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Research in Applied Economics

Does it Pay to be Pretty?: The Effect of Physical Appearances on Earnings and Employment.

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Abstract

This paper uses UK data to analyse links between earnings and physical appearances, using height and weight as proxies for appearance. This is done both for the labour market overall, as well as for specific occupation types. Further, this paper attempts to analyse the source of any appearance-based discrimination, where it exists, and understand the rationale behind such discrimination.

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1. *Introduction*

Apart from the various obvious factors that determine an individual's employment opportunities and career success, such as education and intelligence, a number of other, social-psychological factors could also be responsible. Theories and evidence suggest that, among others, physical appearances of individuals can often be linked to earnings. This paper systematically examines whether such links exist, and analyses their implications.

The work here hopes to shed light on whether in fact an employee's success, measured in terms of his remuneration, may be driven by physical appearances, and to what extent. To do so, the paper uses height and weight as proxies for physical appearance, examining the impact they have on earnings. Reasons for using these variables in particular are elaborated later.

Further, the paper aims to examine some of the possible causes for this discrimination. It is possible that certain physical traits might be associated with higher productivity in certain occupations, or instead that there is some level of 'pure discrimination' based on an individual's appearance.

Theories and evidence to support the idea of links between earnings and appearances come from two main fields of study – economics and psychology, and findings of previous papers from both fields are discussed. This paper focuses on an economic analysis of these links. Although research has been conducted in this area, this paper modifies and extends previous work, resulting in a fresh approach to the topic. Some important differences and extensions to previous papers have been highlighted at a later stage.

2. *Literature Review*

This section discusses previous research findings, briefly overviewing some psychological literature, and then focusing on economic papers.

Psychological research suggests that people are often predisposed to forming better overall impressions of people with certain 'good' physical traits. The 'primacy effect' states that the first impression of a person affects opinions formed of that person thereafter, and the 'halo effect' suggests that if one prominent characteristic of a person is judged positively, this spills over to positively influence our evaluation of the person overall. In support of such theories, Ritts, et al (1992), found that in an academic setting, physically attractive students are judged more favourably by their teachers, in a number of areas such as intelligence, potential and social skills. Dipboye, et al (1975), in applying these theories to the job market, found that physically attractive job applicants perform better throughout the entire application process. Both these findings are concurrent with the evidence of a natural cognitive bias towards attractiveness.

Judge and Cable (2004) put forward an interesting theoretical model, suggesting and providing evidence that height is positively related to social esteem and leadership skills, hence explaining the earnings premium, with stronger evidence for men than for women.

Hamermesh and Biddle (1994) were among the early researchers to conduct economic analysis on the subject. They suggest two possible explanations for such discrimination. Firstly, it is possible that in certain occupations attractiveness may be more productive, such as through consumer bias towards attractive employees. Secondly, such differences may arise due to pure employer discrimination towards attractiveness. They use ratings, based on interview responses to a person's attractiveness, to analyse the impact of looks on earnings (using Canadian and American labour force data). The authors conclude from their analysis that there is a significant impact on wages from 'bad looks' for both men and women. They find that men considered to have 'below average' looks earn around 9 percent less in hourly earnings, whereas those who have 'above average' looks earn 5 percent more in hourly earnings. Women with 'below average' looks earn 7-9 percent less in hourly earnings and those with 'above average' looks earn 5 percent more. The paper further asserts that while these effects are not as significant as those from "gender, education or race, they are not trivial". They suggest that while occupational crowding might occur, it is only partly, if at all, responsible for explaining the looks differential in earnings.

Harper (1999), the first to conduct such analysis on UK data, uses the National Child Development Study to examine the effects of physical traits on earnings. With respect to height, he finds that men in the bottom 20 percent of the height distribution face a significant pay penalty with respect to the 20-79th percentile, those in the 80-89th percentile receive a pay premium, but those in the 90th percentile receive an insignificant pay premium. For women, being in the bottom 10 percent of the height distribution results in a pay penalty; being in the next 10 percent results in a significant premium, and thereafter there are no significant effects of being tall, confirming "social-psychological evidence which emphasises the importance of height primarily among men". His results suggest non-linearity in the response of earnings to height, which this paper examines in more detail. He also finds a "significant pay penalty for obesity in women but not men", with women in the top 20 percent of the weight distribution facing a penalty in earnings.

He then examines whether these results arise from "pure employer discrimination, or from productivity differences which include customer discrimination". His analysis suggests the existence of "both pure employer discrimination and productivity differences", but that "the bulk of the pay differential for appearance arises from employer discrimination". This paper intends to explore employer discrimination using techniques different from those used by Harper.

Nickson, et al (2005), study the qualities that employers in retail and hospitality sectors seek in employees. They found that for client-facing, front-line personnel, employers value 'soft skills' over hard, technical skills. These soft skills include attitude and, importantly, appearance – which they refer to as 'aesthetic skills'. Employers feel that in interactive roles, aesthetic skills play a vital role to establish successful relationships with clients – employees must 'sound right' and 'look good'. This bias suggests that in such occupations, evidence might exist of appearance-based discrimination.

Pingitore, et al (1994), assessed whether obese individuals are discriminated against during interviews. They found evidence to suggest such discrimination does exist, especially among women.

In contrast to previous results, Heineck (2008), in his analysis of UK data, finds that after accounting for occupational differences, there is only very limited evidence of a height premium. Case, Paxson and Islam (2008), believe that most of the height premium disappears if other controlling factors are introduced.

In general, although the literature presents contrasting evidence and opinions on the effect of appearance on earnings, there is generally more support for the existence of a relation than for its absence. The effects of appearance seem to be asymmetric, suggesting that the impact, if any, is not uniform across genders, geographies, and occupations.

3. Data

a. Data Outline

This paper uses the National Child Development Study, available from the UK Data Archive. It is a UK based longitudinal survey conducted on all individuals born between 3rd and 9th March, 1958, tracing them at various ages, with data from each age compiled in a different sweep. It is an extensive survey that includes questions on a wide range of topics, allowing the analysis of a variety of potentially relevant variables. Analysis focuses on Sweep 5, when the individuals were aged 33, in 1991.

Table 1

NCDS observations	
Sweep 4	12,537
Sweep 5	***11,469***
Sweep 6	11,419

Final Observations	
Males	3,517
Females	2,582
	6,099

Initial Observations	**11,469**
Self Employed Individuals	2,107
Unemployed Individuals	350
Outliers: Income	947
Outliers: Height	112
Outliers: Weight	203
Missing Values (Occupation class, work hours, education)	1,651
No. of Observations	**6,099**

This sweep initially had 11,469 observations, but after removing outliers in height, weight and income[1], as well as unemployed and self-employed individuals, 6,099 observations remained. Measurements of height and weight are based on the metric system, measured in centimetres and kg respectively. A BMI variable has been created using the data, and defined as weight/height^2. In addition, extensive data is available on other parameters that might affect an individual's earnings, such as education, occupational type, firm type, and health status. These have been included in the final regressions in appropriate forms.

[1] Values included in the regressions are: incomes between 4000 and 500000 pounds annually, weights between 45 and 200 kg, heights between 120 and 220cm

An important control factor is type of occupation – salaries can vary significantly across job types and it is important to account for these variations. Occupational data is included in the dataset in two forms – a simpler form, consisting of 6 Social Classes[2] and a more extensive form, consisting of over a hundred Occupational Codes. For the sake of simplicity, this paper uses Social Classes. (see Appendix, Summary Graph 1)

b. Summary Statistics

From tables 3 and 4, we can see that average earnings varies quite significantly across occupational classes, rising steadily from its lowest value in the unskilled category to its highest value in the professional category. On average, we see that both height and weight remain largely consistent across all occupational categories. Additionally, this trend exists among both males and females, although averages in the female categories are lower than in the corresponding male categories, which is consistent with national trends.

Table 2

Summary Statistics						6,099 observations
	Males			**Females**		
Variable	**Mean**	**Median**	**Standard Deviation**	**Mean**	**Median**	**Standard Deviation**
Wages (£)	20,187	15,600	24,515	12,687	9,600	17,854
Height (cm)	176.9	177.0	6.9	163.3	163.0	6.5
Weight (kg)	80.3	78.8	13.6	65.7	63.0	13.2

Males			3,517 observations
Occupational Category	**Mean Income**	**Mean Height**	**Mean Weight**
Professional	26,201	177.5	79.2
Managerial/Technical	25,557	177.5	80.2
Skilled Non-Manual	21,619	178.1	81.7
Skilled Manual	15,577	176.1	80.6
Partly Skilled	13,542	175.9	80.3
Unskilled	11,283	175.9	80.0

Table 3

Females			2,582 observations
Occupational Category	**Mean Income**	**Mean Height**	**Mean Weight**
Professional	25,693	164.8	64.3
Managerial/Technical	15,125	163.6	65.7
Skilled Non-Manual	11,135	163.4	65.1
Skilled Manual	8,328	162.7	67.5
Partly Skilled	7,985	161.7	67.6
Unskilled	5,803	158.9	66.8

Table 4

The effect of earnings is expected to be non-linear, and dividing height and BMI into categories yields some interesting results. For the purpose of the results shown here, short and tall are defined as being in the bottom and top 20 percent of the respective height distributions, for males and

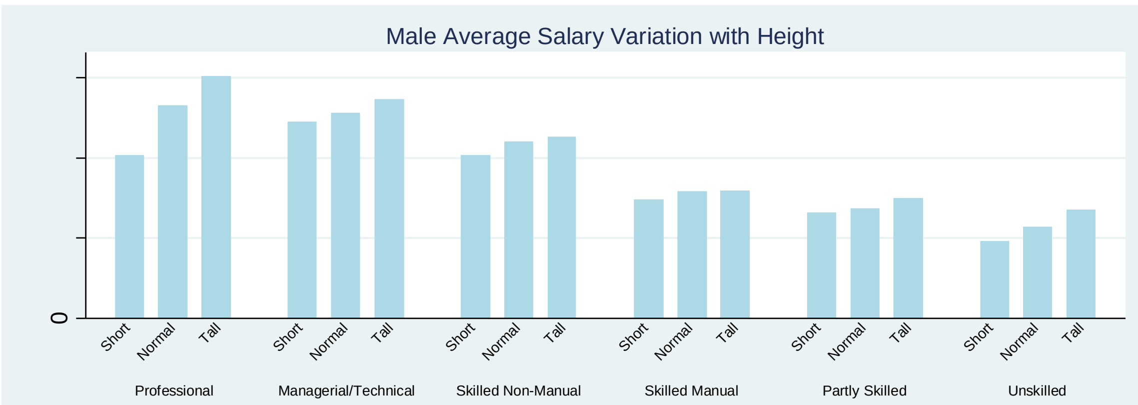
[2] The Social Classes are Professional, Managerial/Technical, Skilled Non-Manual, Skilled Manual, Partly Skilled, and Unskilled

females. For BMI, underweight, normal, and overweight are defined based on standardised health measures[3].

Figure 1

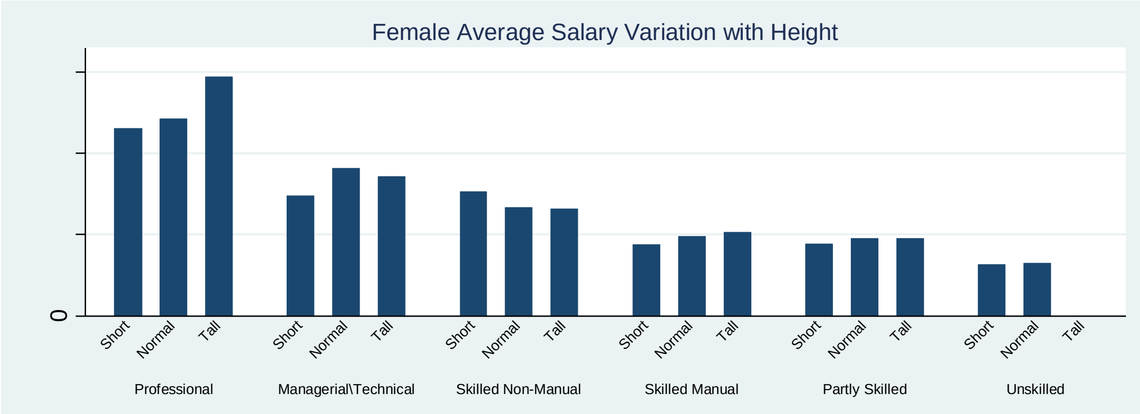
The graphs in Figure 1 show that for both males and females, average earnings increase with height, though the respective averages are lower for females. Additionally, we see that among females, average earnings decrease with an increase in BMI. Among males, a relation between BMI and earnings is less clear – normal and overweight males seem to earn almost the same on average, but underweight males have lower average earnings.

Figure 2



[3] Underweight: BMI<18.5, Overweight: BMI>=25

Figure 3



To take this one step further, graphs are split based on occupational categories (in Figures 2, 3, 4 and 5). Here again, the results are largely consistent with those found earlier – for both males and females, within each occupational category, there are differences in average earnings for different height and BMI levels.

These results show some preliminary signs that there might indeed be appearance-based discrimination between employees, resulting in these earnings differences. At this stage, it is appropriate to start running regressions, in order to control for various other factors that affect earnings, and examine whether links between earnings and appearances still exist thereafter.

Figure 4

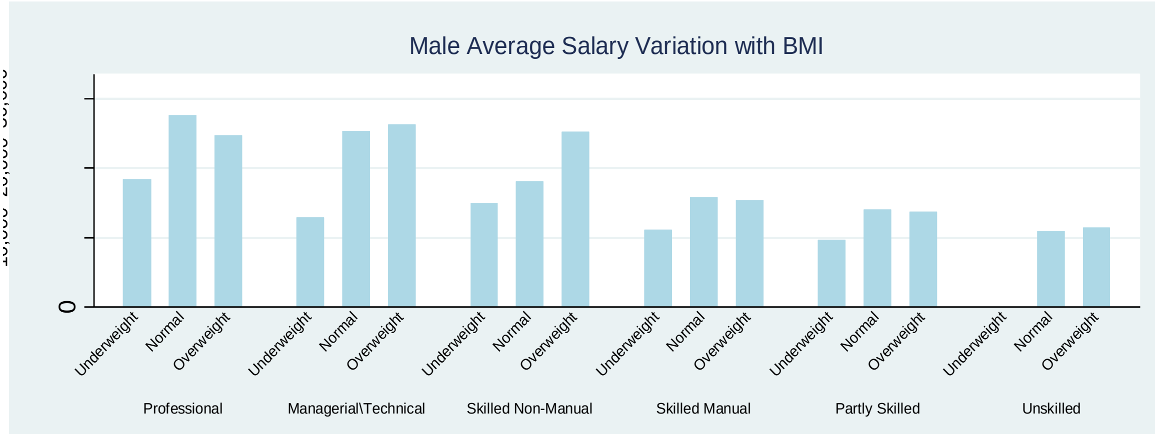
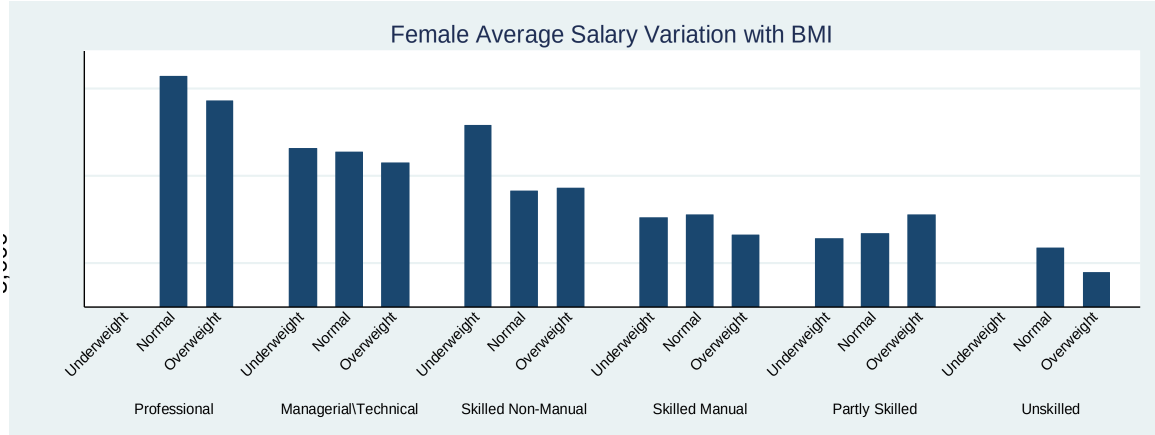


Figure 5



4. *Methodology*

a. Models Used and Methods Applied

Income is regressed on a number of determinants, to understand the effect that height and weight have on an individual's income. Ordinary Least Squares cross-sectional methods have been used, as this was the most suitable for the data at hand. Self-employed and unemployed individuals are excluded, as determinants of earnings are irrelevant for such individuals. Males and females are analysed separately, for two main reasons. Firstly, males and females often have very different earning patterns, and secondly the effects of height and weight on earnings were anticipated to be quite different for males and females. Having run different regressions for both sexes, structural tests confirmed that coefficients from both regressions were significantly different from each other to justify separate analyses.

Analysis followed a top-down approach, beginning with simple regressions including just income, height, weight and BMI. A number of controls were then added, in stages. Final regressions include height and BMI, but not weight. BMI was chosen as it is more representative of appearance, being a measure of weight and height in relation to each other. Literature and my personal opinion suggest that height and weight are likely to have an impact on earnings mostly at extreme levels – little evidence exists of impacts at 'normal' levels of height or weight. Hence, the height and BMI variables were recoded to allow measurement of non-linear effects. In particular, dummies were made at the 10^{th}, 20^{th}, 80^{th}, and 90^{th} percentiles for both height and BMI, to analyse effects within these intervals.

Initially, occupational classes are included in the regressions in the form of dummies, which simply controls for differing wages across these categories. Thereafter, separate regressions have been run for each occupational class – this allows the computation of the effect of height and weight within each category.

Further, it is interesting to understand the source of earnings differentials that exist. In order to do so, probit models have been estimated to determine the probability of individuals being employed within certain occupational categories. The interpretations and implications of these models have been discussed within the results.

At this stage, an equation describing the model used is not included, as the final result comprises a number of different regressions. The models estimated will become clear in the following section.

b. Important Extensions and Modifications to Previous Work

This paper attempts to address some of the shortfalls of previous work. A limitation of analysing physical appearance is that it is, by nature, subjective and difficult to measure. In order to statistically study it, it is necessary to use quantifiable measures. An obvious limitation of using 'attractiveness' as a determinant of earnings (as in Hamermesh and Biddle (1994)) is that measures of it are inherently subjective, leading to potential biases in the results. Averaging out the rankings of "attractiveness" of a number of survey respondents may reduce some of this bias; but even so, the individuals providing the rankings are not the ones determining incomes, and a potential mismatch in the preferences of these two groups causes the results to be less reliable.

In contrast, the effects of attractiveness on earnings can be better captured using suitable proxies, which are tangible and measurable. There are obviously a variety of factors that together constitute an individual's attractiveness (or lack thereof), but this paper focuses on two that are most fundamental – height and weight. These function as proxies for physical appearance. Using quantifiable and standardised variables addresses what I believe weakens the results of some previous work – it is subject to biases in terms of a specific group's judgement of attractiveness. Admittedly, height and weight measure physical appearances only at a very basic and crude level, but they enable the most objective and consistent analysis of appearance.

Many past papers tend to examine gross hourly earnings (such as Harper (1999), Hamermesh and Biddle (1994)). This paper instead uses gross annual salary. Typically, remuneration for full-time jobs is more accurately represented in the form of a total annual figure than a per-hour figure. Often an individual earning more might need to work longer, and perhaps irregular, hours. While this would lower his hourly earnings, such an individual would still be employed in a 'better paying' job, and would earn more overall, hence the need to work with annual earnings.

Deep thought has gone into the rationale behind results. For instance, effort has been made to determine causal directions, in cases where effects seem to be unexplained. Evidence suggestive of reverse causation, in particular in the relation between BMI and male earnings, has been examined further and dealt with appropriately.

Additionally, efforts have been made to determine the source of, and reason behind earning differentials. Previous studies (Harper (1999)) have attempted to do so by introducing interactive terms for employment categories and height/weight characteristics, in addition to occupation and physical trait dummies. This paper instead uses probit models to determine the effect of physical traits on probability of employment within certain occupational categories. The explanations and interpretations of these models have been explained in detail within the results.

Lastly, previous papers tend to analyse weight related attributes of an individual at a young age, rather than at the individual's current age. Stated reasons for doing so are that weight at younger ages might be related to positive career traits (such as self-esteem and confidence) developed at that age and maintained thereafter, and these traits might not change even if weight does. This paper accounts for such a hypothesis by instead including variables with individuals' self-rated measurements of various skills. In addition, individuals' latest BMI is used, to examine the effect on earnings *purely* from an individual's current appearance.

Consequently, the methods used, and results presented are quite different from even the papers that are most similar in their use of data and methods, specifically from Hamermesh and Biddle (1994), and Harper (1999).

5. *Results*

a. Effect of Height and Weight on Earnings

Dummy variables allow analysis of the effect appearances have at the periphery – towards the ends of both the height and BMI distributions. Dummy variables dividing these distributions into categories were included, as can be seen in Regressions 1 and 2 in the Appendix. Having run these regressions separately for males and females, a Chow test for misspecification in this model suggested that results for both sexes are indeed significantly different, with an F-value as high as 20.3[4].

Among males, being 'very short' or 'short' (ie, in the bottom 10% or 10-20th % of the height distribution) results in a pay penalty – males in either category earn 9.7% less and 4.5% less respectively than males in the 'normal' height category, or the middle 60% of the distribution. Interestingly, while males face a penalty for being short, there is no significant effect of being tall. Similarly for females, being 'short' or in the 10-20th % of the height distribution results in a 4% pay penalty, compared to the 'normal' category.

Examining the effect of BMI, we see that women's earnings do not seem to be affects by BMI. On the other hand, males who are in the bottom 10% and the next 10% of the weight distribution earn 8% less and 6.7% less, respectively, than males in the middle 60% of the distribution. These results raise some concern of 'reverse causation' – it is possible that people who earn more might spend more time working and have less time or inclination to exercise, which seems plausible because it is difficult to find reasons to otherwise justify an earnings bias in favour of overweight males.

In order to test this hypothesis, it is necessary to establish a causal direction between BMI and earnings among males. From previous regressions, it is clear that earnings are higher for individuals who work more hours per week (1.2% increase in annual earnings for an every extra hour worked per week, Appendix – Regression 1), suggesting that people who earn more do indeed have less free time outside of work. Regressing BMI on working hours (Appendix – Regression 5), to try and determine if working longer hours resulted in males being more obese, suggested a positive link between working hours and BMI, with a 1% increase in working hours resulting in a 1.12 unit increase in BMI among males. These results provide some support for the theory that higher-earners are more prone to being obese.

Admittedly, Regression 5 does not comprehensively explain an individual's BMI, as its predictive power is low. However, an individual's BMI is at least partly genetically-predisposed, and the factors that determine it are difficult to predict and measure. As long as these factors are not correlated with working hours, the coefficient on working hours should not be biased, and the regression should still be correct in suggesting the presence of reverse causation.

[4] compared to an F-statistic of 1.5 at 5%; testing that each unrestricted coefficient and constant is different from those of the restricted model.

It is reasonable to assume that these effects vary over different occupations, possibly due to the effect of physical appearances on employee productivity in different occupations. The next section examines this idea.

b. Effect of Height and Weight within Different Occupational Categories

This section attempts to address the question of whether employees with certain physical traits, in certain industries, earn more, and if so, whether this is because these traits improve productivity. For this, it was necessary to segregate the data by type of employment. Different regressions (Regressions 3 and 4) have been run for each 'social class' (using variables from final regression 1(5) and 2(5) in Appendix). The coefficients on any height or BMI category in any regression can now be interpreted as the effect on earnings of falling in that particular category, *and being employed in that particular social class.* Again, these regressions are run for both males and females independently.

At first glance at the figures in Regressions 3 and 4, it is clear that not all the results outlined above apply to all occupational classes. Males working in Skilled Manual occupations, for instance, naturally face physically demanding tasks on an everyday basis, and might necessarily be of a certain physique. This is evident from the data, where males who are in the 'short' category, or 11-20th percentile, earn 18% less than males of 'normal' height. Additionally, males who fall among the lowest 10% of BMIs, earn 22.8% less than the reference 'normal' level. These numbers are both economically and statistically significant, demonstrating just how important physical characteristics are in such jobs.

Perhaps a more controversial result appears in the Skilled Non-Manual category, where, among males, being tall results in significant monetary gains. Compared to 'normal height' males, 'very short' males earn 8.4% less. These results are consistent with the findings of Nickson, et al (2005), as discussed previously, of specific employer biases in client service jobs, many of which fall in this category[5]. In the case of males, the bias towards 'looking good' seems to have manifested itself in the form of significant earnings penalties for short males. Individuals who work in such occupations, particularly in sales and service jobs, often earn a large portion of their salary in the form of variable pay through commissions and bonuses. Even in the absence of employer bias in hiring 'attractive' individuals, such individuals may ultimately earn more in these careers due to higher on-the-job success. Importantly, this effect is statistically significant only at extreme height levels (the bottom 10% of the height distribution). It is worth noting that while sales, service and other client-relation jobs form a significant aspect of the skilled non-manual category, intermediate level administrative and clerical occupations also fall within this group, and in these occupations there is little reason to believe that attractiveness is directly related to productivity.

Again, in managerial and technical jobs, we notice the slightly confusing result that underweight males tend to earn less. While males in the 90-100th percentiles of the BMI distribution earn 5.6% less than 'normal' males, males in the 11-20th percentiles also earn less – 9% less than males in the

[5] Sales and service jobs, see Table A in Appendix

normal category. This again brings up the issue of reverse causation. Regressing BMI on working hours (Appendix – Regression 6), again suggested a positive link between working hours and BMI, with a 1% increase in working hours resulting in a 1.4 unit increase in BMI among males within the managerial/technical occupations.

Another interesting, unexplained result is that 'very short' males employed in professional occupations earn 21.9% less than 'normal' males. This can perhaps be attributed to appearance-based discrimination from clients, resulting in lower pay[6]. Although based on the same premise upon which a similar conclusion is drawn earlier (among skilled non-manual workers), this link is weaker – one would imagine that among professional workers, education and experience would take precedence over more superficial factors.

Examining the results for women, there is evidence of earnings differentials in some of the same areas as in men. In skilled non-manual jobs, for instance, females in the 10-20th percentile of the BMI distribution earn 16.4% more than 'normal' weight females. Again, theories to validate these findings allude to consumer biases in these job sectors. Additionally, these results support the findings of Pingitore, et al (1994), which assert that female workplace discrimination stems from obesity.

In managerial and technical occupations, 'short' females earn 9.7% less than 'normal' height females. Additionally, females in these occupations, with the lowest and highest 10% of BMIs earn 7.5% less and 9.2% less than those with normal BMIs. This might, as in the case of males, be an example of consumer/client discrimination, but again, the link drawn here is less strong than it is for skilled non-manual categories, as explained.

Earnings of females working in skilled manual jobs, however, are unaffected by height and weight. Traditionally, manual work performed by females has been less physically intensive than that conducted by males, explaining why there is no bias towards certain physical traits.

It is clear that economically and statistically significant earnings differences exist in the case of some occupations. These may be reflective of either or both of two scenarios – firstly, it is possible that employees with favourable physical characteristics earn more because they are more productive in their jobs, and secondly, employers may discriminate in favour of employees with these favourable characteristics. The next section analyses these possibilities.

c. <u>Source of Discrimination – Employee bias versus productivity differences</u>

Ascribing earnings differentials to either employee biases or productivity differences is a complex task, as it involves separating the effects of physical traits from productivity differences to those from employer biases. This paper attempts to do so by estimating the probabilities of being employed in various occupations, and the effects of physical traits on those probabilities.

[6] Many professional occupations may also require interpersonal communication and client interaction, such as in the case lawyers, accountants, etc

If the presence of certain physical traits increases the probability of being employed in a certain occupation, this is suggestive of an employer bias toward those traits. If, on the other hand, there is no evidence of this, but evidence of an effect of physical traits within that occupation nonetheless, it is likely that these traits actually lead to an increase in productivity within that occupation, and hence higher wages for the concerned individual.

Probit models have been estimated for the likelihood of being employed in each occupation category, given height/weight levels as well as other factors, and the marginal effects are shown in Tables A and B.

Among males, being in the bottom 10% or the next 10% of the distribution reduces the probability of being employed in skilled manual jobs, by 2.9% and 2.8% respectively, suggesting employer biases against employing short males. However, there is no significant effect of height on the probability of either professional or managerial/technical employment. Interestingly, falling in the top 10% of the height distribution actually *decreases* the probability of being employed in skilled non-manual jobs by 4.9%; and at all other height levels, there is no effect. These results imply that employers in professional, managerial/technical and skilled non-manual jobs do not actually discriminate between employees based on appearance, while employers in skilled manual jobs base employment decisions, to some extent, on appearance. It is worth nothing that effects of BMI are not analysed here since potential reverse causation makes their coefficients unreliable.

Among females, there is no significant impact of physical appearances on the probability of being employed in professional, managerial/technical, or skilled non-manual occupations, suggesting no employer discrimination in these sectors. In contrast, females who fall in the highest 10% of the height distribution are 6.4% more likely to be employed in skilled manual jobs, implying an employer bias. Again, BMI is not analysed since it is not possible to establish causal direction with certainty.

While these models are suggestive of the broad industries where employers might discriminate based on appearance, they might also be evidence of another phenomenon: self-selection. To consider the probit models, and indeed all previous regressions, to be representative of employer biases, and not self-selection, is to assume that when an individual makes career choices, he does so on the basis of more concrete and fundamental attributes, such as his education and work-related skills, rather than his assessment of his own appearance related qualities.

6. Conclusion

a. Evaluation of Model

Although every effort has been made to ensure that the model and the corresponding results presented are as robust and accurate as possible, admittedly this paper has shortcomings in the form of external and internal threats to model validity.

There is a possibility of measurement errors in variables, particularly in the case of height and weight, but also in the control variables. However, the average margin of error in height/weight measurement is likely to be quite small, hence not having a significant impact on the analysis.

A very large number of factors are responsible for an individual's earnings, some of which are unobservable and others, unknown. If any of these omitted variables are correlated with included variables, it will result in omitted variable bias. A concern is that unobservable personality traits such as confidence and self-esteem (which could positively impact earnings) might for some individuals be associated with their own perception of their physical appearance (Judge and Cable, 2004), and hence not being able to control for them, might lead to biases in the stated effects of appearances. Attempts to adjust for this have been made by including individual's self-rated measurements of various skills[7].

Finally, attributing effects discussed to employer biases, productivity difference, or self-selection has not been perfected, and causal directions and reasons have not been established with certainty.

b. Results and Implications

From the results presented, it appears that physical traits, in particular height and weight, are in fact responsible for earnings differentials between different individuals, albeit only in specific scenarios. What is less clear from the results is the source of this discrimination. From the tests conducted, there seems to be only little evidence of a 'pure employer bias' – employer's do not seem to usually consider these traits when hiring individuals. This suggests that the differential arises due to productivity differences related to appearance. In some cases, it is possible to put forth plausible economic rationale for the existence of such differences, as has been done. In others, links are unclear.

Without much evidence of employer biases, it is difficult to make a case for external intervention in the labour market. Further, the defined limits within which such discrimination appears to take place would require intervention at too narrow and specific a level. Further insight into the validity of psychological theories, such as the halo effect and primacy effect discussed earlier, will provide a greater understanding of why in fact any differential exists at all, and accordingly if there is any need for external intervention to ensure optimal functioning of the labour market.

[7] Skills included are verbal, keyboard, organization and construction skills

c. Extensions

Given the various shortcomings, there scope for extensions to be made to this paper. More detailed information about an individual's job, or broader occupational categories, will allow for more detailed deliberation over possible rationale behind discrimination that exists, and hence a better understanding of the source of appearance-based biases.

More information about and data on the traits that determine employee success will increase the reliability of the model and help eliminate possible biases in results. Analysing data from different countries and different time periods, and comparing this to the results presented here, will provide a more robust and comprehensive understanding of the issue.

Psychologists are now developing measurable, quantified indices of what people consider attractive. These scientific abstractions of attractiveness can be used more precisely and reliably than proxies such as height and weight.

Perhaps most important is the fact that employer or client biases towards certain physical traits is a result of human psychology, as discussed briefly at the start. In order to fully understand the source, nature and implications of these biases, economic analysis must be more intricately combined with psychological theories and hypotheses, resulting in a truly comprehensive, inter-disciplinary approach.

References

Case A, et al, 2008. Making Sense of the Labor Market Height Premium: Evidence from the British Household Panel Survey. *Economics Letters.* Vol. 102(3), pp. 174-76.

Dipboye RL, et al, 1975. Relative importance of applicant sex, attractiveness, and scholastic standing in evaluation of job applicant resumes. *Journal of Applied Psychology*. Vol. 60(1), pp. 39-43.

Hamermesh DS, Biddle, JE, 1994. Beauty and the Labour market. *American Economic Review*. Vol. 84(5), pp 1174-94.

Harper B, 1999. Beauty, Stature and the Labour Market: A British Cohort Study. *Oxford Bulletin of Economics and Statistics*. Vol. 62(0), pp. 771-800.

Heineck G, 2008. A Note on the Height-Wage Differential in the UK - Cross-sectional Evidence from the BHPS. *Economics Letters.*Vol 98(3), pp. 288-93.

Judge TA, Cable DM, 2004. The effect of physical height on workplace success and income: preliminary test of a theoretical model. *Journal of Applied Psychology*. Vol 89(3), pp.428-41.

Nickson D, et al, 2005. The Importance of Attitude and Appearance in the Service Encounter in Retail and Hospitality. *Managing Service Quality.* Vol. 15(2), pp. 195-208.

Pingitore R, et al, 1994. Bias against Overweight Job Applicants in a Simulated Employment Interview. *Journal of Applied Psychology*. Vol 79(6), pp. 909-17.

Ritts V, et al, 1992. Expectations, Impressions, and Judgments of Physically Attractive Students: A Review. *Review of Educational Research*, Vol. 62, No. 4, pp. 413-26.

Bibliography

Averett, S, Korenman, S, 1996. The Economic Reality of The Beauty Myth. *Journal of Human Resources*. Vol. 31, pp. 304-30.

Cain, G, 1986. The Economic Analysis of Labor Market Discrimination: A Survey. *Handbook of labor economics, Amsterdam: North Holland*. pp. 693-785.

Case A, et al, 2008. Making Sense of the Labor Market Height Premium: Evidence from the British Household Panel Survey. *Economics Letters.* Vol. 102(3), pp. 174-76.

Dipboye RL, et al, 1975. Relative importance of applicant sex, attractiveness, and scholastic standing in evaluation of job applicant resumes. *Journal of Applied Psychology*. Vol. 60(1), pp. 39-43.

Felson, RB, Bohrnstedt, GW, 1979. Are the Good Beautiful or The Beautiful Good?: The Relationship Between Children's Perceptions of Ability and Perceptions of Physical Attractiveness. *Social Psychology Quarterly*. Vol. 42, pp. 386-92.

Hamermesh DS, et al, 2002. Dress for success—does primping pay? *Labour Economics.* Vol. 9., pp. 361–73.

Hamermesh DS, Biddle, JE, 1994. Beauty and the Labour market. *American Economic Review*. Vol. 84(5), pp 1174-94.

Harper B, 1999. Beauty, Stature and the Labour Market: A British Cohort Study. *Oxford Bulletin of Economics and Statistics*. Vol. 62(0), pp. 771-800.

Heineck G, 2008. A Note on the Height-Wage Differential in the UK - Cross-sectional Evidence from the BHPS. *Economics Letters.*Vol 98(3), pp. 288-93.

Judge TA, Cable DM, 2004. The effect of physical height on workplace success and income: preliminary test of a theoretical model. *Journal of Applied Psychology*. Vol 89(3), pp.428-41.

Loh, ES, 1993. The Economic Effects of Physical Appearance. *Social Science Quarterly*, Vol. 74, pp. 420-38.

McLean, R, Moon, M, 1980. Health, Obesity, and Earnings. *American Journal of Public Health*. Vol. 70(9), pp. 1006-9.

Nickson D, et al, 2005. The Importance of Attitude and Appearance in the Service Encounter in Retail and Hospitality. *Managing Service Quality.* Vol. 15(2), pp. 195-208.

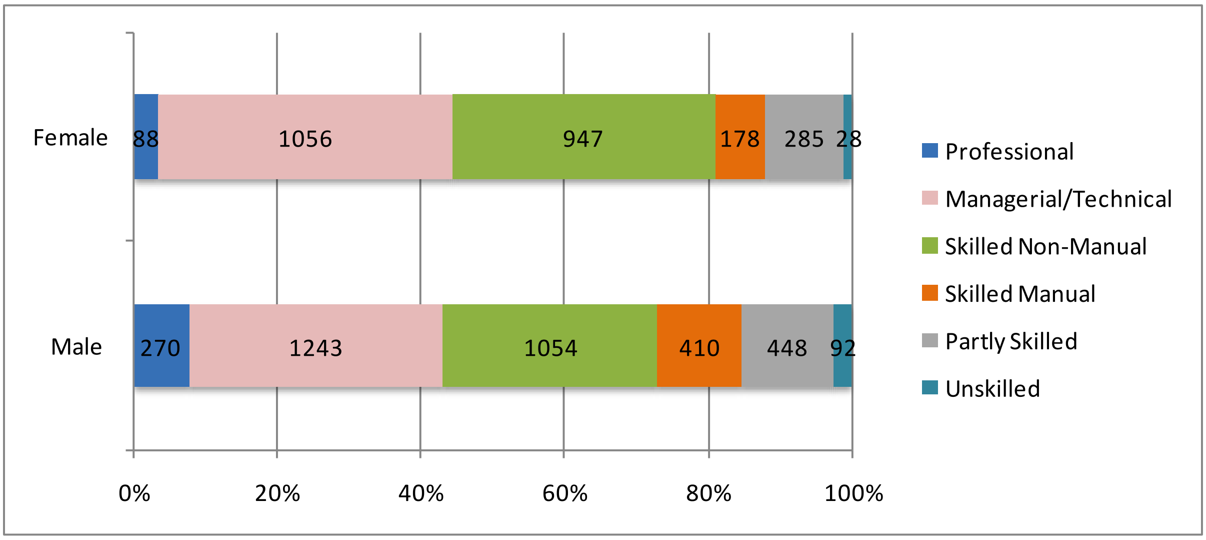
Pingitore R, et al, 1994. Bias against Overweight Job Applicants in a Simulated Employment Interview. *Journal of Applied Psychology*. Vol 79(6), pp. 909-17.

Ritts V, et al, 1992. Expectations, Impressions, and Judgments of Physically Attractive Students: A Review. *Review of Educational Research*, Vol. 62(4), pp. 413-26.

Appendix

Throughout the appendix, relevant, significant coefficients are in **bold**
**:significant at 1%, *:significant at 5%, #:significant at 10%

Summary Graph 1 – Labour division by Social Class



Throughout the appendix, relevant, significant coefficients are in **bold**
**:significant at 1%, *:significant at 5%, #:significant at 10%

Regression 1 – Effect of Height and Weight on Male Earnings

Variable	1	2	3	4	5
	ln_wages				
Very Short (0-10%)	**-0.144**	**-0.104**	**-0.095**	**-0.102**	**-0.097**
	(4.26)**	(3.26)**	(3.09)**	(3.36)**	(3.32)**
Short (10-20%)	**-0.091**	**-0.071**	**-0.053**	**-0.053**	**-0.045**
	(3.52)**	(2.96)**	(2.30)*	(2.31)*	(2.01)*
Tall (80-90%)	**0.074**	0.046	0.038	0.036	0.031
	(2.41)*	-1.57	-1.39	-1.32	-1.18
Very Tall (90-100%)	**0.09**	**0.06**	0.052	0.045	0.032
	(3.04)**	(2.09)*	-1.89	-1.66	1.25
0-10% BMI	**-0.122**	**-0.125**	**-0.108**	**-0.096**	**-0.08**
	(3.99)**	(4.43)**	(3.94)**	(3.53)**	(2.92)**
10-20% BMI	**-0.04**	**-0.051**	**-0.072**	**-0.07**	**-0.067**
	-1.53	(2.04)*	(2.98)**	(2.95)**	(2.88)**
80-90% BMI	-0.051	-0.035	-0.018	-0.016	-0.02
	-1.72	-1.25	-0.69	-0.61	-1.04
90-100% BMI	-0.019	0.004	0.012	0.01	-0.005
	-0.6	-0.14	-0.41	-0.37	-0.35
Full-time employee	0.454	0.409	0.38	0.37	0.306
	(9.81)**	(9.34)**	(8.87)**	(8.88)**	(7.73)**
O-level		-0.43	-0.262	-0.266	-0.252
		(13.77)**	(8.25)**	(8.49)**	(8.16)**
A-level		-0.107	-0.08	-0.073	-0.068
		(2.63)**	(2.04)*	-1.93	-1.85
Diploma		-0.337	-0.191	-0.193	-0.177
		(12.22)**	(6.76)**	(6.97)**	(6.50)**
Degree		-0.125	-0.148	-0.121	-0.094
		(2.58)**	(3.12)**	(2.43)*	(2.01)*
No Qualification		-0.636	-0.378	-0.364	-0.353
		(19.36)**	(10.88)**	(10.64)**	(10.69)**
Other Qualification		-0.362	-0.209	-0.203	-0.194
		(8.83)**	(5.20)**	(5.14)**	(5.00)**
workhours					0.012
					(13.38)**
Constant	9.294	9.66	9.357	9.343	8.876
	(197.38)**	(189.94)**	(155.25)**	(87.92)**	(70.72)**
Observations	3517	3517	3517	3517	3517
R-squared	0.04	0.14	0.22	0.24	0.3
Robust t statistics in parentheses					

Dependent Variable – log(annual wages)

For males, Height and BMI levels are defined as:

Height

Very Short (bottom 10%: <168cm)
Short (10-20%: 168-172cm)
Normal (default – 172-183cm)
Tall (80 - 90%: 183-186cm)
Very Tall (top 10%: >186cm)

BMI

Very Underweight (bottom 10%: <21.5)
Underweight (bottom 10-20%: 21.5-22.7)
Normal (default – 22.7-28)
Overweight (80 - 90%: 28-30.3)
Very Overweight (top 10%: >30.3)

Default Qualification – Undergraduate Degree

Control Factors					
	1	2	3	4	5
Full Time Employee	Yes	Yes	Yes	Yes	Yes
Qualification		Yes	Yes	Yes	Yes
Occupational Category			Yes	Yes	Yes
Firm Size/Sector				Yes	Yes
Promoted in Current Job					Yes
Has a Disability					Yes
Ethnicity					Yes
Skills - Verbal, Organisation, Keyboard, Construction					Yes

Regression 2 – Effect of Height and Weight on Female Earnings

Variable	**1**	**2**	**3**	**4**	**5**
	ln_wages				
Very Short (0-10%)	-0.044	-0.038	-0.022	-0.018	-0.025
	-1.1	-1.03	-0.61	-0.52	-0.74
Short (10-20%)	**-0.073**	**-0.068**	**-0.059**	**-0.057**	**-0.04**
	(2.58)**	(2.51)*	(2.30)*	(2.26)*	(1.66)#
Tall (80-90%)	0.022	0	-0.008	-0.009	-0.002
	-0.7	-0.01	-0.28	-0.31	-0.06
Very Tall (90-100%)	**0.088**	0.063	0.05	0.043	0.026
	(2.39)*	-1.71	-1.49	-1.28	-0.82
0-10% BMI	-0.002	-0.01	-0.013	-0.02	-0.032
	-0.06	-0.32	-0.47	-0.7	-1.26
10-20% BMI	0.05	0.036	0.031	0.03	0.032
	-1.38	-1.03	-0.92	-0.9	-0.98
80-90% BMI	-0.034	-0.009	-0.008	-0.007	-0.022
	-1.04	-0.31	-0.27	-0.22	-0.77
90-100% BMI	-0.078	-0.043	-0.023	-0.024	-0.043
	(2.23)*	-1.3	-0.75	-0.77	-1.48
Full-time employee	0.549	0.534	0.506	0.491	0.33
	(27.37)**	(27.67)**	(26.79)**	(26.04)**	(15.29)**
O-level		-0.369	-0.198	-0.203	-0.217
		(11.52)**	(5.83)**	(5.91)**	(6.64)**
A-level		-0.114	-0.049	-0.059	-0.06
		(2.87)**	-1.3	-1.56	-1.69
Diploma		-0.246	-0.128	-0.141	-0.151
		(7.97)**	(3.99)**	(4.39)**	(4.85)**
Degree		0.147	0.048	0.037	0
		(3.44)**	-1.05	-0.82	0
No Qualification		-0.526	-0.271	-0.277	-0.272
		(13.33)**	(6.37)**	(6.50)**	(6.49)**
Other Qualification		-0.319	-0.173	-0.18	-0.183
		(7.19)**	(3.91)**	(3.96)**	(4.13)**
workhours					0.015
					(12.00)**
Constant	8.877	9.133	8.871	8.818	8.44
	(481.78)**	(305.57)**	(137.65)**	(89.80)**	(71.18)**
Observations	2582	2582	2582	2582	2582
R-squared	0.22	0.3	0.37	0.39	0.46
Robust t statistics in parentheses					

Dependent Variable – log(annual wages)

For females, Height and BMI levels are defined as:

Height
Very Short (bottom 10%: <155cm)
Short (10-20%: 155-158cm)
Normal (default – 158-168cm)
Tall (80 – 90%: 168-171cm)
Very Tall (top 10%: >171cm)

BMI
Very Underweight (bottom 10%: <20.1)
Underweight (bottom 10-20%: 20.1-21.2)
Normal (default – 21.2-27.6)
Overweight (80 - 90%: 27.6-30.8)
Very Overweight (top 10%: >30.8)

Default Qualification – Undergraduate Degree

Control Factors					
	1	2	3	4	5
Full Time Employee	Yes	Yes	Yes	Yes	Yes
Qualification		Yes	Yes	Yes	Yes
Occupational Category			Yes	Yes	Yes
Firm Size/Sector				Yes	Yes
Promoted in Current Job					Yes
Has a Disability					Yes
Ethnicity					Yes
Skills - Verbal, Organisation, Keyboard, Construction					Yes

Regression 3 – Effect of Height and Weight on Males within Occupation Categories
Dependent Variable – log(annual wages)

	Professional	Managerial/Technical	Skilled Manual	Skilled Non-Manual	Partly Skilled	Unskilled
Variable	**a**	**b**	**c**	**d**	**e**	**f**
	ln_wages					
Very Short (0-10%)	**-0.219**	-0.051	-0.153	**-0.084**	-0.068	0.049
	(2.90)**	-0.78	-1.08	(2.51)*	-0.96	-0.32
Short (10-20%)	-0.09	-0.048	**-0.18**	0.041	**-0.087**	-0.16
	-1.13	-0.99	(1.74)#	-1.34	(2.02)*	-1.66
Tall (80-90%)	0.054	0.056	0.095	-0.038	0.037	0.001
	-0.63	-1.17	-1.02	-0.92	-0.54	0
Very Tall (90-100%)	0.06	-0.012	0.025	0.042	0.035	-0.062
	-0.46	-0.26	-0.33	-1.24	-0.63	-0.32
0-10% BMI	-0.007	-0.059	**-0.228**	-0.042	-0.08	0.127
	-0.05	-1.1	(3.33)**	-1.08	-1.68	-1.29
10-20% BMI	-0.081	**-0.09**	-0.051	0.02	-0.044	-0.099
	-0.91	(2.34)*	-0.63	-0.45	-0.77	-0.64
80-90% BMI	-0.025	0.003	-0.021	-0.012	-0.035	**-0.242**
	-0.29	-0.05	-0.23	-0.37	-0.68	(2.32)*
90-100% BMI	**-0.065**	**-0.056**	0.14	-0.011	0.096	-0.251
	(2.09)*	(5.23)**	-0.55	-0.32	-0.6	-1.07
Constant	9.523	9.308	9	8.722	8.375	8.388
	(25.23)**	(44.76)**	(26.07)**	(45.45)**	(29.29)**	(18.14)**
Observations	270	1243	410	1054	448	92
R-squared	0.23	0.18	0.16	0.24	0.32	0.58

Robust t statistics in parentheses

Controls for each of the above regression are those of Regression (5) previously – ie, Full-Time Employee, Qualification, Occupational Category, Firm Size/Sector, Promoted, Disability, Ethnicity, and Work Skills

Regression 4 – Effect of Height and Weight on Females within Occupation Categories
Dependent Variable – log(annual wages)

Variable	Professional a	Managerial/Technical b	Skilled Manual c	Skilled Non-Manual d	Partly Skilled e	Unskilled f
	ln_wages					
Very Short (0-10%)	-0.126	-0.039	-0.005	-0.047	-0.041	0.056
	-0.62	-0.65	-0.08	-0.55	-0.81	-0.47
Short (10-20%)	-0.138	**-0.097**	-0.018	-0.067	0.093	-0.624
	-0.57	(2.75)**	-0.4	-0.99	-1.65	-2.41
Tall (80-90%)	0.003	-0.041	0.023	0.027	-0.079	-0.984
	-0.01	-1.06	-0.48	-0.38	-1.15	-1.8
Very Tall (90-100%)	0.268	-0.027	0.028	0.012	0.031	0
	-1	-0.59	-0.58	-0.12	-0.42	(.)
0-10% BMI	-0.316	**-0.075**	-0.034	0.085	0.092	**1.142**
	-0.88	(1.87)#	-0.82	-0.79	-1.45	(3.19)*
10-20% BMI	-0.132	0.034	0.05	**0.164**	0.027	0.558
	-0.51	-0.59	-0.9	(1.93)#	-0.36	-1.55
80-90% BMI	-0.226	-0.057	0.013	-0.069	0	0.07
	-1.07	-1.31	-0.22	-1	0	-0.47
90-100% BMI	0.216	**-0.092**	-0.063	0.047	0.015	-0.055
	-1.09	(1.24)#	-0.43	-0.96	-1.15	-0.11
Constant	8.189	8.852	8.42	8.387	8.205	8.3
	(11.09)**	(50.32)**	(44.50)**	(25.22)**	(26.31)**	(10.61)**
Observations	88	1056	947	178	285	28
R-squared	0.53	0.36	0.34	0.53	0.48	0.96

Robust t statistics in parentheses

Controls for each of the above regression are those of Regression (5) previously – ie, Full-Time Employee, Qualification, Occupational Category, Firm Size/Sector, Promoted, Disability, Ethnicity, and Work Skills

Regression 5 – Male BMI-reverse causation test (all occupations)
Dependent Variable – bmi

Variable	bmi
log(Working Hours per Week)	**1.122**
	(3.20)**
height	-0.061
	(6.14)**
Constant	32.157
	(14.67)**
Observations	3602
R-squared	0.01

Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

Regression 6 – Male BMI-reverse causation test (Managerial/Technical occupations)
Dependent Variable – bmi

Variable	bmi
log(Working Hours per Week)	**1.431**
	(2.65)**
Height	-0.056
	(3.45)**
Constant	29.984
	(8.52)**
Observations	1243
R-squared	0.01

Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

Table A – Probit – Estimating Probability of Employment within Social Classes – Males

Marginal Effects

	Professional	Managerial/ Technical	Skilled Non-Manual	Skilled Manual
Very Short (0-10%)	0.026	-0.028	-0.005	**-0.029**
	1.49	-0.88	-0.2	(1.68)#
Short (10-20%)	0.009	-0.024	0.025	**-0.028**
	0.74	-0.94	1.06	(1.92)*
Tall (80-90%)	0.022	-0.04	0.003	0.015
	1.6	-1.51	0.13	0.83
Very Tall (90-100%)	-0.009	0.022	**-0.049**	0.019
	-0.81	0.76	(2.06)*	1.03
0-10% BMI	-0.011	-0.023	0.037	-0.009
	-1.1	-0.82	1.39	-0.52
10-20% BMI	-0.013	**0.094**	**-0.067**	0.006
	-1.3	(3.21)**	(2.94)**	0.34
80-90% BMI	**-0.018**	-0.014	-0.007	-0.003
	(1.92)*	-0.53	-0.3	-0.19
90-100% BMI	-0.015	-0.022	0.038	0.002
	-1.4	-0.82	1.43	0.11

Table B – Probit – Estimating Probability of Employment within Social Classes – Females

Marginal Effects

	Professional	Managerial/ Technical	Skilled Non-Manual	Skilled Manual
Very Short (0-10%)	-0.003	-0.035	-0.015	-0.009
	-0.37	-0.92	-1.03	-0.25
Short (10-20%)	-0.005	-0.011	-0.001	0.007
	-0.75	-0.32	-0.03	0.22
Tall (80-90%)	0.006	-0.01	0.003	0.043
	0.76	-0.31	0.25	1.38
Very Tall (90-100%)	0.013	-0.026	-0.013	**0.064**
	1.33	-0.76	-0.99	(1.88)#
0-10% BMI	0.004	0.005	-0.012	-0.013
	0.43	0.16	-0.88	-0.39
10-20% BMI	0.002	-0.007	0.005	0.019
	0.25	-0.22	0.32	0.55
80-90% BMI	-0.001	0.016	0.005	-0.052
	-0.14	0.45	0.29	-1.63
90-100% BMI	**-0.013**	0.007	0.017	**-0.071**
	(2.18)**	0.19	1.00	(2.25)*

Controls for both of the above models are: Full-Time Employee, Qualification, Disability, Ethnicity, and Work Skills

Table C – Various Occupations included within Social Classes

Social class		Types of Jobs
I	Professionals occupations	Higher Professional workers - self-employed Higher Professional workers - employees
II	Managerial and technical occupations	Employers in industry, commerce, etc. - large establishments Managers in government, industry, commerce, etc. - large establishments Managers in industry, commerce, etc. - small establishments Employers in industry, commerce, etc. - small establishments Lower professionals and higher technical - self-employed Lower professionals and higher technical - employees Lower Managerial Intermediate technical and auxiliary Ancillary workers and artists Own account workers (agriculture)
III	Skilled occupations - non-manual	Foremen and Supervisors (Non-Manual) Lower Professionals and Higher Technical Higher supervisory Intermediate clerical and administrative Intermediate sales and service Semi-routine sales Semi-routine clerical
III	Skilled occupations - manual	Skilled manual workers Own account workers (Manual) Foremen and supervisors - manual Intermediate engineering Lower technical craft Semi-routine technical Routine technical
IV	Partly skilled occupations	Semi-skilled manual workers Agricultural workers Personal service workers Lower technical process operative Semi-routine service Semi-routine operative Semi-routine childcare Routine production Semi-Routine agricultural
V	Unskilled occupations	Unskilled manual workers Routine operative

Source: Office of National Statistics, UK