

PEER REVIEW HISTORY

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ARTICLE DETAILS

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| TITLE (PROVISIONAL) | The lifetime cost to English students of borrowing to invest in a medical degree: a gender comparison using data from the Office for National Statistics |
| AUTHORS | Ercolani, Marco; Vohra, Ravinder; Carmichael, Fiona; Mangat, Karanjit; Alderson, Derek |

VERSION 1 - REVIEW

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| REVIEWER | Derek Rogalsky Georgetown University School of Medicine, United States |
| REVIEW RETURNED | 26-Jan-2015 |

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| GENERAL COMMENTS | <p>Thank you for the opportunity to review your manuscript. It is well conceived, well written, and an important contribution with significant policy implications.</p> <p>I have only minor revisions to suggest.</p> <p>1) The fact that data was compiled from a nearly 17 year period should be acknowledged as weakness of the study. Cross sectional analysis is best performed over a short defined time period and 17 years is not short. As is correctly acknowledged salaries over a significant portion of that time were flat in real terms making normalization to 2014 somewhat problematic.</p> <p>2) In the "Repayment of Fees (for any level of debt)" section of the Methods, states "We also assumed that interest was charged... etc." If available the proportion of medical professionals earning a salary less than 41,000 should be included. I do not doubt the authors assumption that the vast majority of medical graduates earn more than this figure, however to make this simplifying assumption the authors should if possible present reasonable justification.</p> <p>3) In the Discussion section a brief acknowledgement is made regarding the fact that 17% of debt comes from non-SLC sources. Further interpretation of this fact is warranted in the Discussion. It would be helpful if the authors could comment on whether this debt is spread evenly among medical graduates or whether this 17% of debt is actually lumped on female graduates or graduates from low socio-economic station.</p> <p>4) The concluding paragraph and especially concluding sentence should be re-written for clarity and express a stronger opinion of what the data mean.</p> <p>5) Table 1 should be edited for significant figures. Age, hours, and percents should be rounded to the nearest whole number as the</p> |
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| | <p>extra digits detract from readability and do not supply additional information. Also for the average hourly wage the appropriate units should be added, which I assume are pounds.</p> <p>Overall this study is excellent. Appropriate data are used to draw meaningful conclusions and assumptions are clearly stated and justified. The figures are tables support the text well. The supplementary tables are difficult to read but appropriate for readers with higher expertise or interest. If anything the authors are too conservative in expressing their opinions regarding the data and its implications.</p> <p>This paper is an important contribution that will be published, and likely read, cited, and discussed and length in policy circles.</p> <p>Thank you for the opportunity to review it,</p> |
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| REVIEWER | Julie Phillips MD MPH Michigan State University College of Human Medicine United States |
| REVIEW RETURNED | 27-Jan-2015 |

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| GENERAL COMMENTS | <p>Interesting paper, that examines total repaid debt over a lifetime for male and female medical school graduates from England who study in the UK. I am not aware of previous studies examining these outcomes. There is very little in the medical education literature about non-American students and their debt, so this may fill an important gap in the literature.</p> <p>I found the paper excessively long, relative to the interest of the findings, and think it would be improved by some editing to "tighten it up." There is a fair amount of repetition and redundancy, especially in the discussion section, which largely restates the results section. I also found the number of figures and the detail of the figures excessive, and I do not believe most readers will be interested in this topic to this level of detail. I would like more "so what" - given these results, what does this mean? What is the potential impact on students and practicing physicians? The authors hint that there are "implications" but I don't really understand what the implications are. I would like to see them explored in a more meaningful way. I also thought the paper would benefit from a richer exploration of the implications of medical education debt from a global perspective. The introduction is not very compelling. Why are the authors analyzing this problem at all?</p> <p>The abstract is confusing. It is difficult to tell, reading the abstract alone, which analyses are hypothetical (although this is made much more clear in the methods section).</p> <p>The authors state as a strength that this is the "first study investigating impact of costs of borrowing to invest in a medical degree." This is grossly untrue.</p> <p>Some of the wording is awkward. The authors use passive voice at times. There are a few spelling errors. The authors also sometimes use terms that are not familiar to me as someone from the U.S., such as "age band," "banding supplements," "maintenance." There are a couple instances of abbreviations not being spelled out at first</p> |
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| | <p>use, which should be corrected. The formatting and numbering of the references within the paper is inconsistent.</p> <p>Some of the math in the Methods section was too complex for me. I appreciate the transparency, but the paper may benefit from review by an economist to ensure that the application of the formulas is appropriate for the research questions.</p> <p>On page 12, line 20, the authors do not acknowledge discrimination as a reason for the wage gap between male and female physicians. I am assuming this is just an oversight, but it is very striking and should be corrected.</p> <p>Finally, I have some suggestions for how the figures could be improved. First, figure 1 and Supplementary Figure 1: There is overlap between the gray areas that is not transparent, so it is impossible to see the true overlap between the interquartile ranges. I would either remove the ranges and just display the lines, or make the overlap transparent. I looked at Figure 2 and Figure 3 for a long time and could not understand what they were trying to convey or the reason for their inclusion. Maybe they should be removed? Figure 4 and Supplementary Figure 2 seem to convey the point much more clearly. Also, is Supplementary Figure 3 necessary? It does not seem at all central or relevant to the paper.</p> |
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1, Derek Rogalsky
(Georgetown University School of Medicine, United States)

Thank you for the opportunity to review your manuscript. It is well conceived, well written, and an important contribution with significant policy implications. I have only minor revisions to suggest.

ISSUE:

1) The fact that data was compiled from a nearly 17 year period should be acknowledged as weakness of the study. Cross sectional analysis is best performed over a short defined time period and 17 years is not short. As is correctly acknowledged salaries over a significant portion of that time were flat in real terms making normalization to 2014 somewhat problematic.

RESPONSE:

The first paragraph in the Methods section (page 7) has been extended to highlight this issue. A reference has now been made to the figure that illustrates this point (was Supplementary Figure 3, has now been renumbered to Supplementary Figure 1)

ISSUE:

2) In the "Repayment of Fees (for any level of debt)" section of the Methods, states "We also assumed that interest was charged... etc." If available the proportion of medical professionals earning a salary less than 41,000 should be included. I do not doubt the authors assumption that the vast majority of medical graduates earn more than this figure, however to make this simplifying assumption the authors should if possible present reasonable justification.

RESPONSE:

Seventy-seven percent of medical graduates earn more than £41,000 per annum when salaries are adjusted to 2014 prices. Though this has loan repayment implications for lower-paid medical graduates, our model is constructed with the average medical graduate in mind who earns more than £41,000 per annum. We have clarified this in the last paragraph of the introduction by stating that this analysis is for the average medical graduate.

ISSUE:

3) In the Discussion section a brief acknowledgement is made regarding the fact that 17% of debt comes from non-SLC sources. Further interpretation of this fact is warranted in the Discussion. It would be helpful if the authors could comment on whether this debt is spread evenly among medical graduates or whether this 17% of debt is actually lumped on female graduates or graduates from low socio-economic station.

RESPONSE:

We have now expanded this in the text. Unfortunately, we are unable to fully address this point because the exact nature of debt that is held from non-Student Loan Company sources is not available. Therefore the repayment terms for these non- Student Loan Company loans cannot be obtained.

ISSUE:

4) The concluding paragraph and especially concluding sentence should be re-written for clarity and express a stronger opinion of what the data mean.

RESPONSE:

We have re-written the concluding paragraph, explained the findings more fully and we have added additional bibliographic references from the popular press and from academic research to support our conclusions.

ISSUE:

5) Table 1 should be edited for significant figures. Age, hours, and percents should be rounded to the nearest whole number as the extra digits detract from readability and do not supply additional information. Also for the average hourly wage the appropriate units should be added, which I assume are pounds.

RESPONSE:

We have implemented these suggestions. We have left the decimal places unaltered in the last two columns because these are statistical tests.

ISSUE:

Overall this study is excellent. Appropriate data are used to draw meaningful conclusions and assumptions are clearly stated and justified. The figures are tables support the text well. The supplementary tables are difficult to read but appropriate for readers with higher expertise or interest. If anything the authors are too conservative in expressing their opinions regarding the data and its implications. This paper is an important contribution that will be published, and likely read, cited, and discussed and length in policy circles. Thank you for the opportunity to review it,

RESPONSE:

Thank you for the comments. We admit we have been very conservative but this is an extremely sensitive political issue across all parts of the UK so we have limited ourselves to factual statements.

Reviewer 2, Julie Phillips MD MPH

(Michigan State University College of Human Medicine, United States)

Interesting paper, that examines total repaid debt over a lifetime for male and female medical school graduates from England who study in the UK. I am not aware of previous studies examining these outcomes. There is very little in the medical education literature about non-American students and their debt, so this may fill an important gap in the literature.

ISSUE:

I found the paper excessively long, relative to the interest of the findings, and think it would be improved by some editing to "tighten it up." There is a fair amount of repetition and redundancy, especially in the discussion section, which largely restates the results section. I also found the number

of figures and the detail of the figures excessive, and I do not believe most readers will be interested in this topic to this level of detail.

RESPONSE:

We have shortened the discussion section and the methodology section. In the discussion section we have tightened up the discussion and removed superfluous repetition of the results. In the methods section we have moved all the equations into a supplementary document and streamlined the discussion. We have simplified Figure 1 and Supplementary Figure 2 by removing the shading, as suggested in the third from last comment made by Reviewer 2. We have simplified figures 2 and 3 by removing information contained in supplementary tables 2 and 3, see the penultimate comment made by Reviewer 2.

ISSUE:

I would like more "so what" - given these results, what does this mean? What is the potential impact on students and practicing physicians? The authors hint that there are "implications" but I don't really understand what the implications are. I would like to see them explored in a more meaningful way.

RESPONSE:

The nine-fold increase in student fees, in the UK, has resulted in an exponential rise in graduate debt. This has resulted in many speculating that there will be a decline in the numbers of those applying to undertake longer degrees such as medicine. The first paragraph in the introduction highlights this but we have now extended it to highlight the implications for student recruitment and the international dimension.

ISSUE:

I also thought the paper would benefit from a richer exploration of the implications of medical education debt from a global perspective.

RESPONSE:

We have focused on English medical students in the UK because the new rules governing both fees and repayment of debt will affect this group most significantly. For example; Welsh, Scottish and Northern Irish students who study in the UK are subject to different financial rules than English students. Non-English students in the UK receive various types of subsidies that reduce their fees substantially. For example, Scottish students in Scotland are only charged £3000 per year in fees and Welsh students receive subsidies so that their fees are below £4000. This is stated in the methods section on page 7. In addition, the Office for National Statistics Labour Force Surveys data only includes UK-based respondents. However, we have highlighted that there may be global repercussions as highlighted in the previous issue.

ISSUE:

The introduction is not very compelling. Why are the authors analyzing this problem at all?

RESPONSE:

We thank the reviewer to highlighting this point, as this is clearly not emphasized. We have now highlighted why this is important for English, UK and the global medical labour markets.

ISSUE:

The abstract is confusing. It is difficult to tell, reading the abstract alone, which analyses are hypothetical (although this is made much more clear in the methods section).

RESPONSE:

The abstract has been substantially rewritten.

ISSUE:

The authors state as a strength that this is the "first study investigating impact of costs of borrowing to invest in a medical degree." This is grossly untrue.

RESPONSE:

Our apologies, in the first sentence of paragraph one, we have now inserted UK-LFS to clarify that this is a UK study that focuses on loans with the Student Loan Company and is not referring to any other nation's Labour Force Survey.

ISSUE:

Some of the wording is awkward. The authors use passive voice at times. There are a few spelling errors.

RESPONSE:

We have prof-read and re-written substantial portions of the text and apologise to the reviewer for this.

ISSUE:

The authors also sometimes use terms that are not familiar to me as someone from the U.S., such as "age band," "banding supplements," "maintenance."

RESPONSE:

"Age band" in Table 1 has been changed to "Age range". The term "banding supplements" has now been removed. On page 5, upon first mention of "maintenance", the following text has been added "... maintenance loan³ to cover students' housing costs and food."

ISSUE:

There are a couple instances of abbreviations not being spelled out at first use, which should be corrected.

RESPONSE:

On page 12 "GP" has been replaced with "General Practice (i.e. family doctor)". On page 2 we replaced "UK Data Service" with "United Kingdom Data Service". On page 3 we define "United Kingdom's (UK)". We did rectify unnecessary re-definition, such as "per annum (pa)" on page 7 and "General Medical Council (GMC)" on page 12. Perhaps we are blinded by the very common usage of other abbreviations in the UK but we could find no other problems.

ISSUE:

The formatting and numbering of the references within the paper is inconsistent.

RESPONSE:

We have checked the numbering of references. References 17 and 18 were in the wrong order and they have now been swapped. The reference numbering is now consistent and sequential, it rises sequentially from 1 to 11 (page 6) and then some references are repeated, e.g. reference 10 on page 7.

ISSUE:

Some of the math in the Methods section was too complex for me. I appreciate the transparency, but the paper may benefit from review by an economist to ensure that the application of the formulas is appropriate for the research questions.

RESPONSE:

Two of the authors are labour economists and this is the reason for some of the technical content. We can see why these equations are difficult to follow for a general medical audience but they are important for transparency and scrutiny. We have therefore moved the equations to a supplementary section to allow interested readers access to the full methodology.

ISSUE:

On page 12, line 20, the authors do not acknowledge discrimination as a reason for the wage gap between male and female physicians. I am assuming this is just an oversight, but it is very striking and should be corrected.

RESPONSE:

We have now included gender discrimination as an additional explanation for the observed wage

differences. We too were initially surprised to see such a large gender differential among medical graduates but this cohort includes medical graduates who might not be practicing medicine and work in settings without structured pay scales. Unfortunately, the LFS does not have the exact work setting of each respondent which would allow us address this.

ISSUE:

Finally, I have some suggestions for how the figures could be improved. First, figure 1 and Supplementary Figure 1: There is overlap between the gray areas that is not transparent, so it is impossible to see the true overlap between the interquartile ranges. I would either remove the ranges and just display the lines, or make the overlap transparent.

RESPONSE:

We have simplified Figure 1 and Supplementary Figure 1 (and supplementary figure 3) by removing the shaded inter-quartile ranges. We attempted to add transparency to these figures but the final look was even more cluttered.

ISSUE:

I looked at Figure 2 and Figure 3 for a long time and could not understand what they were trying to convey or the reason for their inclusion. Maybe they should be removed? Figure 4 and Supplementary Figure 2 seem to convey the point much more clearly.

RESPONSE:

These two figures are the main output of the models we have created. We appreciate these figures were cluttered and therefore difficult to follow. We have therefore cleaned these figures up by removing some of the lines and values that are available in supplementary tables 2 and 3 and in the main text.

ISSUE:

Also, is Supplementary Figure 3 necessary? It does not seem at all central or relevant to the paper.

RESPONSE:

Supplementary Figure 3 illustrates the fact that UK medical salaries have hardly risen in real terms over the last 17 years. We have now cited this figure (now Supplementary Figure 1) on page 7 at the point where we mention the fact that real medical salaries have not risen. This justifies our data collection strategy and the deflation of salaries using Retail Price Inflation, which was requested by Reviewer 1.

VERSION 2 – REVIEW

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| REVIEWER | Derek Rogalsky Georgetown University School of Medicine, USA |
| REVIEW RETURNED | 18-Feb-2015 |

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| GENERAL COMMENTS | Thank you for addressing each issue appropriately. I believe the paper is ready for publication. This is an important study, thank you for doing it. |
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| REVIEWER | Julie Phillips, MD, MPH Michigan State University College of Human Medicine |
| REVIEW RETURNED | 05-Mar-2015 |

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| GENERAL COMMENTS | The authors appear to have addressed the weaknesses noted in initial reviews and the paper is much better. I just one comment. In Table 1, please consider including percentages (%) in every place where a percentage number is used. |
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