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DISCUSSION PAPER SERIES

IZA DP No. 16882

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Anna Stansbury
MIT Sloan and IZA

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Incentives to Comply with the Minimum Wage in the US and UK*

There is substantial evidence of minimum wage noncompliance in the US and the UK. In this paper, I compile new, comprehensive data on the costs minimum wage violators incur when detected. In both countries, the costs violators face upon detection are often little more than the money they saved by underpaying. To have an incentive to comply under existing penalty regimes, typical US firms would thus have to expect a 47%-83% probability of detection by the DOL, or a 25% probability of a successful FLSA suit. In the UK, typical firms would have to expect a 44%-56% probability of detection. Actual probabilities of detection are substantially lower than this for many firms, and would likely remain so even with realistic increases in enforcement capacity. Improved enforcement alone is thus insufficient: expected penalties must also substantially increase to ensure that most firms have an incentive to comply.

JEL Classification: J38, J58, K31

Keywords: minimum wage, labor standards, compliance and enforcement, industrial relations

Corresponding author:
Anna Stansbury
MIT Sloan
100 Main St
Cambridge, MA 02142
USA

E-mail: amms@mit.edu

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The minimum wage is a core worker protection in both the US and UK. A large literature attempts to quantify the effect of minimum wages on pay, employment, inequality, and other outcomes. But the minimum wage is only effective if it is paid. And in both the US and the UK, there is evidence of widespread underpayment. In this paper, I ask *"What incentive do firms have to comply with the minimum wage in the US and the UK"*? This question is important to understand the efficacy of existing minimum wage legislation and the likely degree of non-compliance (because non-compliance itself is hard to measure). In turn, estimating the likely degree of non-compliance is important when interpreting results of other minimum wage research, including estimates of disemployment effects (Clemens 2021).

I focus on the federal minimum wage and overtime law in the US and the national minimum wage in the UK. In both the US and the UK, a variety of different enforcement channels and possible penalties mean that there is no unified data on the costs noncompliant firms face. I therefore first construct a new, detailed dataset of the costs and penalties firms face when they are found to have illegally underpaid the minimum wage in both the US and the UK, across different enforcement channels. I then use these data to estimate the penalty violators can expect to pay under different plausible scenarios, as a share of back wages. Following Chang and Ehrlich (1985), I use this to infer the probability of detection firms would have to expect to have an incentive to comply. I finally compare these expected probabilities of detection to evidence on the actual probability of detection noncompliant firms likely face.

This paper builds on empirical work on firms' minimum wage compliance decisions, including Lott and Roberts (1995), who use data from US Department of Labor enforcement and private lawsuits to estimate firms' expected cost of violating the minimum wage, Weil (2005), who evaluates the effect of interventions designed to increase compliance in the US apparel

industry, Hallett (2018), who provides a systematic analysis of the enforcement system around wage theft in the US, and Metcalf (2018), who analyzes the deterrent effect of the minimum wage penalty and enforcement system in the UK.

1. Background and Empirical Approach

Framework

How to quantify a firm's incentive to comply with the minimum wage? A long tradition in economics applies a cost-benefit framework to compliance decisions, suggesting that a profit-maximizing company complies with the law if the profits made by breaking the law are less than the expected costs – a function of the probability of detection and the costs if detected (Becker 1968). For the minimum wage in particular, Chang and Ehrlich (1985) illustrate that, in order to have an incentive to comply, a firm must expect that the probability of detection λ exceeds the reciprocal of the cost if detected k (expressed as a proportion of the back wages owed): [1]

$$Comply\ if \qquad \lambda > \frac{1}{k}\,. \qquad (1)$$

The cost-benefit approach assumes that at least some firms actively decide whether or not to comply. This is not unreasonable. While some employers underpay inadvertently, there is clear evidence that many employers intentionally violate minimum wage laws in both the US and UK (Bernhardt et al (2009), Mattera (2018), Levine (2018), Clark and Herman (2017), Ipsos Mori (2012)). Consistent with this, evidence from US states finds that higher penalties reduce violations (Galvin 2016; Clemens and Strain 2020), suggesting some employers make a

[1] If firms are risk neutral, and in the absence of efficiency wage effects. See Appendix C. See also Ashenfelter and Smith (1979) and Grenier (1982).

deliberate cost-benefit calculus about compliance. Moreover, one cannot always distinguish clearly between inadvertent and intentional underpayment: firms' incentive to learn about the law and avoid inadvertent non-compliance increases, the greater the penalty for non-compliance.

Note that this paper focuses on the expected penalties levied by the legal system and excludes reputation costs. Both the US and UK enforcement apparatuses make use of reputational harm alongside financial penalties: the US Department of Labor (DOL) publishes case-level information on minimum wage underpayment, and the UK government has an explicit "naming and shaming" scheme. While reputational costs affect some firms' labor compliance decisions (Ji and Weil 2015, Johnson 2020), it is insufficient for laws to rely only on reputation: some firms face few reputational costs (if, for example, they are not customer-facing or have little brand value) and thus, workers at these firms suffer while firms with reputations to maintain may be at a competitive disadvantage.

Context

In the US, I focus only on the Fair Labor Standards Act, which sets the federal minimum wage and overtime law. While several states and localities have minimum wages higher than the federal level, for a large share of workers the federal minimum wage is the binding protection: as of 2020 approximately 40% of US wage and salary workers lived in the twenty-one states where the federal minimum wage prevailed (DeSilver 2021).[2] I therefore focus on the federal level both

[2] In 2000 this share was 75%; the falling share reflects increasing state and local minimum wages. Moreover in many states, federal enforcement is the main enforcement channel since state-level enforcement is weak: Florida has no state minimum wage enforcement agency (Galvin 2016); over half of states have fifteen or fewer wage and hours enforcement staff states (Bobo 2011); most states only undertake enforcement in response to complaints (Lurie 2011, Meyer and Greenleaf 2011); and in some states including Texas and Utah, state enforcement focuses only on workers *not* covered by the FLSA (Lurie 2011). Note that higher state minimum wages may increase the incentives for firms not to comply, particularly in states with a high "bite"; some states tackle this with more stringent penalties (Hallett 2018). A higher federal minimum wage would make federal penalties and enforcements the relevant

because it sets the minimum wage for more than 60 million US workers, and because it provides the baseline preventing race-to-the-bottom dynamics between states.

In the UK, I focus on the National Minimum Wage and National Living Wage, which are a national tiered system of hourly minimum wages based on age and apprenticeship status. The UK is an interesting comparator to the US: its labor market institutions are in many respects similar, with largely decentralized wage setting (private sector collective bargaining coverage of 13% in the UK and 6% in the US in 2023), the minimum wage as one of the major legislated wage protections, and a two-track minimum wage enforcement system which relies on a combination of government inspections and private actions brought by employees in the courts.[3]

Estimates suggest both countries experience substantial minimum wage noncompliance. In the US, a frontline worker survey in low-wage industries found that 68% experienced at least one pay-related violation in any given week, at an average cost of 15% of wages (Bernhardt et al 2009), and random inspections in the fast food and garment industries found FLSA violations in 40% and 85% of workplaces respectively (Weil 2014b, Weil 2018).[4] In the UK, the government-appointed Low Pay Commission (2019) estimates that more than 22% of covered individuals (defining as those earning up to 5p per hour more than the minimum wage) were underpaid in 2019, and that over a third of these were underpaid by more than 62p per hour; estimates of noncompliance from a worker survey are substantially higher (LeRoux et al 2013).

benchmark in more states: for example, as of January 2024 only four states and the District of Columbia had minimum wages higher than $15.

[3] I provide further institutional details on the US and UK minimum wage enforcement systems in Appendix D.

[4] Estimates from the Current Population Survey also suggest substantial noncompliance (Galvin (2016), Cooper and Kroeger (2017), and Eastern Research Group (2014)).

An important difference between the minimum wage landscape in the US and the UK is the "bite" of the minimum wage (ratio of minimum wage to median wage). In the UK in 2021 the adult national minimum wage was 61% of the median, having been increased substantially since its introduction in 1999 at a bite of 46% (Low Pay Commission 2024). In the US the federal minimum wage in 2021 was 31% of the median,[5] having declined in real terms and relative to the median since its last increase in 2009. The substantially higher "bite" in the UK means more workers are affected, creating incentives for more widespread noncompliance.

Data

US: The FLSA has two enforcement channels: a DOL investigation, or a court action. To identify costs faced in DOL investigations, I compiled a case-level dataset on all FLSA wage and hour cases investigated by the DOL since 2005. I obtained back wages, civil monetary penalties, and determinations of repeat and willful violations from the DOL's publicly available WHISARD database, and combined this with case-level information on liquidated damages and the use of the hot goods provision, obtained through a Freedom of Information Act request to the DOL. This combined dataset provides a fully comprehensive account of the costs faced by every minimum wage violator detected by a DOL investigation since 2005. I refer to this dataset going forward as the "DOL WHISARD database".

All willful violators of the FLSA can be referred by the DOL for criminal prosecution. The WHISARD data does not contain information on these referrals. To identify FLSA criminal convictions, I requested data from the Bureau of Justice Statistics.

[5] Calculated using estimated median hourly wages of $23.05 in 2021, from the Economic Policy Institute State of Working America Data Library.

I was unable to obtain comprehensive case-level information on private enforcement actions. My calculations on the costs faced by violators in the courts rely on a combination of legal statutes, prior academic literature, and a random sampling of FLSA case information from Westlaw.

UK: I compiled data on the costs incurred by violating firms from a range of sources by combining publicly available data from UK government reports and the "Naming and Shaming" scheme for large minimum wage violators, with fifteen Freedom of Information requests I submitted to various government departments. This resulted in data on arrears, penalties, and criminal prosecutions. Unfortunately, my Freedom of Information requests for case-level information were rejected, so all information I have about penalties levied by HMRC is at the aggregate level.[6] To estimate penalties incurred in employment tribunals, I manually analyzed hundreds of employment tribunal case records in the UK to construct a new database of minimum wage cases and their outcomes.

To my knowledge, the data I have assembled provides the most comprehensive public-domain estimate of the costs firms face for minimum wage violations in the either the US or UK.

2. US: Incentives to comply with the FLSA

DOL investigations

To analyze the costs firms face after DOL enforcement actions, I use the DOL WHISARD database described above, which contains all 160,992 concluded Wage and Hour Division cases since 2005 which feature at least one violation of FLSA minimum wage or overtime provisions

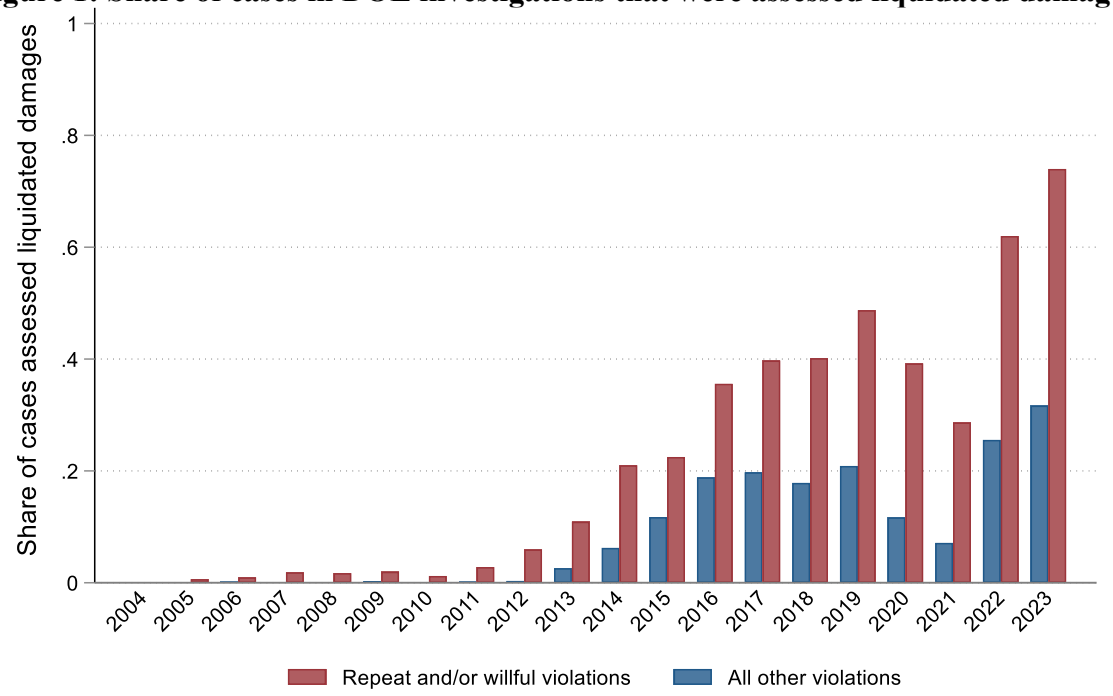
[6] The "Naming and Shaming" scheme provides case-level information on arrears but not on penalties levied.

where back wages were found to be owed. I summarize below the assessment of liquidated damages and civil monetary penalties in these data.

Liquidated damages: All violating firms must pay back wages owed. They may also be required to pay liquidated damages equal to the amount owed in back wages. Until relatively recently, liquidated damages were almost never assessed in DOL investigations, but this has changed in more recent years (Weil 2010, Weil 2018). As shown in Figure 1, fewer than 1 percent of cases before 2012 were assessed any liquidated damages, but by 2022-2023 more than 30% of cases concluded had liquidated damages assessed, and among repeat and/or willful violations the share was over 60%.

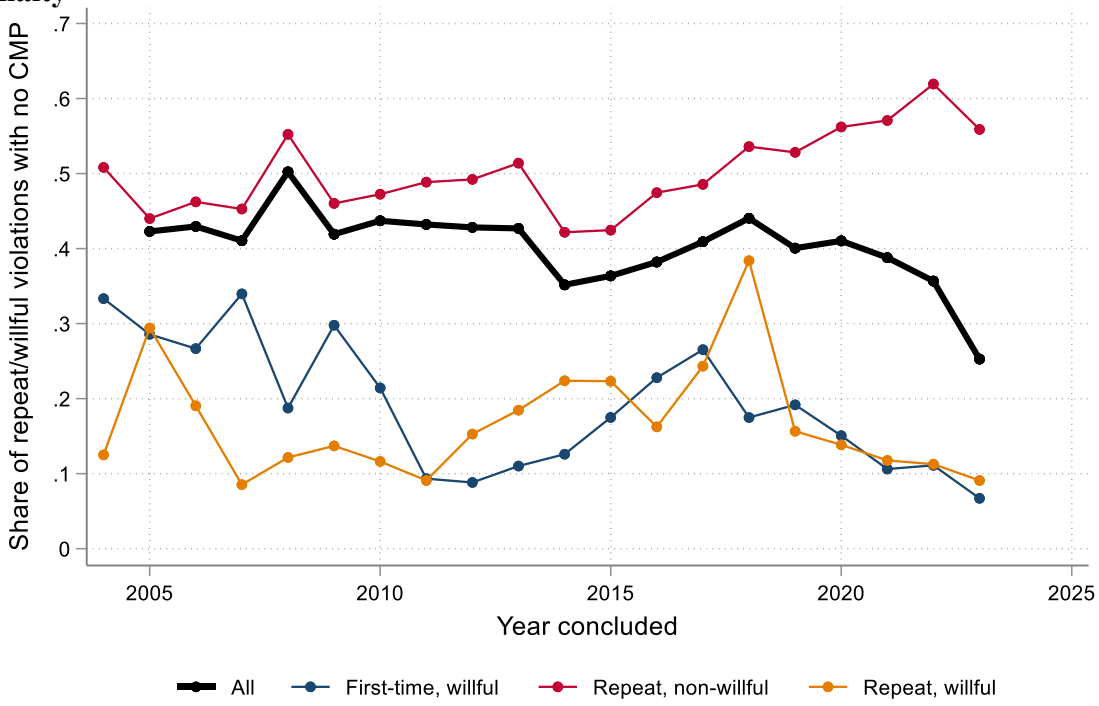
Civil Monetary Penalties: Repeat and/or willful violators may be required to pay a civil monetary penalty (CMP). As Table 1 illustrates, however, CMPs are in practice minimal for almost all violators. First, the vast majority of minimum wage or overtime violations detected by the DOL are not eligible to be assessed CMPs: 91% of cases were first-time violations, and only 2% of first-time violations and 10% of repeat violations were deemed willful. Second, even among repeat and/or willful violators – those eligible for penalties – 41% were not required to pay any CMP (Figure 2). Third, in cases where a CMP is assessed, the amounts are often small relative to the underpayment, as illustrated in Table 1: the median repeat, non-willful violator was required to pay a penalty of 2 cents per dollar of wages owed; the median first-time, willful violator a penalty of 15 cents per dollar of wages owed; and even among violations which were both repeat and willful the median violator had to pay a penalty of only 29 cents per dollar of wages owed. These three factors together meant that only 6.5% of DOL-identified FLSA underpayment cases had any CMP levied, and a penalty worth more than $1 per dollar of wages owed was levied in only 1.4% of cases.

Figure 1: Share of cases in DOL investigations that were assessed liquidated damages



Source: Department of Labor WHISARD database, all concluded WHD actions FY 2005 to July 2023.

Figure 2: Share of repeat and/or willful violations that were not assessed any civil monetary penalty



Source: Department of Labor WHISARD database, all concluded WHD actions FY 2005 to July 2023.
Note: First-time, non-willful violations are not included because they are not eligible to be assessed a civil monetary penalty.

Table 1: Liquidated damages and civil monetary penalty assessments, by violation type and time period

Category	Cases	Share assessed LD	Share assessed CMP	CMP per dollar of back wages owed, by percentile									
				P1	P5	P10	P25	P50	P75	P90	P95	P99	Mean
First-time, non-willful													
2005-2023	143,383	7.3%	-	-	-	-	-	-	-	-	-	-	-
2005-2014	87,377	1.1%	-	-	-	-	-	-	-	-	-	-	
2015-2023	56,006	17.2%	-	-	-	-	-	-	-	-	-	-	
First-time, willful													
2005-2023	3,140	59.4%	83.5%	0	0	0	0.05	0.15	0.36	0.79	1.36	3.51	0.38
2005-2014	954	36.4%	84.8%	0	0	0	0.06	0.14	0.35	0.70	1.14	2.94	0.34
2015-2023	2,186	69.4%	82.9%	0	0	0	0.05	0.15	0.37	0.83	1.44	3.92	0.40
Repeat, non-willful													
2005-2023	13,077	10.4%	50.9%	0	0	0	0	0.02	0.41	1.30	2.28	6.07	0.49
2005-2014	7,931	1.8%	52.2%	0	0	0	0	0.03	0.40	1.16	1.91	4.48	0.41
2015-2023	5,146	23.7%	49.1%	0	0	0	0	0	0.46	1.63	2.89	7.98	0.60
Repeat, willful													
2005-2023	1,392	39.5%	82.3%	0	0	0	0.08	0.29	0.83	2.08	3.80	9.42	0.90
2005-2014	662	15.7%	84.7%	0	0	0	0.10	0.33	0.84	1.76	3.41	8.76	0.85
2015-2023	730	61.1%	80.0%	0	0	0	0.06	0.25	0.81	2.32	4.06	10.70	0.95

Source: Department of Labor WHISARD database, all concluded WHD actions FY 2005 to July 2023

Note: “LD” = liquidated damages. “CMP” = civil monetary penalty. See also Appendix Figures A1 and A2.

Hot goods provision: Under section 15(a) of the FLSA, the DOL is able to embargo goods which have been manufactured in violation of the FLSA. This increases the probability of detection by incentivizing companies higher in the supply chain to monitor their subcontractors, and increases the cost of detection as the costs of goods embargos can be many multiples of DOL fines (Weil 2005). The hot goods provision is overwhelmingly used in the garment industry (Weil (2018)): 76% of hot goods violations in the DOL WHISARD data were in NAICS 313, 314, 315, or 316. For firms in these industries, the likelihood of hot goods provision being used is high, at 43% of cases. But these industries only represent about 1.1% of all wage and hour violations. For firms in every other industry, the chance of the hot goods provision being used is close to zero (0.15% of cases). Thus, while the DOL has the ability to use the hot goods provision beyond the garment industry (Koltookian 2014, Weil 2014b), this occurs so rarely that it seems unlikely to be a major factor in the cost calculus for firms in other industries.

Criminal prosecution: The FLSA enables willful violators to be referred by the DOL to the DOJ for criminal prosecution. However, only 38 criminal convictions have occurred for violations of FLSA minimum wage or overtime provisions (sections 206, 207, 211C, 215, 216) in the 26 years between 1994 to 2020 according to data from the Bureau of Justice Statistics and Federal Criminal Case Processing Statistics, as shown in Table 2. While the law provides for a fine of up to $10,000 and a prison sentence of up to 6 months if convicted, fines were levied in only four cases (with a mean value of $3,063), and none led to prison. Thus, even *conditional* on

a violation being detected and deemed willful by the DOL, there is less than a 0.7% chance of a criminal conviction, and a 0.08% chance of a criminal conviction with a fine.[7]

Table 2: Criminal convictions, FLSA minimum wage or overtime violations, 1994-2020

Code 29 Section	Number Convicted	Sentence: Fine only	Mean fine (if fined)	Sentence: Probation, no prison	Mean probation months (if sentenced probation)	Sentence: Prison
206	8	0	-	4	26	0
207	11	2	$6,250	9	35	0
211C	4	0	-	4	18	0
215	11	1	$5,000	10	19	0
216	4	1	$1,000	3	33	0

Source: Bureau of Justice Statistics, Federal Criminal Case Processing Statistics.
Notes: Table shows the number of defendants convicted under U.S. Code Title 29 Chapter 8 sections 206 (minimum wage), 207 (overtime), 211C (record-keeping), 215 (prohibited acts), and 216 (penalties) in fiscal years 1994-2020 inclusive.

Court actions

If found to have underpaid the minimum wage or overtime in court, the violating firm will be ordered to pay back wages. Courts typically also award liquidated damages alongside back wages (see e.g. Callen 2012). Other penalties (like CMPs) are not available in court actions.

The violating firm may also be required to pay the legal costs of the employee(s) who brought the action, as well as having to pay its own legal costs. Attorney's fee awards can vary substantially depending on the case, and there is no systematic dataset available of attorney's fee awards in FLSA cases. Examining a random sample of 42 federal FLSA cases in Westlaw over 2005-2020 for which information was given on attorney's fees, cost awards, and damages

[7] Calculated using the 3,752 willful FLSA violations over 2005-2020 in the DOL WHISARD as the denominator, and the 26 criminal convictions, and 3 convictions requiring fines over the same period as the numerators.

awarded or settlement amounts, we find that the median attorney's fee award as a share of costs paid by the employer was 34% (and the mean was 41%). Similarly, Eisenberg et al (2017) find that the median attorney fee award in FLSA collective actions over 2009-2013 was 33% and the mean was 30% (see also Fitzpatrick 2010). In general, the larger the settlement amount in the case, the smaller the attorney's fee award as a share of settlement costs (Eisenberg et al 2017). Since the settlement in an FLSA minimum wage underpayment case typically consists of back wages and an equal amount in liquidated damages, our estimates would be consistent with the average attorney's fee awards being roughly of a similar magnitude to the back wages.

Minimum probability of detection required to incentivize compliance

With detailed data on firms' liquidated damages and CMPs, I now infer the minimum probability of detection firms must expect, to be incentivized to comply. This is the reciprocal of the expected penalty per dollar of wages owed (see expression (1)). I separately examine four scenarios firms might expect, and summarize them in Table 3.

For a DOL investigation, I examine three different scenarios, separately analyzing first-time and repeat violators. In all scenarios, the firm is required to pay back wages, but they differ as to expected liquidated damages or CMPs, which I estimate using the DOL WHISARD data for roughly the last decade (2015-2023).[8]

DOL - average violator: First, consider the average violating firm caught by the DOL: the firm pays back wages, faces the average likelihood of being made to pay liquidated damages, faces the average likelihood of being deemed willful (2% for first-time violators, and 9% for

[8] I do not include the hot goods provision or criminal prosecution since they are so rarely used.

repeat violators), and pays the average CMP. For the average first-time violator, this makes the expected cost per dollar of wages underpaid $1.205, meaning that the firm would have to expect detection with an 83% probability or higher to have an incentive to comply with the law. For the typical repeat violator, where liquidated damages are levied more frequently and CMPs are higher, the expected cost per dollar of wages owed is $1.93 and the probability of detection required to incentivize compliance at least 52%.

DOL – average willful violator: The average *willful* violator caught by the DOL pays back wages, is deemed a willful violator, faces the average likelihood *for a willful violator* of being made to pay liquidated damages, and pays the average CMP for a willful violator. In this case, for a first-time violator the expected cost per dollar of wages owed is $2.09, meaning the firm would have to expect detection with a 48% probability or more to have an incentive to comply with the law. For a repeat violator, the relevant figures are $2.56 and 39% respectively. This scenario applies to only a small share of firms: 2% of first-time and 9% of repeat violations are deemed willful.

DOL – upper bound willful violator: This scenario represents an extreme upper bound that only the most serious violators might reasonably expect to face: the firm pays back wages and liquidated damages, is deemed a willful violator, and pays the 95th percentile CMP for a willful violator. Since willful violators comprise only 2% of first-time and 9% of repeat violators, scenario 3 effectively estimates the 99.9th percentile penalty for first-time violators and the 99.5th percentile penalty for repeat violators. In this case, for first-time violators the expected cost per dollar of wages owed is $3.44, and for repeat violators $6.06; requiring a probability of detection of at least 29% or 17% to incentivize compliance respectively.

Court – average violator: For court actions, I consider a scenario where back wages and liquidated damages are automatically awarded, and where there is an additional expected attorney's fee award equivalent to the total back wage award. Since this attorney's fee award only covers the cost of the plaintiffs' fees, I follow Department of Labor (2016) methodology in doubling the plaintiff fee estimate to account for the defendants' legal costs as well. In this case, the expected cost per dollar of wages owed is $4, requiring a probability of detection of at least 25% to incentivize compliance. Note that attorney's fee awards tend to be a smaller share of the total settlement, the larger the value of total underpayment. This 25% figure is thus likely an underestimate of the incentive to comply for smaller violators and an overestimate for larger violators.

Table 3: Expected Cost of Violation and Minimum Probability of Detection Required to Incentivize Compliance in the US: DOL investigations and court actions

Back wages owed are normalized to 1. Expected liquidated damages, civil monetary penalties, legal costs, and total expected cost are all expressed as a proportion of back wages owed.

DOL investigations	Back wages	Expected Liquidated Damages	Expected Civil Monetary Penalty	Total Expected Cost	Minimum Probability of Detection Required to Comply
Average violator – first time	1	0.19	0.015	1.205	83%
Average violator – repeat	1	0.28	0.65	1.93	52%
Average willful violator – first time	1	0.69	0.4	2.09	48%
Average willful violator – repeat	1	0.61	0.95	2.56	39%
Upper bound willful violator – first time	1	1	1.44	3.44	29%
Upper bound willful violator – repeat	1	1	4.06	6.06	17%
Court actions	**Back wages**	**Expected Liquidated Damages**	**Expected Legal Costs**	**Total Expected Cost**	**Minimum Probability of Detection Required to Comply**
Average violator	1	1	2	4	25%

Source: Authors' calculations.

Margin for error

This analysis may overestimate firms' incentive to comply for three reasons. First, firms may pay less in back wages than the value of their initial underpayment, whether because the statute of limitations binds, because firms have kept bad records (Bobo 2011), or because a settlement is reached (Hallett 2018, Cooper and Kroeger 2017). Second, the CMP figures reported represent the CMPs assessed by the DOL, not those actually paid; over 1998-2008 only 61% of CMPs assessed were ultimately deemed receivable (Weil (2014b)). For the average willful repeat violator, adjusting the expected CMP down to 61% of its assessed value would increase the expected probability of detection required to incentivize compliance from 39% to 46%. Third, the wage cost avoided through non-compliance may be larger than we assume, if there are within-firm minimum wage spillover effects. Using the estimate from Gopalan et al. (2021) that 20% of the increase in labor costs to firms as a result of higher minimum wages come from spillovers to non-minimum-wage workers, we would need to inflate our estimates of the saved wage costs from underpayment by 25%. This would mean that for the average first-time violator, there would be no incentive to comply: the cost of detection is 120.5% of back wages but the savings in wage payments from noncompliance would be 125% of back wages.

On the other hand, this analysis may underestimate firms' incentives to comply to the degree that efficiency wage effects are important: if worker productivity rises or turnover falls as wages rise, the benefit to the firm of paying workers a wage $1 lower is less than a dollar. I discuss efficiency wage effects and spillovers further in Appendix C.

Actual probability of detection

Table 3 shows that a typical violator would have to expect a 48%-83% probability of detection by the DOL, or a 25% probability of a court action, to have an incentive to comply with the minimum wage. What is the probability of detection they face in practice?

The probability that any given establishment is inspected by the DOL is relatively low: Galvin (2016) estimates that even in the most heavily targeted industries (retail, fast food, and janitorial services), the probability a covered establishment was investigated by the DOL WHD in 2012 was less than 1%. The probability of a violation being detected is weakly higher than these random inspection probabilities, because the DOL targets investigations to sectors, places, and firms most likely to have violations. What is the probability that a *violating firm* is detected through a targeted inspection? We can estimate this using data from fast food, which is a sector with high violation rates and good data on violation prevalence and inspection frequency. Around 40% of randomly inspected fast food establishments had FLSA violations, and the annual probability of inspection for an establishment among the top twenty fast food brands was around 0.8 percent (Weil 2014b). If 40% of establishments are violators, 0.8% of establishments are inspected per year, and 69% of these targeted inspections find violations, this suggests that each violating firm has a 1.4% chance of being detected through a targeted inspection in a given year (or a 4.2% chance over three years, the maximum length for which back wages can be claimed). This illustrates that even under relatively effective targeting, detection probabilities would need to increase by more than an order of magnitude to reach the range of 48%-83% which the estimates in this paper suggest is required to incentivize compliance.

Given the relative scarcity of inspection resources, worker-initiated actions are a key channel for FLSA enforcement. 50% of WHD investigations are complaint-led (Weil 2018), and

collective actions through the courts have rapidly become a meaningful complement to DOL enforcement action: over 2013-2019 an average of 7,900 FLSA cases were filed in federal court each year (Seyfarth Shaw 2020). Yet worker-initiated actions cannot be relied upon to detect all violations, since workers often do not make complaints or bring suits. This is particularly true for the most vulnerable workers. Weil and Pyles (2006) estimated for example that for every 130 overtime violations, only one complaint is received, and the industries with the highest rate of FLSA complaints to the DOL are not the industries with the highest rates of violations.[9]

Why don't workers report violations? First, many workers are unaware that their employer's pay practices are illegal (Bobo 2011, Alexander and Prasad 2014).[10] Second, workers may suspect they have been underpaid, but lack records to prove it (e.g. Dombrowski et al 2017). Third, even workers who *are* aware they are being underpaid may be reluctant to complain if they are scared of employer retaliation, of losing their job if the firm is penalized by the DOL, or of contacting the authorities, if they are undocumented for example (Weil and Pyles 2006, Fine 2006, Bernhardt et al 2009, Milkman et al. 2010, Fussell 2011, Alexander and Prasad 2014, Grittner and Johnson 2021).[11] Or, in high-turnover industries, workers may simply move on to another job (Bobo 2011). Finally, if a worker believes that their job would not exist with a higher wage, a firm and worker may collude to avoid paying the minimum wage (e.g. Clemens and Strain 2020). Even if a worker does want to bring a suit, high costs mean that FLSA cases are

[9] Moreover, since complaints have a positive externality, even in a world with perfect information and no retaliation, workers would complain too little (Weil and Pyles 2006).

[10] Workers may not know the law, or employers may violate the law in ways which are hard to detect. These include requiring unpaid training; making illegal deductions; not giving breaks or pay for breaks not taken; requiring work before or after shifts; not paying for driving time between jobs; paying insufficient piece rates; making workers pay to work (e.g. for the right to earn tips); or misclassifying workers as independent contractors or as exempt from overtime (see e.g. Bobo 2011, Nir 2015, Weil 2018).

[11] In Bernhardt et al (2009), 43% of surveyed low-wage workers who had complained about a workplace issue reported retaliation.

often not financially viable for individuals or small groups.[12] Collective actions for large groups are more often financially viable, but an estimated 23% of workers are subject to class action waivers (Colvin 2018).

3. UK: Incentives to comply with the minimum wage

To calculate UK firms' incentives to comply with the national minimum wage, as with the US analysis I compile data on the costs firms face through different enforcement channels. Unlike in the US, where there is publicly-available case-by-case data on individual DOL investigations, HMRC only makes available aggregate data on arrears and penalties.[13] The primary enforcement channels are investigations by HMRC or by a worker bringing an action to an employment tribunal. The data available suggest that in both HMRC investigations and employment tribunals, the penalties firms incur in practice rarely reach the upper limits allowed by the law.

HMRC investigations

If HMRC finds a minimum wage violation, one of two routes may be followed. In most cases, firms are required to pay arrears owed and an additional penalty, of 100% of arrears if paid within 14 days (the prompt payment discount) and 200% of arrears if paid later.[14] In other cases "where the potential arrears owed are low and the number of workers is small", the firm

[12] An employee is often responsible for costs of FLSA litigation upfront, and may remain liable for attorney fees if unsuccessful (Ruan 2012). Free legal services are limited (and those with federal funding cannot serve undocumented workers). No-win no-fee agreements are rarely viable in smaller FLSA cases because of low damage amounts (Becker and Strauss 2008, Lee 2014). Moreover, the opt-in requirement makes bringing large collective actions more difficult under the FLSA than in Rule 23 class actions (Ruckelshaus 2008).
[13] "Naming and Shaming" scheme data lists companies and arrears owed, but not penalties levied; Freedom of Information requests for case-level data were denied.
[14] Up to a maximum of £20,000 per worker. The penalty ratio was increased to 200% in 2016 (from 100% in 2014-2016, and 50% before 2014).

may be allowed to self-correct (BEIS 2018), paying only arrears and no further penalties. Table 4 shows the total arrears in HMRC investigations, penalties levied, and number of workers who received arrears. In the two most recent years, 2017/18 and 2018/19, 27% of violators self-corrected (paying no penalty), 52% paid a penalty worth 100% of arrears, and 13% paid a penalty worth 200% of arrears.[15] The average penalty imposed was £0.78 for each £1 of arrears owed, and the average penalty for firms not offered the option to self-correct was £1.29 for each £1 of arrears owed.

Table 4: Arrears recovered and penalties levied by HMRC, 2009/10 to 2018/19

Fiscal year	Total arrears identified	Arrears self-corrected (incurring zero penalty)	Arrears identified in investigation (incurring a penalty)	Penalties levied	Average penalty as % of arrears, for non-self-correcting firms	Average penalty as % of arrears, across all violating firms
2018/19	£24.4m	£10m	£14.4m	£17m	118%	70%
2017/18	£15.6m	£5.9m	£9.7m	£14.1m	145%	90%
2016/17	£10.9m	£6.0m	£4.9m	£3.9m	80%	36%
2015/16	£10.3m	£4.6m	£5.7m	£1.78m	31%	17%
2014/15	£3.3m	N/A	£3.3m	£0.93m	28%	28%
2013/14	£4.7m	N/A	£4.7m	£0.82m	17%	17%
2012/13	£4.0m	N/A	£4.0m	£0.78m	20%	20%
2011/12	£3.6m	N/A	£3.6m	£0.77m	21%	21%
2010/11	£3.8m	N/A	£3.8m	£0.52m	14%	14%
2009/10	£4.4m	N/A	£4.4m	£0.11m	2.5%	2.5%

Source: Author's analysis of HMRC Government Evidence on Minimum Wage Non-Compliance for each year.

Criminal prosecution and individual liability: Over 1999-2018 there were just 14 criminal prosecutions of firms for minimum wage violations (Table 5), representing 0.2% of the 7,486 non-self-corrected violations over the period. While potential fines have been unlimited since

[15] The remainder of firms paid a different penalty amount, likely because the underpayments occurred before the penalty uplift in 2016: the maximum penalty was 100% in 2014-2016, and 50% before 2014. The number of firms paying different penalties was obtained in a Freedom of Information request to HMRC (FOI2019/02042). See also Appendix Table A1.

2015, the average fine across these 14 cases was £2,695, and the average total costs levied on firms (including fines, paying compensation to workers, and workers' costs) per case was £5,287.

Individual company officers can also be referred for criminal prosecution or disqualified as company directors if found to have connived or consented with underpayment. Publicly available data suggests that as of 2019 there had been no criminal prosecutions of individual officers and only four director disqualifications (see Appendix Table A3).

Table 5: Criminal prosecutions for National Minimum Wage Act violations

	Number of prosecutions for National Minimum Wage Act violations										
Fiscal year	**2007 /08**	**2008 /09**	**2009 /10**	**2010 /11**	**2011 /12**	**2012 /13**	**2013 /14**	**2014 /15**	**2015 /16**	**2016 /17**	**2017 /18**
Number of prosecutions	2	5	1	0	0	1	0	0	0	4	1
Average fine	£1,750	£1,410	£2,250	-	-	£1,000	-	-	-	£6,500	£2,977
Average cost order	£500	£190	£100	-	-	£1,000	-	-	-	£965	£633
Average compensation	£0	£2,215	£0	-	-	£0	-	-	-	£4,238	£0

Source: Author's analysis of data in BEIS (2018), Annex C.
Notes: There were no prosecutions before 2007. Data after 2017/18 was unavailable at time of writing.

Employment tribunals

In employment tribunals, beyond paying arrears owed violating firms may have to compensate the worker(s) for financial losses incurred. If there are "aggravating features", a penalty of 50% of arrears may also be levied, up to £20,000 (reduced by half if paid within 21 days). In certain circumstances judges may make a cost order. To estimate how often firms pay compensation or penalties in excess of arrears, in August 2019 I manually analyzed the Ministry of Justice's online database of employment tribunal actions, extracting all cases where minimum wage arrears were listed and where the jurisdiction was one of *National Minimum Wage*,

unlawful deduction of wages, or *breach of contract*, or the judgment featured the words *minimum wage*. This yielded 141 cases (since February 2017, the first cases in the database) where a firm was found to have underpaid the minimum wage and where information about the arrears or award was provided. This analysis reveals that in the vast majority of minimum wage cases, tribunals awarded arrears only and no further costs: only one of the 141 cases featured a financial penalty for 'aggravating features', five involved a cost award (with an average value of £183), and seven featured compensation in relation to the minimum wage offence (see Appendix Table A2). Many employers fail even to pay the arrears owed: only 32% of individuals awarded arrears for unpaid wages in employment tribunals received their payment in full without pursuing further enforcement according to a 2013 government study, and 44% received no payment at all (BIS 2013; see also Appendix Figure A3 and Rose et al 2014).

Minimum probability of detection required to incentivize compliance

As in the US analysis, I use these data on penalties levied to ask: *what is the minimum probability of detection which is required to incentivize compliance with the UK's minimum wage*? I consider scenarios for both HMRC investigations and employment tribunals, summarized in Table 6.

HMRC - Average violator. If the firm expects to face the average outcome of all violating firms subject to an HMRC investigation in 2017/18 and 2018/19 (with the average probability of being offered the option to self-correct), the expected penalty is 78% of arrears, the expected cost per pound of underpaid wages is £1.78, and the expected probability of detection required to incentivize compliance is 56%.

HMRC - No self-correction, prompt payment penalty discount: This scenario assumes the firm will not be offered the option to self-correct, but will pay the penalty promptly, leading to an expected cost of £2 per every £1 of unpaid wages, and an expected probability of detection required to incentivize compliance of 50%.

HMRC - No self-correction, average penalty: This scenario assumes that the firm can expect the average outcome of all firms that are not offered self-correction by HMRC (facing the average probability that it will not be able to pay the penalty within 14 days), leading to an expected penalty of 129% of arrears owed and an expected probability of detection required to incentivize compliance of 44%.

HMRC - No self-correction, full penalty: Finally, this scenario assumes that, for some reason, the firm will be unable to pay promptly so it will have to pay the maximum penalty of 200% of arrears, leading to an expected cost of £3 per £1 of unpaid wages, and an expected probability of detection required to incentivize compliance of 33%.

Employment tribunal, average violator: The evidence above suggests that, in employment tribunals, violators almost never have to pay more than the arrears owed. Firms may, however, have to pay their own legal costs. In the absence of comprehensive evidence on legal costs in employment tribunal minimum wage cases, I apply my estimate from US data, of legal costs as roughly equal to back wages. This makes the expected cost per pound of arrears £2, meaning a firm would have to expect detection with 50% probability to have an incentive to comply with

the minimum wage purely as a result of this enforcement channel – or, if the firm does not incur legal costs, the firm would have to expect detection with certainty.[16]

Table 6: Expected Costs of Violations and Minimum Probability of Detection Required to Incentivize Compliance in the UK: HMRC investigations and employment tribunals

Arrears owed are normalized to 1. Expected penalties, legal costs, and total expected costs are all expressed as a proportion of arrears owed.

HMRC investigation	Arrears	Expected Penalty	Total Expected Cost	Minimum Probability of Detection Required to Comply
Average violator	1	0.78	1.78	56%
No self correction, prompt payment penalty	1	1	2	50%
No self correction, average penalty	1	1.29	2.29	44%
No self correction, late payment penalty	1	2	3	33%
Employment tribunal	**Arrears**	**Expected Legal Costs**	**Total Expected Cost**	**Minimum Probability of Detection Required to Comply**
Average violator	1	1	2	50%

Source: Authors' calculations.

Actual probability of detection

Table 6 illustrates that a typical firm must expect a 44%-56% probability of detection by HMRC, or a 50% probability of a successful employment tribunal case, to have an incentive to comply with the minimum wage. What is the probability of detection firms face in practice?

[16] Unless the minimum wage has been increased since the underpayment occurred – then the firm must pay arrears evaluated at the current minimum wage. Note that this estimate reflects an upper bound of the incentives firms face for a worker-initiated action, since many settle in ACAS conciliation (where the firm would pay, at most, the arrears owed).

In the UK, a firm's violation can be detected either by a targeted HMRC investigation into a high-risk sector or firm, or through a worker-initiated action (either a worker complaint to HMRC or a worker action through ACAS, an employment tribunal, or a county court).

Using the Low Pay Commission's estimates of the prevalence of minimum wage underpayment, I estimate that in April 2018, between 10,960 and 94,490 firms were underpaying the minimum wage.[17] This is almost surely an underestimate for two reasons: first, this comes from an employer survey so it excludes intentional underpayment or the informal economy (Metcalf 2008, Ritchie et al 2017), and second, it covers only one month of the year and some firms may underpay in other months. HMRC identified 1,456 firms underpaying the minimum wage in fiscal year 2018/19.[18] This suggests that a typical violating firm's probability of detection was no greater than 13%, and may have been as low as 1.5% (or a two-year probability of detection – the maximum time period for which arrears can be repaid – of between 3% and 26%). While significantly higher than estimates for the US, likely because of the higher ratio of inspectors to covered workers in the UK,[19] this is still substantially less than the 44%-56% probability required to incentivize compliance.

Unlike in the US, we can estimate the probability of a worker-led enforcement action, since these must start with a call to ACAS before proceeding to an employment tribunal or county court. ACAS received 10,310 calls relating to the minimum wage in 2017/18, of which 4,430

[17] The LPC estimates the number of workers underpaid and the size categories of their employers. The lower (upper) bound is estimated by assuming that for each firm size category, the total number of workers underpaid were employed in the minimum (maximum) number of firms possible.
[18] Obtained from Freedom of Information Request to HMRC, FOI2019/01761. Analysis of *Naming and Shaming* scheme data by Judge and Stansbury (2020) suggests that HMRC targeting focuses on larger firms with large total arrears, but often small arrears per worker (while violations detected in employment tribunals tend to be cases affecting few workers with large arrears per worker). See Appendix Figure A4.
[19] See Appendix B.

specifically referred to non-payment (BEIS 2018). With the Low Pay Commission's estimate that 439,000 workers were underpaid the minimum wage in April 2018, this suggests a probability of, at most, 1%-3% that a worker who is being underpaid will call ACAS.[20] While many of these cases may be settled in conciliation or investigated by HMRC, very few proceed to employment tribunals: in 2018-19, 350 cases were taken to employment tribunal in relation to minimum wage underpayment, suggesting a less than 0.1% chance of an underpaid worker reaching an employment tribunal.

As in the US, it is unsurprising that worker-led enforcement actions are infrequent. Workers may be unaware that their pay is below the legal minimum,[21] unable to prove it if they lack payslip information (Cominetti and Judge 2019), or afraid of retribution by their employer or engagement with the legal system. Moreover, legal support is limited: legal aid is not available (Pyper et al 2017), trade union legal representation (10% of workers in the lowest hourly pay decile are union members (Tomlinson 2019)), and pro bono services are unable to meet demand (Free Representation Unit 2018).

5. Concluding remarks

The evidence in this paper shows that for many firms in the US and the UK, the legal system does not create sufficient incentive to comply with the minimum wage. This conclusion is

[20] As before, the 439,000 figure almost certainly underestimates the number of workers underpaid in a given year: (1) it is an estimate from an employer survey, and (2) it is estimated in a single month.
[21] For similar reasons as listed for the US. In addition in the UK there are several legal minimum wage bands. Firms may fail to raise pay when a worker ages into a new band, or may pay the apprentice minimum wage in incorrect circumstances. Examples of disguised minimum wage underpayment in different industries can be found in Warhurst et al (2008), Rubery et al (2011), Hussein (2011), Ipsos Mori (2012), Pennycook (2013), HMRC (2013), BIS (2014), Gardiner (2015), Clark and Herman (2017), Ritchie et al (2017), Kik et al (2019a, 2019b), and López-Andreu et al (2019).

consistent with a body of research in both the US and the UK which finds very substantial noncompliance.

The US evidence suggests that the penalties levied by DOL investigations, in particular, provide relatively little incentive to comply. This is particularly true for the large majority of violators, who are first-time violators and deemed non-willful. For this group, despite progress in recent years, most violators are still only required to pay back wages owed: liquidated damages are still only levied a third of the time, and there is no eligibility for additional penalties.

Why do these firms comply at all with the FLSA? It is important to emphasize that many do not: estimated rates of underpayment are high across many studies. Galvin (2016), for example, estimated that 17% of low-wage workers (defined as those earning up to 1.5x the minimum wage) experienced a minimum wage violation in 2013, losing, on average 23% of their earnings. Bernhardt et al (2009) found that 68% of surveyed low-paid workers experienced a pay-related violation in a given week.

There are four reasons, however, why firms may comply even where the incentives we estimate here push toward non-compliance. First, note that private actions in the courts, where liquidated damages are the norm and legal costs can be high, likely provide a greater deterrent for many firms than DOL enforcement at current penalty levels. This is likely particularly the case for large firms, against whom large collective action cases may be brought. Moreover, the probability of a worker complaint will be substantially higher than average for large or high-profile firms (since only one worker needs to complain for a violation to be detected, and since these might attract more attention from unions, labor advocates, or investigative journalists).

Second, note that in the US the federal minimum wage is so low that even for many very low-wage firms, the market wage they need to pay to workers is likely as high as or higher than the federal minimum: only 1.3% of hourly-paid US workers were paid at or below the federal minimum wage in 2022 (BLS 2023). Underpayment would likely become substantially more relevant to firms if the federal minimum was raised: for example, a minimum wage of $15 in 2022 would have affected an estimated one third of US workers (Acs et al 2022).

Third, as outlined in section 1, I excluded reputation costs from my analysis in this paper. For some firms, reputation costs are an important business factor. This is particularly true for large firms, or for firms with brand value to maintain (see e.g. Alexander 1999).

Finally, to the extent that many people prefer to obey the law, absent strong business pressures the other way, a non-trivial share of employers may choose anyway to comply with the minimum wage. Further research into individual firms' and employers' compliance decisions – and the role of each of these factors in them – would be highly valuable.

How could compliance incentives be improved? If governments wish to increase incentives to comply, they can act on two margins: increasing average penalties or increasing the probability of detection.[22] The two are inversely related, as illustrated by expression (1): to create an effective deterrent, the expected penalty must increase exponentially as the probability of detection declines (Weil 2014b). With current penalty levels in both the US and UK, most firms would need to expect a probability of detection of more than one in two by the enforcement agencies (DOL or HMRC respectively) to have an incentive to comply with the law. The scale of

[22] A social planner may alternatively choose a high minimum wage with imperfect compliance and enforcement (Basu et al 2010), or tolerate limited underpayment and focus scarce enforcement resources only on deep underpayment (Bhorat et al 2015).

inspection resources required for all potential violators in low-wage labor markets to face a 50% probability of detection would be very costly if not unfeasible: many firms are small, violations are hard for employees to detect, and employees are often reluctant to report. At the same time, with current probabilities of detection for many firms likely in the single digits, penalties would need to be extremely – perhaps punitively – high to create an effective deterrence regime. This suggests that action is needed on both margins if the legal system is to create a financial incentive for firms to comply with the minimum wage.

The probability of detection can be increased both by increasing staff and resources for proactive strategic inspections, (Weil 2014b, Weil 2018, Metcalf 2018), and by making it easier for workers to bring their own challenges by increasing cooperation with worker advocacy organizations and reducing legal costs (Weil 2014b, Gindling et al 2015, Fine 2017). In turn, the expected penalty can be increased in a number of ways. First, reducing the share of firms which only pay back wages: in the US, ensuring liquidated damages are always levied, and in the UK, reducing the share of violations eligible for self-correction. Second, increasing the penalty for typical violators: considering treble damages in the US, as some states do, and reducing the prompt payment discount in the UK. Third, substantially increasing penalties for serious violators: in the US, substantially increasing civil monetary penalties for willful and repeat violations, extending the statute of limitations for willful and/or repeat violations, extending the use of the "hot goods" provision, and increasing the use of criminal prosecutions; in the UK, increasing the scope for penalties in cases of egregious or intentional minimum wage violation, automatically levying penalties in employment tribunal cases, and increasing the use of criminal prosecutions and director disqualifications.

When considering appropriate penalties, it is illustrative to note that in both the US and the UK the penalties firms face for underpaying workers – wage theft – are far smaller than the penalties individuals face for theft of items of equivalent value. For example, in the US, shoplifting goods worth $2,500 or more can lead to felony charges and imprisonment in every state (Traub 2017). In the UK, for theft of property worth between £500 and £10,000 where the offender has 'medium culpability', the Sentencing Council recommends up to 36 weeks' custody. In contrast, in both countries, while minimum wage underpayment can in theory result in criminal prosecution, large fines, and jail time, this almost never happens.

Finally, effective minimum wage enforcement must deal with the increasingly 'fissured' workplace, where workers are increasingly employed by subcontracting firms, staffing agencies, or franchisees, or work as independent contractors (Weil 2014a). These employment structures increase noncompliance with labor and employment laws and make detection more difficult (Ruckelshaus 2008, Weil 2010, Bewley et al 2014).

Ensuring firms have a strong incentive to comply with the minimum wage will only become more important in the context of proposals to raise minimum wages substantially in both the US and the UK. The higher the minimum wage, the larger the number of workers covered and the greater the financial incentive for firms to avoid compliance. In the context of the existing penalty regime, there is a substantial risk that large increases in minimum wages will fail to translate into large increases in take-home pay for many workers, unless penalties and enforcement are systematically strengthened.

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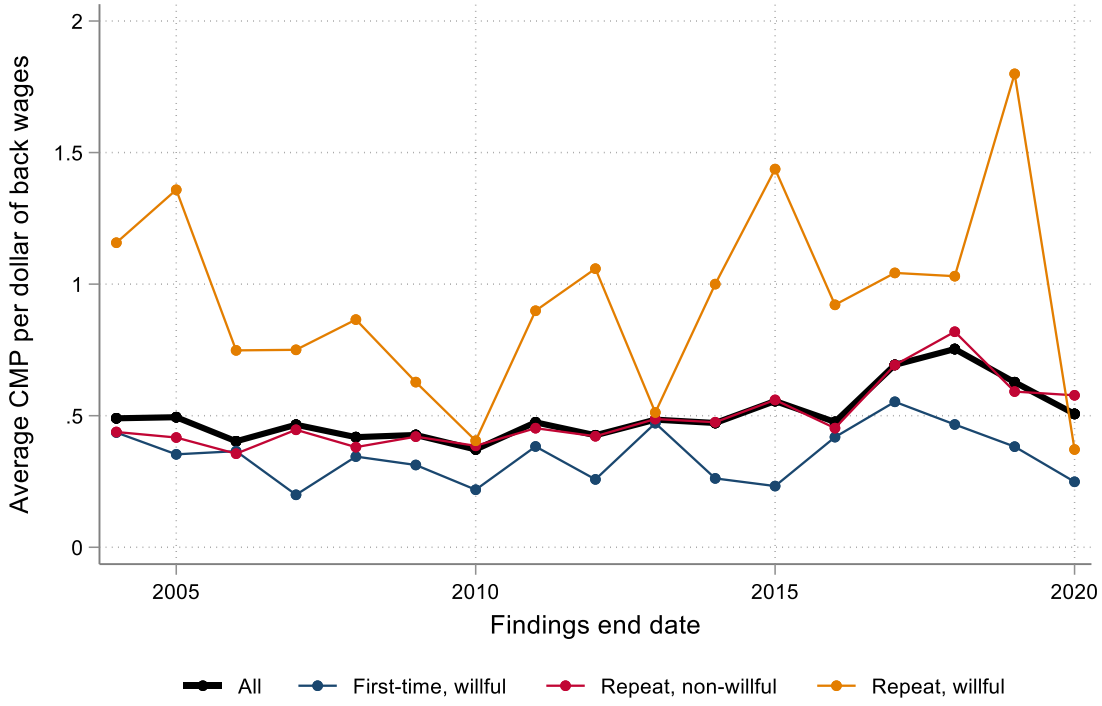
Appendix A: Figures and Tables

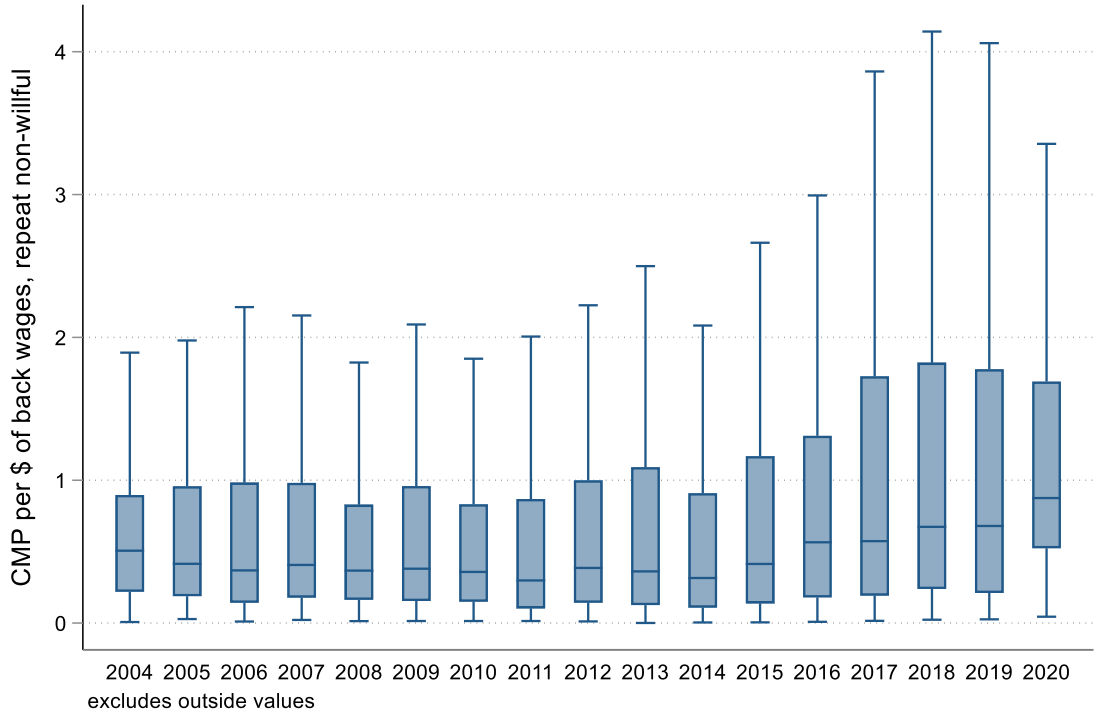
Figure A1: Average civil monetary penalty per dollar of back wages levied in DOL investigations of FLSA wage and hour violations (US)



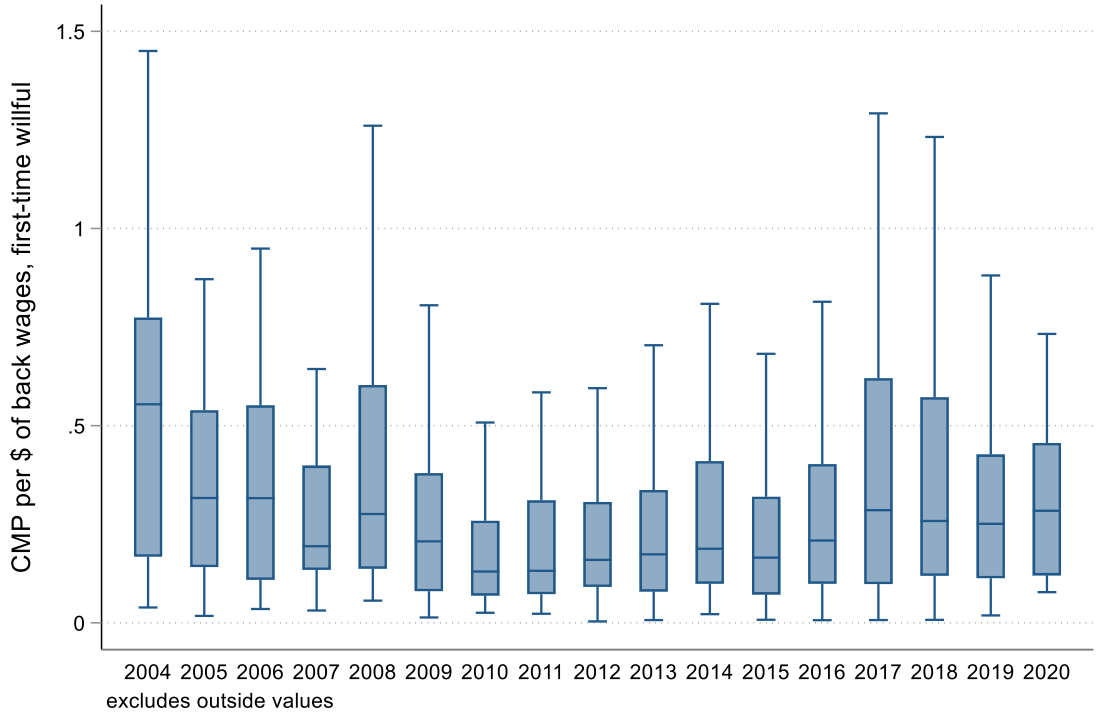
Source: DOL WHISARD database, all concluded WHD actions for FY 2005 - January 2021.
Notes: "Findings end date" refers to the latest date in which the DOL found violations in each investigation, rather than the year in which the investigation was concluded.

Figure A2: Distribution of civil monetary penalty per dollar of back wages levied in DOL investigations of FLSA wage and hour violations (US)

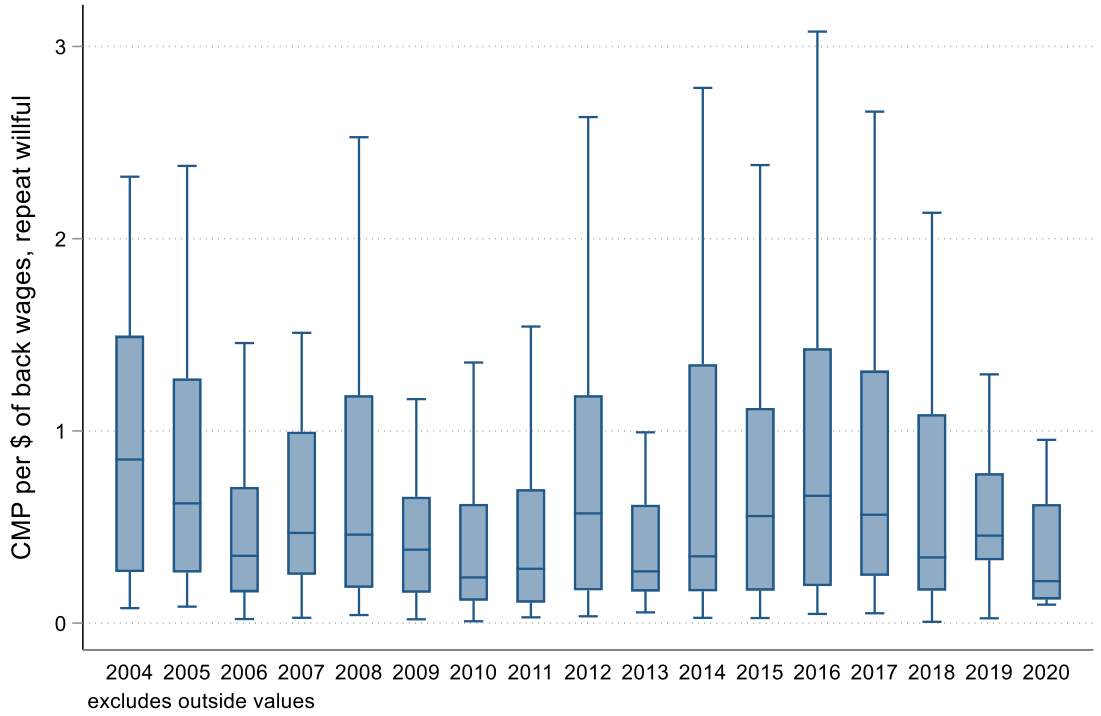
Panel A: Repeat, non-willful



Panel B: First-time, willful

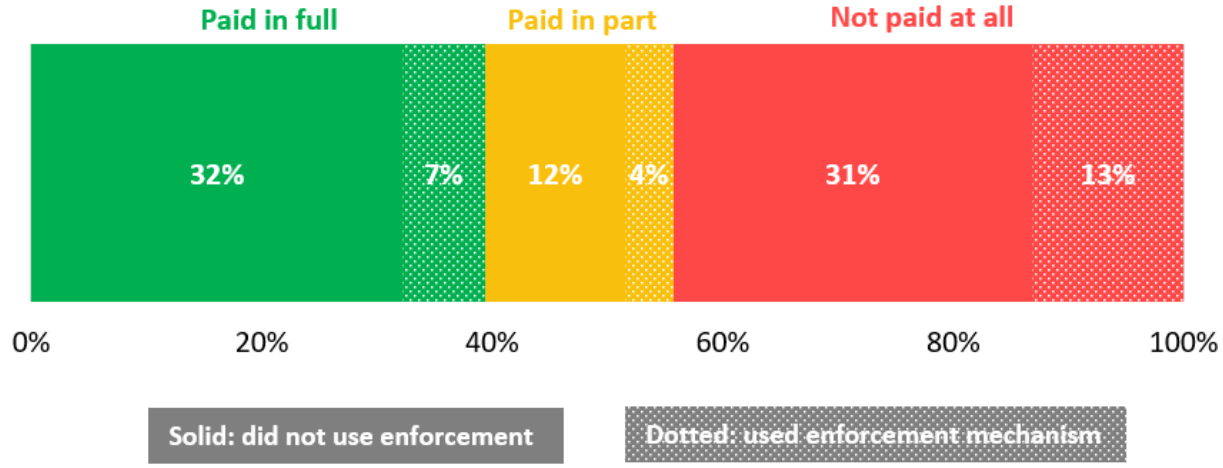


Panel C: Repeat, willful



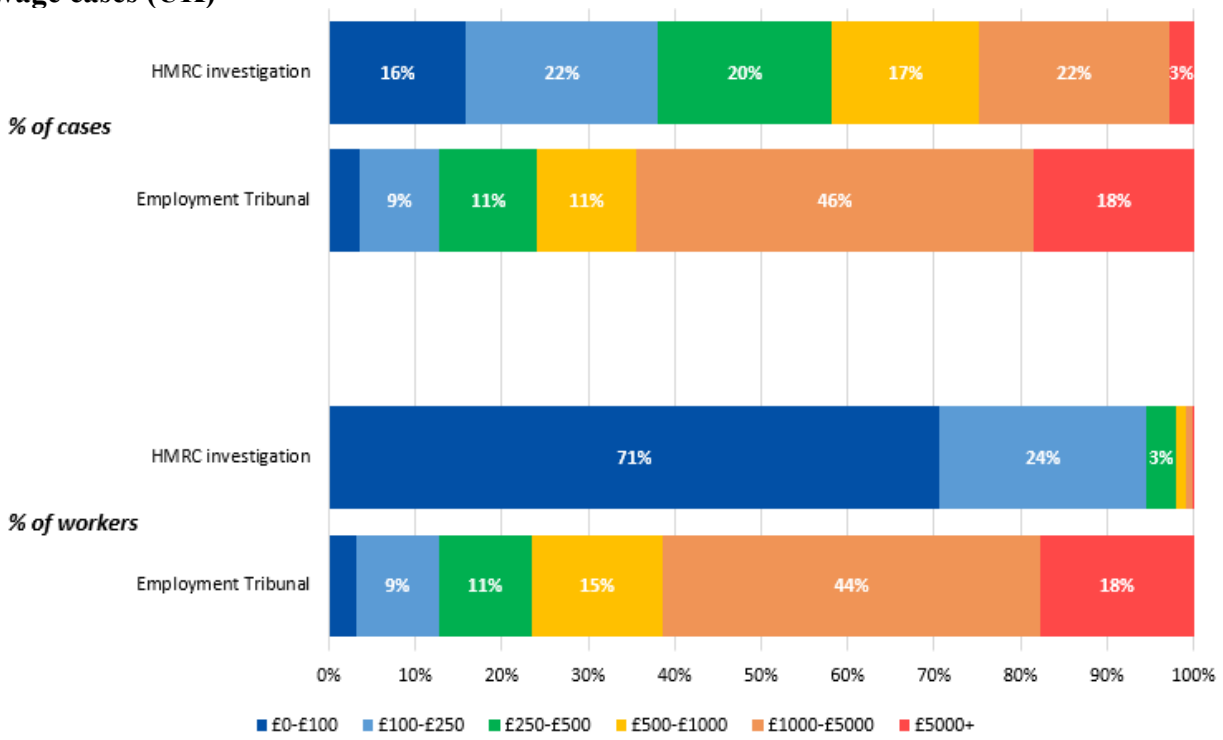
Source: DOL WHISARD database, all concluded WHD actions FY 2005 - January 2021.
Notes: "Findings end date" refers to the latest date in which the DOL found violations in each investigation, rather than the year in which the investigation was concluded. Boxplots exclude outside values.

Figure A3: Payment of employment tribunal awards for unpaid wages (UK)



Source: Author's analysis of data in BIS (2013).
Notes: This figure shows the share of employment tribunal awards for unpaid wages which were paid in full, paid in part, or not paid at all, according to a survey on payment of employment tribunal awards conducted by BIS.

Figure A4: Average arrears per worker in HMRC and Employment Tribunal minimum wage cases (UK)



Source: Author's analysis of publicly available data from BEIS Naming Scheme in 2017 and 2018 (which includes all HMRC-detected minimum wage violations except those offered self-correction) and the Ministry of Justice Employment Tribunal database for February 2017-August 2019.
Notes: This figure shows the average arrears per worker by the percentage of cases and by the percentage of workers in HMRC investigations and in employment tribunal minimum wage cases.

Figure A5: Enforcement channels and possible penalties for UK minimum wage violations

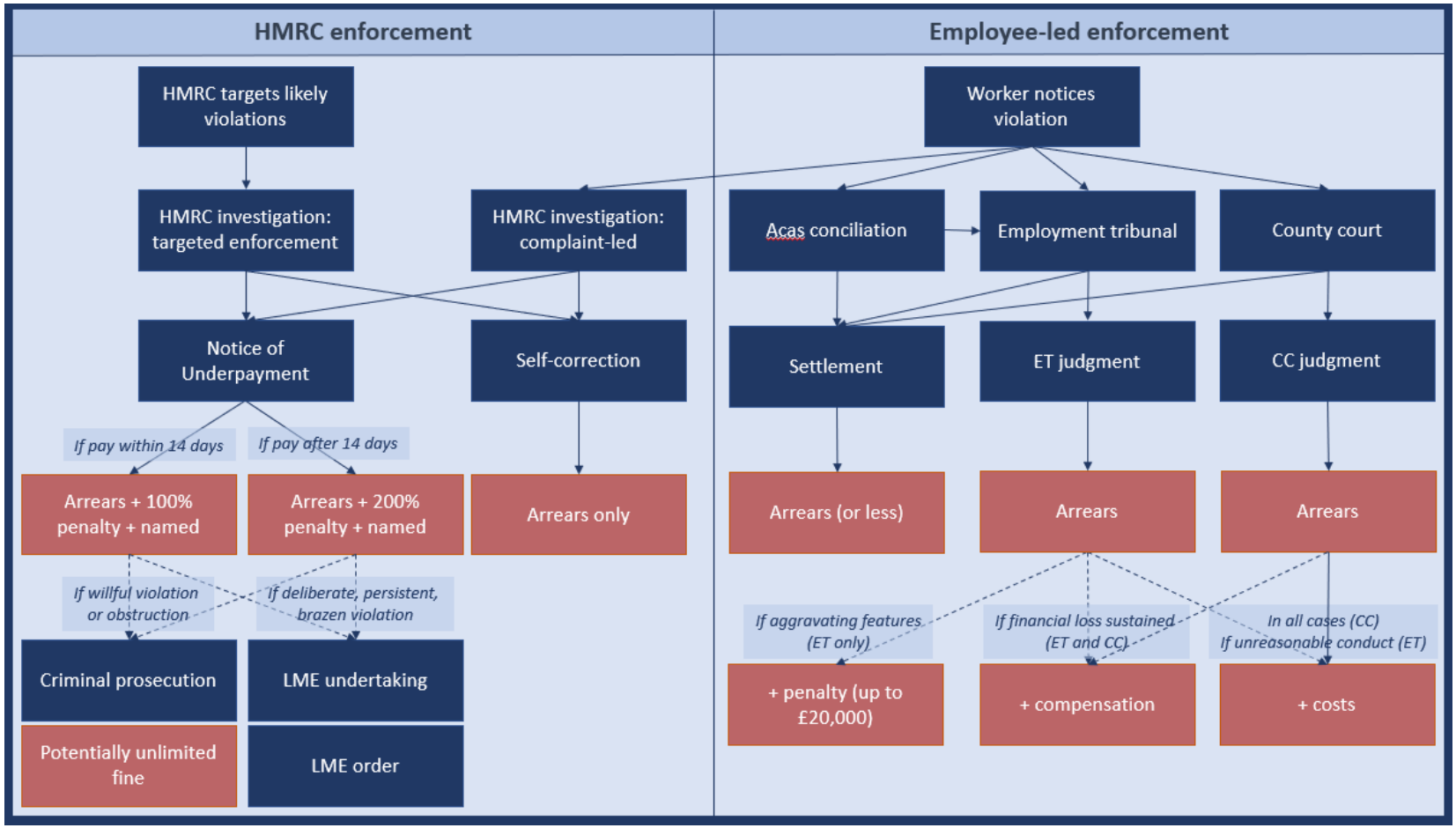


Table A1: HMRC investigations: self-correction (UK)

Fiscal year	Total arrears identified	% of arrears which were self-corrected	Number of firms identified with arrears	% of firms who paid arrears through self-correction
2018/19	£24.4m	41%	1,456	28%
2017/18	£15.6m	38%	1,116	25%
2016/17	£10.9m	55%	1,313	32%
2015/16	£10.3m	45%	1,040	17%

Source: HMRC Government Evidence on Minimum Wage Compliance (for arrears) and Freedom of Information request to HMRC (for number of firms).
Notes: This table shows the share of arrears which were self-corrected and the share of firms who paid arrears through self-correction in HMRC investigations from 2015/16 to 2018/19.

Table A2: Minimum wage cases in the online employment tribunals decision database which feature positive penalty, costs, or compensation relating to minimum wage claims (UK)

Case	No. of workers	Value of unpaid wages	Other awards	Penalty, costs or compensation	Details
Ms J Wang v Wangping Travel Ltd: 4122579/2018	1	£1,806	--	Compensation: £100	The unpaid wage award was for a combination of breaches of National Minimum Wage, holiday pay, and unpaid arrears. Compensation was awarded since the Claimant had to take out credit to cover her expenses while she was being underpaid.
Mr Kieran Pattni v Hitshomes Ltd and Others: 2600130/2018	1	£3,287	£1,802	Compensation: £107	The other award was for breach of contract. Compensation was awarded pursuant to section 24(2) of the Employment Rights Act 1996.
Mr V Atanasui and Mrs M Atanasui v Mr Samir Gad Salama: 2302880/2016 and 2302881/2016	2	£1,453	£758	Costs: £284	The case had two claimants. Amounts listed here are total awards across both claimants. The other awards were for unpaid holiday pay and notice pay. The cost award was for preparation time and expenses.
Mr Elek Bottlik and Ms Melinda Berecz v Gurdial PJ Ltd: 3331452/2018 and 3331453/2018	2	£29,982	£19,545	Costs: £8,000	The case had two claimants. Amounts listed here are total awards across both claimants. The other awards were for compensation for unfair dismissal of both workers. The cost award was £4,000 for each worker.
Don Amarasekara and Ahangama	2	£34,51	£19,762	Penalty: £5,000	The case had two claimants. Amounts listed here are total awards across both claimants. The other awards were basic

Ahangama v Pirathini Elanchcheliyan and Manickam Jasokaran: 1411564/2015					and compensatory awards for unfair dismissal, compensation for wrongful dismissal, unpaid holiday pay, unpaid notice pay, compensation for failure to provide a statement of terms and conditions, compensation for failure to inform and consult under TUPE.
Mr G Warley v Metro Lodgings Ltd: 2501301/2018	1	£1,029	£1,251	Compensation: £308	Compensation was awarded pursuant to section 24(2) of the Employment Rights Act 1996 for various bank charges and overdraft fees incurred as a result of the non-payment of wages. The other award was for the failure to give a written statement of employment particulars.
Miss R Latif v Eminant Childcare Ltd T/a Laugh 'n' Learn: 1301220/2017	1	£1172	--	Compensation: £180	Compensation was for bank charges incurred as a result of the late payment of wages.
Mr A Jones v Sportfact Ltd: 3303557/2018	1	£43	£483	Compensation: £200	Compensation for breach of contract for non-payment of the minimum wage of £200 was awarded. The additional awards were for failure to pay holiday pay, and for breach of contract for unpaid notice pay.
Mrs B Belkadi v Edward Jones Estate Agents and others: 2601614/2018	1	£1,566	£2,229	Compensation: £350	Compensation awarded pursuant to section 24(2) of the Employment Rights Act 1996. Additional awards were for unpaid holiday pay, failure to provide written pay statement, and failure to provide a statement of employment particulars.
Ms D Rose v Paula Deans: S/4117252/2018	1	£269	--	Compensation: £33 Costs: £66	Compensation awarded pursuant to section 24(2) of ERA 1996 for costs incurred from taking photographs and sending recorded delivery letters to proceed with case. Cost order made for 2 hours' preparation time.
Miss AP Read v Aftala Norfolk Ltd T/a Papa John's Pizza and Whitestone Norwich Ltd T/a Papa John's Pizza: 3400414/2017	1	£478	£12,243	Costs: £4,250	Additional awards were for unfavourable treatment as a result of pregnancy and for unpaid holiday pay.
Mr G Jones v Cupio Vehicle Management Ltd: 2401585/2017	1	£3,174	£15,700	Costs: £2,550	Additional awards were for disability discrimination and for unpaid holiday pay.

Source: Author's analysis of the Ministry of Justice Employment Tribunal database.
Notes: This table shows all minimum wage cases in the employment tribunal database (February 2017-August 2019) which lists any penalty, cost award, or compensation relating to minimum wage underpayment. The value of awards are rounded to the nearest pound.

Table A3: Examples of director disqualification after minimum wage arrears (UK)

1	A 2019 case in the High Court, *Antuzis -v- DJ Houghton Catching Services Limited*, found two company directors of a chicken-catching firm in breach of their requirement to "act in good faith so as to promote the success of the company". The case involved numerous egregious breaches of employment law, including minimum wage violations, excessive hours, failure to pay holiday pay, and unsanitary and unacceptable working conditions. (The company had previously had its license revoked as part of a GLA investigation, which called it "the worst gangmaster ever". In 2016, it was found guilty of various counts of labour exploitation in the High Court and agreed to a settlement of over £1 million).
2	Joanne Ward, owner of the nursery *Cygnets to Swans* in Manchester, was disqualified as a company director for 6 years. Her nursery had underpaid 10 staff a total of £11,789. The company went into insolvency without paying the arrears or penalty levied by HMRC. Over the period, Ms. Ward had received personal benefits from the company of £157,601.
3	Kenneth Nnaemeka Ikerunanwa, the sole director of both *Widescope Security Services Limited* and *Atlas Manned Guarding Security Limited,* was disqualified for 9 years after an insolvency service investigation found he paid employees at below the national minimum wage and submitted a series of under-declared VAT returns to HM Revenue & Customs.
4	Shakil Ahmed, director of *Euro Contracts Services Limited*, was disqualified for 7 years after repeatedly failing to pay workers the minimum wage. An HMRC investigation in 2009 found wage arrears of £65,000. These were repaid, but a second HMRC investigation in 2010-11 found wage arrears of more than £110,000. The money owed was still unpaid by the time the company entered liquidation in 2016.

Source: Internet searches of UK government website (gov.uk) and media records. Sources for individual disqualifications are: https://www.lexology.com/library/detail.aspx?g=5f83ead8-e27a-4649-bdd3-7dda6d22ee50, https://www.gov.uk/government/news/failure-to-pay-the-minimum-wage-sees-manchester-nursery-owner-banned-for-six-years, https://www.gov.uk/government/news/security-company-director-given-9-year-ban-for-exploiting-workers, https://www.gov.uk/government/news/director-banned-after-failing-to-pay-minimum-wage-to-farm-labourers.

Notes: This table shows four examples of director disqualifications after minimum wage arrears. These are the only examples the authors could find after an extensive internet search in August 2019.

Appendix B: Data and calculations

Details on some of the data sources and calculations in this paper are below.

DOL WHISARD data: The DOL WHISARD data used to analyze penalties and costs incurred by firms in wage and hour cases was constructed from two sources.

First, from the publicly-available US DOL WHD WHISARD database (available at: https://enforcedata.dol.gov/views/data_catalogs.php), downloaded in September 2023 and using the version last updated by the DOL on July 10th 2023. These publicly available data contain information for each case on back wages agreed to pay, civil monetary penalties assessed, and whether the case was repeat/willful.

Second, I matched this data with the restricted-access WHISARD data obtained from the DOL through a FOIA request, receiving the data in September 2023. The restricted-access data contains back wages assessed and liquidated damages assessed, as well as the use of the hot goods provision.

I restrict all analysis using the DOL WHISARD data to cases in the fifty US states and DC.

UK Freedom of Information requests: The outcomes of all Freedom of Information requests made as a part of the UK research for this project can be found at WhatDoTheyKnow.com under user profile "amstansbury": https://www.whatdotheyknow.com/user/amstansbury

DOL WHD Field Operations Handbook: The (partly redacted) DOL WHD Field Operations Handbook was obtained by a third-party FOIA request in 2017 (unrelated to this author or this paper), and can be found at the website governmentattic.org under FOIA number 836790 (https://www.governmentattic.org/27docs/DOL-WHD-FOH_2016.pdf).

UK Employment Tribunal Database: I carried out a manual analysis of the UK's employment tribunal database to identify minimum wage cases as detailed in section 3 of the paper. The full employment tribunal database is searchable at: https://www.gov.uk/employment-tribunal-decisions. The database of the 141 minimum wage cases I identified over February 2017 to August 2019 is downloadable from my website annastansbury.com.

Westlaw FLSA case analysis: We analyzed a random sample of Westlaw FLSA cases to estimate attorney fee awards. The sampling methodology using Westlaw was as follows: Split the period 1 Jan 2005 to 31 Dec 2020 into four equal-length blocks and draw four dates at random from each block. Search for all cases in the 5-day period after each date drawn, which contained both "minimum wage" and "Fair Labor Standards Act", alongside one of either "attorney('s/s') fees/costs" and "legal fees/costs". Use the case history for each case to identify the settlement amount and any attorney's fee or cost award. This sampling methodology broadly follows the methodology to determine average attorney's fees in FLSA cases used by the Department of Labor (2016).

Estimate of inspectors to covered workers for US and UK: The ratio of federal wage and hour investigators to covered workers under FLSA minimum wage or overtime provisions, in 2018, was estimated at around 1:175,000 by Hamaji et al (2019). As of March 2019 HMRC had 442 minimum wage compliance officers (BEIS 2020), and there were around 1.975 million covered workers (Low Pay Commission 2020), suggesting a ratio of compliance officers to covered workers of 1:4,468. Funding for HMRC's minimum wage enforcement activities more than quadrupled and the number of compliance officers nearly tripled over the period from 2013/14 to 2018/19 (BIS 2014b, Metcalf 2019, BEIS 2020).

Appendix C: Conceptual framework

Following Chang and Ehrlich (1985), I lay out a brief conceptual framework below. This illustrates that under broad assumptions, the incentive for a firm to comply with the minimum wage is determined by the product of (i) the probability of detection and (ii) the expected penalty (as a proportion of the wages owed).

Setup. Firms produce a homogeneous good with labor *L*. Firm output *Y = F(L)*. Firms are wage- and price-takers, facing wage *w* and output price *p* (with *p* normalized to 1). The firm chooses labor *L* to maximize profits π. Minimum wage *M* is imposed where *M>w*. Non-payment of the minimum wage is detected with probability λ. If detected, the non-compliant firm must pay a penalty which is formulated as a multiple *k>1* of the wages owed, such that the total penalty *P=k(M-w)L*.

Firm optimization. The firm chooses whether or not to comply with the minimum wage. If the firm complies with the minimum wage, its profit maximization problem is: $\max_L \pi = F(L) - ML$, with associated first order condition $F_L(L) = M$. If the firm does not comply with the minimum wage, it pays market wage *w* and its profit maximization problem is: $\max_L E(\pi) = F(L) - E(\omega)L$, with associated first order condition $F_L(L) = E(\omega)$, where $E(\omega) = w + \lambda k(M - w)$ is the expected cost per unit of labor, including both the subminimum wage paid *w*, and the expected penalty $\lambda k(M - w)$. Optimized profits $\pi^*(w)$ are therefore a function of the minimum wage *M* in the former case and of the expected labor cost $E(\omega)$ in the latter case.

Compliance decision. The risk-neutral firm which only cares about expected profit has an incentive to comply only if $\pi^*(M) > \pi^*\big(E(\omega)\big)$. Since profit is decreasing in the wage, the risk-neutral firm will therefore comply only if the expected labor cost in the case of non-compliance

exceeds the minimum wage, $E(\omega) > M$. This requires that the product of the probability of detection and the penalty ratio exceeds one: $\lambda k > 1$.

Minimum probability of detection required to incentivize compliance. Data on penalties relative to back wages (k) can be gathered, but estimates of the probability of detection λ are intrinsically highly uncertain, as they require an estimate of the degree of non-compliance. I therefore reframe the question: what is the minimum probability of detection firms must expect to incentivize compliance with the minimum wage? (And how does this compare to realistic estimates of the actual probability of detection?). Using the formula in the previous paragraph, the minimum probability of detection required to incentivize compliance, λ^*, is the reciprocal of the expected penalty per dollar of unpaid wages:

$$\lambda^* \geq \frac{1}{k} \qquad (1)$$

Minimum wage spillovers. The framework above assumes that there are no within-firm spillovers. If firms wish to preserve the spread of wages across employees, an increase in the minimum wage for its lowest paid workers might necessitate increases in wages further up the wage distribution as well.[23] Gopalan, Hamilton, Kalda, and Sovich (2021) estimate that spillovers to higher-wage workers within an establishment represent about 20% of all labor cost increases after a minimum wage increase. This can be used as a back-of-the envelope benchmark as to how minimum wage spillovers might affect a firm's decision to comply: the expected

[23] There is substantial evidence of minimum wage spillovers, including Autor, Manning, and Smith (2016), Cengiz, Dube, Lindner, and Zipperer (2019) and Fortin, Lemieux, and Lloyd (2021). Gopalan et al (2021) and Forsythe (2022) provide evidence specifically of within-establishment minimum wage spillovers.

benefit of avoiding the minimum wage is now 25% larger, so the minimum probability required to incentivize compliance is now $\lambda^* \geq 1.25\frac{1}{k}$.

Efficiency wages. The framework above also assumes that there are no beneficial effects to the firm of paying a higher wage. In practice, a $1 wage increase may cost the firm less than $1 if efficiency wage effects are present, either because workers are more productive when wages are higher or because turnover costs are lower (Akerlof and Yellen 1986; see also Bassier, Dube, and Naidu 2019, Manning 2021, Emanuel and Harrington 2021). The stronger efficiency wage effects are, the smaller the probability of detection and/or the penalty ratio need to be to incentivize compliance with the minimum wage. This can be seen if firm output depends on effort: $Y = (e(\omega)L)^{\alpha}$, where $e(\omega)$ is each worker's effort as a function of wage ω and where α<1. The first order conditions become for the compliant firm $\alpha(e(M))^{\alpha}L^{\alpha-1} = M$, and become $\alpha(e(w))^{\alpha}L^{\alpha-1} = E(\omega)$ for the non-compliant firm. For the firm to have an incentive to comply, the expected profit from compliance must exceed the expected profit from non-compliance, which requires $\lambda k > \frac{\rho M - w}{M - w}$, where $\rho = \frac{e(w)}{e(M)}$, the ratio of effort at the market wage to effort at the minimum wage.

Risk aversion. The analysis in the paper assumes firms are risk-neutral. If firms or managers are risk-averse, the probabilities of detection required to incentivize compliance will be lower than those estimated in the paper. Here, I undertake some sensitivity exercises with reasonable estimates for firms' degree of risk aversion.

Assume that a firm has constant relative risk aversion (CRRA) utility over profits (see e.g. Chiappori and Paiella 2011 for empirical support for CRRA utility). Under the simplest assumption that the firm's total production and employment will be the same whether or not it

complies with the minimum wage, the firm will comply if $\frac{(\pi(1-x))^{1-\gamma}}{1-\gamma} > (1-\lambda)\frac{\pi^{1-\gamma}}{1-\gamma} + \lambda\frac{(\pi(1-kx))^{1-\gamma}}{1-\gamma}$, where π is the firm's profit if it underpays the minimum wage, x is the wages underpaid by the firm expressed as a % of profits π, λ is the probability of detection, k is the penalty ratio if detected (penalty as a share of wages owed), and γ is the coefficient of relative risk aversion.

Rearranging this and under the assumption that $\gamma > 1$, we have that the firm has an incentive to comply if

$$\lambda > \frac{(1-x)^{1-\gamma} - 1}{(1-kx)^{1-\gamma} - 1} \qquad (2).$$

In the case where $\gamma = 0$ this collapses to the condition for the risk-neutral firm, which has an incentive to comply if $\lambda k > 1$. The greater the firm's risk aversion, the greater the incentive to comply for any given penalty ratio k or probability of detection λ. Note also that large underpayments (as a share of total profits) are more disincentivized than small underpayments, since the loss in the scenario where the firm is detected is greater as a total share of profits/wealth.

What is the appropriate degree of risk aversion to assume? For firms with a diversified investor base, managers acting in the interests of maximizing expected utility of their shareholders should behave as if they are risk neutral except in cases where there is risk of financial distress. Managers with wealth concentrated in firm equity, or with career concerns, may however manage the firm in a more risk averse fashion (see e.g. Berkman and Bradbury 1996, Holmstrom and Ricard i Costa 1986). Brenner (2015) estimates coefficients of relative risk aversion for 7,000 senior executives of US companies from option exercise decisions. He

estimates a median coefficient of relative risk aversion of 1 and a mean of 3 across these executives; note that this represents these executives' risk aversion over their own personal wealth, and not over the profits of the company they manage, and so seems likely to be an upper bound of the true degree of risk aversion displayed by managers in decisions about firm operations (since most individuals' wealth is diversified across multiple firms and across other asset classes as outlined above). In a survey of CEO and CFO attitudes, Graham, Harvey, and Puri (2013) estimate that less than 10% of US CEOs or CFOs have a coefficient of relative risk aversion greater than 3.76 (their threshold for "very risk averse").

Based on this review of empirical research, I carry out a sensitivity exercise below which estimates compliance incentives under coefficients of relative risk aversion between 0 and 3. Specifically, Table C1 illustrates the probability of detection λ required to incentivize compliance, calculated using expression (2) above as a function of different penalty ratios k, and under different assumptions about (i) the firm coefficient of relative risk aversion, γ, and (ii) the intended minimum wage underpayment as a share of total profits, x. Specifically, I illustrate the probability of detection required to incentivize compliance at penalty ratios between 1 and 4 times the initial back wages owed (the most relevant empirical range based on calculations in sections 2 and 3), at coefficients of relative risk aversion of 0, 1, 2, and 3, and with minimum wage underpayment as a share of total profits at 5%, 10%, and 20%.

Table C1: Probability of detection required to incentivize compliance, λ, as a function of penalty ratio k, coefficient of relative risk aversion γ, and minimum wage underpayment as share of profits x.

		Penalty ratio k (total penalty incurred / minimum wages underpaid)			
		1	**2**	**3**	**4**
Coefficient of relative risk aversion	*Panel A: Minimum wage underpayment as share of profits x = 5%*				
	0	1	0.50	0.33	0.25
	1	1	0.49	0.32	0.23
	2	1	0.47	0.30	0.21
	3	1	0.46	0.28	0.19
	Panel B: Minimum wage underpayment as share of profits x = 10%				
	0	1	0.50	0.33	0.25
	1	1	0.49	0.32	0.23
	2	1	0.47	0.30	0.21
	3	1	0.46	0.28	0.19
	Panel C: Minimum wage underpayment as share of profits x = 20%				
	0	1	0.50	0.33	0.25
	1	1	0.44	0.24	0.14
	2	1	0.38	0.17	0.06
	3	1	0.32	0.11	0.02

Source: Authors' calculations

This exercise illustrates that at current penalty levels, even relatively high degrees of risk aversion do not substantially alter the calculus in this paper. For example, if the minimum wage underpayment as a share of profits is 5%, a relatively small share of total wealth, the probability of detection required to incentivize compliance with a penalty ratio of 2 is 50% for someone who is risk neutral and 46% for someone with a high degree of risk aversion (γ =3). Even if the minimum wage underpayment as a share of profits is 20%, a relatively large share of total wealth, the probability of detection required to incentivize compliance with a penalty ratio of 2 falls only a little, to 32%, for someone with a high degree of risk aversion (γ =3). Note that this exercise also illustrates the dependence between two factors: the penalty ratio and risk aversion. The larger the penalty ratio, the more difference managerial risk aversion makes for the incentive to comply.

Appendix D: Additional institutional details

This section contains further institutional details on the minimum wage enforcement system in the US and the UK.

US

There are two primary mechanisms to enforce the FLSA: DOL enforcement actions, or employees taking employers to court. As detailed in the body of the paper, penalties depend in part on the enforcement channel. If found to have underpaid an employee, an employer must always pay the back wages owed. The employer may also be required to pay up to an additional equal amount in liquidated damages. In court, the employer may be required to pay legal costs. In a DOL investigation, willful or repeat violators may incur further costs: civil monetary penalties of up to $2,014 per violation,[24] an embargo of goods which have been manufactured in violation of the FLSA (the "hot goods provision"), or, for willful violators, criminal prosecution (which can result in a fine of up to $10,000 and/or imprisonment for up to six months). Relevant further details follow.

Statute of limitations: The statute of limitations is two years, except for willful violations (three) or criminal prosecutions (five).

Definition of willful violations: McLaughlin v. Richland Shoe Co. (1988) defines willful as when "the employer either knew or showed reckless disregard for the matter of whether its conduct was prohibited by the statute", and excludes violations based on "nothing more than

[24] A violation can be defined per person per week of wages owed. The FLSA stipulates that the penalty should take into account size of business and gravity of violation.

negligence, or, perhaps, on a completely good-faith but incorrect assumption". The DOL expanded its guidance in 2016 to include cases where the party "knew that its conduct was prohibited by any of the Labor Laws or showed reckless disregard for, or acted with plain indifference to, whether its conduct was prohibited by one or more requirements of the Labor Laws".

Assessment of liquidated damages: Guidance suggests liquidated damages are to be levied by the DOL unless the employer can show that the violation was in good faith and that there were reasonable grounds for believing they were not violating the minimum wage (1947 Portal-to-Portal Act; DOL WHD Field Operations Handbook). DOL policy on seeking liquidated damages has changed in recent years: DOL policy is now to seek liquidated damages even in non-litigation settlements of FLSA cases, unless the employer mounts a good faith defense and/or the Regional Solicitor deems the matter inappropriate for litigation (Weil 2018, DOL Field Assistance Bulletin 2021-2). Liquidated damages were very rarely assessed by the DOL in the past. For example, Weil (2010) estimates that for cases concluded between 2003 to 2008, *"less than one half of one percent of cases had liquidated damages computed by investigators and zero cases had liquidated damages assessed",* and Bobo (2011) writes that *"I had never heard of workers getting liquidated damages when they filed complaints with the Department of Labor"*.

Assessment of civil monetary penalties: According to the DOL WHD Field Operations Handbook Section 52f15, "CMPs must not be assessed in an amount related to the amount of back wages. We do not want to leave an impression that CMPs are anything like liquidated damages." This suggests that CMPs are not related to the severity of the offense in terms of the

amount of wages underpaid. Unfortunately, most of the other sections of the Handbook which discuss the criteria for assessing CMPs are redacted in the public version.

Use of hot goods violation: Under section 15(a) of the FLSA, often called the "hot goods" provision, the DOL is able to embargo goods which have been manufactured in violation of the act. The DOL WHD Field Operations Handbook recommends considering these factors when determining whether a hot goods action is appropriate: (1) history of prior violations, (2) employers who may be unable to pay back wages, (3) concealment or falsification of records, (4) temporary or transient workers, and (5) systemic violations. Prior to the Obama administration, the hot goods provision was primarily used in the garment industry. Under Weil's tenure as Administrator of the DOL Wage and Hour Division the DOL substantially increased their usage of this provision in the garment industry, as well as using it in agriculture (Weil 2018).

Referral for criminal prosecution: According to the 2018 version of the DOL WHD Field Operations Handbook, "It is the WHD's policy to treat all inexcusable or willful violations of the FLSA … as criminal or potential blacklist" (Section 81b01). An investigation for criminal prosecution will not be accepted "unless the evidence is such that there is a reasonable probability that a conviction will be obtained".. Note that we focus here on federal prosecutions; state-level prosecutions also occur (see e.g. National Employment Law Project 2013).

Calculation of attorney fee awards: Attorney fee awards are typically calculated either by a percent-of-settlement method, by the lodestar method, or by judicial discretion (Fitzpatrick 2010; Eisenberg et al 2017). The percent-of-settlement method takes a fixed percentage of the settlement award for attorney fees. The lodestar method uses a reasonable estimate of attorney hours expended and an hourly rate, then makes certain adjustments up or down based on factors in the case.

UK

Violations are enforced either by an investigation by HM Revenue & Customs ("HMRC") or by a worker bringing an action to the Advisory, Conciliation, and Arbitration Service's (ACAS') early conciliation system, an employment tribunal, or more rarely a county court (ACAS 2018). ACAS conciliation is the mandatory first step for a worker-initiated action, unless the worker explicitly opts out. Further details follow, and the UK enforcement channels are visualized in Appendix Figure A5.

Statute of limitations in employment tribunals: Employment Tribunal claims must be brought within 3 months of the most recent underpayment (although the clock is stopped during ACAS conciliation), and the maximum period for which unpaid wages can be claimed is two years.

County court: Alongside the option to bring a claim in an employment tribunal, workers can bring actions for unpaid wages in a county court. This is used less frequently than employment tribunals. If an employer is convicted in a county court, there is no scope for awarding financial penalties for aggravating features. Moreover, on the small claims track (for claims worth less than £10,000, which would apply to most individual minimum wage claims) the court may not typically order costs, fees, or expenses. Thus, the violating employer would likely have to pay only the unpaid wages owed.

Referral for criminal prosecution: Specifically, HMRC can refer the "small minority of employers that are persistently non-compliant and/or refuse to cooperate with a NMW Officer" for criminal prosecution, which can lead to a potentially unlimited fine and possibly criminal

liability for company officers. Company officers can be held liable if the offence was committed with their consent or connivance, or was attributable to their neglect (HMRC 2016).

Labour Market Enforcement undertakings and orders: Since 2016, serious or persistent violators may be subject to a Labour Market Enforcement (LME) undertaking or order designed to implement measures "necessary to prevent further non-compliance". Refusal to comply is a criminal offence. The intent of these LME orders is to increase compliance, not to deter violations, according to the Home Office/BEIS code of practice. They do not impose penalties on firms. We therefore do not consider them explicitly in our calculations.

Employment tribunal – condition for "aggravating features": Aggravating features may be found in cases where: "it was shown that the employer had deliberately breached the law or were motivated by malice in behaving as they did".

Employment tribunal – condition for cost orders: A cost order may be made if one party has exhibited "vexatious, abusive, disruptive, or otherwise unreasonable" conduct, has brought a case with no reasonable prospect of success, or has breached an order of practice (BEIS 2019).

Use of aggravating features in employment tribunals: The single minimum wage case in the online employment tribunal database over Feb 2017-August 2019 with a penalty for 'aggravating features' involved a minimum wage underpayment of £34,516.15 for two workers, alongside unfair and wrongful dismissal and failure to pay holiday and notice pay (ET cases 1411564/2015 and 1411565/2015). Penalties for "aggravating features" are rare across the board in all employment cases, not just for minimum wage cases: from January 2016-September 2019, penalties were levied in only 28 of more than 55,000 employment tribunal cases which found in favor of the worker, and the average penalty per firm (£3,137) was substantially smaller than the

maximum of £20,000 (Ministry of Justice Employment Tribunal Statistics, Freedom of Information request FOI2019/17430).

Note: See also Judge and Stansbury (2020) for more institutional details about the UK minimum wage enforcement system.

Appendix – Additional References

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