Play Hard, Shirk Hard? The Effect of Bar Hours Regulation on Absence and Health

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Abstract

How government taxation and transfer policy influence labour supply behaviour is well understood. Governments also regulate the timing and extent of leisure activity which may also influence labour-leisure decisions. Legislative changes in bar opening hours provide a potential quasi-natural experiment of the effect of government regulation on working effort. This paper examines two recent policy changes, one in England/Wales and one in Spain that increased and decreased opening hours, respectively. A robust positive causal link between opening hours and absence is demonstrated. Further evidence is provided that longer opening hours cause poorer health outcomes, particularly amongst regular bar attendees.

KEY WORDS: Labour Supply, Absenteeism, Drinking Laws
JEL Classification: J22, K32, D04

[*] The authors would like to thank Steve Bradley, Mirko Draca, John Heywood, Gareth Leeves, Ian Walker, Anwen Zhang and seminar participants at the University of Wisconsin-Milwaukee for helpful comments. María Navarro gratefully acknowledges financial support from the Spanish CYCIT Research Project ECO2008-06395-C05-03/ECON. Colin Green, Economics Department, Lancaster University, Lancaster, LA1 4YX, UK. e-mail: c.p.green@lancaster.ac.uk. Maria Navarro, Economics Department, Lancaster University, Lancaster LA14YX UK, e-mail: m.navarropaniagua@lancaster.ac.uk.

The data was provided by the U.K. Data Archive. The data are available on request, subject to registering with the Data Archive. The usual disclaimer applies.

I. INTRODUCTION

How taxation and transfer payments influence individual labour supply behaviour is well understood. There is, for instance, a large body of research on the incentive effects of taxation and how hours of work are affected by taxes and transfers (see for instance Burtless and Hausman, 1978; Blundell, Meghir, Symons and Walker, 1988; Heckman, 1993; Blundell, Duncan and Meghir, 1998).[1] In turn, how governments influence leisure decisions is typically thought of through the lens of income and substitution effects. However, governments commonly intervene and regulate leisure activity directly. The reasons for and the forms of regulation are numerous. These include prohibition and restriction of the use of recreational substances, but also restrictions on the timing of the consumption of a range of leisure activities. These timing based interventions are typically justified on the basis of reducing negative externalities from leisure behaviour. For instance, restrictions in opening hours for live music venues (noise pollution), restrictions in the timing of night time sports in urban areas (light pollution) and restrictions on the opening hours of licensed venues. These interventions have the potential to markedly influence workersô leisure-labour decisions, but this has received little attention to date. Individual labour supply behaviour could be influenced by leisure regulation if, for instance, it affects the timing proximity of leisure consumption and working hours. In addition, in the case where it involves intoxicating substances, like alcohol, the timing of consumption could have spill-over effects into working hours.

This paper investigates this issue by examining how the regulation of licensed hours at establishments that serve alcohol influences working hours, focusing primarily on worker absenteeism. Carpenter and Dobkin (2011) have previously suggested that alcohol legislation in the form of minimum drinking ages can influence workforce productivity. We use recent changes in legal pub and club (herein bars for simplicity) opening hours in the UK and Spain to identify the effect on absence, which provides a proxy for effort (Audas et al, 2004). These two legislative changes provide a nice point of comparison, as one involves a substantial liberalisation of opening hours (the UK) while the other involves a similarly substantial decrease in opening hours (Spain). These changes have the potential to affect working behaviour due to the proximity of leisure activity to normal working hours, but also through

[1] Examples of empirical evidence in different countries include Blomquist et al., 1990 (Sweden), Blundell et al., 1992 (UK), Bourguignon et al., 1990 (France) and Triest, 1990 (US).

the timing of the consumption of alcohol. It is difficult to definitively disentangle these two channels of influence. However, we provide evidence on transmission channels by further examining the causal effect of these legislative changes on individual health outcomes which may be indicative of the role of variations in alcohol consumption.

To summarise our results, we demonstrate a causal link between bar opening hours and worker absenteeism, longer opening hours increase absence. We do this by taking advantage of a `quasi-naturalô experiment that entails a liberalisation of drinking licensing hours in the UK and a contraction in Spain. These results are symmetric for Spain and the UK; decreasing opening hours (Spain) reduces absenteeism, increasing opening hours (UK) increases absenteeism. These results are robust across a range of specification and differing identification strategies within both countries. For instance, whilst we can identify the causal effect using difference in difference approaches, we also identify the policy effect within a panel fixed effects strategy for the UK, and demonstrate the robustness of our results to other common sources of bias in the estimates derived from applying a difference-in-difference methodology. In particular, both the fixed effects approach and the multiple country nature of our study reduces the concern that our policy effect is being driven by common unobserved random shocks. We demonstrate that the policy effect is concentrated among young workers and in the UK amongst women in particular. This policy effect may reflect the impact of the removal of constraints on the proximity of leisure timing to work timing and/or the effect of alcohol consumption on labour supply. In further estimates we provide evidence of a causal effect of drinking laws on individual health outcomes, and weak evidence of an expenditure increase on alcohol at bars. This is suggestive that the main channel of the absence effect we have identified is through alcohol consumption.

II. DATA AND INSTITUTIONAL BACKGROUND

Changes in Drinking Laws, Spain and the UK

The identification strategy in this paper is based on two legislative changes; a reduction in the permitted hours that bars could remain open in Spain and an extension of legal closing hours in two parts of the UK, England and Wales. In the Spanish case, this reduction in opening hours consisted of a requirement that licensed venues, such as bars, were legally required to close at 3:00 am (with some minor variation noted below). Prior to

the legislative change the legal closing time was 6 am. This legislation was enacted at different times regionally across Spain, and varied in terms of the actual new time of closing ranging from 2:00 am to 3:30 am.[2] Specifics of the actual legislative changes are reported in Table 1. Column 2 of Table 1 shows the quarter and year the reform came into force in Spain in each of the regions (reported in column 1).

For England and Wales, prior to the legislative change licensed premises were not allowed to stay open (and serve alcohol) after 11:00 pm. Following the Licensing Act of 2003, licensed venues could apply to remain open for longer up to a maximum of 5:00 am. This came into effect in all of England and Wales as of the 24th of November 2005, as at 1st April 2006 (the first available official statistics) some 50114 venues had been granted these licenses**.** By 2010 this had increased to 78879 venues. Hence the main expansion occurred in the initial time period that the legislation was enacted. It is worth noting that the stated reasons for these two legislative changes were markedly different. In Spain, it primarily reflected concerns over noise pollution and general disruption to residents near licensed venues. While in the UK, it reflected a view that the prior regime of 11pm closing was needlessly restrictive and that shorter opening hours may encourage binge drinking insofar as individuals would increase the speed of alcohol consumption.

INSERT TABLE 1

When comparing the effects of these types of legislative changes such as England, Wales and Spain one must be aware of the substantial cross-country differences in culture and habits related to alcohol consumption and the attendance of licensed venues. While both have the same legal age of drinking, 18 years, the difference in the culture related to drinking in the UK and southern European countries such as Spain are well-known. The UK has long recognised problems with excessive and binge alcohol consumption. For instance MacDonald and Shields (2004) report problem drinking rates for males in the UK of around 20%, and that 10% of the male population aged 22-64 drank at least 45 units of alcohol per week.[3]

[2] The differential timing of the reform in Spain reflects the devolution of certain legislative powers to regional levels. In the case of public entertainment and recreation policy, devolution was completed by 1996. This meant that whilst the key legislative change in opening hours was mandated at a federal level, some regional autonomy in the timing of the adoption and actual closing times was permitted. We investigate the potential for bias of our results from non-random timing of adoption later.

[3] Where a unit of alcohol is defined as 10 millilitres in the UK, which is 0.564 of a US standard unit of alcohol (17.7 millilitres). While a Spanish unit of alcohol is 12.7 millilitres.

Alcohol consumption in Spain is common, Gual (2006) reports that approximately 60% of male and 35% of females drink alcohol weekly. However, excessive and binge drinking has traditionally been uncommon. In comparison to the figures for the UK above, less than 20% of males and 10% of females in Spain report drinking more than 5 units of alcohol at least once per week. An additional key difference between the two countries is the demographics of bar attendance. In the UK, bar attendance is common across age groups. For instance data from the British Household Panel Survey reveal that in 2000 62% of males and 55% of females aged 16-24 years report `going out for a drinkô at least once a week, this drops to 44% and 27%, for males and females respectively aged 25 to 34 years, but stays remarkably high after that; 38% of males aged 35-64 report going out for a drink at least once a week, while the figure for females is 19%. In contrast, it is generally understood that bar attendance is heavily concentrated among young people in Spain (Calafat et al., 2002). As a result, whilst there are some statistics available on young peopleôs bar and pub attendance in Spain,[4] there is no comparable statistics for the over 30ôs. These differences in the demographics of bar attendance help to inform our country specific identification strategies later.

Data

This paper uses two data sets that are very similar in basic structure, the UK Labour Force Survey (UK LFS) and the Spanish Labour Force Survey (SLFS). Both are quarterly representative surveys that provide a range of information on individual and work characteristics. A key feature for our purposes is that they both have an internationally consistent definition of absence (Barmby, Ercolani and Treble, 2002), which we describe in more detail below.

The SLFS is a quarterly survey from which we have data available from the 1st quarter of 1996 to the 4th quarter of 2007. It is a repeated cross-section and contains 3,090,703 observations. For the UK, a 5 quarter rotating cohort version of the LFS is available which we use. This follows individuals for 5 consecutive quarters from entry. It is a rotating panel insofar as every quarter one cohort enters and another exits (after their 5

[4] For instance the Youth in Spain Report (2008) shows that 48% of 15-19 years olds report that they go out to bars either all or almost all weekends, the percentage is 47% for 20-24 years old and by the age of 25 to 29 this has decreased to 31%.

quarters). It contains 1,998,050 observations for 399,610 different individuals from 1997 to 2008.

We use information on usual and actual hours of work per week to generate two indicators of absence. The first is the hours a worker is absent per week. We calculate this variable as the difference between usual hours and actual hours $A_{it} = H_{it}^{u} - H_{it}^{e}$.[5] For ease of interpretation we multiply this number by 60 so that the estimated coefficients are in terms of minutes of absence. The second variable is the absence rate. It is defined as the ratio of the hours reported absent to contracted hours in the reference week $AR_{it} = A_{it} / H_{it}^{u}$. These measures of absenteeism may include variations in time at work that are outside of the control of the worker and as a result should not be readily affected by changes in drinking laws. Both the SLFS and the UK LFS contain information on why hours varied in the reference week. This allows us to construct absence measures that are more narrowly defined, excluding (for instance) variation due to flexible working hours, variations due to changes in jobs, training episodes and industrial disputes. Importantly, our key estimates are robust to using these narrower definitions of absence. This is discussed in more detail in the results section. Finally, this measure of absence may also capture any variation in contractual hours caused by the policy. In unreported estimates we found no effect of the policy change on contractual hours in either England/Wales or Spain. We also found no effect on the probability of being employed.

Both data sets have quite a rich set of potential control variables, including many of the candidates that have been shown to be important determinantôs of worker absenteeism in previous research. Thus, we incorporate socio-demographic variables, including the age and the age squared, gender, marital status, education level. We also include labour market variables which denote whether the individual works in the public sector, the type of contract, industry dummies, occupation dummies and size of the firm/establishment. We also control for year, quarter and regional fixed effects so as to take account of regional, seasonal and time variations.

An important issue is that certain individualsô working hours may be directly affected by the change in drinking laws, most notably those who work in bars. We exclude all

[5] We consider usual hours as synonymous of contractual hours. This is similar in spirit to the approach used in previous research by Hamermesh, Myers and Pocock (2008), Lozano (2010) and Green and Navarro (2011).

individuals working in these establishments, and to be especially sure, those working in allied industries such as hotels and restaurants. Finally, workers on part time work may have more natural variability in their working hours; in the results we investigate the robustness of our results to excluding part time workers. Appendix Table A1 provides summary statistics for the resultant samples for both Spain and the UK.

III. METHODOLOGY AND IDENTIFICATION

The differences in the nature of the legislation, data and institutional factors lead to variations in the identification strategy we adopt for Spain and England/Wales

In Spain, we rely upon the differential timing of the legislation across regions to identify the effect of the change in drinking laws on absence. Due to the way in which drinking and attending licensed premises is age-concentrated in Spain we further refine our strategy so that our treatment group is young people. The validity of these strategies is investigated in more detail in the results section.

For Spain, workersô minutes of absence per week can be specified as follows:

$$A_{it} = \phi + \delta Policy_{it} + \gamma\beta Treatment_i + \beta Policy_{it} \times Treatment_i + \alpha X_{it} + \varepsilon_{it} \quad (1)$$

Where A_{it} corresponds to the minutes of absence of worker i in period t. $Policy_{it}$ is an indicator that takes value of unity if the worker is observed after the reform period in a certain region and 0 otherwise. $Treatment_i$ is a dummy variable that equals one if the worker is 20 or younger (25 or 30) and 0 if is older than 30. The interaction term $Policy_{it} \times Treatment_i$ equals one for treated individuals (young workers) in the post-treatment period (after the legislation came into force in the region of the individualôs residence). The OLS estimate of β is equivalent to the Differences-in-Differences (DiD) estimator and this provides the absence caused by the reform for the treated group (i.e. the reduction in absenteeism for young workers caused by shutting bars and pubs earlier).

Our identification strategy for the UK differs in a number of important ways. In England there was no differential timing of the reform and there is a substantially less pronounced variation across age in drinking habits and attendance of licensed venues. However, we have two options that are not available in the Spanish case. First, we can use workers in Scotland and Northern Ireland as a counterfactual comparison group as there was

no change in drinking laws at this time in these two jurisdictions. The chief advantage, however, is that we observe the same worker over time in the UK LFS. This allows the observation of how a given individual changes absence behaviour before and after the policy change, and hence the application of an individual fixed effects strategy. This leads to the estimation of the following models:

$$A_{it} = \phi + \delta Policy_{it} + \gamma\beta Treatment_i + \beta Policy_{it} \times Treatment_i + \alpha X_{it} + \varepsilon_{it} \quad (2)$$

$$A_{it} = \phi + \sigma_i + \eta Pubs_{rt} + \alpha X_{it} + \varepsilon_{it} \quad (3)$$

where A_{it} corresponds to the minutes of absence of worker i in period t. $Policy_{it}$ is an indicator that takes value of unity if the worker is observed after the reform period in England and Wales and 0 otherwise. $Treatment_i$ is a dummy variable that equals one if the worker is in England or Wales and 0 if he/she is in Scotland or Northern Ireland. And the interaction term $Policy_{it} \times Treatment_i$ equals one for treated individuals (those living in England or Wales) in the post-treatment period (after the change in legislation came into force). The OLS estimate of β is equivalent to the Differences-in-Differences (DiD) estimator and this provides an estimate of the increase in absence caused by the licensing laws for workers in England and Wales compared to those living in Scotland and Northern Ireland. The estimate of η follows from observing the within worker variation in absence behaviour before and after the period of reform. Hence this model is identified only for those workers in England and Wales that we observe in the data in at least one quarter before and after the change in reform. In addition, we estimate variants of (1), (2) and (3) where the dependent variable is instead the absence rate (AR) as computed above.[6]

Figures 1 and 2 provide some illustrative information on the changes in the dependent variables with respect to the policy change. Specifically they show absence behaviour in the immediate periods around the policy changes, recalling that these absence figures capture any variation in hours worked from contractual hours. These figures provide a preliminary indication of three key things. First there are variations in absenteeism behaviour across the policy regimes for the treatment groups. Second, there is almost no change, and no

[6] We also estimated, but do not report, the policy effect on the incidence of absence; where this took the value of 1 if usual hours exceed actual hours in the reference week and 0 otherwise. The pattern of sign and significance of the key policy estimates for this alternative measure of absenteeism were identical to those reported for minutes difference and the absence rate.

statistically significant change, in absence behaviour for the control group in Spain. Finally, there is some minor reduction in minutes of absence for the control group in the UK case which could potentially bias upwards our policy estimates. This change in Scotland and Northern Ireland is not, however, statistically significant and it will not influence the (within worker) fixed effects estimates that we also report for England and Wales.

IV. RESULTS

Table 2 provides the estimates for the effect of the drinking law regulation in Spain on worker absenteeism. Two groups of estimates are reported, Tobit estimates for absence rate and OLS estimates for hours difference.[7] We show estimates for successively broader treatment groups, starting with those aged 20 or under, then 25 or under and finally 30 or under. The control group in each case is workers aged more than 30. It is important to note that our estimates are not substantively altered by using more restrictive control groups, such as greater than 40 year old workers (which we report in the appendix as Table A2). Moreover, in all cases using more restrictive control groups leads to larger magnitude estimates of policy effects; hence the estimates we focus on are conservative. A set of standard control variables are included covering age, gender, marital status, education, sector of employment, contract type along with occupation, industry, regional, year and quarter dummies which are not reported for the sake of brevity but are available on request from the authors. Looking at the coefficients on the key variable of interest (Policy×Treatment) demonstrates a substantial effect of the drinking law regulation on worker absence. For instance, the effects range from a decrease in the absenteeism rate of between 2.7% and 5.6% and a corresponding reduction in working minutes lost through absence of between 10 and 17 minutes. This is a marked effect when compared to our sample means for the treatment group ($\leq$ 30 years) of a 8.5% absence rate and 190.90 minutes of absence.[8] Moreover, this effect increases in magnitude as we look at younger treatment groups and is particularly marked for workers 20 years old or younger. Together these estimates suggest that reducing the legal

[7] In unreported results, we also estimated the absence rate models by OLS, the sign and significance of our estimates were unaffected by this.

[8] Overall sample means are an absence rate of 11% and 258 minutes of absence.

opening hours of licensed pubs and bars in Spain substantially reduced worker absenteeism among younger workers.

INSERT TABLE 2 HERE

Table 3 displays the corresponding Tobit and OLS estimates for the increase in legally allowed opening hours in England and Wales. The chief difference here is that we do not focus on worker age to assign treatment status but instead exploit the lack of legislative change in Scotland and Northern Ireland. Again we report the effect of the legislative change on workerôs absence rate and minutes lost due to absence. The control vector is similar to that for the case of Spain, with only a slight difference in the education controls reflecting cross-country differences in qualification structure. Again for brevity we do not report the estimates for the occupational, industry, year and quarter controls.[9] As in the Spanish case the impact of the legislative change on absenteeism is substantial for workers in England and Wales. In this case, increasing opening hours increased worker absence by approximately 3% and lead to an increase in time lost through absence of 15 minutes per week. This, when combined with the results for Spain suggest a positive causal relationship between licensed opening hours and worker absenteeism.

INSERT TABLE 3 HERE

In the case of England and Wales we can go a step beyond difference-in-difference estimation and exploit the panel dimension of the UK LFS to examine how given workers absence behaviour changed post-reform. Table 4 reports estimates from panel fixed effects models of absence rates and minutes of absence. These models are identified for workers who we observe in our five quarter panel before and after the legislative change in England and Wales. Again these results show that the extension of drinking hours substantially affect worker absence behaviour. For instance, the minutes of absence effect is only slightly smaller than that reported earlier in the difference-in-difference estimation. Whilst, the effect of the absenteeism rate is more marked, it reduces from approximately 3% to 1% but remains statistically significant at standard levels. This suggests that these earlier results were not driven entirely by, for instance, some compositional change in the unobservable

[9] It is worth noting that in both the Spanish and UK cases the estimates on the control variables largely follow those previously reported in the literature on absence. For instance, temporary workers take less absence (Bradley, Green and Leeves, 2011, Ichino and Riphahn, 2005), public sector workers take more absence and female and married workers take more absence (Barmby, Orme and Treble, 1991).

characteristics of workers pre-and-post reform, or due to some change in behaviour of our control group of Scottish and Northern Irish workers that was contemporaneous to the legislative change. In unreported estimates we also investigated whether there was a within-worker change in absenteeism in Scotland and Northern Ireland at the time of the policy introduction as a form of placebo policy test. The resultant fixed effects estimate of the placebo policy effect whilst positive was far from statistical significant at standard levels (9.59 [S.E. 15.64] and 0.007 [S.E. 0.007] for hours difference and absence rate, respectively).

INSERT TABLE 4 HERE

Before moving on to robustness tests of our key estimates, in Table 5 we provide estimates for two subsamples that are of particular interest. First, our current estimates include all workers irrespective of working hours. A concern is that part-time workers have hours of work that naturally vary and this may somehow bias our policy estimates. The first columns in Table 5 provide estimates for full-time workers only, where for brevity we report only the policy effects and for Spain only the broadest of our treatment groups (≤ 30 years).[10] In all cases the difference between these estimates and those reported earlier are at most modest. Another issue is that the policy may impact differently across gender, hence we report males and females separately in subsequent columns. For Spain, the differences are slight ï there is some suggestion that the policy impact was larger for male working hours. However, for the UK a more dramatic pattern appears. The policy impact seems concentrated almost entirely in female workers.[11] We will return to this issue later when discussing health impacts of the policy.

Ideally, we would like to isolate the policy effect on those individuals who attend or have some non-zero propensity to attend bars. This type of information is not typically available within labour force surveys. However, in further unreported estimates we examine a group with arguably higher bar attendance that we can observe; singles. For both countries we re-estimated our models where the treatment group was refined to singles (in the given age or regional groups). For Spain, these estimates were essentially the same as those previously reported. This is perhaps not surprising given the reliance on young age groups to

[10] Estimates for ≤ 25 and ≤ 20 years old treatment groups follow the patterns reported in the earlier tables.

[11] We have no definitive explanation for why there is this marked gender difference but it is worth noting that female drinking has increased markedly in the UK within the last decades. For instance it has been reported that female binge drinking rates have doubled in the UK since the early 1990ôs (Smith and Foxcroft, 2009).

assign treatment. For England/Wales, the treatment effect for singles was much higher than that in previous models. For instance the policy increased minutes absence by 32.56 [S.E. 9.47] and the absence rate by 0.047 [S.E. 0.014]. Moreover, whilst effects on females where still higher (minutes = 37.30 [S.E. 12.99]; absence rate = 0.052 [S.E. 0.023]), the effect on male singles is statistically greater than zero (minutes=28.22 [S.E. 13.79]; absence rate = 0.040 [S.E. 0.017]). These results again make us more confident that the absence effect we are observing is due to the change in the licensing laws.

INSERT TABLE 5 HERE

FURTHER ROBUSTNESS CHECKS

Our results demonstrate that drinking law regulations have the potential to influence an individualôs intra-marginal labour supply decisions. One strength of our approach is that the effect is found for two different countries where the policy was operating in different directions, and moreover, where different identification strategies are used. Nonetheless in this section we conduct a range of other robustness checks on our main estimates.

First, we examine whether our results reflect disruption associated with the implementation of the policy. We do this by excluding the year of reform from our sample. In the case of Spain the excluded year varies by region due to the differential timing of reform. These estimates are reported in Table 6 for both countries (for Spain and the UK). These reveal that omitting the year of the reform does not change the main results. For instance, the estimated effect of the legislative change on the absence rate in Spain and the UK is not statistically different from those reported earlier. The same is true for the minutes difference models. We can use this type of approach to assess whether the policy continued to influence behaviour in the years after implementation. These estimates reveal two things, the policy is not being identified by some form of disruption or other implementation effect, and by extension the policy continues to exert an influence on worker absence behaviour at until, at least, one year after the reform year. This second point is important as it suggests that the policy has a lasting impact and individuals do not revert to pre-policy behaviour after some period of adaptation. Finally, we re-estimated our main models with the reform lagged one year, this provides another form of placebo test. Estimates from these models revealed no effect of the lagged reform on absence behaviour.

As mentioned earlier, our measures of absenteeism may be too broad insofar as they capture all variations in working time, including those that occur for reasons out of the control of workers. In unreported estimates we used information in the SLFS and UK LFS on reasons for variation of working hours to exclude categories that were least likely to be in the control of workers and hence, be affected by the policy. Specifically we excluded those workers whoôs hours `usually varyô along with absence due to changing or loss of job, undertaking training, and union representation, strike or labour conflict and technical partial stop or employment regulation within a firm because of financial problems. This did not materially change our key estimates. In fact there is an increase in the estimated effect of the policy change for the UK (along with some improvement in the precision of estimates). For instance, UK minutes of absence due to the reform increases to 21.85 (from 15.26) and the absence rate is 9.3% (from 3.1%) in the difference-in-difference models. The corresponding figures for the fixed effects models are 57.33 minutes of absence and an absence rate increase of 3.4%.

Two further issues relate to policy implementation, in the case of Spain there was some discretion in the timing of the adoption of the policy, as reported in Table 1. It could be that regions where there were more marked problems related to extended drinking hours adopted the policy early and this may bias our results. To investigate this we re-estimated our DiD models for those three regions that adopted early, La Rioja, Balearic Islands and Pais Vasco. The policy estimates for these regions were slightly higher than those reported in Table 2, but were not statistically different from the full sample estimates. For instance the minutes difference and absence rate effects for the ≤ 30 years treatment group were -16.36 and - 3.1% and, respectively. All these estimates remained statistically significantly different from zero at standard levels. Likewise, we re-estimated our models for those late adopters (2004 on) and again these estimates were not statistically different from those in Table 2.

A related issue with the estimates for England and Wales, is that unlike Spain, the change in licensing were in effect not mandatory. That is, individual venues had to apply for an additional licence to remain open later. We use this to further investigate whether it is actual variations in drinking hours that is causing the change in absence behaviour. The UK Department for Culture, Media and Sport reports the number of licenses granted by region. In areas where there is a greater density of venues that increased hours, we might expect a larger absence response. Most regions have quite a similar density of extended hours licences per

head of population (16 years or older) of between 0.94 licenses per thousand people and 1.47 per thousand people. However, three regions have particularly high densities, the South West of England, London and the North East of England (1.47, 1.44 and 1.25, respectively). We re-estimated our DiD models for these regions only (again using Scotland and Northern Ireland as control groups) and these reveal slightly higher estimates of the policy effect than those for England and Wales in total, for instance the estimate of 15 minutes rises to 22 minutes. These estimates remain statistically significant at standard levels.

A concern with DiD estimates is that when the dependent variable is serially correlated in panels with a long time dimension this can lead to standard errors that are biased downwards potentially leading to spurious inference (Bertrand, Duflo and Mullainathan, 2004). To investigate this we collapse our data (by group characteristics in Spain and by individual in the UK) into two periods, pre and post reform. We then re-estimate equations (1) and (2) on this collapsed data. The results are reported in Table 7 and demonstrate that the policy caused young workerôs absence rate to decrease by 1% in Spain and an increase by 1.9% in workerôs absence rate in the UK. Young workers reduce the minutes they are absent from work in Spain by 10.83 while workers in England and Wales increase the minutes they are absent from work due to increase in pub closing hours by 18 minutes. Importantly, these estimates remain statistically significant at standard levels and do not suggest that our inference is incorrect due to serial correlation in absenteeism.

Why Do Drinking Laws affect Workplace Absence? The Role of Drinking, Health and Consumption.

To this point we have demonstrated a robust causal effect of changes in pub and bar opening hours on worker absenteeism. However, we cannot directly distinguish whether the effect comes from a pure leisure-labour trade off due to the timing and the choice of sleeping hours (Biddle and Hamermesh, 1990) or in an indirect way through a spillover of alcohol consumption and intoxication into working hours. Here we use further household data for Spain and the UK to examine whether the policy changes affected individual health outcomes. This, we argue, may be indicative of a channel of effect via changes in the level of alcohol consumption. While, previous research has demonstrated a link between alcohol consumption and absenteeism (Balsa and French, 2010). We focus on two data sets, again with similar structures. For Spain we use the European Community Household Panel Survey

(ECHP) 1994-2001, while for the United Kingdom we use the 1997-2007 data from the British Household Panel Survey (BHPS). Both ask individuals a variant of the following question, do you have any physical or mental health problem, illness or disability.[12] These include health related problems unlikely to be affected by alcohol consumption. This introduces measurement error with the resultant bias in our policy estimates towards zero. We use these responses to construct a binary dependent variables of health problems which we include in analogous regression specifications to (1), (2) and (3) before.

INSERT TABLE 8

Again our identification strategy varies between Spain and the UK. For Spain, because of the time period of the ECHP we only observe the policy change occurring in the Balearic Islands. Ideally, we would observe the policy change in all regions, but one advantage of the Balearic Islands is that it comprises of 7 island and would be very difficult for people living near the `bordersô of this region to move to adjacent regions to attend pubs or bars. We use young workers in this region as the treatment group and young workers in the rest of Spain as the control group.[13] A further difficulty is that in the regional disaggregation available (NUTS 2) in the ECHP the Balearic Islands are grouped with the regions of Catalonia and Valencia where there was not a policy implemented at that point. As a result our estimates provide a lower bound for the Balearic Islands, and one that may not be generalisable to the rest of Spain. Table 8 provides the estimates for this model. These suggest a large decrease in the incidence of health problems among young people due to the policy change.

INSERT TABLE 9

For the UK we have more advantageous data in a number of ways. The BHPS allows us to replicate directly the difference in difference specification from before but also has additional information that provides more confidence that the estimated effect is actually being driven causally by the policy change. Given the gender disparities in policy effect revealed earlier for England and Wales we report all health estimates separately for males and females. The initial difference in difference estimates reveal that licensing laws increased the

[12] The questions are, in the ECHP, do you have any chronic physical or mental health problem, illness or disability? while in the BHPS it is do you have any of health problems or disabilities?

[13] Again our key estimates are robust to the use of alternative aged control groups etc.

incidence of health problems of males and females in England and Wales by 1.2 percentage points and 1.8 percentage points, respectively. The estimate for males is not statistically significant and the estimate for females only at a 10% level. To help pinpoint the source of this apparent policy effect we use a question in the BHPS which asks how often, on average, the interviewee goes out to licensed venues to drink. We use this information to estimate separate models according to whether the individual reports going out at least once a week, at least once a month or at a frequency less than once a month. If it is changes in licensing hours driving these health effects then it should be more pronounced in more frequent attendees of bars, and zero for those who do not frequently go to bars. The estimates reported in the last 3 columns of Table 9 fit with this intuition. Regular drinkers, who are most likely to be affected by the policy, had a substantial increase in the incidence of health problems due to the change in licensing hours. This effect is absent for infrequent attendees of bars. Of course these results could reflect unobservable factors influencing both drinking and health. Whilst there are well known problems with implementing conditional logit models with respect to sample selection, we re-estimated our model of the policy effects on health to account for unobserved time invariant characteristics. This revealed a marginal effects coefficient of 0.078 [S.E. 0.007] of the policy effect on having a health problem.

Finally, we sought to examine whether these health and absence effects were matched by a change in expenditure on alcohol at licensed venues. To do this we used the 2001 to 2008 waves of the UK Expenditure and Food Survey (EFS), which provides a representative sample of household's expenditure in the UK as an annual repeated cross-section.[14] The EFS asks respondents to keep a two week diary detailing expenditure items and the value of purchases. In particular, it provides information on expenditure on alcohol at licensed venues. A difficulty with this data is the excess of zeros which could reflect either that these individuals never consume alcohol at bars, or merely that their consumption was zero in the reference weeks. If we estimate a simple analogue of our DiD model for the UK with log alcohol expenditure (£) at licensed venues as the dependent variable and again England/Wales as the treatment group we find no effect of the policy on consumption. Limiting our sample to non-zeros we find that individuals in the treatment group in the policy

[14] A Spanish FES equivalent exists. However a lack of consistent data on the particular expenditure group of interest across our policy period means that we cannot estimate the policy impact on alcohol expenditure at drinking establishments in Spain.

period increased expenditure by approximately 5 percent. This again hides gender differences, whereby female drinkers increased expenditure by nearer 10 percent, and male expenditure did not increase. This provides some weak evidence of a policy effect on consumption, at least amongst the sub-group of the population who choose to drink at bars. Again, this is suggestive that the effect of changing licensing hours on absence is related to alcohol consumption.

V. CONCLUSION

This paper sought to examine how changes in the regulation of leisure activities can influence individual labour supply decisions. Specifically, we used two recent and symmetric changes in the legal opening hours of licensed premises in Spain and England and Wales. These are particularly advantageous insofar as they provide policy changes in opposite directions, a reduction in drinking hours in Spain and an extension in England and Wales. Focusing on one dimension of intra-marginal labour supply, absenteeism, we demonstrate a causal effect of these legislative changes. Reducing opening hours in Spain reduced absenteeism, whilst increasing opening hours in England and Wales increased worker absenteeism. This result proves robust to a variety of specifications, alternative treatment and control groups and identification approaches.

This change in behaviour may result from changes in the proximity of working and leisure hours and/or changes in alcohol consumption and the likelihood of the effects of intoxication being felt during working hours. We provide further evidence that the change in legislation had a causal effect on individual health. UK evidence demonstrates that this is most acute for those who report regularly attending licensed premises. This, coupled with evidence of an increase in alcohol expenditure at bars, is suggestive that the channel of effect is through alcohol consumption. In turn, this indicates that the policy in England and Wales did not have the desired effect of reducing health problems related to drinking.

How governments influence work-leisure decisions is typically thought of through the lens of income and substitution effects. However, governments also often intervene and regulate leisure activity directly. Our results suggest that government intervention in the regulation of leisure activities has the potential to have unintended consequences on labour supply decisions. An important implication of our paper then is that governments influence

leisure-work trade-offs not only through taxation and transfer payments but also through direct regulation of leisure activities.

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Figure 1. Minutes of Absence and absence rate for workers in Spain

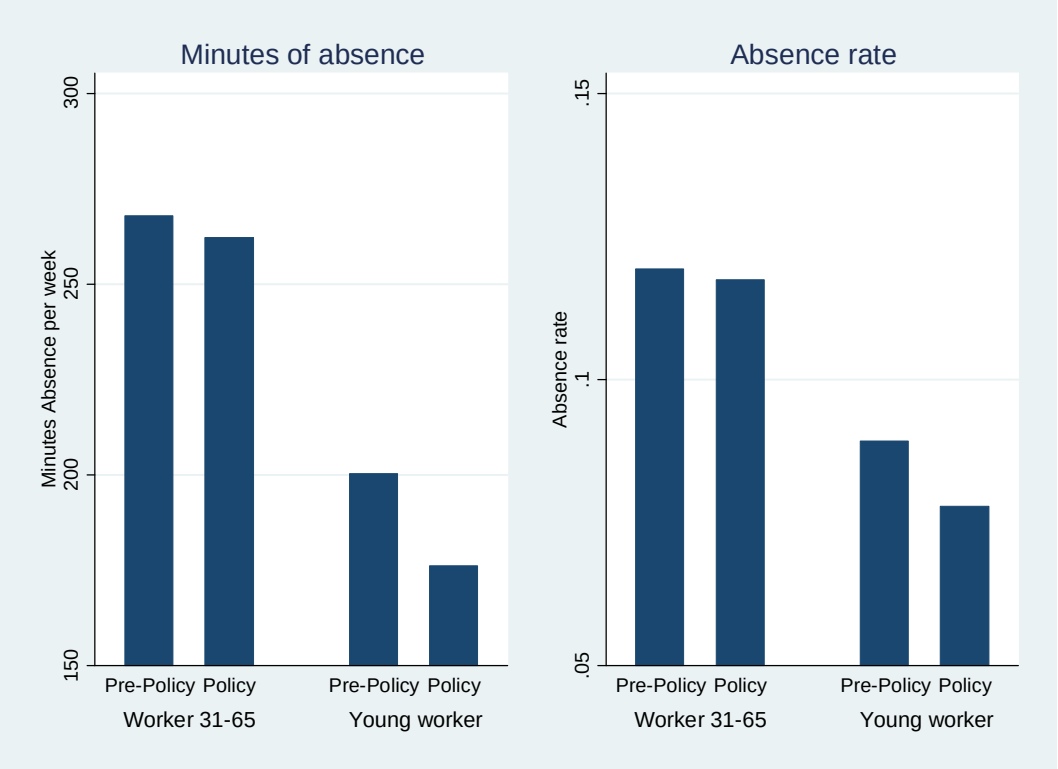

Figure 2. Minutes of absence and absence rate for workers in the UK

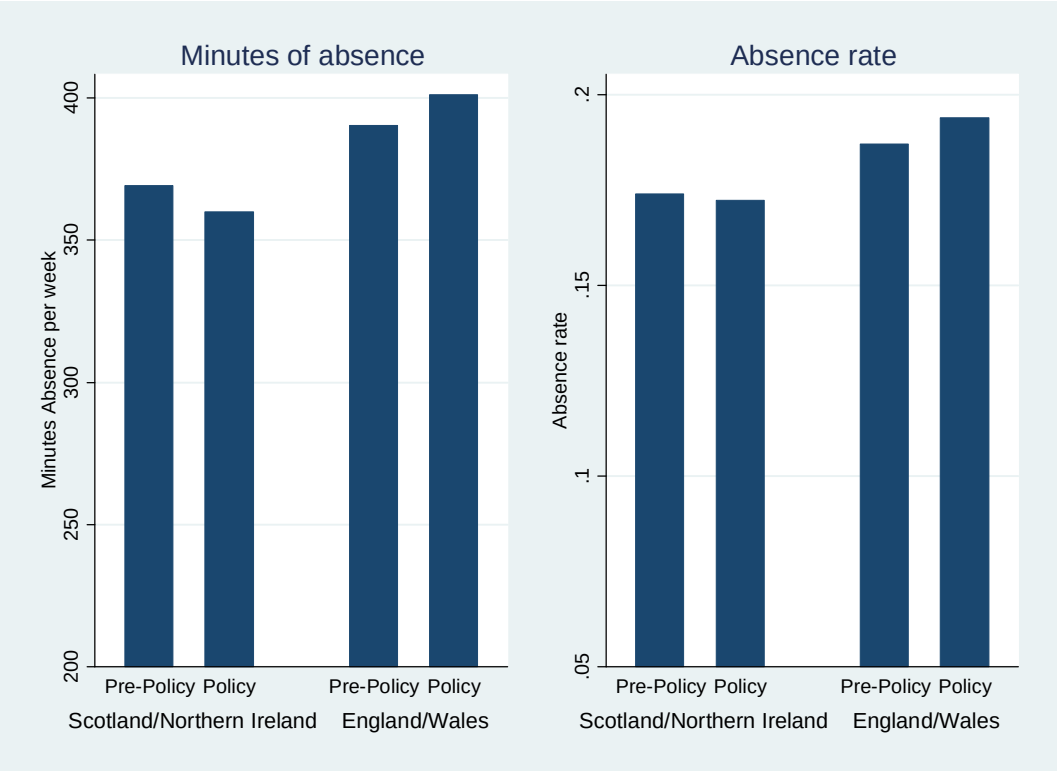

Table 1. Regional Timing of Drinking Hours Law Changes in Spain and England/Wales.

Regions (CCAA)	Law came into force	Law	Closing time
Spain			
Andalucia	1st quarter 2003	Ley 13/1999, de 15 de diciembre, de Espectáculos Públicos y Actividades Recreativas de Andalucía (BOE núm. 15, de 18 de enero), modificada por la Ley 10/2002, de 21 de diciembre (BOE núm. 14, de 16 de enero de 2003).	3:00am*
Aragon	1st quarter 2006	Ley 11/2005, de 28 de diciembre, reguladora de los espectáculos públicos, actividades recreativas y establecimientos públicos de la Comunidad Autónoma de Aragón (BOE núm. 23, de 27 de enero).	3:30am*
Canary Islands	2nd quarter 2002	Ley 1/1998, de 8 de enero, de Régimen Jurídico de los Espectáculos Públicos y Actividades Clasificadas (BOE núm. 27, de 31 de enero). Corrección de errores en BOE núm. 68, de 20-03-98 y modificada por la Ley 2/2002, de 27 de marzo (BOE núm. 97, de 23 de abril).	3:30am
Castilla Leon	4th quarter 2006	Ley 7/2006, de 2 de octubre, de espectáculos públicos y actividades recreativas de la Comunidad de Castilla y León (BOE núm. 272, de 14 de noviembre).	3:00am
Comunidad de Madrid	3rd quarter 2002	Ley 17/1997, de 4 de julio, de Espectáculos Públicos y Actividades Recreativas (BOE núm. 98, de 24 de abril de 1998), modificada por la Ley 24/1999, de 27 de diciembre (BOE núm. 48, de 25 de febrero de 2000), por la Ley 5/2000, de 8 de mayo (BOE núm. 126, de 26 de mayo) y por la Ley 5/2002, de 27 de junio (BOE núm. 176, de 24 de julio).	3:00am**
Navarra	2nd quarter 2004	Ley Foral 2/1989, de 13 de marzo, Reguladora de los Espectáculos Públicos y Actividades Recreativas (BOE núm. 84, de 8 de abril), modificada por la Ley Foral 26/2001, de 10 de diciembre (BOE núm. 39, de 14 de febrero de 2002). 27 de octubre de 2003, 656/2003 Decreto Foral (BON145 de 14/11/2003), entrada en vigor 1 de abril de 2004.	3:30am**
Comunidad Valenciana	1st quarter 2004	Ley de las Cortes Valencianas 4/2003, de 26 de febrero, de los Espectáculos Públicos, Actividades Recreativas y Establecimientos Públicos (BOE núm. 81, de 4 de abril). Ley 4/2003, de 26 de febrero, Orden de 19 de diciembre de 2003, entrada en vigor en 2004.	3:30am
Balearic Islands	2nd quarter 1999	Ley 7/1999, de 8 de abril, de Atribución de Competencias a los Consejos Insulares de Menorca y de Eivissa i Formentera en materia de Espectáculos Públicos y Actividades Recreativas (BOE núm. 124, de 25 de mayo).	3:00am
La Rioja	4th quarter 2000	Ley 4/2000, de 25 de octubre, de Espectáculos Públicos y Actividades Recreativas. (BOE núm. 287, de 30 de noviembre).	3:30**
Pais Vasco	3rd quarter 1998	Ley 4/1995, de 10 de noviembre, de la Comunidad Autónoma del País Vasco, sobre normas reguladoras de Espectáculos Públicos y Actividades Recreativas (BOE núm. 230, de 1 de diciembre). 210/1998 de 28 de Julio 1998.	2:00am*
Asturias	1st quarter 2005	Ley 8/2002, de 21 de octubre, de Espectáculos Públicos y Actividades Recreativas. (BOE núm. 278, de 20 de noviembre). Decreto 90/2004, de 11 de noviembre, por el que se regula el regimen de horarios de los establecimientos, locales e instalaciones para espectáculos públicos y actividades recreativas en el Principado de Asturias.	3:30am*
UK			
England and Wales	24th November 2005	Licensing Act 2003	

Source: http://www.mir.es/SGACAVT/juegosyespec/espectaculos/legislacionxCA.html and BOE for the case of Spain and the Licensing Act 2003 for the UK.

* Fridays and Saturdays are allowed to stay open for an hour more.

** Fridays and Saturdays are allowed to stay open for half an hour more.

Table 2. Effect of licensing laws on youngsters absence behaviour in Spain, comparison group workers >30 years old, 1996-2007.

	Absence rate			**Minutes difference**		
	Treatment ≤ 20	Treatment ≤ 25	Treatment ≤ 30	Treatment ≤ 20	Treatment ≤ 25	Treatment ≤ 30
Policy $\times$Treatment	-0.056	-0.038	-0.027	-17.639	-12.650	-10.041
	(0.017)***	(0.009)***	(0.006)***	(4.306)***	(2.462)***	(1.984)***
Treatment	-0.190	-0.135	-0.043	-59.914	-44.265	-11.499
	(0.016)***	(0.010)***	(0.007)***	(4.836)***	(3.081)***	(2.079)***
Policy	0.050	0.052	0.051	11.086	11.844	11.912
	(0.006)***	(0.005)***	(0.005)***	(1.879)***	(1.790)***	(1.710)***
Age	-0.022	-0.018	-0.008	-5.889	-4.549	-1.155
	(0.002)***	(0.001)***	(0.001)***	(0.530)***	(0.449)***	(0.351)***
Age^2	0.028	0.022	0.012	7.712	6.235	2.632
	(0.002)***	(0.002)***	(0.001)***	(0.564)***	(0.482)***	(0.382)***
Female	0.155	0.142	0.143	35.951	33.248	34.976
	(0.004)***	(0.004)***	(0.003)***	(1.242)***	(1.146)***	(1.055)***
Secondary education	0.002	-0.000	-0.000	-0.726	-1.887	-1.726
	(0.005)	(0.004)	(0.004)	(1.431)	(1.297)	(1.201)
Higher education	0.036	0.030	0.029	12.573	9.215	8.843
	(0.005)***	(0.005)***	(0.004)***	(1.676)***	(1.502)***	(1.365)***
Public sector	0.191	0.189	0.178	78.335	78.109	74.103
	(0.006)***	(0.005)***	(0.005)***	(1.917)***	(1.807)***	(1.681)***
Temporary contract	-0.120	-0.124	-0.126	-50.210	-51.451	-52.209
	(0.004)***	(0.004)***	(0.003)***	(1.216)***	(1.086)***	(0.983)***
Observations	1540615	1741377	2004279	1540892	1741662	2004582

Note: Controls for marital status, industry, workersô occupation, establishment size, region, year, and quarter are included but not reported. Robust standard errors are in parentheses.
*, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

Table 3. Effect of Licensing Laws on Absence Behaviour in the UK, 1997-2008

	Absence rate	**Minutes difference**
Policy ×Treatment	0.031	15.261
	(0.011)***	(7.113)**
Treatment	0.082	35.229
	(0.004)***	(2.415)***
Policy	-0.035	10.651
	(0.013)***	(7.963)
Age	0.012	5.171
	(0.001)***	(0.430)***
Age^2	-0.000	-0.058
	(0.000)***	(0.005)***
Female	0.065	44.478
	(0.003)***	(2.035)***
Degree or higher	0.074	35.854
	(0.004)***	(2.764)***
Vocational training/Diploma	0.080	33.949
	(0.004)***	(2.696)***
A-Levels	0.057	26.613
	(0.003)***	(1.984)***
Temporary contract	0.009	-33.067
	(0.005)*	(2.924)***
Part time job	0.033	-186.880
	(0.003)***	(1.903)***
Public sector	0.096	65.514
	(0.004)***	(2.633)***
Observations	866576	868397

Note: Controls for marital status, presence of dependent children, industry, workersô occupation, year, and quarter are included but not reported. Robust standard errors are in parentheses.
*, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

Table 4. Effect of licensing laws on absence behaviour in England and Wales, Fixed Effects Estimates, 2004-2008

	Absence rate	**Minutes difference**
Policy	0.012	12.824
	(0.003)***	(6.113)**
Degree or higher	0.014	13.505
	(0.012)	(26.591)
Vocational training/Diploma	0.025	44.307
	(0.009)***	(20.384)**
A-Levels	0.014	20.533
	(0.006)**	(14.129)
Temporary contract	-0.003	-20.646
	(0.007)	(13.677)
Part time job	-0.035	-213.133
	(0.007)***	(15.359)***
Public sector	0.008	15.097
	(0.009)	(18.629)
Observations	192024	193039
Number of individuals	56656	56756

Note: Controls for marital status, presence of dependent children, industry, workersô occupation, region and quarter are included but not reported. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively. Estimates for our full period, 1997-2008, are the same.

Table 5. Effect of Changes in Drinking Laws for UK and Spain, Full-Time Workers Only and Males vs Females

	Full time workers		**All workers**			
	Total		Male		Female	
	AR	MD	AR	MD	AR	MD
Policy ×Treatment	-0.023	-9.645	-0.028	-11.673	-0.025	-7.620
	(0.007)***	(2.193)***	(0.008)***	(2.552)***	(0.011)**	(3.150)**
Treatment	-0.049	-17.900	-0.008	-1.052	-0.103	-27.323
	(0.007)***	(2.277)***	(0.008)	(2.596)	(0.012)***	(3.419)***
Policy	0.048	12.326	0.046	11.607	0.058	11.842
	(0.005)***	(1.855)***	(0.006)***	(2.155)***	(0.009)***	(2.803)***
Observations						
UK (DD)						
Policy ×Treatment	0.041	18.500	0.023	5.287	0.040	25.227
	(0.011)***	(8.911)**	(0.013)*	(10.501)	(0.018)**	(9.634)***
Treatment	0.072	44.565	0.074	44.207	0.091	27.177
	(0.004)***	(3.047)***	(0.004)***	(3.610)***	(0.006)***	(3.224)***
Policy	-0.046	-2.934	-0.036	10.738	-0.035	3.490
	(0.014)***	(10.023)	(0.016)**	(27.069)	(0.022)	(12.706)
Observations						
UK (FE)						
	0.008	18.326	0.001	-2.631	0.022	28.290
	(0.003)**	(8.503)**	(0.003)	(8.964)	(0.004)***	(8.327)***
Observations						

Note: All controls as per tables 2 & 3. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

Table 6. Effect of Licensing Laws on Absence Behaviour for Spain and the UK; Robustness test for Implementation Effects (DiD estimates excluding year of policy implementation).

	Spain			United Kingdom
Absence rate				
	Treatment ≤ 20	Treatment ≤ 25	Treatment ≤ 30	
Policy × Treatment	-0.073	-0.043	-0.028	0.031
	(0.018)***	(0.009)***	(0.007)***	(0.011)***
Treatment	-0.200	-0.142	-0.047	0.082
	(0.017)***	(0.010)***	(0.007)***	(0.004)***
Policy	0.074	0.076	0.074	-0.035
	(0.007)***	(0.006)***	(0.006)***	(0.013)***
Observations	1431052	1617433	1860844	866576
Hours difference				
	Treatment ≤ 20	Treatment ≤ 25	Treatment ≤ 30	
Policy × Treatment	-21.341	-14.147	-10.851	15.261
	(4.725)***	(2.705)***	(2.176)***	(7.113)**
Treatment	-63.068	-46.562	-12.675	35.229
	(4.975)***	(3.177)***	(2.138)***	(2.415)***
Policy	17.774	18.679	18.659	10.651
	(2.151)***	(2.045)***	(1.949)***	(7.963)
Observations	1431320	1617708	1861137	868397

Note: All controls as per tables 2 & 3. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

Table 7. Effect of Licensing Laws on Absence Behaviour, Collapsed Samples, Spain and the UK.

	Spain			United Kingdom
Absence rate				
	Treatment ≤ 20	Treatment ≤ 25	Treatment ≤ 30	
Policy × Treatment	-0.016	-0.007	-0.006	0.019
	(0.009)*	(0.005)	(0.004)	(0.005)***
Treatment	-0.006	-0.013	-0.004	0.029
	(0.008)	(0.005)**	(0.003)	(0.002)***
Policy	0.017	0.017	0.017	-0.020
	(0.003)***	(0.003)***	(0.003)***	(0.005)***
Observations	351905	408484	481599	230527
Hours difference				
	Treatment ≤ 20	Treatment ≤ 25	Treatment ≤ 30	
Policy × Treatment	-13.656	-10.926	-10.826	18.021
	(6.877)**	(3.924)***	(3.197)***	(8.180)**
Treatment	-45.771	-38.385	-8.842	31.414
	(6.951)***	(4.408)***	(2.938)***	(3.077)***
Policy	23.867	24.351	24.807	-13.911
	(2.637)***	(2.531)***	(2.441)***	(7.643)*
Observations	351995	408577	481699	230609

Note: All controls as per tables 2 & 3. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

Table 8. Effect of Licensing Laws on Health Problems in Spain, ECHP 1994-2001.

	(1)	**(2)**
	IB vs Spain	IB vs Madrid
Policy ×Treatment	-0.074	-0.073
	(0.020)***	(0.021)***
Treatment	0.024	0.024
	(0.016)	(0.026)
Policy	0.013	-0.013
	(0.009)	(0.011)
Age	0.002	0.003
	(0.001)	(0.002)
Age^2	0.003	0.003
	(0.002)	(0.002)
Female	0.001	-0.002
	(0.005)	(0.007)
Secondary education	-0.013	-0.017
	(0.005)***	(0.008)**
Higher education	-0.026	-0.034
	(0.006)***	(0.009)***
Public sector	-0.009	-0.006
	(0.005)*	(0.008)
Observations	24205	10007

Note: All controls as per tables 2 & 3. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

Table 9. Effect of Licensing Laws on Health Problems in the UK, BHPS 1997-2007.

	Total	**Male**	**Female**	**Goes Out to Drink**		
				At least Weekly	**Monthly**	**< than once a month**
Policy ×Treatment	0.015	0.012	0.018	0.051	0.019	-0.003
	(0.008)**	(0.011)	(0.010)*	(0.021)**	(0.008)**	(0.021)
Treatment	0.035	0.026	0.043	0.023	0.034	0.052
	(0.004)***	(0.005)***	(0.005)***	(0.010)**	(0.004)***	(0.011)***
Policy	-0.055	-0.100	-0.013	-0.060	-0.057	0.009
	(0.022)**	(0.031)***	(0.030)	(0.021)***	(0.022)***	(0.017)
Age	0.014	0.016	0.013	0.010	0.012	0.026
	(0.001)***	(0.001)***	(0.001)***	(0.002)***	(0.001)***	(0.002)***
Age^2	-0.000	-0.000	-0.000	0.000	-0.000	-0.000
	(0.000)***	(0.000)***	(0.000)***	(0.000)	(0.000)***	(0.000)***
Female	0.067			0.094	0.069	0.028
	(0.003)***			(0.008)***	(0.003)***	(0.010)***
Public sector	-0.015	-0.005	-0.022	-0.011	-0.016	0.004
	(0.005)***	(0.008)	(0.006)***	(0.014)	(0.005)***	(0.016)
A-Levels	-0.008	-0.010	-0.011	-0.011	-0.008	-0.005
	(0.004)**	(0.005)*	(0.005)**	(0.009)	(0.004)**	(0.012)
Vocational training/Diploma	-0.029	-0.038	-0.022	-0.008	-0.024	-0.068
	(0.006)***	(0.008)***	(0.008)***	(0.016)	(0.006)***	(0.019)***
Degree or higher	-0.043	-0.050	-0.041	-0.033	-0.040	-0.061
	(0.005)***	(0.007)***	(0.006)***	(0.013)***	(0.005)***	(0.016)***
Observations	138242	64446	73796	19132	124649	13593

Note: All controls as per tables 2 & 3. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.

APPENDICES:

Table A1. Descriptive statistics

	Spain			UK	
	Mean	Std		Mean	Std
Minutes of absence	258.477	629.557	Minutes of absence	388.761	722.656
Absence rate	0.113	0.277	Absence rate	0.185	0.331
Age	39.559	11.769	Age	40.508	11.742
Female	0.395	0.489	Female	0.505	0.500
Married	0.606	0.489	Married	0.629	0.483
Second education	0.205	0.404	A-Levels	0.239	0.426
Higher education	0.299	0.458	Vocational training/Diploma	0.128	0.334
			Degree or higher	0.177	0.382
Public sector	0.191	0.393	Public sector	0.300	0.458
Temporary contract	0.381	0.486	Temporary contract	0.057	0.233
			Part time job	0.266	0.442
			Dependent children	0.808	1.120
Observations	2004279			868396	

Table A2. Effect of licensing laws on young workers absence behaviour in Spain, comparison group is older workers (>40 years)

	Total
Absence rate	
Treatment ≤20	-0.059
	(0.017)***
Treatment ≤25	-0.040
	(0.009)***
Treatment ≤30	-0.030
	(0.007)***
Minutes difference	
Treatment ≤20	-19.260
	(4.402)***
Treatment ≤25	-14.230
	(2.620)***
Treatment ≤30	-11.941
	(2.175)***

Note: All controls as per table. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, the 5%, and the 1% levels, respectively.