations[6] (ASEAN) in 2000, was transformed into the CMIM in 2009. The CMIM agreement went into force in 2010. The objectives of the CMIM are 1) to finance balance of payments or provide short term liquidity and 2) to support existing international financial agreements in the ASEAN +3 countries and Hong Kong. The main financing method is multilateral swap arrangements between countries that are parties to the CMIM treaty. Thus, from 2010 onward, the CMIM replaced bilateral swap arrangements (BSA) with multilateral swap agreements. A quota has been set for each country that is party to the CMIM. Under the CMIM, a member that needs liquidity will sell its local

[4] In the aftermath of the 1997 Asian Crisis, the CMI was created in 2000 by the Association of Southeast Asian Nations (ASEAN) members and China, Japan and South Korea to improve regional financial co-operation. It was expected that in cases of balance of payments problems, the ASEAN countries and China, Japan and South Korea would make bilateral swap arrangements (BSA). One can take the creation date of the ASEAN arrangements (ASA) back to 1977. Between 1979 and 1992, the ASEAN members made five small-scale swap arrangements. However, after the Asian Crisis, it was deemed necessary to strengthen this framework. Over time, the members started to sign BSAs within the CMI. As of 2009, CMI members had signed 16 BSAs for a total amount of USD 90 billion. The countries that signed the CMI treaty were allowed to make BSAs that amounted to 10% of their quotas without an IMF agreement. This proportion was raised to 20% in 2005 (Henning, 2002; Kawai, 2015).

[5] ASEAN members plus China, Japan and South Korea are also known as ASEAN +3.

[6] Brunei Darussalam, Malaysia, Indonesia, Philippines, Singapore, Thailand, Vietnam, Cambodia, Myanmar, and Laos.

currency in exchange of US dollars within the limit of its predefined quota. To use a high level of its quota through a swap arrangement, a member should have a standing or a recently completed loan agreement with the IMF, which the CMIM calls as the IMF-link. The size of the funds a member could use without an IMF commitment, in other words the de-linked portion, was initially limited to 20% of the quota.

The severe effects of the 2008-2009 Global Financial Crisis (GFC) pushed the CMIM to strengthen its financial capabilities. The improvements that took effect in July 2014 are as follows. 1) the total size of the potential swap agreements, previously USD 120 billion, has been increased to USD 240 billion; 2) the de-linked portion has been raised to 30% of the quota of a CMIM member; 3) a new lending tool (CMIM precautionary line, CMIM-PL) was introduced for the prevention of crises; and 4) the maturities and availability periods of the financing facilities provided by the CMIM have been extended. After these amendments, the total funds that some CMIM members (e.g., Malaysia and Thailand) could potentially obtain from the CMIM exceeded the funds they could borrow from the IMF through SBAs. However, no member country has yet utilized the CMIM since the amendments came into force. For institutionalization purposes, the ASEAN +3 Macroeconomic Research Center (AMRO) was established in 2011, with a mission to carry out the administrative work of the CMIM. The AMRO helps the CMIM enhance its institutional and operational capacity. In 2016, the AMRO conducted a test run on the use of IMF-linked portion of its financing facilities with the support of the IMF (Kawai, 2015; AMRO, 2017a; AMRO, 2017b).

4.4. Contingent Reserve Arrangement (CRA)

The CRA was created in 2014 by the BRICS countries (Brazil, Russia, India, China and South Africa), and the CRA treaty went into force in 2015. We regard the CRA as different from AMF, FLAR and CMIM because the BRICS are not based on regional cooperation. The BRICS countries have agreed that the CRA would support the GFSN and play a complementary role in the existing international monetary and financial system. The CRA was established to provide financial support to potential short-term balance of payments problems. A total of USD 100 billion has been committed by the BRICS countries for the CRA, and a quota has been allocated to each member. Similarly to the CMIM, the CRA also has IMF-linked and de-linked portions.

The financing that can be accessed without an IMF commitment (de-linked portion) is limited to 30% of the country quota, and needless to say, the IMF-linked portion under the CRA is set at 70%. In case a member needed liquidity in US dollars under the CRA, it will sell its local currency to buy USD for a maximum term of one year. Depending on the financing tool, it is possible to extend the maturity twice or three times. The highest decision-making body of the CRA is the Governing Council, in which the governors of the central banks or the ministers of finance participate. The Governing Council has such authorities as granting membership to the CRA or changing the de-linked portion of the country quotas. The other component of the governance, the Standing Committee, is responsible for the daily administrative work of the CRA (BRICS, 2014; Cattaneo, Biziwick, & Fryer, 2015; He, 2016).

The BRICS countries had a total quota of around SDR 70.6 billion (USD 100 billion) in the IMF as of 2016. The total amount that these countries can borrow with SBAs is approximately SDR 307 billion SDR (USD 433.4 billion) (IMF, 2016b). However, the BRICS countries have not asked for IMF resources for many years. On the other hand, the CRA instruments have not been utilized since 2015. Some critics have argued that the CRA cannot be utilized even if the BRICS countries needed liquidity. The potential causes of this difficulty are 1) the relatively small size of the CRA sources compared to that of the IMF, and 2) the IMF-link condition for accessing the major part of the resources. It has been emphasized that the privilege should be given to boosting the financial capabilities of the CRA to make the organization more functional. Moreover, it has been recommended that the CRA should make arrangements to develop institutional capacity and conduct surveillance activities on member countries in a similar way to the CMIM/AMRO (Cattaneo, Biziwick, & Fryer, 2015; He, 2016).

4.5. Bilateral Swap Arrangements (BSA)

During and after the 2008-2009 GFC, the central banks' interest in bilateral swap arrangements has risen significantly due to the extraordinary need for liquidity worldwide. Because of the global effects of the crisis, several swap arrangements have been made between the central banks of the advanced economies. However, since the scope of this study is limited to developing countries, we will focus on the developing country-developing country and developed country-developing country BSAs in this subsection. After 2008, the US Federal Reserve (FED)

and the People's Bank of China (PBOC) came to the forefront as major liquidity suppliers through BSAs. However, we observe that the two central banks basically have different motivations regarding the swap arrangements.

The main motive of the US FED has been to provide liquidity to global financial markets through BSAs. In October 2008, the US FED announced that it had signed four swap agreements with the central banks of Brazil, Mexico, South Korea and Singapore, each of which amounted to USD 30 billion. The FED, taking into account the risks that the banks with US origin were exposed to, stated that these countries were deemed systemically important (FED, 2008). The BSA with South Korea Central Bank is an interesting example because South Korea preferred to make a BSA with the US FED instead of the IMF or the then-CMI. It is important to note that the swap arrangement was made for precautionary purposes, and not due to the inadequacy of South Korea's foreign exchange reserves.[7] The lack of confidence in the IMF in Southeast Asia since the 1997 Asian Crisis influenced Korea's decision to not to resort to the IMF. South Korea did not opt to use the CMI either, due to the IMF-link condition. The swap arrangement between South Korea Central Bank and the FED has been put forward as a striking example of the CMI's ineffectiveness. It was argued that this BSA was so influential that it played a partial role in the CMI's transformation into the CMIM in 2009 (Aizenman, Jinjarak, & Park, 2010; IMF, 2016d). On the other hand, the PBOC has aimed at increasing the weight of the Chinese renminbi in global trade and international reserves through bilateral swap arrangements. Contrary to the FED, the PBOC has not attached much importance to the economic foundations of the developing economy that signed the BSA. Instead, the PBOC considers whether the counterparty had a significant share in China's export volume. As of the end of 2015, the total amount of the 33 BSAs signed by the PBOC denominated in renminbi reached about yuan 3.3 trillion (approximately USD 500 billion) (IMF, 2016d; PBOC, 2016).

There is no mechanism within the FED or the PBOC to closely monitor the macroeconomic outlook of the counterparty developing countries. Moreover, in contrast with the IMF facilities, those particular swap arrangements do not include any conditionality provisions. Therefore, there is a possibility of counterparty risk, which means that the dollar-borrowing or

[7] South Korean Central Bank signed swap arrangements with the Central Banks of China and Japan to boost market confidence by the end of 2008.

renminbi-borrowing country may not comply with the terms of the BSA. To counter this risk, the US FED takes account of the counterparty country's relative weight in the global trade and financial markets as well as the indicators on its economic foundations, such as its level of international reserves or domestic saving rate. We cannot infer that all developing countries would be able to sign BSAs to secure liquidity in dollars because the FED's behavior would be selective while considering whether to sign an arrangement (Aizenman, Jinjarak, & Park, 2010).

5. Conclusion and the Policy Options for Turkey

The IMF decided to make a series of reforms in 2008 and 2010 to strengthen its central position in the international monetary system. The 2008-2009 Global Financial Crisis and crisis-related liquidity needs played an important role in the adoption of the reform packages. The 2010 Quota and Governance Reform, which doubled the total IMF quotas, entered into force in 2016. The IMF raised its total quotas to SDR 477 billion, reaching a fund size that could meet global liquidity needs. In terms of quota sizes, the other components of the GFSN (i.e., AMF, FLAR, CMIM and CRA) remained at a significantly lower level than the IMF.

The IMF reform efforts during the period 2006-2016 yielded positive results to Turkey in terms of its quota size, voting power and representation. Thanks to the reform packages, Turkey will be able to borrow remarkably more IMF resources in the future. However, the conditionality principle inherent in the IMF financing may require austerity measures that Turkey may be reluctant to implement. For this reason, it is important for Turkey to explore alternative external financing sources that can be obtained on more flexible terms. Under the current circumstances, we suggest that it may be in Turkey's interest to consider the following policy options.

Firstly, given the current situation, Turkey should strive to protect its gains in the IMF and increase them whenever possible. It should also try to defend its power at the IMF Executive Board during the renewal negotiations of the constituency agreement.

Turkey can get in touch with the other components of the GFSN to expand the potential external financial resources it can access. Among the four international organizations discussed within this study, the AMF, FLAR and the CMIM do not constitute promising alternatives for Turkey since they have been established to enhance cooperation within certain regions. However,

the CRA of the BRICS countries may be a more appropriate policy option because it is open to new members and does not have a regional character. To this end, Turkey can make accession negotiations with the BRICS countries regarding the CRA. If Turkey is granted membership, it can contribute to developing its institutional capacity and thus to reduce the weight of the IMF-link for facilitating the financial tools of the CRA.

Bilateral swap arrangements between the central banks may be another potential instrument of external finance for Turkey. As a matter of fact, a swap arrangement for yuan 10 billion/Turkish lira 3 billion between Turkey's central bank and the PBOC was signed in 2012, and renewed for yuan 12 billion/Turkish lira 5 billion in 2015 (PBOC, 2016). However, the BSA with the PBOC serves to increasing the weight of the Chinese renminbi in international markets, rather than providing potential external funds to support a developing country. On the other hand, the US Federal Reserve's swap arrangements with developing countries are considered more relevant with external financing. Still, the FED has been selective about the developing country to which this facility would be offered. The FED considers the soundness of the economic foundations of a developing country in its evaluation of signing a BSA. For this reason, Turkey should strive to keep its economy sound and stable and reduce its existing vulnerabilities to be eligible to negotiate with the FED.

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ANNEX – 1

A Brief History of Turkey-IMF Relationship

Turkey became a member of IMF in 1947. As of the end of 2016, Turkey's quota is SDR 4,658.6 million and the voting power is about 0.96%. Out of the total quota assigned to Turkey, the reserve tranche position is SDR 112.8 million and SDR allocation is SDR 4,545.8 million (IMF, 2016b).

Turkey utilized approximately SDR 33,821 million in total from the IMF resources between 1961 and 2008[8]. Turkey borrowed SDR 27,033 million through the Stand-By Arrangements (SBA), whereas it drew SDR 5,784 million from the Supplemental Reserve Facility (SRF). The remaining part of the funds that the IMF disbursed consisted of the Extended Fund Facility (EFF), the Compensatory Financing Facility (CFF), Oil Facility (OF) and the Emergency Assistance (Istemi, 1985; Cortuk, 2006; IMF, 2015) (see Table 6).

During the period 1961-2016, Turkey made SDR 33,632 million repayments to the IMF. A very large portion (SDR 29,808 million) of such payments was remitted during the period 2002-2013, following the large drawdowns between 2000 and 2002. The difference between the resources and the repayments emanated from the resources that Turkey obtained prior to 1961. Turkey completed the repayments to the IMF in 2013. As of the end of 2016, Turkey has no payment obligation to the IMF.

[8] According to the IMF-International Financial Statistics Turkey used IMF resources in 1953, 1957 and 1958. However, we could not find the details regarding the nature of those facilities.

Table 6

The breakdown of the financial resources that Turkey obtained from the IMF by financial facilities, 1961-2008 (SDR million)

	No. of Stand-By	SBA	SRF	EFF	CFF	OF	Emergency Assistance	Total disbursement
1961	1	16.00	-	-	-	-	-	16.00
1962	2	15.00	-	-	-	-	-	15.00
1963	3	21.50	-	-	-	-	-	21.50
1964	4	19.00	-	-	-	-	-	19.00
1966	6	21.50	-	-	-	-	-	21.50
1967	7	27.00	-	-	-	-	-	27.00
1968	8	27.00	-	-	-	-	-	27.00
1969	9	10.00	-	-	-	-	-	10.00
1970	10	75.00	-	-	-	-	-	75.00
1971	10	15.00	-	-	-	-	-	15.00
1975	-	-	-	-	37.75	169.82	-	207.57
1976	-	-	-	-	37.50	91.74	-	129.24
1978	11	90.00	-	-	74.50	-	-	164.50
1979	12	230.00	-	-	-	-	-	230.00
1980	13	260.00	-	160.00	71.63	-	-	491.63
1981	13	400.00	-	-	-	-	-	400.00
1982	13	300.00	-	-	-	-	-	300.00
1983	13 and 14	346.25	-	-	-	-	-	346.25
1984	15	168.75	-	-	-	-	-	168.75
1994	16	235.50	-	-	-	-	-	235.50
1995	16	225.00	-	-	-	-	-	225.00
1999	17	221.72	-	-	-	-	361.50	583.22
2000	17	2,622.08	-	-	-	-	-	2,622.08
2001	17	3,111.16	5,784.00	-	-	-	-	8,895.16
2002	18	9,929.20	-	-	-	-	-	9,929.20
2003	18	1,191.00	-	-	-	-	-	1,191.00
2004	18	793.80	-	-	-	-	-	793.80
2005	19	1,665.51	-	-	-	-	-	1,665.51
2006	19	1,998.61	-	-	-	-	-	1,998.61
2007	19	749.48	-	-	-	-	-	749.48
2008	19	2,248.44	-	-	-	-	-	2,248.44
	Total	27,033.50	5,784.00	160.00	221.38	261.56	361.50	**33,821.94**

Source: Istemi (1985), Cortuk (2006), IMF.

According to the IMF's 2008 annual report, the upper limit of resource utilization through a Stand-By Arrangement or an Extended Fund Facility is limited to 100% and 300% of the country quota annually and cumulatively, respectively (IMF, 2008a). However, over the periods 1980-1984 and 2000-2007, Turkey obtained financial resources in excess of 300% of its quota. Between 2001 and 2005, the resource utilization/quota ratio exceeded 1,000%. Therefore, in some cases the IMF considers the country quota only as an indicator, and the quota size-borrowing capacity relationship is not always binding.

Turkey and the IMF signed 19 Stand-By Arrangements throughout 1961-2008. Out of the 19 SBAs, only seven have been finalized according to the terms of the loan agreement and, therefore fully utilized. Turkey signed the first Stand-By Arrangement in the end of 1961 and, the 19th arrangement in May 2005. The IMF disbursed the last tranch of the 19th SBA in 2008. The total amount of the loans under the SBAs that Turkey had expected to draw was SDR 31,923 million. However, Turkey actually utilized a total of SDR 27,033 million under the SBAs (see Table 7).

Table 7

The Stand-By Arrangements signed between the IMF and Turkey, 1961-2008 (SDR million)

	Date of Stand-By Arrangement	Duration (No. of Months)	Amount of the Facility (SDR million)	Disbursed Amount (SDR million)	Undisbursed Amount (SDR million)	Status
1	01.01.1961	12	37.50	16.00	21.50	Partial utilization
2	30.03.1962	9	31.00	15.00	16.00	Partial utilization
3	15.02.1963	11	21.50	21.50	-	Completed
4	15.02.1964	11	21.50	19.00	2.50	Cancelled
5	01.02.1965	12	21,50	0.00	21.50	Partial utilization
6	01.02.1966	12	21.50	21.50	-	Completed
7	15.02.1967	11	27.00	27.00	-	Completed
8	01.04.1968	9	27.00	27.00	-	Completed
9	01.07.1969	12	27.00	10.00	17.00	Cancelled
10	17.08.1970	12	90.00	90.00	-	Completed
11	24.04.1978	24	300.00	90.00	210.00	Cancelled
12	19.07.1979	12	250.00	230.00	20.00	Cancelled
13	18.06.1980	36	1,250.00	1,250.00	-	Completed
14	24.06.1983	12	225.00	56.25	168.75	Cancelled
15	04.04.1984	12	225.00	168.75	56.25	Cancelled
16	08.07.1994	14	610.50	460.50	150.00	Cancelled
17	22.12.1999	36	9,254.00	5,954.96	3,299.04	Cancelled
18	04.02.2002	36	12,821.20	11,914.00	907.20	Partial utilization
19	11.05.2005	36	6,662.04	6,662.04	-	Completed
		Total	**31,923.24**	**27,033.50**	**4,889.74**	

Source: Istemi (1985), Cortuk (2006), IMF.

We explain the financial tools that Turkey used in the past, but not currently offered by the IMF, in the following part.

Supplemental Reserve Facility

The IMF began to offer the Supplemental Reserve Facility (SRF) when the Asian crisis emerged in 1997. The Fund aimed at providing short-term financing for the balance of payments problems that arose due to the crisis in the IMF members. It was an option only available when a member had an active SBA or EFF, and when policies were in place to establish market confidence. The SRF was abolished in 2009 during the revision of lending instruments. Turkey utilized the Supplemental Reserve Facility during the 2001 crisis (Cortuk, 2006; IMF, 2009).

Compensatory Financing Facility

The Compensatory Financing Facility (CFF) was put into practice in 1963. It was used to provide medium-term financing to the member countries that had trade deficits which emanated from the deterioration in terms of trade. The IMF extended the CFF only if an exogenous shock deteriorated the terms of trade. The IMF terminated offering the CFF following the reform on lending tools. Turkey used the Compensatory Financing Facility due to the oil shocks that occurred between 1975 and 1980 (Cortuk, 2006; IMF, 2009).

Oil Facility

The Oil Facility was used to finance the member countries' balance of payments in the face of the sudden rise in oil prices in the 1970s. Turkey used the Oil Facility in 1975 and 1976. The IMF no longer offers the Oil Facility (Cortuk, 2006).

Emergency Assistance

The Emergency Assistance was a financial facility that was available to member states that suffered from internal conflicts or, natural disasters. Credits for natural disasters were available since 1962 already. Additionally, the IMF began to offer the post-conflict loans since 1995. Turkey used the Emergency Assistance in 1999 due to the Marmara earthquake. This lending instrument was converted into the rapid financing instrument (RFI) in 2011 (IMF, 2012a).

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The Impact of Domestic Investment on Economic Growth: New Policy Analysis from Algeria

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ABSTRACT

This paper investigates the relationship between domestic investment and economic growth in Algeria. In order to achieve this purpose, annual data for the period between 1969 and 2015 was tested by using co integration analysis of Vector Error Correction Model. The equation of the long run relationship shows that domestic investment has a negative effect on economic growth. However, in the short run term, the Granger Causality Tests shows that domestic investment cause economic growth in Algeria. These results prove that domestic investment is a source of economic growth for Algeria, but unfortunately it suffers from several obstacles and problems that are directly related to the poor management and the weak strategy for development and investment, Lead to the appearance of this long-term negative effect, if it left in this situation.

Keywords
Domestic Investment, VECM, Causality, Economic Growth, Algeria

JEL Classification
C13, E22, F14

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1. Introduction

In 1993, Algeria underwent a period of transition, from a centralized socialist approach to a market economy. In this manner, her natural resources played the most important role. Algeria has Africa's fourth-largest economy. Algeria's national income is estimated at more than $211.9 billion in 2014, with GDP growing 4 percent from last year. Socialism also played its role in disrupting the agricultural role, headed towards the industrial sector without ruddiness, but the arrival of President Chazli Bennid confirmed the importance of changing the old policy as a whole. The events of Black October in 1988 were behind the acceleration of the reform process. Political and Economic Reforms during the President's period, the world oil price slump in 1986 was behind the country's crisis at the time. The oil sector is the mainstay of the Algerian economy, accounting for about 60% of the general budget, 30% of GDP and 97% of total exports. Algeria aspires to reduce the dependence on oil revenues by focusing on agriculture to limit the import of agricultural products such as cereals, potatoes and fruits in particular. And the development of export of other products such as dates, which is famous for. Algeria also has other natural resources such as iron, coal and uranium. The main objective of the reforms, the transformation of the market economy, was to seek investment and create a competitive environment within the country. The State left the administration in public institutions by 2/3 and abolished its monopoly on imports. Finally, it frequently encouraged the privatization of the agricultural sector. Algeria's economic indicators rose in the second half of the 1990s due to the World Bank's support for reform policies and the debt rescheduling[1] process approved by the Paris Club[2]. Although Algeria's ranking in terms of GDP is 49 out of the 190 countries surveyed, its unemployment rate is relatively high at 9.8% according to 2013 statistics.

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[1] Debt restructuring is a process that allows a private or public company, or a sovereign entity facing cash flow problems and financial distress to reduce and renegotiate its delinquent debts to improve or restore liquidity so that it can continue its operations.

[2] The Paris Club is a group of officials from major creditor countries whose role is to find coordinated and sustainable solutions to the payment difficulties experienced by debtor countries. As debtor countries undertake reforms to stabilize and restore their macroeconomic and financial situation, Paris Club creditors provide an appropriate debt treatment. Paris Club creditors provide debt treatments to debtor countries in the form of rescheduling, which is debt relief by postponement or, in the case of concessional rescheduling, reduction in debt service obligations during a defined period (flow treatment) or as of a set date (stock treatment).

Given the dire economic situation in which Algeria is confronted, it is clear to us that domestic investment is one of the most necessary solutions to promote the advancement of the country and reduce most of these disasters. Domestic investment occupies a very important place in the economies of the countries as it stimulates economic growth and sustainable development through its impact on several economic variables. Romer (1986); Lucas (1988); Grier and Tullock (1989); Barro (1991); Levine and Renelt (1991) Mankiw, Romer and Weil (1992); Fischer (1993) confirmed the importance of domestic investment in improving economic growth. Other studies show that domestic investment does not necessarily have an influence or a favorable effect on economic growth Khan (1996); Devarajan (1996).

In particular, this work tries to empirically find an answer for the question of whether there is a nexus between domestic investment and economic growth in Algeria, to achieve this objective the paper is structured as follows. In section 2, we present the review literature concerning the nexus between domestic investment and economic growth. Secondly, we discuss the Methodology Model Specification and data used in this study in Section 3. Thirdly, Section 4 presents the empirical results as well as the analysis of the findings. Finally, Section 5 is dedicated to our conclusion.

2. Literature Survey

Several empirical studies which investigated the relationship between domestic investment and economic growth found several different results that describe this relationship. These studies include:

Table 1

Studies related to the relationship between domestic investment and economic growth

	Authors	Countries	Period	Methodology	Results
1	Omri and Kahouli (2014)	13 MENA countries	1990 - 2010	GMM	DI <=> Y
2	Farhani et al (2014)	France	1970 - 2010	Cointegration Analysis ARDL VECM Granger Causality Test	DI <=> Y: LR DI <=> Y: SR
3	Forgha et al (2014)	Cameroun	1980 - 2013	2SLS	DI => Y
4	Bayar (2014)	7 emerging countries in Asia	1982 - 2012	Cointegration Analysis Granger Causality Test	DI <=> Y
5	Adams and Opoku (2015)	22 SSA Countries	1980 - 2011	GMM	DI => Y
6	Tahir & Azid (2015)	50 Developing Countries	1990 - 2009	Fixed Effects Random Effects Pooled OLS 2SLS	DI => Y
7	Tang and Tan (2015)	Malaysia	1991- 2010	Cointegration Analysis ARDL VAR Granger Causality Test	DI <=> Y
8	Bakari (2017a)	Sudan	1976 - 2015	Cointegration Analysis ECM Granger Causality Test	DI # Y: LR DI <= Y: SR
9	Bakari (2017b)	Gabon	1980 - 2015	Cointegration Analysis ECM Granger Causality Test	DI => Y: LR (-) DI => Y: SR
10	Bakari (2017c)	Malaysia	1960 - 2015	Correlation Analysis Cointegration Analysis ECM Granger Causality Test	DI => Y: LR DI # Y: SR
11	Sapkota and Bastola (2017)	14 Latin American Countries	1980 - 2010	OLS Fxed Effects Models Random Effects Models Hausman Test	DI # Y
12	Keho (2017)	Cote D'Ivoire	1965 - 2014	ARDL Granger Causality Test	DI <=> Y: LR DI <=> Y: SR
13	Alagidede and Ibrahim (2017)	Ghana	1980 - 2013	GMM	DI # Y
14	Menegaki and Tugcu (2017)	G7 countries	1995 - 2013	ARDL Granger Causality Test	DI => Y: LR DI => Y: SR
15	Choi and Yi (2017)	105 Countries	1994 - 2014	Fixed Effects Models Random Effects Models Pooled OLS	DI => Y
16	Sarwar et al (2017)	210 Countries	1960 - 2014	Cointegration Analysis FMOLS VECM Granger Causality Test	DI <=> Y: LR DI <=> Y: SR
17	Khobai et al (2017)	South Africa	1985 - 2014	Cointegration Analysis ARDL	DI => Y: LR DI # Y: SR
18	Jibiry and Abdu (2017)	Nigeria	1970 - 2014	Cointegration Analysis VECM Granger Causality Test	DI # Y: LR DI <= Y: SR
19	Adams et al (2017)	Senegal	1970 - 2014	ARDL	DI => Y: LR

20	Siddique et al (2017)	Pakistan	1975 - 2015	ARDL	DI # Y
21	Bano et al (2017)	180 countries	1981 - 2012	OLS Hausman Test	DI => Y
22	Mbulawa (2017)	Botswana	1985 - 2015	OLS VECM	DI => Y
23	Bakari and Mabrouki (2017)	South-Eastern Europe Countries	2006 - 2016	Fixed Effect Model Random Effects Models Hausman Test	DI => Y
24	Huchet-Bourdon (2018)	196 countries	1988 - 2014	GMM	DI => Y
25	Bakari and Ahmadi (2018)	South Africa	1960 - 2015	Cointegration Analysis ECM	DI => Y : LR DI # Y: SR
26	Umar-Gingo et Demireli (2018)	Ghana	1980 - 2015	Cointegration Analysis VECM	DI => Y: LR (-) DI # Y: SR
27	Sepehrdoust (2018)	14 OPEC Countries	2002 - 2015	GMM	DI # Y
28	Karimi et Daiari (2018)	10 ASEAN Countries	1996 - 2014	GMM Fixed Effects Panel	DI => Y
29	Golitsis et al (2018)	Albania	1996 - 2014	Cointegration Analysis VECM Granger Causality Test	DI # Y
30	Appiah (2018)	Ghana	1960 to 2015	Cointegration Analysis ARDL ECM	DI # Y

Note: DI means Domestic Investment, Y means Economic Growth, LR means Long Run, SR means Short Run, (+) means Positive Effect and (-) means Negative Effect.

3. Data and Methodology

The analysis used in this study cover annual time series of 1969 to 2015 or 46 observations which should be sufficient to capture the relation between Export, Import, Fixed Formation Capital and economic growth in Algeria. The data set consists of observation for GDP, exports of goods and services (constant US$), imports of goods and services (constant US$) and Gross Fixed Formation Capital (constant US$). All data set are taken from World Development Indicators 2016.

We will use the most appropriate method which consists firstly of determining the degree of integration of each variable. If the variables are all integrated in level, we apply an estimate based on a linear regression. On the other hand, if the variables are all integrated into the first difference, our estimates are based on an estimate of the VAR model. When the variables are integrated in the first difference we will examine and determine the cointegration between the variables, if the cointegration test indicates the absence of cointegration relation, we will use the model VAR. If the cointegration test indicates the presence of a cointegration relation between the different variables studied, the model VECM will be used.

The augmented production function including domestic investment, exports and imports is expressed as:

$$\mathrm{GDP_t} = \mathrm{f(EX, IM, FBCF)} \qquad (1)$$

The function can also be represented in a log-linear econometric format thus:

$$\log(\mathrm{GDP})_t = \beta_0 + \beta_1 \log(\mathrm{EX})_t + \beta_2 \log(\mathrm{IM})_t + \beta_3 \log(\mathrm{FBCF})_t + \varepsilon_t \qquad (2)$$

Where β_0 is the constant term, $\beta_1$is the coefficient of variable (Exports: EX), $\beta_2$is the coefficient of variables (Imports: IM), β_3 is coefficient of variable (Domestic Investment: FBCF), t is the time trend and $\varepsilon$is the random error term assumed to be normally, identically and independently distributed.

4. Empirical analysis

4.1. Tests for unit root

The first step is to check the variation of the variables over time to determine the links between them. To complete this step, there are certain tests that aim to determine the stationarity of the variables. In our case, we will use the most appropriate tests which are the PP test and the ADF test.

Table 2

Tests for unit root ADF and PP

Unit Roots Tests	**ADF**		**PP**	
	Constant	***Constant, Linear Trend***	***Constant***	***Constant, Linear Trend***
Y	(1.790144)	(1.994324)	(1.885455)	(2.302784)
	[8.798281]	[8.981170]	[8.462055]	[8.671723]
DI	(1.497865)	(1.608179)	(1.537841)	(2.014662)
	[4.485247]	[4.382049]	[4.550157]	[4.445817]
X	(1.146073)	(2.556095)	(1.076945)	(2.524800)
	[8.837526]	[8.801516]	[9.286612]	[9.429443]
M	(1.216012)	(1.366708)	(1.384671)	(1.596834)
	[5.012050]	[4.587137]	[5.060018]	[4.997977]

***; ** and * denote significances at 1%; 5% and 10% levels respectively

( ) denotes stationarity in level

[ ] denotes stationarity in first difference

The results of the two stationary tests show that all the variables are stationary and especially they are integrated in order 1.

This step is more important and we will use a set of information criteria such as AIC and SC to determine the number of optimal delays included in our model.

Table 3

VAR Lag Order Selection Criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
1	288.1479	NA	2.02e-11	-13.27551	-12.60679*	-13.03200
2	316.3318	45.36920*	1.14e-11*	-13.86984*	-12.53242	-13.38283*
3	324.3212	11.30217	1.77e-11	-13.47908	-11.47295	-12.74856
4	340.4180	19.63026	1.95e-11	-13.48381	-10.80896	-12.50978
5	358.5276	18.55125	2.12e-11	-13.58671	-10.24316	-12.36917

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Based on the information criterion SC, the number of the optimal lag chosen in our model is equal to 1.

4.3. Cointegration analysis

The third step in applying the Sims model is the cointegration analysis. This step consists to verify the cointegration between the variables. For this reason, we will use the Johanson test.

Table 4

Johanson Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.723314	124.5746	47.85613	0.0000
At most 1 *	0.642209	68.04034	29.79707	0.0000
At most 2 *	0.364868	22.81687	15.49471	0.0033
At most 3	0.062598	2.844272	3.841466	0.0917

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results of the Johanson test show that there are 3 cointegration relationships, so the error correction model will be retained. The equation of long-term equilibrium is written as follows:

$$\text{Log(GDP)} = 0.0212 - 0.0755\ \text{Log(FBCF)} + 0.2091\ \text{Log(EX)} + 0.3904\ \text{Log(IM)} \qquad (3)$$

According to this equation, a 1% increase in domestic investment leads to a decrease of 0.075563% GDP. On the other hand, a 1% increase in exports and imports leads to an increase of 0.3% and 0.2% Of GDP. To verify the credibility of this long-term equation, it is estimated using the error correction model

4.4. Estimation of error correction model (ECM)

In his analysis, the estimation of the error correction model has two outputs; the first is the determination of the link between variables in the long run using the Least Squares of Gauss-Newton. And the second is the determination of the nexus between variables in the short run using Wald Tests.

4.4.1. Estimation of the cointegration equation: the long-run equilibrium equation

The following table shows the results of estimating the equation. If the coefficient of the variable C (1) is negative and possesses a significant probability. This means that all variables in the long-term relationship are significant in explaining the dependent variables.

Table 5

Estimation of the cointegration equation: the long-run equilibrium equation

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C(1)	-0.613394	0.275647	-2.225289	0.0321

Method: Least Squares (Gauss-Newton / Marquardt steps)

D(DLOG(GDP)) = C(1)*(DLOG(GDP(-1)) + 0.075*DLOG(FBCF(-1)) - 0.209*DLOG(EX(-1)) - 0.390*DLOG(IM(-1)) - 0.021) + C(2)*D(DLOG(GDP(-1))) + C(3)*D(DLOG(FBCF(-1))) + C(4)*D(DLOG(EX(-1))) + C(5)*D(DLOG(IM(-1))) + C(6)

In our case, the correction error term is significant and has a negative coefficient. These prove that in the long run, a 1% increase in domestic investment leads to a decrease of 0.075563% GDP.

4.4.2. VEC Granger Causality/Block Exogeneity Wald Tests

The objective of the WALD test is to determine that if there is a short-term relationship between the variables used.

Table 6

VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(DLOG(GDP))	**Chi-sq**	**df**	**Prob.**
D(DLOG(FBCF))	4.571326	1	0.0325
D(DLOG(EX))	0.243886	1	0.6214
D(DLOG(IM))	0.004297	1	0.9477

The results of the Wald Test prove that domestic investments cause economic growth in the short run.

4.4.3. Checking the quality of model

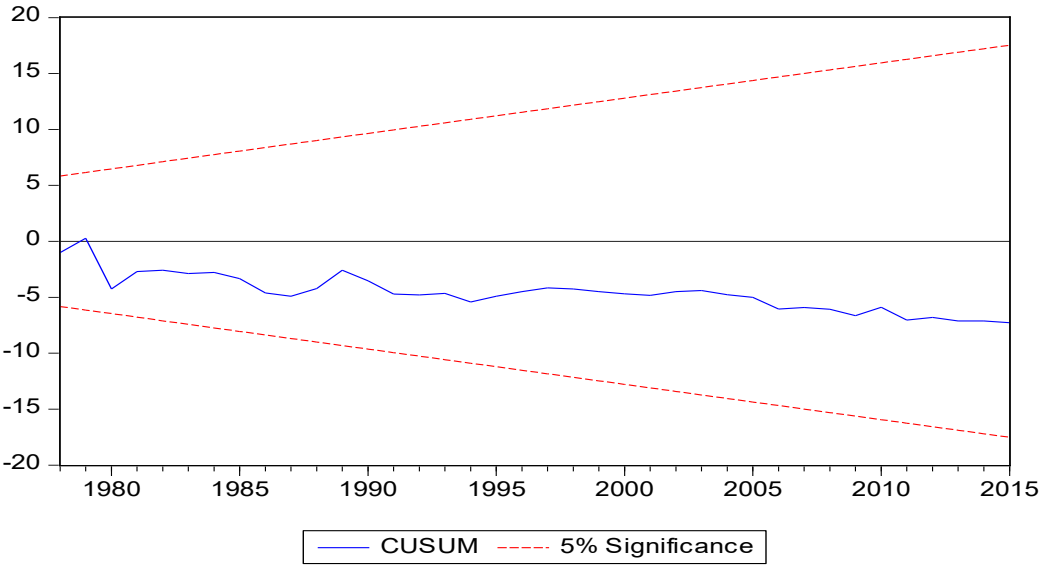
Finally, we applied the diagnostic tests and the CUSUM test to check the robustness and the stability of our estimate and the quality of the model.

Table 7
Diagnostics Tests

Heteroskedasticity Test: Harvey			
F-statistic	1.135180	Prob. F(12,31)	0.3692
Obs*R-squared	13.43223	Prob. Chi-Square(12)	0.3384
Scaled explained SS	18.70070	Prob. Chi-Square(12)	0.0960
Heteroskedasticity Test: ARCH			
F-statistic	0.890714	Prob. F(1,41)	0.3508
Obs*R-squared	0.914301	Prob. Chi-Square(1)	0.3390
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.249534	Prob. F(1,37)	0.6204
Obs*R-squared	0.294756	Prob. Chi-Square(1)	0.5872

Graph 1

Test CUSUM



The results of verification of our empirical investigation show that our results are satisfactory and acceptable.

5. Conclusion and Recommendations

The aim of this study was to explain the impact of domestic investment on economic growth in Algeria during the period 1969-2015. The Co-integration, Vector Error Correction Model and Granger's Causality tests are applied to investigate the influence of exports, imports and domestic investment on economic growth. The unit root properties of the data were examined

using the Augmented Dickey Fuller test (ADF) and the Phillips–Perron test (PP) after that the cointegration and error correction model were conducted. Empirical results show that in the long run domestic investment has a negative effect on economic growth; however, exports and imports have a positive effect on economic growth. In the short run, only domestic investment and imports cause economic growth in Algeria. These empirical results can be explained by four reasons which make domestic investment can be able to produce economic growth in Algeria.

1) The First reason is the lack of a competitive market.

This is due to the inability of the private sector to participate in the investment process. The sector has not yet reached the required level, although its activity represents 44% of the national activity. In addition, the lack of experience and experience in this sector make it not contribute as required. We also note from the Algerian economy that the commercial activity related to imports is predominant and this is because of the high profitability compared to the investment activity. In addition to the previous reasons, the decline in investments can be attributed to the large number of informal activities which represent a quarter of the economic activity. This situation does not allow any investor to invest in a market where the black market is dominant; this issue is sensitive and must be dealt with wisely because it employs 1.2 million workers3. Also, the inefficiency of the banking institutions, especially the private sector, its lack of development and the closure of some banks due to its failure to honor its commitments to the customers and the community lead Algerian investors prefer to go to other countries where the financial environment is effective and appropriate.

2) The second reason is the lack of transparency in transactions related to investment.

The existence of corrupt practices in many countries of the world is the focus of interest of investors and civil society on these practices, which aim to achieve the maximum profit in the shortest time and illegally. This can be done either by trading in arms or by trading in drugs and

[3] The facilitations and manipulations in this area encouraged the private to continue this activity rather than venture into the investment process.

financial crimes, so those who do this are trying to carry out the subsequent process of corruption, which is money laundering so that it can be seen as a legitimate source, so they try to contact and search for the link that is achieved. They have this objective, and this is done by dealing with the bank, judges, lawyers, politicians, businessmen, police and others to achieve this goal. Therefore, the more information and transparency is clear in the transactions of these bodies, the more the reasons for making local investments. Therefore, the state should make great efforts to eliminate corruption, and this is to monitor all activities and those responsible for corruption, and this is done if there is an administrative, judicial, journalist, civil society and independent media.

3) The third reason is the lack of transparency in economic policy.

The existence of a clear economic policy will be an incentive to make investments in various fields such as, monetary policy, finance, taxation, social legislation on the conditions of employment and insurance. A government that operates in stable and clear conditions is better than governments that are characterized by volatility and a change in economic policy. The objective of the investor is to know the climate and the economic environment in which he conducts his activity. In other words, he knows the previous operations of the investment process and the following. This is because investing in fixed assets is a long-term process that can be up to 50 years. The successive governments 'credibility is a key factor in encouraging investments because the divergence and retreat from the previous economic policies of Algeria has affected its credibility and this has made the investor in a volatile and unstable situation in the event of fear of future governments' retreat on agreed agreements and laws. For example, in the area of privatization, the lack of clear information and laws encourage the investor to refrain from entering this activity, and the change of laws at random and without justification is an indicator of the instability of the economic system, and the transparency of financial transactions is an incentive to Investment.

4) The last reason is the weakness of the agricultural sector

Algeria now ranks first in the list of countries importing food and agricultural products with a population of more than 30 million and an average bill of 2.5 billion dollars annually. This

is due to the poor profitability of agricultural investments, as well as the lack of exploitation of agricultural resources, Weak technology, and on the whole they reveal this deep crisis in the agriculture sector. The irrigation system and waterways are often in poor condition, despite efforts to fight land salinity like other Maghreb countries, and Algeria is still suffering from the problem of soil erosion, which is a major hindrance to the future of natural resources in the country. In addition, desertification threatens 32 million hectares of vast land and forest cover in northern Algeria, noting that the intensive exploitation of groundwater resources has reduced its capacity, while poor quality land has endured in the last 10 years attacks from the human population and agricultural techniques that do not it fits the impact on some ecosystems.

In summary, domestic investments are a source of economic growth in Algeria (because domestic investments cause economic growth in the short term) but in their current situation they are not able to stimulate economic growth and they will lead the country to a bigger bankruptcy (because domestic investments have a negative impact on long-term economic growth). This makes it imperative for the Algerian government to do as soon as possible encouraging investments; Improving laws and economic strategies: resistance to corruption and bribery; attention to the agricultural sector; and establishing a policy of economic diversification

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Socio-Economic Status Gradient in Health: Micro Evidence from Turkey

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ABSTRACT

Numerous studies have shown a strong relationship between health and socio-economic status (SES). However determining which aspect of SES affects health and how much more rapidly health declines for some individuals than others over life cycle are keys to policy debate. In this respect, by using TURKSTAT's 2010 Survey of Income and Living Conditions (SILC), the contribution of this study to the literature is depicting SES gradient in health over life course by using different aspects of SES for Turkey. Results show that the bottom of SES hierarchy are in much worse health than those at the top and average health among men is better than women. The health gradient exists in all indicators of SES. We observe relatively wide SES gradient in health in middle-ages and narrowing of it in old ages implying some mixture of cumulative advantage hypothesis and age-as-leveler hypothesis operates through life cycle.

Keywords
socio-economic status, health gradient, life-cycle, Turkey

JEL Classification
C10, D15, I10

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1. Introduction

Huge literature on socioeconomic disparities reveals a persistent phenomenon of social inequalities in health in many countries and people at low socio-economic status suffer a heavier burden of poor health than their better-off counterparts. In this respect the following questions can be arised: Does the distribution of health change across generations? Do socio-economic disparities narrow or widen as people age? What dimensions of socio-economic status (SES) matter- financial aspects like income or wealth or non-financial aspects such as education? All of these questions address the strong relationship between health and socio-economic conditions in which individuals live and work both in rich and poor countries (Kunst & Mackenbach, 1994; Smith, 2004; Smith, 2007; Van Doorsleer & Van Kippersluis & O'Donell, &Van Ourti, 2008; Van Kippersluis & Van Ourti & O'Donnel & Van Doorslaer, 2009b; Willson & Shuey & Elder, 2007). These socio-economic inequalities in health are a major challenge for health policy, not only because most of these inequalities can be contemplated unfair, but also because a reduction in the burden of health problems in disadvantaged groups offers excessive potential for improving the average health status of the population as a whole (Kunst & Mackenbach, 1994).

However looking at socioeconomic differences only at certain ages would lead incomplete impression of the extent of health differences over the life course. Life cycle component to the SES gradient in health should be taken into account in order to reflect how health of certain individuals decline more rapidly than others. Knowledge of how the distribution of health changes over the life cycle is key to understanding individual behavior with respect to retirement, saving, health insurance and the utilization of health care and consequently, to the formation of public policy (Van Kippersluis et al., 2009b).

Turkey has undergone substantial changes in health policy and retirement schemes in the last several decades and the debate has focused on the age limit in retirement and pension systems. For instance two retirement reforms were passed in 1999 and 2008 that aim to regulate the retirement and work patterns and to increase retirement age. Additionally, the existing three social security systems have been merged under one system which covers the whole population. These changes offer the importance of understanding fundamental relationships between

education, occupation, work and health in order to form an efficient public policy concerning retirement, pensions, health financing, health and social care. Comprehending the nature and evolution of socio-economic status (SES) gradient in health in a developing country like Turkey, becomes crucial in policy designs and improving socio-economic and health status of the whole population. In this respect this study could be attributed as a precursor analysis to determine efficient health policies.

Literature is divided between two approaches on the evolution of socio-economic status (SES) gradient in health over life cycle; *cumulative advantage hypothesis* and *age-as-leveler hypothesis*. According to the cumulative advantage hypothesis differences in health by SES are established in life and subsequently widen as the economic and health disadvantages of less privileged interact and accumulate (Willson et al., 2007). On the other hand, age-as-leveler hypothesis suggests that deterioration in health is an inevitable part of the process of aging and irrespective of economic conditions or social position, with the result that SES-health gradient narrows at prime ages (Beckett, 2000). A compromise scenario, for which there is growing evidence, is that cumulative advantage operates though middle age, with the SES-health gradient widening until retirement age, before it narrows in older ages as the biological determinants of health strengthen relative to the socioeconomic determinants (Van Doorsler et al., 2008).

However there are important points remarkable in the process of analysis conducted here. One limitation of cross section data is that cohort effects may confound life cycle patterns. The strength of the relationship between SES and health may increase across cohorts (Van Doorslaer et al., 2008). Cohort effects can be covered by taking them explicitly into account by pooling the data or by following a single cohort as it ages (Willson et al. 2007, Herd 2006, Van Doorslaer et al. 2008). Due to data limitations we cannot observe cohort effetcs, however we believe that analysis applied here still gives the fundamental structure of the SES gradient in health in Turkey.

Another limitation would be due to selective mortality. At older ages the most robust of the lower socioeconomic groups survive given that mortality is correlated with SES. This situation can explain why socioeconomic differences in health among those surviving in old ages appear to narrow (Smith 2007; Van Kipperluis et al. 2009b, Van Doorslaer et al. 2008, Lynch

2003). In other words, less healthy people who are socioeconomically disadvantaged are more likely to die at relatively younger ages which will obscure the SES-health gradient. Once again due to data limitations we cannot observe selective mortality explicitly.

In the light of above discussion the rest of the study is organized as follows: Second section gives brief review on literature. Third section gives information about the data. Fourth section presents SES-health gradient over life cycle in which we provide information on income, education, work status and occupation gradients in self assessed health. Lastly, fifth section concludes.

2. Literature Review

Health is extensively regarded as an important part of human capital since the seminal work of Grossman. Grossman (1972) proposes the first model for demand of health capital in which health can be viewed as a durable capital stock which produces an output of healthy time and health capital differs from other types of human capital. Grossman (1972) assumes that health of individuals depreciate over time and can be increased by investment in health. Investment in health is produced by household production functions that depend on education.

After Grossman's work, numerous studies conducted to examine health demand and health determinants in which socio-economic inequalities in health over life cycle constitute a remarkable part. Deaton and Paxson (1998) examine whether inequality in health status increases with age and how the distribution of health and income evolve over life course. Their results show that health status decline with age and decrease in household income but the pace of decline is greater for women. Ross and Wu (1996) examine whether education based gap in health rises with age. According to their results the SES gap in health diverges with age. Beckett (2000) analyzes whether the educational differences in self reported chronic and serious conditions converge in old ages. The results show that age is positively and linearly related to the probability of reporting more health conditions and years of education is negatively related to chronic conditions. Mackenbach & Bakker & Kunst & Diderichsen (2002) compare inequalities in morbidity and mortality among Western Europe countries and conclude that inequalities in health exist all over Europe.

Lynch (2003) investigates how cohort structures the influence of education on life-cycle health trajectories. The results present that the effect of education is increasing in magnitude across birth cohorts, and that the life-course effect is quadratic in cross-sectional data but can be modeled as linear and is increasing in panel data. Case and Deaton (2005) discuss multiple causal links between health income and education, and third factors that affect both health and socioeconomic status. Their results suggest that self-reported health worsens with age and that it does so much more rapidly among those at the bottom of the income distribution. The differences in health and health decline in different parts of the income distribution are due to whether or not people are in the labor force.

Herd (2006) examines whether functional inequalities grow, stagnate, diminish, or disappear in old age for United States and provides support for the age-as-leveler hypothesis. In a detailed study Smith (2004) examines the different dimensions of SES-health relationship by looking at the both directions from SES to health and from health to SES. Smith (2004) finds out that new serious health events have a quantitatively large impact on work, income, and wealth. Smith (2007) also discusses the life cycle component of health-SES gradient by focusing on the dimensions of SES that effect health such as financial aspects (income, wealth) and non-financial aspects (education). He concludes that education plays the most important role.

Deaton (2007) investigates the relationship between life, health satisfaction, national income, age and life expectancy by using 2006 Gallup World Poll. According to Deaton (2007) national income moderates the impact of aging on self-reported health, and the decrease in health satisfaction and rise in disability with age and these affects are much pronounced in poor countries than in rich countries. Willson et al. (2007) investigate how multiple dimensions of socio-economic status are related to health differences as people age by examining if cumulative advantage hypothesis operates over life cycle. Their study is consistent with a path-dependent process of cumulative advantage. Cutler & Lleras-Muney & Vogl (2008) focus on four dimensions of socioeconomic status; education, financial resources, rank, and ethnicity. Among all age groups, each additional year of schooling is associated with a clear and consistent improvement in self reported health status and income is protective for all age groups, with the association strongest at lower levels of household income.

Van Doorslaer et al. (2008) investigate SES-health gradient in The Netherlands and compare the results to those of US. They show that socio-economic differences in health widen until middle age before narrowing in later years of life. Additionally they determine very similar pattern in the gradients both in The Netherlands and United States. Van Kippersluis & Van Ourti, & O'Donnel & Van Doorslaer (2009a) examine the evolution of health and income-related health inequality over life cycle across generations in 11 EU countries. They disentangle age and cohort effects for the mean level of self reported health as well as for overall and income-related health inequality. According to results, in most countries there is a steady decrease in mean health from early adulthood until around the age of 50 and the deterioration in health generally levels off in middle-age before accelerating rapidly beyond the age of 70. In another study Van Kippersluis et al. (2009b) adopt a life cycle perspective in the evolution of SES gradient in health for The Netherlands. The conclusions are similar to Van Doorslaer et al. (2008) in which socio-economic differences in health widen until middle age and then starts to narrow as individuals age.

Most of the studies mentioned above propose socio-economic status(SES) gradient in health exists for developed countries. However the studies related with developing countries, such as Turkey, is limited. This study contributed the literarure in the following manners: First, it is the first study that provides life-cycle picture of SES gradient in health for Turkey. Second, by presenting the relationship between health and socio-economic status, it gives information of the extent of health disparities since diversified dimensions of SES-health nexus are important for policy designs. Furthermore, Turkey has launced series of changes in health and retirement policies recently and nature of SES gradient in health would form a substructure to determine the effectiveness of these policies.

3. Data

The data is from the wave of Turkstat Income and Living Conditions Survey (SILC) of Turkey for the year 2010. SILC contains information on demographic characteristics, income, poverty, social exclusion and living conditions with respect to the region and population. There are 12106 households and 45389 household members. Since the analysis is focused on adults, we exclude observations under 25. After excluding individuals younger than 25 we have 25503 observations of whom 12310 are men and 13193 are women. The variables used are as the

follows:

Self Assessed Health Status: Self assessed health is obtained from the question "How do you rate your health" and categorized as good or bad in this study. Good health contains very good and good health status, while bad health contains very bad, bad and fair health status. Despite imposing measurement errors in its nature, self assessed health is known to be a very good predictor of health outcomes (Idler and Benyamini 1997, Kerkhofs and Lindeboom 1995).

Income Quartiles: Income quartiles are obtained from the incomes from certain activities, such as wage, salary, entrepreneurial income, unemployment benefit, disability benefit, pension and scholarship. Per-capita household income is calculated by using OECD equivalence scale which assigns 1 for the head of household, 0.5 for each other person if he is older than 14 and 0.3 if he is younger than 14.

Education Quartiles: Education quartiles are obtained from the education level variable in the survey. First two quartiles have illiterate individuals and primary education respectively. Third quartile contains secondary education and fourth quartile has high&vocational high school and higher education.

Work Status: Work status variable used in this study has two categories; working and non-working. Working category contains individuals who are employed-full time and employed part-time. Individuals who are unemployed, student, retired, disabled and in home production are regarded as non-working.

Occupation: Occupation gives the individual's occupation code according to ISCO88. Managers, professionals, associate professionals, office clerks, service workers and artisans are regarded as white collar-workers and agriculture workers, skilled&unskilled workers as blue-collar workers.

Labor Force Participation: Labor force participation shows whether the individual is in or out of the labor force. Individuals in the labor force are either employed or unemployed.

4. Behaviour of SES Gradient in Health in Turkey

In this section evolution of SES gradient in health is depicted by using Turkstat SILC 2010 data. First, differences in self-assessed health by household per-capita income over the adult life course are illustrated. Next, disparities in self-assessed health by education and labor are presented. The sample used in the study is restricted to the adults older than 25.

4.1 Self Assessed Health by Age

Before analyzing the SES gradient in health through life course, we present the average picture according to gender. Figure 1 shows the percentage of individuals in good health by age according to gender. Good health refers to good and very good health. Percentages in good health could be treated as the probability of being in good health given age and gender, such as: *Prob(good health/gender&age).*

First, not surprisingly, percentage in good health decreases with age and men report better health than women in every age category. Second, percentages of individuals in good health are very close for men and women in the first age group and then the gap starts to widen immediately and reaches the biggest size in middle ages. The gap stays wide until age of 60s indicating the greatest difference in the range of middle age. We also observe that deterioration rate of health is higher for women. For instance, about 45 percent of women report good health in age group 45-49, while this ratio is attained in the age group 55-59 for men. After age group 60-64 the difference between men and women begins to narrow but we can not observe the trend after the age 65 due to data limitations. The convergence of health status for men and women in old ages would be due to selective mortality which leaves the healthiest individuals in the sample.

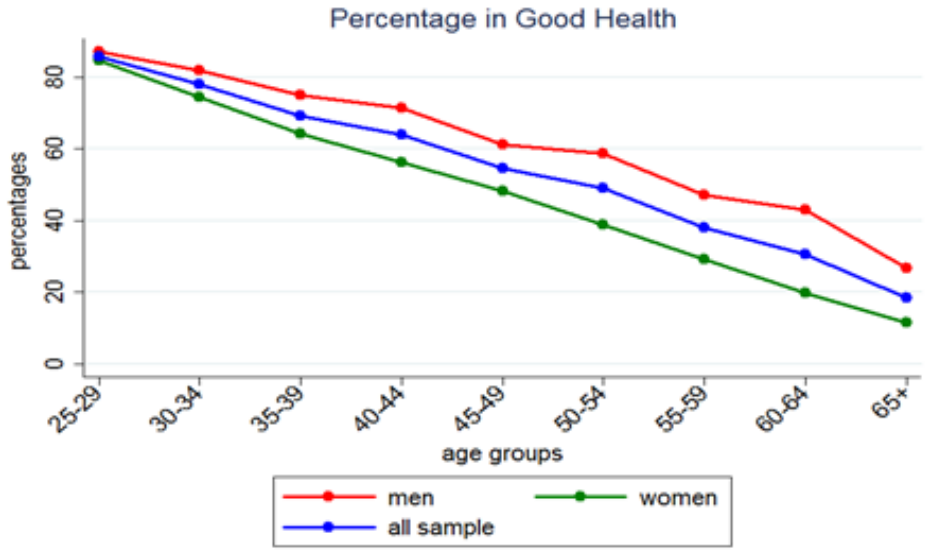

Figure 1. Self Assessed Health by Age According to Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

Health-reporting differences between men and women could be related to the social welfare incentives, social roles that the society imposes on different genders, justification bias or selective mortality. Since labor force participation for women is very low in Turkey (about 30 percent in 2010), one reason for low level of health status for women might be to justify the fact that they do not work. Furthermore, selective mortality might obscure the deterioration in health in survey data, which is obviously restricted to the more robust survivors (Van Doorslaer et al., 2008). Social roles would also be the reason behind the different perception of health for men and women, since women spend more time in household work, child care and less time in employment and leisure. However correcting for justification bias, selective mortality and social roles are out of scope of this study due to data limitations.

4.2 Self Assessed Health by Income

Income is attributed as the first indicator of socio-economic status (SES). Income is the household income per capita adjusted by OECD equivalence scale in which 1 is assigned for the head of household, 0.5 for each other person if he/she is older than 14 and 0.3 if he/she is younger than 14. We compare self assessed health status of individuals from different income quartiles. First income quartile represents the lowest quartile (lowest income group), whereas the

fourth income quartile represents the highest quartile (highest income group).

Figure 2 shows self assessed good health according to income quartiles. Again one can think of percentages in the Figure 2 as: *Prob(good health/1st quartile & age & gender)*. Income gradient in health is clear from the figure. Individuals in higher income quartiles always report better health with respect to worse counterparts for both men and women.

Although the income gradient is obvious, we observe different patterns for men and women. Despite the fact that starting points of first (bottom) and fourth (top) income quartiles are very close to each other, the rate of deterioration, which is given by the slope of the curves, is greater for women. For men income gradient between the first and fourth income quartiles stays almost the same in young ages and income differences in health diverges at the beginning of the middle ages before it starts to converge after age of 64. On the other hand, the divergence in health starts immediately at young ages but convergence begin to occur at around age 45 for women. The immediate divergence for women would be due to justification bias and/or social roles.

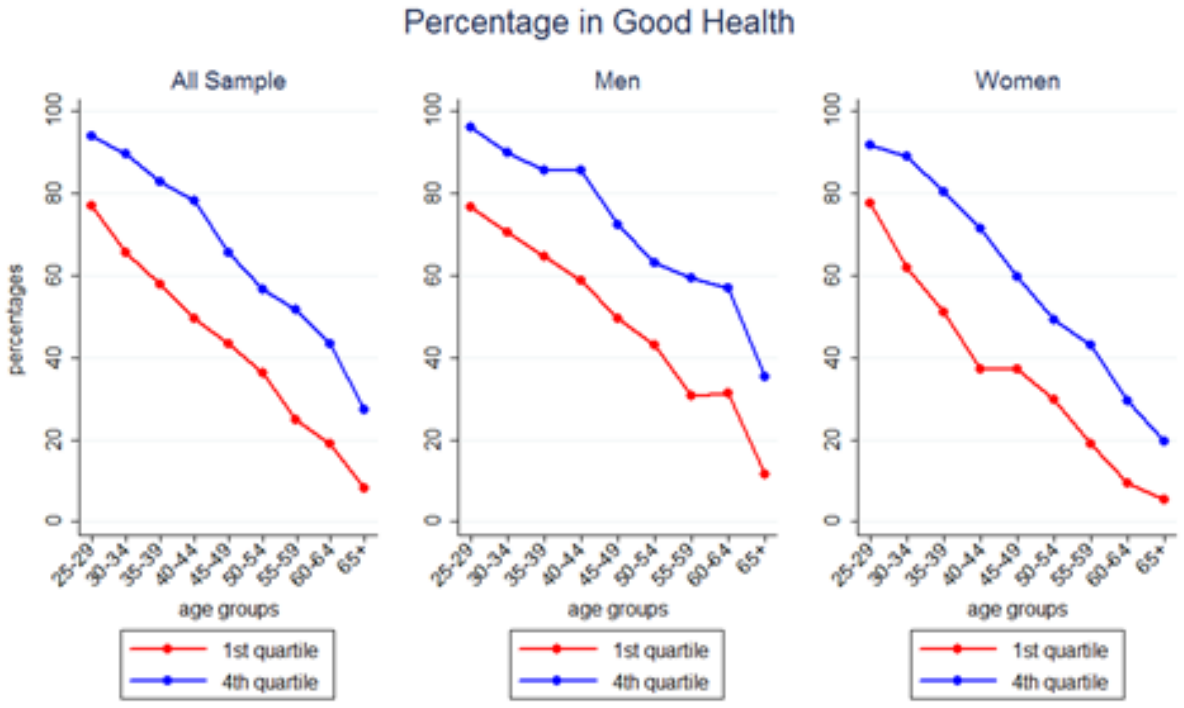

Figure 2. Self Assessed Good Health by Age According to Income Quartiles and Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

About 60 percent of men aged 40-44 in first income quartile report good health, whereas the same rate is reached at 50-59 age group for fourth income quartile. About 38 percent of women aged 40-44 in first income quartile report good health and this ratio is attained between 55-59 and 60-64 for women who are in the fourth income quartile. Additionally one striking feature of the figure for men is the modest increase in share of good health in first income quartile between the age groups 55-59 and 60-64 which would be due to selective mortality which leaves healthier individuals in the sample.

As mentioned before, the pattern of divergence in middle ages before the convergence in old ages could reflect cumulative advantage hypothesis operates until the middle ages which is overtaken by age-as leveler hypothesis in which biological factors kick in at older ages. However these patterns could also be due to cohort effects and selective mortality confounding the cumulative advantage at older ages.

4.3 Self Assessed Health by Education

Educational attainment is an essential determinant of health in both consumption and investment models of the demand for health. Education increases the efficiency with which gross investments in health are produced, the more educated people would demand a larger optimal stock of health and they are more efficient producers of health (Grossman, 1972). Additionally, educational attainment hardly varies over adulthood and so it will not affected by adult health (Van Doorslaer et al., 2008). This structure of education does not hold for income which is contingent on labor market behavior.

In this section we use education quartiles as determinants of socio-economic status. First quartile includes illiterate individuals and fourth quartile involves individuals who have completed high/vocational high school and university or higher education. Figure 3 shows percentages of individuals who report good health by age according to education quartiles and gender.

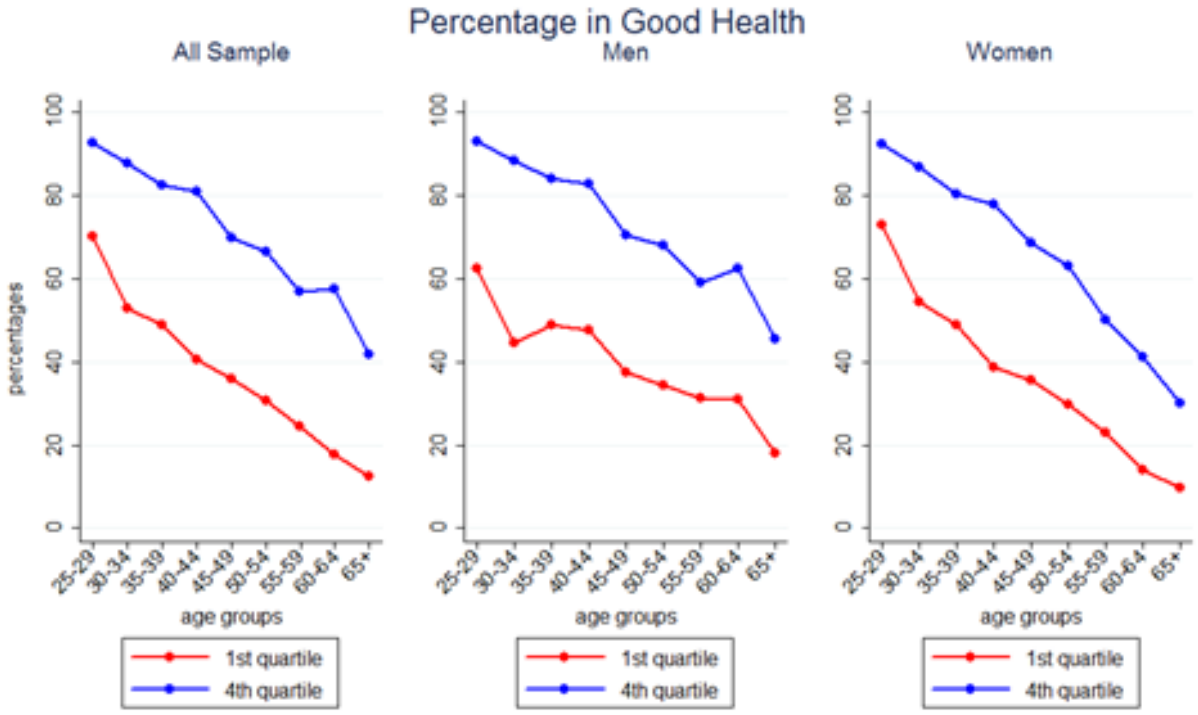

Figure 3. Self Assessed Good Health by Age According to Education Quartiles and Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

As in the income gradient, men always report better health in every education and age category. For men widening of education gradient from young ages up to late middle age is immediately apparent. The magnitude of education gradient is biggest at the age group 30-34. In comparison with the picture for the income gradient in Figure 2, the size of the education gradient is larger both at younger and older ages. The relative bigger magnitude of education gradient with respect to income gradient is probably due to the fact that at younger and middle ages education provides a better indicator of social background than income that may affect health. Furthermore, despite the narrowing of the education gradient at older ages, it still remains larger than the income gradient. A plausible explanation would be cumulative advantage of educationally favored individuals. Additionally, unlike income, education is not responsive to health changes. Thus, the income gradient may strengthen with age, as health shocks increasingly lead to labor market exit and drop in income, but there is no such mechanism to drive the dynamics of the education-health relationship (Van Doorslaer et al., 2008).

About 50 percent of men aged 40-44 report good health in the first(bottom) education quartile whereas this ratio is reached at the age more than 65 for men in fourth(top) education quartile. Similar structure is also valid for women; about 40 percent of women aged 40-44 in the bottom education quartile report good health while this proportion is attained after age 60-64 for the top education quartile. Furthermore the magnitude of education gradient for women in almost every age group is smaller than men. Moreover, strong education gradient is observed which remains slightly stable through younger and early middle ages and then starts to narrow in late middle ages. Slight increase in good health between the age groups 55-59 for men and 60-64 for women for both first and fourth education quartiles would be due to selective mortality as in the picture in income gradient.

The difference in the magnitudes of income and education gradients might be due to the differential responsiveness of education and income to health. The difference with the pattern for men may be attributed to differential disease patterns, with low educated women being less prone to the onfall of cardiovascular disease than low educated men are, and education-determined occupational choice being less relevant to the health of women than men (Van Doorslaer et al., 2008).

4.4 Self Assessed Health by Labor Indicators

The theory predicts that individuals with physically demanding jobs will result in higher depreciation rates and will have a higher relative health decline over the life cycle (Grossman, 1972). Occupation is less predetermined than education, but is more so than income, offering another opportunity to examine whether the widening of income gradient until old ages may be influenced by the impact of health on work activity (Van Doorslaer, et al., 2008). In this respect this section presents the evolution of self assessed health through life cycle according to basic labor indicators such as labor force status, work status, employment status and work type.

Figure 4 shows the percentages in good health according to labor force status. Individuals in the labor force are the ones who are employed and unemployed. Theory predicts that working in a regular job has positive affect on health while unemployment has a negative impact since

losing a job leads to a lot of psychological distress. On the other hand, some individuals choose to exit the labor force voluntarily (i.e.maternity leave) while others do so involuntarily (discouraged workers) which makes expectations about the relationship between health satisfaction and being out of the labor force ambiguous (Bender & Habermalz, 2005).

Figure 4. Self Assessed Good Health by Age According to Labor Force Status, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

Figure 4 reveals many interesting patterns. First, individuals in the labor force report better health than individuals out of labor force for both men and women. Next, labor force gradient in health is more pronounced for men than the gradient for women. For men labor force gradient widens at the younger ages and reaches the maximum at the age group 30-34, then begins to narrow after age 45. Huge labor force gradient at young ages could be due to justification bias or serious health problems that make individuals to stay out of labor force. On the contrary, labor force gradient is not prominent for women implying low level of labor force participation for women and unresponsiveness of women's health to labor force status.

Figure 5 draws the same picture as the Figure 4, but this time according to work status.

Working category includes individuals who are employed full time and part time, non-working category refers to the individuals who are both unemployed and out of labor force. The picture is similar with the previous one, however work status gradient for men is less pronounced than the labor force status gradient. Narrowing of the gradient could be due to the drop in poor health for non-working individuals which covers people out of labor force and who are unemployed. A plausible explanation would be that health status is not responsive to unemployment as we expected. The gradient for women stays almost the same, again implying that women's health is not responsive to both work and labor force status.

Figure 5. Self Assessed Good Health by Age According to Work Status, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

Figure 6 shows the percentages in good health according to employment status. Employed category refers to only full-time employed individuals. Employment gradient in health do not follow a regular pattern like the previous SES gradients in health. The gradient widens from the young ages until middle ages and then starts to fluctuate implying the positive affect of employment on health until late-middle ages. After late-middle ages health status of unemployed individuals is better than the employed counterparts. Slight increase in good health of

unemployed individuals observed between the age group 45-54 and 55-64 for men, and between the age group 35-44 and 50-59 for women could be due to justification bias and withdrawal of unhealthy individuals from labor force. Furthermore the jumps seen in the Figure 6 could be due to small sample size observed in certain groups.

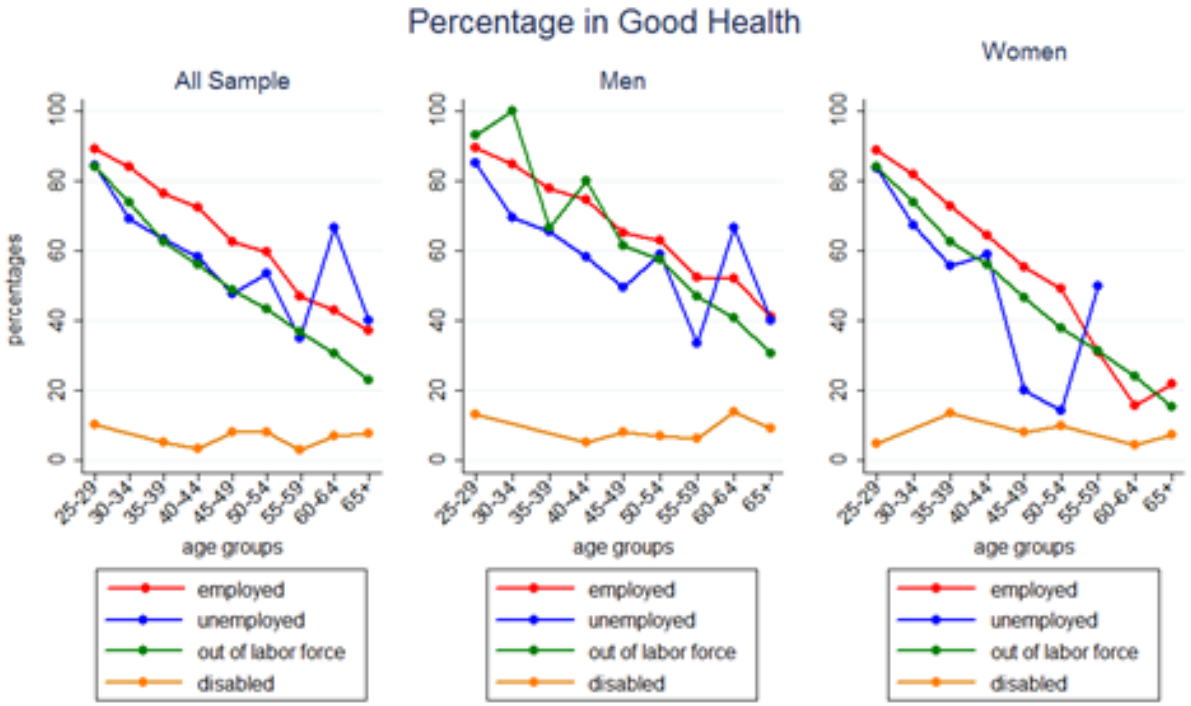

Figure 6. Self Assessed Good Health by Age According to Employment Status, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

Figure 7. Self Assessed Good Health by Age According to Work Type, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

As mentioned before, theory suggests that individuals with physically demanding jobs have higher depreciation rates and have a higher relative health decline over the life course. In this respect we distinguish between blue and white collar workers. Figure 7 presents slightly widening of occupational gradient in health until late middle ages and narrowing of the gradient in old ages. In the young ages differences in health between blue and white collar workers are evident but not marked. Given that little time has passed at this stage of the life cycle for occupation to plug an effect on health, the observed differences presumably derive from earlier childhood experiences that impact both occupational choice and health (Van Doorslaer et al.,2008). However health trajectories experienced by blue collar workers are steeper. For example, about 65 percent of blue collar workers report good health at the age group 40-44, whereas this ratio is reached by white collar workers at the age group 50-54 for men.

4.5 How Does the Picture Change When Education and Income is Conditioned on Work Status?

In order to understand the importance of work status versus income and education in determining the life cycle profile of health, we present the prevalence of good health according to income and education conditioned on work status. According to Case and Deaton (2005) Smith (2004 ,2007), Van Doorslaer et al. (2008), Van Kippersluis et al. (2009b) education increasingly affects health either directly or indirectly through choice of occupation and the depreciation of health leads to labor force withdrawal and a decline in income of economically disadvantaged groups.

We have argued in the previous sections that widening of income gradient might be due to an increasing effect of health on work and thus on income. To gain further insight about the importance of this mechanism, we now compare the evolution of self assessed health status according to income across workers and non-workers which are given in Figure 8 and Figure 9 respectively.

The first important feature is rather flat profile of self assessed health according to income quartiles for those who are working even if the magnitude of the income gradient slightly changes if we compare the picture with Figure 2. For example, the percentage of good health for working men at the age group 35-39 is about 50 percent in the first income quartile and this rate is reached at the age group 55-59 for fourth income quartile in Figure 8. The same ratio at the age group 35-39 was 63 percent and reached at age group 50-54 in Figure 2.

Second, the sizes of gradients for both working and non-working men and women change dramatically. The gradient for working men is relatively narrow at young ages and starts to widen at older ages where as the opposite is applied for working women. This disparity between men and women could be attributed to the fact that work is being a strong contributor to the widening of income gradient for men. Furthermore, since labor force participation is very low for women in Turkey and work status of women do not contribute as much as it does for men.

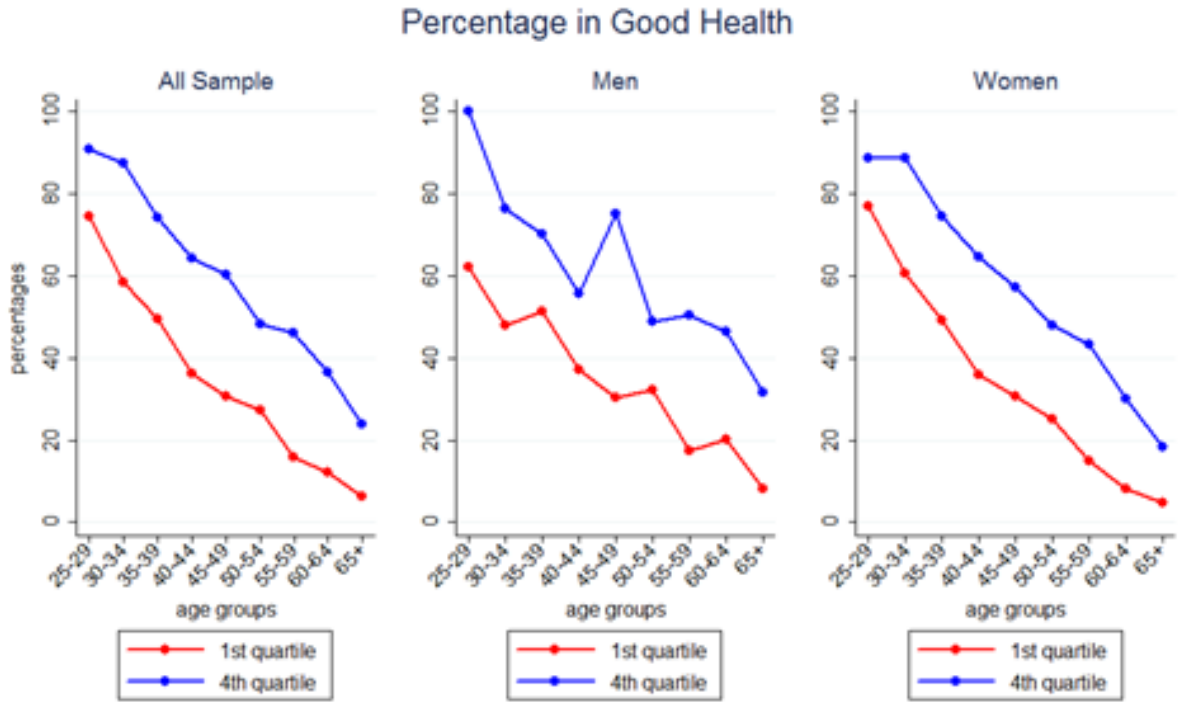

Figure 8. Self Assessed Good Health of Working Individuals by Age According to Income Quartiles and Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

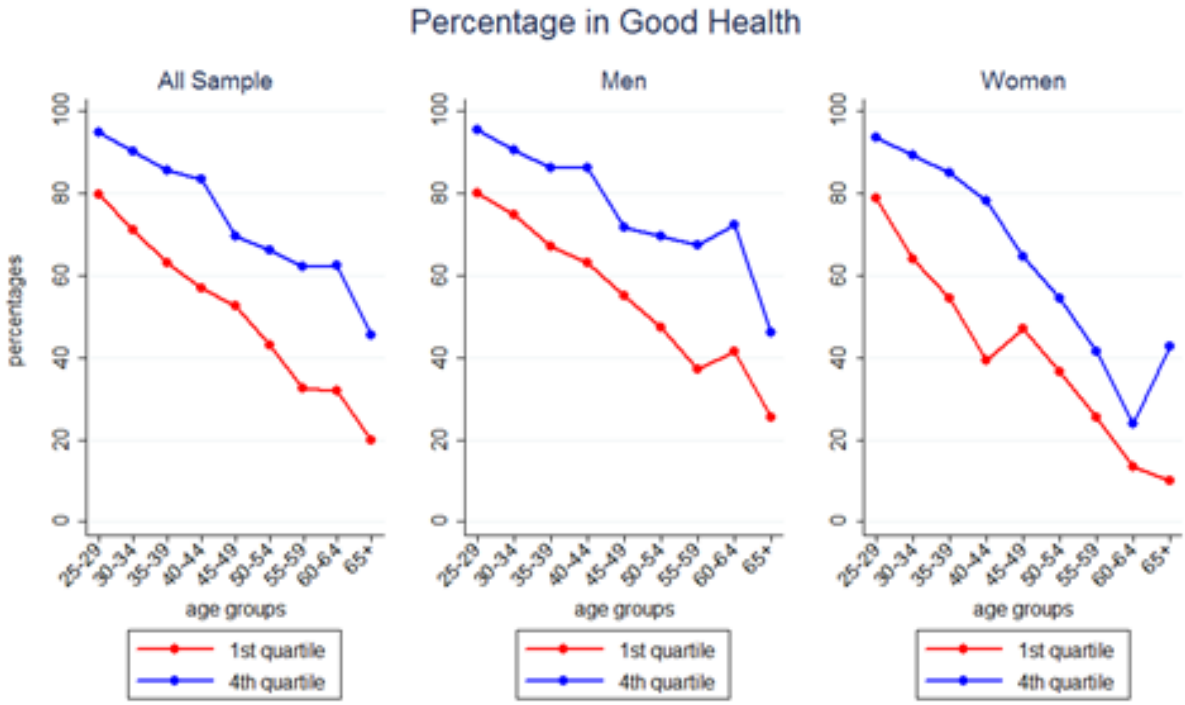

Figure 9. Self Assessed Good Health of Non-Working Individuals by Age According to Income

Quartiles and Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

Non-working individuals are always in poorer health, and the widening of the differential suggests that health progressively becomes a more important reason for not working until the age group 50-54. Narrowing of the gradient after the age group 50-54 for both men and women could be due to the growing importance of non-health reasons for not working, principally voluntary retirement (Van Doorslaer, et al., 2008). The widening of gradient among workers at the same age groups is consistent with this explanation.

Now let's turn attention to the change of education gradient when we condition education quartiles on work status. Figure 10 and Figure 11 show the education gradients for workers and non-workers. The first striking observation is that the education gradient gets narrower for working men and wider for non-working men. Additionally we observe rather flat profile of reported good health for those working at each age category for both men and women. On the other hand, in almost every age group the magnitude of education gradient increases for both working and non-working women indicating the crucial importance of education on health for women. For example in Figure 3 the gap between highest and lowest education gradient for age group 50-54 was about 32 percent for women. However the gap between first and fourth quartiles for working women rises to 40 percent and to 20 percent for non-working women as depicted in Figure 10 and Figure 11 respectively.

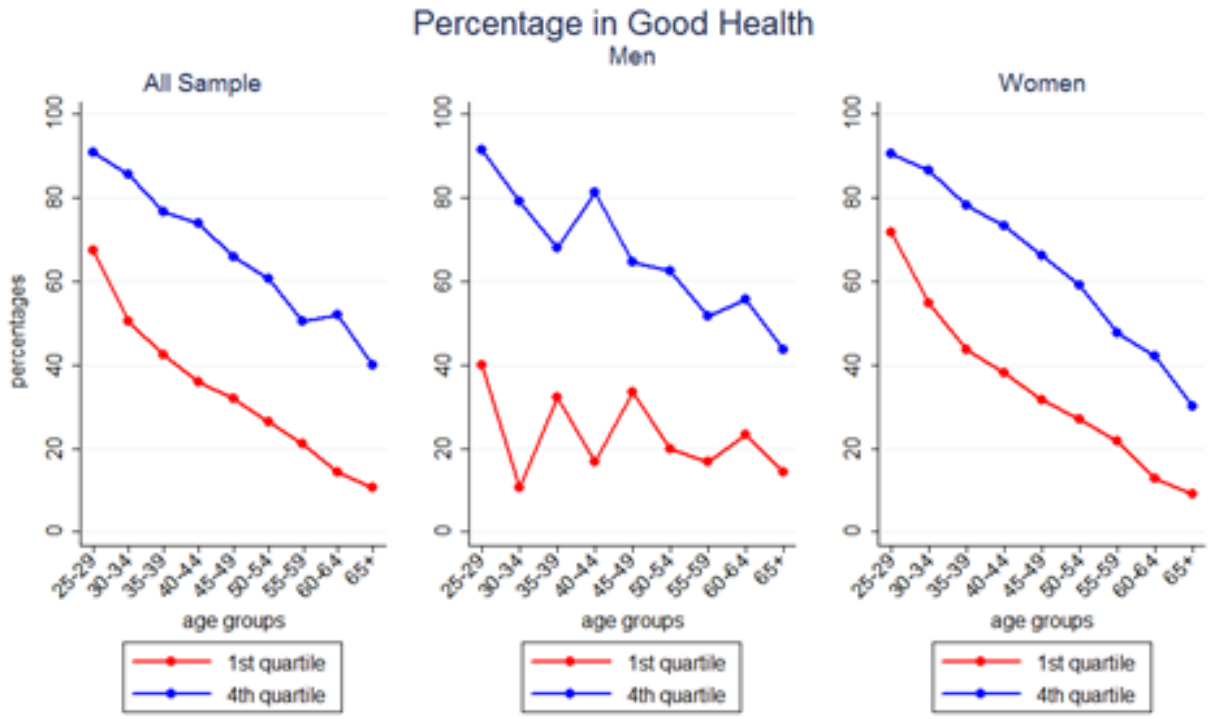

Figure 10. Self Assessed Good Health of Working Individuals by Age According to Education Quartiles and Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

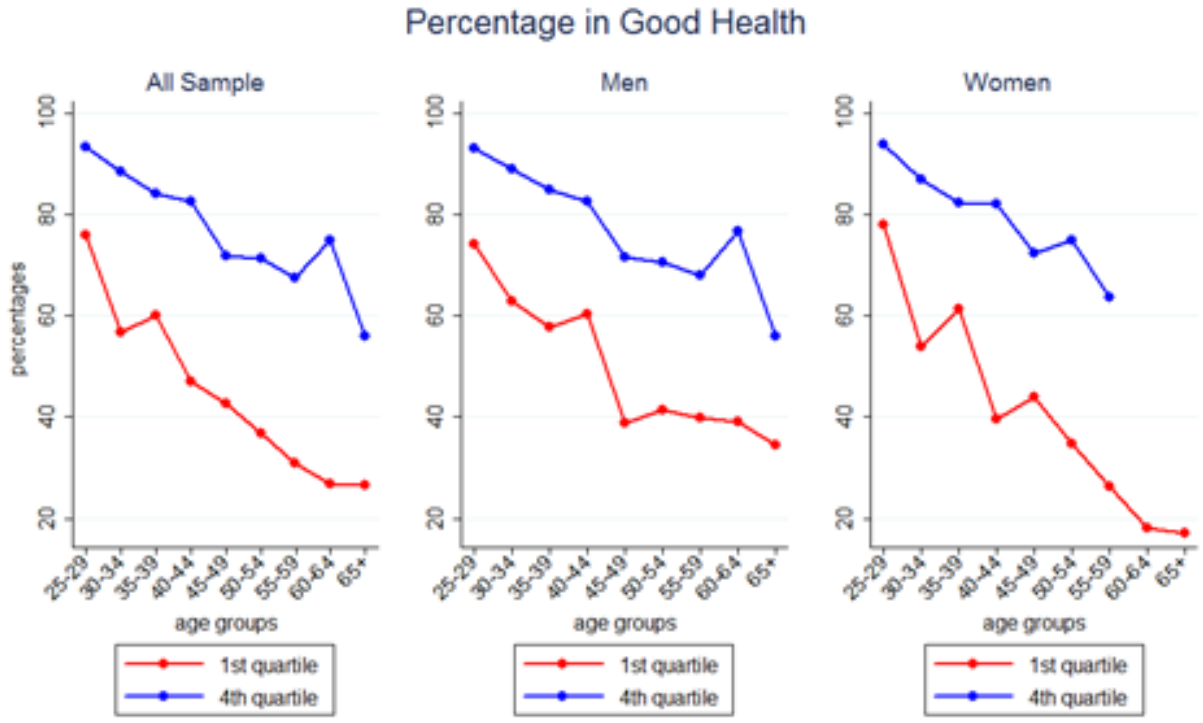

Figure 11. Self Assessed Good Health of Non-Working Individuals by Age According to Education Quartiles and Gender, Source: TURKSTAT SILC 2010 and author's calculations. Percentages are adjusted by sample weights.

5. Conclusion

We mentioned that socio-economic status (SES) has a substantial impact on health in which socially and economically favored individuals enjoy better health and individuals with lower SES suffer from poor health. However a snapshot of socio-economic differences in health at a given age gives rather an incomplete information of the extent of health disparities over life cycle since diversified dimensions of SES-health nexus are important for designing economic and social policies (Smith 2005, Smith 2007, Van Doorslaer et al. 2008, Van Kipperluis et al., 2009b). For instance if fundamental relationships between income, education, work, occupation and health do not vary over life course or varies identically in all countries then SES gradient in health would be unresponsive to policy environment. In this respect we try to bring a life cycle perspective on the relationship between health status and SES in Turkey. Our basic objective here is not to form causal relationships but to develop precedent analysis. But the descriptive analysis conducted here would reveal the nature of the relationship and be helpful in suggesting the mechanism that operates from SES to health.

Relatively wide SES gradient in health in the middle ages and narrowing of it in old ages is a sign of cumulative-advantage hypothesis operating in middle ages before age-as-leveler hypothesis begins to play the major role in old ages in Turkey. Although we cannot explicitly observe selective mortality and cohort effects, the evolution of gradients reveals many interesting features. Education, work and income gradients imply that they are important for the production of adult health. Moreover we observe significant difference between men and women over life cycle. Women's health status is always worse than men in every SES group in any age category. However health of women seems to be much more responsive to education than men. On the other hand, we observe that women's self assesed health is not responsive to labor force and work status. We can argue that policies directed at increasing female education would contribute to increase labor force participation and achive better health status for women.

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