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Foreign visa salary requirement and natives' reservation wages

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Abstract

We study whether reservation wages of native workers are affected by the information about visa salary requirements for foreign workers. We conduct two experiments to test the hypothesis, a survey experiment on university students and an incentivized experiment with workers on an online labour platform. We find that native workers' reservation wages are higher when exposed to a high than low visa salary requirement for foreign workers. We test for several mechanisms behind this finding. Our results can partly be explained by the visa salary requirement information acting as an anchor reference point for fair wage perceptions which in turn affects reservation wages. Our results highlight the importance of unintended consequences of immigration policies on local labour markets.

Keywords: reservation wages; fair wages; visa salary requirement; immigration policy; experiment

Data Availability: Data will be publicly available once accepted for publication.

JEL Code: C90, E24, C83

Highlights:

- We ask whether the information about visa salary requirement for foreign workers affects native workers reservation wages.
- We conduct a survey experiment among university students (Experiment 1) and an incentivized experiment on an online labour platform (Experiment 2).
- In both Experiment 1 and Experiment 2, we find that subjects respond to the hypothetical information about higher visa salary requirements by reporting higher reservation wages.
- In Experiment 1, this result can be explained by treatment effects on fair wage perceptions. In Experiment 2, treatment effects on fair wage perceptions and reservation wages operate independently.

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1. Introduction

Indirect effects of government policies are often overlooked when evaluating the policy's social and economic impacts. One of such policies is the minimum visa salary requirement for foreign workers. The United Kingdom government has adjusted the minimum salary requirement to obtain a work visa several times in recent years. The requirement was first introduced at £20 800 in 2011 (Waldron & Ali, 2018), which was subsequently raised to £30 000 in 2016 (Haynes, 2015; MAC, 2016). These changes were aimed at the government's policy of reducing immigration numbers. In this paper, we ask whether the information about minimum visa salary requirement for foreign workers can affect native workers' reservation wages.

Reservation wages are important determinants of job search behaviour and consequently unemployment durations. Several theoretical models provide a framework of unemployed sequentially searching for a job where it is optimal to accept a random job offer that is above searcher's reservation wage (Lipmann & McCall, 1976). Even when job searcher learns over time, learning about the distribution of wages is not a straightforward task and the prior reservation wages play a role how searchers update their beliefs (Böheim, Horvath, & Winter-Ebmer, 2011). It is therefore important to understand what affects reservation wages. We hypothesize that the information (or so to say the news) about the visa salary requirement for foreign workers may affect the reservation wages of natives.

With increasingly more conservative governments in power in many developed countries (Greven, 2016), it is crucial to understand the effect of immigration policies on local economies. There are only a very limited number of recent papers investigating the effects of such immigration policies. Mayda, Ortega, Peri, Shih, & Sparber (2018) and Sparber, (2019) study how changes in foreign-born hiring quotas affect hiring decisions of firms and wages in the USA. They find that the decrease in the annual quota of H-1B status significantly affected the hiring of foreign workers which was most pronounced in top and bottom quartiles of the wage distribution. Sumption & Vargas-Silva, (2019) study how the change in the minimum salary requirement for sponsoring spouses in the UK promotes gender

discrimination. Given average salary statistics per gender, British women are 30% less likely to be able to sponsor non-European Economic Area partners than British men. While these studies focus on the direct effects of immigration laws, there is no current work on the indirect effects of such laws on native workers' labour supply decisions. Relatedly (Edo & Rapoport, 2019) use cross-state variation of state and federal-level minimum wages in the USA and test whether differences in minimum wages affect immigration effects on natives' labour market outcomes. They find that the successive rises in the federal minimum wage between 2007 and 2010 strongly mitigated the adverse labour market effects of immigration in low minimum wage states relative to high-minimum wage states.

Our study is the first to suggest that information about government immigration policies may create unintended spillovers on local economies, in our case native workers' reservation wages. Several related studies have shown minimum wage laws' impact workers' reservation wages both in laboratory and more recently in field settings through affecting fair wage perceptions. Falk, Fehr and Zehnder (2006) was the first study to propose that minimum wage laws can affect workers' reservation wages by affecting their perceptions of what fair wage constitutes. As a result, the introduction of a minimum wage laws may have far reaching consequences even after the law is removed. Wang (2012) show that asymmetric knowledge about the minimum wage laws between the employers and employees have negative consequences on offered wage rates and subsequent employment decisions. The findings help explain why the impacts of minimum wages are different in labour markets where workers have a different degree of information access, such as in some developing countries. Bottino et al. (2016) on the other hand show that endogenously set wages have positive effects on employees' effort levels and employment decisions than exogenously set minimum wages, accentuating the importance of worker reciprocity and social preferences. The main mechanism behind the effect of minimum wages on reservation wages has been argued to be the reference point effect which changes the entitlement expectations of workers (i.e. fair wage perceptions). Recently Koenig et al. (2019) has challenged this view and provided the evidence that

minimum wage laws change the fair wage perceptions artificially without actually changing workers' underlying entitlement expectations.

Similar to the cited papers, we also study the effects of providing information about a wage law on native workers' reservation wages, however, the law is such that it is not directly applicable to native workers. Our conjecture is that visa salary requirement for foreign workers will act as an anchoring point to natives' reservation wages and fair wage perceptions. This will be due to the anchoring and insufficient adjustment heuristic extensively studied in psychology and more recently in the behavioural economics literature (Bergman, Ellingsen, Johannesson, & Svensson, 2010; Epley & Gilovich, 2006). We thus hypothesize that workers anchor on a reference point created by the information of the visa salary requirement and insufficiently adjust when forming their own reservation wages and fair wage perceptions.

We conduct two experiments with different subject pools to test this hypothesis. Experiment 1 is a survey experiment on university students, while Experiment 2 is an incentivized online experiment recruits workers from a UK-based online labour platform. Both experiments have two between-subject treatment manipulations. In the first part of the experiment, we ask subjects to read a short description of a hypothetical scenario introducing minimum salary requirement for foreign workers. The scenario describes a government law passed in the UK in Experiment 1 and a policy passed by the online platform in Experiment 2. In one treatment, the salary requirement is *High* while in the other one it is *Low*. We ask subjects several filler questions about their attitudes towards this law/policy. This is aimed at reducing the experimenter demand effect that may govern the anchoring effect between the provided information and subjects' own reservation wages. We also use it as a treatment manipulation check. In the second part of the experiment, we elicit subjects' reservation wages using unincentivized survey question in Experiment 1 and incentivized minimum willingness to accept (WTA) to work on a task in Experiment 2. We describe Experiment 1 and Experiment 2 and the results of the experiments sequentially in Section 2 and Section 3 of the paper.

In Experiment 1, we find that subjects report £2345 higher reservation wages in the High treatment compared to the Low treatment. In Experiment 2, we find a similar result where the subjects' minimum willingness to accept to work on a task is £0.27 higher in the High treatment compared to the Low treatment. These differences represent medium to high effect sizes, which are both economically significant. Checking for several mechanisms behind this treatment difference, we find that the foreign salary requirement information is likely to affect workers' fair wage perceptions which in turn may affect reservation wages. This result is consistent with previous studies that find that minimum wage laws affect fair wages through creating reference anchor points (Bottino et al., 2016; Koenig et al., 2019). We conclude by discussing the limitations of our studies and directions for further research in Section 4 of the paper.

2. Experiment 1: Survey Experiment on Students

2.1 Experimental Design

We conduct a pen and paper survey experiment among Engineering, Business and Law School students at a large university in the UK. In Part 1 of the survey, we present subjects with a hypothetical scenario of the government introducing a minimum salary requirement for foreign workers to obtain a visa to work in the UK. We vary the amount of the minimum required salary in two between-subject treatments. In the *High* treatment, the required salary is £45 000 while in the *Low* treatment the required salary is £15 000. Subjects have to read a short paragraph on this hypothetical law and answer two questions, on 5-item Likert-scale, whether they agree or disagree whether this new law is fair for foreign and for UK citizens. These two questions serve as filler questions to distract the attention of subjects from our main research question of assessing their own reservation wages and reduce the experimenter demand effect (Zizzo, 2010). We also use the answers to these questions as manipulation checks that our treatment of inducing high versus low visa salary requirement was indeed successful.

In Part 2 of the survey, we ask subjects to answer some questions about themselves. We ask them to state their reservation wages by answering the question "In your first job after the university, what is the minimum salary you would be willing to accept to become hired? This can be full-time or part-time. Please state when part-time wages are given. (*Please give either an annual or a monthly rate*)." We then collect a number of auxiliary and control variables such as subjects' fair wage perceptions, their gender, age, if they had previous job experience, if they plan to apply for a postgraduate course, what industry they would like to work in and whether they would like to work in London. These variables were collected as they may have significant impacts on graduates' wage expectations and reservation wages. For example, more experienced graduates and those wanting to work in London may expect higher wages. Meanwhile, those wanting to work in the public sector may expect lower wages. We also elicited a number of characteristics of subjects that we wanted to control for and check that the characteristics of subjects in the two treatments are similar: we asked whether they regularly read news, are members of student clubs and whether they consider themselves as materialistic. See Appendix A for the full survey presented to subjects. The study was ethically approved by the Faculty Ethics Committee and written consent was sought.

We calculated the required sample size using Bonferroni adjustment for testing three hypotheses (critical *p-value* 0.05/3 = .017). The first and the main hypothesis is that we will observe significant treatment effects on reservation wages. The second and third are auxiliary hypotheses that we will observe significant treatment differences on subjects' perceptions of fair wage immediately after graduation and 5 years after graduation which will explain the treatment effects on reservation wages. We use the non-parametric Mann-Whitney test with the expected effect size of Cohen's d=0.65 (based on a pilot study), 1-to-1 allocation ratio and power of 0.80 (Faul, Erdfelder, Buchner, & Lang, 2009). This required us to collect 108 observations, 54 per each treatment. We collected 138 observations as a precaution for outliers and unusable data. Out of this, we discard 34 observations in our data analysis, as these were from non-European Union nationality subjects whom the visa salary requirement is directly applicable. We are left with 104 usable observations 88 of which are UK

nationality and 16 are other EU nationality subjects. We treat other EU subjects as native since at the time of data collection all EU workers were subject to the same laws as UK workers. All of our results are robust to excluding other EU subjects from our sample (see Table B1 in Appendix B).

2.2 Results

Table 1 presents descriptive statistics of our variables across the two treatment conditions. We first provide evidence that our treatment manipulation was successful. We test whether subjects respond differently to the two filler/manipulation check questions of whether the described hypothetical law is fair for foreign and UK citizens. Subjects report low visa salary requirements as being fairer to foreign citizens than high visa salary requirements while the opposite is the case for UK citizens (p < 0.010). This shows that the visa salary treatment manipulation was successfully achieved and subjects engaged with the survey meaningfully.

We now check that the samples for each treatment are comparable to each other according to subjects' observable characteristics. We find that the gender, age, current year of study, intention to apply for a postgraduate degree, placement year work experience and other self-reported characteristics are similar between the two treatments (Fisher exact p > 0.100 in all cases). This demonstrates a successful randomization of subjects to treatment conditions.

Figure 1 plots the mean reported reservation wages across the two treatment conditions. The mean reservation wage is £22 360 (s.e. = 553.53) in the Low and £24 705 (s.e. = 759.93) in the High treatment (Mann-Whitney p = 0.014; Cohen's d = 0.49). The results demonstrate the effect of the information about the high visa salary requirement versus low salary requirement on native subjects' reservation wages.

We check for the robustness of our treatment effects to the inclusion of control variables of demographics, previous job experience and the industry they would like to work in.³ Columns 1 and 2

³ We classified industries according to their expected earnings as either Business/Economics/Technology, Public/Environment/Sport sectors or Other (Smith, 2019).

of Table 2 summarize our results. We find a significant effect of the treatment variable on the reported

reservation wages with and without the inclusion of the control variables.

	High	Low	High = Low p-value
Law being fair to foreigners	2.55 (.15)	3.71 (.11)	0.000
Law being fair to UK citizens	3.11 (.12)	3.55 (.11)	0.008
Mean age	21 (1.03)	21 (1.55)	0.610
Male ratio	73%	70%	0.830
Percentage of final year students	67%	78%	0.276
Intending to apply Postgraduate degree	17%	17%	1.000
Wants to work in London	87%	92%	0.515
Placement year work experience	14%	19%	0.598
Percentage regularly reading news	83%	87%	0.594
Whether a member of any student society	41%	43%	0.845
Reported being materialistic	47%	45%	1.000

Table 1: Manipulation Checks, Demographics and Control Variables of Experiment 1

The p-values are from Mann-Whitney ranksum test and Fisher-exact test for proportions. Standard errors are in parentheses.





2.2.1 Testing for mechanisms behind the treatment effects

Given the focus of the previous literature on the mechanisms governing the effects of minimum wage laws on reservations wages, we test whether the variability in fair wage perceptions explains the treatment effects. Figure 2 plots the mean fair wage perceptions across the two treatment conditions. The mean fair wage for a university graduate to receive after graduation is £21 879 (s.e. = 579.58) in the Low and £24 264 (s.e. = 506.50) in the High treatment (Mann-Whitney p = 0.001; Cohen's d = 0.61). The mean fair wage for an average graduate to receive 5 years after graduation is £34 820 (s.e. = 1201.80) in the Low and £35 544 (s.e. = 1392.55) in the High treatment (Mann-Whitney p = 0.999; Cohen's d = 0.08). Columns 3 and 4 of Table 2 report the coefficients for the treatment effect with the inclusion of the elicited fair wage perceptions. We use the decomposition of direct and indirect effects of the treatment on reservation wages (Baron & Kenny, 1986). The total effect of the treatment on reservation wages is 2528 (with controls) and the direct effect is 739. This leaves the indirect effect of the treatment on reservation wages (through altering fair wage perceptions) to be 1789. The direct effect is not significant, while the indirect effect is quite substantial and significant. This suggests that fair wage perceptions absorb most of the variability in reservation wages caused by the treatment manipulation.





One could argue that there is a direct route how minimum visa salary requirement may affect native workers' reservation wages: through altering the number of available jobs in the industry and hence affecting the chances of getting a job. If visa salary requirement is low, then there will be more foreign workers eligible to get a job in the country and there will be a more competitive job market. Native workers may hence react to this by lowering their reservation wages. The opposite will be the case when the visa salary requirement is high. To test for this mechanism behind the effect of foreign visa salary requirements on natives' reservation wages, we ask our subjects the following question on a five-point Likert scale: "How certain are you that you would find a job in this [preferred] industry?".

The scale ranged from Not at All Certain (1) to Extremely Certain (5). If the foreign salary requirement directly affects natives' perceptions of competitiveness in the job market, then we should observe a lower/higher certainty of finding a job in one's preferred industry when visa salary requirement is high/low, respectively. Figure 2 summarizes our results. We observe that in the Low treatment the certainty mean is 3.28 (s.e. = 0.16) while in the High treatment the mean is 3.47 (s.e. = 0.15). This difference is not statistically significant at conventional levels (Mann Whitney p = 0.345, Cohen's d= - 0.17). Thus we do not find any evidence that foreign visa salary requirement affects natives' perceptions of job prospects in the industry they would like to work in.

	(1)	(2)	(3)	(4)
Treatment High	2345.51**	2527.58***	510.19	738.70
	(940.09)	(940.05)	(678.02)	(730.85)
Fair Wage			.77***	.72***
			(.14)	(.12)
Constant	22360.38***	17979.9**	5526.99*	8899.49
	(553.63)	(8585.53)	(3045.07)	(7308.02)
Adj R ²	.049	.127	.427	.428
Ν	104	102	104	102
Controls	No	Yes	No	Yes

Table 2: OLS regression of reservation wages

Robust standard errors are in parentheses. Controls include the age, gender, whether subjects had one-year job placement experience, and industry they would like to work in. * 10%, ** 5% and *** 1% significance levels.



Figure 3: Certainty of finding a job in the preferred industry. Error bars represent 95% confidence levels.

2.3 Discussion

In Experiment 1, we show that native subjects state higher reservation wages when they receive

information about higher visa salary requirement for foreign workers. This effect on reservation wages

operates by altering subjects' fair wage perceptions. Since we did not explicitly manipulate fair wage perceptions, our results on the fair wage perceptions operationalizing the treatment effect are suggestive. We do not rule out the possibility that there may be an additional mechanism on how visa salary requirement affects fair wage perceptions.

We also demonstrate that higher visa salary requirement is perceived to be significantly "fairer" for UK citizens than lower minimum visa salary requirement. This result contributes to a wider debate about immigration policies and the effects of immigration on local economies. For example, a recent paper by Bertoli & Stillman (2019) show the point-based immigration systems based on education and wages in the destination country is not likely to improve the quality of immigrants. Meanwhile, Alesina, Murard, & Rapoport, (2019) show that natives show lower support for redistributive policies from rich to poor in regions where the observed immigration has been high. Immigration policies such as visa salary requirement may thus affect natives' redistribution preferences, discriminatory behaviour against other group identities and sabotage in the workplace (Carlsson & Rooth, 2007; McLeish & Oxoby, 2011). Given that our survey respondents were university students in Engineering, Business and Law departments, we expect that we only demonstrate the lower bound effect of this perception, as more educated individuals tend to have more favourable attitudes to immigration than less educated ones (Hainmueller & Hiscox, 2007; Hainmueller & Hopkins, 2014; Ortega & Polavieja, 2012).

Experiment 1 has two main limitations. We study the reservation wages and fair wage perceptions using un-incentivized self-reported measures, which may result in imprecise effect sizes and more prone to experimenter demand effects despite our efforts to minimize it. Saying this, it is worthwhile to note that the most of the existing literature also focuses on self-reported wage data elicited in (representative household) surveys (Blackaby, Latreille, Murphy, O'Leary, & Sloane, 2007; Gorgens, 2002; Koenig et al., 2019; Lammers, 2014; Sumption & Vargas-Silva, 2019) and hence our findings are

directly comparable to the previous literature.⁴ Another limitation of our study is that we only focus on student reservation wages and one can argue that students may not be aware of the labour market wage rates. Recent evidence, however, has shown that students and those especially in the final year of their studies (i.e. the majority of our subjects) are sufficiently accurate in predicting their starting salaries (Jerrim, 2011; Webbink & Hartog, 2004). Moreover, studying experimental effects on students has been shown to be valid since treatment effects show similar effect sizes between representative samples and student samples (Falk & Heckman, 2009).

3. Experiment 2: Online Experiment on Workers

3.2 Experimental Design

Experiment 2 tackled two main limitations of Experiment 1: being non-incentivized and using student subject pool. We design an incentivized online experiment where we elicit subjects' minimum willingness to accept (WTA) to work on a real work task. The subjects in the experiment were real workers that are registered to complete tasks/surveys at a UK-based online labour platform Prolific (<u>www.Prolific.ac</u>). All subjects were prescreened to be working age (18-65) residents of the UK with a UK nationality. Subjects received a fixed payment and were promised additional bonus payment for participating in the experiment.

Economists increasingly use such online labour markets for academic research (Bordalo, Coffman, Gennaioli, & Shleifer, 2016; Gagnon, Bosmans, & Riedl, 2020; Kuziemko, Norton, Saez, & Stantcheva, 2015; Pallais & Sands, 2016). Such an online labour platform provides a number of advantages over a possible laboratory or a field experiment inside a physical firm. Firstly, we can control for peer effects resulting from subjects observing each other either in the laboratory or in a physical firm. Peer effects can affect reservation wages if there is a chance that a high reservation wage will result in no work. Similarly idleness-aversion may result in unwillingness to report high reservation wages if it will result

⁴ An alternative method to study reservation wages empirically has been using past wages as proxies and decomposing wages into worker-specific, human-capital specific and firm-specific components (Böheim et al., 2011).

in having to wait in the lab (or in some cases in a firm) without any work to do (Corgnet, Hernán-González, & Schniter, 2015). In an online platform, subjects that do not receive a job offer can go back to their daily tasks. Secondly, the online platform provides access to a pool of workers with diverse backgrounds, which would lack in lab experiments that have access to student populations.

In Part 1, subjects were asked to read a hypothetical scenario that described Prolific deciding on a new policy. The policy is such that UK researchers posting studies for participants residing in other countries have to pay a minimum hourly rate of £6.00 (Low treatment) or £10.00 (High treatment).⁵ We elicit subjects' social views about the policy using a procedure similar to Krupka & Weber (2013) where subjects had to choose an answer on a 4-point Likert Scale from "Strongly Disagree" to "Strongly Agree". Subjects earn a bonus payment of £0.05 by matching their choices to the choices of the majority of the subjects about: i) the policy gives a fair hourly rate to overseas participants, ii) researcher will not be able to recruit many overseas participants, iii) UK participants will be able to participate in more studies than overseas participants, and iv) the minimum hourly rate for overseas participants is quite high. The order in which these questions are asked are randomized. These four questions serve two purposes (similar to Experiment 1). First, they provide us with manipulation checks that subjects perceived £6.00 as lower than £10.00. Secondly, they mitigate the experimenter demand effects: subjects perceive Part 1 as a stand-alone study where researchers are interested in their views on such a policy and not relating it to Part 2.⁶ And thirdly, using monetary incentives we increase subjects' engagement with the experiment which could be a problem in non-incentivized online experiments.

In Part 2 of the experiment, we elicit subjects' WTA to work on Counting Zeros task; subjects have to count the number of zeros in 10-row x 10-column table consisting of 1 and 0s (a variant of Abeler,

⁵ These amounts were decided by Prolific guidelines that describe £6.00 as a "Low" hourly payment and anything above £9.00 as a "Great" hourly payment.

⁶ We also check for this, by asking subjects at the end of the study, what they thought the study was about. Less than 3% of all subjects referred to any relationship between Part 1 and Part 2 in their answers.

Falk, Goette, & Huffman, 2011). An example table can be seen in Appendix A. The task involves counting zeros in 10 tables. We have pretested the task on Prolific separately and we inform the subjects that the task on average takes 8 minutes to complete. Subjects have to report what their WTA to work on this task is. We incentivize the elicitation of WTA using incentive-compatible Becker-Degroot-Marschak mechanism (BDM; Becker, Degroot, & Marschak, 1964). The mechanism involves subjects reporting their WTA which can be between £0.00 and £2.00. A random number is generated between 0 and 2. If the reported WTA is less than the computer-generated number, the subjects can proceed to the Counting Zeros task and will receive their reported WTA as a bonus payment for completing the task. If the reported WTA is greater than the computer-generated number, then the subject cannot proceed to the task and Part 2 ends. We explain the mechanism to subjects using multiple examples and check their understanding using two control questions (please see Appendix A for instructions). The elicited WTA thus serves as our main dependent variable of subjects' reservation wages to work on the task. The computer-generated numbers can be seen as uniformly distributed wage offers that workers accept or reject depending on their WTA. Hence subjects' WTA reports are actually a decision variable that affects if they receive a job offer or not.

Additionally we elicited subjects' fair wage perceptions at the end of the experiment: we asked their own fair wage "What do you personally think is a fair hourly rate for studies that are usually completed on Prolific?" and social norm of the fair wage "What do you think most of the other Prolific participants think is a fair hourly rate for studies that are usually completed on Prolific? If you guess the response given by most of the participants of this study you will receive an additional £0.10 in BONUS payments". They could choose an hourly rate ranging from £4.00 to £12.00+ in £0.50 increments. We use these measures to explore whether the treatment effects on reservation wages operate by affecting subjects' fair wage perceptions. We also collect a number of control variables such as subjects' age bracket, sex, ethnicity, employment status, education level and monthly disposable household income.

We calculated the required sample size using Bonferroni adjustment for testing three hypotheses critical *p-value* 0.05/3 = .017). The first and the main hypothesis was that there will be significant treatment effects on subjects' WTA. The second and third are auxiliary hypotheses that we will observe treatment effect on fair wages and social norm of fair wages and these will explain the treatment effects on WTA (. We use the non-parametric Mann-Whitney test with the effect size of Cohen's d=0.50 (based on Experiment 1), allocation ratio of 1-to-1 and the power of 0.80 (Faul et al., 2009). This required us to collect 134 observations, 67 per each treatment. We collected 150 observations as a precaution for outliers and unusable data. The experiment was pre-registered which can be viewed at https://osf.io/cbp2d. The experiment lasted on average 12 minutes and the average payment was £1.20.

3.2 Results

Table 3 presents the descriptive statistics of our variables across the two treatment conditions. We first provide evidence that out treatment manipulation is successful. We test whether participants responded differently to the first four filler/manipulation check questions about the hypothetical policy that Prolific decided on. We find that participants reported significantly higher agreement with the statements that the described "minimum hourly rate requirement was fair to overseas participants", that "the UK participants will participate in more studies" and that "in general, the minimum hourly rate is quite high" (Mann-Whitney p < 0.050). Participants, however, did not think that researchers would not recruit many overseas participants because of the higher minimum hourly rate requirement (p = 0.113).

We check that the samples for each treatment are comparable to each other according to subjects' observable characteristics. We find that the gender, age bracket, ethnicity, employment status, highest education level, and monthly household income are similar between the two treatments (Fisher exact test p > 0.100 in all cases). This demonstrates a successful randomization of subjects to treatment conditions.

	High	Low	High = Low p-value
Min hourly rate is fair to overseas part.	3.04	2.68	0.005
Researchers won't recruit many overseas part.	2.89	2.65	0.113
UK part. will participate in more studies	2.87	2.53	0.032
Min. hourly rate is quite high	2.29	2.59	0.000
Age			0.076
18-27	25%	27%	
28-37	29%	38%	
38-47	27%	23%	
48-58	15%	9%	
58+	4%	4%	
Male ratio	45%	35%	0.182
Ethnicity			0.369
White	88%	89%	
Employment			0.774
Full Time	52%	56%	
Part Time	27%	21%	
Student	8%	10%	
Highest Education			0.157
High School/A-level/Vocational	40%	31%	
Bachelor Degree	37%	52%	
Master's Degree	12%	15%	
Monthly Household Income			0.431
0-£500	9%	4%	
£501-£1000	14%	21%	
£1001-£1500	21%	24%	
£1500+	54%	50%	
Ν	75	75	
The p-values are from Mann-Whitney ranksum tes	st and χ^2	test. Stand	ard errors of means are
in narentheses			

Table 3: Manipulation Checks, Demographics and Control Variables of Experiment 2

Figure 3 plots the mean reported WTA across the two treatment conditions. We observe the effect of the treatment manipulation on reservation wages: the mean WTA is £1.12 (s.e. = 0.04) in the High treatment and £0.85 (s.e. = 0.03) in the Low treatment. This difference is statistically significant and demonstrates a large effect size (Mann-Whitney p = 0.000, Cohen's d = 0.85). We check the robustness of the treatment differences to the inclusion of controls in columns 1 and 2 of Table 4. We find that with and without controls the treatment effect is highly significant. Subjects have higher willingness to accept to work on counting zeros task in the High treatment compared to the Low treatment controlling for characteristics such as their age, ethnicity, age, income and employment status.



Figure 4: Willingness to Accept to Work on Counting Zeros task

	(1)	(2)	(3)	(4)		
Treatment High	.27***	.32***	.28***	.33***		
	(.52)	(.06)	(.06)	(.06)		
Own Fair Wage			.01	.02		
			(.02)	(.02)		
Social Norm			02	03		
of Fair Wage			(.02)	(.02)		
Constant	.85***	.71***	.94***	.78***		
	(.03)	(.14)	(.14)	(.22)		
Adj R ²	.149	.169	.143	.164		
Ν	150	150	150	150		
Controls	No	Yes	No	Yes		
Robust standard errors are in parentheses. Controls include gender, the						
dummies on age brackets, on employment status, on income brackets and on						

Table 4: OLS regression of WTA

Robust standard errors are in parentheses. Controls include gender, the dummies on age brackets, on employment status, on income brackets and on ethnicity. * 10%, ** 5% and *** 1% significance levels.

3.2.1. Testing for the mechanisms and the economic consequences of treatment effects

At the end of our experiment, we asked subjects their own fair wage perceptions (unincentivized) and social norm of fare wage (unincentivized) for participating in studies ran in Prolific. We compare whether the hypothetical scenario that subjects read in Part 1 of the experiment affect their fair wage perceptions which we hypothesize to explain the treatment effect on reservation wages. Figure 5 plots the elicited fair wage perceptions across the treatments. We find that subjects' thought that a fair hourly rate for participating in Prolific studies is on average £7.39 (s.e. = 0.20) in the High treatment and £6.45 (s.e. = 0.15) in the Low treatment (Mann-Whitney p = 0.001, Cohen's d = 0.61). Moreover, subjects' guess of the other subjects' most common fair hourly rate choice was on average £7.37 (s.e. = 1.20) in the High treatment and £6.61 (s.e. = 0.15) in the Low treatment (Mann-Whitney p = 0.004, Cohen's d = 0.50). The Spearman correlation coefficient between the two variables is 0.617 which is highly significant (p = 0.000). Given that the treatment had significant effects on fair wages, we test whether the treatment effect on reservation wages can be accounted for by the fair wage perceptions.



Figure 5: Fair Wage Perceptions across the Treatments. *Mean in terms of £ hourly rate. Error bars are 95% confidence intervals.*

Columns 3 and 4 of Table 4 report the results of the regression of WTA on treatment variable augmented by fair wage perception variables with and without controls. We find that the treatment effect survives the inclusion of fair wage perceptions: the total and direct effect of the treatment on WTA is identical between columns 1 and 2 to columns 3 and 4, indicating that the treatment effect operates independently of fair wage perceptions.

What is the economic consequence of the treatment effect? We test whether the probability of working on the counting zeros task that is receiving a job offer, given the subjects WTA was different between the treatments. The wage offers ranged uniformly from £0.00 to £2.00 given the BDM mechanism of incentivizing WTA elicitation. We transform each subject's WTA into a probability of receiving a job offer by subtracting WTA from £2.00 and dividing by 2. We find that probability of

getting to work on a task was 57% in the Low treatment and 44% in the High treatment (Mann-Whitney p = 0.000). We next check whether it pays off financially to hold higher reservation wages given that the probability to work is lower with high reservation wages. We find that conditional on working on the counting zeros task, subjects earned on average £1.04 (s.e. = 0.04) in the High treatment and £0.78 (s.e. = 0.03) in the Low treatment (Mann-Whitney p = 0.000, Cohen's d= 0.92). Thus we show that while the probability of getting to work on the task is the lower in the High treatment, the positive bonus payment subjects earned is higher in the High than in the Low treatment. This may be due to small sample issue that resulted in the random mechanism rewarding the subjects that had high reservation wages. The difference is much smaller and only marginally significant if we focus on all subjects , both the ones that got to work and those that did not (p = 0.051, Cohen's d = 0.32).

3.3 Discussion

We tested the robustness of Experiment 1 results in Experiment 2. The incentivization of the decisions and recruitment of real workers from an online labour platform as subjects in Experiment 2 tackled two main limitations of Experiment 1. We showed that information on a possible policy by the online platform to require a minimum hourly rate for overseas participants provided in Part 1 of the experiment had a significant effect on native workers' reservation wages. The subjects who received high minimum hourly rate requirement information had higher reservation wages to work on an identical task than those who received low minimum hourly rate requirement information. We also observed a significant treatment effect on fair wage perceptions: the subjects who received high minimum hourly rate requirement information had higher fair wage perceptions (both as their own judgement and their view on the judgement of other participants) than those who received low minimum hourly rate requirement. However, differently from Experiment 1, we did not observe fair wage perceptions to explain the treatment effects on reservation wages. The two effects operate independently. In Experiment 2, the reference point effect of the information on hourly rates for overseas participants may have affected different subjects differently. Some subjects reacted to the information in their reservation wages, and some reacted in their fair wage perceptions. Given the limits of our data, we find it difficult to speculate why this might have been the case and what other variables might be able to explain the treatment effects on reservation wages. This goes against most of the literature that finds that the minimum wages usually affect the reservation wages through their effect on fair wage perceptions (Bottino et al., 2016; Falk et al., 2006; Wang, 2012).

We find that subjects in the High treatment earn more than the subjects in the Low treatment. This result is mainly due to the fact that the wage offers that is the computer-generated random numbers, from the BDM mechanism came from a uniform distribution between £0.00 and £2.00. The subjects with lower WTA in the Low treatment had higher probability of working on counting zeros task than those with higher WTA in the High treatment. This, however, did not translate in more subjects receiving job offers between the treatments in our data. Given that in naturally occurring labour markets, the wage offers are usually not uniformly distributed the economic effects of the treatment may be different than what our results suggest. We invite further research to test the robustness of our results in naturally occurring settings.

4. Concluding Discussion

Reservation wages and fair wages are important determinants of labour supply decisions and hence have consequences on economic variables such as unemployment duration and effort in the workplace (Flinn, 2006; Koenig et al., 2019). In this paper, we ask whether the information about the visa salary requirements for foreign workers have an effect on natives' reservation wages. In two experiments describing a realistic yet hypothetical scenario, we find that native workers react to the information about high salary requirement for foreign workers by increasing their reservation wages and fair wage perception compared to the information about the low salary requirement. We find medium effect sizes in both experiments. We expect that this only demonstrates a lower bound of the effect since the information about foreign salary requirement clearly is hypothetical. With real policies/laws, the effect may be much more pronounced. The implications of our results highlight the unintended indirect effects of policies that governments should take into account when evaluating the economic impacts of the policies.

To the best of our knowledge, there have been very few studies on the economic effects of immigration targeting policies (Mayda et al., 2018; Sumption & Vargas-Silva, 2019). We acknowledge that indeed evaluating the effects of immigration policies can be quite difficult since there are a number of potential confounds and endogeneities in naturally occurring data. Given that in most countries immigration policy affects the whole country, there is no possibility of having a treatment and control conditions in the data that can be compared to each other. For this reason, online, lab and survey experiments are a useful tool to study direct and indirect effects of such policies. Our two experiments are the first steps to fill in the gap in the literature and we hope it inspires more empirical research on this area using researcher created and naturally-occurring data.

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Online Supplementary Material for the manuscript "Foreign visa salary requirement and natives' reservation wages"

Appendix A

Experiment 1: The Survey Experiment [between-subject treatment manipulation highlighted in grey]

Part 1: Please read the following hypothetical scenario and answer the questions below it.

Suppose the UK government are trying to address vacancies in several sectors. The government approved to pass a law adjusting the minimum wage needed to gain a general work visa for foreign citizens. In this law, foreigners will need to earn at least £15,000/£45,000 annually (equivalent to £3,750 monthly) to gain a work visa to work in the UK, assuming a 40-hour full-time working week.

1. Please state whether you agree or disagree that this new law is fair for foreign citizens.

Strongly agree
Agree
Neither agree or disagree
Disagree
Strongly Disagree

2. Please state whether you agree or disagree that this new law is fair for UK citizens.

Strongly agree
Agree
Neither agree or disagree
Disagree
Strongly Disagree

Part 2: Please circle where appropriate and answer in the spaces provided.

1. In your first job after university, what is the <u>minimum</u> salary you would be willing to accept to become hired? This can be full-time or part-time. Please state when part-time wages are given. (*Please give either an annual or monthly rate*)

2. What would you consider to be a fair wage for an average university graduate for their first job? (*Please give either an annual or monthly rate*)______

3. What would you consider to be a fair wage for an average university student 5 years after completing their degree? (*Please give either an annual or monthly rate*)

4. Is there anything else you would like to add to these answers?

5.	5. What Gender do you identify as?							
Male 🗆	Female 🗆	Other 🗆	Rather not say					
6.	What nationality are you?							
7.	What is your current age?							
8.	What is your current ye	ear of study?						
First 🗆	Second 🗆	Third 🗆	Fourth 🗆	Postgraduate 🗆				
9.	What course do you st	udy?						

10. What university faculty are you part of? (e.g. Business and Law)

11.	Do you read the news?	Yes 🗆	No 🗆	Rather not say \Box
12.	Do you take part in a unive	ersity society?	Yes 🗆	No 🗆
If Yes, v	which one(s)?			
13.	Have you been on a place	ment year durin	g your studies at univ	versity? Yes 🗆 No 🗆
14.	If Yes, what was	your positio	n at the com	pany you worked for?
15. 16.	Do you plan on applying f What industry wo	— or a postgraduat uld you —	e course? (MSc) Ye like to work	es □ No □ I don't know □ in after university?
17.	How certain are you that y	ou would find a	job in this industry?	
Extrem	ely certain 🗆 Very certain 🛛	Moderately 0	Certain 🗆 Slightly Ce	rtain 🗆 Not at all Certain 🗆
18.	Briefly explain your previ	ous work experi	ence (e.g. Summer i	nternship, full time, part time

work)

What is your dream job? _____
 Would you consider yourself materialistic? Yes □ No □ I don't know □
 Would you like to work in London after university? Yes □ No □ I don't know □

Experiment 2: The Online Experiment Instructions

Welcome to this study. You will be paid £0.50 fixed payment for completing this study. This study has two parts. In each part, you will be able to earn an additional bonus payment that will depend on your and other participants answers. Bonus payments in each part are unrelated to each other.

Please provide your Prolific ID and verify the Captcha before we start.

Your Prolific ID

Verify



Please select I CONSENT AND WISH TO PROCEED and NEXT PAGE if you agree with the terms below to continue to the survey.

- I confirm that I have read and understood the instructions of the study. I have had the
 opportunity to consider the <u>participant information sheet</u> and decide on participating in
 the study.
- I understand that my participation is voluntary and that I am free to withdraw my participation in this study without giving any reason
- I agree for my anonymised data to be used for this study.
- I understand that data will be collected using Qualtrics software. This software is used by academic institutions worldwide and Qualtrics gives assurances that data collected in the EU will remain in the EU. I understand that all the data collected from my responses will be anonymised and the collected data points will not be linked to my identity.
- I understand that all data will be stored securely and will be managed in accordance with the Data Protection Act 2011 for a minimum of 10 years in line with University of Portsmouth policy. I understand that my personal data is held and processed in the strictest confidence, and in accordance with the General Data Protection Regulation (2018).
- I understand that the results of this study may be published and/or presented at meetings or academic conferences, and may be provided to research commissioners or funders. I give my permission for my anonymous data, which does not identify me, to be disseminated in this way. The anonymized data can also be published open access.
- I am aware that the study procedure and payment protocol will comply with Human Participants Use protocol of transparency between researchers and participants, no deception, fair pay and respectful treatment of participants and researchers.
- I confirm that I have read and understood the above and freely consent to participate in this study. I have been given adequate time to consider my participation.

Instructions for Part 1

Please read the following hypothetical scenario and answer the questions below it. Your **BONUS** payment will depend on how accurately you guess the most common answer given by other participants in this study. If you correctly guess the most common answer chosen by all other participants in this study you will receive £0.05 for each correct guess.

All participants in this study reside in the UK. Just like you, they were asked to choose the most common answer amongst everyone else in the study in order to receive bonus payments. Take your time and be thoughtful in your responses.

[Treatment Low]

Scenario:

Suppose that www.Prolific.ac has decided to set a new policy such that UK researchers posting studies for participants residing in other countries have to pay a minimum hourly rate of £6.00 to them. By this policy, researchers in the UK can recruit online participants residing outside of the UK only if they pay them a minimum hourly rate of £6.00.

[Treatment High]

Scenario:

Suppose that www.Prolific.ac has decided to set a new policy such that UK researchers posting studies for participants residing in other countries have to pay a minimum hourly rate of £10.00 to them. By this policy, researchers in the UK can recruit online participants residing outside of the UK only if they pay them a minimum hourly rate of £10.00.

Please choose what you think will be the most common answer given by other participants in this study for each statement. You will receive £0.05 if your choice is correct.

	Strongly Agree	Agree	Disagree	Strongly Disagree
The minimum required rate for the overseas participants is quite high.	Ο	Ο	Ο	0
This policy will mean that UK participants will be able to participate in more studies than overseas participants.	Ο	0	Ο	0
This policy gives a fair hourly rate to overseas participants.	Ο	0	Ο	0
This policy will mean that researchers will not recruit many overseas participants.	0	0	0	0

Your age

T

Your sex

Male

Female

Your residence

Outside of UK

UK

Your ethnicity (simplified)

Other Asian Mixed White Black

Your employment

•

Your highest level of education

T

Monthly income available to your household to spend (including rent and bills)

•

INSTRUCTIONS FOR PART 2

In this part of the experiment, you have a chance to earn additional bonus payment by completing a work task. The work task involves seeing a 10 row by 10 column table consisting of 1s and 0s. You have to count the number of 0s in the table and input it in the box below. Please see an example of a table below.

Please see an example of a table below which has exactly 43 zeros. So the correct answer to this table is 43.

0	1	1	1	0	0	0	1	1	1
0	0	0	1	0	1	1	0	1	0
0	0	1	1	1	1	1	1	1	1
1	0	0	0	0	1	1	1	0	1
1	Ъ	8)	1	1	D		1	1
1	0	1	1	1	1	1	1	1	1
0	0	1	1	0	0	0	1	0	0
0	1	0	0	0	0	0	1	1	0
0	0	0	0	0	1	1	1	0	1
1	0	1	0	1	1	1	1	1	1

You will have to correctly complete **ten of these tables** to be paid the bonus payment. The task of correctly completing all ten tables on average takes 8 minutes: some people are slightly faster, some slightly slower.

We would like to know what is the **minimum bonus payment you are willing to accept to complete ten counting zeros tables**. You can choose anything in between £0.00 and £2.00. However, the actual bonus payment you will be paid for this task will depend on the following mechanism.

Payment Mechanism:

Once you choose a minimum bonus payment you are willing to accept from £0.00 to £2.00 (let's call this number YourMinimum), the computer will randomly draw a number between 0 and 2 (let's call this number ComputerNumber). If the ComputerNumber is greater or equal than YourMinimum, then you will be able to complete the task, and you will receive the bonus payment that will be equal to £ YourMinimum. If the ComputerNumber is less than YourMinimum, then you will not be able to complete the task and you will not earn any bonus in Part 2.

The mechanism may seem quite complex, but it is designed so that you choose your TRUE minimum bonus payment you are willing to accept to do this task. If you choose too high of a minimum, then you run the chance of not being able to do the task and missing out on the bonus payment. If you choose too low of a minimum, then you will have to do the task for a lower than your minimum bonus payment. Please see two examples of how this works.

Example 1: Suppose the true minimum bonus payment you are willing to do the task for is $\pounds 0.90$ but that you choose YourMinimum = $\pounds 1.50$. The computer draws a number equal to ComputerNumber = 1.10. Since ComputerNumber is less than YourMinimum, you cannot do the task and the experiment will end.

Example 2: Suppose the true minimum bonus payment you are willing to do the task for is $\pounds 0.70$ but that you choose YourMinimum = $\pounds 0.40$ The computer draws a number equal to ComputerNumber = 0.90. Since ComputerNumber is greater than YourMinimum, you will be able to do the counting zeros task. You will receive $\pounds 0.40$ as a bonus payment for Part 2. But this means that you will receive $\pounds 0.40$ whereas you could have received $\pounds 0.70$ if you had chosen your true minimum YourMinimum = $\pounds 0.70$.

Please answer the following question to make sure that you understand the payment mechanism correctly. You will be able to proceed only if you answers are all correct.

Suppose you report YourMinimum to be equal to £0.80 and the ComputerNumber is 0.90. Which of the following is correct?

I will be able to complete the counting zeros task and I will receive £0.80 for completing it.

I will be able to complete the counting zeros task and I will receive £0.00 for completing it.

I will be able to complete the counting zeros task and I will receive £0.90 for completing it.

I will not be able to complete the counting zeros task.

Suppose you report YourMinimum to be equal to £0.80 and the ComputerNumber is 0.15. Which of the following is correct?

I will not be able to complete the counting zeros task.

I will be able to complete the counting zeros task and I will receive £0.80 for completing it.

I will be able to complete the counting zeros task and I will receive £0.15 for completing it.

You have to think carefully what is the TRUE minimum bonus payment that you are willing to accept to do this task (correctly completing ten counting zeros tables) and then choose it as YourMinimum. There are no right or wrong answers, it really depends on your preferences and circumstances.

Once you have chosen YourMinimum, the software will draw a number and you will know whether YourMinimum is greater or equal or less than the ComputerNumber. Depending on this you will either continue to do the task or complete the experiment without proceeding to do the task. In either case, you will still receive a £0.30 fixed payment for participating in this study and be eligible for a bonus payment from Part 1.

Please enter YourMinimum between £0.00 and £2.00 below

(Make sure to use two decimal spaces using a dot in between and that there are no spaces or other characters.)

Thank you for entering YourMinimum = £.

Please continue to draw a random ComputerNumber between 0.00 and 2.00

Generate ComputerNumber

[Feedback if the computer number is greater or less than YourMinimum]

[Accordingly work on the Counting Zeros task, or skip to the last page of the study: below]

What do you personally think is a fair hourly rate for studies that are usually completed on Prolific?

•

What do you think most of other Prolific participants think is a fair hourly rate for studies that are usually completed on Prolific? If you guess the response given by most of the participants of this study you will receive an additional £0.10 in BONUS payment.

•

Thank you completing this study. We will be shortly in contact regarding your bonus payments.

What do you think this study was about?

Is there anything you would like to tell us about this study? If yes, please input below.

Please enter your Prolific ID again to complete the study.

Appendix B

Additional Tables and Figures

Table B1: OLS regression of reservation wages only for subjects of UK Nationality

	(1)	(2)	(3)	(4)
Treatment High	2116.66***	2518.35***	875.49	1187.49
	(799.02)	(803.25)	(688.83)	(736.12)
Fair Wage			.62***	.60***
			(.09)	(0.11)
Constant	22083.33***	20414.32***	8624.38***	12865.67**
	(532.79)	(6071.47)	(2083.79)	(4926.29)
Adj R_sq	.064	.119	.389	.409
Ν	88	86	88	86
Controls	No	Yes	No	Yes

Robust standard errors are in parentheses. Controls include the age, gender, whether subjects had a one-year job placement experience, and industry they would like to work in.