GALATASARAY UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS

DETERMINANTS OF HIGH SCHOOL ENROLLMENT DECISION IN TURKEY

MASTER OF SCIENCE THESIS

Yasemin ÖZBAL

Director of Research: Doç. Dr. Haluk LEVENT

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ABBREVIATIONS

OLS: Ordinary Least Squares Estimation

PBS: Primary Boarding Schools

OECD: Organization for Economic Cooperation and Development

UNESCO: United Nations Educational, Scientific and Cultural Organization

EdData: Malawi Educational Data Survery

LDT: Level Determination Test of High School Entrance in Turkey

GLM: Generalized Linear Model

MLM: Maximum Likelihood Method

STATA: Data Analysis and Statistical Calculation Software

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RESUME

Becker indique à son œuvre « Le Capital Humain » (1964) que « *l'éducation et l'entrainement sont les plus importants investissement pour le capital humain* ». Le plus le peuple reçoit l'éducation, le plus le capital humain s'améliore et chaque système économique a besoin de plus de capital humain pour s'améliorer. Cette étude examine le niveau secondaire d'éducation de la Turquie ainsi que c'est le niveau de l'enseignement secondaire qui attire l'attention. En 1997, la Turquie a accepté de changer le système de l'éducation primaire à une éducation compensatoire de huit années pour améliorer le taux de la scolarisation. Depuis, haut niveau de scolarisation au niveau de l'éducation primaire a été atteint. Cependant, la scolarisation au niveau de l'éducation secondaire est encore insatisfaisante. De nombreux enfants abandonnent le système scolaire après avoir terminé l'école primaire et ne continuent pas à l'éducation secondaire. C'est pour cela que les déterminants de la scolarisation au niveau secondaire sont examinés dans cette étude.

Le but de cette étude est d'analyser les facteurs déterminants de la scolarisation au niveau secondaire en Turquie. L'analyse repose sur les données du Ministère de l'Education du National Turc de l'année scolaire 2010 / 2011. Les données consiste la scolarisation au niveau secondaire des enfants, leurs âges, les informations le niveau d'éducation et la profession des parents des enfants, le nombre des frères et des sœurs, le revenu du ménage, les résultats du test d'entrée au lycée, la région et le lieu où vivent les enfants.

Les données obtenues du Ministère de l'Education du National Turc comprend les renseignements sur les caractéristiques du ménage et individuel des enfants qui sont diplômé de l'école primaire en année scolaire 2010 / 2011. La variable dépendante dans cette étude est que si les enfants sont "inscrits à l'école secondaire» ou «abandonnés le système d'éducation après avoir été diplômé de

l'école primaire". Ce n'est pas un type de donné ordinal ou numériques ; il prend les valeurs "0" pour les enfants qui ont abandonné le système d'éducation après avoir obtenu le diplôme de l'école primaire et "1" pour les enfants qui sont inscrits à l'école secondaire. Ce type de données variables fictives est considéré comme résultat binaire. Les résultats binaires ne peuvent pas être estimés avec les moindres carrés ordinaires (MCO), le MCO suppose que la variable dépendante soit continue et illimitée. Les variables indépendantes de l'estimation de cette étude, tels que le niveau d'éducation des parents, la profession des parents, les quintiles de revenu du ménage, les régions, et al sont aussi des variables fictives.

Pour estimer les facteurs qui affectent la scolarisation au niveau secondaire / l'abandon après être diplômé de l'école primaire, la technique de régression logistique est utilisée. La méthode de régression logistique est un modèle linéaire généralisé pour modeler les variables binaires. Ce type de régression a été utilisée de nombreuses fois par les chercheurs qui ont analysé les facteurs qui déterminent la décision de l'inscription scolaire au niveau secondaire (Tansel, 2000; Hoşgör et Smits, 2006; Göksel, 2008; Moyi, 2009). Les modèles de régression de logit et de probit peuvent être utilisées pour estimer les déterminants de la scolarisation, dans notre cas, la technique de régression de logit est appliquée. Moyi (2009) a calculé les odds ratios (qui est une mesure de comparer les effets des variables indépendantes) dans son étude sur la scolarisation retardée en Malawi. Notre étude calcule les odds ratios de facteurs ménage et individuelles affectant les taux de scolarisation au niveau secondaire en Turquie.

La variable dépendante peut prendre la valeur 1 avec une probabilité de succès p (dans cette étude, c'est la scolarisation au niveau secondaire) ou la valeur 0 avec une probabilité de défaillance (1 – p) (c'est l'abandon après l'école primaire dans cette étude). Ce type de variable (variable binaire) est appelée une variable de Bernoulli[1]. Dans la littérature statistique, une interprétation commune des coefficients de régression logistique est en termes d'effets marginaux sur l'odds ratio. (p / (1 - p)) mesure la probabilité dont y prend la valeur 1 par rapport à la probabilité que y = 0 et il est appelé **l'odds ratio** ou **le risque relatif**. Grâce à l'odds

[1] Cameron A., Trivedi P., *Microeconometrics,* Cambridge University Press, 2005

ratio, la régression logistique peut prédire la probabilité de réussite ou d'échec, ce qui est dans notre cas la scolarisation au niveau secondaire ou d'abandonner le système après l'école primaire. Dans cette étude, les odds ratios pour chaque facteur sont calculés et sont interprétées en tenant compte les dernières recherches de la scolarisation et la participation d'éducation en Turquie (Tansel, 2000; Hoşgör et Smits, 2006; Göksel, 2008).

Nos analyses montrent que, en 2011, environ 20% des enfants quittent le système d'éducation après avoir obtenu le diplôme de l'école primaire. C'est un cinquième de 1.189.154 d'enfants qui sont diplômés de l'école primaire et qui est un nombre très important qui nécessite attention.

Depuis 1997, après que la politique de huit années compensatoires pour l'école primaire a été acceptée par le gouvernement turc, la scolarisation au niveau primaire a augmenté et a presque atteint 98% de taux de scolarisation. En 1997, l'école primaire et l'école secondaire ont été combinées et ils sont devenus l'enseignement primaire. Depuis lors, l'école secondaire est devenue la formation de niveau secondaire. En 2006, l'année d'enseignement de l'école secondaire a été étendue à quatre ans, donc l'éducation nationale est devenue douze années d'études.

Même si des niveaux élevés de scolarisation au niveau primaire sont atteints, le taux de scolarisation au niveau d'enseignement secondaire en Turquie n'est pas satisfaisant. Par conséquent, le but de notre étude est d'examiner les raisons de la baisse des taux après avoir diplômé de l'école primaire. Les caractéristiques des ménages et les déterminants régionaux sont principalement significatifs affectant la décision de scolarisation au niveau de l'enseignement secondaire.

On découvre que l'éducation des parents et leurs professions sont des facteurs déterminants de la demande de l'éducation secondaire, le nombre de frères et sœurs est également déterminante sur la demande secondaire en Turquie contrairement à Patrinos et Psacharapoulos' étude menée au Pérou (1997). Cependant, des recherches supplémentaires sont nécessaires pour contrôler la décision de la famille à inscrire leurs enfants à l'éducation secondaire; les raisons culturelles, démographiques et régionales peuvent affecter la décision d'inscription

des enfants au lycée.

Le statut de l'éducation de la mère est l'un des déterminants les plus importants sur la décision de l'inscription au lycée de leurs filles. Si le niveau d'éducation des mères est supérieur de huit ans, la probabilité de leurs enfants de s'inscrire au lycée est plus élevé que les enfants des mères analphabètes ou diplômées de l'école primaire. C'est également le cas pour les enfants de pères qui sont éduqués huit ou plus de huit ans. Cependant les effets de niveaux d'éducation des pères ne sont pas aussi importants que les effets de niveaux d'éducation des mères.

La profession des parents est un facteur décisif. Chaque type de profession, autre que d'être au chômage, a des effets positifs sur la scolarisation des enfants au niveau secondaire, sauf si les mères travaillent sur le secteur privé. Cela peut être dû aux horaires de travail du secteur privé et les mères ne peuvent pas assez prendre soin de leurs enfants. Les heures de travail du secteur privé en Turquie sont très étendues, dans le secteur des services les heures supplémentaires durent longs et dans certaines occasions, les deux parents peuvent travailler de longues heures. Considérant les résultats de cette étude, l'odds ratio pour les mères dans le secteur privé indique que, travailler au secteur privé peut affecter négativement la scolarisation au niveau secondaire des filles et de tous les enfants.

Profession du père, sauf la section « autre », est un effet positif sur l'inscription des enfants au niveau secondaire. Si le père est travailleur autonome, cela peut affecter négativement le taux de scolarisation au niveau secondaire, mais pas la scolarisation de ses fils. Selon l'étude de Tansel (2002), si le père est travailleur autonome, il pourrait également être moins éduqué et il pourrait décider de ne pas envoyer ses enfants à l'école secondaire. Cependant dans nos résultats, il ne touche que la décision d'inscription des filles au lycée.

L'endroit où vivent les enfants est important. L'urbanisation est un indicateur remarquable de développement et les enfants vivant dans les centres-villes ou les villes ont plus de probabilité de s'inscrire aux lycées que les enfants vivant dans les zones rurales et des bidonvilles. Les différences régionales sont également restantes,

mais les enfants de la région de l'Anatolie du Sud-est et les garçons de la région de la mer Noire ont plus de probabilité de s'inscrire aux lycées s'ils ont les mêmes caractéristiques que les enfants dans l'Est de l'Anatolie (le groupe de référence dans l'analyse). Autres régions (Marmara, Egée, Méditerranée et l'Anatolie centrale) n'ont pas les mêmes résultats.

Le revenu des ménages est un facteur déterminant de la scolarisation au niveau secondaire. Les enfants issus de familles autres que le quintile de revenu inférieur, ont plus de probabilité de s'inscrire aux lycées. Néanmoins, les garçons de seconde quintile de revenu ont moins de probabilités que les garçons de quintile inférieure de revenu, cela peut être dû à l'appui de leur revenu familial. Les enfants vivant dans la quintile l'inférieure de revenu et probablement les garçons vivant dans le quintile seconde de revenu peuvent préférer travailler plutôt que d'aller aux lycées, principalement pour soutenir le revenu familial.

Les familles avec de nombreux frères et sœurs ne prennent pas soin de leurs enfants également. On peut dire que si le nombre d'enfants augmente dans une famille, l'éducation de chaque enfant sera différente. Les résultats de cette étude montrent que le plus le nombre les frères et sœurs dans une famille augmente, la probabilité d'un enfant pour s'inscrire au lycée diminue. Les frères et sœurs plus âgés dans ces familles peuvent aussi travailler pour soutenir leur revenu familial ou peuvent prendre soin de leurs jeunes frères et sœurs, si leurs deux parents travaillent.

Comprendre ces résultats peut aider les décideurs à améliorer la situation des enfants vivant dans les régions où l'éducation est insuffisante et à investir dans l'éducation.

ABSTRACT

Becker indicates in Human Capital (1964) that *"education and training are the most important investments in human capital"*. The more the people are educated, the more the human capital improves and every economical system in development needs more human capital to improve itself. This study investigates Turkey's secondary level education as it is the second level of the education that requires to be examined. In 1997, Turkey has accepted to change the primary education system into eight years of compensatory education to improve the rate of school enrollment. Since then, high level of primary school enrollment has been reached. However, secondary school enrollment is still unsatisfactory. A large number of children drop out after completing primary school and do not continue to high school. In this study, the determinants of high school enrollment are examined.

This paper's aim is to analyze the determinant factors of high school enrollment in Turkey. The analysis is based on data of Turkish National Ministry of Education data from 2010/2011 education year. The data involves the high school enrollment of the children, their age, the information about the education and the occupation of children's parents, the number of siblings, the income of household, the entrance test results, the region and place where the children live.

The data acquired from Turkish National Ministry of Education includes the information about household and individual characteristics of children graduated from primary school in 2010 / 2011 school year. The dependent variable in this study is that if the children are "enrolled to high school" or "drop out after graduating from primary school". This is not an ordinal, numerical data; it takes the values "0" for the children who are drop out after graduating primary school and "1" for the children who enroll to high school. This type of dummy variable data is considered as binary outcome. The binary outcomes can not be estimated with Ordinary Least Squares (OLS) estimation; the OLS assumes that the dependent variable is continuous and unlimited. The independent variables of this study's

estimation, such as the education level of parents, the occupation of parents, the household income quintiles, the regions, et al are also dummy variables.

To estimate the factors those affect the high school enrollment / drop out after primary school, logistic regression technique is used. Logistic regression method is a generalized linear model to model binary outcome. This type of regression has been used numerous times by the researchers who analyzed the factors determining the high school enrollment decision (Tansel, 2000; Hoşgör and Smits, 2006; Göksel, 2008; Moyi, 2009). Logit and probit regression models can be used to estimate the determinants of school enrollment, in our case the logit regression technique is applied. Moyi (2009) calculated the odds ratio (which is a measure to compare the effects of independent variables) in his study of Malawian delayed school enrollment. Our study computes the odds ratio of household and individual factors affecting the high school enrollment in Turkey.

The dependent variable may take the value 1 with a probability of success p (in this study it is high school enrollment) or the value 0 with a probability of failure ($1 - p$ (it is the drop out after primary school in this study)*)*. This type of variable (binary variable) is called a Bernoulli variable[2]. In the statistics literature, a common interpretation of the coefficients of logistic regression is in terms of marginal effects on the odds ratio. (p / (1 − p)) measures the probability that y takes the value 1 relative to the probability that y = 0 and is called **odds ratio** or **relative risk**. With the odds ratio, logistic regression may predict the probability of success or failure, which is in our study school attainment or drop out after primary school. In this study, the odds ratios for each factor are calculated and are interpreted considering the last researches of school enrollment and educational participation in Turkey (Tansel, 2000; Hoşgör and Smits, 2006; Göksel, 2008).

Our analyses show that in 2011, about %20 of the children drop out the education after graduating from primary school. This is one fifth of 1.189.154 children graduated from primary school which is a very important and large number of children that requires attention.

[2] Cameron A., Trivedi P., *Microeconometrics,* Cambridge University Press, 2005

Since 1997, after the compensatory eight years policy for primary school has been accepted by Turkish government, primary school enrollment has been increasing and almost reached 98% rate of enrollment. In 1997, primary school and middle school has been combined and became primary education. Since then, high school became the secondary level education. In 2006, the educational years of high school has been extended to four years, thus the national education became twelve years of education.

Even though high levels of primary school enrollment are reached, high school enrollment rate in Turkey is not satisfactory. Therefore the aim of our study is to examine the reasons of the drop out rates after graduating from primary school. The household characteristics and regional determinants are mostly significant on high school enrollment decision.

We find out that parental education and parents' occupation are determinative factors on high school demand, number of sibling are also determinative on high school demand in Turkey contrarily to Patrinos and Psacharapoulos' study in Peru (1997). However more research is needed to control the decision of family to enroll their child in high school; cultural, demographic and regional reasons may affect the decision of children's high school enrollment.

Mother's education status is one of the most prominent determinants of their daughter's high school enrollment decision. If their education level is higher than eight years, their children's probability of getting enrolled to high school is higher than the children of illiterate or primary school graduated mother's. This is also the case for the children of fathers who are educated for more than eight years. However the effects of fathers' education levels are not as prominent as mothers' education level.

The occupation of parents is a decisive factor. Every occupation type other than being unemployed has positive effects on children's high school enrollment except the mothers working on private sector. This may be due to working hours of private sector and mothers may not take care of their children enough. The working

hours of private sector in Turkey are very extensive; in service sector the shift are long and in some occasions both parents may work in long hours. Considering the results of this study, the odds ratio for mothers in private sector indicates that, working in private sector may affect negatively the daughters' and all the children' high school enrollment.

Father's occupation except the "other" section is positively affecting the children's high school enrollment. If the father is self employed, this may affect negatively his daughters' high school enrollment but not his sons' enrollment. According to Tansel's study (2002), if father is self employed he might also be less educated and he may decide not send his children to high school. However in our results, it only affects the decision of daughter's high school enrollment.

The place where the children live is important. Urbanization is an outstanding indicator of development and the children living in town centers or cities have more probability to get enrolled in high school than the children living in rural areas and squatter settlements. Regional differences are also remaining; however the children from Southeastern Anatolia region and the boys from Black Sea region have more probability of getting enrolled to high school if they have the same features as the children in Eastern Anatolia (the reference group in the analysis). Other regions (Marmara, Aegean, Mediterranean and Central Anatolia) do not have the same results.

The income of household is a determinative factor on high school enrollment. The children from families other than the lowest income quintile have more probability to getting enrolled to high school. However the boys from second wealth quintile have less probability than the boys from lowest wealth quintile, this may be due to support their family income. The children living in lowest wealth quintile and probably the boys living in second wealth quintile may prefer to work instead of going to high school, mostly to support the family income.

The families with numerous siblings do not take care equally of their children. It can be said that if the number of children in a family increases, the education of every child will be different. This study's results show that the more

the siblings in a family the probability of a child to get enrolled to high school decreases. The older siblings in those families may also work to support their family income or may take care of their younger siblings if both of their parents are working.

Understanding these results may help policy makers to improve the situation of the children living in the regions where the education is insufficient and to invest in education.

ÖZET

Becker, "Human Capital" (1964) isimli kitabında "*eğitim ve öğrenim beşeri sermayeye yapılan en önemli yatırımlardır*" demektedir. İnsanlar ne kadar eğitimlilerse beşeri sermaye de o kadar gelişir; her ekonomik sistemin kendini geliştirebilmesi için daha fazla beşeri sermayeye ihtiyacı vardır. Bu çalışma Türkiye'nin, günümüzde dikkat gerektirmekte olan orta öğretim düzeyinde eğitim durumunu incelemektedir. 1997'de Türkiye ilköğretim düzeyinde eğitim sisteminde değişikliğe gitmiş ve ilkokul ile ortaokulu birleştirip, okullulaşma oranını arttırmak için ilköğretim düzeyini zorunlu sekiz yıllık eğitime çevirmiştir. O günden bu yana, yüksek oranda ilköğretimde okullulaşma oranlarına ulaşılmıştır. Yine de orta öğretim düzeyinde eğitimde okullulaşma oranları hâlâ tatmin edici değillerdir. Yüksek oranda öğrenci, ilköğretimi tamamladıktan sonra okulu bırakmakta ve liseye kaydolmamaktadırlar. Bu çalışmada liseye kayıt olmanın belirleyenleri incelenmektedir.

Bu çalışmanın amacı Türkiye'de liseye kayıt olmanın belirleyici nedenlerini incelemektir. İncelemeler, Türkiye Milli Eğitim Bakanlığı'nın 2010 / 2011 eğitim öğretim yılı verilerine dayanmaktadır. Veriler öğrencilerin liseye kayıt olma bilgilerini, yaşlarını, ebeveynlerinin eğitim seviyelerini ve mesleklerini, ailedeki kardeş sayısını, Hanehalkı gelir düzeyini, liseye giriş sınav sonuçlarını, yaşadıkları bölge ve kırsal/kentsel durumuyla ilgili bilgileri içermektedir.

Türkiye Milli Eğitim Bakanlığı'ndan alınan veriler, 2010 / 2011 eğitim öğretim yılında ilköğretimden mezun olmuş öğrencilerin hane halkı ve bireysel özellikleri ile ilgili bilgileri içermektedir. Bu çalışmadaki bağımlı değişken çocukların "liseye kayıtlı olma" veya "ilköğretimden mezun olduktan sonra okulu bırakma" durumlarını ifade etmektedir. Derece gösteren veya sayısal bir değer değildir; ilköğretimden sonra okulu bırakan çocuklar için "0" değerini, ilköğretimden sonra liseye kayıt olan çocuklar için ise "1" değerini almaktadır. Bu tarz gölge değişkenler "ikili sonuç" olarak adlandırılmaktadırlar. İkili sonuçlar

Sıradan En küçük Kareler tahmini ile tahmin edilememektedir; Sıradan En küçük Kareler tahmini bağımlı değişkenin sürekli ve sınırsız olduğunu varsaymaktadır. Bu çalışmanın tahmininin bağımsız değişkenleri – ebeveynlerin eğitim seviyesi, ebeveynlerin meslekleri, hane halkı gelir seviyesi, bölge ve diğerleri de gölge değişkenlerdir.

Liseye kayıt olma / ilköğretim mezuniyetinden sonra okulu bırakmayı etkileyen değişkenleri tahmin edebilmek için bu çalışmada lojistik regresyon tekniği kullanılmaktadır. Lojistik regresyon tekniği, ikili sonuçları modelleyebilen bir genelleştirilmiş en küçük kareler yöntemidir. Bu teknik daha önce diğer araştırma ve çalışmalarda, liseye kayıt olma kararının belirleyenlerini analiz eden araştırmacılar tarafından birçok defa kullanılmıştır (Tansel, 2000; Hoşgör ve Smits, 2006; Göksel, 2008; Moyi, 2009). Logit ve probit regresyon modelleri de liseye kayıt olma belirleyenlerini tahmin etmek için kullanılmaktadır, bizim durumumuzda logit regresyon tekniği uygulanmaktadır. Moyi (2009) Malawi'deki gecikmiş okula yazılmayı konu alan çalışmasında göreceli olasılıklar oranını (bağımsız değişkenleri karşılaştıran bir ölçek) hesaplamıştır. Çalışmamızda Türkiye'de liseye yazılmayı belirleyen hane halkı ve bireysel etkenlerin göreceli olasılıklar oranları hesaplanmıştır.

Bağımlı değişken başarı ihtimali p için (bizim çalışmamızda liseye kayıt olma durumu için) 1 değerini ya da başarısızlık ihtimali $(1 - p)$ (bizim çalışmamızda ise ilköğretimden sonra okulu bırakma durumu için) 0 değerini alır. Bu tarz değişkenler (ikili değişken) Bernoulli değişkeni olarak adlandırılır[3]. İstatistik yazınında, lojistik regresyon katsayılarının ortak bir yorumlanması göreceli olasılıklar oranının marjinal etkileri açısından ele alınır. $(p / (1 - p))$ oranı y'nin 1 değerini alma ihtimaline karşılık y'nin 0 değerini almasının göreli oranını hesaplar ve buna göreceli olasılıklar ya da göreli risk oranı adı verilir. Göreceli olasılıklar oranı ile lojistik regresyon başarı veya başarısızlık ihtimallerini (bizim çalışmamızda liseye yazılma veya ilköğretimden sonra eğitimi bırakma durumunu) öngörebilir. Bu çalışmada, her etken için göreceli olasılıklar oranı hesaplanmakta ve Türkiye'deki okullulaşma ve eğitime katılım konularını inceleyen daha önceki araştırmaları

[3] Cameron A., Trivedi P., *Microeconometrics,* Cambridge University Press, 2005

(Tansel, 2000; Hoşgör ve Smits, 2006; Göksel, 2008)da göz önünde bulundurularak yorumlanmaktadır.

Analizlerimiz 2011 senesinde, öğrencilerin yaklaşık %20'sinin ilköğretimden mezun olduktan sonra eğitimi bıraktıklarını göstermektedir. Bu oran 1.189.154 çocuğun, beşte birine denk gelmektedir. Bu kadar büyük ve ciddi bir miktar öğrencinin eğitimi bırakması dikkat çekmektedir.

1997'den bu yana, sekiz yıllık zorunlu eğitim politikalarının Türkiye devleti tarafından kabul edilmesiyle birlikte, ilköğretime katılım oranı artmış ve neredeyse %98 ilköğretime yazılım oranına ulaşılmıştır. 1997'de ilkokul ve ortaokul birleştirilmiş ve ilköğretime dönüştürülmüştür. O günden beri lise, orta öğretim kurumu haline gelmiştir. 2006 senesinde lisenin eğitim süresi dört yıla uzatılmış ve böylelikle toplam milli eğitim süresi on iki sene eğitim haline gelmiştir.

İlköğretime kayıt olma oranlarında çok yüksek seviyelere ulaşılmış olsa bile Türkiye'deki liseye katılım oranları tatmin edici seviyede değildir. Bu nedenle bizim çalışmamızın amacı ilköğretimden mezun olduktan sonra eğitimi bırakma nedenlerini incelemektir. Hane halkı nitelikleri ve bölgesel etkenler, liseye kayıt olma kararını etkileyen istatistikî açıdan en anlamlı değişkenlerdir.

Ebeveynlerin eğitim seviyeleri ve ebeveynlerin mesleklerinin lise eğitimine talebi etkileyen önemli değişkenler oldukları bu çalışmada ortaya konulmuştur, ailedeki kardeş sayısı da Patrinos ve Psacharapoulos'un (1997) çalışmalarındaki sonuçların aksine, Türkiye için liseye talebi etkileyen bir başka önemli değişkendir. Ancak ailenin çocuğu liseye kayıt ettirme kararını etkileyen değişkenleri – kültürel, demografik ve bölgesel nedenleri incelemek için daha fazla çalışma yapılması gerekmektedir.

Annenin eğitim seviyesi, kızlarının okula yazılma kararını etkileyen en önemli etkenlerden biridir. Eğer annenin eğitim seviyesi sekiz yıldan daha fazla bir eğitim süresi ise, çocuklarının orta öğretime yazılma ihtimali, okuma yazması olmayan veya sekiz yıldan daha az bir süre eğitim almış annelerin çocuklarının yazılma ihtimalinden daha yüksek çıkmaktadır. Bu durum aynı zamanda, babası

sekiz yıl ve daha uzun süre eğitim almış çocuklar için de geçerlidir. Ancak babanın eğitim seviyesi annenin eğitim seviyesi kadar etkileyici bir belirleyen değildir.

Ebeveynlerin meslekleri orta öğretime katılım üzerinde belirleyici bir etkendir. İşsiz olmak dışında tüm meslek türleri çocukların liseye yazılma oranlarını arttıran bir etkendir – ancak annelerin özel sektörde çalışması liseye yazılma oranını olumsuz etkilemektedir. Bu durum özel sektörde çalışan annelerin uzun süreler boyunca çalışmasına ve çocukları ile yeteri kadar ilgilenememelerine bağlanabilir. Türkiye'de özel sektörde çalışma süreleri uzun olmakla birlikte, hizmet sektöründe mesai saatleri de fazla olabilmektedir ve bazı durumlarda ebeveynlerin ikisi de uzun sürelerde çalışıyor olabilirler. Bu çalışmanın sonuçları göz önüne alınarak, annelerin özel sektörde çalışması kızların ve tüm çocukların liseye yazılma ihtimallerini kötü etkiliyor denilebilir.

Babaların "diğer" seçeneği dışında kalan meslek grubunda çalışıyor olmaları çocukların liseye katılımını iyi yönde etkilemektedir. Eğer baba serbest meslek sahibi ise, bu durum kızlarının liseye yazılma ihtimalini olumsuz etkileyebilir ancak aynı durum oğulları için söz konusu değildir. Tansel'in çalışmasına göre (2002), serbest meslekte çalışan bir baba az eğitimli olabilir ve çocuklarını liseye yollamamayı tercih edebilir. Ancak bu çalışmadaki sonuçlara göre, babanın "diğer" meslek grubunda çalışıyor olması yalnızca kızlarının liseye katılımını olumsuz etkilemektedir.

Çocukların yaşadıkları yer liseye katılım açısından önemli bir etkendir. Kentleşme, olağanüstü bir gelişim göstergesi olmakla birlikte, kasabalarda ve şehirlerde yaşayan çocukların kırsal alanlarda ve kenar mahallelerde yaşayan çocuklara oranla okullulaşma ihtimalleri daha da fazla artmaktadır. Bölgesel farklılıklar ise devam etmektedir ancak Güneydoğu Anadolu bölgesinde yaşayan çocuklar ve Karadeniz bölgesinde yaşayan erkek çocuklar eğer analizdeki referans grup olan Doğu Anadolu'daki çocuklar ile aynı özelliklere sahip olurlarsa, okula yazılma ihtimalleri Doğu Anadolu'daki çocuklardan daha fazla çıkmaktadır. Diğer bölgelerde (Marmara, Ege, Akdeniz ve İç Anadolu) bu sonuçlar elde edilmemektedir.

Liseye kayıt olma konusunda hane halkı gelir düzeyi de önemli bir etkendir. En düşük gelir düzeyi hariç, diğer gelir düzeyinde yer alan ailelerin çocuklarının hepsi en düşük gelir düzeyli ailelerin çocuklarından daha fazla liseye kaydolma ihtimaline sahiptir. Ancak ikinci gelir düzeyinde yer alan erkek çocukların en düşük gelir düzeyine sahip çocuklardan daha az ihtimale sahip oldukları görülmektedir. Bunun nedeni, çocukların hane halkı gelirine katkıda bulunmak için çalışmaları olabilir. En düşük gelir seviyesindeki çocukların ve ikinci gelir seviyesindeki erkek çocukların liseye yazılmak yerine çalışmaya başlamaları tercih ettikleri ve hane halkı katkıda bulundukları söylenebilir.

Çok sayıda kardeş içeren aileler çocuklarına eşit şekilde davranamamaktadırlar. Bu nedenle eğer bir ailede kardeş sayısı artıyorsa her çocuğun eğitim seviyelerinin farklı olacağı söylenebilir. Bu çalışmada çok fazla kardeş sayısına sahip çocukların liseye yazılma ihtimallerinin daha düşük olduğu sonucuna ulaşılmıştır. Aynı zamanda yaş olarak büyük kardeşler ailelerine yardım etmek için kardeşlerinin bakımını üstleniyor ya da aile gelirine katkıda bulunuyor olabilirler.

Bu sonuçları anlamak ileride eğitim politikalarının belirlenmesinde, eğitimin yetersiz olduğu bölgelerin geliştirilmesine ve eğitime yatırım yapılmasına yardımcı olabilir.

1. INTRODUCTION

Education is one of the basic needs of a developing country; an economic improvement could be performed with a solid education system. Many developing countries still suffer from low levels of education and this is one of the reasons why they are behind the developing world. The demand of education is explained by the human capital theory and according to this theory education is an investment for future earnings. The aim of our paper is to observe the determinants of high school demand in Turkey as it is low from average secondary education of OECD countries (see Appendix 1).

The low levels of education can be related to numerous reasons. Most of the literature points out that while family size may affect negatively the school enrollment; nevertheless Patrinos and Psacharapoulos (1995) suggest that number of siblings does not have much of an effect on school enrollment, although it may have an impact on the probability of child labor – it is important to observe the family structure and siblings activities. Recent literature (Tansel, 2000; Moyi, 2009) also relates the school enrolment with poverty; the household income and the child labor are strongly related to school enrolment. While some of the literature figures that child labor may help school enrolment (Psacharapoulos, 1995), some literature claim that education is a "luxury good" for poor families with an extremely low income which results with child labor (Grigoni & Sbrana, 2009).

Household characteristics, such as education level of parents, occupation of parents and family size are strongly related to children's school enrollment. The primary idea is that educated parents who have stable occupations are mostly sending their children to school because they are aware of the basic education's importance. Hoşgör and Smits (2006) have stated in their study that in Turkey, school enrollment might be related to education level of parents, their occupation, number of siblings and also the patriarchal culture of the country.

Some studies also consider the gender issues, such as gender of the child or his/her siblings' gender. Tansel (2000) in her study, states that the effect of permanent income is larger for girls than boys. She points that gender issues should not be neglected in a research for determinants of schooling.

Why do the children drop-out after completing primary education? Our aim differs from other studies by analyzing the dynamics of high school drop out, the reasons behind the rates of secondary level education drop outs. As the primary education became compulsory on 1997, there are only a few number of children who are not enrolled to primary school. However, there still exists the problem in transition to high school from primary school. As the secondary level education is not compulsory in Turkey, there are still some families who don't send their children to high school for many reasons.

The data which will be used in this study is provided from Turkish Ministry of National Education for children on the last grade of primary school (which endures eight years). Logistic regression is the standard way to model binary outcomes (where the data y(i) take on the values 0 or 1) and it will be used in this study to estimate the determinants of high school drop outs. Odds ratio will be examined to see which determinants are affecting the high school enrollment in Turkey.

2. DETERMINANTS OF DROP-OUT FROM SCHOOL: LITERATURE REVIEW

The lack of school enrollment is one of the most prominent problems in developing countries. Children, after completing primary school, may not continue to secondary school and they drop out from the educational system. Recent researches have been resolved that in Turkey, the main reasons of preventing from schooling are parents' education level, their occupations, household income, family size, gender of the siblings, birth order, health problems and maternal language. In this paper, we will observe the effects of individual and household factors on educational participation, how are these factors affecting educational participation and why the children drop out after primary school and do not continue their education at secondary level.

There are numerous papers investigating the determinants of school attainment especially written about developing countries. The main determinants that are considered in these papers are mostly the gender of the children, education level of parents, household income, number and gender of siblings, rural/urban residence (regional differences), employment of the parents, the cost of schooling, etc. Very recently, this subject has been also studied for Turkey by Tansel (2000), Smits and Hoşgör (2006), and Göksel (2008).

Tansel's study is explaining in detail the determinants of school attainment in Turkey. Her paper states that, even the compulsory education has been extended to eight years; the enrolment of children to primary school was not 100%. Smits and Hoşgör have studied family background effects on participation in primary and secondary education of children in Turkey using large representative data sets. Göksel's study intends to explain the main factors that affect the demand for education in Turkey and to find out if there are any differences between genders. She

also, attempts to evaluate the impact of the extension of the compulsory education in Turkey. This section will first illustrate the recent educational system in Turkey. Subsequently, main problems in the educational system will be pointed out and finally main determinants of drop-out from school will be explained.

2.1 Education in Turkey

The formal education system in Turkey consists of primary, secondary and tertiary levels of schooling. It is provided free of charge in public schools and also at all levels, private schools exist. Until recently primary school was during five years and it was the only compulsory education in Turkish educational system. In 1997, it has been extended to eight years from five years. The reason behind this was to improve the participation of girls to primary school. Because many children were dropping out from primary school and were not following the secondary school, the compulsory education became an education enduring for eight years. Secondary schooling system was composed of middle school and high school but since the change in the system, it compromises only the high school. Tertiary levels of schooling take place at universities and it consists of 2 year programs or 4 year programs at faculties.

Primary education starts at age six and it covers the children of 6-14 age group. Education is compulsory for every child (boys and girls) in Turkey and it is provided free of charge in State schools. After the new system was established, some primary schools in small villages have been closed, and the children in those villages were transported to the nearest town or larger village schools by bus. In areas where the population is low and dispersed, primary schools with boarding facilities are constructed in village and regional boarding primary schools are envisaged for villages where such grouping is not possible. These schools are mostly built in rural areas and in the less developed regions of the country where small settlements could not provide basic primary education services to children. The ministry of national education meets the needs of these children such as transportation, lunch, books and stationary.

Since the academic year of 1999/2000, free textbooks have been given to the primary education children of lower income groups or rural families. In the 2004/2005 academic year, free textbooks were distributed to all students of primary school. In order to provide primary education services to children of poor families and also to primary school age children living in villages and smaller settlement units that have no schools, Primary Boarding Schools (PBS) and boarding primary education schools were established. These efforts were made to increase the rate of the children to enroll in schools.

Secondary education provides the education after primary school and it lasts 4 years since the new law accepted in 2006. It was covering the children of 15-17 age group but now it covers the 15-18 age group. In the old education system, secondary school was consisted of three years of education covering the children between 12-14 age and 15-17 age groups. In the new system it only covers 15-18 age children for high-school. Secondary education is also free of charge in State schools but it is not compulsory. Private high schools, Anatolian high schools and Science High Schools compromise of 5 years of education including one year of preparatory class in a foreign language. The aim of the ministry of national education is to increase compulsory education to 12 years in long term.

Table 1
Net primary and secondary school enrollment in Turkey as of 1997

Net primary school education enrollment ratio %			
	1997/98	**2004/05**	**2010/11**
Total	84,74	89,66	98,41
Male	90,25	92,58	98,59
Female	78,97	86,63	98,22

Net secondary school education enrollment ratio %			
	1997/98	**2004/05**	**2010/11**
Total	37,87	54,87	69,33
Male	41,39	59,05	72,35
Female	34,16	50,51	66,14

Source: Turkish Statistical Institute (2011)

Table 1 makes clear that the enrollment ratio to primary education still increases since 1997/1998 academic year and it reached at 98,41% of all children in 2010/2011 academic year. But the secondary education enrollment ratio is still rather low even it increased since 1997/1998 academic year but it's approximately 70% of all children in 2010/2011 academic year. Because of the primary education is compulsory, it is normal to have an approximate rate of enrollment to a 100% but the secondary education ratio is still at 70% rates which is not compulsory yet.

The gender disparities in primary education have been decreased since 1997/1998 academic year; although they still continue. The ratio of female figures for primary education was 78.97% in 1997 and it reached to 98.22% for 2010/2011 academic year. But the gender gap still continues for secondary education; even it increased since 1997, it only reached 66% of female figures in 2011 and it is still lower than the male figures (72%). These gender disparities are related to cultural, demographic and social factors.

2.2 Main problems in the education system

The school enrollment ratios have been improved since 1997; female figures for primary school students are close enough to 98% in 2011 academic year. Even though the figures for secondary school students have improved, they are not satisfying as much as primary school figures.

The figures presented in Table 1 show that non-schooling in secondary education still continues and it is still a major problem. As the secondary education is not compulsory, despite the efforts of the State, it can not reach every child in the country. Regional differences remain between the East and the West of the country. More generally in Middle East and South East parts of the country, a great lack of education can be observed; 10% of the population living in these areas (age 15 and greater) are illiterate (most of them are women) contrary to the 4% of illiterate population living in West part of the country.

The OECD report for Ministry of Education states that the problems that ministry face are due to the rapid increase in population, migration from rural to urban areas, and budget restrictions. Main problems that ministry face are crowded classrooms, unsatisfactory schooling rates, waste of resources and time caused by failure or repetition of the grade, double shift education, integrated classrooms especially in rural areas, lack of equipment, lack of finance, problems related to the training, balanced distribution, economic conditions, social status and in-service training of teachers and review need of the curricula, and the educational material according to the changing and varying educational needs of society. This study will emphasize the unsatisfactory schooling rates problem and will search for the determinants of this problem.

As of 2011, the rate of the children which enrolled in high schools after graduating from primary schools is approximately 80% of 1.189.156 children and 20% of them had not been enrolled to high schools:

Table 2

Net secondary enrollment ratio in Turkey as of 2011	
Total	79,97%
Female	81,60%
Male	78,52%

Source: Turkish National Ministry of Education (2011)

Turkey has a high rate of drop out after graduation from primary school (20-30% of graduated primary school students). The lack of educational infrastructure provides disparities and polarization in educational opportunities. These disparities are related to rural-urban division and regional differences over the country. Especially, in some villages over Eastern regions, the infrastructure of eight year primary education has not been improved yet and many children could not reach the education they need.

The quality of education is different from school to school. Especially in urban areas, at private schools, students can access higher quality education and they can learn second languages like German or French (as English is taught in most of

high schools). In public schools, integrated classrooms especially in rural areas, lack of equipment and lack of teachers cause a less quality education than the children need. These kinds of infrastructure problems in educational system provide polarization and disparities in the country.

The gender disparities are also notable as it can be seen on Table 1. Female figures are always lower than the male figures even if they get close to their ratios. This problem is due to cultural norms and social factors. In Eastern regions, many of the women are illiterate (20%), most of them are literate but did not even completed primary school (12,5 - 14%), and many of them do not know how to speak Turkish as they speak their local languages at home. This may be the proof of cultural factors in Turkey which are the concerning problem about girls' education level and their opportunity to get a constant job.

2.3 Main determinants of drop out from school

Education constitutes the main means of investment in human capital. Many developing countries still have the same problems of low levels of educational attainment; these low levels are one of the major reasons that developing countries are far behind the developed world. The literature of determinants of educational attainment is wide. Even so, before moving to the empirical analysis, we will review some of the contributions on the determinants of school attainment.

An early study for children's school attainment in Turkey has been realized by Tansel (2000). Her study examines the determinants of school attainment in Turkey by observing individual, household and community factors. She implies that, although high levels of enrollments have been achieved in primary education, enrollment rates at secondary level (middle and high schools) are low and substantial regional differences remain. She also states that the gender disparities still exist at secondary level of education.

Tansel used the individual data survey from the 1994 Household Budget Survey (State Institute of Statistics 1998) to estimate ordered probit models of

primary, middle and high school attainments.[4] She notices that the most consistent factors affecting school attainment were parents' education and the household permanent income. Parents' occupation (mostly father's employment) also affects the probability of schooling at the middle and high school levels suggesting that work at the family farm or business is an alternative to schooling. Urbanization is one the determinants of schooling; school attainment of both the boys and the girls were higher in an urban settlement.

Tansel's study empirically used "ordered probit models". This model defines the latent demand for the desired level of schooling "y" as an unobserved continuous variable:

$y^* = \beta x + u$ where "x" is a vector of individual, household and locational explanatory variables, "u" is the normally independently distributed disturbance term and β is the vector of coefficients to be estimated. Ordinary Least Squares model was not applied because it's assuming that the dependent variable is continuous and unlimited. Children's age, squared term in age, years of schooling of mother and father as parents' education, whether the father is self employed or not, whether the mother is self employed or not, total household expenditure as a proxy for household permanent income, urban/rural residence and distance from a province are used as the determinants of schooling.

Tansel separately explains the effects of determinants of schooling. First, it is stated that household expenditure used as a proxy of household permanent income could be biased; several factors (such as labor supply decisions and the saving decisions of the households) can cause total expenditures to be endogenous. Exogeneity testing has been effectuated; it has proved that total expenditure was a valid variable. The estimation results show that an increase in household income will increase the probability of schooling. The estimation results also show that an increase in parents' years of schooling increases the probability of children to get higher schooling achievements. If the parents' have their own business (such as farm

[4] In the timeline of Tansel's study (1994), the compulsory education of eight years did not exist (as it is accepted in 1997), thus she studied the school attainment at primary, middle and high levels of education.

work), the opportunity cost of schooling is higher for children of these families. The results imply that the effect of parents' occupation is positive. The effect of urban location is positive for children; urbanization contributes to the probability of schooling. Distance from a province is an important factor that causes migration between regions. The negative coefficients on distance estimates are negative which suggest that easier migration possibilities increase schooling attainment. Tansel mentions that people, who migrate to urban areas but settle on squatter settlements, often do not have enough human capital to get decently paying jobs. Results expose that many of the poorest migrants in squatter settlements can not have high quality education.

Low levels of education might be related to child labor. Patrinos and Psacharopoulos' (1997) analyzes the effects of being indigenous, the number of siblings, sibling activities and sibling structure on children's schooling progress and children's non-school activity in Peru. They actually investigate the determinants of child labor but also consider the reasons of non-schooling. Their research brings out that family size, the activities and the number of siblings is related to the children's school enrollment or their involvement to child labor. The analysis of their research also shows that having numerous younger siblings implies less schooling, more age-grade distortion in the classroom and more child labor.

This study's empirical question is to find out what extent does the work detract from educational performance while there is clear evidence that school and work are closely linked. It is concentrated on child labor (instead of children's school enrollment). Many children in developing countries work, regardless of schooling enrollment. It is argued that child labor force activity is damaging to adult wages and employment, thus contributing to poverty. In addition to poverty, family size is hypothesized to be a determinant of the children's enrollment in school. The larger the family is, the lower the chance of a child is in school. Still, there are some researches suggesting that in developing countries, larger families may facilitate schooling, at least for some of their children.

Patrinos and Psacharopoulos' study details the quantity and quality of siblings; larger investments in child human capital are documented for smaller

families. Larger families' children receive less schooling; they fail on tests and are less well-nourished. It is argued that the number of children and investments in children's education are substitutes and more children cause lower educational investment per child. In other words, the children's educational investment depends on their number of siblings. Both school attributes and household characteristics are associated with enrollment in school and dropping out of school in rural Peru (Ilon and Moock 1991). Male children have a higher probability of getting involved to work, to help the household income, especially at later ages. Even if schooling free, children may be obligated to work to buy their school uniform and utensils. Many children work primarily to raise money for themselves or for their younger siblings. In the case of Peru, being indigenous is also a determinant for school attainment. Despite that indigenous languages are widely spoken they have low status in the country. Many people are speaking the official language, rejecting their own language and culture to improve their socioeconomic position.

Two events are analyzed in their study; schooling progress measured in terms of age-grade distortion or overage and the probability that the student works. In a simple household demand model, schooling progress is a function of individual, household and demographic factors. Given the complex nature of the relationship, they use a reduced form of the true model in which schooling is a function of household, individual and demographic characteristics: The analysis of this study shows that family size is important to determine the school attainment. The number of siblings is a stimulating proxy for wealth and it is also a determinant factor for family resources. As the number of younger siblings increases the older ones work to supply the schooling costs of their siblings and for themselves. This shows that the relationship between child labor and schooling is complex; while child work may have damaging effects on schooling, without work many children can not afford their schooling costs. This assumes that family income makes child work necessary if needed.

Smits and Hoşgör's study has resulted that in Turkey, the children with numerous siblings have less probability of school enrollment. In contrast to Smits and Hoşgör's (2006) study, Patrinos and Psacharopoulos' results demonstrate in Peru that if the children have more siblings they have more chance to get enrolled in school

because older children in poor families support their siblings and themselves for the costs of schooling.

Smits and Hoşgör (2006) analyses the effects of family background characteristics on primary and secondary educational participation in Turkey. They imply that, despite the compulsory education of eight years for primary school, the level of schooling in Turkey is rather low. The number of the children not enrolled at secondary and tertiary level of education has remained high. Their study tries to explain the effects of enrollment to school and they find that parental education, number of siblings, household income, occupation of the father, traditionality of the mother and the mother's ability to speak Turkish are major factors affecting educational participation.

Smits and Hoşgör count several hypotheses behind the reasons of school enrollment. These hypotheses fall into categories such as socio-economic characteristics, cultural factors, demographic factors and geographical factors. In socio-economic characteristics, it is indicated that participation in education is an investment in human capital because of the expected returns in future. Parents of the children decide whether to send (or not) their children to school with immediate costs against expected benefits they will earn in future. Those benefits are for children and also for the parents because the children are the old-age security for them. There are also the indirect costs of schooling; the help of the children at home, in the household or at the family farm. These costs weigh heavier for poorer households because of the need of the children at home. The occupations and educational levels of the parents are also socio-economic characteristics that are expected to play a role in educational participation.

Cultural factors in Turkey show that illiterate women are economically dependent on their male family members and this plays an important role in the prevailing values. If the women get education, the possibility of their daughters to enroll in school gets higher. This is a concerning problem, because the gender disparities can still be found in statistics. The patriarchal culture may influence the families to marry their daughter rather than investing on their education.

Demographic factors that may influence the educational participation of children are birth order, family size and living in an extended family. The number of siblings may affect negatively the possibility of children to get enrolled in school. The gender of the siblings also has the same effect because of the patriarchal culture. The younger children have more opportunities to go to school because the older children run the household chores, do farm work or contribute to household income. Family size might be negatively correlated to educational participation because the available resources have to be divided among more children.

Geographical factors include regional differences and rural/urban differentiation. Turkey's regions have large differences within themselves. The West part of the country, the Marmara region and the Central region are the most developed parts; the educational participation in these parts, is expected to be higher. The Southern part is also developed – it has highly fertile agricultural areas as well as industrial centers. The Eastern and Southeastern parts of the country are not as developed as the parts mentioned above – there are not sufficient fertile agricultural areas and the most important activity is husbandry. Crops are produced only for household consumption. These regions' population growth is below zero because of outmigration. Patriarchal culture is mostly seen in these regions of the country thus it is expected that the least participation to education are found in those areas. It is also implied that the level of education will differ regarding to level of urbanization within the regions.

Smits and Hoşgör explored the data using bivariate cross-tabulations and the method of multivariate logistic regression analysis. In the analyses, the educational participation is measured with variables including geographic characteristics (region and urbanization), socio-economic characteristics (education level and occupation of parents, household income), demographic characteristics (age, number of brothers and sisters, birth order, family size) and socio-cultural characteristics (gender role attitudes, dependency, Turkish language proficiency of mother). The results' figures show that a significant number of children who enrolled in school, start dropping out of it after some years or after completing five years of primary school (in old system of primary education). Regional differences are remarkable; the rate of drop out of girls aged 13-14 years in Eastern part of the country is 74% and for boys it is 40%.

Non-participation of children increases with decreasing level of urbanization. Regarding to parental education, the less the level of education is the probability of the children to continue to school decrease. If father's and mother's occupation are other than farm occupations, the probability of the children to get enrolled in school gets higher. The birth order and the number of siblings are also significant; first born children have higher participation rates (in contrast to Patrinos and Psacharapoulos' study (1997)) than their siblings and children with few siblings have more chance to get enrolled in school. The native language of the mother and her dependency to male members of the family are also correlated with participation to education; participation of children is lower among the children of mothers who depend on their family, married young and not able to speak Turkish.

The study discusses that, although the educational participation has been improving in the last decades, it is still a concerning problem for the secondary level of the educational system. Numerous children do not enroll in secondary school (in other words, they drop out after primary school) and moreover, there are disparities between regions and subgroups of the country. It is also stated that the ability of speaking Turkish and the illiteracy of mothers of dropped out children and the patriarchal culture are still major factors concerning the drop out problem of the children in Turkey.

Moyi's study (2009) investigates about household characteristics and delayed school enrollment in Malawi. He has stated numerous household characteristics that are involved in delayed school enrollment. Malawi was the first country to provide free primary education in Sub Saharan countries after the Jomtien conference. Despite this policy, education has remained elusive and many children who enrolled in school dropped out before completing school – even some of them had been enrolled in primary school at later age. His study manages to investigate the reasons behind this delayed enrollment problem and finds that the survival of the mother, female headship and the house head's level of education are associated with a lower probability of delayed enrollment.

The out of school children in Moyi's study split into two main categories: those who never enrolled in school and those who enrolled but dropped out. A

UNESCO report (2005) states that the majority of these 45 million children, consists from the dropouts. Recent studies prove that delayed school entry still exists in many countries of Africa (Ghana, Kenya, Cameroon, Mozambique…). Children do enroll in school after the legal age (6 or 7). It is also stated that delayed enrollment should be a concerning problem because it is associated with higher repetition rates and fewer years of schooling. Delayed entrants in school find difficult to complete school; their early departure are due to household responsibilities/chores and the cost of schooling.

Moyi's research finds several explanations involved with delayed school enrollment: childhood nutrition, distance to school, poverty and school quality. Poor childhood nutrition impedes children's physical and mental development thus the malnourished children perform poorly and they're out of school. The distance to school is also another reason for delayed enrollment; the inability to walk the long distances to school (because of malnutrition), or the difficulty of obtaining transport children may delay enrollment. The farther away the school is, the longer the parents wait before enrolling their children; they are concerned about their safety. The direct and indirect costs of schooling to household determine the enrollment in school. Children depend on their family's economical support to go to school and the cost of schooling has direct implications on children's education. The indirect costs – loss of farm labor and domestic labor – are the main obstacles to children living in poverty.

In Moyi's study, a multivariate analysis has been pursued and the Malawi EdData Survey has provided the data on issues such as enrollment, attendance and dropout, the reasons for delayed enrollment in school, household expenditures on schooling, distances to schools, etc. The objective of his study – estimating the household characteristics associated with delayed school entry – was realized by logistic regression techniques. The analysis results shows that the following household characteristics are associated with school entry by age seven: female head of household, survivorship of the mother, socioeconomic status of the household (measured by wealth and the number of years of education), and place of residence (region and rural/urban residence). It has also been implied that, if the religion is another than Christian or if the number of the children between 6 and 14 years increases, the probability of delayed entry is higher.

Moyi states the implications of the results are remarkable: even though the free education is provided, delayed school enrollment is still a problem in Malawi. The cost and distance to school are still factors of delayed entry. He remarks that, there might be other barriers to on-time enrollment which may be within households or within schools. It is also implied that Malawi needs to address inequality in schooling because wealth, religion and regional inequalities continue to affect the education of children.

Grigoli and Sbrana (2011) have worked on the determinants of schooling and child labor in Bolivia. Their study investigates the dynamics of primary school enrollment, school attendance and child labor in Bolivia between 1999 and 2007. The analysis practiced in their study intends to indentify the relationship between schooling and working of children. It is found out that the enrollment rates have increased, even though the lack of attendance remained as a problem. Extremely poor children's school attendance had increased but the child labor rate had not changed. It is also stated that for indigenous children schooling and working are substitutes, in other words an increase in school attendance causes a decrease in child labor rate.

Bolivia remains the poorest country in South America with 37.7% of the population living below the extreme poverty line and the illiteracy rate is 13% for people aged 15 or older (despite the efforts of free-of-charge primary education). Results at descriptive level show that school enrollment became more widespread in Bolivia. However, 40% of the children did not attend school even if they are enrolled. Poverty and being indigenous are the main characteristics driving the attendance behavior. Poor children manage to allocate their time between school and work.

Grigoli and Sbrana's results show that the decision of school enrollment mainly depends on being indigenous and poverty. Extremely poor families need the support of their children's work to get higher income. Although schooling programs oriented to extremely poor children achieved some positive results, the rate of no-attendant children who are enrolled to school is still high. Their empirical results acquire how schooling/labor decisions interact across different groups and time; in Bolivia, extremely poor children do not substitute between schooling and working.

This is not the same case for indigenous children; schooling and labor are substitutes for them.

Previous studies have stated many reasons for drop out from school or delayed school enrollment of children. We can enlist these reasons as following:

Family size is one of the major reasons that have been discussed. It is hypothesized that family size is a decisive factor to enroll in school in developing countries. The number of children in a family has a negative effect on investments in children; if the number of the children is abundant, then the investment per child will be diminished. This mechanism is mostly due to family resources available per child which is distributed to children in that family. There is another factor for children of self employed families in rural settlement; if the costs of schooling for children are greater than the farm labor income and/or domestic labor - which means the opportunity cost of the schooling to work – then the family resigns sending their children to school.

The birth order is also, another factor that affects school enrollment. Smits and Hoşgör (2006) have stated that, in developing countries, regarding the birth order, the cost of high fertility has negative effects on older siblings in a family. In other words, older siblings in poor families may be obligated to take care of younger children in the family or to help their parents on their work such as doing the household chores, the farm work or working in a job to contribute to household income. Family size tends to correlate negatively with educational participation in some developing countries. This is mostly due to distribution of resources for children's education. However, Patrinos and Psacharapoulos (1995) have discovered that the number of siblings in a family does not have much effect on school enrollment but to the probability of child labor. As Chernichovsky (1985) has stated, these findings may be evidence of "specialization" in the household, where by some children work, while their siblings are permitted to attend school and concentrate on studying.

Gender of the siblings is another factor correlated with school enrollment. As Turkey's demographic constitution possess a patriarchal culture (especially in East and South East regions), many girls are forced to marry at young age and these

children's parents may prefer to invest in the education of their sons. In spite of that, Tansel's study (2002) has found that there have been substantial improvements towards closing the gender gap recently. Mean years of schooling is found to be same for boys and girls at age 14. It may also be seen in Table 1 that, the gap of education between girls and boys is closing. Even tough, there is still a gap which is slightly notable. Briefly, this cultural factor prevents women to get a good education and to work in a job which requires a complete education.

Parents' education levels and their occupations are expected to have a large impact on their children's school enrollment. The "human capital" is basically affected by factors such as nutrition, health, formal education and on-the-job training. As a result, educational level of the parents plays a role on human capital function of their children. Parents with certain level of education would send their children to school to get the same level of education they have reached. As the years of schooling of both parents' progresses, the probability of children's school enrollment increases. In other words, parents' education is a positive impact for their children; an increase in parents' year of schooling increases the probability of the children to get higher schooling achievements. The education means the social mobility, and if the parents invest on their children's school training, it will cause an impact of social mobility for their children.

The occupation of a person is determined by his/her level of education. If father is self employed, this may imply that his eldest son (or his sons) may be obligated to learn his father's skills and continue his work - this is the most happened case in rural parts and Eastern and South Eastern regions of the country where families mostly work in farms in Turkey. However, if mother is employed, daughters may have a chance to reach the necessary degree of education to get an employment (Tansel, 2002). In other words, financially independent women can create the possibility for their daughters to be enrolled to school. The opportunity cost of schooling to work gets higher to families of farm labor, of self employment and families caught in poverty. As a result children of self occupied parents, children of farmers and children of poor families are predicted to have less chance of participation to school. When parents' education level grows, the possibility of their children to attain a certain level of schooling gets higher.

Regional differences (rural and urban locations) are also correlated to school enrollment. In an urban location, as the school number increases, the probability of a child to live nearby a school gets high. In rural areas, the chance of a child to get enrolled in high school falls off as the school number is limited. On the other hand the quality of the education varies as the rate of teacher per school decreases; in other words student-teacher ratios are explanatory variables for the quality of education.

Regions in Turkey have large differences; the West part and the Marmara region are the most advanced and populated regions of the country. These urbanized parts of the country have a large capacity of marketing and it is suggested that higher enrollment rates at school take place here. The Southern region is like the West part of the country, there are fertile agricultural areas and also tourism industry is evolved largely in the coastline. The North part of the country has also fertile agricultural areas but because of geographical factors – such as high mountains – it had developed more recently. Smits and Hoşgör state in their study that the women of the Northern region tend to have a more independent position than in other parts of Turkey because of outmigration of males. The Eastern region and the South Eastern region are the least developed parts of the country. The economic activity comprehends husbandry and agriculture; the production is consummated on households and it is not traded. This is due to lack of the mechanization of the agriculture and to highlands which are hard to cultivate. Population from the East and the South East immigrate to the developed regions mostly to West coast and to Marmara region because of relatively high employment rates.

3. METHODOLOGY:

The human capital theory views the education as an investment to future earnings (Schultz, 1960; Becker, 1975). Tansel (2000) has indicated that additional school level contributes in terms of future earnings and necessitates direct costs and opportunity costs associated with delayed entry into the labor market. The individuals will compare the direct and opportunity costs of schooling and they will provide investment until the marginal rate of return to additional schooling surmounts the cost of borrowing. Therefore the optimal level of schooling is determined by its contribution to human capital and the cost of schooling.

Tansel has set up an equation that explains the demand for children's schooling by a function of the wages of the household members, market prices of inputs, unearned household income and a set of child, household and the local labor market characteristics. Parents may have different preferences for their sons and daughters; therefore it leads to gender specific demand functions of schooling. According to Rosenzweig and Schultz (1982) this difference in preferences may be due to differences in labor market returns to female and male schooling. In our study, we will set up an equation of high school enrollment like Tansel's study; however our equation differs from hers by its size and variables.

3.1. Data

To examine the household and individual aspects associated with high school drop-outs, the data of children in 8^{th} grade of primary school provided by National Ministry of Education will be used. This survey contains family background and school information of children at 8^{th} grade of the primary school in Turkey. This survey of national education was administered to 1.189.156 children all around the country. 232.000 of these children were out of school in 2011. Because of lack of

information, it was solely possible to use the background information of approximately 667.000 children. This sample was reduced to the 14–19 age group in order to obtain a representative sample of children for high school drop-outs.[5] The questions asked on the survey were used to provide current information on education (e.g. their achievements in courses, their points of success in high school entrance tests, their points in the high school entrance exam, etc.) with the household factors influencing the enrollment decision to secondary education.

The survey provides data on issues such as enrollment, attendance and drop-out; the absenteeism; household income; number of children in household; parents' level of education; parents' occupation; children's success/failure in class; their high school entrance exam results; rural/urban area. This data is appropriate for this analysis because it contains an extensive collection of individual and household characteristics. The shortcoming of this data is that it does not contain the longitudinal information; the longitudinal information may give the possibility to examine the changes over time for a given household (e.g. death, birth, migration, etc.).

The dependent variable of interest in this analysis is a dummy variable which indicates whether the child is enrolled to high school or not (the variable takes the values "0" for not enrolled to school and "1" for enrolled to school). The models include independent variables that the survey highlights; the individual (age and gender), and household characteristics (number of siblings, family income, parents' level of education, their occupation, place of residence – rural/urban) that influence high school enrollment.

[5] Tansel mentions in her study that "children leave the household of their parents after a certain age and therefore, those we observe still in the household would be an unrepresentative sample… to preserve the representativeness, I restrict the sample to age less than 19 to study the determinants of primary schooling and middle schooling." In our study, the sample is restricted to 14-19 age group in order to preserve the representativeness of analysis as Tansel did.

Table 3						
Education status of children by age in 2011						
Age	**14**	**15**	**16**	**17**	**18**	**19**
Boys						
Enrolled	80,43	83,78	66,29	44,23	32,67	39,79
Not enrolled	19,57	16,22	33,71	55,77	67,33	60,21
Girls						
Enrolled	77,80	85,16	68,84	63,61	47,08	41,52
Not enrolled	22,20	14,84	31,16	36,39	52,92	58,48
Data provided from Turkish National Ministy of Education, 2011						

Table 3 shows that after age 16, the drop-out rate grows by age. It is also remarkable that, the drop-out rate of male children is higher than the rate of female children. Because of starting late and grade repeating some children may find difficult to complete school and they are more likely to drop out from school (Hoşgör and Smits 2006; Moyi, 2009). At the official age of 14-15, about 18% of the boys and 18.5% of the girls are not enrolled to high school. This trend continues and grows for boys but it is slightly lesser for the girls than the boys' rate.

Table 4			
Net secondary enrollment ratio by gender, residence and wealth quintiles in 2011			
	Enrolled	**Dropped out**	**Total**
Gender			
Female	81,60	18,40	100
Male	78,52	21,48	100
Residence			
Rural	58,96	41,04	100
Town	66,93	33,07	100
Urban	83,14	16,86	100
Wealth quintiles			
Lowest	54,53	45,47	100
Second	67,71	32,29	100
Third	83,42	16,58	100
Fourth	89,13	10,87	100
Highest	79,26	20,74	100
Source: Turkish National Ministry of Education, 2011			

Table 4 displays the net secondary enrollment ratio by gender, residence and wealth quintiles in 2011. This table underlines that, in 2011, male children's drop-out

ratio is greater than the female children's ratio (21% dropped out male children against 18% dropped out female children). It is also remarkable that the place of residence is quite affecting the enrollment decision; 41% of the children living in rural areas are dropped out from high school. The drop-out ratios of "town" and "urban" locations are 33% and 17% respectively; these drop-out ratios may be related to the squatter settlements and the undeveloped streets as indicated in Tansel's study (2000). Surprisingly, the drop-out ratio of highest wealth quintile is 21%; it may be related to the children's Level Determination Test (LDT) results or their parents may send them to foreign countries high schools.

3.2. Empirical specification and variables

In this study, to estimate the determinants affecting secondary school drop-outs, logistic regression techniques will be used. In previous studies, logistic regression techniques such as logit model, probit model and logistic models were used. For instance, Tansel (2000) used ordered probit model to estimate the school attainment in Turkey. She stated that "*ordered probit models are specified for estimating primary, middle and high school attainments*". Her model differs from logit model; the variable estimated is defined as an unobserved and continuous variable and depends on a vector of (in her study) individual, household and locational explanatory variables with a normally and logically disturbance term.

Hoşgör and Smits (2006) also used logistic regression technique to find out which factors are most important to affect the children's school enrollment. Educational participation in their analysis was measured with variables indicating if the children were enrolled in primary or secondary education at the time of the interview.

Moyi (2009) used logistic regression model to estimate the household characteristics associated with delayed school entry. This model induces the users to estimate the technique called **odds ratio**. Moyi, using calculations of odds ratio, estimates the household characteristics associated with delayed school enrollment. Therefore the dependent variable of his study is delayed school entry which is a

binary outcome (this type of variable only takes values 0 for enrollment on time and 1 for delayed school entry). Independent variables for this estimation are gender, household variable (parent's education level, household head, mother/father alive), religion, wealth quintiles, residence and region of Malawian children.

Application of Ordinary Least Square (OLS) method is impossible because OLS assumes that dependent variable is continuous and unlimited. In our case, the dependent variable is neither continuous nor unlimited but it's a binary variable (which means that it only takes two values). As our aim is to estimate the effects of the household and individual factors on high school attainment, a Generalized Linear Model (GLM) will be used: the logistic regression method.

Logistic regression method is a generalized linear model to model binary outcomes (in other words the dependant variable y(i) takes on the values 0 or 1). Our dependent variable is **dichotomous**, in other words it has 2 responses: whether the child is enrolled to high school or not. The following variables are used as determinants of schooling which are called dummy variables:

a) The education level of mother and father are described from 0 to 11 scale. These 0 through 11 scales indicate the graduation level of parents' as following: 0 indicates primary school, 1 indicates secondary school, 2 indicates high-school, 3 indicates college, 4 indicates undergraduate, 5 indicates graduate, 6 indicates postgraduate, 7 indicates 3 years of training institute, 8 indicates literate, 9 indicates illiterate, 10 indicates elementary education, 11 indicates student at primary school.

b) The occupation of mother and father are described from 0 to 12 scale which indicates if she/he is a teacher, an officer, an employee in public sector or private sector, retired, not working or working for a ministry, etc.

c) Gender of the child is 0 for girls and 1 for boys.

d) Age of the child are from 14 to 19.

e) Number of siblings in family (including the child in the survey).

f) The income level of the family in 5 scales; 1 for lowest quintile, 2 for second quintile, 3 for third quintile, 4 for fourth quintile and 5 for highest income quintile.

g) The place where the child lives: 0 for rural, 1 for town and 2 for urban.

h) The city where the child is registered to school.

Logistic regression models are specified for binary outcomes. To estimate the reasons of school attainment / drop outs, this model is one of the appropriate techniques within individual and household explanatory variables. Logistic regression allows predicting a discrete outcome from a set of variables that may be continuous, discrete or dichotomous. Generally, the dependent or response variable is dichotomous such as presence / absence or success / failure. The dependent variable may take the value 1 with a probability of success p or the value 0 with a probability of failure $(1 - p)$. This type of variable (binary variable) is called a Bernoulli variable[6]. In the statistics literature, a common interpretation of the coefficients of logistic regression is in terms of marginal effects on the odds ratio. For the logit / logistic model, it is:

$$p = \frac{\exp(x'\beta)}{1+\exp(x'\beta)}$$

$$\Rightarrow (p/(1-p)) = \exp(x'\beta)$$

$$\Rightarrow \ln(p/(1-p)) = x'\beta \qquad \textbf{(1.1)}$$

(p / (1 − p)) measures the probability that y takes the value 1 relative to the probability that y = 0 and is called **odds ratio** or **relative risk**. With the odds ratio, logistic regression may predict the probability of success or failure, which is in our

[6] Cameron A., Trivedi P., *Microeconometrics,* Cambridge University Press, 2005

study school attainment or drop-out from school. The relationship between the predictor and response variables is not a linear function in logistic regression; instead the logistic regression can be described as:

$$p_i = \Pr[y_i = 1 \mid x_i] = \frac{\exp(\beta_1 + \beta_2 x_i)}{1 + \exp(\beta_1 + \beta_2 x_i)} \quad \textbf{(1.2)}$$

This model, also called **the logit model**, specifies and clearly ensures that $0 < p_i < 1$. It is clear that the relationship between p_i and x_i also its relationship with coefficients β are not linear[7]. This is the main reason that the **OLS** is not applicable in this situation (OLS predicts a linear relationship between dependent and independent variables). From the equation below, another equation can also be described:

$$(1 - p_i) = \frac{1}{1 + \exp(\beta_1 + \beta_2 x_i)} \quad \textbf{(1.3)}$$

Therefore we can conclude:

$$\frac{p_i}{(1 - p_i)} = \frac{1 + \exp(\beta_1 + \beta_2 x_i)}{1 + \exp(-\beta_1 - \beta_2 x_i)} \quad \textbf{(1.4)}$$

Pi / (1 – Pi) is the **odds ratio**; here in our study it represents the probability of a child to be enrolled to high-school to the probability of not being enrolled to high-school.

$$\Rightarrow L_i = \ln(p_i / (1 - p_i)) = \beta_1 + \beta_2 x_i \quad \textbf{(1.5)}$$

L_i presents the **logit** and the equation (1.5) describes the **logit** model. As the variables is binary outcomes, the logit / logistic model uses **maximum likelihood method** (MLM) to estimate the parameters. In this study, we will use the STATA

[7] Gujarati, Damodar N., *Basic Econometrics*, 2004

program to estimate the determinants of the high school dropout rates. The next section presents the results from the estimated logit model.

4. ESTIMATION RESULTS:

This section presents the estimated results of the logistic regression model; the determinants of high school enrollment for boys and girls in Turkey. The analysis is done for the total sample and then for girls and boys solely to discover the gender differences.

The results of the logistic regression are represented in Table 5. The table shows the odds ratio of logistic regression; 1 represents no effect on the dependent variable, a ratio greater than 1 represents that the independent variable increases the probability of high school enrollment ratio and an odds ratio less than 1 represents that the independent variable diminishes the probability of high school enrollment ratio.

The coefficients of the logistic regression estimation results are represented in Table 6. As it is mentioned on Section 3, to interpret the odds ratio estimated by logistic regression is preferable against interpreting coefficients of the estimation. The coefficients of the independent variables (which are binary and not measured in natural units of measurement) may not be interpreted properly considering they might be extremely major or minor numbers (as seen on Table 6).

Individual and household determinants such as gender, age, high school entrance exam results and number of siblings are shown on the Table 5. First determinant of the individual variables, being a girl, diminishes the possibility of high school enrollment. Tansel (2002) has pointed out that permanent income is affecting the girls' probability of enrollment to high school more than the boys' probability of enrollment in Turkey. Bommier and Lambert (2000) have found different pattern of school enrollment for boys and for girls in Tanzania; girls were enrolling to school at an early age than boys however remaining at school for a short period. They related this issue to two reasons: First is that this difference may be due to lower returns to

pre-school experience for girls for than boys and the second suggests that a bride price exists. In Turkey, these two reasons may exist in special occasions – child brides (Rankin and Aytaç, 2004; Rankin and Aytaç, 2006) and gender differences (Tansel, 2002; Hoşgör and Smits, 2006) are mentioned in previous studies. Within the analyses in this study, the odds ratio of being a boy (1.66) indicates that the boys' probability of getting enrolled in a high school is 1.66 times higher than the girls' probability to be enrolled in a secondary education. Thereupon, our model's results demonstrate that girls' possibility to enroll to high school is lower than the boys' probability. Yet, there is an improvement in school enrollment ratio of girls as we mentioned in Table 1 (it increased from 34% to 66%).

Table 5

Odds ratio for the likelihood of high school enrollment rates for children

	Full sample		**Girls**		**Boys**
	Model 1		**Model 2**		**Model 3**
Number of children	568.460		284.065		284.395
Individual					
Male	1,666		-		-
Age	0,907		1,001		0,926
No. of siblings	0,931		0,939		0,901
Entrance test result	1,021		1,023		1,020
Wealth quintiles					
Second	1,350		2,771		0,547
Third	2,246		2,739		1,404
Fourth	2,641		2,832		1,891
Highest	2,061		2,435		1,397
Mother's education					
1-8 years	1,316		1,627		1,122
8-11 years	5,016		16,569		1,904
Graduate-PhD	14,685		26,793		1,022
Father's education					
1-8 years	1,032		2,692		0,643
8-11 years	1,191		2,398		1,012
Graduate-PhD	1,045		1,751		1,062
Mother's occupation					
Public officer	1,380		1,260		1,506
Private sector	0,794		0,622		1,406
Retired	2,354		1,373		2,312
Other	1,474		1,239		1,654

Father's occupation					
Public officer	1,583		1,638		1,616
Private sector	2,063		1,553		2,446
Retired	1,857		1,202		2,549
Other	1,029		0,874		1,164
Region					
Mediterranean	0,678		0,811		0,678
Aegean	0,479		0,541		0,425
Marmara	0,517		0,486		0,554
Black Sea	0,811		0,613		1,171
Central Anatolia	0,340		0,377		0,336
Southeastern Anatolia	1,266		0,911		2,306
Place					
Town	1,666		1,978		1,377
City	2,857		3,100		2,725

Reference for wealth group is "Lowest wealth quintile"
Reference for education group is "illiterate"
Reference for occupation group is "unemployed"
Reference for region group is "Eastern Anatolia region"
Reference for place group is "rural"

Data is provided from Turkish National Ministry of Education, 2011

Age of the children negatively contributes to full sample and also to girls and boys solely. This means that delayed school enrollment may be related to drop out from school. As the age of children grows more than the legal age, they are mostly unwillingly going to school and they tend to drop out. Moyi (2009) pointed out in his study that the children who delayed primary school enrollment find it difficult to complete school because of household responsibilities or cost of schooling, etc. Within our analyses, the odds ratios for children who are older than 16, show that these children tend to not get enrolled to high school. This issue may be due to the costs of schooling and also, when the children are older and they do not enroll to a high school they start to supply for their household income or take care of their sibling if it is needed (Tansel, 2002; Hoşgör and Smits, 2006).

Number of siblings is negatively affecting the high school enrollment; as the number of children in a family increases the investment in education of a family diminishes gradually. Whereas the investments in education per each child are

substitutes, having a large number of siblings decreases the probability of enrollment to high school. Patrinos and Psacharapoulos (1997) have mentioned in their study that number of siblings does not involve the school enrollment but the child labor. In our model, the odds ratio of number of siblings to the high school enrollment is lower than 1, which denotes that it weakens the enrollment. Hoşgör and Smits (2006) also stated in their study that having a large number of brothers reduces the probability to get an education and having a large number of sisters reduces the probability to get a secondary education comparing to have no brothers / sisters. Rankin and Aytaç (2006) mentioned in their study that having siblings lower than age 12, reduces the probability for both gender to be enrolled in education.

The high school entrance test results are also one of the determinants to high school entry, if the child fails at this test he / she will not be able to be enrolled in a high school. Its odds ratio predicts to increase the probability of high school enrollment as it can be predicted; if the child gets a sufficient mark to be enrolled in high school, he / she will be able to enroll in a high school. However, this variable might be relative to children's age; depending to their age children will try or give up the entrance tests to get enrolled to secondary education.

It can be predicted that the income level of a household may increase the probability of a child to be enrolled in school. The odds ratios of wealth quintiles prove that the wealth level provides contribution to the school enrollment. In every quintile (except for boys in second wealth quintile), the odds ratio is positive, which explains that an increase in household income contributes to the probability of children's high school enrollment. The odds ratios for girls are greater than for boys generally; it can be implied that an increase in household income might be more contributive to the girls' high school attendance than the boys' high school attendance. The positive relationship between household income and children's schooling has been discussed in a number of studies (Behrman and Wolfe, 1987; Tansel, 1997 and 2000; Hoşgör and Smits, 2006; Rankin and Aytaç, 2006; Moyi, 2009).

Mother's and father's education levels are positively contributing to their children's high school enrollment. Especially, mother's education level is very

effective on their daughter's high school enrollment (if mother is educated for more than 8 years – graduate, postgraduate or PhD – her daughter has a very high possibility to be enrolled to high school, the odds ratio of mother's education on daughter's high school enrollment is 13,036). Father's education level is also very effective on their daughter's and son's high school enrollment however it is not as much effective as mother's education level. Behrman and Wolfe (1984) and Tansel (2002) also found out that mother's education level is more important to their daughters' schooling then their sons' schooling. Consequently, it can be said that if a child's parents are at least literate or educated, the probability of this child to be enrolled to high school is strongly positive. It can be implied that uneducated parents tend to live in locations where there are some barriers for girls' high school attendance (poorer settlements or rural areas); that parents' education level has a big influence on their attitude toward their daughters' schooling. This problem needs attention; compensatory policies might be resolution in the areas where parents are least educated.

Parents' occupations are highly positive on their children's high school enrollment. However if mother is working on private sector, this situation negatively affects their daughter's schooling. It can be implied that mothers could not take care off adequately on their daughters schooling because of working hours or their career achievements in private sector. Furthermore, if fathers' occupation is in "other" category, it has a negative effect on their daughters' high school enrollment. Tansel (2002) has discussed the father's self employment situation; if father is self-employed his son or daughter's probability to get enrolled to high school decreases. The explanation of the self-employment issue is that the opportunity cost of going to school is lower than working; in other words, father will prefer to teach his skills to his son rather than sending him to school. Thus, the children will contribute to household income. In the locations where self employment is highly seen, the education level tends to be low.

The odds ratios of regions in the analyses are all lower than 1, except Southeastern region for all sample and boys, and Black Sea region for solely boys. It can be interpreted that a child from Marmara, Aegean or Central Anatolia region with the same features (gender, household income, parents' education level and their

occupation, et al) as a child from Eastern Anatolia region (the reference group in this analysis) has the same probability as this child from Eastern Anatolia region; whereas there are not statistical differences between Eastern Anatolia region and Marmara, Aegean or Central Anatolia region. However to live in Southeastern Anatolia region for all sample or living in Black Sea for male children is statistically different from living in Eastern Anatolia region; living in those two regions has positive effects on high school enrollment and increases the probability of the children's school enrollment. The possibilities of education in the areas where the education is not spread enough and inaccessible are insufficient as compared to the possibilities in industrially developed regions. An industrial improvement creates brand new employment opportunities and demand of employment needs more human capital (which in fact is more need of education). The industrial employment opportunities increases the probabilities of receiving higher school attainments, in contrary the service employment reduces the probabilities of receiving higher school attainment as it does not require higher education skills.

Compared to the reference group of "living in a rural area", living in a town or a city is highly contributing to the high school enrollment (Table 5). If the child lives in a town center or a city, his / her probability to get enrolled in a high school is 1.5 – 3 times higher than the children living in a rural area. Tansel (2002) signified this problem that considering in squatter settlement and rural areas there are lower probabilities and less qualified schools, people living in those areas are not well paid and they tend to be in poverty. The distance to school might be long and it is perceived by numerous parents to be dangerous (Tansel, 2002; Moyi, 2009). The areas where the people tend to live in poverty the opportunity cost of schooling against working gets higher; this might provoke the children of these families to start working instead of getting enrolled in a high school. These results may also be connected with the migration issue. People who migrate from other regions to industrially and economically better regions (especially to Marmara and Aegean regions) tend to settle in squatter quarters, not to urban locations. They do not have enough human capital (due to their lack of level of education) to get a sufficient occupation support their families and continue to live in poverty. This trend may continue if cautions are not provided.

Table 6

Logistic regression estimates of secondary school enrollment

	Full sample		Girls		Boys	
Variables	**Coefficient**	***t-ratio*[1]**	**Coefficient**	***t-ratio*[1]**	**Coefficient**	***t-ratio*[1]**
Individual						
Male	0,510	47,86	-	-	-	-
Age	-0,097	12,22	0,002	0,15	-0,076	-6,86
No. of siblings	-0,071	23,87	-0,062	-14,63	-0,104	-23,81
Entrance test result	0,021	200,89	0,023	148,00	0,020	133,21
Wealth quintiles						
Second	0,300	13,75	1,019	36,47	-0,601	-14,96
Third	0,809	36,38	1,007	35,33	0,339	8,39
Fourth	0,971	39,45	1,040	32,57	0,637	14,67
Highest	0,723	13,11	0,890	11,74	0,334	4,00
Mother's education						
1-8 years	0,275	17,59	0,486	21,81	0,115	5,06
8-11 years	1,612	42,99	2,807	46,83	0,644	13,13
Graduate-PhD	2,686	29,38	3,288	24,96	0,022	0,18
Father's education						
1-8 years	0,032	1,21	0,990	24,61	-0,440	-11,67
8-11 years	0,174	5,60	0,874	18,94	0,012	0,27
Graduate-PhD	0,044	0,84	0,560	7,54	0,060	0,76
Mother's occupation						
Public officer	0,322	3,12	0,231	1,41	0,409	3,00
Private sector	-0,229	-7,65	-0,474	-12,89	0,340	5,80
Retired	0,856	12,71	0,317	3,27	0,838	8,65
Other	0,388	25,84	0,214	10,31	0,503	21,64
Father's occupation						
Public officer	0,459	16,41	0,494	11,04	0,480	12,65
Private sector	0,724	33,44	0,440	14,25	0,894	28,34
Retired	0,619	22,30	0,184	4,67	0,935	23,14
Other	0,029	1,68	-0,133	-5,31	0,152	5,95
Region						
Mediterranean	-0,387	-17,18	-0,208	-5,89	-0,388	-12,52
Aegean	-0,735	-29,85	-0,614	-16,61	-0,853	-24,84
Marmara	-0,659	-31,59	-0,720	-23,74	-0,590	-19,73
Black Sea	-0,209	-7,86	-0,489	-13,22	0,158	3,96
Central Anatolia	-1,076	-49,01	-0,974	-29,77	-1,089	-35,26
Southeastern Anatolia	0,236	10,12	-0,092	-2,87	0,835	22,77
Place						
Town	0,511	23,95	0,682	20,39	0,320	11,11
City	1,050	66,52	1,131	45,53	1,002	47,30

[1] Absolute value of *t-ratio*

5. DISCUSSION AND CONCLUSION

The secondary level education is an important issue in Turkey's agenda after the approval of compensatory eight years for primary education. Compensatory policies in primary education were on purpose and about 98% of the children are enrolled to primary school[8], nonetheless the secondary school enrollment does not seem to reach the same level as the primary education level. Compared to first years of compensatory policies' implementation (1997-98 school year), the secondary school enrollment rate further increased from 37% to 69% (Table 1). Yet, about 30% of all the children are not enrolled in high school in 2010 / 2011 school year (Table 1). This study examines the factors affecting the high school enrollment in Turkey. Individual and household factors such as age of the child, number of siblings and parental education are considered to be affecting the decision of high school enrollment.

Since the data provided to estimate the determinants of children's high school enrollment rate consists of binary variables, the logistic regression technique is used to estimate the effects of the determinative factors on high school enrollment. The odds ratios for each factor are calculated to examine their effects on high school enrollment. Secondary level enrollment was strongly related to household income, children's parents' education level and occupations and the region where they live.

In this study, a socio-economic model is developed where the high school enrollment is considered to be dependent to the children's age, their mother's and father's education level and occupation status solely, the household income, also to number of his/her siblings, regions, the place where the children live and their entrance test results. Family resources, external factors such as region and place and children's success at high school entrance test are the determinative factors. If the child's age gets higher than 15 years, he/she tends to drop out after being graduated

[8] According to 2010 / 2011 report of Turkish Ministry of Education, about 98% of the children in Turkey were enrolled in primary school.

from primary school. The number of siblings has negative effects on children's high school enrollment contrarily to Patrinos and Psacharapoulos' study (1997); for the entire sample, as the number of siblings increases the high school enrollment decreases as a result. The high school entrance test results are also important as it is a condition to register in a high school; the test results are hypothesized to be positively affecting high school enrollment and the analysis results proves the hypothesize.

The education level of parents and their occupations are decisive factors to enroll a child in a high school. In our results it is found that education level of mothers is especially very important for the decision of their daughters' high school enrollment. If the mother is educated for more than eight years of schooling (graduated from high school or from university, a master's graduate or PhD), her daughter's probability is 15 or higher times better than a daughter of an illiterate mother. The education level of fathers is also very important for their daughters' and sons' high school enrollment however it is not a factor as much decisive as the children's mothers' education level. Particularly, if father is educated for 1-8 years, his son's probability to get enrolled to high school decreases.

The occupation of parents are positively contributing to their children's high school enrollment, however if mother's occupation is in private sector it is negatively affecting her daughters' high school enrollment and also the full sample's enrollment rate. This situation may be due to hard conditions on private sector; well paid occupations require working long hours. If father's occupation is considered to be other than public / private sector and retired category, it is negatively affecting his daughters' high school enrollment.

The children living in Southeastern Anatolia region and the boys living in Black Sea region were highly contributed to school enrollment compared to the children living in Eastern Anatolia region. According to estimation results, if the children living in Southeastern Anatolia and boys living in Black Sea regions has the same features (gender, household income, parents' education level and their occupation, et al) as a child from Eastern Anatolia region, their probability to get enrolled to high school is higher than a child living in Eastern Anatolia. This result demonstrates that these two regions have high potential of high school enrollment if

they have the same opportunities as the Eastern Anatolia region. This situation should be evaluated carefully.

The place where the children live is important; the probability of a child to get enrolled to high school increases if he/she lives in a town center or a city. Undeveloped quarters and squatter settlements are likely to be economically and culturally undeveloped areas. Living in a squatter settlement or undeveloped quarters might be related to living in low income family with low educated parents. Families living in those areas are also tended to be migrated from other areas of the country (Tansel, 2000). Local high schools might be far from the settlements and the families may not want to send their children to school and let them walk these long distances. If the chain of living in squatter settlements did not break by being educated, this cycle of resting uneducated and living in poor conditions will continue. Furthermore, living in developed quarters – towns or cities – increases the probability of high school enrollment rate for the entire sample. As the urbanization in those areas is higher, the education level tends to be higher, as the education level is better the parents tend to have well paid occupations and families are better living conditions.

The main purpose of this study is to find out the determinants affecting the high school enrollment and drop out rates after graduating from primary school. The results of this study indicate that parents' education level, especially mother's education level, the occupation of parents, the number of siblings, the region and place where the children live, the household income are very highly affecting the high school enrollment. It can be assumed that, urbanization and industrialization are highly important to increase the education level of children as it is strongly related to education and occupation conditions of their parents. For the further research, the investments in education for regions Black Sea and Southeastern Anatolia are strongly recommended to be considered.

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APPENDIX 1

	Youth education attainment level				Early leavers from education and training			
	Total		Male	Female	Total		Male	Female
	2005	2010	2010	2010	2005	2010	2010	2010
EU-27	77.5	79.0	76.2	81.8	15.8	14.1	16.0	12.2
Euro area	74.3	76.1	72.7	79.5	17.6	15.6	18.0	13.1
Belgium	81.8	82.5	80.3	84.7	12.9	11.9	13.8	10.0
Bulgaria	76.5	84.4	85.0	83.6	20.4	13.9	13.2	14.5
Czech Republic	91.2	91.9	91.1	92.8	6.2	4.9	4.9	4.8
Denmark (2)	77.1	68.3	61.4	75.6	8.7	10.7	13.6	7.5
Germany (3)	71.5	74.4	72.2	76.7	13.5	11.9	12.7	11.0
Estonia (4)	82.6	83.2	76.9	89.5	13.4	11.6	15.2	9.3
Ireland	85.8	88.0	85.3	90.6	12.5	10.5	12.6	8.4
Greece	84.1	83.4	79.5	87.2	13.6	13.7	16.5	10.8
Spain (3)	61.8	61.2	54.7	67.9	30.8	28.4	33.5	23.1
France	83.4	82.8	79.8	85.8	12.2	12.8	15.4	10.3
Italy	73.6	76.3	72.6	80.2	22.0	18.8	22.0	15.4
Cyprus (3)	80.4	86.3	83.2	89.0	18.2	12.6	16.2	9.8
Latvia	79.9	79.9	74.1	85.9	14.4	13.3	17.2	9.4
Lithuania (5)	87.8	86.9	84.2	89.7	8.1	8.1	9.9	6.2
Luxembourg (6)	71.1	*73.4*	*67.9*	*78.7*	13.3	7.1	8.0	6.0
Hungary	83.4	84.0	82.0	85.9	12.5	10.5	11.5	9.5
Malta	53.7	*53.3*	*47.0*	*60.8*	38.9	*36.9*	*41.0*	*32.4*
Netherlands (2)	75.6	77.6	73.7	81.6	13.5	10.1	12.2	7.9
Austria	85.9	85.6	84.9	86.2	9.1	8.3	8.4	8.2
Poland	91.1	91.1	88.4	93.8	5.3	5.4	7.2	3.5
Portugal	49.0	58.7	54.8	62.7	38.8	28.7	32.7	24.6
Romania	76.0	78.2	77.7	78.8	19.6	18.4	18.6	18.2
Slovenia (7)	90.5	89.1	86.1	92.8	4.9	5.0	6.4	3.3
Slovakia	91.8	93.2	93.2	93.1	6.3	4.7	4.6	4.9
Finland	83.4	84.2	82.8	85.6	10.3	10.3	11.6	9.0
Sweden	87.5	85.9	84.9	86.9	*10.8*	*9.7*	*10.9*	*8.5*
United Kingdom (	78.1	80.4	78.9	82.0	11.6	14.9	15.8	14.0
Iceland	50.8	53.4	51.4	55.5	24.9	22.6	26.0	19.0
Norway (2)	96.2	71.1	66.4	75.9	4.6	17.4	21.4	13.2
Switzerland	78.3	82.3	80.5	84.3	9.7	*6.6*	*6.1*	*7.0*
Croatia (7)	93.8	95.3	94.0	96.8	5.1	3.9	4.9	2.8
FYR of Macedonia	:	82.8	86.0	79.5	:	15.5	13.7	17.5
Turkey	:	51.1	57.2	46.0	:	43.1	37.8	47.9

(1) Refer to the Internet metadata file (http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/lfsi_edu_a_esms.htm); early leavers from education and training: based on annual averages of quarterly data.
(2) Break in series between 2005 and 2010.
(3) Early leavers from education and training: break in series between 2005 and 2010.
(4) Male and female early leavers from education and training, unreliable or uncertain data; female early leavers from education and training, 2009.
(5) Female early leavers from education and training: unreliable or uncertain data.
(6) Early leavers from education and training, 2010: unreliable or uncertain data.
(7) Early leavers from education and training: unreliable or uncertain data.
Source: Eurostat (online data codes: tsiir110 and tsisc060)

Source: Eurostat Statistics, Edition 2009

CURRICULUM VITAE

Yasemin ÖZBAL

Contacts:

Daytime: +905555102575
E-mail: yaseminozbal@gmail.com

Personal Details:

Place, Date of Birth:	**Istanbul, 02 / 06 / 1986**
Sex:	**Female**
Marital Status:	**Single**

Education:

2009 – Present:	**Galatasaray University Department of Economics** MSc. Dissertation: Determinants of High School Enrollment Decision in Turkey Thesis Supervisor: Doç. Dr. Haluk Levent Cumulative GPA: 3,14 / 4
2005 – 2009:	**Galatasaray University Department of Economics, Major** (Language of instruction, French) Cumulative GPA: 2,76 / 4
January – June 2008 :	**Université Nice Sophia-Antipolis Department of Economics, Erasmus Student Exchange Program**
2002 – 2005:	**Lycée Français Saint-Joseph Istanbul, Sciences** GPA : 3,66 / 5
1997 – 2002 :	**Lycée Français Saint-Joseph Istanbul**

Work Experience:

January 2010 – May 2010: Assistant Supervisor, Corporate Credits Assessment, HSBC Bank A.Ş.

July 2007 – September 2007: Trainer, Purchase & Supply Department, Glaxo Smith Kline Gebze

July 2007 – August 2007: Trainer, Finance Department, BSH Home Appliances, Istanbul

IT Skills and Languages:

Foreign languages:

French: Advanced

English: Advanced

Turkish: Native language

Russian: Intermediate

Computer skills:

Software: STATA, Microsoft Office Package (MS Word, MS Excel, Powerpoint)

References:

Doç. Dr. Haluk LEVENT +(90)5337296385 levhaluk@gmail.com

Yard. Do. Dr. Bilge ÖZTÜRK +(90)5326833449 sacrebilge@yahoo.com

TEZ ONAY SAYFASI

Üniversite:	**Galatasaray Üniversitesi**
Enstitü:	**Sosyal Bilimler Enstitüsü**
Ad Soyad:	**Yasemin ÖZBAL**
Tez Konusu:	**Determinants of High School Enrollment Decision in Turkey**
Savunma Tarihi:	**27 Mart 2012**
Danışman:	**Doç. Dr. Haluk LEVENT**

JÜRİ ÜYELERİ

Ünvanı, Ad, Soyad **İmza**

Doç. Dr. Haluk LEVENT

Doç. Dr. Raziye SELİM

Yard. Doç. Dr. Ruhi TUNCER

Enstitü Müdürü

Prof. Dr. V. Mehmet BOLAK