ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL

THE WORST FORMS OF CHILD LABOR IN TÜRKİYE: ASSESSING PROGRESS USING 2012 AND 2019 CHILD LABOR SURVEYS

M.A. THESIS

Buse BOZKURT

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ISTANBUL TEKNİK ÜNİVERSİTESİ ★ LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ

TÜRKİYE'DE ÇOCUK İŞÇİLİĞİN EN KÖTÜ BİÇİMLERİ: 2012 VE 2019 ÇOCUK İŞÇİ VERİLERİ İLE İLERLEME DEĞERLENDİRMESİ

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To my family and all the children in the world,

FOREWORD

"When you really want something, the whole universe conspires to help you achieve it." -Paulo Coelho

I have never lost faith in the universe collaborating with me on this journey. At every step, I have felt closer to realizing my envisioned outcome. With this belief, this dissertation has been successfully completed.

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July 2024 Buse BOZKURT

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ABBREVIATIONS

AG	**:** Age Group
BWC	**:** Bad Working Conditions
CAPI	**:** Computer Assisted Personal Interview
G	**:** Gender
HS	**:** Household Size
ILO	**:** International Labor Organization
IPEC	**:** International Labor Organization of International Programme on the Elimination of Child Labor
S	**:** Student
TURKSTAT	**:** Turkish Statistical Institute
U.S.	**:** United States

SYMBOLS

Chi^2	**:** Chi-Square
Df	**:** Degrees of Freedom
G	**:** Goodness of Fit
p	**:** p-value
P	**:** Probability
SE	**:** Standard Errors
ß	**:** Beta coefficient

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THE WORST FORM OF CHILD LABOR IN TÜRKİYE: ASSESSING THE PROGRESS USING 2012 AND 2019 CHILD LABOR SURVEYS

SUMMARY

Child labor in Türkiye is a significant socioeconomic problem with enduring negative effects in the short- and long-term. Child labor entails engaging children in tasks that deprive them of their rightful childhood experiences, hinder their access to education, and pose detrimental effects on their mental, physical, social, and moral well-being. It encompasses situations where children are often compelled to work in roles unsuitable for their age group. During the mid-19th century Industrial Revolution, child labor became increasingly apparent as children were attracted to industrial settings.

The relationship between the Industrial Revolution and child labor is a noteworthy historical phenomenon that underscores the exploitation of children in the early stages of industrialization. As industrialization swept across Europe and later other parts of the world, it brought about profound changes in economic and social structures. Factories emerged as centers of production, powered by new technologies and machinery. During this period, the demand for labor in factories and mines soared, leading to a significant influx of workers, including children, into urban industrial centers. Child labor became increasingly prevalent as employers sought to maximize profits by employing cheap and easily exploitable labor. Children were viewed as particularly desirable workers due to their small size, nimble fingers, and ability to perform tasks that required dexterity. Young children, as young as five or six years old, were frequently hired in factories, mills, and mines, often enduring extended shifts in unsafe environments. They were subjected to grueling labor, exposed to dangerous machinery, and deprived of basic rights and protections. Their wages were meager, and they often faced physical abuse and neglect. The exploitation of child labor during the Industrial Revolution was fueled by several factors. Poverty was rampant among working-class families, pushing households for sending children to work in order to bolster household income. Additionally, the rapid pace of industrialization and urbanization disrupted traditional family structures and social norms, leading to the breakdown of traditional forms of child-rearing and supervision. Moreover, the lack of effective labor regulations and enforcement mechanisms allowed employers to exploit child labor with impunity. In many cases, children worked in conditions that were detrimental to their health, development, and well-being, without access to education or opportunities for social mobility. The plight of child laborers during the Industrial Revolution sparked widespread social reform movements and calls for legislative action to protect children's rights. Over time, concerted efforts were made to enact laws and regulations with the goal of restricting child labor, enhancing conditions of work and expanding access to education. While the relationship between the Industrial Revolution and child labor is rooted in historical context, its legacy continues to resonate today.

Child labor is also related to situations where families face economic hardship or poverty. When families struggle to meet their basic needs, they might view children as

a way to add to the family’s earnings. In many cases, children are sent to work out of necessity rather than choice, as their earnings may be crucial for the family's survival. Factors such as lack of access to education, social protection, and adequate employment opportunities can exacerbate the likelihood of child labor. Deprived of adequate educational opportunities, children may not have the opportunity to develop essential skills and knowledge that would enable them to secure better-paying jobs in the future. Additionally, the lack of efficient social safety nets exposes families to economic instability, heightening the probability of turning to child labor as a means of dealing with hardships. In some instances, cultural norms and societal attitudes may also contribute to the perpetuation of child labor. In communities where child labor is normalized or where children's contributions to household income are undervalued, families may be more inclined to engage their children in work from a young age. Additionally, globalization and the expansion of informal economies can create conditions conducive to child labor. In industries like agriculture, manufacturing, and household labor, where informal employment is common, and labor regulations are frequently ignored, children could be especially susceptible to exploitation and mistreatment. Overall, child labor is a complex phenomenon influenced by a myriad of economic, social, cultural, and institutional factors. Combating child labor necessitates a comprehensive strategy that addresses its underlying drivers, such as poverty, limited access to education, insufficient social safeguards, and lax enforcement of labor regulations. By tackling these fundamental issues, communities can establish environments that shield children from exploitation and enable them to flourish and realize their capabilities.

On the other hand, the problem of the worst forms of child labor, which is aimed to be eliminated, is also an issue of great importance and requires urgent intervention. The term "worst forms of child labor" denotes the most severe and harmful instances of child exploitation, as outlined by the International Labour Organization (ILO) Convention No. 182 on the Worst Forms of Child Labour. These encompass various types of work that pose significant risks to the health, safety, and overall well-being of children. Examples include hazardous labor, where children are exposed to physical dangers such as operating dangerous machinery or working in unsafe environments like mines or construction sites. Forced labor is another form where children are coerced or deceived into work against their will, often through debt bondage or trafficking. Furthermore, children could fall victim to commercial sexual exploitation, experiencing prostitution, pornography, or other types of sexual abuse in exchange for financial profit. Child trafficking encompasses the recruitment, transportation, or harboring of children for the purpose of exploitation while involving children in illegal activities exposes them to dangers related to drug trafficking, smuggling, or armed conflict. These practices violate children's fundamental rights and are prohibited under international law. Tackling the worst forms of child labor requires a multifaceted approach, tackling underlying factors such as poverty, limited access to education, and inadequate legal protections. Strategies may include legislative reforms, awareness campaigns, social support initiatives, and targeted interventions to assist vulnerable children and families. By confronting the underlying causes and effects of child labor, societies can strive towards creating safer and more equitable environments for children to thrive.

This study aims to delve into this multifaceted problem, presenting a comprehensive analysis with dual objectives. Firstly, it seeks to meticulously evaluate Türkiye's progress leading up to 2019, adhering to the objectives outlined in national

development programs aimed at eliminating the worst forms of child labor by 2023. This evaluation serves as a critical benchmark, shedding light on the efficacy of existing policies and initiatives in combating child labor within the nation. Secondly, this study endeavors to empirically scrutinize the intricate web of factors that underpin the worst forms of child labor, employing a gender-disaggregated approach. By meticulously analyzing nationally representative survey data from 2012 and 2019, the research aims to discern nuanced patterns and dynamics that contribute to the prevalence of child labor, particularly focusing on gender differentials. Through this lens, the study seeks to unravel the underlying drivers of child labor and provide different insights for policymakers.

In this study, the methodological approach involves analyzing data from the TUIK Child Labor Survey conducted in Türkiye in 2012 and 2019. The main emphasis is on the occurrence and factors influencing the worst forms of child labor in Türkiye. To achieve this, a logit model is employed to statistically analyze the relationship between various socio-economic factors and the likelihood of children engaging in hazardous labor, forced labor, or other forms of exploitative work. By using the logit model, the study aims to identify significant predictors of child labor and evaluate the effectiveness of Türkiye's efforts to combat this pressing issue. This methodological framework allows for a rigorous examination of the underlying factors contributing to the persistence of child labor.

In essence, this study represents a pivotal stride towards comprehensively understanding the determinants of the worst forms of child labor in Türkiye, while concurrently evaluating the nation's progress in addressing this pressing issue. The empirical findings unearth critical revelations, underscoring the imperative need for Türkiye to fortify its child labor policies and craft more robust intervention strategies. Moreover, the findings illuminate the pervasive gender disparities inherent within the realm of child labor, highlighting the disproportionate vulnerabilities faced by boys, who frequently face exploitative work environments and extended work hours.

Furthermore, the study discerns a strong correlation between educational attainment and the likelihood of children engaging in the worst forms of child labor, emphasizing the pivotal role of education as a deterrent.

In summary, this research's findings emphasize the urgent need to tackle the underlying reasons for child labor and promote an environment where children can flourish without being exploited. Moving forward, concerted efforts must be directed towards bolstering educational infrastructure, mitigating gender disparities, enacting stringent measures, and fostering collaboration between government, civil society, and international organizations to eliminate child labor in every manifestation, thereby ensuring a brighter and more equitable future for Türkiye's youth.

TÜRKİYE'DE ÇOCUK İŞÇİLİĞİNİN EN KÖTÜ BİÇİMİ: 2012 VE 2019 ÇOCUK İŞÇİ VERİLERİ İLE İLERLEME DEĞERLENDİRMESİ

ÖZET

Türkiye'de çocuk işçilik, kısa ve uzun vadeli olumsuz etkilere sahip önemli bir sosyoekonomik sorundur. Çocuk işçilik, çocukları hak ettikleri çocukluk deneyimlerinden mahrum bırakan, eğitimlerine engel olan, zihinsel, fiziksel, sosyal ve ahlaki açıdan zararlı işlerde çalıştırılması anlamına gelmektedir. Çocukların yaşlarına uygun olmayan işlerde çalıştırılmasıdır. Çocuk işçiliğinin daha görünür ve fark edilir bir durum haline gelmesi 19. yüzyılın ortalarında meydana gelen sanayi devrimi başlar.

Sanayi Devrimi ile çocuk işçilik arasında güçlü bir ilişki vardır. Endüstrileşmenin erken dönemlerinde çocukların sömürülmesini vurgulayan önemli bir tarihsel olaydır. Endüstrileşme Avrupa'da ve daha sonra dünyanın diğer bölgelerinde yayıldığında, ekonomik ve sosyal yapılar üzerinde derin değişiklikler meydana getirmiştir. Fabrikalar, yeni teknolojiler ve makinelerle güçlendirilmiş üretim merkezleri ortaya çıkmış ve hızla yayılmıştır. Bu dönemde, fabrikalarda ve madenlerde iş gücüne olan talep yükselmiş ve bu durum, çocuklar da dahil olmak üzere işçilerin büyük bir akınına neden olmuştur. Kentlerdeki endüstriyel merkezlere önemli ölçüde bir göç olmuştur. İşverenler, ucuz ve kolayca sömürülebilir işgücünü istihdam ederek karlarını maksimize etmeye çalıştıkça, çocuk işçilik giderek daha yaygın hale gelmiştir. Bu dönemde çocuklar, küçük boyutları, çevik parmakları ve küçük el yapısı gerektiren görevleri yapabilme yetenekleri nedeniyle özellikle aranan işçiler olarak görülmüşlerdir. Beş veya altı yaşından itibaren çocuklar, genellikle tehlikeli koşullarda uzun saatler boyunca çalıştırılan fabrikalarda, değirmenlerde ve madenlerde yaygın olarak istihdam edilmiştir. Zorlu işlere maruz kalmış, tehlikeli makinelerle temas etmiş ve temel haklardan ve korumalardan mahrum bırakılmışlardır. Maaşları oldukça düşük olup, genellikle fiziksel istismar ve ihmal ile karşı karşıya kalmışlardır. Sanayi Devrimi dönemindeki çocuk işgücü sömürüsü, birkaç faktörün etkisiyle beslenmiştir. Yoksulluk, çalışan aileler arasında oldukça yaygındı. Bu durum ebeveynleri çocuklarını ev gelirini artırmak için işe göndermeye zorluyordu. Ayrıca, endüstrileşmenin ve kentleşmenin hızlı temposu, geleneksel aile yapılarını ve toplumsal normları bozarak, geleneksel çocuk yetiştirme ve denetim biçimlerinin çökmesine neden olmuştur. Dahası, etkili iş düzenlemeleri ve uygulama mekanizmalarının eksikliği, işverenlerin çocuk işçiliği cezasız olarak sömürmesine izin veriyordu. Birçok durumda çocuklar sağlıkları, gelişimleri ve refahları için zararlı olan koşullarda çalışmaktaydılar, eğitime veya sosyal hareketlilik fırsatlarına erişemiyorlardı. Sanayi Devrimi sırasında çocuk işçilerin sıkıntısı, geniş çapta sosyal reform hareketlerine ve çocuk haklarını korumak için yasal önlemler alınmasına yol açtı. Zaman içinde, çocuk işçiliği kısıtlamayı, çalışma koşullarını iyileştirmeyi ve eğitime erişimi genişletmeyi amaçlayan yasalar ve düzenlemeler çıkartmak için kararlı çabalar sarf edildi. Sanayi Devrimi ile çocuk işçilik arasındaki ilişki, tarihsel bağlamda kök salmasına rağmen, günümüzde hala etkisini sürdürmektedir.

Tüm bunların yanında çocuk işçilik, ailelerin ekonomik zorluklarla veya yoksullukla karşılaştığı durumlarla da ilişkilidir. Aileler temel ihtiyaçlarını karşılamakta zorlandığında, çocukları ev gelirini artırmak için bir araç olarak görebilirler. Birçok durumda çocuklar tercihen değil, ailenin hayatta kalmasıyla ilgili olarak kazançlarının hayati önem taşıdığı durumlarda ihtiyaçtan dolayı işe gönderilirler. Eğitime erişim eksikliği, sosyal koruma ve yeterli istihdam fırsatlarının olmaması gibi faktörler, çocuk işçilik olasılığını artırabilir. Kaliteli eğitime erişim olmadan, çocuklar gelecekte daha iyi ücretli işleri sağlayacak temel becerileri ve bilgileri geliştirme fırsatına sahip olmayabilirler. Ayrıca, etkili sosyal koruma mekanizmalarının bulunmaması, aileleri ekonomik şoklara karşı savunmasız bırakır ve çocuk çalıştırılmasına başvurma olasılığını artırır. Bazı durumlarda, kültürel normlar ve toplumsal tutumlar da çocuk işçiliğin devamını destekleyebilir. Çocuk işçiliğinin normalleştirildiği toplumlarda, aileler çocuklarını küçük yaşlardan itibaren işe göndermeye daha meyilli olabilirler. Ek olarak, küreselleşme ve kayıt dışı işlerin genişlemesi, çocuk işçiliğin oluşması için uygun koşulların sağlanmasına katkıda bulunabilir. Tarım, imalat ve ev içi işler gibi sektörlerde, kayıt dışı istihdamın yaygın olduğu ve iş standartlarının sıklıkla göz ardı edildiği yerlerde, çocuklar özellikle sömürü ve istismara maruz kalabilirler. Genel olarak, çocuk işçilik, ekonomik, sosyal, kültürel ve kurumsal birçok faktörün etkisiyle karmaşık bir olgudur. Çocuk işçilikle başa çıkmak, yoksulluk, eğitim eksikliği, yetersiz sosyal koruma ve iş yasalarının zayıf uygulanması gibi temel nedenleri ele alan çok yönlü bir yaklaşım gerektirir. Bu temel faktörleri ele alarak, toplumlar çocukların sömürüden korunduğu ve potansiyellerini gerçekleştirme fırsatına sahip olduğu ortamlar yaratabilirler.

Öte yandan, ortadan kaldırılması amaçlanan en kötü biçimlerdeki çocuk işçilik meselesi, büyük önem taşıyan ve acil müdahale gerektiren bir konudur. "En kötü biçimlerdeki çocuk işçilik" terimi, Uluslararası Çalışma Örgütü (ILO) 182 Sayılı En Kötü Biçimlerdeki Çocuk İşçiliğin Ortadan Kaldırılması İçin Acil Eylem Sözleşmesi'nde belirtildiği gibi, çocukların sağlığına, güvenliğine ve genel refahına yönelik önemli riskler taşıyan en ciddi ve zararlı çocuk sömürüsü örneklerini ifade eder. Bunlar, çocukların tehlikeli makineleri kullanma gibi fiziksel tehlikelere maruz kaldığı ya da madenler veya inşaatlar gibi güvenli olmayan ortamlarda çalıştığı tehlikeli işler gibi çeşitli iş türlerini kapsar. Zorla çalıştırma, çocukların istekleri dışında işe zorlanması veya kandırılmasıyla gerçekleşen başka bir biçimdir. Bu genellikle borç bağı veya kaçakçılık yoluyla olur. Ayrıca, çocuklar ticari amaçlı cinsel sömürüye maruz kalabilir. Fuhuş, pornografi veya diğer cinsel istismar biçimlerine para kazanmak için tabi tutulabilirler. Çocuk kaçakçılığı, çocukların sömürü amacıyla toplanması, taşınması veya barındırılmasını içerirken, çocukların uyuşturucu kaçakçılığı, kaçakçılık veya silahlı çatışma gibi tehlikelerle karşılaşmasına neden olan yasadışı faaliyetlerde kullanılması, çocukların temel haklarını ihlal eder ve uluslararası hukuk tarafından yasaklanmıştır. En kötü biçimlerdeki çocuk işçilik ile başa çıkmak, yoksulluk, sınırlı eğitime erişim ve yetersiz yasal korumalar gibi temel faktörleri ele alan çok yönlü bir yaklaşım gerektirir. Stratejiler, yasal reformlar, farkındalık kampanyaları, sosyal destek girişimleri ve savunmasız çocukları ve ailelerini desteklemeyi hedefleyen müdahaleleri içerebilir. Çocuk işçiliğin kök nedenlerini ve sonuçlarını ele alarak, toplumlar çocukların gelişmesi için daha güvenli ve daha adil ortamlar yaratma çabası içinde olmalıdırlar.

Bu çalışma, çok yönlü bir sorunu incelemeyi hedefleyerek kapsamlı bir analiz sunmayı amaçlamaktadır. İlk olarak, Türkiye'nin 2019'a kadar olan ilerlemesini titizlikle değerlendirmeyi ve bu sayede 2023'e kadar en kötü biçimlerdeki çocuk işçiliği ortadan

kaldırmayı hedefleyen ulusal kalkınma programlarının hedeflerine ne ölçüde uyum sağladığını araştırmayı amaçlar. Bu değerlendirme, ülke içindeki çocuk işçilikle mücadelede mevcut politika ve girişimlerin etkinliğini aydınlatmak için kritik bir referans noktası sağlar. İkinci olarak, en kötü biçimlerdeki çocuk işçiliğin temel faktörlerini cinsiyete göre ayrılmış bir yaklaşım kullanarak ampirik olarak incelemeyi hedefler. Araştırma, 2012 ve 2019 yıllarına ait ulusal temsiliyeti olan anket verilerini dikkatlice inceleyerek, çocuk işçiliğin yaygınlığına katkıda bulunan karmaşık dinamikleri, özellikle cinsiyet farklılıklarına odaklanarak belirlemeyi amaçlamaktadır. Bu bağlamda, çalışma çocuk işçiliğin temel nedenlerini anlamayı ve politika yapıcılar için yeni perspektifler sunmayı hedeflemektedir.

Bu çalışma, Türkiye'de 2012 ve 2019'da gerçekleştirilen TÜİK Çocuk İşgücü Anketi verilerinin analizini içermektedir. Temel odak noktası, Türkiye'deki en kötü biçimlerdeki çocuk işçiliğin yaygınlığını ve belirleyicilerini değerlendirmektir. Çeşitli sosyo-ekonomik faktörler ile çocukların tehlikeli işlerde çalışma, zorla çalıştırılma veya diğer sömürü nitelikli işlere katılma olasılığı arasındaki ilişkiyi istatistiksel olarak analiz etmek için lojistik regresyon modeli kullanılmıştır. Lojistik regresyon modeli kullanılarak, en kötü biçimlerdeki çocuk işçiliğin önemli belirleyicilerini tahminlemeyi ve Türkiye'nin bu önemli sorunla mücadele etme çabalarının etkinliğini değerlendirmeyi amaçlamaktadır. Bu metodolojik çerçeve, en kötü biçimlerdeki çocuk işçiliğin devam etmesine katkıda bulunan temel faktörlerin titiz bir şekilde incelenmesine olanak tanır.

Temel olarak çalışma, Türkiye'deki en kötü biçimlerdeki çocuk işçilik belirleyicilerini kapsamlı bir şekilde anlama yolunda önemli bir adımı temsil ederken, aynı zamanda ülkenin bu acil sorunu ele almadaki ilerlemesini değerlendirmektedir. Ampirik bulgular, Türkiye'nin çocuk işçilikle ilgili politikalarını güçlendirmesi ve daha etkili müdahale stratejileri geliştirmesi gerekliliğini vurgulayan kritik bulguları ortaya çıkarmaktadır. Ayrıca bulgular, çocuk işçiliğinde yaygın olan cinsiyet eşitsizliklerinin altını çizmekte ve genellikle sömürücü çalışma koşullarına ve uzun saatler süren çalışmaya maruz kalan erkek çocukların karşılaştığı orantısız zorlukları vurgulamaktadır.

Ayrıca araştırma, eğitim düzeyi ile çocukların en kötü biçimlerdeki çocuk işçiliğe katılma olasılığı arasında güçlü bir ilişki tespit etmekte ve eğitimin caydırıcı bir rol oynadığını vurgulamaktadır.

Özetle çalışmanın bulguları, çocuk işçiliğin kök nedenlerinin ele alınmasının kritik bir zorunluluk olduğunu vurgulamaktadır. Çocukların sömürüden uzak, gelişebilecekleri uygun bir ortamın oluşturulmasını sağlanmalıdır. Bu konuda bir ilerleme kaydedebilmek için, eğitim altyapısının güçlendirilmesi, cinsiyet eşitsizliklerinin azaltılması, sıkı tedbirlerin alınması gerekmekte olup hükümet, sivil toplum kuruluşları ve uluslararası kuruluşlar arasında iş birliğinin teşvik edilmesi için yoğun çaba gösterilmelidir. Bu sayede, Türkiye'nin gençleri için daha aydınlık ve daha adil bir gelecek sağlanmış olacaktır.

1. INTRODUCTION

Child labor includes all forms of employment that rob children of their childhood, impede their access to consistent education, and present mental, physical, social, or moral hazards. This term involves the employment of children in work that is often considered inappropriate for their age. Throughout the ages, child labor has been commonplace. In the middle of the 19th century, due to the fact that children were being attracted into industrial settings, child labor became more noticeable. Currently, due to the rise in the number of children manufacturing goods for export, child labor is becoming increasingly obvious (Brown, Deardoff and Stern, 2002).

Child labor manifests in diverse ways, encompassing hazardous tasks, forced employment, and exploitation across sectors like agriculture, manufacturing, mining, and services. This practice contradicts children's rights and correlates with adverse effects on their health, education and holistic growth.

The worst forms of child labor involve situations where children are subjected to extreme exploitation, harm, or abuse. This includes activities such as forced labor, human trafficking, and involvement in hazardous or dangerous work that poses a threat to their health and well-being (ILO Convention 182 Article 3, 1999). According to Convention No. 182 on the Worst Forms of Child Labour, which Türkiye ratified in 2001, the following practices are prohibited: the sale, trafficking, or buying of children; bonded or forced labor; the use of children in armed conflicts; and all forms of practices similar to slavery, such as forced or compulsory labor. Additionally, the convention prohibits using, procuring, or offering a child for prostitution, the production of pornographic materials or performances, and engaging a child in illegal activities, particularly in the production and trafficking of drugs as specified by relevant international agreements. Work that jeopardizes the health, safety, or moral development of children due to its nature or the conditions under which it is performed is also considered among the worst forms of child labor. In these situations, children are often deprived of their basic rights, such as education and a safe environment. Examples of the worst forms of child labor include children being forced to work in

dangerous industries like mining, construction, or factories, where they may face physical injuries, exposure to harmful substances, or long hours of work. Additionally, situations of child trafficking, where children are coerced or deceived into various forms of exploitation, are also considered among the worst forms of child labor.

Efforts to combat the worst forms of child labor involve strict enforcement of laws, international collaboration, and initiatives that aim to provide education, support, and protection for vulnerable children. Eliminating these harmful practices is crucial for ensuring the well-being and development of children around the world.

Child labor and the worst forms of it exhibit parallels as they both entail the exploitation of children, robbing them of their childhood and fundamental entitlements. In both scenarios, children experience disruptions in their typical development, encompassing their physical, mental, and social welfare, alongside infringements upon their basic rights like education access and safeguarding from exploitation. However, they differ in the severity and nature of the exploitation. Child labor, in a broader sense, encompasses all forms of work by children, which may or may not be harmful. On the other hand, the worst forms of child labor involve extreme exploitation, including forced labor, human trafficking, or hazardous work that poses significant risks to the child's health and safety (ILO, 2017). Legal frameworks, international conventions, and efforts to combat both issues are in place, but the worst forms of child labor require particular attention due to the heightened risks and severity involved (UNICEF, 2009). State policies established and implemented regarding the worst forms of child labor in Türkiye focus on child labor in seasonal and small to medium-sized workplaces in agriculture, which involves children working for wages or daily wages under the supervision of employers, and on children working on the streets (United States Department of Labor, 2020) . Indeed, in the National Program on the Elimination of Child Labor prepared by the Ministry of Labor and Social Security in 2017, "Working on the Streets," "Working in Heavy and Hazardous Jobs in Small and Medium-Sized Enterprises," and "Working in Seasonal and Temporary Agricultural Jobs for Wage Outside of Family Business" were identified as the worst forms of child labor in Türkiye (Ministry of Labour and Social Security, Republic of Türkiye, 2017). Furthermore, according to the first paragraph of Article 69 of the Labor Law No. 4857; workers under the age of 18 cannot be employed in tasks that involve preparation, completion, and cleaning, as well as in the production and

wholesale of alcohol, tobacco, and substances leading to addiction, the wholesale and retail sale of flammable, explosive, harmful, and hazardous materials, and the production, processing, and storage of such substances, as well as any work involving exposure to such materials, tasks carried out in environments with high noise and/or vibration, jobs requiring working in extremely hot or cold conditions, tasks involving harmful substances leading to health risks and occupational diseases, jobs involving exposure to radioactive materials and harmful radiation, jobs requiring excessive attention and continuous standing, piece-rate and incentive-based payment jobs, jobs excluding the possibility of returning home or to their family after work, jobs exceeding their physical and psychological capabilities according to the workplace physician's report, jobs involving lack of education, lack of experience, or lack of attention to safety, tasks involving money handling and collections, as well as tasks carried out during the night period specified. All these mentioned factors lead to the worst forms of child labor, exposing children to physical danger and/or severe psychological trauma that may have lifelong effects (Kayaoglu, 2022).

As mentioned before, according to the International Labour Organization (ILO), children aged 5 to 17 are determined to be child laborers. Being kept away from school and working as a child between 5 and 17 can have detrimental effects on the well-being of those children. These effects can be seen in different forms in childhood, later in adolescence, or later in adulthood.

Still, in today’s world, child labor stands as a pressing global issue, significantly impacting the well-being of children worldwide. According to data from the International Labour Organization (ILO) in 2022, an estimated 152 million children between the ages of 5 and 17 are currently involved in various forms of child labor across the globe (ILO, 2022). This concerning figure encompasses diverse economic sectors such as agriculture, manufacturing, and services. Although there has been a discernible decline in child labor rates over the past two decades, the progress has been uneven, with persistent challenges. Notably, Sub-Saharan Africa bears a disproportionate burden, contributing to approximately one-fifth of the global total of child labor cases (ILO, 2022). Additionally, the Asia and Pacific region continues to grapple with substantial child labor issues, representing nearly half of the total number of child laborers worldwide (ILO, 2022). Ongoing efforts to combat child labor involve collaborative international initiatives, legislative measures, and interventions

targeting root causes like poverty and limited access to education. Despite advancements, the persistent prevalence of child labor underscores the critical need for sustained global commitment to eliminate this violation of children's rights and ensure their comprehensive development.

Türkiye has been actively addressing the issue of child labor through legislative measures and international commitments. The Turkish government has ratified key International Labour Organization (ILO) conventions related to child labor, demonstrating a commitment to addressing this concern (ILO, 2022). However, challenges persist, with child labor often associated with informal sectors, agriculture, and seasonal work, particularly in rural areas. Economic factors, poverty, and limited access to quality education contribute to the prevalence of child labor in the country. Governmental efforts to mitigate child labor in Türkiye include the introduction of laws aimed at regulating child labor, promoting school attendance, and strengthening labor inspection mechanisms (ILO, 2022). One of the legislative measures aimed at addressing child labor focused on prohibiting and eliminating the worst forms. In Türkiye, the worst forms of child labor are defined and regulated by national legislation and international conventions. According to Türkiye's Labor Law No. 4857 and the Regulation on the Worst Forms of Child Labor, these forms encompass activities that pose significant risks to the health, safety, or morals of children. Such forms include work that exposes children to physical, psychological, or sexual abuse, tasks performed underground, underwater, at dangerous heights, or in confined spaces, and jobs involving hazardous substances, machinery, or conditions that endanger children's well-being. Additionally, any work that interferes with children's education or social development is also classified under the worst forms of child labor. In pursuit of this objective, Türkiye ratified the International Labour Organization (ILO) Convention No. 182 in June 1999. Subsequently, Türkiye officially endorsed the adoption of ILO Convention No. 182 on January 25, 2001, through Law No. 4623. In line with the principles delineated in ILO Convention No. 182, Türkiye's Ministry formulated the "National Time-Bound Policy and Programme Framework for the Elimination of Child Labour" in 2005. This initiative sought to eradicate the worst forms of child labor by fostering collaborative endeavors among relevant institutions and organizations. Furthermore, Article 71 of Labour Law No. 4857 was promulgated in the Official Gazette on April 6, 2004. According to Article 71, it is prohibited to

employ children under the age of 15, with regulations stipulating and restricting children's working hours. Additionally, the Turkish government introduced Law No. 6287, which amended the Primary Education and Education Law along with other statutes. Published in the Official Gazette on April 11, 2012, under identification number 28261, this legislation extended the duration of compulsory education from 8 to 12 years, a system commonly known as 4+4+4 (Ministry of Labour and Social Security, Republic of Türkiye, 2017; ILO).

The primary objectives of this educational reform included elevating the average duration of education within society and structuring the education system to better cater to individuals' interests, needs, and abilities. This legislative change mandated that students in the 8th grade during the 2011-2012 school year were required to complete a full 12 years of schooling, while those who had already finished the 8th grade earlier had the option to discontinue their education (Dayioglu, 2007). After this reform in Türkiye, studies were carried out to investigate the effects of the extended compulsory education period on child labor.

These steps were helpful in reducing child labor in Türkiye. However, considering that although it has decreased, child labor still exists. So that, new and continuous steps are beyond necessary for being able to ensure reliable protection for children. Efforts to eliminate child labor involve both legal and social measures, including the establishment and enforcement of laws to protect children from exploitation, the promotion of education, and the creation of awareness about the importance of child rights. International organizations, governments, and non-governmental organizations play crucial roles in addressing and combating child labor globally.

The subsequent sections of this thesis are structured as follows: Section 2 provides a comprehensive review of literature pertaining to child labor, both globally and within Türkiye. Section 3 offers the hypotheses of the research question. Section 4 encompasses the presentation of data, including descriptive statistics and correlation analysis, followed by an exposition of the methodology employed. Section 5 gives an examination of the empirical testing of various aspects of child labor and the worst forms of it is presented. Finally, Section 6 offers concluding remarks, summarizing the findings and proposing policy recommendations.

2. LITERATURE REVIEW

Child labor has been a long-standing problem, and despite all the policies, bans, and initiatives aimed at reducing this situation, it remains a prevalent issue in today's world. According to the International Labor Organization (ILO), child labor is a term that describes employment that robs children of their childhood, potential, and dignity and poses risks to their physical and mental development.

Researchers employed two theoretical approaches in order to analyze intra-household resource allocation. The first one is the household production theory. It focuses mainly on maximizing households' common utility. However, there is a constraint. It is the total income of household. This theory indicates that households simultaneously produce and consume. So, this situation requires efficient time allocation to optimize common utility. This approach is frequently applied in child labor studies. And the second approach is the bargaining model. It challenges the notion of a shared household utility function. According to this model, each household member has their own utility, which leads them to allocate more resources toward activities they individually prefer.

Basu (1999) examines child labor using both the bargaining model and intra-household production theory. The goal is to find a sustainable solution to the child labor problem. His analysis is based on the 'unitary model'. This model treats the household as a single decision-making unit. It is valid only if one member dictates terms for the rest or all members have the same utility function. He criticizes this approach, arguing that individuals have different bargaining powers based on their contributions to the household. In order to solve the child labor problem, Basu suggests two primary policy approaches. He suggests government intervention and public action to change the economic environment. He advocates for minimal restrictions, such as prohibiting hazardous and worst forms of child labor, to avoid worsening the situation.

Basu and Van (1998) evaluate child labor with two models to find solutions, considering the existence of multiple equilibrium points. They identify a "good" equilibrium, where children do not work, and a "bad" equilibrium, where parents send their children to work to help increase household income. The study suggests that higher adult wages could reduce child labor.

Baland and Robinson (2000) examine the efficiency of child labor time and its social welfare implications, arguing that banning child labor could be ‘Pareto improving’ in general equilibrium, a perspective different from other studies. However, in poverty, children may still work in various jobs to survive.

There are also many empirical studies on child labor in the literature. Edmonds and Pavcnik (2005) study the relationship between child labor and household income in Vietnam using panel data analysis. They hypothesize that increased household income leads to a reduction in child labor. Their findings show that as household income increases, the incidence of child labor decreases. This suggests that poverty alleviation efforts are essential in reducing child labor rates.

As mentioned before, Basu and Van (1998) propose a theoretical model showing that higher adult wages can reduce the necessity for child labor. Krueger (1997) empirically supports this hypothesis, examining Mexican labor market data and finding that improvements in adult wages correlate with declines in child labor rates. Their combined findings suggest that increasing adult wages can play a crucial role in reducing child labor.

Ray (2000) examines the impact of educational access and quality on child labor in Peru and Pakistan using survey data analysis. He hypothesizes that better educational access and quality reduce child labor. His findings indicate that improved school infrastructure and lower education costs are associated with reduced child labor rates, highlighting the importance of enhancing educational opportunities to combat child labor.

Sakellariou and Lall (2000) investigate the effects of compulsory education laws in the Philippines through comparative regional analysis. They hypothesize that strict enforcement of compulsory education laws reduces child labor. Their study finds that regions with stringent enforcement of these laws show significantly lower child labor rates, suggesting that legal measures can effectively reduce child labor.

Bhalotra and Heady (2003) analyze household survey data from Ghana to explore the influence of household structure on child labor participation. They hypothesize that children in larger families or single-parent households are more likely to work. Their findings support this hypothesis, showing that increased financial pressure in these households often necessitates children contributing to the family income.

Dorman (2001) evaluates the effectiveness of minimum-age employment laws in South Korea through comparative analysis. He hypothesizes that strict enforcement of these laws reduces child labor. His findings reveal that countries with stringent child labor laws, like South Korea, have seen significant declines in child labor rates, demonstrating the effectiveness of legal restrictions when properly enforced.

Bhalotra and Tzannatos (2003) explore the impact of financial support programs for poor families on child labor through program evaluation. They hypothesize that financial support can reduce the economic necessity for child labor. Their findings indicate that microfinance programs and other forms of financial support reduce child labor, demonstrating the potential of such interventions as policy tools.

Bundy et al. (2009) investigate the effects of school feeding programs on school attendance and child labor in low-income countries through program evaluation. They hypothesize that these programs increase school attendance and reduce child labor. Their findings show that school feeding programs improve attendance and reduce child labor by alleviating short-term hunger and providing an incentive for children to attend school.

Filmer and Pritchett (1999) use impact analysis to analyze the impact of expanding educational access on child labor in rural areas. They hypothesize that increased educational access reduces child labor. Their findings suggest that building more schools, reducing education costs, and improving transportation significantly reduce child labor rates, emphasizing the importance of educational access.

These empirical studies provide a comprehensive understanding of the factors influencing child labor and the effectiveness of various policy interventions. By addressing economic, educational, and legal aspects, a multifaceted approach can significantly reduce child labor and its long-term consequences.

In its most severe forms which is called as worst form of child labor, it includes children facing enslavement, detachment from their families, exposure to significant risks and illnesses, and/or being left to navigate the challenges of urban streets – often from a very young age. To elaborate further, according to Article 3 of the ILO Convention No. 182, the term "worst forms of child labor" encompasses various exploitative practices including slavery, forced labor, and debt bondage. Additionally, it includes activities such as exploiting children for prostitution or the production of pornography, as well as involving them in illicit practices like drug trafficking. Furthermore, it encompasses work that poses risks to the health, safety, or moral integrity of children. In addition to all these, child labor deters children from many things, especially education, which is an important factor contributing to a child's development. Education plays an important role in the development of children.

Ravallion and Wodon (2000) argue that child labor and schooling are imperfect substitutes. This means that simply increasing access to schooling may not be enough to eliminate child labor entirely. Their research suggests that there are other factors, such as poverty, cultural norms, and the availability of alternative income sources, that influence a child's decision to engage in labor. Therefore, comprehensive strategies to address child labor should consider these factors alongside efforts to improve access to education. Because of the urgency of this problem, global public policy issues now prioritize the abolition of child labor.

According to Deardorff and Stern (2001), this process has led to the implementation of laws requiring schooling in many developing nations to guarantee that all children complete a minimum number of years of education. Numerous studies examine the correlation between child labor and education, making the literature quite rich in this context.

Little evidence for significant external returns to education is found in Acemoglu and Angrist's (2000) analysis of U.S. census microdata on educational attainment to investigate the effects of mandatory schooling and child labor regulations. In contrast, compulsory education initiatives have improved enrollment in other nations far more successfully.

For instance, Brunello, Fort, and Weber (2009) demonstrated how school reforms affected the number of years that students spent in school in 12 European nations and

demonstrated that the upward shift over the reform period is readily apparent and about equivalent to 0.3 extra years of education.

Upon reviewing the Turkish literature, there are many studies examining the factors influencing child labor. Tansel (1998) explores the determinants of child labor and schooling in Türkiye using data from the 1994 Household Labor Force Survey. The hypothesis is that economic and demographic factors significantly influence child labor participation and educational attainment. By employing a probit model, the analysis reveals that household income, parental education, and urban versus rural residence play crucial roles. Higher household income and parental education levels are associated with reduced child labor and increased school attendance. Conversely, children from rural areas are more likely to be engaged in labor than their urban counterparts, largely due to agricultural demands and lower access to educational facilities.

Kayaoglu and Kanun's study (2019) on "Child Labor and Its Sectoral Distribution in Turkey" analyzes data from the 2012 Child Labor Survey, revealing that girls are more likely to engage in agricultural work, while boys are predominantly found in manufacturing. The study also highlights that household size and parental education levels significantly influence the prevalence of child labor, with a stronger negative impact of child labor on education observed for children aged 15 to 17. The influx of Syrian refugees has further exacerbated the issue of child labor in Türkiye.

Dayıoğlu (2006) investigates the gender dimensions of child labor in Türkiye using data from the 1999 Child Labor Survey. The study hypothesizes that boys and girls are involved in different types of work and face distinct educational outcomes. Using a multinomial logit model, the findings indicate that boys are more likely to be engaged in economic activities outside the home, while girls are more often involved in household chores. This gender division affects schooling, with working boys showing lower school attendance and performance compared to girls, who manage to balance school and household responsibilities more effectively. However, both groups suffer educational setbacks due to their labor involvement.

Ersado (2005) analyzes the impact of economic shocks on child labor and school enrollment in rural Türkiye. Utilizing panel data from rural households, the study hypothesizes that adverse economic conditions increase child labor and decrease

school enrollment. The empirical results support this hypothesis, showing that during periods of economic hardship, households rely more on children's labor contributions to maintain income levels. This is particularly evident in agricultural regions where seasonal fluctuations in income can lead to higher child labor during off-peak seasons.

Tunalı (1996) investigates the determinants of child labor in Türkiye, focusing on the economic and demographic factors that influence children's participation in the labor force. Utilizing data from the 1988 Turkish Household Expenditure Survey, the study hypothesizes that household income, parental education, and family size are significant predictors of child labor. The econometric analysis reveals that lower household income and larger family sizes are associated with higher child labor rates. Additionally, parental education, especially maternal education, plays a crucial role in reducing child labor, as educated parents are more likely to prioritize their children's schooling over economic contributions.

Apart from these, there are also many studies examining the relationship between compulsory education laws and child labor outcomes. Dayıoglu and Kırdar (2020) examined the impact of Türkiye's 1997 education reform, which extended the compulsory schooling from 5 to 8 years on child labor outcomes and found that school enrollment and child labor were highly substitutable in rural areas, but the effect was bigger in urban areas. Additionally, Dincer and Erten (2015) used the change in compulsory schooling law in 2012 in Türkiye, which extended compulsory education from 8 years to 12 years, to estimate the causal effects of high school attendance on the incidence of child labor. They suggested various results that depend on the degree of tightness in the child labor markets and the levels of poverty in the various regions. According to their findings, for boys, the reform resulted in a large reduction in child labor, particularly in the industrial sector, while for girls, the reform resulted in a smaller tradeoff between school attendance and child labor in the services sector. For both boys and girls, the reform had a larger impact in richer regions in comparison with those of poorer regions.

Again, in a study by Dayıoglu (2007), the effects of changing cost and benefit structures of work and schooling were examined, and it was found that the negative correlation between the two has gotten stronger over time. Additionally, Dayıoglu (2007) analyzed working children by separating them by gender in this study and found evidence of the increasing detrimental effects of poverty on female children's

education as well as a larger desire among households for their male children's education overall. Dayıoglu came to the conclusion that meeting the requirements of low-income families was even more important if children, especially females, were to be kept in school and out of the workforce.

When child labor and its determinants, compulsory education and reforms in this field are examined, we can say that there are many studies on these topics in the literature. While numerous studies have explored the beneficial impacts of compulsory education reforms on child labor, making significant contributions to the broader discourse on child labor, there is a notable scarcity of research specifically addressing the worst forms of child labor in existing literature.

Hoque (2022) investigates the factors influencing hazardous child labor in Bangladesh using data from household surveys. Employing econometric methodologies like regression analysis and probit models, the study explores the correlation between child labor and household attributes such as poverty, parental education, and access to social services. The findings reveal that household poverty, parental educational attainment, and availability of social services significantly impact hazardous child labor in Bangladesh. Specifically, the research indicates that children from economically disadvantaged households with lower levels of parental education are more prone to engaging in hazardous labor. Moreover, inadequate access to essential social services, including education and healthcare, heightens the vulnerability to child labor. These empirical results emphasize the necessity for targeted interventions aimed at addressing socio-economic disparities and enhancing access to education and social welfare programs to mitigate hazardous child labor.

Kapar (2019) explained in depth the items included in the definition of the worst forms of child labor in his study on the worst forms of child labor and Türkiye. However, there is no empirical study conducted on the factors affecting the worst forms of child labor in Türkiye.

Although it is essential to eliminate the worst form of child labor in the world and in Türkiye within the scope of ILO targets, it is obvious that the studies on this subject are limited. However, more studies on an issue that needs to be resolved urgently could have a great impact on solving this problem. In this context, the objective of this thesis is to provide a comprehensive investigation into the most severe types of child labor

in Türkiye and to empirically analyze the factors impacting these forms of labor. Additionally, it seeks to assess Türkiye's advancements up to 2019, which are aligned with the objectives of national development initiatives aimed at eradicating the most egregious forms of child labor.

3. HYPOTHESES

Based on insights from existing literature on child labor and its determinants, as well as the guidelines delineated in legislation regarding the most severe forms of child labor, several hypotheses are developed to explore the inquiry regarding the factors influencing these adverse labor practices in Türkiye. Tunalı (1996) asserts that certain characteristics such as age, gender, and the educational level of parents play a pivotal role in children's participation in the labor force. My dataset does not involve information about the income of households in total. Although Tansel (2002) claimed that the income of individuals in a family and the schooling characteristics of children in that family are related to each other and there is a positive relation, we could not test for it due to a lack of information about the income of families in our dataset. Because of this case, we could test for the size of the household. Dayioglu, Kirdar, and Koc (2012) examined the effects of the education policy implemented in 1997 and found a negative relation between being student and child labor. So, student status was tested in analysis. Guler and Wingenbach (2016) highlighted that children from households where the head is employed in agriculture are more likely to be engaged in child labor, especially in seasonal and informal agricultural work. This is thought to be due to economic necessity and lack of alternatives. So, household heads working on agriculture are tested in this research.

Moreover, according to the Regulation on Procedures and Principles of Employment of Child and Young Workers, published in the Official Gazette on April 6, 2004, children under the age of 15 are prohibited from working, while those aged between 15 and 17 are limited to 40 hours per week. Hence, these specified conditions are taken into consideration when examining the worst forms of child labor.

In this study, the following hypotheses related to children being in the labor force are tested.

Hypothesis about children aged between 6 and 14 who work:

- H1a: Among children aged between 6 and 14 who work, boys are more likely to be employed than girls.
- H1b: Among families where mother currently works, children aged between 6 and 14 are less likely to be employed.
- H1c: Among families where father currently works, children aged between 6 and 14 are less likely to be employed.
- H1d: The larger the household size is, the more likely the children are to be employed, among children aged between 6 and 14 who work.

Hypothesis about children aged between 15 and 17 who work more than 40 hours per week are as the following:

- H2a: Among children aged between 15 and 17 who work more than 40 hours per week, boys are more likely to be employed than girls.
- H2b: Among children aged between 15 and 17 who work more than 40 hours per week, children who are currently students are less likely to be employed than non-students.
- H2c: Among families where mother currently works, children aged between 15 and 17 are less likely to be employed more than 40 hours per week.
- H2d: Among families where father currently works, children aged between 15 and 17 are less likely to be employed more than 40 hours per week.
- H2e: The larger the household size is, the more likely the children are to be employed, among children aged between 15 and 17 who work more than 40 hours per week.

Hypothesis about children who work under conditions involving risks:

- H3a: Boys are more likely to be employed under risky conditions.
- H3b: Children aged between 15 and 17 are more likely to be employed under risky conditions.
- H3c: Children who currently attend school are less likely to be employed under risky conditions.

Hypothesis about children who work in bad working environments:

- H4a: Boys are more likely to be employed in bad working environments.
- H4b: Children aged between 15 and 17 are more likely to be employed in bad working environments.
- H4c: Children who currently attend school are less likely to be employed in bad working environments.
- H4d: The larger the household size is, the more likely the children are to be employed in bad working environments.

Hypotheses about the education levels of mother and father and about sector the household head works are as follows:

- H5a: It is more likely for a child to be employed in the worst form if the household head works in the agricultural sector.
- H5b: It is less likely for a child to be employed if the education level of mother increases.
- H5c: It is less likely for a child to be employed in the worst form if the education level of the father increases.

Hypotheses about the working status of father and mother are:

- H6a: It is more likely for a child to be employed in the worst form if both mother and father do not work.
- H6b: It is less likely for a child to be employed in the worst form by at least one of the parents.

4. DATA AND METHODOLOGY

In this section, details regarding the data source and its structure will be provided, alongside an overview of the descriptive statistics and summary statistics for the variables. Additionally, the pairwise relationships between variables will be presented.

4.1 Data

The data utilized in this study was sourced from the 2012 and 2019 Child Labor Surveys conducted by the Turkish Statistical Institute (TURKSTAT). These surveys were meticulously designed to furnish policymakers and researchers with comprehensive insights into the multifaceted nature of child labor phenomena within Türkiye. The surveys encompass a rich array of variables that delve into potential determinants and implications of child labor, including factors related to individual, household, and community-level dynamics. Key variables cover aspects such as the socio-economic status of parents, educational attainment levels, and various indicators shedding light on the circumstances surrounding child labor. Data collection for both surveys took place over consecutive weeks in October, November, and December, covering the entire span from Monday to Sunday. The precise timing and broad coverage of these surveys provide a strong basis for exploring the intricacies of child labor and devising well-informed policy measures. Information was gathered through Computer Assisted Personal Interviews (CAPI), which entailed conducting face-to-face interviews with household members. Data collectors used computers to input respondents' answers to the survey questions during the interview sessions.

The inquiries in these surveys can be classified into four primary categories.

1. Individual and Education-Related Factors: Respondents are asked standard questions concerning individuals and their educational backgrounds, including

their age groups, gender, current school attendance status, and the highest level of education completed, etc.

2. Family Related Factors: Questions related to respondents' families such as age groups, education levels, working status, household sizes, and sector of employment etc.

3. Employment Factors: Questions related to children who are currently in labor force such as sector, working hours, type of workplace etc.

4. Worst Form Risk Factors: Questions that tries to measure the risk that can be faced during work such as having injury, discomfort due to working conditions, being subject to physical ol verbal violations and questions related working environment such as inadequate lighting, exposure to various chemicals and etc.

Since some questions and answers in the 2012 Child Labor Survey and the 2019 Child Labor Survey were not directly matched in the datasets due to differences in how the questions were grouped, certain adjustments were made to align the data in the appended dataset. For instance, while the age group variable in the 2012 dataset consisted of two categories, in the 2019 dataset, the age group variable consisted of three categories. Furthermore, while the rural-urban distinction was present in the 2012 child labor data, it was absent in the 2019 data. Therefore, although the study aimed to consider the rural-urban distinction, it was not feasible. Additionally, in the 2012 child labor dataset, questions regarding the family were asked under the title of household head, whereas in the 2019 dataset, questions directed at mothers and fathers were more detailed. For example, information about mothers' and fathers' education statuses was provided separately, rather than under a single variable titled household head. Such differences can constrain the analysis in certain respects. I am of the opinion that these surveys, conducted at regular intervals, should adhere to consistent question patterns and response categories without alterations. Certainly, new questions can be added or developed to measure different circumstances. However, in such cases, questions should be classified, and information should be provided about changes occurring between years to shed light on research, guide direction, and prevent potential errors.

Despite these constraints, all necessary research has been conducted, and the data have been collected under a single dataset.

4.1.1 The descriptive statistics of variables

In this section of the dissertation, the main emphasis is on clarifying the variables and their distinct attributes. Subsequently, pairwise tabulations will be provided to identify any discrepancies. By utilizing pairwise tabulations in conjunction with descriptive statistics, our objective is to gain a deeper understanding of the variables' characteristics.

4.1.1.1 Variables

Information about the dependent and independent variables used will be given in this part of the dissertation.

4.1.1.1.1 Dependent variables

In this study, being a child labor in the worst form is a dependent variable for the first model. We created a dummy variable among children aged between 6 and 14 who work. It takes the value ‘1’ if the child works with these features, otherwise ‘0’.

The second model's dependent variable is child labor in its worst form. We created a dummy variable among children aged between 15 and 17 who work more than 40 hours per week. It takes the value ‘1’ if the child works with these features, otherwise ‘0’.

Being a child laborer in risky conditions is a dependent variable for the third model. We created a dummy variable among children who work under risky conditions, such as children who are injured during work, are subjected to physical/verbal violence, or experience discomfort due to working conditions. It takes the value ‘1’ if the child works with these features, otherwise ‘0’.

Being a child laborer in the bad working environment is a dependent variable for the fourth model. It takes the value ‘1’ if the respondents work under physically bad working conditions such as inadequate lightening, excessive noise, extreme heat or cold, working with a posture that affects physical health that can cause to be at risk of accidents and etc., otherwise ‘0’.

Being a child labor in the worst form is the dependent variable for the fifth model. It is a dummy variable taking the value ‘1’ if the child is working, and ‘0’ otherwise.

Being a child labor in the worst form is the dependent variable for the sixth model. It is a dummy variable taking the value ‘1’ if the child is working, and ‘0’ otherwise.

4.1.1.1.2 Independent variables

In order to assess the factors influencing the worst forms of child labor in Türkiye, the following independent variables are used for testing the hypothesis of this dissertation:

- Age group: A dummy variable with value ‘1’ for children aged between 15 and 17, ‘0’ for children aged between 6 and 14.
- Gender: A dummy variable takes the value ‘1’ for males and ‘0’ for females.
- Household Size: A continuous variable with minimum value of ‘1’ and maximum value of ‘23’ for the year 2012, minimum value of ‘1’ and maximum value of ‘17’ for the year 2019.
- Student: A dummy variable equals to ‘1’ if respondents go to school and ‘0’ otherwise.
- Sector of Household Head: A dummy variable takes the value of ‘1’ if the sector in which the head of household works is agriculture, ‘0’ for non-agricultural sectors. This data exists only for the year 2019.
- Education Level of Mother: A categorical variable showing the education level of mother. It is ‘1’ for the ones with no literacy, ‘2’ for education below high school, ‘3’ for highschool education, ‘4’ for vocational or technical highschool, and ‘5’ for university degree. This data exists only for the year 2019.
- Education Level of Father: A categorical variable showing the education level of father. It is ‘1’ for the ones with no literacy, ‘2’ for education below high school, ‘3’ for highschool education, ‘4’ for vocational or technical highschool, and ‘5’ for university degree. This data exists only for the year 2019.
- Working Status of Mother: A dummy variable takes the value of ‘1’ if mother works, ‘0’ for otherwise. This data exists only for the year 2019.
- Working Status of Father: A dummy variable takes the value of ‘1’ if father works, ‘0’ for otherwise. This data exists only for the year 2019.

- Non-working Parents: A dummy variable taking the value of '1' if both mother and father do not work, otherwise '0'.
- At Least One Working Parent: A dummy variable taking the value of '1' if at least one of the parent; mother or father work, otherwise '0'.

For the first model, independent variables used are gender, student, household size, working status of mother and working status of father. For the second model, independent variables used are gender, student, household size, working status of mother and working status of father. For the third model, independent variables used are age group, gender and student. For the fourth model, independent variables used are age group, gender, student and household size. For the fifth model, independent variables used are sector of household head, education level of mother and education level of mother. For the sixth model, independent variables used are non-working parents and at least one working parent.

4.1.1.2 The summary statistics of variables

In this section, Table 4.1 provides the summary statistics for the variables. This table presents the mean, standard deviation, as well as the minimum and maximum values of these variables.

Table 4.1 : Summary statistics of variables.

Variables	Mean	Std. Dev	Min	Max
Worst Form 1 (Yes:1, No:0)	0.013	0.115	0	1
Worst Form 2 (Yes:1, No:0)	0.019	0.138	0	1
Worst (Yes:1, No:0)	0.014	0.116	0	1
Risky Conditions(Yes:1, No:0)	0.003	0.056	0	1
Bad Conditions (Yes:1, No:0)	0.051	0.221	0	1
Child Labor (Yes:1, No:0)	0.051	0.220	0	1
Age Group (Between 15-17: 1, Between 6-14:0)	0.247	0.431	0	1
Gender (Male:1, Female:0)	0.509	0.499	0	1
Household Size	5.223	1.962	1	23
Student (Yes:1, No:0)	0.896	0.305	0	1
Sector of HH Head (Agriculture:1, Non-agriculture:0)	0.174	0.379	0	1
Working Mother(Yes:1, No:0)	0.131	0.337	0	1
Working Father (Yes:1, No:0)	0.089	0.284	0	1
Non-Working Parents (Yes:1, No:0)	0.131	0.337	0	1
At least one working parent (Yes:1, No:0)	0.370	0.483	0	1
Education Level of Mother (Reference Category: Illiteracy)	2.352	1.113	1	5
Education Level of Father (Reference Category: Illiteracy)	2.756	1.177	1	5

4.1.1.3 Pairwise tabulations of variables

The appended data of 2012 CLS and 2019 CLS contains information about 52,297 children. Children between the ages 6 and 14 are 39,398 people in total, and children between the ages 15 and 17 are 12,908. Table 4.2 shows that 1.79% of children work as child laborers among 6 to 14 aged ones. The remaining 98.21% do not work. 84.65% of children aged between 15 and 17 do not work in this data, and the remaining 15.53% work.

Table 4.2 : Child Labor vs Age Group.

Child Labor	The Age Group of Children		Total
	6-14 Age	15-17 Age	
Not Employed	38,690 98.21%	10,930 84.65%	49,620 94.86%
Employed	706 1.79%	1,982 15.53%	2,688 5.14%
Total	39,396 100%	12,912 100%	52,308 100%

This dataset includes 25,676 female and 26,632 male respondents. Table 4.3 shows that male child workers are more than female ones. 96.97% of females do not work in any type of job, while 3.03% of them work. Also, 92.82% of male children do not work as child laborers and 7.18% of them work.

Table 4.3 : Child Labor vs Gender.

Child Labor	Gender		Total
	Female	Male	
Not Employed	24,899 96.97%	24,721 92.82%	49,620 94.86%
Employed	777 3.03%	1,911 7.18%	2,688 5.14%
Total	25,676 100%	26,632 100%	52,308 100%

Table 4.4 shows that children aged between 6 and 14 who work exist in our dataset. In total, 706 children have these features. While 0.88% of children who work in the worst form are female, 1.8% are male. This makes 1.35% of them who work in the worst form in this dataset.

Table 4.4 : Worst Form 1 vs Gender.

Worst Form 1	Gender		Total
	Female	Male	
Not Employed	25,450 99.12%	26,152 98.20%	51,602 98.65%
Employed	226 0.88%	480 1.8%	706 1.35%
Total	25,676 100%	26,632 100%	52,308 100%

Table 4.5 presents that while the working rate of children aged from 6 to 14 with working mothers is 0.55%, the working rate of children aged between 6 and 14 with non-working mothers is 1.92%.

Table 4.5 : Worst Form 1 vs Mother Working Status.

Worst Form 1	Mother Working Status		Total
	Non-working	Working	
Not Employed	8,228 98.08%	1,255 99.45%	9,483 98.26%
Employed	161 1.92%	7 0.55%	168 1.74%
Total	8,389 100%	1,262 100%	9,651 100%

Table 4.6 presents that while the working rate of children aged from 6 to 14 with working fathers is 0.16%, the working rate of children aged between 6 and 14 with non-working fathers is 1.03%.

Table 4.6 : Worst Form 1 vs Father Working Status.

Worst Form 1	Father Working Status		Total
	Non-working	Working	
Not Employed	18,721 98.97%	1,839 99.84%	20,560 99.05%
Employed	195 1.03%	3 0.16%	198 0.95%
Total	18,916 100%	1,842 100%	20,758 100%

Table 4.7 shows that children whom age is between 15 and 17 and also work more than 40 hours in a week is also exist in our dataset. In total 1,018 children have these

features. While 0.72% of children work in worst form is female, 3.13% of them is male. This makes 1.95% of them works in the worst form in this dataset.

Table 4.7 : Worst Form 2 vs Gender.

Worst Form 2	Gender		Total
	Female	Male	
Not Employed	25,492 99.28%	25,798 96.87%	51,290 98.05%
Employed	184 0.72%	834 3.13%	1,018 1.95%
Total	25,676 100%	26,632 100%	52,308 100%

Table 4.8 shows that children whom age is between 15 and 17, and also work more than 40 hours in a week, and if they are currently students or not. In total 1,018 children have these features. While 0.54% of children work in worst form is also student, 14.12% of them are non-students.

Table 4.8 : Worst Form 2 vs Student.

Worst Form 2	Student		Total
	No	Yes	
Not Employed	4,666 85.88%	46,802 99.46%	51,290 98.05%
Employed	767 14.12%	251 0.54%	1,018 1.95%
Total	5,433 100%	46,875 100%	52,308 100%

Table 4.9 presents that while the working rate of children aged from 15 to 17 who work more than 40 hours per week with working mothers is 0.48%, with non-working mothers is 1.62%.

Table 4.9 : Worst Form 2 vs Mother Working Status.

Worst Form 2	Mother Working Status		Total
	Non-working	Working	
Not Employed	8,253 98.38%	1,256 99.52%	9,509 98.53%
Employed	136 1.62%	6 0.48%	142 1.47%
Total	8,389 100%	1,262 100%	9,651 100%

Table 4.10 presents that while the working rate of children aged from 15 to 17 who work more than 40 hours per week with working mothers is 0.48%, with non-working mothers is 1.62%.

Table 4.10 : Worst Form 2 vs Father Working Status.

Worst Form 2	Father Working Status		Total
	Non-working	Working	
Not Employed	18,677 98.74%	1,814 98.48%	20,491 98.71%
Employed	239 1.26%	28 1.52%	267 1.29%
Total	18,916 100%	1,842 100%	20,758 100%

Table 4.11 presents pairwise correlation between age groups of children and working in risky conditions. In total, we can observe that 165 children works in risky conditions. While 0.09% of them are between 6 and 14 years old, 0.99% of children aged between 15 and 17.

Table 4.11 : Risky Conditions vs Age Groups.

Risky Conditions	The Age Group of Children		Total
	6-14 Age	15-17 Age	
Not Employed	39,359 99.91%	12,748 99.01%	52,143 99.68%
Employed	37 0.09%	128 0.99%	165 0.32%
Total	39,396 100%	12,912 100%	52,308 100%

Table 4.12 shows that while 0.13% of children who work in risky conditions are female, 0.49% of them are male children.

Table 4.12 : Risky Conditions vs Gender.

Risky Conditions	Gender		Total
	Female	Male	
Not Employed	25,642 99.87%	25,501 99.51%	51,143 99.68%
Employed	34 0.13%	131 0.49%	165 0.32%
Total	25,676 100%	26,632 100%	52,308 100%

Table 4.13 indicates that children who involved working in risky conditions are non-student with 1.51%, while 0.18% are student and work in risky conditions.

Table 4.13 : Risky Conditions vs Student.

Risky Conditions	Student		
	No	Yes	Total
Not Employed	5,351 98.49%	46,792 99.82%	52,143 99.68%
Employed	82 1.51%	83 0.18%	165 0.32%
Total	5,433 100%	46,875 100%	52,308 100%

Table 4.14 shows the pairwise tabulation between the age groups of children and being involved in bad working conditions. We can see that children aged between 6 and 14 work in bad conditions by 1.79%. Also, children whom age is between 15 and 17 work in bad conditions by 15.35%.

Table 4.14 : Bad Working Environments vs Age Groups.

Bad Working Conditions	The Age Group of Children		
	6-14 Age	15-17 Age	Total
Not Employed	38,690 98.21%	10,930 84.65%	49,620 94.86%
Employed	706 1.79%	1,982 15.35%	2,688 5.14%
Total	39,396 100%	12,912 100%	52,308 100%

Table 4.15 shows the pairwise relations between children who involved in bad working conditions and their gender. Children who involved in bad working conditions are female by 3.03%, and male by 7.18%.

Table 4.15 : Bad Working Environments vs Gender.

Bad Working Conditions	Gender		
	Female	Male	Total
Not Employed	24,899 96.97%	24,721 92.82%	49,620 94.86%
Employed	777 3.03%	1,911 7.18%	2688 5.14%
Total	25,676 100%	26,632 100%	52,308 100%

Table 4.16 offers the pairwise relations between children' status of being a student or not and working in bad conditions. We can observe that children who are currently student are employed in bad working conditions by 3.18%, while non-students are being employed in bad working conditions by 22.03%.

Table 4.16 : Bad Working Environments vs Student.

Bad Working Conditions	Student		Total
	No	Yes	
Not Employed	4,236 77.97%	45,384 96.82%	49,620 94.86%
Employed	1,197 22.03%	1,491 3.18%	2,688 5.14%
Total	5,433 100%	46,875 100%	52,308 100%

Table 4.17 shows that while the rate of child labor for children whose household head work in agriculture is 12.08%, this rate is 3.16% for non-agricultural sectors.

Table 4.17 : Child Labor vs Sector of HH Head.

Child Labor	Sector of HH Head		Total
	Non-agriculture	Agriculture	
Not Employed	14,975 96.84%	2,859 87.92%	17,834 95.29%
Employed	488 3.16%	393 12.08%	881 4.71%
Total	15,463 100%	3,252 100%	18,715 100%

Table 4.18 indicates that as the mother's education increases, children's employment rates decreases. The employment rate of children of illiterate mothers is 7.08%, the employment rate of children of mothers who have completed primary education is 5.15%, the employment rate of children of mothers who have completed high school is 1.29%, the employment rate of children of mothers who have graduated from vocational or technical high school is 1.43% and finally the employment rate of children of mothers who have completed university is 0.16%.

Table 4.18 : Child Labor vs Education Level of Mother.

Child Labor	Education Level of Mother					Total
	Illiterate	Primary Education	Highschool	Voc. or Tech. Highschool	Undergraduate	
Not Employed	3,346 92.92%	14,419 94.85%	1,911 98.71%	1,449 98.57%	2,465 99.84%	23,590 95.59%
Employed	255 7.08%	783 5.15%	25 1.29%	21 1.43%	4 0.16%	1,088 4.41%
Total	3,601 100%	15,202 100%	1,936 100%	1,470 100%	2,469 100%	24,678 100%

Table 4.19 indicates that as the father's education increases, children's employment rates decreases. The employment rate of children of illiterate fathers is 7.08%, the employment rate of children of fathers who have completed primary education is 5.15%, the employment rate of children of fathers who have completed high school is 1.29%, the employment rate of children of fathers who have graduated from vocational or technical high school is 1.43% and finally the employment rate of children of fathers who have completed university is 0.16%.

Table 4.19 : Child Labor vs Education Level of Father.

Child Labor	Education Level of Father					Total
	Illiterate	Primary Education	Highschool	Voc. or Tech. Highschool	Undergraduate	
Not Employed	558 93.91%	13,027 93.96%	2,309 98.01%	2,335 97.66%	3,542 99.49%	21,771 95.61%
Employed	41 6.84%	837 6.04%	47 1.99%	56 2.34%	18 0.51%	999 4.39%
Total	599 100%	13,864 100%	2,356 100%	2,391 100%	3,560 100%	22,770 100%

Table 4.20 indicates that ıf both parents are not working in the family, 7.27% of the children are working.

Table 4.20 : Child Labor vs Non-Working Parents.

	Non-Working Parents		
Child Labor	**No**	**Yes**	**Total**
Not Employed	43,253 95.18%	6,367 92.73%	49,620 94.86%
Employed	2,189 4.82%	499 7.27%	2,688 5.17%
Total	45,442 100%	6,866 100%	52,308 100%

Table 4.21 indicates that, in cases where at least one of the parents in the family works, the working rate of children is 4.54%.

Table 4.21 : Child Labor vs At Least One Working Parent.

	At Least One Working Parent		
Child Labor	**No**	**Yes**	**Total**
Not Employed	31,138 94.51%	18,482 95.46%	49,620 94.86%
Employed	1,808 5.49%	880 4.54%	2,688 5.14%
Total	32,946 100%	19,362 100%	52,308 100%

4.2 Methodology

In this part of the study, the methodology used in this thesis is explained. In order to test the hypothesis mentioned in the third section, a logit model is presented based on the Child Labor Survey (CLS). To do so, different dependent variables used for different models. They are worst form 1, worst form 2, risky conditions, bad working conditions and child working which are binary dependent variables are used. These binary dependent variables takes the value of '1' if the child is currently working and takes the value of '0' otherwise.

4.2.1 Logit model specifications

In this study, logistic regression which is commonly known as the logit model is employed for analyzing the relationship between the dependent variable and independent variables. The logit model is a statistical method used for binary

classification tasks. In this model, the dependent variable is binary with two possible outcomes. By doing so, the probability of a binary outcome based on one or more predictor variables is analyzed (Hosmer, Lemeshow and Sturdivant, 2013). This model is widely used in various fields like epidemiology, economics, social sciences, and biomedical research.

The prerequisities for using logit model encompass several key considerations. Firstly, the dependent variable must be categorical, typically binary for binary logistic regression, and multinomial or ordinal for multinomial and ordinal logistic regression, respectively. Secondly, the independence of observations assumption should hold, implying that observations in the dataset are not influenced by each other. Additionally, the absence of multicollinearity among independent variables is essential to ensure the model's stability and accuracy. Moreover, an adequate sample size relative to the number of predictor variables is necessary to produce reliable estimates and valid inferences (Hosmer, Lemeshow, & Sturdivant, 2013; Long & Freese, 2014; Menard, 2002).

Upon closer examination, it becomes evident that logistic regression operates on the fundamental premise that the association between the predictor variables and the log odds of the outcome variables adheres to linearity. The log odds, alternatively referred to as the logit function, denote the natural logarithm of the odds pertaining to the occurrence of an event. This concept is expressed as follows:

$$logit(p) = ln\left(\frac{p}{1-p}\right) \tag{4.1}$$

Where p is the probability of the event occuring.

In logistic regression, the goal is to determine coefficients (β) for predictor variables that optimize the likelihood of observing a specific outcome. These coefficients are then utilized with the logistic function, or sigmoid function, to convert the linear combination of predictor variables into predicted probabilities. This method is widely employed in statistical modeling to predict binary outcomes.

The logistic function is represented as:

$$p = \frac{1}{1 + e^{-(\beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n)}} \quad (4.2)$$

where:

- p is the probability of event occuring,
- e is the base of the natural logarithm (Euler's number),
- $\beta_0,\beta_1,\ldots,\beta_n$ are the coefficients of the predictor variables,
- $X_1, X_2,\ldots,X_n$ are the predictor variables.

The logistic function converts the linear combination of predictor variables and coefficients into probabilities constrained within 0 and 1. Consequently, we can interpret the coefficients as indicating the impact of a one-unit alteration in the predictor variable on the log odds of the outcome.

$$P(Y = 1 \mid X) = \frac{1}{1 + e^{-(\beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n)}} \quad (4.3)$$

Where $P(Y = 1 \mid X)$ is the probability of the dependent variable Y being in category 1 given the values of the independent variables X, and $\beta_0,\beta_1,\ldots,\beta_n$ are the coefficients estimated by the model.

The equation can be expressed in terms of odds ratio as:

$$\frac{P(Y = 1 \mid X)}{1 - P(Y = 1 \mid X)} = e^{(\beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n)} \quad (4.4)$$

This conversion enables the interpretation of how each independent variable influences the odds of the dependent variable falling into the '1' category. The model is then fitted using maximum likelihood estimation to gauge parameters that optimize the probability of observing the outcomes.

In comprehending marginal odds ratios within a logistic regression model, it entails grasping the impact of a one-unit alteration in an independent variable on the odds of the dependent variable, as outlined by Allison (1999).

In logistic regression, the marginal odds ratio signifies the shift in the odds of the dependent variable with a one-unit rise in an independent variable, while keeping all other factors constant. This metric measures the influence of a particular independent variable on the odds of the outcome.

Interpreting marginal odds ratios allows researchers to understand the relative importance of different independent variables in influencing the outcome of interest, providing valuable insights into the underlying relationships within the data (Long, 1997).

Logistic regression is particularly useful when the outcome variable is binary (e.g., yes/no, success/failure) and the relationship between the predictor variables and the outcome is nonlinear or the assumptions of linear regression are not met. It is commonly used for binary classification tasks.

To sum up, the logistic regression model predicts the likelihood of a binary outcome by establishing a linear association between predictor variables and the logarithm of the odds of the outcome. Through the logistic function, this linear combination is converted into probabilities. It serves as a versatile and extensively applied statistical method for examining binary outcome data across diverse domains.

4.2.1.1 The unweighted and weighted logit models

Unweighted and weighted logit regressions represent distinct methodologies within logistic regression analysis, each presenting its unique attributes, benefits, and drawbacks.

In the unweighted model, every observation within the dataset is accorded equal significance during the estimation process. This implies that all data points, irrespective of their individual attributes or frequency within the dataset, contribute evenly to the model's fitting procedure. The unweighted logit regression methodology is relatively uncomplicated to implement and comprehend, treating each data point uniformly. It proves especially beneficial in scenarios where the dataset maintains

equilibrium and accurately represents the target population. However, unweighted logit regression may prove inadequate when dataset imbalances exist, such as variations in sample sizes across diverse groups or instances where certain observations exert disproportionate influence compared to others. In such instances, unweighted regression runs the risk of yielding biased parameter estimates and diminished predictive accuracy (King and Zeng, 2001).

Conversely, weighted logit regression employs distinct weights for each observation based on predefined criteria. These weights serve to modulate the impact of each observation on the estimation process, with greater emphasis placed on observations deemed more representative or pivotal. Weighted logit regression frequently finds application in rectifying dataset imbalances, including discrepancies in sample sizes across subgroupings or variations in selection probabilities within survey data. By addressing these imbalances, weighted logit regression enhances the model's representational fidelity and predictive efficacy. Nonetheless, determining appropriate weighting mechanisms poses a challenge, necessitating meticulous consideration of study design and sampling methodologies (Hosmer and Lemeshow and Sturdivant, 2013). Furthermore, weighted logit regression may entail heightened computational complexity.

In essence, both weighted and unweighted logit regressions offer distinct advantages and limitations. Unweighted logit regression is straightforward in execution and interpretation, yet susceptible to bias in the presence of imbalanced data. Conversely, weighted logit regression rectifies dataset imbalances, enhancing representational fidelity, albeit at the expense of requiring meticulous weighting and potentially escalating computational complexity (Gelman and Hill, 2006).

4.2.2 Statistical test for individual parameters

Wald test is employed to evaluate the hypotheses concerning parameter significance within a logistic model, among these examinations, we used just the Wald test and gave information about the maximum likelihood test.

4.2.2.1 Wald test

The Wald test is a statistical technique used to determine the importance of individual parameters within a statistical model like logistic regression. It aims to ascertain whether the estimated coefficient associated with each predictor variable is significantly different from zero, indicating whether the predictor has a substantial effect on the outcome variable.

To utilize the Wald test, first, the coefficients of the predictor variables in model should be estimated and their standard errors should be computed. I is calculated by using the following formula:

$$Wald\ Statistic = \left(\frac{\hat{\beta}}{SE(\widehat{\beta})}\right)^2 \tag{4.5}$$

In this formula, $\hat{\beta}$ is the estimated coefficient for independent variable. And, $SE(\widehat{\beta})$ is the standard error of the coefficient estimate.

The test statistic adheres to a chi-square distribution with one degree of freedom under the null hypothesis that the true coefficient is zero. Thus, to assess the statistical significance of the coefficient, the computed Wald statistic against the critical value from the chi-square distribution with one degree of freedom at the desired significance level (typically 0.05 or 0.01) is compared. If the calculated Wald statistic surpasses the critical value, the coefficient is considered statistically significant, suggesting that the predictor variable significantly influences the outcome variable.

In essence, the Wald test evaluates the importance of individual coefficients in a statistical model by comparing their estimated values to their standard errors. If the calculated Wald statistic exceeds the critical value from the chi-square distribution, the coefficient is deemed statistically significant, implying a meaningful impact of the predictor variable on the outcome (Agresti, 2002).

4.2.2.2 Likelihood ratio test

The likelihood ratio test (LRT) is a statistical technique used to compare the fit of two nested models, typically within the framework of maximum likelihood estimation. It determines whether augmenting a simpler model with additional parameters significantly enhances its compatibility with the observed data.

The assumptions are as follows:

H_0: the reduced model is true.

H_A: the current model is true.

The test statistic for the likelihood ratio test is computed as the difference between the log-likelihoods of the two models, multiplied by -2:

$$LRT = -2\,x\,(lnL_0 - lnL_A) \tag{4.6}$$

The test statistic approximately adheres to a chi-square distribution with degrees of freedom equivalent to the disparity in parameter counts between the two models. Consequently, to ascertain the statistical significance of the test, the computed LRT statistic against the critical value from the chi-square distribution at the desired significance level is compared (typically 0.05 or 0.01).

If the calculated LRT statistic surpasses the critical value, it indicates that the more intricate model offers a substantially better fit to the data compared to the simpler model. Essentially, the additional parameters incorporated into the more complex model capture significant information not captured by the simpler model.

In essence, the likelihood ratio test evaluates whether augmenting a model with additional parameters significantly enhances its compatibility with the observed data. It serves as a robust tool for comparing and selecting models in statistical analysis (Casella, 2002).

5. EMPIRICAL ANALYSIS

Six models are tested in order to assess the factors influencing the worst forms of child labor in two categories, child labor in risky conditions, child labor in bad working conditions and child labor.

The models are as follows:

Model 1: In this model, the dependent variable is called as worst form 1. We created a dummy variable for children who aged between 6 and 14, and also work. The independent variables in this model are gender, being a student or not, household size, mother working status and father working status.

Model 2: In this model, the the dependent variable is called as worst form 2. We created a dummy variable for children who aged between 15 and 17, and also work more than 40 hours in a week. The independent variables in this model are gender, being a student or not, household size, mother working status and father working status.

Model 3: In this model, the dependent variable is risky conditions. If respondents say 'Yes' at least one of the questions of "Have you ever been injured during work?", "Have you ever experienced discomfort during work due to working conditions?", or "Have you ever been subjedted to physical or verbal violence?", then this variable takes the value of '1', otherwise '0'. The independent variables in this model are age groups of children, their gender and their student status.

Model 4: In this model, the dependent variable is bad working conditions experienced in bad working environments. The dataset includes questions about working environments. If respondents claim at least one the the bad working conditions among inadequate lightening, exposure to various chemicals, exposure to loud noise or violent shaking, extreme heat and cold, extreme humidity or lack of moisture, working in a posture that affect physical health and being at risk of accidents, then this variable takes the value of '1', otherwise '0'. The independent variables are age group of children, gender, student status and household size.

Model 5: In this model, the dependent variable is child labor in the worst form. If the child is currently in the worst form of labor force, then it is '1'. The independent variables are working sector of household head, education level of mother and education level of father.

Model 6: In this model, the dependent variable is child labor in the worst form. If the child is currently in the worst form of labor force, then it is '1'. The independent variables are non-working parents and at least one working parent.

5.1 Empirical Results

With these analyses, we explore the reasons behind children being in the worst form of child labor according to their ages and working hours. Additionally, we tested the factors influencing children working at risky conditions and bad working conditions. Lastly, we tested the child labor itself on household features and then, non-working and at least one working parent. In all the models, the logistic regression is run.

In model 1, we can observe that being a male child increases the probability of being in the worst form of child labor by 1.47%, And also we can observe that a one-unit increase in the household size increases the probability of being in the worst form of child labor by 0.17%. If the mother works, then being child laborer in the worst form decreases by 1.24%. If the father works, then being child laborer in the worst form decreases by 1.34%. Therefore, H1a, H1b, H1c and H1d are confirmed.

In model 2, it is observed that being a male child increases the probability of being in the worst form of child labor by 1.09%, and being a student decreases the probability of being in the worst form of child labor by 4.02%. If the mother works, then being child laborer in the worst form decreases by 0.42%. And also, we can observe that a one-unit increase in household size increases the probability of being in the worst form of child labor by 0.11%. Our hypothesis that if the father works, then being child laborer in the worst form decreases the probability of being in the worst form of child labor cannot be interpreted because the result is not significant in terms of its p-value. Therefore, H2a, H2b, H2c, H2e are confirmed.

In model 3, we can observe that being a child aged between 15 and 17 increases the probability of working in risky conditions by 0.46%, being a male child increases the probability of working in risky conditions by 0.16%, and being a student decreases the

probability of working in risky conditions by 0.04%. Therefore, H3a, H3b, and H3c are confirmed.

In model 4, it is observed that being a child aged between 15 and 17 increases the probability of working in bad conditions by 8.86%, being a male child increases the probability of working in bad conditions by 2.5%, being a student decreases the probability of working in bad conditions by 8.43%. And also, we can observe that a one-unit increase in household size increases the probability of being in bad conditions as child laborer by 0.06%. Therefore H4a, H4b, H4c and H4d are confirmed.

In model 5, we can see that if the household head works in agricultural sector, it increases the probability of being a child labor in the worst form by 4.43%. Also education levels of father and mother matters in terms of being a child labor in the worst form. In case of education level of mother, we can see that if the mother is graduated from highschool it decreases the probability of the child to be in the worst form of child labor by 3.49%; if the mother is graduated from vocational or technical highschool it decreases the probability of the child to be in the worst form of child labor by 2.82%, if the mother is graduated from undergraduate programmes it decreases the probability of the child to be in the worst form of child labor by 4.56%. In case of education level of father, we can see that if the father is graduated from highschool it decreases the probability of the child to be in the worst form of child labor by 3.61%; if the mother is graduated from vocational or technical highschool it decreases the probability of the child to be in the worst form of child labor by 2.89%, if the mother is graduated from undergraduate programmes it decreases the probability of the child to be in the worst form of child labor by 4.82%. Therefore H5a, H5b and H5c are confirmed.

In model 6, we can observe that if both mother and father do not work, then the probability of being a child laborer in the worst form increases by 5.92%. If at least one of the parents works, then then the probability of being a child laborer in the worst form decreases by 2.72%. Therefore H6a and H6b are confirmed.

Table 5.1 : The Average Marginal Effects of Logit Model.

	Marginal Effects					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age Group (Reference Category: Between 15&17 years)			0.0046***	0.0886***		
Gender (Reference Category : Male)	0.0147***	0.0109***	0.0016***	0.025***		
Student (Reference Category : Yes)		-0.0402***	-0.004***	-0.0843***		
HH Size	0.0017***	0.0011***		0.0006**		
Non-Working Parents (Reference Category : Yes)						.0591***
At Least One Working Parent (Reference Category : Yes)						-.0272***
Mother Working Status (Reference Category : Yes)	-.0124***	-.0042**				
Father Working Status (Reference Category : Yes)	-.0134***	-.0025				
Sector of HH Head (Reference Category : Agriculture)					0.0443***	
Education Level of Mother (Reference Category : Illiteracy)						
Primary Education					-.0036	
Highschool					-0.0349***	

	Marginal Effects					
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Vocational or Technical Highschool					-0.0282***	
Undergraduate					-0.0456***	
Education Level of Father (Reference Category : Illiteracy)						
Primary Education					-0.0053	
Highschool					-0.0361**	
Vocational or Technical Highschool					-0.0289**	
Undergraduate					-0.0481***	

Significant values *p<0.1; **p<0.05; ***p<0.01

Table 5.2 : The Regression Statistics of Logit Model.

	Regression Statistics					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Number of Observations	8176	8179	52308	52308	17733	52308
Pseudo R-Squared	0.0473	0.1579	0.1576	0.2323	0.0990	0.0092
Mean of dependent variable	0.0032	0.0195	0.0031	0.0514	0.0135	0.3702

Table 5.3 : Wald Test, Model 1.

Variables	Chi^2	df	$p>Chi^2$
Gender	31.95	2	0.0000
Mother Working Status	8.16	2	0.0043
Father Working Status	4.29	2	0.0407
HH Size	10.12	2	0.0015

Table 5.4 : Wald Test, Model 2.

Variables	Chi^2	df	$p>Chi^2$
Gender	37.85	2	0.0000
Student	128.36	2	0.0000
Mother Working Status	3.15	2	0.0761
Father Working Status	0.78	2	0.3779
HH Size	14.64	2	0.0001

Table 5.5 : Wald Test, Model 3.

Variables	Chi^2	df	$p>Chi^2$
Age Group	106.85	2	0.0000
Gender	45.61	2	0.0000
Student	98.24	2	0.0000

Table 5.6 : Wald Test, Model 4.

Variables	Chi^2	df	$p>Chi^2$
Age Group	1901.31	2	0.0000
Gender	486.76	2	0.0000
Student	1378.63	2	0.0000
HH Size	7.70	2	0.0055

Table 5.7 : Wald Test, Model 5.

Variables	Chi^2	df	$p>Chi^2$
Sector of HH Head	190.18	2	0.0000
Education Level of Mother	34.13	2	0.0000
Education Level of Father	70.94	2	0.0000

Table 5.8 : Wald Test, Model 6.

Variables	Chi^2	df	$p>Chi^2$
Non-working Parents	171.27	2	0.0000
At least one working parent	114.20	2	0.0000

6. CONCLUSIONS AND RECOMMENDATIONS

This thesis aims to evaluate the factors affecting the worst forms of child labor in Türkiye using the 2012 and 2019 data from the Child Labor Survey conducted by TURKSTAT. In the analysis, children's age groups, genders, household sizes, education levels of mother and father, working status of mother and father were taken into account. A total of 6 models were tested using the logit model in the analysis. In the first model, we created a dummy variable for children aged 6 to 14 who work, and it was tested on gender, household sizes and working status of parents. The results showed that these factors have a significant impact on the worst form of child labor. Male children aged 6-14 are particularly at risk. Furthermore, an increase in household size positively affects the likelihood of child labor in this form. Also, working situations of mother and father significantly decreases the probability of being a child labor in the worst form. Another model was created for children aged 15-17 who work more than 40 hours per week considering the age group and working hours specified in the legislation. This model, tested on gender, being a student or not, household size and working status of mother and working status of father, yielded similar results. Hypotheses established for these two models were accepted. The dependent variable in the third model was a created dummy variable considering the risks that could affect the worst form of child labor among working children, such as injury during work, discomfort due to working conditions, and exposure to physical or verbal violence. This variable was tested on age groups, genders, and school attendance statuses. The results indicated that being between the ages of 15 and 17 increases the likelihood of working under these risky conditions. When considering gender, male children are again at greater risk in this category. School attendance, however, reduces the likelihood of working under these risky conditions. In another model, a dummy variable was created based on the responses of children working in bad conditions regarding their working environments. This variable was shaped by affirmative responses to questions about inadequate lighting, exposure to hazardous chemicals,

high noise and violent shaking, working in excessively hot/cold/humid environments, and working in a posture that could affect physical health negatively. It was tested on age groups, genders, school attendance status, and household sizes, and hypotheses established regarding this matter were accepted. Again, children aged 15-17 are at great risk, especially male children. Being a student negatively affects the likelihood of working in these poor conditions, while an increase in household size increases the likelihood. Finally, in the fifth model, only the children's working status in the worst form was analyzed concerning whether the head of the household works in the agriculture sector or not, the mother's and father's education levels. The head of the household working in agriculture positively influences children's worker status. Since there was no rural/urban distinction in the 2019 data, this aspect could not be tested, but an assessment could be made considering the head of the household working in the agriculture sector. This result suggests that children of families engaged in agriculture may be employed to assist their families, perhaps even unpaid. When looking at the education levels of the mother and father, it is observed that as the education level increases, the likelihood of children working in the worst form decreases significantly. Lastly, in the sixth model, we tested for children being a child labor in the worst form in cases of non-working parents and at least one working parent. While non-working parents increase the probability of beaing a child labor in the worst form, at least one working parent decreases the probability.

When evaluating the results of the analysis, it is believed that the development of new policies regarding children's continued education status could have positive effects on the worst form of child labor. Furthermore, in terms of gender, various efforts should be made for both girls and boys in this direction, especially ensuring protection for boys. Although education has been made compulsory for up to twelve years, considering the issues raised in the survey, it is evident that some children who attend school also work simultaneously. Therefore, besides compulsory education, the development of strict policies regarding school attendance can pave the way for positive outcomes. Additionally, it is crucial to focus on the education of mothers and fathers, recognizing that their education is essential for ensuring that future generations do not engage in child labor and especially for completely eliminating the worst form of child labor. Policies targeting parents for education and raising awareness about

child labor especially in the worst form can contribute to positive outcomes alongside policies for children.

Within the scope of Türkiye's goals regarding child labor, more effort is required to achieve the goals set for combating the worst form of child labor. Access to education for children should be increased, and measures should be taken to ensure that no child remains out of school. Additionally, support programs for families and necessary social services should be provided to prevent the worst forms of child labor and child labor. Establishing effective monitoring mechanisms and stricter enforcement of laws are also essential. Awareness and educational campaigns should be organized to raise public awareness and consciousness about the current and future harms of child labor. Lastly, despite the worst forms of child labor being a violation of human rights and a social issue, there is still no clear definition at the international level. The lack of clear definitions, especially regarding the harsh practices considered the worst forms of child labor such as exploitation, trafficking, sexual abuse, and involvement in armed conflict, makes it difficult to protect children. This situation leads to various forms of child labor remaining undefined and hinders international cooperation in combating this issue. Therefore, a universal criterion defining the worst form of child labor should be established, ensuring the protection of children from all forms of exploitation. Countries should legally define the worst form of child labor at the national level and enact the necessary legislative measures. Education and awareness campaigns should be organized to increase social awareness and prevent the worst forms of child labor. More effective cooperation among countries should be established to protect children and combat the worst forms of child labor. However, rigorous monitoring remains crucial throughout these efforts.

This thesis contributes to the literature by empirically analyzing the worst forms of child labor and providing insights into Turkish context. Individuals planning to work in this field can conduct future-oriented prediction studies regarding the worst forms of child labor. These studies can help identify future trends and potential risks of child labor, aiding in the implementation of preventive measures.

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