Short- and Long-Term Influences of Education, Health Indicators, and Crime on Labor Market Outcomes

Five Essays in Empirical Labor Economics

Elisabeth Lång

LINKÖPING UNIVERSITY

Till pappa

Du kommer alltid att vara min inspiration.

Du skulle ha varit så stolt.

Saknar dig oerhört.

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Abstract

The objective of this thesis is to improve the understanding of how several individual characteristics, namely education (years of schooling), health indicators (height, weight, smoking, alcohol consumption, and exercise), criminal behavior, and crime victimization, influence labor market outcomes in the short and long run. The first part of the thesis consists of three studies in which I adopt a within-twin-pair difference approach to analyze how education, health indicators, and earnings are associated with each other over the life cycle. The second part of the thesis includes two studies in which I use field experiments in order to test the employability of ex-offenders and crime victims.

The first essay, *Learning for life?,* describes an analysis of the education premium in earnings and health-related behaviors throughout adulthood among twins. The results show that the education premium in earnings, net of genetic inheritance, is rather small over the life cycle but increases with the level of education. The results also show that the education premium in health-related behaviors is mainly concentrated on smoking habits. The influences of education on earnings and health-related behaviors seem to work independently of each other, and there are no signs that health-related behaviors influence the education premium in earnings or vice versa.

The second essay, *Blowing up money?,* details an analysis of the association between smoking and earnings in two different historical social contexts in Sweden: the 1970s and the 2000s. I also consider possible differences in this association in the short and long run as well as between the sexes. The results show that the earnings penalty for smoking is much stronger in the 2000s as compared to the 1970s (for both sexes) and that it is larger in the long run as compared to the short run (for men).

The third essay, *Two by two, inch by inch*, describes an analysis of the height premium among Swedish twins. The results show that the height premium is relatively constant over the life cycle and that it is larger below median height for men and above median height for young women. The estimates are similar for monozygotic and dizygotic twins, indicating that environmentally and genetically induced height differences are similarly associated with earnings over the life cycle.

The fourth essay, *The employability of ex-offenders*, published in *IZA Journal of Labor Policy* (2017), 6:6, details an analysis of whether male and female ex-offenders are discriminated

against when applying for jobs in the Swedish labor market. The results show that employers do discriminate against ex-offenders but that the degree of discrimination varies across occupations. Discrimination against ex-offenders is pronounced in female-dominated and high-skilled occupations. The magnitude of discrimination against ex-offenders does not vary by applicants' sex.

The fifth essay, *Victimized twice?,* describes an analysis of whether male and female crime victims are discriminated against when applying for jobs in the Swedish labor market. This study is the first to consider potential hiring discrimination against crime victims. The results show that employers do discriminate against crime victims. The discrimination varies with the sex of the crime victim and occupational characteristics and is concentrated among high-skilled jobs for female crime victims and among female-dominated jobs for male crime victims.

List of Essays

I. Elisabeth Lång and Paul Nystedt. *Learning for Life? The Education Premium in Earnings and Health-Related Behaviors over the Life Cycle*.

II. Elisabeth Lång and Paul Nystedt. *Blowing up Money? The Earnings Penalty of Smoking in the 1970s and the 21st Century*.

III. Elisabeth Lång and Paul Nystedt. *Two by Two, Inch by Inch: Height as an Indicator of Environmental Conditions during Childhood and its Influence on Earnings over the Life Cycle among Twins*.

IV. Ali Ahmed and Elisabeth Lång. *The Employability of Ex-Offenders: A Field Experiment in the Swedish Labor Market.* Published in *IZA Journal of Labor Policy* (2017), 6:6.

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Introduction

People growing up under different circumstances have different opportunities in life, and research shows that early-life conditions influence life outcomes, such as health, cognition, and labor market success, in adulthood (Almond and Currie 2011; Auld 2005; Barker 2007; Black et al. 2007; Cunha and Heckman 2008). Health, cognition, and labor market outcomes can also originate partly from genetic inheritance (Benjamin et al. 2012; Bouchard et al. 1990; Gerdtham et al. 2016; Plugh and Vijverberg 2003) and partly from the influence of individual choices of, for example, education levels, social behaviors, and health-related behaviors (Adams et al. 2003; Böckerman and Maczulskij 2016; Böckerman et al. 2017; Card 1999; Cutler and Lleras-Muney 2008; Heckman et al. 2008; Isacsson 1999; Lundborg et al. 2016; Meghir and Palme 2013; Pager 2003). The relationships between these individual characteristics and labor market success may also depend on the social context in terms of a wide array of factors, such as social norms, peer influences, and laws and regulations. Furthermore, these relationships are likely to vary with overall labor market conditions and employer (or co-worker or customer) preferences. Finally, the directions of the relationships between these entities are not obvious and may very well be multidimensional. Given the complexity of predicting labor market outcomes in different contexts, this thesis aims to improve the understanding of how the individual characteristics of education, health indicators, criminal behavior, and crime victimization influence labor market success in the short and long run.

The first part of this thesis provides new evidence on the associations between education, health and health-related behaviors, and labor market success with new perspectives that have previously been overlooked. Specifically, I analyze how education (years of schooling), health indicators (height, weight, smoking, alcohol consumption, and exercise), and earnings are linked to each other. The novelty of these studies is that I consider both short- and long-term relationships between these entities while accounting for family background (i.e., genetically inherited traits and childhood environmental conditions) by analyzing differences between twins. I also consider possible structural changes in the associations over time by evaluating the relationships in the 1970s and in the early 21st century. In addition, the data samples used to generate the results presented in this study include both sexes, whereas the previous literature is primarily focused on men. Hence, the first part of this thesis, consisting of three studies, provides a comprehensive picture of the relationships between education, health indicators, and earnings for men and women.

There is a large literature on the associations between criminal background, crime victimization, and labor market outcomes (Adams et al. 2013; Apel and Sweeten 2010; Hanson et al. 2010; Holzer et al. 2005; Loya 2015; Pager 2003; Pager et al. 2009; Reeves and O'Leary-Kelly, 2007; Staggs and Riger, 2005; Western et al. 2001). Many of these studies have, however, focused on factors on the supply side of the labor market to explain the relationships between crime and labor market outcomes. I instead examine the role of the demand side of the labor market in the labor market success of individuals who either have been convicted or are victims of crime. In the fourth study described in this thesis, I investigate whether a criminal background affects the employability of men and women in the Swedish labor market. Specifically, I investigate whether employers discriminate against ex-offenders in the initial part of the hiring process. There are a few studies that have previously analyzed whether ex-offenders are discriminated against in the labor market (Agan and Starr 2016, 2017; Baert and Verhoftstadt 2015; Pager 2003; Pager et al. 2009; Uggen et al. 2014). However, most of these studies are conducted in the U.S., are mainly limited to low-skilled occupations, and only consider the prospects of male ex-offenders. I argue that it is important to replicate studies carried out in, for example, the U.S. in other geographical and social contexts, such as Europe, since studies carried out in one specific context are not necessarily generalizable to other contexts. It is also important to consider both low-skilled and high-skilled occupations as well as both sexes, since the degree of discrimination may very well vary across different types of occupations as well as between the sexes of the job applicants. The last study described in this thesis is focused on the employability of crime victims, which, to my knowledge, has not been studied before. Previous literature has mainly attributed worse labor-market outcomes among crime victims to characteristics of the victimized individuals. I argue that some of the barriers that crime victims face in the labor market can be attributed to discriminating agents on the demand side, that is, employers, co-workers, and customers

Methodological Approaches - Advantages and Limitations

Although descriptive research is important for outlining and identifying various phenomena in a society, social scientists are often interested in uncovering the *causal effects* of changing conditions, that is, *why* and *how* an observed outcome came to be. Uncovering the causal effects of a change in, for example, years of schooling is not only important for theoretical purposes but is also crucial for policy purposes since the efficiency of policy implications critically hinges upon whether the estimated returns to education represent the true effects of

additional schooling on, for example, earnings and health. In this thesis, I employ two different methods in order to close in on the causal relationship between education, health indicators, and crime and labor market success: *within-twin-pair differencing* (*WTPD*) and *correspondence testing field experiments*. Since the correspondence test studies are randomized experiments, the estimated effect of the treatment of interest can be considered causal. The WTPD approach, however, does not measure the whole truth and nothing but the truth with assurance – in particular, when estimating the returns to schooling – for reasons I will discuss below. Nevertheless, given a set of assumptions, the WTPD estimated association between education and earnings complements other approaches by providing an upper bound of the true effect of additional schooling. Moreover, since the WTPD approach neutralizes genetic inheritance, it can be seen as a quasi-experimental test of environmental explanations of variations in individual traits (Johnson et al. 2009), although one cannot always explain what these environmental factors are. The two methodological approaches used in these studies are described below.

Within-Twin-Pair Differencing

Analyzing differences in traits and outcomes between twins is appealing for many reasons and is a well-established approach in behavioral and medical research (Benjamin et al. 2012; Boomsma et al. 2002; Johnson et al. 2009) as well as in other disciplines, such as economics (Amin et al. 2013, 2015; Angrist and Krueger 1991; Ashenfelter and Rouse 1998; Behrman and Rosonzweig 2004; Bharadwaj et al. 2017; Bhuller et al. 2017; Gerdtham et al. 2016, Lundborg 2013; Lundborg et al. 2016). Monozygotic (or "identical") twins growing up together share childhood environmental conditions (e.g., parental customs and norms and childhood residential area) and genetic endowments. Hence, studying differences in outcomes between twins provides an opportunity to observe variations in outcomes for two otherwise very similar individuals. In contrast, in an analysis of unrelated individuals, the extent to which unobserved individual or family environmental or genetic characteristics influence the relationship of interest is uncertain, and applying *ordinary least squares (OLS)* on cross-sectional data is likely to yield biased estimates. Another advantage of using the WTPD approach when analyzing the effects of, for example, additional schooling is that the estimated effects are likely to represent population averages, as differences in years of schooling within twin pairs should be represented along the entire education distribution. In contrast, studies that rely on natural experiments using, for example, an increase in

compulsory schooling generate local average treatment effects. However, there are also some potential issues with employing the WTPD approach, in particular when estimating the returns to education, which have received attention in the literature (Bound and Solon 1999; Grilches 1979; Isacsson 2004; Neumark 1999; Sandewall et al. 2014).

The initial idea behind using twins in empirical research was to compare two identical individuals who only differed in the outcome variable because of a random difference in the explanatory variable of interest (e.g., schooling). The question is whether one can really interpret observable differences in, for example, education between twins as purely random. Twins differ from each other from conception onward, and, although the differences in, for example, birth weight and cognition are small, so are the within-twin-pair differences in years of schooling. Hence, it may be that small differences early in life, such as placement in the womb and nutritional intake, which affect traits such as cognition, are the reasons for the (small) later-in-life differences in years of schooling. If such differences also are related to labor market success in adulthood, the WTPD-estimated associations are plagued with endogeneity, just as the OLS-estimated relationships on cross-sectional data of unrelated individuals are. However, following the argument of Bound and Solon (1999), the WTPD estimated relationship between education and earnings is still likely to constitute an upper bound of the earnings returns to education. As Bound and Solon (1999, p. 170) argue:

> "The siblings-based literature originally was motivated by a suspicion that conventional cross-sectional comparisons tend to overestimate the return to schooling because schooling is positively correlated with unobserved factors that raise wages. If one starts with that presumption, twins-based estimates that correct for measurement error may by viewed as providing an upper bound on the return to schooling. If the twins-based estimates were to come out substantially smaller than those from conventional cross-sectional estimation and other approaches, then the twins-based estimates could be credited for bounding the return to schooling within a narrower range."

Hence, given the smaller WTPD estimates relative to the OLS estimates, the first study in this thesis (*Learning for life?*) will complement previous literature by providing an upper bound of the effects of education on earnings while also providing a life-cycle perspective on the estimated relationship. Moreover, the fact that twins are exposed to variations in their environment from conception onward is, in fact, what I exploit when estimating the height premium over the life cycle (in *Two by two, inch by inch*).

Using the quasi-experimental feature of the WTPD approach, I analyze the association between smoking and earnings over time and age and find that smokers generally do earn less

than nonsmokers, particularly in the long run (in *Blowing up money?*). Unfortunately, I cannot say to what degree this "earnings penalty" of smoking is purely causal. However, considering the ethical issues with randomly assigning individuals to smoking, this analysis contributes to the literature by providing estimates that are close to the truth but not necessarily the whole truth. At the very least, the estimates of the earnings penalty of smoking among monozygotic twins represent the effects of variations in the environment that affect both smoking and earnings.

Another potential issue is attenuation bias from classical measurement error in the explanatory variables, which inflates when differencing between twins (Bound and Solon 1999; Grilches 1979; Isacsson 2004). Fortunately, the data used to generate the results in the first study described in this thesis are based on administrative Swedish-based measures of schooling, which have been shown to be highly reliable (Holmlund et al. 2011), suggesting that the problem of measurement error in the schooling measure is small. Moreover, if the data on height used to generate the results in the third study described in this thesis contain measurement errors, the measurement error ought to be correlated within twin pairs, implying that the actual error in the height differences between twins will be less pronounced than any misreports per se. Nevertheless, in all three analyses that are based on twin data, I cautiously interpret my results and discuss the potential consequences of measurement error in the explanatory variables, as suggested in previous literature (Bound and Solon 1999; Grilches 1979; Isacsson 2004).

Correspondence Test Studies

Using administrative individual-level data to measure labor market discrimination is problematic because of potential unobserved heterogeneity or selection bias. Even using a regression control approach including a vast number of controls and proxies for productivity will not guarantee that the discrimination coefficient is the whole truth and nothing but the truth. A more appropriate alternative to measure labor market discrimination is to use field experiments, such as audit or correspondence test studies. Field experiments can control for a rigorous set of characteristics and, thus, circumvent the potential problems of omitted variable or selection bias.

Audit studies involve sending two auditors (or "testers") acting as jobseekers to employers. Even though the two auditors are matched in as many observed characteristics as possible (i.e., height, age, and dressing style) except for the trait that is being manipulated and

tested, it is almost impossible to ensure that the two auditors are completely identical in all characteristics and behaviors except for the manipulated trait. Correspondence tests can address such weaknesses, since they rely on fictitious applicants, and the researcher can construct the fictitious applicants to be identical in all observed traits with the exception of the trait being manipulated and tested.[1] I therefore chose to use correspondence test studies to examine whether there is hiring discrimination against ex-offenders and crime victims in the Swedish labor market.

As with most methodological approaches, there are a number of limitations associated with correspondence test studies. I will briefly discuss some of them here. First, correspondence tests measure potential average discrimination but not discrimination at the margin. As Bertrand and Duflo (2017, p. 331) explain:

> "...we generally think that applicants care about the marginal response. Real job seekers are likely to adjust their behavior during the search process in a strategic manner: in other words, they will not apply for positions in a random fashion. So, while informative about discrimination on average in a given setting, correspondence and audit studies are not informative about discrimination at the margin, when real job seekers have fully optimized their job search strategy to the realities of the workforce."

Hence, results generated from a standard correspondence test study may be uninformative about the degree of discrimination faced by an individual with a certain trait in reality. Nevertheless, I argue that correspondence test studies in the labor market are still important for uncovering and highlighting potential labor market inefficiencies in a society.

Second, correspondence test studies only measure discrimination in the very first stage of the hiring process. It has, however, been shown that employer biases with regard to, for example, ethnicity vary in the different stages of the hiring process (Åslund and Skans 2012). It is therefore important to complement correspondence test studies that indicate a prevalence of discrimination with analyses of whether discrimination exists in the later stages of the hiring process.

Third, correspondence test studies do not account for differences in market tightness, that is, variations in how difficult it is for employers to recruit new employees. Baert et al. (2015) show that hiring discrimination may vary with labor market tightness at the level of the occupation. Individuals with foreign-sounding names, as compared to natives, are not

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[1] For a more detailed description and literature review on audit and correspondence test studies, please see Bertrand and Duflo (2017).

discriminated against when market tightness is high, but they are discriminated against when market tightness is low. This finding suggests that researchers may either under- or overestimate overall labor market discrimination if they do not include a relatively wide set of occupations or if they restrict their sample to one type of geographical area (e.g., large cities). It also implies that correspondence test studies should be replicated in both economic downturns and upturns.

Fourth, the estimated degree of discrimination may depend on how the researcher has set the standard for the job applications (Carlsson et al. 2014). If the researcher has set a low (high) standard for the job application, it may be that the degree of the discrimination is underestimated (overestimated). However, if the treatment group (e.g., ex-offenders) receives significantly fewer positive employer responses than the control group (e.g., non-offenders), I argue that this result still reflects discrimination, although the degree of discrimination should be interpreted with caution. Fifth, the standard design of correspondence test studies does not allow the researcher to distinguish statistical from taste-based discrimination, which is important for designing efficient policies to combat labor market discrimination and improve labor market conditions for disadvantaged groups.

I unfortunately cannot address all the limitations of correspondence test studies discussed here. Notwithstanding their limitations, the last two studies described in this thesis still make a meaningful contribution to the literature on crime and labor market outcomes. Since the literature on discrimination against ex-offenders is limited and the fifth study described in this thesis (*Victimized twice?*) is the first to present results on hiring discrimination against crime victims, these studies contribute to the literature by complementing previous studies (ex-offenders) as well as filling a research gap (crime victims). In order to address all of the limitations discussed here, however, future research is still needed.

Summary of thesis

Associations between education, health indicators, and earnings

Essay I: *Learning for Life? The Education Premium in Earnings and Health-Related Behavior over the Life Cycle*

Extended abstract: The aim of this study is to improve the understanding of how education may enhance human welfare through earnings and health-related behaviors (HRBs) over the course of adulthood and over time. The *education premium* (i.e., the estimated effect on an outcome variable of one additional year of schooling) in earnings is well covered in the literature, and it is typically found that one additional year of schooling is associated with 5-10% higher earnings in developed countries. The education premium in HRBs has also been studied, but the results are mixed, making it hard to draw general conclusions. Two limitations of many of the studies on the education premiums in earnings and HRBs are: (1) overlooking the role of family background (i.e., genetically inherited traits and childhood environmental conditions), which has been shown to influence schooling, earnings, and HRBs, as well as health; and (2) neglecting possible age and time-related dynamics in the education premiums. I contribute to the literature by addressing both these of typical limitations by using a within-twin-pair differencing approach and estimating the relationships between education, earnings, and HRBs across ages (ages 18-75) and in two different time periods (the years 1973 and 2000). The sample consists of around 25,000 dizygotic and monozygotic twins, where the former share on average 50% of their genes and the latter have identical genes, born between 1926 and 1958.

We find that the overall education premium in earnings is fairly constant from age 35 onward, amounting to 2–3% higher earnings per additional year of schooling for monozygotic twins. However, the premium varies markedly over the education distribution. Whereas there is no (or a low) premium in the lowest educational category (primary schooling), the premiums amount to around 5% and 7% in the highest category (tertiary schooling) for men and women, respectively. We also find that the education premium in earnings has decreased over time for women. The education premium in HRBs varies across age groups, between the sexes, and over time. Differencing between monozygotic twins shows that the premium in HRBs is mainly concentrated on smoking habits; one additional year of schooling is associated with a lower likelihood of smoking by around one to three percentage points. The

influences of education on earnings and HRBs seem to work independently of each other, and there are no signs that HRBs influence the education premium in earnings or vice versa.

Although the estimated education premiums are small, they are not unimportant, considering, for example, the impact of smoking on health and mortality. Further, although the overall education premium in earnings is low, it increases with level of education. Hence, the lifetime net pecuniary benefit of additional schooling may still be positive, but the major pecuniary benefits do not kick in until people already have reached a certain level of education. The non-linearity of the education premium in earnings may have serious implications for public policies aiming at increasing education levels for people with low levels of education. If one year of additional education in this particular group adds little to their expected future incomes, their incentives to enroll in publicly provided or subsidized educational programs will also be limited.

Essay II: *Blowing up Money? The Earnings Penalty of Smoking in the 1970s and the 21st Century*

Extended abstract: Smokers have, on average, worse labor-market outcomes, such as lower earnings, than nonsmokers. Hence, the societal burden of smoking is not limited to public health and health care costs but could also extend into general prosperity, equity, and welfare. However, whether smoking actually causes lower earnings is not clear. Moreover, the relationship between smoking and earnings could also vary with social context along a wide array of interdependent dimensions, such as social norms, peer influences, tobacco laws and regulations, and health risk campaign intensities. Smoking behavior and earnings have also been shown to be influenced by family background, that is, genetically inherited traits and childhood environmental conditions.

In this study, we analyze the consequences of smoking on earnings in the year 1973 and in the year 2000, representing radically different social contexts in Sweden. In the 1970s, smoking was much more common and accepted, was cheaper, and was allowed in the public domain, whereas smoking is increasingly stigmatized, more expensive, and prohibited in public facilities in the 21st century. I also provide new evidence of the long-term association between smoking and earnings for both men and women and show how the earnings penalty of smoking is potentially influenced by family background, years of schooling, and self-reported health.

Analyzing differences in smoking habits and earnings for a sample of Swedish twins, I show that the short-term earnings penalty of smoking is much stronger in the 21st century as compared to the 1970s. The results also imply that genetics (and childhood environmental conditions) matter more for the association between smoking and earnings in contexts where smoking is less common and more stigmatized (i.e., the 21st century). The long-term earnings gap for men is largest between never-smokers and continuous-smokers. For women, this gap seems instead to be an earnings "bonus" for smoking cessation in the long run. The earnings penalties of smoking are fairly insensitive to the inclusion of years of schooling and self-reported health when differencing between monozygotic twins, indicating that health and education do not heavily influence the relationship between smoking and earnings. From a general social science perspective, the stark context-dependent results of this study enforce the difficulties in generalizing from one setting to another when analyzing the influence of health-related behaviors on labor market outcomes.

Essay III: *Two by Two, Inch by Inch: Height as an Indicator of Environmental Conditions during Childhood and its Influence on Earnings over the Life Cycle among Twins*

Extended abstract: Recent research has provided evidence on the importance of environmental conditions related to early-life nutrition and disease load for outcomes in adulthood, including health, cognition, and labor-market success. The purpose of this study is to use height as an indicator of unobservable environmental conditions during childhood and adolescence to close in on a causal interpretation of its influence on earnings over the life cycle. We analyze the height premium among twins, 10,000 of whom are monozygotic. We find that the premium is relatively constant over the life cycle, amounting to 5-6% higher earnings per decimeter for men, with a smaller premium for women. The height premium is larger below median height for men and above median height for young women. The estimates are similar for monozygotic and dizygotic twins, indicating that environmentally and genetically induced height differences have a similar effect on earnings. The height premium among twins is remarkably insensitive not only to the inclusion of years of schooling but also to the inclusion of birth weight and self-reported health in the main specification. Hence, the better part of the significant height premium in earnings among twins does not seem to originate from prenatal conditions or to be mediated by education or health status. A complementary analysis performed on enlistment data shows that controlling

for cognitive ability among twins has no impact on the estimated relationship between height and earnings.

Few twin pairs vary in height by a full decimeter, but the estimated height premium still captures the marginal effect of additional height on earnings. The monozygotic twins in the studied sample differ in height by an average of three centimeters. In combination with the twin fixed-effects estimates, this finding implies that a taller twin earns approximately 2% more per year than his shorter twin. These 2% higher annual earnings reflect the impact of randomly distributed environmental experiences during childhood and youth among individuals of equal genetic predispositions and family conditions, providing a windfall for the more fortunate twin. A wage gap of 2% among monozygotic twins, originating from comparably small variations in their environmental experiences, implies that the structural environmental differences between unrelated children have a substantial impact on their labor market success.

Crime and employability

Essay IV: *The Employability of Ex-Offenders: A Field Experiment in the Swedish Labor Market*

Published in *IZA Journal of Labor Policy* (2017), 6:6

Extended abstract: Research on ex-offenders' labor-market performance suggests that a criminal past has negative consequences on various labor-market outcomes, such as employment and earnings. Being deprived of labor-market opportunities due to a criminal background has serious consequences for ex-offenders and for society as a whole. For ex-offenders, barriers to the labor market can affect economic wellbeing and health. This effect is problematic both for the individual and society, since disadvantages in the labor market may encourage or force ex-offenders to return to the criminal world and fail to reintegrate into society post-punishment.

This study presents the findings of the first field experiment on hiring discrimination against ex-offenders in the Swedish labor market. This study is also the first to consider female ex-offenders' employability. Matched pairs of written job applications for fictitious male and female applicants with and without a past conviction of assault were sent to employers for nine different occupations. The offense that we use to convey ex-criminality in this experiment is an assault resulting in a conviction that did not involve any incarceration.

The results show that discrimination against ex-offenders exists but that its extent varies across occupations. A past assault conviction is associated with a 7–18 percentage point lower probability of receiving a positive employer response. Discrimination is most prominent in female-dominated and high-skilled occupations. The magnitude of discrimination against ex-offenders does not vary by the applicants' sex.

Essay V: *Victimized Twice? A Field Experiment on the Employability of Crime Victims*

Extended abstract: Measures of labor-market opportunities have revealed that crime victims have higher rates of unemployment, lower earnings, and higher rates of absenteeism and job turnover than do non-victims. Hence, crime may have serious consequences extending beyond its immediate costs and physical and psychological damage, namely in terms of lost labor market opportunities. On the one hand, crime victims' disadvantages in the labor market could be explained by supply side factors, such as physical or psychological injuries resulting in lower productivity. On the other hand, worse labor market outcomes among crime victims could also be attributed to factors on the demand side if employers, recruiters, or co-workers are discriminating against crime victims. Such discrimination could originate from employers simply preferring non-victims or associating crime victims with lower productivity or an unstable life situation and, thus, being less willing to hire or promote them.

In this study, I test the hypothesis of employer discrimination against crime victims by applying a correspondence test experiment with fictitious crime-victim and non-victim job seekers in the Swedish labor market. Although field experiments on hiring discrimination have been conducted to test employer discrimination based on applicants' age, sex, sexual orientation, ethnicity, religious beliefs, physical attractiveness, and criminal background, this study is the first to use a field experiment to test hiring discrimination against crime victims. Matched pairs of written job applications for fictitious same-sex crime victims and non-victims were sent to employers in the Swedish labor market. The crime victim status was revealed in the narrative application letter by adding a paragraph stating that the applicant was under serious threat and, therefore, did not provide a postal address. The results show that hiring discrimination against crime victims exists. Crime victims have a 3-12 percentage point lower probability of receiving a positive employer response than non-victims. The discrimination varies with the sex of the crime victim and occupational characteristics, with discrimination being concentrated in high-skilled jobs for female crime victims and in female-dominated jobs for male crime victims.

The documented observations of hiring discrimination against crime victims in this study are important from a theoretical perspective since neglecting lost labor market opportunities underestimates the true pecuniary and non-pecuniary costs of crime victimization. The results call for a deeper theoretical understanding of the linkages between the stigma of being a victimized person and employers' preferences and perceptions as related to hiring decisions regarding victimized people. The results are also important from practical and policy perspectives, as in the case of policy decisions regarding which groups to offer labor market interventions to improve job security and reduce unemployment.

References

Adams, P., Hurd, M. D., McFadden, D., Merrill, A., and Ribeiro, T. (2003). Healthy, wealthy, and wise? Tests for direct causal paths between health and socioeconomic status. *Journal of Econometrics*, *112*(1), 3-56.

Adams, A. E., Tolman, R. M., Bybee, D., Sullivan, C. M., and Kennedy, A. C. (2012). The impact of intimate partner violence on low-income women's economic well-being: The mediating role of job stability. *Violence Against Women*, *18*(12), 1345-1367.

Agan, A. Y., and Starr, S. B. (2016). Ban the box, criminal records, and statistical discrimination: A field experiment. *Law and Economics Research Paper Series,* 16-012, University of Michigan.

Agan, A., and Starr, S. (2017). The Effect of Criminal Records on Access to Employment. *American Economic Review*, *107*(5), 560-64.

Almond, D., and Currie, J. (2011). Human capital development before age five. In *Handbook of Labor Economics, Vol 4B*, ed. David Card and Orley Ashenfelter. Amsterdam: North-Holland.

Apel, R., and Sweeten, G. (2010). The impact of incarceration on employment during the transition to adulthood. *Social Problems*, *57*(3), 448-479.

Baert, S., Cockx, B., Gheyle, N., and Vandamme, C. (2015). Is there less discrimination in occupations where recruitment is difficult? *ILR Review, 68*(3), 467–500.

Baert, S., and Verhofstadt, E. (2015). Labour market discrimination against former juvenile delinquents: evidence from a field experiment. *Applied Economics, 47*(11), 1061–1072.

Barker, D. J. (2007). The origins of the developmental origins theory. *Journal of Internal Medicine*, *261*(5), 412-417.

Benjamin, D. J., Cesarini, D., Chabris, C. F., Glaeser, E. L., Laibson, D. I., Guðnason, V., ... and Johannesson, M. (2012). The promises and pitfalls of genoeconomics. *Annual Review of Economics*, *4*(1), 627-662.

Bertrand, M., and Duflo, E. (2017). Field experiments on discrimination. In A. Vinayak Banerjee and E. Duflo, *Handbook of Economic Field Experiments*, Vol 1. Amsterdam: Elsevier Science, 309-393.

Black, S.E., Devereux, P.J, and Salvanes, K.G. (2007), From the cradle to the labor market? The effect of birth weight on adult outcomes. *Quarterly Journal of Economics, 122*(1), 409-439.

Boomsma, D., Busjahn, A., and Peltonen, L. (2002). Classical twin studies and beyond. *Nature Reviews Genetics*, *3*(11), 872-882.

Bouchard Jr, T. J., Lykken, D. T., McGue, M., Segal, N. L., and Tellegen, A. (1990). Sources of human psychological differences: the Minnesota study of twins reared apart. *Science*, *250*(4978), 223-229.

Bound, J., and Solon, G. (1999), Double trouble: On the value of twin-based estimation of the return to schooling. *Economics of Education Review, 18*(2), 169-182.

Böckerman, P., Hyytinen, A. and Kaprio, J. (2015). Smoking and long-term labour market outcomes. *Tobacco Control*, *24*(4), 348-353.

Böckerman, P., Hyytinen, A., and Maczulskij, T. (2017). Alcohol consumption and long-term labor market outcomes. *Health Economics, 26*(3), 275-291.

Card, D. (1999). The causal effect of education on earnings. In O. Ashenfelter and D. Card, *Handbook of labor economics*, Vol. 3A. Amsterdam: Elsevier Science, 1801-1863.

Carlsson, M., Fumarco, L., and Rooth, D. O. (2014). Does the design of correspondence studies influence the measurement of discrimination?. *IZA Journal of Migration*, *3*(1), 11.

Cunha, F., and Heckman, J. J. (2008). Formulating, identifying and estimating the technology of cognitive and noncognitive skill formation. *Journal of Human Resources*, *43*(4), 738-782.

Cutler, D., and Lleras-Muney, A. (2008). Education and health: Evaluating theories and evidence. In J. House, R. Schoeni, G. Kaplan, and H. Pollack, *Making Americans Healthier: Social and Economic Policy as Health Policy*, New York: Russell Sage Foundation.

Gerdtham, U-G., Lundborg, P., Lyttkens C. H., and Nystedt, P. (2016). Do education and income really explain inequalities in health? Applying a twin design. *Scandinavian Journal of Economics, 118*(1), 25-48.

Griliches, Z. (1979), Sibling models and data in economics: beginnings of a survey. *Journal of Political Economy, 87*(5), 37-64.

Hanson, R. F., Sawyer, G. K., Begle, A. M., and Hubel, G. S. (2010). The impact of crime victimization on quality of life. *Journal of Traumatic Stress*, *23*(2), 189-197.

Heckman, J. J., Stixrud, J., and Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, *24*(3), 411-482.

Holmlund, H., Lindahl, M., and Plug, E. (2011). The causal effect of parents' schooling on children's schooling: A comparison of estimation methods. *Journal of Economic Literature*, *49*(3), 615-651.

Holzer, H. J., Offner, P., and Sorensen, E. (2005). Declining employment among young black less-educated men: The role of incarceration and child support. *Journal of Policy Analysis and Management*, *24*(2), 329-350.

Isacsson, G. (1999). Estimates of the return to schooling in Sweden from a large sample of twins. *Labour Economics*, *6*(4), 471-489.

Isacsson, G. (2004). Estimating the economic return to educational levels using data on twins. *Journal of Applied Econometrics, 19*(1), 99-199.

Johnson, W., Turkheimer, E., Gottesman, I. I., and Bouchard Jr, T. J. (2009). Beyond heritability: Twin studies in behavioral research. *Current Directions in Psychological Science*, *18*(4), 217-220.

Loya, R. M. (2015). Rape as an economic crime: The impact of sexual violence on survivors' employment and economic well-being. *Journal of Interpersonal Violence*, *30*(16), 2793-2813.

Lundborg, P., Lyttkens, C. H., and Nystedt, P. (2016). Human capital and longevity. Evidence from 50,000 twins. *Demography, 53*(4), 1135-1168.

Meghir, C., and Palme, M. (2005). Educational reform, ability, and family background. *The American Economic Review*, *95*(1), 414-424.

Neumark, D. (1999). Biases in twin estimates of the return to schooling. *Economics of Education Review*, *18*(2), 143-148.

Pager, D. (2003). The mark of a criminal record. *American Journal of Sociology 108*(5), 937–975.

Pager, D., Western, B., and Sugie, N. (2009). Sequencing disadvantage: Barriers to employment facing young black and white men with criminal records. *Annals of the American Academy of Political and Social Science 623*(1), 195–213.

Plug, E., and Vijverberg, W. (2003). Schooling, family background, and adoption: Is it nature or is it nurture? *Journal of Political Economy*, *111*(3), 611-641.

Reeves, C., and O'Leary-Kelly, A. M. (2007). The effects and costs of intimate partner violence for work organizations. *Journal of Interpersonal Violence*, *22*(3), 327-344.

Sandewall, Ö., Cesarini, D., and Johannesson, M. (2014). The co-twin methodology and returns to schooling - testing a critical assumption. *Labour Economics*, *26*, 1-10.

Staggs, S. L., and Riger, S. (2005). Effects of Intimate Partner Violence on Low-Income Women's Health and Employment. *American Journal of Community Psychology*, *36*(1-2), 133-145.

Uggen, C., Vuolo, M., Lageson, S., Ruhland, E., and Whitham, H. K. (2014). The edge of stigma: An experimental audit of the effects of low-level criminal records on employment. *Crimonology 52*(4), 627–654.

Western, B., Kling, J. R., and Weiman, D. F. (2001). Labor market consequences of incarceration. *Crime & Delinquency*, *47*(3), 410-427.

Åslund, O., and Skans, O. N. (2012). Do anonymous job application procedures level the playing field?. *ILR Review*, *65*(1), 82-107.

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