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Looks matter: Attractiveness and employment in the Former Soviet Union*

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ABSTRACT:
The rigid Soviet policy of full employment ensured employment for all able-bodied population. By removing this policy, the collapse of the system has made discrimination less costly. Has it also become prevalent? This paper studies the labour market discrimination on the basis of looks using data from three post-Soviet countries of the Caucasus: Armenia, Azerbaijan and Georgia. I estimate a large positive effect of attractive looks on males' probability of employment. Using a partial identification approach, I show that this relationship is likely to be causal. The results are potentially consistent with taste-based discrimination in favour of attractive males.

JEL classification: J21, J70, P23

Keywords: Attractiveness; Employment; Former Soviet Union.

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The rigid Soviet policy of full employment ensured employment for all able-bodied population. By removing this policy, the collapse of the system has made discrimination less costly. Has it also become prevalent? This paper studies the labour market discrimination on the basis of looks using data from three post-Soviet countries of the Caucasus: Armenia, Azerbaijan and Georgia. I estimate a large positive effect of attractive looks on males' probability of employment. Using a partial identification approach, I show that this relationship is likely to be causal. The results are potentially consistent with taste-based discrimination in favour of attractive males.

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1. Introduction

Egalitarianism was a central aspiration of the communist regime. Not only this was expressed in ideological terms, it was often formally institutionalised. Labour markets are one area where this phenomenon manifested itself. Achieving full employment for all able-bodied population was one of the central policies of the centralized planned economies of the Former Soviet Union (FSU) (Porket, 1989). Unemployment was not officially recognized. In some countries not having a job was even penalised criminally (Brainerd, 2000). Did the collapse of the regime undermine the equality in the labour market? On the one hand, the breakdown of institutions of protective labour laws, centralized employment and wages removed the constraints on discrimination making it less costly for employers. On the other hand, competition among employers in a market economy system should make discrimination more costly. Whether labour market discrimination on the basis of an economically irrelevant characteristic is prevalent in the countries of the FSU is the focus of this paper.

The literature on labour market discrimination in transition countries has predominantly focused on the case of gender. The findings of this literature remain mixed as to whether transition has resulted in an improvement or deterioration of women's relative position (e.g., Brainerd, 2000; Gerber and Mayorova, 2006); several studies demonstrate actual improvements in women's labour market outcomes post-transition (e.g., Orazem and Vodopivec, 1995; Jolliffe and Campos, 2005). However, the case of gender has an important idioscyncrasy that limits the scope for generalized inferences on labour market discrimination in FSU countries: a form of gender discrimination was institutionalised in the Soviet Union. The labor legislation regarded women as a 'specific labor force' because of their maternity and childcare roles and imposed restrictions around their employment (Ogloblin, 1999). In this study I focus on a different basis for discrimination that is free of such caveat: physical looks. Do employers reward physical attractiveness in transition countries?

Labour market return to physical attractiveness is the subject of a growing literature in economics. Most of the studies have shown that attractiveness matters for labour market outcomes in the context of various developed countries such as the US and Canada (Hamermesh and Biddle, 1994; Mocan and Tekin, 2010), United Kingdom (Harper, 2000), Germany (Gehrsitz, 2014; Oreffice and Quintana-Domeque, 2016), Australia (Borland and Leigh, 2014). A few studies have looked at the relationship in developing countries including Bangladesh (Islam and Smyth, 2012), China (Hamermesh et al., 2002), Ecuador and

Mexico (Arunachalam and Shah, 2012).[1] However, there doesn't seem to be research into the labour market discrimination on the basis of attractiveness in transition countries. In this paper I attempt to fill this gap in the literature using a unique dataset from three FSU countries of Armenia, Azerbaijan and Georgia that contains information on interviewer-assessed measures of attractiveness along with standard labour market outcomes and background characteristics of employers.

A key challenge in studying the relationship between physical attractiveness and labour market outcomes is unobserved heterogeneity: physical looks may be correlated with a range of unobserved variables (e.g. cognitive or non-cognitive characteristics) that may have the potential to directly affect labour market outcomes. In the absence of experimental data, the conventional way to address the issue of potential bias is to find an instrumental variable for attractiveness. However, as Hamermesh and Abrevaya (2013) note, "it is difficult to impossible to construct instrument for beauty that would allow one to claim convincingly to have eliminated concerns about causality" (p. 362). In their study, Hamermesh and Abrevaya (2013) exploit information on lagged attractiveness measures as instruments for current attractiveness. This approach, however relies on the (rather strong) assumption that the error term is uncorrelated with the past values of the endogenous variable. It is perhaps due to the absence of persuasive instruments that attractiveness is treated as exogenously determined in most previous studies in this literature (see the review by Liu and Sierminska, 2014). Identification in these studies largely relies on controlling for potentially confounding influences. However, this approach clearly cannot fully account for all such influences. I apply a novel strategy to the estimation of attractiveness effect: I assess the extent of the bias based on measuring the ratio of selection on unobservables to selection on observables that would be required to explain away the entire causal effect of attractiveness following the approach proposed by Altonji et al. (2005).

I find a large positive effect of attractive looks on males' probability of employment. The results from a model with a comprehensive list of controls suggest a marginal effect of 6.8 percentage points; this is equivalent to an over 10% increase in the probability of employment. Applying the Altonji et al. (2005) approach, I find that this effect is likely to be causal: selection on unobservables would need to be 2.6 times stronger than selection on observables to cancel out the attractiveness effect; this seems rather unlikely. I provide additional

[1] The literature has also considered the effect of attractiveness on other outcomes, including life satisfaction (Hamermesh and Abrevaya, 2013), electoral success in politics (King and Leigh, 2009; Berggren et al., 2010) and in professional organisations (Hamermesh, 2006), students' academic performance at high school (French et al., 2009) and at university (Cipriani and Zago, 2011), student's evaluations of instructors' performance (Hamermesh and Parker, 2005), criminal behaviour (Mocan and Tekin, 2010), etc.

evidence on the link between attractiveness and type of employment that is consistent with taste-based employer discrimination in favour of attractive males.

The rest of the paper proceeds as follows: the next section presents the data; in section 3, I describe the methodology; section 4 reports the estimation results; I discuss the implications of these results in section 5; section 6 concludes.

2. Data

Source and sample. My data source is the annual Data Initiative (DI) survey conducted by the Caucasus Research Resource Centres (CRRC) in Armenia, Azerbaijan, and Georgia.[2] Introduced in 2004, the first wave of the survey was carried out in the three capital cities only while the second wave also included one region in each country. In 2006 the DI survey was expanded to cover all the regions controlled by central governments in the three countries. In 2007, CRRC introduced a unified sampling methodology in line with international best practices to ensure full comparability of data across the three countries (CRRC, 2007). Since then the surveys have been running annually in Armenia, Azerbaijan, and Georgia based on the same methodological approach (based on a stratified two stage sampling) and the same survey instruments (CRRC, 2008). The surveys provide reliable data on a wide range of demographic, social, economic and political variables, and have been already utilised in several recent published articles (e.g., Habibov and Afandi, 2011; Habibov, 2012; Duncan and Mavisakalyan, 2015; Antinyan, 2016; Mavisakalyan and Meinecke, 2016).

I use the 2008 wave of DI survey which provides data on the respondents looks (not included in subsequent waves) along with usual labour market and demographic variables of interest. This wave comprises 5,869 observations of which 2,075 are from Armenia, 1,996 from Azerbaijan, and 1,798 from Georgia. I restrict the sample to those aged 26 to 60 to exclude the students and retirees, and drop observations with missing outcome data.[3] I further restrict the sample to males, avoiding the analysis of more complicated female labour force decisions (for similar approaches see Kreisman and Rangel, 2015; Scholz and Sicinski, 2015). One source of such complication is marriage, with more attractive women often marrying more successfull men (e.g., Becker, 1973; Bergstrom and Bagnoli, 1993) - a possibility I am not able to explore within the scope of the current dataset. Most previous studies find stronger evidence of beauty premium in the labour market for males than for females (e.g.,

[2] DI was renamed into Caucasus Barometer (CB) in 2010

[3] The results based on samples restricted by different age brackets are similar - available on request.

Mocan and Tekin, 2010; Gehrsitz, 2014). Moreover, some do not find any evidence for attractiveness premium for females (e.g., Biddle and Hamermesh, 1998; Borland and Leigh, 2014). This is also the case in the current data[4] - something that warrants attention in future research. The final sample size is 1,296 observations.

Description of variables. Table 1 provides the definitions and descriptive statistics for all variables used in the baseline analysis. I split the sample into two sub-samples divided by the level of attractiveness. In the survey, the interviewers were asked to rate how attractive they found the respondent on the five-point scale. I reduce this information to a dummy variable, ATTRACTIVE that takes on the value 1 if the respondent was rated as attractive or very attractive by the interviewer, and 0 otherwise.[5] Asking interviewers to rate people's physical attractiveness (either during face-to-face contact or based on photos) is the main approach to measuring attractiveness in the literature (e.g., Hamermesh and Biddle, 1994; Mocan and Tekin, 2010; Hamermesh and Abrevaya, 2013). This measure is consistent with standard dictionary definitions of beauty as "the quality or aggregate of qualities in a person or thing that gives pleasure to the senses or pleasurably exalts the mind or spirit" (Hamermesh, 2011, p. 11). Other measures of physical looks used in the literature include height (Steckel, 1995; Persico et al., 2004), weight (Cawley, 2004; Rooth, 2009), hair colour (Price, 2008; Johnston, 2010). While these measures are less prone to measurement error, they are also less likely to capture the concept of attractiveness compared to my measure.[6] In the sample, 56% are classified as attractive.

My analysis of economic returns to attractiveness focuses on employment.[7] The baseline models employ a binary employment status distinguishing between those employed and not employed (including those not in the labor force). This approach has been used to minimize the misclassification error in contexts where the distinction between unemployed and not being in the labour force is vague; individuals in both groups may be willing to take up employment if there was the opportunity, however individuals may be discouraged from actively searching for work or have little incentives to register as unemployed (e.g., Daly,

[4] The results are available on request.

[5] In the robustness checks (Table 5) I also employ more refined measures of looks.

[6] They are also not available in the current dataset.

[7] Although other labour market outcomes such as wages or promotions can be influenced by attractiveness, these are not available in the current dataset. In extended results I employ proxies of these measures as dependent variables.

1993). This measure of employment has also been employed in previous studies on the region (e.g., Duncan and Mavisakalyan, 2015; Mavisakalyan and Meinecke, 2016).[8] As Table 1 demonstrates, the employment rate is 73% among attractive males, and only 59% among unattractive males. This gap of 14 percentage points suggests a positive effect of attractive looks on employment.

[Table 1 about here.]

My analysis of the link between attractiveness and employment probability controls for a range of observable characteristics of individuals. Three groups of covariates are included in baseline employment models. The first includes individual characteristics such as age group, ethnic and linguistic majority background, family status and self-reported health. There is no apparent trend in the age distribution. The majority of males come from ethnic and linguistic majority background. Eighty-four percent report having a partner. Around 44% are of good or very good health.

The second group of covariates is educational attainment. I include dummies for school education and below, EDUC$\leq$ 10, secondary technical or incomplete university education, EDUC11-14, and first or higher university degree, EDUC$\geq$ 15 (omitted category). EDUC$\leq$ 10 and EDUC11-14 comprise 39% and 37% of the population respectively. The remaining 24% are university-educated. Levels of attractiveness increase in educational attainment. Thirty-one percent of attractive males have a university degree, while only 15% of unattractive males have. On the other hand, 45% of unattractive males have no more than 10 years of education compared to 35% among attractive males. This pattern is consistent with research findings that suggest attractiveness at young age may contribute to subsequent human capital investment since attractive children receive more attention from teachers and peers (e.g., Lerner et al., 1990; Langlois et al., 2000).

The final group of control variables are dummies for the location of residence. These include dummies for capital city (omitted), other urban and rural areas, as well as country dummies (with Azerbaijan omitted from the regressions). Forty-eight percent of respondents come from rural areas with the rest evenly split between capital and other cities. The largest country by population in the sample, Azerbaijan makes up for 56% of the sample. Twenty-two percent of the respondents come from Georgia, and the remaining 21% are from Armenia.

[8] The results (available on request) are robust to applying a standard definition of employment that excludes those not in the labor force.

3. METHOD

Baseline model. To establish a baseline effect of attractiveness, I start with a standard model of employment propensity Y_i^* for an individual i of the following form

$$Y_i^* = X_i\beta + \alpha A_i + \varepsilon_i \text{ for all } i = 1, ..., N. \tag{1}$$

where A_i is attractiveness, X_i is a vector of controls for age, ethnicity, marital status, health, education and location characteristics and ε_i is a disturbance term. Observed employment status Y_i is assumed to relate to latent propensity through the criterion $Y_i = 1(Y_i^* \geq 0)$, which under an assumption of normality for ε_i gives rise to the standard probit model of the form

$$Pr(Y_i = 1|X_i, A_i) = \Phi(X_i\beta + \alpha A_i) \tag{2}$$

Estimating the causal effect of attractiveness on employment requires that it is exogenously determined and uncorrelated with the error term in (1). However, this is unlikely to hold due to unobserved variables that might affect employment and be correlated with attractiveness. Thus, estimating this single equation probit model is likely to provide biased estimates of the impact of attractiveness on employment. The standard approach to addressing the problem of unobserved heterogeneity is to estimate the joint likelihood of employment and attractiveness using a bivariate probit model. However this approach requires the exclusion of at least one reliable instrument. The absence of a reliable instrument in the data prevents the implementation of this approach. My strategy to mitigate the endogeneity problem instead includes selecting a comprehensive set of controls and comparing the effects of selection on observables with selection on unobservables. These strategies provide useful robustness tests of the baseline results.

Comprehensive controls. As a first step to mitigate the influence of unobserved heterogeneity I control for a comprehensive list of relevant observables that remain correlated with the unobserved component of employment. I am concerned with two possibilities. First, attractiveness may be correlated with unobserved characteristics that are rewarded in the labour market, leading to an omitted variable bias in the estimates. Second, a non-classical measurement error may arise due to the fact that the information on respondent's attractiveness is elicited at the very end of the interview and the attractiveness ranking and

the unobservable component of employment propensity may be correlated.[9] To mitigate the effect of the bias arising from these possibilities, I include an extensive list of additional controls in estimations. First, I include proxies for cognitive characteristics of respondents. Second, I include proxies for their non-cognitive characteristics. Measures of social connectedness are a third group of variables included in estimations. Fourth, I include a proxy for investment in one's looks (e.g. grooming). I sequentially introduce these proxies into the empirical specification. The intention in so doing is to reveal the extent to which these variables cause bias in the effects of attractiveness on employment by comparing the estimated parameters from baseline and comprehensive specifications. Given the richness of information available in the dataset, this approach allows me to capture the effect of important sources of bias; however it cannot eliminate the bias entirely.

Selection on unobservables. My second strategy to assessing the role of unobserved heterogeneity in the absence of a reliable instrument is to use the amount of selection on the observables as a guide to the amount of selection on the unobservables proposed by Altonji et al. (2005). The idea here is to assess how much selection on unobservables there must be, relative to the amount of selection on observables, to entirely account for the estimated association between attractiveness and employment.

Selection on unobservables is formalized by the ratio

$$S_{uo} := \frac{\mathbb{E}\left[\varepsilon_i|\mathrm{A}_i = 1\right] - \mathbb{E}\left[\varepsilon_i|\mathrm{A}_i = 0\right]}{\mathrm{Var}[\varepsilon]}, \tag{3}$$

Altonji et al. (2005) show that under the hypothesis that the effect of attractiveness is zero, i.e. $\alpha = 0$, the maximal amount of selection on unobservables can be estimated as

$$\hat{S}_{uo} := \hat{\pi}^{-1}\hat{\alpha}. \tag{4}$$

where $\hat{\alpha}$ is the estimate of α in equation (2) and π is given by

$$\pi := \mathrm{Var}[\mathrm{A}_i]/\mathrm{Var}[\widetilde{\mathrm{A}_i}]. \tag{5}$$

where $\widetilde{\mathrm{A}_i}$ is the residual in the regression of A_i on X_i.

Similarly, selection on observables is defined as

$$S_o := \frac{\mathbb{E}\left[X_i'\beta|\mathrm{A}_i = 1\right] - \mathbb{E}\left[X_i'\beta|\mathrm{A}_i = 0\right]}{\mathrm{Var}[X_i'\beta]}, \tag{6}$$

[9] It is unlikely that the reported employment propensity directly affects the attractiveness ranking, given the substantial space between the two questions.

and can be consistently estimated by sample averages and plugging in the estimate $\hat{\beta}$ from the constrained estimation of equation (2) forcing $\alpha = 0$. I denote this estimate of selection on observables by $\hat{S}_o$.

The ratio of the estimate $\hat{S}_{uo}$ to the estimate $\hat{S}_o$ tells us the relative magnitude of the role of unobservables to observables in order to explain away the entire causal effect of attractiveness. I compute this ratio for the baseline model as well as for the comprehensive model with additional controls.

A note on classical measurement error. In the absence of objective information on beauty, asking interviewers to rate people's physical attractiveness (either during face-to-face contact or based on photos) is the main approach to measuring attractiveness in the literature. This approach is justified based on the observation that there is substantial agreement among observers on what constitutes human beauty (for a summary of existing evidence, see Chapter 2 of Hamermesh, 2011). This is the case "within a society at a point in time, including the worldwide society of developed nations" (Hamermesh, 2011, p. 13).

A measurement error may arise, however, if standards of beauty differ across interviewers. To the extent that interviewer standards are randomly correlated with the respondents' employment propensities, this would lead to a downward bias in the estimates of attractiveness. To account for this issue, I include interviewer fixed effects in the estimations, following previous studies (e.g., Hamermesh and Biddle, 1994; Mocan and Tekin, 2010; Hamermesh and Abrevaya, 2013). Similarly, there may be inconsistency in the baseline results based on the pooled sample of three countries if standards of attractiveness differ across these countries. As a way to deal with this possibility, I re-estimate the relationship between attractiveness and employment propensity separately for each country.

4. Results

Baseline results. Probit model estimates of the effect of attractiveness on the probability of employment given in equation (2) are reported in Table 2. For ease of interpretation, marginal effects are reported throughout. The specification reported in column (1) excludes other controls (parsimonious specification). Consistent with the descriptive statistics reported in Table 1, the estimates identify a positive relationship between attractiveness and the probability of employment. The marginal effect of attractiveness is 12.4 percentage points.

Next, I examine the relationship between attractiveness and employment probability, controlling for standard individual characteristics of respondents. I find very similar results for

attractiveness (column (2)). Looking at other significant correlates of employment, males aged 31-35 as well as those in the age groups 41-45 and 46-50 are more likely to be employed relative to those 36-40 years of age. Having a partner is associated with a positive probability of employment. As expected, healthier males are more likely to be employed.

In column (3), I augment the parsimonious specification with measures of educational attainment of respondents. Consistent with patterns of sorting into educational attainment based on attractiveness endowment reported in Table 1, I observe a decline in the size of the estimated marginal effect on attractiveness. Educational attainment itself is associated with a significant increase in the probability of employment.

The specification reported in column (4) includes dummies for location of residence, in addition to ATTRACTIVE dummy. The estimated marginal effect on ATTRACTIVE is robust to inclusion of these variables; moreover the size of the marginal effect is larger compared to parsimonious model. Capital-city-based males have a higher probability of employment relative to those in other urban and rural residences. Armenian and Georgian males are less likely to be employed compared to their Azerbaijani counterparts.

[Table 2 about here.]

Finally, in column (5) I report the estimation results of baseline model that includes all the controls jointly. The marginal effect of changing the dummy ATTRACTIVE from 0 to 1 is 0.127. This is an economically substantial effect; it is comparable, for example, to the effect of moving from single to partnered status, or from the intermediate to university level educational attainment.

Robustness checks.

Comprehensive controls. A key concern with the findings is whether attractiveness itself is rewarded in the labour market or whether it is simply a proxy for unobserved characteristics that offer a comparative advantage in the labour market. Here I address the issue of possible bias in the estimates of attractiveness by adding proxy variables that could be correlated with hitherto unexplained part of employment. The results of this exercise are summarised in Table 3.

I consider several possibilities. First, omitted cognitive skills may lead to upward bias in estimates of attractiveness if cognitive skills and attractiveness are positively correlated. This may be the case, for example, if attractive individuals make more investment into their human capital since they receive more attention from teachers (e.g., Lerner et al., 1990). As the descriptive statistics in Table 1 suggests, attractiveness increases in level of education.

Moreover, the baseline results reported in Table 2 demonstrate that controlling for educational attainment reduces the size of the estimated marginal effect on attractiveness. Here I additionally include information on the respondents' language and computer proficiency. Presumably these would be correlated with unobserved skills productive in the labour market. I control for: RUSSIAN PROFICIENCY, a dummy equal to 1 if the person has an advanced or intermediate self-reported proficiency of the language and 0 otherwise; COMPUTER PROFICIENCY, a dummy equal to 1 if the person has an advanced or intermediate self-reported computer proficiency (specified to include Microsoft Office programs, excluding games) and 0 otherwise; and INTERNET USER, a dummy equal to 1 if the person has experience of accessing internet, and 0 otherwise. Column (1) reports the marginal effect estimates after adding these variables. As expected, the size of the marginal effects on attractiveness is smaller; however it remains significant. Computer proficiency is positively correlated for employment probability. No statistically significant effect of other cognitive skill proxies is found.

Second, attractiveness may be correlated with non-cognitive skills correlated with employment. For example, there is evidence to suggest that attractiveness is positively correlated with confidence (Mobius and Rosenblat, 2006) as well as sense of self-acceptance, purpose in life and personality traits (Scholz and Sicinski, 2015). To proxy for unobserved non-cognitive characteristics of respondents, I control for HIGH LOCUS OF CONTROL in the regressions. This variable is defined based on the question eliciting the respondents' level of control over their economic situation on a scale from 1 (no control at all) to 10 (complete control), and re-defined as a categorical variable representing low, intermediate and high loci of control. With conceptual links to both motivation and self-control, locus of control is one of the most important constructs for understanding a wide range of economic decisions (Cobb-Clark, 2015). Previous studies have linked Internal locus of control with labor market success (e.g., Heineck and Anger, 2010; Caliendo et al., 2015). It may also be positively correlated with attractiveness, leading to upward bias in estimates. In addition to HIGH LOCUS OF CONTROL, I control for two behavioural characteristics of individuals. The first of these is a dummy that takes 1 for positive number of cigarettes smoked on a daily basis and 0 otherwise. The second variable, NOT RELIGIOUS, is a dummy that takes 1 if the respondent never attends religious services and 0 otherwise.[10] These variables arguably proxy for a wide range of non-cognitive characteristics (e.g. self-reliance, risk-averseness,

[10]The presence of country and ethnic/linguistic majority status dummies means that the role of religiosity is considered broadly within a given religious denomination.

time-preference) potentially correlated with attractiveness.[11] They should also have relevance for labour market outcomes. To the extent smoking behaviour proxies for risk-taking or high rates of time preference, it may be positively associated with employment (e.g., Mavisakalyan and Meinecke, 2016). Religions, on the other hand, may encourage discipline and diligence (Guiso et al., 2003, for example, show that religious beliefs are associated with 'good' economic attitudes.); if so NOT RELIGIOUS will be negatively correlated with the employment probability. The marginal effect on attractiveness is largely unaffected as a result of including these three variables in the estimation (column (2)). As expected, HIGH LOCUS OF CONTROL is positively associated with employment probability, as is smoker status, although the association with the later is statistically insignificant. Conversely, the marginal effect on NOT RELIGIOUS is negative but insignificant.

A third source of bias I consider is social capital. The observed effect of attractiveness may operate through favourable experiences of socialisation. Langlois et al. (2000), for example, find that attractive adults are treated more positively than unattractive adults, even by those who know them. It is possible, that the effect of attractiveness on employment is over-estimated, given the evidence on positive implications of social capital for employment outcomes (e.g., Mouw, 2003; Yakubovich, 2005). To address this issue, I introduce three measures of social connectedness available in the dataset. First, I control for the objective NUMBER OF FRIENDS. I include two further measures to capture the respondents' perception of their own social connectedness. I include a dummy, FEELS REJECTED, that equals 1 if the respondents agree that the statement 'I often feel rejected' describes or more or less describes their feelings, and 0 otherwise. Similarly, the dummy FEELS EMPTINESS included in the regressions equals 1 if the respondents agree that the statement 'I experience a general sense of emptiness' describes or more or less describes their feelings, and 0 otherwise. The results are reported in column (3). The estimated marginal effect on ATTRACTIVE is indeed smaller compared to the baseline estimates as a result of introducing these variables. The significant positive effect of attractiveness on males' probability of employment is robust to this change, nevertheless. Additionally, the number of of friends is positively associated with probability of employment, while feeling rejected or feeling emptiness is negatively associated with it (the later effect is statistically insignificant).

Fourth, both beauty and employment may be correlated with investment in one's looks. While I don't have data on grooming itself, I include a dummy BIG SPENDER, defined to equal 1 if the respondent's 'personal spending' was USD251-400 or above in the preceding

[11] Cigarette smoking may also affect attractiveness directly through its association with lower weight levels (e.g., Chou et al., 2004; Lin et al., 2004)

month (these comprise less than 35% in the sample) and 0 otherwise. The aspiration here is to capture those whose personal spending goes beyond the basic necessities. As column (4) shows, this variable is positively correlated with the probability of employment. Its inclusion reduces the attractiveness premium; however it remains significant in both economic and statistical terms.

Finally, column (5) reports the results after including the entire list of comprehensive controls. The estimated marginal effect on attractiveness for males is halved in size compared to the baseline estimate. Thus a portion of the male attractiveness premium can be accounted for by its correlation with their cognitive and non-cognitive skills, social capital and personal expenditures. However, even after accounting for such a comprehensive list of controls, attractiveness remains positively correlated with the employment probability of males with a marginal effect equal to 0.068. This is equivalent to over a 10% increase in employment probability.

[Table 3 about here.]

Selection on unobservables. The analysis performed in the preceding section can at the best mitigate the problem of unobserved heterogeneity; however it cannot eliminate it. The later would require having a convincing instrumental variable, which is not available in the dataset. Here I take a different approach to addressing the issue of unobserved heterogeneity: I identify the relative role of unobservables required in order for the attractiveness premium for males to be zero. This approach provides further guidance in assessing the reliability of estimates of the male attractiveness effect.

I compare the amount of selection on unobservables to the amount of selection on observables for two probit specifications: the baseline specification with the full set of controls (as per column (5) of Table 2), and the comprehensive specification with the full set of comprehensive controls, including the baseline controls (as per column (5) of Table 3). Table 4 reports the results.

Based on the baseline specification, the amount of selection on observables under the hypothesis of no causal effect of attractiveness is equal to 0.150. The estimate of α at 0.358, adjusted for the value of $\hat{\pi}$ of 1.079 implies a maximum amount of selection on unobservables of 0.332. The resulting ratio of 2.22 means that the maximum amount of selection on unobservables would have to be 2.22 times as large as the amount of selection on the observables to explain away the entire male attractiveness effect. Performing similar calculations for the comprehensive specification yields a ratio of 2.605. That is, the maximum amount of selection on unobservables would have to be 2.605 times as large as the amount of selection

on the observables to cancel out the attractiveness effect. This is rather improbable, given the comprehensive set of explanatory variables included in the models (pseudo R^2=0.289). In assessing the effectiveness of Catholic schools, Altonji et al. (2005) report selection ratios of 1.43 (for college attendance) and 3.55 (for high school graduation), and suggest these to be "unlikely". Numbers in similar range are reported and declared as unlikely in other studies having applied this approach in different contexts (e.g., Fletcher and Frisvold, 2011; Chintrakarn et al., 2013; Mavisakalyan and Meinecke, 2016).

[Table 4 about here.]

Measurement of attractiveness. The fact that attractiveness can be defined in a number of ways may bear implications for the results. My baseline measure of attractiveness is generated based on interviewers' assessment on how attractive they found the respondents on the five-point scale. I reduced this information to a dummy variable coded 1 if the respondent was rated as attractive or very attractive by the interviewer, and 0 if the rating was 'neither attractive nor not attractive', 'unattractive' or 'very unattractive'. This approach minimizes the probability of misclassification of attractiveness. However, a drawback associated with it is that it does not distinguish across those with plain and unattractive looks, something that has been done in previous studies (e.g., Hamermesh and Biddle, 1994; French, 2002). Here I introduce more nuance to the measurement of looks by merging the bottom two (instead of three) categories into one, 'unattractive'. I then compare the employment outcomes for attractive and unattractive individuals to those who are neither attractive nor not attractive (excluded category). Column (1) of Table 5 reports the results of this exercise. The results suggest that attractive males have significantly higher probability of being employed compared to males with plain looks; however there is no significant difference in employment probabilities of males with plain and unattractive looks.

In an effort to introduce further nuance in the relationship between attractiveness and employment, I next introduce a distinction between individuals rated as 'very attractive' or just 'attractive' by interviewers (at the cost of having noisier measures of attractiveness). I then compare the employment probability of these two groups relative to those with plain or unattractive looks. Column (2) presents the results. Interestingly, the positive relationship between attractiveness and employment propensity is more pronounced for those with just attractive looks. The estimated marginal effect on JUST ATTRACTIVE is 13.2 percentage points while that on VERY ATTRACTIVE is 9.9 percentage points. One explanation behind this finding is that most people may apparently prefer the company of those close to the statistical norm, and similar to themselves (Huebler, 2009).

An important justification behind using interviewer ranking-based measures of looks in economic analysis is the absence of large disagreement about looks. In fact, as Langlois et al. (2000) suggest, raters agree on a universal beauty standard, not just within cultures, but also between cultures. To assess the implications of potential differences in interviewer perceptions in attractiveness within and between cultures, two further robustness checks are employed. First, to allow for the fact that interviewers may use different scales in assessing the looks of respondents, interviewer fixed effects are controlled for in column (3). The results are robust to this change; as expected, the marginal effect on attractiveness is larger compared to the baseline estimate. Second, to allow for cross-cultural differences in perceptions of attractiveness, I estimates separate models for each of the countries. The results are reported in columns (4)-(6). The significant attractiveness premium is observed in each of the three countries with the estimated marginal effects ranging from 0.095 (Armenia) to 0.158 (Georgia).

[Table 5 about here.]

5. Discussion

The results establish a robust link between attractiveness and employment probability of males. An important question is whether these results suggest employer discrimination on the basis of looks. Theories of employer discrimination predict that employers may simply have a taste for attractive employees (Becker, 1971). Under such taste-based discrimination scenario, attractive employees will be favoured over equally productive unattractive employees in the labour market. Yet it is also possible that the results are not an evidence of discrimination but instead of productivity associated with attractiveness itself. This may be the case in certain occupations, such as sex work or sales, where looks are likely to enhance productivity (Hamermesh and Biddle, 1994). Empirically distinguishing between these scenarios is challenging. Here I provide some suggestive evidence within the limits of the data.

If there is taste-based discrimination on the basis of attractiveness, we are more likely to observe more attractive individuals among employees rather than self-employed since in the later group there is no employer who can discriminate (e.g., Biddle and Hamermesh, 1998).[12] To evaluate this possibility, I estimate the effect of attractiveness on the probability of being self-employed or employed in a small family business (relative to other forms of employment) within the sample of employed. This group constitutes 35% of the sample of employed; the rest are employed in private or public sector companies, foreign/international

[12] Some sorting on the basis of attractiveness across the two sectors is also possible.

organizations or NGOs, or elsewhere. The results reported in column (1) of Table 6 confirm that attractiveness is negatively associated with males' probability of being self-employed. This is potentially consistent with taste-based employer discrimination in favour of attractive males.

Another implication of taste-based theories of discrimination is that competition among employers should limit such discrimination since it is costly. However, this is less likely to hold for public sector employers for whom profit maximization is not a key objective, and who are therefore more able to follow taste for discrimination. This may be particularly true for settings with poor-quality and corrupt public institutions as in the case of the three countries of this study. Another way to determine whether the results are consistent with the taste-based theory of discrimination is therefore to consider the relationship between attractiveness and employment by public/private sector. Column (2) of Table 6 reports the results of a regression with a dummy for public (versus private) sector employment used as a dependent variable (within this sub-sample nearly 60% are employed in the public sector while the rest are employed in the private sector). The results suggest that attractive employees are more likely to be found among those employed in the public sector - a pattern supportive of the taste-based theory of discrimination given that there is no reason to believe that attractiveness is particularly productive in the public sector (indeed if anything, it may be more productive in private sector for certain occupations - for evidence on job market for lawyers see Biddle and Hamermesh, 1998).

[Table 6 about here.]

To explore these results further, I consider additional labour market outcomes in relation to attractiveness. Ehrenberg and Schwarz (1987) posit that discrimination in the public sector primarily takes the form of unequal access to initial jobs and promotion opportunities and not of unequal pay given the structured nature of employment in the public sector that often requires equal pay for all individuals with the same seniority and qualifications. There is no information on pay in the dataset; however it includes information on 'personal income' in the preceding month reported in 8 categories. I apply the simple procedure of treating the midpoint of a group as if it is the observed value of that variable to construct a proxy for pay.[13] The results of OLS regressions using (the log of) this proxy as the dependent variable separately in the sub-samples of public and private sector employees are reported in columns (3) and (5) of Table 6. The relationship between attractiveness and pay

[13] Applying this approach to construct a dependent variable in a linear regression model should not create serious issues (e.g. Fryer and Pethybridge, 1972).

is insignificant in both sub-samples.[14] Data on promotions is also unavailable in the data. What it does contain is information on change in the respondents' 'employment status' over the preceding 12 months. Based on this information, I construct a dummy that equals 1 if the respondent reports having experienced positive change in employment status and 0 otherwise. To ensure that the initial offer of employment is not counted as a positive change in employment status, the estimations are limited to those with at least two years of employment with the current employer. As the results reported in columns (4) and (6) of Table 6 demonstrate, there is a positive association between attractiveness and the incidence of positive employment change of public but not private sector employees.

These results are consistent with the scenario of tasted-based discrimination limited to the public sector.[15] It cannot be entirely ruled out, of course, that the observed positive significant effect of attractiveness on labour market outcomes is attributable to its productive value. Such value, however, would be highly occupation-specific, and testing for it would require detailed data on occupations which is not available in the current dataset. The analysis in Hamermesh and Biddle (1994) exploits information on productivity-enhancing values of occupations. That analysis, however, finds only weak support for a productivity-related mechanism. Hamermesh and Biddle (1994) conclude that employer discrimination is likely to underlie their findings on positive labour market returns to attractiveness. This is likely to also hold in the context at hand. The scenario of employer discrimination in favour of attractive individuals is also supported by findings from field experiments. Recent studies document lower callbacks for unattractive individuals after submitting a resume (e.g., Boo et al., 2013; Ruffle and Shtudiner, 2015) even though attractiveness is not correlated with labor productivity (Mobius and Rosenblat, 2006).

6. Conclusion

This study provides the first evidence on labour market return to physical attractiveness in transition countries. Based on data from three post-Soviet countries of the Caucasus, I document large positive effect of attractiveness on the employment probability of males. This result is robust to conditioning on an extensive set of characteristics. Moreover, following

[14] It is possible that the used measure is not a good proxy for pay.

[15] The fact that there is an effect of attractiveness on the probability of experiencing a positive employment status change two years along the employment path suggests limited scope for statistical theory of discrimination under which employers lack information about the productivity of new employees and 'statistically discriminate' among them in their hiring decisions on the basis of easily observable characteristics such as looks (e.g., Phelps, 1972; Arrow, 1973).

an approach proposed by Altonji et al. (2005), I show that the degree of selection on the unobservables would have to be much stronger than the degree of selection on the observables to overturn this result. I therefore conclude that at least part of the effect of attractiveness on employment probability is likely to be causal. Applying this approach to assessing the selection bias is novel to the economics literature on attractiveness and strengthens the evidence base for causal inferences on its labour market returns.

While I am not able to precisely identify the mechanism that accounts for the attractiveness effect, my results suggest a role for taste-based discrimination. That there is scope for such discrimination in transition countries is not surprising given the absence of truly competitive markets and fair employment laws to prevent discrimination following the breakdown of institutions of full employment after the collapse of the Soviet Union. A policy implication that follows from this study is therefore to adopt formal (e.g. anti-discrimination laws) and informal (e.g. social norms) institutions to prevent refusing employment on the basis of physical characteristics (along with other characteristics not bearing direct relation to productivity such as gender or race). Such institutions, among other things, would discourage the use of photos in recruitment decisions - a practice still widely applied in the countries of this study.

Further investigation of the relationship between attractiveness and labour market outcomes in the context of other transition countries, particularly those with relatively more evolved labour market institutions, would be beneficial. Whether discrimination vs productivity-related mechanisms mediate the observed relationship between attractiveness and labour market outcomes is another area with high potential returns to further analysis, since existing findings are far from being conclusive. Finally, assessment of discrimination on the basis of other characteristics such as race, weight, or age in transition countries is another important area of future research.

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Table 1: Descriptive statistics

Variables	Definition	Mean (s.d.)		
		Unattractive	Attractive	All
ATTRACTIVE	0-1 binary variable; equals 1 if rated 'attractive' or 'very attractive'	0	1	0.56 (0.50)
EMPLOYED	0-1 binary variable; equals 1 if respondent reported having a job	0.59 (0.49)	0.73 (0.44)	0.67 (0.47)
AGE 26-30	0-1 binary variable; equals 1 if respondent is aged 26 to 30	0.19 (0.40)	0.17 (0.38)	0.18 (0.39)
AGE 31-35	0-1 binary variable; equals 1 if respondent is aged 31 to 35	0.15 (0.35)	0.14 (0.35)	0.14 (0.35)
AGE 36-40	0-1 binary variable; equals 1 if respondent is aged 36 to 40	0.14 (0.35)	0.16 (0.37)	0.15 (0.36)
AGE 41-45	0-1 binary variable; equals 1 if respondent is aged 41 to 45	0.15 (0.36)	0.15 (0.35)	0.15 (0.35)
AGE 46-50	0-1 binary variable; equals 1 if respondent is aged 46 to 50	0.15 (0.36)	0.18 (0.38)	0.16 (0.37)
AGE 51-55	0-1 binary variable; equals 1 if respondent is aged 51 to 55	0.15 (0.36)	0.12 (0.32)	0.13 (0.34)
AGE 56-60	0-1 binary variable; equals 1 if respondent is aged 56 to 60	0.07 (0.26)	0.09 (0.28)	0.08 (0.27)
ETHNIC MAJORITY	0-1 binary variable; equals 1 if respondent is from ethnic majority	0.89 (0.31)	0.96 (0.19)	0.93 0.25
LINGUISTIC MAJORITY	0-1 binary variable; equals 1 if respondent is from linguistic majority	0.92 (0.28)	0.97 (0.16)	0.95 (0.22)
PARTNERED	0-1 binary variable; equals 1 if respondent has a partner	0.84 (0.36)	0.83 (0.37)	0.84 (0.37)
GOOD HEALTH	0-1 binary variable; equals 1 if respondent has good/very good health	0.43 (0.49)	0.45 (0.50)	0.44 (0.50)
EDUC$\leq$ 10	0-1 binary variable; equals 1 if at most 10 years of education	0.45 (0.50)	0.35 (0.48)	0.39 (0.49)
EDUC11-14	0-1 binary variable; equals 1 if between 11 and 14 years of education	0.40 (0.49)	0.34 (0.47)	0.37 (0.48)
EDUC$\geq$ 15	0-1 binary variable; equals 1 if 15 or more years of education	0.15 (0.36)	0.31 (0.46)	0.24 (0.43)
CAPITAL CITY	0-1 binary variable; equals 1 if respondent lives in capital city	0.28 (0.45)	0.24 (0.43)	0.26 (0.44)
OTHER URBAN	0-1 binary variable; equals 1 if respondent lives in urban area	0.25 (0.43)	0.28 (0.45)	0.27 (0.44)
RURAL	0-1 binary variable; equals 1 if respondent lives in rural area	0.48 (0.50)	0.48 (0.50)	0.48 (0.50)
ARMENIA	0-1 binary variable; equals 1 if respondent lives in Armenia	0.17 (0.37)	0.24 (0.43)	0.21 (0.41)
AZERBAIJAN	0-1 binary variable; equals 1 if respondent lives in Azerbaijan	0.64 (0.48)	0.50 (0.50)	0.56 (0.50)
GEORGIA	0-1 binary variable; equals 1 if respondent lives in Georgia	0.19 (0.39)	0.25 (0.44)	0.22 (0.42)
N		568	728	1296

Note.—Means are representative of the population. Standard deviations in parentheses.

Table 2: Baseline model—probit marginal effects

Control variables	(1)	(2)	(3)	(4)	(5)
ATTRACTIVE	0.124***	0.122***	0.100***	0.151***	0.127***
	(0.034)	(0.022)	(0.030)	(0.029)	(0.021)
AGE 26-30		0.071			0.076**
		(0.055)			(0.038)
AGE 31-35		0.150***			0.173***
		(0.037)			(0.053)
AGE 41-45		0.138***			0.156***
		(0.036)			(0.022)
AGE 46-50		0.033***			0.037***
		(0.013)			(0.011)
AGE 51-55		0.054			0.064
		(0.038)			(0.047)
AGE 56-60		-0.040			-0.017
		(0.052)			(0.045)
ETHNIC MAJORITY		0.079			0.046
		(0.111)			(0.107)
LINGUISTIC MAJORITY		0.103			0.088
		(0.067)			(0.076)
PARTNERED		0.136***			0.132***
		(0.030)			(0.014)
GOODHEALTH		0.162***			0.137***
		(0.036)			(0.026)
EDUC$\leq$ 10			-0.220***		-0.185***
			(0.041)		(0.035)
EDUC11-14			-0.138**		-0.120*
			(0.058)		(0.069)
OTHER URBAN				-0.163***	-0.154***
				(0.024)	(0.015)
RURAL				-0.200***	-0.142***
				(0.052)	(0.047)
ARMENIA				-0.091***	-0.086***
				(0.014)	(0.023)
GEORGIA				-0.065***	-0.066***
				(0.019)	(0.016)
Pseudo R^2	0.027	0.120	0.076	0.090	0.202
N	1296	1296	1296	1296	1296

Note.—Dependent variable is EMPLOYED. Marginal effects for a discrete change of a variable from 0 to 1 for a person with ATTRACTIVE=0; controls are fixed at sample means. Standard errors clustered at the country level. *Denotes significance at 10 percent; **at 5 percent; ***at 1 percent levels. Pseudo R^2 calculated as $\widehat{\text{Var}}(X_i'\hat{\beta})/(1+\widehat{\text{Var}}(X_i'\hat{\beta}))$.

Table 3: Model with comprehensive controls — probit marginal effects

Control variables	(1)	(2)	(3)	(4)	(5)
ATTRACTIVE	0.083***	0.130***	0.117***	0.113***	0.068***
	(0.023)	(0.018)	(0.029)	(0.018)	(0.018)
RUSSIAN PROFICIENCY	0.074				0.047
	(0.046)				(0.039)
COMPUTER PROFICIENCY	0.096***				0.073
	(0.028)				(0.078)
INTERNET USER	0.040				0.060**
	(0.053)				(0.030)
HIGH LOCUS OF CONTROL		0.159***			0.101**
		(0.047)			(0.043)
SMOKER		0.042			0.034
		(0.043)			(0.050)
NOT RELIGIOUS		-0.046			-0.034
		(0.031)			(0.060)
NUMBER OF FRIENDS			0.004*		0.002
			(0.002)		(0.004)
FEELS REJECTED			-0.098***		-0.026
			(0.028)		(0.036)
FEELS EMPTINESS			-0.023		-0.003
			(0.046)		(0.063)
BIG SPENDER				0.297***	0.253***
				(0.024)	(0.040)
Baseline controls	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.195	0.236	0.215	0.257	0.289
N	1021	1206	1189	1146	830

Note.— Dependent variable is EMPLOYED. Marginal effects for a discrete change of a variable from 0 to 1 for a person with ATTRACTIVE=0; controls are fixed at sample means. Standard errors clustered at the country level. *Denotes significance at 10 percent; **at 5 percent; ***at 1 percent levels. Pseudo R^2 calculated as $\widehat{\text{Var}}(X_i'\hat{\beta})/(1+\widehat{\text{Var}}(X_i'\hat{\beta}))$.

Table 4: Amount of selection on unobservables relative to selection on observables

Control variables	$\hat{S}_0$	$\hat{\alpha}$	$\hat{\pi}$	$\hat{S}_{uo}$	$\frac{\hat{S}_{uo}}{\hat{S}_o}$
	(1)	(2)	(3)	(4)	(5)
Baseline controls	0.150	0.358	1.079	0.332	2.220
Comprehensive controls	0.075	0.218	1.115	0.195	2.605

Note.—Column (1) reports amount of selection on observables based on equation 6. Column (2) reports the probit estimate of α in equation 2. Column (3) reports the variance ratio defined in equation 5. Column (4) reports the maximum amount of selection on unobservables based on equation 4. Column (5) reports the amount of selection on unobservables relative to selection on observables. $N = 1296$ (baseline model) and $N = 830$ (comprehensive model).

Table 5: Robustness checks of measurement of attractiveness — probit marginal effects

Control variables	All	All	All	Armenia	Azerbaijan	Georgia
	(1)	(2)	(3)	(4)	(5)	(6)
ATTRACTIVE	0.123***		0.180***	0.095*	0.135***	0.158**
	(0.012)		(0.015)	(0.056)	(0.037)	(0.063)
UNATTRACTIVE	-0.022					
	(0.081)					
VERY ATTRACTIVE		0.099**				
		(0.044)				
JUST ATTRACTIVE		0.132***				
		(0.017)				
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Interviewer effects	No	No	Yes	No	No	No
Pseudo R^2	0.202	0.202	0.389	0.422	0.257	0.151
N	1296	1296	1086	401	578	317

Note.— Dependent variable is EMPLOYED. Marginal effects for a discrete change of a variable from 0 to 1 for a person with ATTRACTIVE=0 (ATTRACTIVE=0 and UNATTRACTIVE=0 in column (1); VERY ATTRACTIVE=0 and JUST ATTRACTIVE=0 in column (2)); controls are fixed at sample means. Standard errors clustered at the country level in columns (1)-(3); columns (4)-(6) report results by country samples. *Denotes significance at 10 percent; **at 5 percent; ***at 1 percent levels. Pseudo R^2 calculated as $\widehat{\text{Var}}(X_i'\hat{\beta})/(1+\widehat{\text{Var}}(X_i'\hat{\beta}))$.

Table 6: Model with alternative dependent variables - probit marginal effects and OLS coefficients

Control variables	All employees	All employees	Public sector employees		Private sector employees	
	(1)	(2)	(3)	(4)	(5)	(6)
ATTRACTIVE	-0.061**	0.078***	0.043	0.136***	0.059	0.074
	(0.029)	(0.002)	(0.035)	(0.022)	(0.191)	(0.072)
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
(Pseudo) R^2	0.188	0.188	0.193	0.545	0.273	0.348
N	857	408	238	216	160	123

Note.—Dependent variable is: employment in own/family business (column (1)); employment in public sector (column (2)); log personal income (columns (3) and (5)); incidence of positive change in employment status in the last 12 months (columns (4) and (6)). Columns (3) and (5) report OLS regression coefficients; columns (1), (2), (4) and (6) report probit marginal effects for a discrete change of a variable from 0 to 1 for a person with ATTRACTIVE=0; controls are fixed at sample means. Standard errors clustered at the country level. *Denotes significance at 10 percent; **at 5 percent; ***at 1 percent levels; Pseudo R^2 for probit models calculated as $\widehat{\text{Var}}(X_i'\hat{\beta})/(1+\widehat{\text{Var}}(X_i'\hat{\beta}))$.

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