CORE
Metadata, citation and similar papers at core.ac.uk
Provided by Research Papers in Economics

CENTRE for ECONOMIC PERFORMANCE

CEP Discussion Paper No 947

August 2009

Did the National Minimum Wage Affect UK Prices?

Jonathan Wadsworth

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Abstract
One potential channel through which the effects of the minimum wage could be directed is that firms who employ minimum wage workers could have passed on any higher labour costs resulting from the minimum wage in the form of higher prices. This study looks at the effects of the minimum wage on the prices of UK goods and services by comparing prices of goods produced by industries in which UK minimum wage workers make up a substantial share of total costs with prices of goods and services that make less use of minimum wage labour. Using sectoral-level price data matched to LFS survey data on the share of minimum wage workers in each sector, it is hard to find much evidence of significant price changes in the months that correspond immediately to the uprating of the NMW. However over the longer term, prices in several minimum wage sectors – notably take-away foods, canteen meals, hotel services and domestic services - do appear to have risen significantly faster than prices of non-minimum wage sectors. These effects were particularly significant in the four years immediately after the introduction of the minimum wage.

JEL Classification: J6
Key words: Minimum wage, prices

This paper was produced as part of the Centre's Labour Markets Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

Acknowledgements
This work is based on a report for the Low Pay Commission. Thanks to Tim Butcher, Steve Machin and David Metcalf for helpful comments.

Jonathan Wadsworth is a Senior Research Fellow at the Centre for Economic Performance, London School of Economics. He is also Professor of Economics at Royal Holloway, University of London.

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission in writing of the publisher nor be issued to the public or circulated in any form other than that in which it is published.

Requests for permission to reproduce any article or part of the Working Paper should be sent to the editor at the above address.

© J. Wadsworth, submitted 2009

ISBN 978-0-85328-413-0

Introduction

When the national minimum wage, (NMW), was introduced in Britain, much effort focused on establishing the possible effects on the hours and employment prospects of those workers affected by its introduction. The consensus that emerged was that the overall effect on the level of employment in Britain was broadly neutral, (see for example Stewart, 2004). Given the lack of an employment effect, research has shifted toward establishing whether the margin of adjustment was borne elsewhere. Stewart and Swaffield (2005) establish that there may have been a small fall in the number of hours worked by low wage workers. Draca, Machin and VanReenen (2006) produce evidence to suggest that productivity may have risen more in firms that employ more low wage workers and that profitability may have fallen in firms that were more affected by the minimum wage introduction. There is also another potential channel through which the effects of the minimum wage could be directed. Firms that employ minimum wage workers could have passed on any higher labour costs resulting from the minimum wage in the form of higher prices.

The existing, limited, empirical literature on the price effects of minimum wages, summarised in Lemos (2008), has focused on the effect of the minimum wage on aggregate retail price inflation. Lemos (2008) concludes that the accumulated, worldwide, evidence on the effects of the NMW on aggregate price inflation appears to be small[1]. There have been fewer attempts to focus on prices in sectors that make use of a large number of minimum wage workers. A few notable studies make use of more disaggregated price data. Aaronson (2001) looks at fast food sectoral price variation across US states subject to different minimum wage levels and concludes that prices in this sector rise, with an elasticity of around 0.1, within one month of any minimum wage rise. MacDonald and Aaronson (2006) show that most fast-food outlets only raised the prices of a subset of their products in response to a change in the minimum wage, which suggests that there may be item-specific fixed costs to changing price, or demand elasticities that vary across goods. Aaronson, French and MacDonald (2005) use US establishment-level price data for the fast-food sector and conclude that price rises were most common in stores more likely to pay the minimum wage and that "most" of the higher costs faced by employers there are passed on to consumers almost immediately in the form of higher prices. Card and Krueger (1994, 1995) also analyse several different samples of establishment-level fast-food price data but conclude that "it is difficult to reach firm conclusions" about the relationship between minimum wages and prices. In the only existing UK estimates relating to prices Draca, Machin and Van Reenen (2005) outline sectoral-level retail price changes in three low-paying UK industries – take-away food, restaurants and canteens. The authors conclude that there was not much evidence of prices changes in these sectors at the time of the introduction of the NMW and the subsequent upratings to the end of 2002.

In what follows we apply a difference-in-difference strategy to give a more comprehensive assessment of the effects of the minimum wage of retail prices in the UK. We first use the Labour Force Survey (LFS) and the Annual Survey of Hours and Earnings (ASHE) to estimate the employee and the wage bill shares relating to minimum wage workers in each three or four digit UK industry sector in order to identify minimum wage goods and services. We then match these data to sectoral-level data on retail prices and look to see if there is any evidence that prices in minimum wage sectors, sectors that received the biggest shock to their wage bills, were changed more than elsewhere by the introduction of and subsequent changes in the minimum wage through to 2007. In particular we examine whether prices in those minimum wage industries rose at the months leading up to and

[1] With an elasticity of price inflation with respect to the NMW of around 0.04.

following the NMW introduction and subsequent upgrades and also whether prices in those industries rose, relative to prices in other industries in the longer term.

Section 2 sets out the theoretical considerations that underlie the study and which guide the search for appropriate data, while section 3 outlines the data and estimation techniques used here. Section 4 sets out the main results of the paper, namely that prices appear to have risen faster in several minimum wage sectors than elsewhere since the NMW was introduced. Section 5 concludes.

2. Theoretical Framework and Institutional Background

In May 1997, the UK government set up an independent Low Pay Commission, (LPC), consisting of representatives from employers, unions and academia to take evidence and make recommendations on the initial level of the NMW and subsequently on the size of any increases, based on monitoring and evaluation of its impact. Aside from the introduction, each uprating has been in the October of every subsequent year. The LPC typically gives its recommendations in February of each year and the government decides whether to accept its recommendations on the new level, if any, by March. Consequently employees and employers have around six months notice of any impending changes. Since inception there has been a separate adult rate for those aged 22 and over and a youth rate for those aged 18 to 21. From October 2004 there has also been a separate rate for 16 to 17 year olds.

The Low Pay Commission (2001) estimated that workers in 1.3 million jobs, some 5% of all jobs, were entitled to higher wages as a result of the introduction of the NMW of £3.60 for adults and £3.00 for youths in 1999. While the median annual percentage wage increase was estimated at around 20% for individuals entitled to the NMW, the impact on the aggregate wage bill was an average estimated rise of 0.35%. Of course, this increase in costs varied widely across sectors with differing fractions of low wage employees, ranging from 7 percent in the hairdressing sector to less than 0.1 percent in the IT sector. This variation across sectors is used inn the analysis that follows. Since 1999 the subsequent increases in the NMW have been more modest. The average percentage rise in the nominal level of the adult NMW between 2000 and 2007 was 5.5%. There were much larger increases in 2001, (10.4%) and in 2003 and 2004 (7.1% and 7.8% respectively).[2]

Price changes

Microeconomic consumer and labour demand theories indicate that a firm's potential set of responses to a cost increase depends on factors like the extent of competition in the firm's product market, the firm's ability to make compensating productivity improvements, the presence of imports or close substitutes not subject to the same cost increase, and also on the price elasticity of demand for the good in question. In the case of a cost increase induced by the minimum wage, then all domestic firms producing the same product will be subject to the same cost pressures, which will differ only by the share of minimum wage labour in production. Firms which use a higher share of minimum wage labour in their production process will be subject to the highest cost pressures, other things equal. In addition if there are any wage spillovers from the minimum wage, putting upward pressure on wages further along the wage distribution, then the effect on costs will be magnified.

The prices of substitutes and complements for the good also matter for pricing decisions. These prices in turn depend on the input costs of these substitutes and complements and the elasticity of each factor's supply. If labour is a substitute for capital

[2] See Low Pay Commission (2008) for more details on the levels and history of the NMW so far.

then firms can react to a rise in labour costs through capital substitution, reducing the number of employees, cutting hours, or by making productivity improvements. In many services the scope for capital substitution is limited and the labour share typically higher than for many manufactured goods. If so then these sectors should face higher upward pressures on costs. The more substitutes for a good, the more price elastic the demand. Moreover, the more a good competes with a potential substitute produced abroad not affected by the UK minimum wage, the harder it will be for UK firms to pass on cost increases and so maintain market share, other things equal. In this regard, we might expect many services, which are typically not traded abroad, to be able to pass on cost increases, other things equal. In short, the less competitive the market, the easier it is to pass on increases in the costs of production and maintain profit levels.

The demand for luxury goods, (where luxury goods are typically defined as any good having an income elasticity above one), is thought to be more price elastic than the demand for necessities. This is because price changes generate substitution effects – if the price of one good rises, consumers try to find cheaper substitutes - and price changes also generate income effects through their effects on real incomes – higher prices mean lower real incomes. So if the good is highly income elastic, demand will tend to be more responsive to price changes, other things equal. A given change in price reduces real incomes and demand for luxury goods falls more in response to a fall in real income than demand for necessities. A larger income effect for luxury goods then reinforces the substitution effect on the overall demand elasticity.

The larger the budget share (the proportion of total expenditure accounted for by the good), the greater the effect on real incomes from any price change of that good. However this does not guarantee that the proportionate change in demand will be greater, since this will only happen if the good is a luxury. So goods that comprise a high fraction of the budget share are not automatically price elastic goods.

Card and Krueger (1995) and Aaronson and French (2007) argue that the extent of labour market competition also has implications for prices. Under perfect competition for labour, wages equal the marginal cost of labour and the minimum wage raises the marginal costs of production and ultimately prices, since firms set prices related to marginal costs. Under monopsony, the minimum wage can reduce marginal costs, since the firm no longer has to raise wages to attract marginal labour. Lower marginal costs will tend to raise the demand for labour and hence increase output. Higher output should act to lower prices other things equal. However this will not hold if either firms price according to average costs, (since the minimum wage raises average costs under monopsony or perfect competition), or firms adjust the quality of output rather than quantity.

The less competitive the product market, the easier it is for firms to pass on increases in the costs of production and maintain profit levels. The more substitutes for a good, the more price elastic the demand and the harder it becomes for firms to raise prices. Moreover, the more a good competes with a potential substitute produced abroad not affected by the UK minimum wage, the harder it will be for UK firms to pass on cost increases and so maintain market share, other things equal. Many services, which are typically not traded abroad, may be more able to pass on cost increases.

In the absence of detailed information at the firm level on any of these factors it is hard to isolate their respective effects. The price outcomes that we observe are thus the net result of all these influences and others.

Inflation response to price shock

In the absence of detailed information at the firm level on any of these factors in the UK it is hard to isolate their respective effects. The price outcomes that we observe are thus the net

result of all these influences and others. The mechanics of price adjustment have been studied extensively in the macroeconomics literature concerning the existence or otherwise of price rigidities. Indeed Cabellero and Engle (2003) argue that the microeconomic response of firms to price shocks is lumpy and invariant and that failure to allow for this possibility when modelling the adjustment process can lead to upward biased estimates of the speed of adjustment.

Even though we are concerned realised price movement and not with modelling the adjustment process, it is helpful to consider what different patterns of price adjustment imply about what to expect from realised movements in price data. If prices at a representative firm simply followed a random walk

$$P_t = P_{t-1} + e_t \tag{1}$$

then this month's price (or whatever unit of time the subscript t measures) equals last month's price, give or take any positive or negative shocks which cause a firm to adjust its prices in the intervening period. The price level series will exhibit periodic mean shifts around a rising trend, (Figure 1). The monthly change in the price level is $\Delta P_t = P_t - P_{t-1} = e_t$ so the price level changes only when there is a new shock at time t, e_t, and otherwise remains at the same level. The one-monthly inflation rate has a single period spike at the point where prices are raised and remains at zero in all other periods where there is no price change. The height of the spike corresponds to the relative size of the price increase. By repeated substitution for lagged prices in (1), the current price level can be shown to equal the sum of all previous shocks following on from the previous price level. Over a twelve month window then $P_t = \sum_{j=0}^{11} e_{t-j} + P_{t-12}$ and the annual inflation rate is

$$(P_t - P_{t-12})/P_{t-12} = \sum_{j=0}^{11} e_{t-j} / P_{t-12} \tag{2}$$

Hence the inflation rate will also only adjust whenever there is a new shock (or shocks), and the inflation rate also embodies the history of all previous shocks. The annual inflation rate series will display a crenulated pattern with periodic upward (or downward) mean shifts.[3] However the annual inflation rate is also influenced by the price level (and hence previous shocks) from 12 months earlier. This makes it harder to use the inflation rate to pinpoint the timing of any movements in the price level, since the inflation rate can be influenced by factors that affected prices in the past.

However, the accumulated evidence suggests that; the average firm adjusts its prices around once or, perhaps, twice a year, (Taylor, 1999; Hall, Walsh and Yates, 2000; Bils and Klenow, 2004; Nakamura and Steinsson, 2008). Large firms tend to adjust prices more than smaller firms, Apel et al (2003), Ball and Mankiw (1994); firms in competitive sectors review and adjust prices more than firms in less competitive sectors, Carlton (1986), Hall et al. (2000). The evidence from Alvarez et al (2006) suggests that the frequency of price adjustment in the Euro area is around half that in the US and, interestingly, most frequent of all in the food sector and least frequent in the rest of the service sector in which most of the minimum wage sectors in what follows are found. Hence the timing of a firm's price adjustments depends on the size of the shock relative to any costs of adjustment (state dependence) and on whether firms have a preference for adjusting prices on a set date

[3] Any price index also follows a similar pattern to the inflation rate.

irrespective of the size of the shock (time dependence). If prices are adjusted before the minimum wage comes in then the upward mean shift in the price series will begin earlier so that the timing of these patterns in the price data need not begin with the minimum wage uprating.

Since there are no available nationwide data on individual firm pricing behaviour, researchers only have access to aggregated data at the sectoral level comprised of the pricing behaviour of many different firms.[4] If all firms behave the same and adjust prices at the same time, then the aggregate price data series will also follow the same pattern as that of the representative firm. This suggests that it may still be possible to use sectoral level price data to test for either breaks in the annual inflation rate series, The literature (see for example Bai and Perron (1996) typically does this by looking for significant changes in the value of the intercept term in the inflation rate series.

Unfortunately, the accumulated evidence on pricing behaviour suggests that firms in the same sector do not always adjust their prices at the same time, (see Lach and Tsiddon, 1992; Sheshinski and Weiss, 1993). Moreover different firms often make different sized price adjustments to the same shock. This gives another potential source of variation in timing of any price changes if a subset of firms chooses to adjust prices in anticipation of a forthcoming increase. Since each sector retail price is an average of the prices of different firms with different structures, the larger the level of aggregation the more likely it is that these firms will be operating in different markets. If firms adopt either a state or time-dependent pricing policy, then prices at individual firms will also jump discretely at different time periods, as firms hold prices fixed, absorbing any intermediate shocks until the date of the next price adjustment. As such the range of price responses that might be expected will also vary, making it much less likely that a distinct crenulated pattern will be produced in aggregate price series data than at the level of the firm. Even though the minimum wage affects all firms at the same time, so that the timing of the shock does not differ across firms, the size of the shock will, depending on the wage bill share of minimum wage workers; the minimum wage labour share of different firms; and when the firm decides to adjust its prices.

As a result, it is straightforward to show that the sectoral price level (and price index) moves toward the new level in a series of smaller, discrete jumps than in the uniform response model outlined above, since the price level at any point in time is a weighted average of those firms who have adjusted prices in that period and those who have not. Indeed Caplin and Spulber (1987), show that it is possible that the timing of adjustment could be uniformly distributed, so that the same proportion of firms adjust their prices to a given shock in each subsequent time period. Hence, price levels adjust continuously and there will be no discrete breaks in the price or inflation series. Nevertheless if prices are adjusted infrequently the price adjustment will be long-lasting and the impact of shocks on prices could only be measured in the long run. For this reason we adopt a second approach in what follows by also looking at long run differences in prices between minimum wage sectors and other industries.

The pricing behaviour and cost structures of suppliers in the firm's production process also matters, Gordon (1981). With the introduction of the suppliers to minimum wage firms, Blanchard (1987) shows that prices respond more gradually as firms react to a change in their suppliers' prices.[5] It is also possible then that there will be a difference between the short-run and long-run response of firms to an increase in their production costs and of consumers to changes in prices. It is easier for firms to switch production techniques in the long-run and

[4] Though these data exist, since price returns for a representative sample of firms/retail outlets form the basis on which the Retail Price Index is calculated in the UK.

[5] In the absence of disaggregated UK input-output data it is not possible to track the minimum wage content of supply chains.

this will tend to reduce upward pressure on prices. It is also easier for consumers to change their consumption patterns over time away from more expensive goods, making demand more price elastic in the long run, which should also act to maintain downward pressure on prices.

Given all this, the one-month inflation rate will display a series of spikes at each adjustment period, rather than a single spike at the time of a change in the NMW, (Figure 2). These spikes will be smaller than if a single price adjustment were observed. The more periods in which prices are adjusted the more spikes in the monthly inflation rate and the smaller the height of each spike. If in every period there are always some firms who are observed adjusting prices then the aggregate monthly inflation rate will also adjust in every period. The yearly inflation rate will also approach its new steady state level (and remain there for a shorter period), but the size of the intermittent price adjustments can create volatility in the inflation rate series during the adjustment period. Moreover the behaviour of prices twelve months earlier also affects the behaviour of the 12-month rate as it adjusts to its new steady state level. With different products and hence different prices in the aggregate then any pattern in the data become less distinct again.

In short, heterogeneity in both pricing behaviour and market structure across firms, makes it difficult to follow a strategy of trying to identify structural breaks from sectoral-level price and inflation data. However it remains true that retail prices in a sector subject to a larger wage shock might be expected, other things equal, to be higher than in sectors not subject to as large a wage shock. The next section therefore pursues this idea further.

3. Data and Estimation

We first use the earnings and industry affiliation information contained in each wave of the LFS and ASHE to obtain a ranking of industries at 4-digit level by i) the wage bill share of workers paid at or below the minimum in each year and ii) the share of this minimum wage labour in total costs (the labour share). For the LFS we pool across 4 quarters to give around 50,000 wage observations in each calendar year. For ASHE we use the single point in time estimates in April of each year. Both data sets are not without measurement problems. In the LFS, prior to the summer of 1999, each adult was asked to provide information on their employment circumstances and, if in work, their gross weekly wage. As such, the hourly wage has to be derived for all employees currently in work by dividing gross weekly pay by usual normal hours plus usual paid overtime. While the ASHE sample is three times as large as the LFS sample, its sample frame (in the 1990s) was based on employees earning more than the National Insurance weekly earnings threshold and so under-sampled many part-time, low paid-workers.

A separate database on a sample of firm company accounts, Financial Analysis Made Easy, (FAME), provides complementary data on the aggregate wage bill and value added (gross profits) of each firm. We can therefore calculate the labour share[6] for each 4-digit industry in order to arrive at an estimate of the share of minimum wage workers in total costs. Aaronson and French (2007) argue that the appropriate measure in the denominator of total costs should be intermediate consumption rather than value added, the latter is the only data available in FAME. We can then rank each 4-digit industry. If there were one-to-one pass

[6] Defined as the wage bill divided by the sum of the wage bill and gross profits. Table 1 uses the LFS to estimate the NMW wage bill share. A Table based on ASHE to estimate the wage bill share is available on request. The rankings do not change much.

through of the minimum wage we would expect industries with the highest minimum wage share in total costs to raise prices more.

Table 1 lists the top ten sectors by the NMW wage share in total costs for 1998/99 and for 2004/5. In the year prior to the introduction of the minimum wage, the retail sector employed around 25% of all potential minimum wage workers, those adults age 22 and over and who were paid below the nominal introductory rate of £3.60 an hour. However other service sectors employed proportionately more minimum wage workers as a share of their own employees. Take-away food shops, hairdressing, mini-cabs and pubs are notable and persistent low paying sectors. It is perhaps here, where minimum wage workers account for upwards of twenty percent per cent of total costs, that pressures on costs and potentially prices would be expected to be larger. Of the top ten low paying industries, all are services and only one, industrial cleaning, is not a consumer service. Together these 9 consumer services employed around 15% of all NMW workers.[7] While somewhat noisy, because of the measurement error implicit in the calculation of the hourly minimum wage in the LFS data, the sector ordering does not change much if the share of the minimum wage worker wage bill in the total wage bill for that sector is used to rank industries. Eight of the ten low paid sectors remained in the top ten in 2004/05, though the shares of all employees paid the minimum had fallen in each of these sectors. The new low paying sectors in 2004/05 are retail and private nursery schools. [8]

Most of these minimum wage industries are consumer services and so can be matched to the basket of 120 or so goods and services used to calibrate the (weighted) index of retail prices produced by the Office of National Statistics (ONS). As such monthly price indices for eight of the top ten minimum wage sectors are readily available. In addition the ONS produces aggregated monthly price indices for the "items" that comprise these main sectors.[9] While the minimum wage shares cannot be calculated for these sub-categories it is possible to test whether the item-level price indices in each category move together or whether there is any evidence of variation within each sector. Items also move regularly in and out of the sectoral series according to consumer buying preferences. There are however 35 items with at least 7 years of data that straddle the two year period before the introduction of the NMW and after. These goods and services are used in the item-level regressions that follow. A full list is given in the appendix. There is no sectoral-level RPI for mini-cab services but there is an item-level series. The one producer service, industrial cleaning, in the top ten can be matched to a separate quarterly producer price series produced by the ONS. Since it is difficult to obtain price data for the retail sector as a whole or for private primary schools, in the analysis that follows we restrict the sample to the nine low paying consumer services identified in 1998/99.

Note that the share of adult NMW workers in the sectoral workforces tends to fall over time. Net of any measurement error, we might expect some of these workers in these sectors will have been swept up beyond the minimum wage over time, if growth or

[7] According to ASHE the two largest minimum wage sectors are bars (SIC 5540) and the primary education sector (SIC 8010) who each accounted for some 15% of all minimum wage workers in 1999. Retail superstores accounted for a further 6% of the total despite not featuring in the top ten rankings in Table 1. The LFS does not disaggregate the retail sector below 2 digit level.

[8] Around 20% of all employees in the retail sector were paid at or below the NMW according to the 1998/99 LFS. The majority of private primary school workers at the NMW are classified as being in "childcare service" occupations, typically nursery school workers. Another notable low paying sector are "religious organisations". For this group accommodation may well be provided in-kind with the job and so we exclude them from the list. The minimum wage recipients in mini-cab services are typically office workers rather than the (self-employed) drivers.

[9] For example the Take-Away Food category in the RPI is currently based on weighted information of 15 different take-away items ranging from fish and chips to pizza to beef burgers, sandwiches, tea and coffee.

productivity changes leads to changes in the structure of the workforce or its compensation structure. As such the impact on prices of any given percentage change in the NMW might be expected to decline over time.

4. Results

We next outline who buys these goods and services in Table 2 by noting the share of total expenditure of each item consumed by the different household types based on FES data.[10] Who buys goods and services produced by minimum wage workers also matters for the "real income" effects of a minimum wage. Since any given nominal rise in wage income could theoretically be offset by a rise in prices, then if the prices of goods and services consumed by minimum wage workers increased proportionately in response to the minimum wage, recipients of the minimum wage would be no better off in real terms.[11] If consumption of minimum wage goods and services were distributed evenly across the population, we would expect these households to account for a similar share of total consumption. However, if minimum wage households were the only consumers of minimum wage goods then any price effects of the NMW would be exclusive to NMW households. This then is a matter for empirical verification.

In 1998/99 (potential) minimum wage households comprised just under 12% of all households. It is apparent from Table 2 that minimum wage households do not account for the majority of total consumption of these minimum wage goods and services. The share of total consumption of some goods is higher than the population share, but never larger than 18%, (for take-away food, canteen meals and alcohol bought in pubs). As such, any NMW price effects will not be exclusive to minimum wage households. For some minimum wage goods, (domestic cleaners, dry cleaning and laundry and hotels), NMW households spend disproportionately less. So for these goods any price effect on real incomes of minimum wage households will be small. With the exception of restaurant meals, alcohol bought in pubs and take-away food, these minimum wage goods and services generally account for a small fraction of the total consumer budget (net of housing costs). For these goods, any change in total real income from any price change will also be small. Even for goods with a 2 to 4% share of the net of housing household budget, such as alcohol in pubs and restaurants, then a 10% rise in prices in one of these goods, will reduce real incomes by around 0.2%, other things equal.[12]

Incidence of price changes

Given an average labour share of around 0.7, and assuming no spillover effects, the results in Table1 suggest that a 10% rise in the minimum wage might be expected to raise total costs by around 2-3% in the take-away food sector, other things equal, and by around 1% in the hotel sector.[13] Whether changes in costs of this magnitude result in commensurate changes in prices is the next task. Figure 3 plots the yearly inflation rate prevailing in each month for each of the minimum wage goods. The vertical lines on each graph correspond to the periods when the NMW was introduced and subsequently uprated.[14] The inflation rate series in

[10] See Wadsworth (2007) for details on using the FES to estimate "minimum wage households".

[11] This point was made almost 100 years ago in the debate surrounding the introduction of the Wages Councils , see Webb and Webb (1911), pp. 780-83.

[12] Housing accounts for around 15 to 20% of total household spending over the sample period. If the prices of all the 9 NMW goods and services used in the Table rose by 10% then real incomes would fall by around 1%.

[13] For take-away foods, 10*0.4*0.7 =2.8

[14] The smaller October 2000 and 2002 NMW increases (2.8% and 2.4% respectively) are not drawn in Figure 3.

Figure 3 display few obvious signs of discrete jumps. When they do, as for example with restaurant meals, the jumps do not appear to occur at the same time as the NMW changes.

Figure 3 also tracks the yearly change in the retail price index (the inflation rate) of each minimum wage good identified alongside the change in the overall retail price index for each month beginning in 1996. This indicates that the inflation rate for these minimum wage goods was generally higher than retail price inflation as a whole over the full sample period. This is perhaps not too surprising given the labour-intensive nature of many of these services. The aggregate RPI does not rise at the time of the NMW changes, indicating that overall the NMW had little impact on overall prices in the month of implementation. Indeed as the bottom right hand side panel of Figure 3 shows, average retail price inflation seems to fall at the points when the NMW was adjusted.[15]

As a more formal summary of whether the price inflation for these goods was different in the periods after any minimum wage changes, Table 3 reports the results of simple regressions of the monthly inflation rate – specifically the monthly change in the log price index - for each good over a 136 month period, beginning in January 1996, on a dummy variable that takes the value one if the minimum wage is "on" (ie introduced or uprated depending in that particular month and a constant, which captures the average inflation rate in the "minimum wage off" period.

$$\Delta LogP_t = \alpha + \sum_{t=T1}^{T2} \delta_t Min_t + \varepsilon_t \qquad (3)$$

where $Min_t = 1$ if Minimum wage adjusted in period t, = 0 otherwise. The coefficient on the dummy variable then measures the average change in the inflation rate in the months when the minimum wage was adjusted relative to the "minimum wage off" months. To allow for lagged or leading effects of the minimum wage, dummy variables for the 2 months before and after any wage hike are also included. Table 3 reports the results of the OLS estimation of equation (3). With the exception of industrial cleaning, it is hard to find evidence of any significant effects on sector-wide prices around the time of the minimum wage upgrades in any of the other sectors.

The results for the 35 minimum wage items are given in Table A4 of the appendix. There are significant positive price effects on the adjustment dummy in the month of implementation only for take-away tea and coffee and the price of a glass of wine in a pub. This is weakly consistent with MacDonald and Aaron's (2006) findings in the US that low wage sectors often only change the prices of a subset of their products in response to an NMW increase.

Since interrogation of the individual sector price series may put excessive demands on the data – there are at most 8 data points that the "Min.Wage On" dummy represents - Table 4 reports the results of a pooled estimator, estimated at both sector and item-level, that combines sectors/items together allowing for the presence of sector/item fixed effects α_i that net out any tendency for certain sector prices to be typically higher (or lower) than average. The estimation also nets out any year and month effects common to all price series, (β_t and γ_m respectively). [16]

[15] Appendix A3 gives the tests of stationarity with a deterministic trend against a non-stationary series with drift for each of the minimum wage goods that we identify. In each case the null of a random walk with drift cannot be rejected.

[16] To allow for autocorrelation the standard errors in the individual series regressions are adjusted using a Newey-West correction factor of order one. The standard errors in the pooled regressions are adjusted using the fixed effects robust correction suggested by Wooldridge (2002).

$$\Delta LogP_{it} = \sum_{t=T1}^{T2} \delta_t Min_t + \alpha_i + \beta_t + \gamma_m + \varepsilon_{it} \quad (4)$$

The pooled results at sector-level (column 2) indicate a positive but insignificant effect on the prices of minimum wage goods in the month in which the minimum wage is introduced or upgraded. The pooled item-level estimates (column 4) suggest that there is an average significant positive effect, in the order of 0.2 percent, on prices in the month of any adjustment.[17] No such effect is observed among the other non-minimum wage goods (column 3). There are also smaller, but statistically significant prices effects in the two months after any minimum wage adjustment for minimum wage items, and for non-minimum wage items there are positive effects two months after and two months before any adjustment.[18]

If however firms have preferences for adjusting prices on specific dates then it may be that they are willing to absorb (small) cost shocks in the short run and then adjust prices at a given date in the future. This then warrants an investigation of when prices typically adjust in the sectors central to this study. Hendry, Johansen and Santos (2006) show that it is possible to find and produce unbiased estimates of any spikes in a time series despite having to saturate the model with "pulse dummy variables". Their suggested approach is to create N period-specific dummy variables and then to regress the 1st N/2 dummies on a sample of N, saving any significant variables. This strategy is then repeated for the 2nd N/2 dummies. The set of significant dummies from the two regressions are then combined in a single regression.[19]

Figure 4 graphs the monthly change in each sector-level price series in order to help identify any significant pulses in the data. Table 5 presents the results of the pulse dummy approach to estimate the periods in which prices changed significantly for each of the sectors. The data confirm that there are periods for each sector in which prices are raised (or lowered) significantly and that often these changes occur at the same time each year for each sector, but not always at the time of any minimum wage upgrade. The domestic service sector, for example, typically adjusts its prices in January and the price of alcohol in pubs is typically adjusted in March or April, around the time of the budget. The introduction of the NMW certainly generated the largest cost increase compared to any of the subsequent upratings, (now outlined in the text). However there is no evidence in the monthly pulse dummy estimates in Table 5 that prices rises were any higher during this period.

This exercise is then repeated for each of the 35 minimum wage good items.[20] The results are available on request, but it is apparent that for several items, prices did appear to rise significantly in the month in which the minimum wage was introduced, April 1999, the period which also generated the largest rise in labour costs compared to subsequent increases. For some items, (for example pub meals, school meals, take-away drinks), the size of these

[17] These results do not change significantly if we add another 5 minimum wage items with at least 7 years of continuous data but not covering the period before the NMW was introduced. If retail food items, a potential minimum wage sector, are dropped from the list of non-minimum wage goods in column 3, the "minimum wage on" dummy becomes significantly negative -0.0017 (0.0007).

[18] We also used month of announcement rather than month of introduction of the NMW level to centre the dummy variables in order to test whether there is any evidence of anticipation effects. The results, available on request, show little sign of any price hikes in the month the NMW level is announced.

[19] The (mean shift) structural break techniques advocated by Bai and Perron (2003) are more suited to sustained breaks in the series rather than the analysis of single pulses in the series.

[20] Not all the sectors are represented here in the item-level estimates because there is no consecutive seven year monthly price series for certain items spanning the requisite time periods. The Hotel sector is notably absent from these item-level regressions.

price increases were however similar to those observed in the months and years prior to the introduction of the NMW, while for others, notably secondary school dinners, the size of the April 1999 price increase was significantly higher. For other items, notably pub drinks, there is no significant April 1999 effect, consistent with the more aggregated results in Table 4. Again this gives some support to the idea that certain items may have larger fixed costs of changing or may have different demand elasticities than others. However, thereafter it is harder to detect any clustering of prices rises in the months in which the NMW was subsequently upgraded. For example, April or May continues to be the month in which the prices of many pub drinks and haircuts are raised.

In summary the evidence of significant price changes in the months that correspond immediately to the uprating of the NMW is mixed. There is perhaps more evidence however to suggest that the introduction of the NMW in April 1999 and the larger cost shock associated with this compared to subsequent NMW upratings, coincided with significant price increase for some industries.

However this does not necessarily mean that prices did not change as a result, only that there is less evidence of single coordinated price hikes. We therefore now examine whether the relative prices of minimum wage goods changed over a longer period. If prices are changed infrequently, the inflation adjustment process would be slow and we would not necessarily expect spikes in inflation but rather a very slow increase in inflation. As such using monthly price indices, this impact would not be visible. Any price adjustment will be long-lasting and the total impact of shocks on prices could only be measured in the long run.

Difference-in-difference estimates

In order to measure the rate of inflation of minimum wage goods over a longer period of time relative to other goods, we estimate a simple difference-in-difference regression model pooled over the monthly observations on the *annual* inflation rate prevailing in each month t of both minimum wage and non-minimum wage goods over the period January 1997 to a) first December 2003 and then b) December 2007.

$$Inflation_{it} = b_0 + b_1 MinWageGood + b_2 April99 + b_3 MinWageGood * April99 + u_{it} \qquad (5)$$

where "MinWageGood" is a dummy variable to indicate whether the good i is a minimum wage good (1 = yes, 0 = No); "April99" is a dummy variable to indicate whether the inflation observation is before or after April 99, (1 = yes, 0 = No), and the third term is the interaction of the two dummy variables. The estimated coefficient on the constant, b_0, gives the average yearly inflation rate for non-minimum wage goods over the period before the minimum wage was introduced. The estimated coefficient on the "MinWageGood" dummy, b_1, gives the difference between the average inflation rate for non-minimum wage goods and minimum wage goods in the period before the minimum wage was introduced. The coefficient on the April99 dummy variable, b_2, gives the change in the average inflation rate for non-minimum wage goods after the minimum wage was introduced and the coefficient on the interaction term, b_3, is the change in the inflation rate for minimum wage goods relative to the RPI in the period after the minimum wage was introduced – the difference-in-difference estimator.

Since the choice of appropriate counterfactual is not obvious – for example aggregate retail prices are influenced in part by the prices of imports which are not subject to the same labour-input cost pressures – we compare prices against the all items inflation rate, the inflation rate excluding housing and the inflation rate for a basket of goods with a high

domestic share of production but which do not employ as large a fraction of minimum wage workers as the other goods set out in Table 1.[21]

Table 6 confirms the impression of Figure 3 that price inflation of minimum wage goods was significantly higher than the aggregate inflation rate in the period leading up to the introduction of the NMW. On average, the annual inflation rate for minimum wage goods was around 1 percentage point higher than general RPI inflation over the period, (panel i, column 1); some two points higher than RPI inflation excluding housing, (panel ii column 1) and little different compared to a basket of non-minimum wage goods, (panel iii, column 1). This (unweighted) average conceals significant differences in the inflation rates for the individual minimum wage goods. Inflation for canteen meals and hairdressing was one to two points higher than that of take away food before April 1999.

The difference-in-difference estimates suggest that in the period after the minimum wage was introduced, relative retail price inflation of these minimum wage goods was, on average, an *additional* 0.7 points higher, (panel i, row 4, column 1). So not only were prices of minimum wage goods rising faster in the period before the minimum wage, they rose by an even greater rate relative to other goods in the period after.[22] When benchmarked against retail prices excluding housing, the central estimate of the relative increase is around 0.4 points, (panel ii, row 8, column 1) and when benchmarked against the basket of other goods the relative increase is around 0.9 points, (panel iii, row 12, column 1).

Again these average estimates disguise differences in the individual price series. However the extent of the price rises is not correlated strongly with the NMW cost share rankings outlined in Table 1. If we instead use the estimated NMW share in total costs rather than a simple dummy variable, (not shown but available on request), the interaction term is insignificantly different from zero. Similarly, Table 1 suggested that the take-away food might be expected to face the largest upward pressure on prices from the NMW. However it seems that the prices of domestic services rose most sharply in the period after April 1999, by more than 2 percentage points than the benchmark inflation rate, (panel i, column 9).[23] In contrast, the relative price of hairdressing services changed little after April 1999, (panel i, column 10).[24] When benchmarked against the RPI excluding housing, the sector rankings are unchanged but the size of any differential price effects in the period after April 1999 are smaller. Nevertheless the inflation rates for take-away foods, canteen meals, hotel services and domestic services all grew significantly faster in the period after April 1999. When compared to the basket of non-minimum wage goods, it is apparent that while inflation rates between the minimum wage and non-minimum wage sectors were not significant in the period before April 1999, they became significantly higher after April 1999 for the same four sectors of take-away foods, canteen meals, hotel services and domestic services.

The equivalent regressions for the individual item inflation series are given in Table A6 of the appendix. The difference-in-difference estimates of the minimum wage effect are rather varied. Inflation for some items is faster than average after April 1999 and slower than average for other items. However the inflation rate for some items, notably burgers, (evening) restaurant meals, canteen meals, fish and chips, domestic services and hairdressing services

[21] These goods are: soft drinks, alcohol off sales, sweets, tobacco, books, furniture, gardening products. These are not free of minimum wage influences since many of them will be sold in shops whose staff are covered by NMW. A graph of their respective inflation rates is given in Figure A3

[22] The coefficients in column one indicate that the inflation rate for minimum wage goods was 3.9% in the period after April 1999 compared to the retail price index average of 2.2% for the same period.

[23] The difference-in-difference estimates are the relative inflation rate differences. To obtain the actual inflation rates for the goods in period 2 add all four coefficients for the minimum wage goods, the coefficient on the constant and the April 1999 dummy for the other goods.

[24] In other words prices of hairdressing service continued to rise faster than the prices of other goods, (row 2 column 2), but this price differential did not change significantly in the period after April 1999.

all increased relative to the average inflation rate in the four years after the NMW was introduced. Since these items belong to the four sectors that show the greatest rise in the relative inflation rate in Table 5, this seems to be consistent with the pattern of price behaviour already observed.

In summary then it seems that there is some evidence to suggest that the prices of domestic services, hotel services, canteen meals and take-away food all rose by a significantly greater rate – in the order of 0.5 to two percentage points - than the prices of other goods in the period after the minimum wage was introduced.

Robustness checks

Table 7 extends the window of observation by four years to cover the end of 2007. It seems that the inflation effects of minimum wage goods are smaller when compared to the aggregate inflation rate but little changed when benchmarked against the inflation rate for the basket of non-minimum wage goods.[25] While the 2004 rise in the NMW, of 7.9%, was relatively large, the average increase over this latter period is lower than in the earlier period. Allied to the apparent falls in the share of NMW workers in each sector that observed in Table 1 and any (unobserved) productivity improvements, this may explain the smaller response over the longer period. As such the impact of and given percentage change in the NMW on prices might be expected to decline over time. The item-level equivalent regressions are given in Table A3. Again it seems that the prices of certain items within a sector appear to respond more than others.

In order to test whether these relative price movements were also present before the NMW was introduced, Figure 5 graphs the results of a set of difference-in-difference estimates where the treatment intervention threshold period is allowed to vary. The left most estimates are based on data using a sample window in which the NMW was not in existence. Then the window is changed by one month forward, keeping the sample size, and the number of before and after treatment periods fixed. The vertical line in the graphs indicate the first estimation period in which a time period relating to a month after the NMW was introduced appears in the treatment dummy. Thereafter the treatment window includes successively more NMW periods culminating in the final set of estimates where all periods in the treatment window correspond to periods after the NMW. This is the same period as that on which the estimates in Table 6 are based. A necessary condition for the existence of a NMW effect on prices therefore would be that the DiD estimates should become larger as more NMW periods enter the treatment window. This is exactly what is observed for 6 of the 9 minimum wage price series we observe. The exceptions are hairdressing, dry cleaning and UK hotel sectors, where the DiD effect falls over the period[26]. This suggests that prices in these three sectors were rising faster than aggregate inflation before the NMW arrived, consistent with the patterns observed in Figure 3.

5. Conclusion

In summary there may be some evidence to suggest that some firms who employ minimum wage workers could have passed on some of the higher labour costs resulting from the

[25] The aggregate inflation rate was some 0.5 points higher in the period 2003-2007 than between 1999 & 2003. The inflation rate among the basket of non-minimum wage goods was little changed over the same two time periods which explains the general result. If we include seven interaction dummies (one for each NMW period) rather than one, the estimated coefficients – available on request – confirm the idea of a stronger price response in the earlier period, though larger price responses do not always follow larger percentage rises in the NMW.

[26] The price data for these series begin in 1995 and 1997 so estimates do not exist before these periods.

minimum wage in the form of higher prices. The prices of several minimum wage sectors, notably domestic services, hotel services, canteen meals and take-away food all rose by a significantly greater rate – in the order of 0.5 to two percentage points a year - than the prices of other goods in the period after the minimum wage was introduced. There is also some evidence that low wage sectors may change the prices of a subset of their products in response to an NMW increase, though more work needs to be done here should firm level price data become available. However the extent of any price rises do not appear to rise in line with the share of minimum wage workers in total costs share rankings, suggesting that a simple pass-through model of price changes may not hold. There is less evidence that prices of minimum wage goods rise in the month of any minimum wage upgrade – with the possible exception of April 1999 when the minimum was introduced and the magnitude of the wage cost shock was higher than in any subsequent upgrade. Nor does there appear to be much evidence of anticipation effects in specific months. Firms do not appear to change prices when the new level of the NMW is announced six months prior to its introduction. Rather any effects on prices appear to accumulate gradually over time.

References

Aaronson, D. (2001), 'Price Pass-Through and the Minimum Wage', Review of Economics and Statistics, Vol. 83, pp. 158-169.

Aaronson, D., French, E. and MacDonald, J. (2005), 'The Minimum Wage, Restaurant Prices and Labor Market Structure', Journal of Human Resources, Vol. 43, No. 3, pp. 688-720.

Aaronson, D. and French, E. (2007), 'Product Market Evidence on the Employment Effects of the Minimum Wage', Journal of Labor Economics, 2007, Vol. 25, No. 1, pp. 167-200.

Alvarez, L., Dhyne, E., Le Bihan, H., Veronese, G., Dias, D., Hoffman, J., Jonker, N., Lunnemann, P., Rumler, F. and Vilmunen, J. (2005), 'Sticky Prices in the Euro Area. A Summary of New Micro-Evidence', Journal of the European Economic Association, Vol. 4, No. 2-3, pp. 575-584.

Bai, J. and Perron, P. (1996), 'Estimating and Testing Linear Models with Multiple Structural Changes', Econometrica, 1998, Vol. 66, pp. 47-78.

Bai, J. and Perron, P. (2003), 'Computation and Analysis of Multiple Structural Change Models', Journal of Applied Econometrics, Vol. 18, pp. 1-22.

Ball, L. and Mankiw, G. (1994), 'A Sticky-Price Manifesto', Carnegie-Rochester Conference Series on Public Policy, Vol. 41, pp. 127–151.

Bils, M. and Klenow, P. (2004), 'Some Evidence on the Importance of Sticky Prices', Journal of Political Economy, Vol. 112, No. 5, pp. 947-985.

Cabellero, R. and Engel, E. (2003), 'Adjustment is Much Slower Than You Think', Economic Growth Center Discussion Paper No. 865, Yale University.

Caplin, A. and Spulber, D. (1987), 'Menu Costs and the Neutrality of Money', Quarterly Journal of Economics, Vol. 102, pp. 703-725.

Card, D. and Krueger, A. (1994), 'Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania', American Economic Review, Vol. 84, No. 4, September, pp. 772-793.

Card, D. and Krueger, A. (1995), 'Myth and Measurement. The New Economics of the Minimum Wage', Princeton University Press.

Carlton, D. (1986), 'The Rigidity of Prices', American Economic Review, Vol. 76, No. 4, September, pp. 637-658

Draca, M., Machin, M. and Van Reenen, J. (2005), 'The Impact of the National Minimum Wage on Profits and Prices: Report for Low Pay Commission' http://www.lowpay.gov.uk/lowpay/research/pdf/NMW_profits_and_prices.pdf

Gordon, R. (1981), 'Output Fluctuations and Gradual Price Adjustment' Journal of Economic Literature, Vol. 19, No. 2, June, pp. 493-530.

Hall, S, Walsh, M. and Yates, A. (2000), 'Are UK Companies' Prices Sticky?', Oxford Economic Papers, Vol. 52, pp. 425–446.

Hendry, D, Johansen, S. and Santos, C. (2006), 'Selecting a Regression Saturated by Indicators', University of Oxford Working Paper.

Lach, S. and Tsiddon, D. (1992), 'The Behavior of Prices and Inflation: An Empirical Analysis of Disaggregate Price Data', Journal of Political Economy, Vol. 100, No. 2, pp. 349-389.

Lemos, S. (2008), 'A Survey of the Effects of the Minimum Wage on Prices', Journal of Economic Surveys, Vol. 22, No. 1, pp. 187-212.

Low Pay Commission, (2001), *The National Minimum Wage: Making a Difference. Third Report of the Low Pay Commission* http://www.lowpay.gov.uk/lowpay/report/pdf/report3.pdf

Low Pay Commission (2008), *The National Minimum Wage: Low Pay Commission Report 2008,* http://www.lowpay.gov.uk/lowpay/report/pdf/2008_min_wage.pdf

Macdonald, J. and Aaronson, D. (2006), 'How Firms Construct Price Changes: Evidence from Restaurant Responses To Increased Minimum Wages', American Journal of Agricultural Economics, May, pp. 292-307.

Nakamura, E. and Steinsson, J. (2008), 'Five Facts About Prices: A Reevaluation of Menu Cost Models', Quarterly Journal of Economics, Vol. 123, No. 4, pp. 1415-1464.

Sheshinski, E. and Weiss, Y. (1993), 'Optimal Pricing, Inflation and the Cost of Price Adjustment', MIT Press: Cambridge Massachusetts.

Stewart, M. (2004), 'The Employment Effects of the National Minimum Wage', Economic Journal, Vol. 114, pp. C110-116.

Stewart, M. and Swaffield, J. (2008), 'The Other Margin: Do Minimum Wages Cause Working Hours Adjustments for Low Wage Workers?', Economica, Vol. 75, Issue 297, pp. 148-167.

Taylor, John B. (1999), 'Staggered Price and Wage Setting in Macroeconomics', in *Handbook of Macroeconomics*, (eds.) J. Taylor and M. Woodford, pp. 1009–1050, Amsterdam: Elsevier Science.

Wadsworth, J. (2007), ''Did the Minimum Wage Change Consumption Patterns?', Report to Low Pay Commission, February, http://www.lowpay.gov.uk/lowpay/research/pdf/t0Z96GK8.pdf

Webb, B. and Webb, S. (1911), *Industrial Democracy*, Macmillan Press: London.

Wooldridge, J. (2002), *The Econometrics of Cross-Section and Panel Data*, MIT Press.

Appendix. Microeconomic Foundations of Price Effects

In a world of perfect competition, a large number of firms with identical production technologies each seeking to produce a level of output q to maximise profits, then the marginal revenue facing the firm is given by

$$MR(q) = \frac{dR(q)}{dq} = \frac{dp(q)q}{dq} = p + q\frac{dp}{dq} = p\left(1 + \frac{q}{p}\frac{dp}{dq}\right) = p\left(1 + \frac{1}{e}\right)$$

Where p is price and e is the price elasticity of demand with respect to output. If price does not change with the level of output, (the demand curve is perfectly elastic) as in perfect competition, then the firm is a price taker and marginal revenue equals price. Otherwise reductions (increases) in output will cause prices to rise (fall). Profit maximisation requires marginal revenue equals marginal cost and so

$$MC = MR(q) = p\left(1 + \frac{1}{e}\right) \qquad \text{and} \quad \frac{p}{MC} = \left(\frac{e}{1+e}\right)$$

Hence the mark-up of price over costs depends on the price elasticity of demand. The more price inelastic is demand (e→ -1) the higher the mark-up of prices over marginal costs. If demand is perfectly elastic (e=∞) there is no mark-up and price equals marginal cost.
In a 2 labour input world L=(L_1, L_2) and Total Costs C = L_1w_1 + L_2w_2, where w_1 and w_2 are the wages [aid to each labour type. Under perfect competition, price equals marginal cost and so p = l_1w_1 + l_2w_2 , where l_1 and l_2 are the amounts of labour needed to generate 1 extra unit of output. If w_1 changes, with the price of the other factor fixed, then price changes in line with marginal costs generated by the wage change. In this case the change in prices

dp= $l_1 dw_1 = l_1 w_1 \frac{dw_1}{w_1}$ and the proportional change in price is $\frac{dp}{p} = \frac{l_1 w_1}{p}\frac{dw_1}{w_1} = s_{l_1}\frac{dw_1}{w_1}$

Hence the larger the share of labour input L_1 in total costs, s_{l1}, the greater the effect of a wage increase of that labour type on output prices. If firms are able to substitute between factor inputs, then these price effects will be smaller.

Figure 1. Stylised Price Patterns with Uniform Price Adjustment by Firms

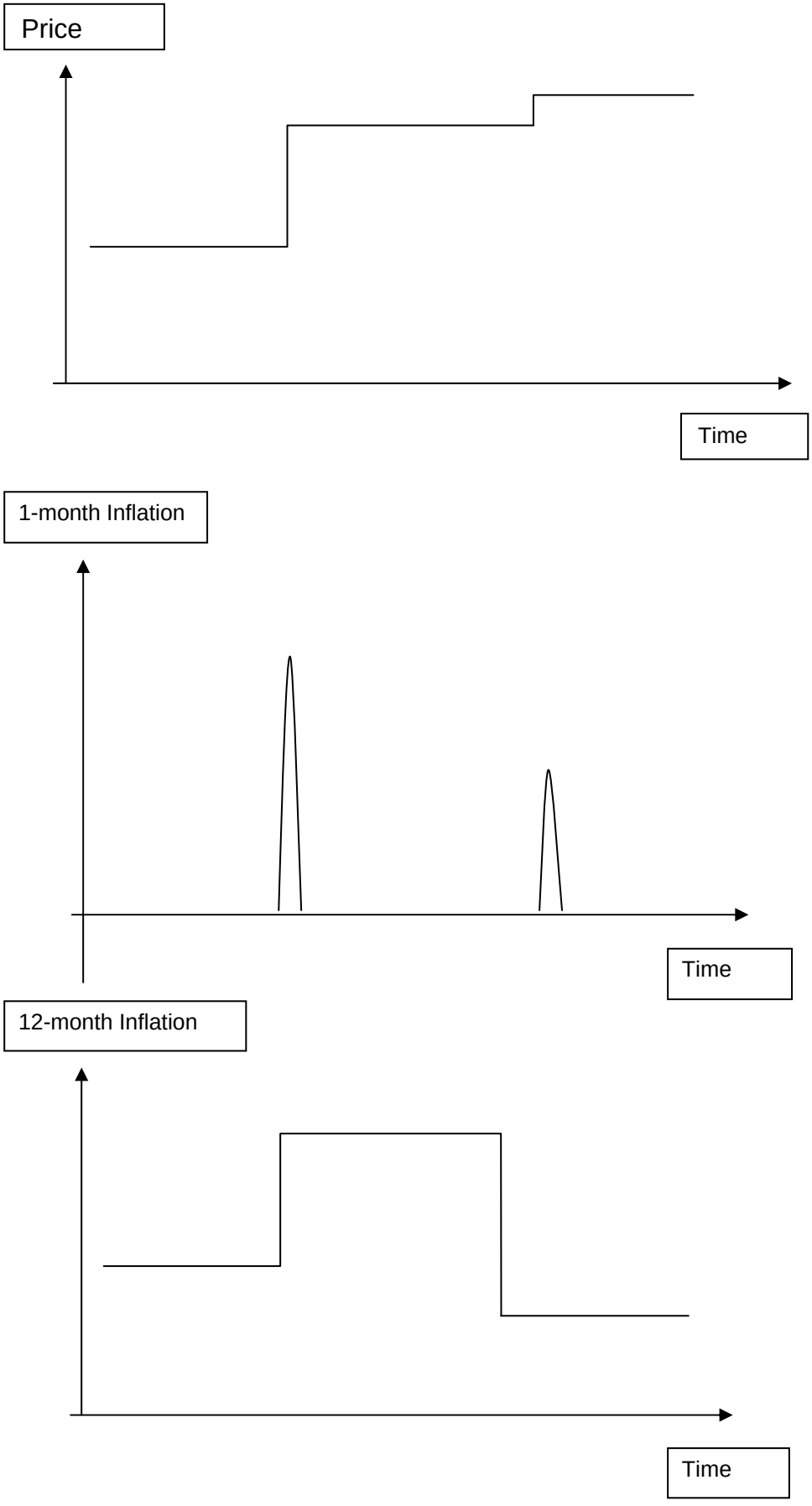

Figure 2. Stylised Sector-level Price Responses with Differential Response by Firms

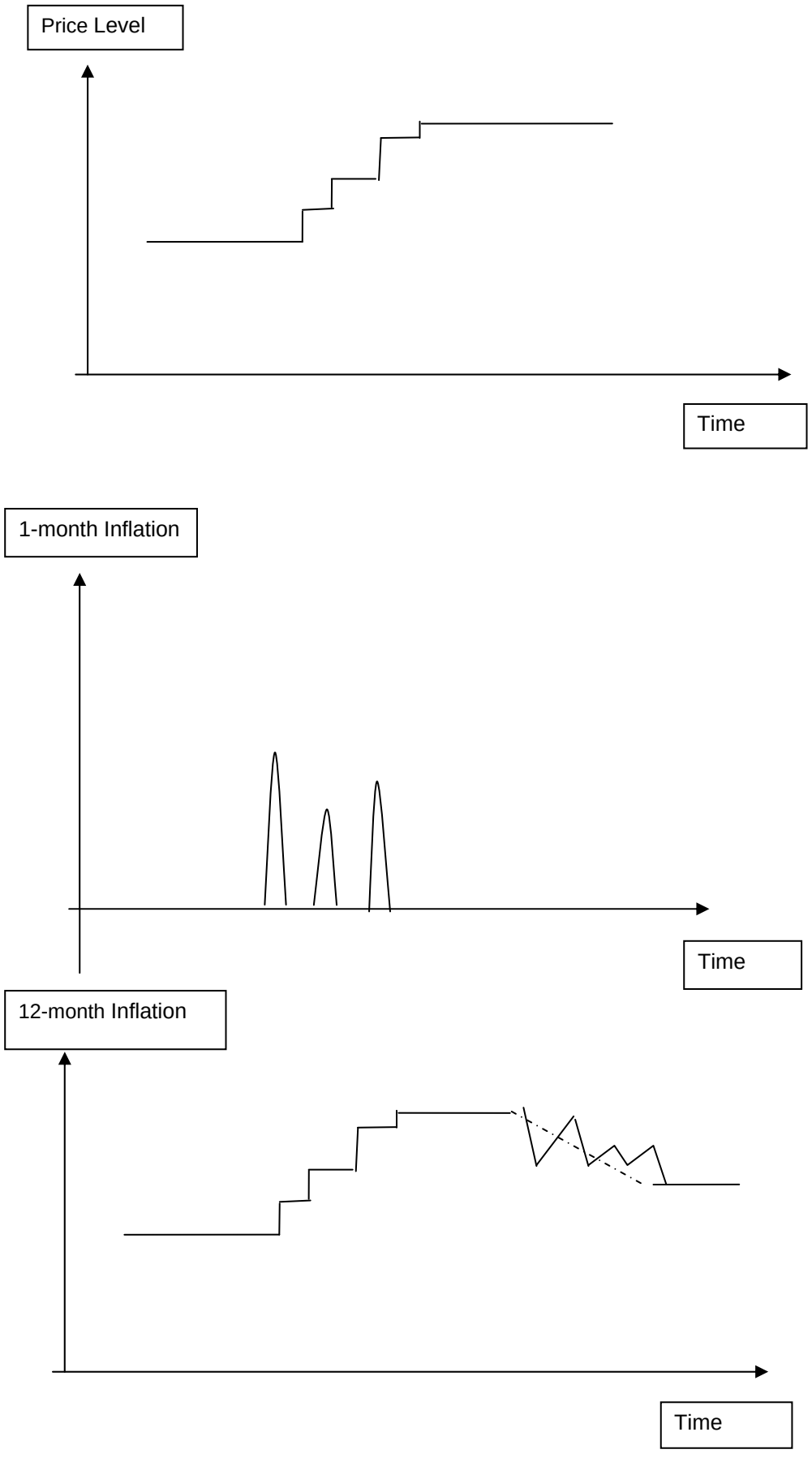

Figure 3. Yearly Inflation Rate Movements in Minimum Wage Goods

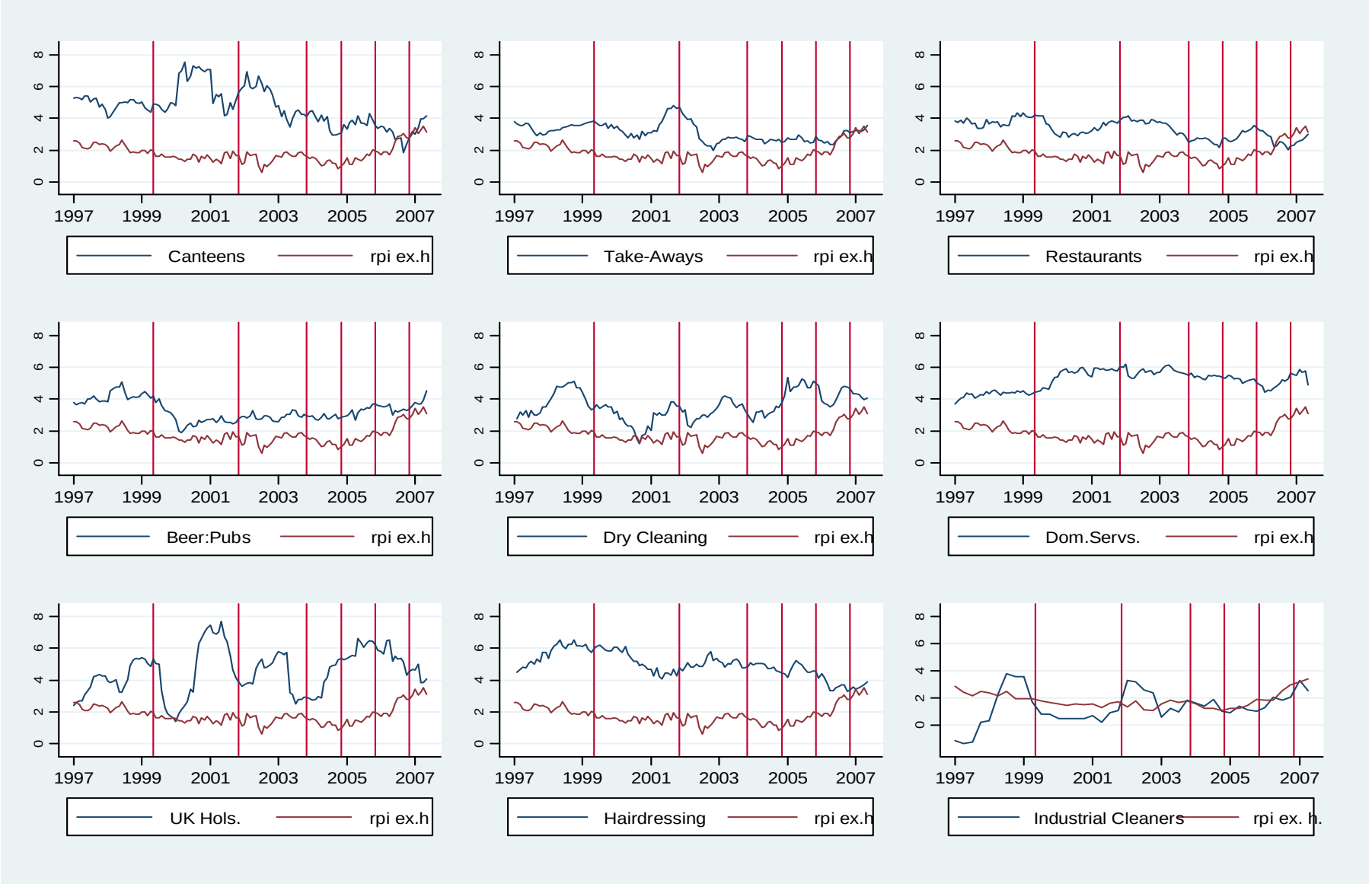

Figure 4. One-Month (Log) Price Changes for Minimum Wage Goods

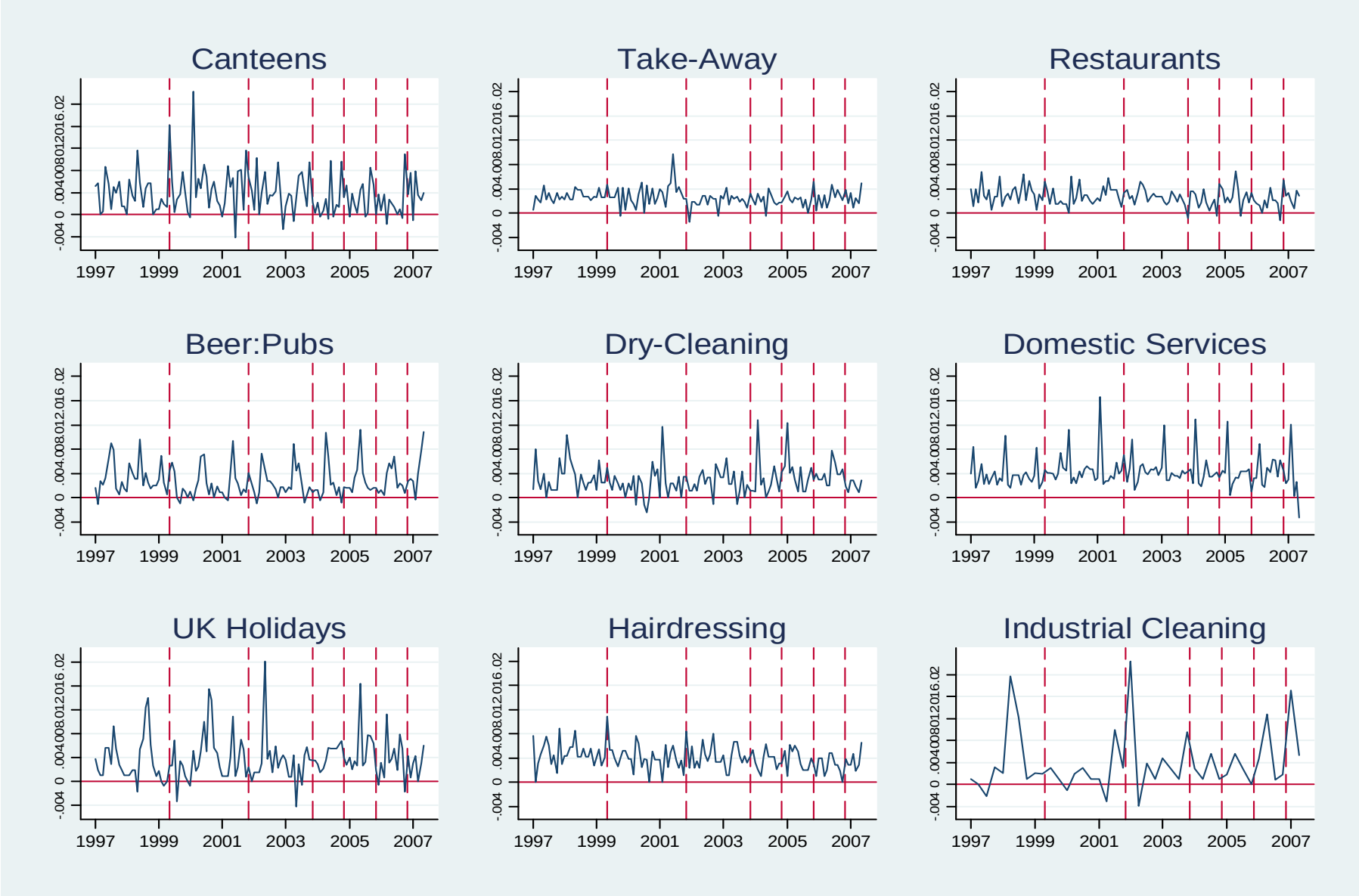

Figure 5. Difference-in Difference Robustness Checks (Moving Intervention Threshold)

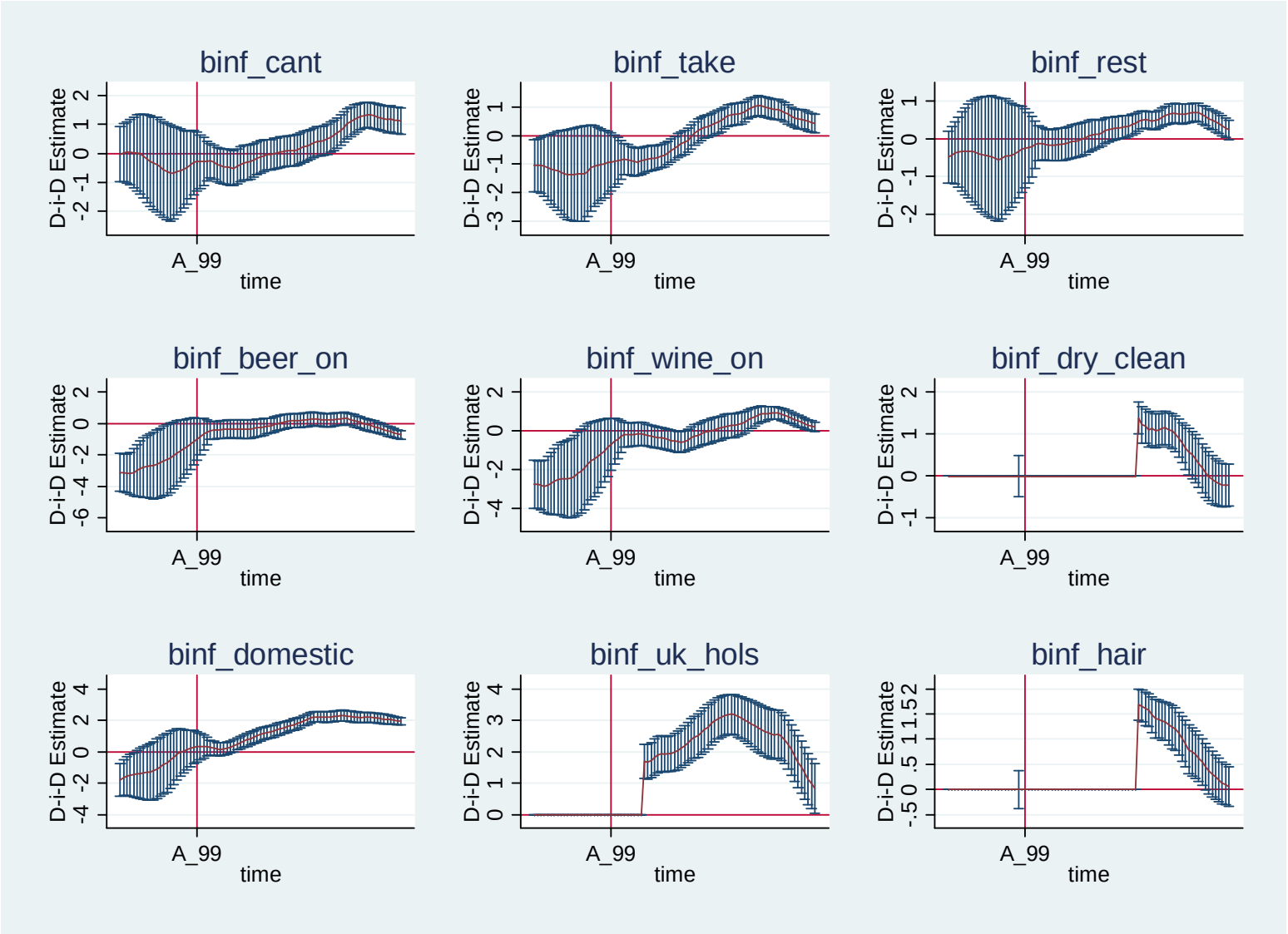

Table 1. Top Ten Low Paying Sectors

Rank	Industry	% <= adult NMW	Wage bill share (%)	Labour share (%)	% NMW worker share in total costs (2)*(4)/100	Industry	% <= adult NMW		Wage bill share (%)	Labour share	% NMW worker share in total costs (2)*(4)/100
		(1)	**(2)**	**(3)**	**(4)**		**(5)**		**(6)**	**(7)**	**(8)**
	1998/99					***2004/5***					
1	Take Away	57.8 (4.4)	41	72	30	Take Away	51.8	(5.4)	30	77	23
2	Mini Cabs	54.2 (5.4)	27	78	21	Mini Cabs	22.0	(5.8)	20	87	17
3	Hairdressing	39.3 (3.7)	23	93	21	Canteens	25.0	(5.1)	18	79	14
4	Cleaners:firms	39.7 (2.2)	23	91	21	Cleaners:firms	22.3	(2.2)	13	93	12
5	Canteens	34.1 (4.1)	24	86	21	Pubs	33.8	(2.9)	17	60	10
6	Pubs	52.8 (2.4)	30	59	18	Hairdressing	19.8	(2.9)	11	81	9
7	Cleaners:homes	36.6 (2.5)	23	74	17	Restaurants	25.6	(2.1)	11	77	8
8	Restaurants	41.1 (2.2)	21	72	15	Hotels	23.7	(2.3)	11	67	7
9	Dry Cleaners	28.0 (3.3)	17	83	14	Primary Education :private	19.8	(2.4)	7	91	6
10	Hotels	28.7 (2.2)	15	64	10	Retail	18.0	(0.6)	8	73	6

Source: LFS. Sample adult employees aged 22 and over. Standard errors in brackets. Labour share defined as wage bill over valued added (profit before interest plus wage bill). Labour share numbers in last column are for 2001/02 (latest years available).

Table 2. Expenditure on Top Ten Low Paying Sectors by Minimum Wage Households

1998 Rank	Industry	Weekly Amount (% of budget) All households	Weekly Amount (% of budget): Adult NMW households	% of total expenditure Accounted for by NMW households	Industry	Weekly Amount (% of budget) all households	Amount (% of budget): Adult NMW households	% of total expenditure Accounted for by NMW households
		(1)	**(2)**	**(3)**		**(4)**	**(5)**	**(6)**
	1998/9				***2004/5***			
1	Take Away Food	2.80 (2.2)	3.50 (2.9)	17.2	Take Away Food	2.90 (2.3)	3.40 (2.9)	16.3
2	Pubs	4.10 (2.7)	5.00 (3.5)	17.7	Pubs	3.60 (2.3)	3.70 (2.7)	14.7
3	Mini Cabs	0.60 (0.4)	0.70 (0.5)	16.0	Mini Cabs	0.60 (0.4)	0.40 (0.4)	12.6
4	Cleaners (homes)	0.80 (0.5)	0.10 (0.05)	2.8	Cleaners (homes)	0.90 (0.5)	0.20 (0.1)	4.5
5	Restaurants	4.70 (2.9)	3.80 (2.6)	12.4	Restaurants	5.50 (3.3)	4.30 (2.8)	11.8
6	Cleaners (firms)	----	----	----	Cleaners (firms)	----	----	----
7	Hairdressing	1.25 (0.8)	0.70 (0.5)	9.2	Hairdressing	1.40 (0.9)	0.90 (0.6)	10.3
8	Canteens	0.70 (0.5)	0.90 (0.7)	17.4	Canteens	0.50 (0.3)	0.70 (0.6)	18.1
9	Dry Cleaners	0.20 (0.1)	0.10 (0.05)	7.0	Dry Cleaners	0.10 (0.1)	0.10 (0.03)	8.1
10	Hotels	1.00 (0.6)	0.50 (0.3)	8.2	Hotels	1.00 (0.7)	0.50 (0.4)	8.5

Source: FES. Note minimum wage households are 11.6% (11.8%) of all households sampled in 1998/99 (2004/05). Expenditure figures are per head in 2004 prices. Budget shares net of housing costs in brackets.

Table 3. Minimum Wage Changes and Log Monthly Price Changes of Minimum Wage Sectors

	Dependent Variable: Log Monthly Change in Retail Price Index of Sector							
	Canteen	Take-Away	Beer: Pubs	Dry Cleaning	Domestic Services	UK Hols.	Hairdressing	Industrial Cleaning
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Min. wage $_t$	0.001	0.001	-0.003	0.001	0.001	-0.001	0.001	0.004
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)*
Min. wage $_{t+1}$	-0.001	-0.001	-0.011	0.001	-0.001	-0.002	-0.001	
	(0.001)	(0.001)*	(0.004)*	(0.001)	(0.001)	(0.001)	(0.001)	
Min. wage $_{t+2}$	-0.003	0.001	-0.008	0.001	-0.001	-0.001	-0.001	
	(0.001)*	(0.001)	(0.004)*	(0.001)	(0.001)	(0.001)	(0.001)	
Min. wage $_{t-1}$	0.004	-0.000	-0.001	0.001	0.001	-0.001	-0.001	
	(0.001)*	(0.001)	(0.004)*	(0.001)	(0.001)	(0.001)	(0.001)	
Min. wage $_{t-2}$	-0.001	-0.001	-0.001	-0.001	-0.001	0.001	-0.001	
	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	
Constant	0.004	0.003	0.002	0.003	0.004	0.004	0.004	0.003
	(0.001)*	(0.001)*	(0.001)*	(0.001)*	(0.001)*	(0.001)*	(0.000)*	(0.001)*
N	136	136	136	135	136	136	135	45
Adj. R^2	0.10	0.01	0.05	0.01	0.01	0.01	0.02	0.06

Robust standard errors in brackets; *significant at 5%. Industrial cleaning data based on quarterly producer price series.

Table 4. Minimum Wage Changes & Log Monthly Price Changes

	Dependent Variable: Log Monthly Change in Retail Price Index of Sector		Dependent Variable: Log Monthly Change in Retail Price Index of Item	
	Non-Min. Wage	Min. Wage	Non-Min. Wage	Min. Wage
	(1)	**(2)**	**(3)**	**(4)**
Min. Adjust$_t$	0.0001	0.0006	-0.0002	0.0020
	(0.0009)	(0.0005)	(0.0010)	(0.0006)*
Min. Adjust$_{t+1}$	-0.0009	-0.0001	-0.0001	0.0005
	(0.0009)	(0.0004)	(0.0006)	(0.0002)*
Min. Adjust$_{t+2}$	-0.0011	-0.0001	0.0027	0.0006
	(0.0007)	(0.0004)	(0.0009)*	(0.0002)*
Min. Adjust$_{t-1}$	0.0023	0.0001	-0.0009	-0.0009
	(0.0012)*	(0.0005)	(0.0008)	(0.0005)
Min. Adjust$_{t-2}$	-0.0004	-0.0001	0.0014	0.0002
	(0.0009)	(0.0004)	(0.0007)*	(0.0003)
Year Dummies	Yes	Yes	Yes	Yes
Month Dummies	Yes	Yes	Yes	Yes
Item Dummies	Yes	Yes	Yes	Yes
No. Items	78	8	370	35
N	9133	960	51432	4594

Robust standard errors in parentheses; * significant at 5%.

Table 5. Pulse Dummy Estimates of Significant Changes in Log Monthly Retail Prices: Minimum Wage Goods 1996-2007

Canteens		Restaurants		Take-Away Food		Beer:Pubs		Dry Cleaning	
August 1996	0.008	April 1997	0.004	June 1996	0.003	June 1996	0.003	Jan. 1997	0.006
	(0.003)*		(0.001)*		(0.001)*		(0.001)*		(0.001)*
April 1998	0.008	Nov. 1997	0.003	July 1996	0.003	June 1997	0.007	Jan. 1998	0.008
	(0.003)*		(0.001)*		(0.001)*		(0.001)*		(0.001)*
April 1999	0.013	August 1998	0.004	Sept. 1999	-0.003	July 1997	0.006	July 2000	-0.005
	(0.003)*		(0.001)*		(0.001)*		(0.001)*		(0.001)*
Jan. 2000	0.019	Oct. 1998	0.003	May 2000	0.002	May 1998	0.008	Jan. 2001	0.009
	(0.003)*		(0.001)*		(0.001)*		(0.001)*		(0.001)*
May 2001	-0.008	April 1999	0.003	June 2000	-0.003	April 2001	0.007	Jan. 2004	0.010
	(0.003)*		(0.001)*		(0.001)*		(0.002)*		(0.001)*
Sept. 2001	0.008	Feb. 2000	0.003	April 2001	0.002	Mar. 2002	0.005	Dec. 2004	0.010
	(0.003)*		(0.001)*		(0.001)*		(0.002)*		(0.001)*
Sept. 2006	0.008	May 2000	0.003	May 2001	0.007	Mar. 2003	0.007	May 2006	0.005
	(0.003)*		(0.001)*		(0.001)*		(0.002)*		(0.001)*
		April 2001	0.004	Nov. 2001	-0.004	Mar. 2004	0.008		
			(0.001)*		(0.001)*		(0.002)*		
		Oct. 2003	-0.003	Oct. 2002	-0.003	Apr. 2004	0.005		
			(0.001)*		(0.001)*		(0.002)*		
		Sept. 2004	-0.003	April 2004	-0.003	Apr. 2005	0.009		
			(0.001)*		(0.001)*		(0.002)*		
		April 2005	0.004	Aug. 2005	-0.003	May 2006	0.005		
			(0.001)*		(0.001)*		(0.002)*		
		June 2005	-0.003			Mar. 2007	0.006		
			(0.001)*				(0.002)*		
		Feb. 2006	-0.003			Apr. 2007	0.009		
			(0.001)*				(0.002)*		
		Sept. 2006	-0.004						
			(0.001)*						
Constant	0.003		0.003		0.003		0.002		0.003
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		(0.001)*
Adj. R^2	0.39		0.46		0.46		0.55		0.55

Standard errors in parentheses * significant at 5%. Sample size 136 for each series except Industrial cleaning where sample size is 48.

Table 5 (continued)

Domestic Services		UK Holidays		Hairdressing		Wine/Spirits :Pubs		Industrial Cleaning	
Jan. 1997	0.005	July 1998	0.009	Dec. 1996	0.004	May 1998	0.003	1996 Q3	-0.014
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		(0.003)
Jan. 1998	0.007	August 1998	0.011	Jan. 1997	-0.004	April 2001	0.003	1998 Q1	0.018
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		(0.003)*
Jan. 2000	0.008	July 1999	-0.006	May. 1997	0.004	April 2002	0.003	2001 Q1	0.020
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		(0.003)*
Jan. 2001	0.013	May 2000	0.007	Oct. 1997	0.005	June 2002	0.004	2006 Q1	0.011
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		(0.003)*
Jan. 2002	0.006	July 2000	0.013	April 1998	0.005	Jan. 2003	-0.003	2006 Q4	0.015
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		(0.003)*
Jan. 2003	0.008	Aug. 2000	0.011	April 1999	0.007	March 2004	0.003		
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		
Jan. 2004	0.009	April 2001	0.008	March 2000	0.004	Jan. 2005	-0.004		
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		
Jan. 2005	0.009	April 2002	0.017	Aug. 2000	-0.004	Jan. 2006	-0.003		
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		
Jan. 2006	0.005	April 2003	-0.007	Jan. 2001	-0.004	May 2006	0.003		
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		
Jan. 2007	0.008	April 2005	0.013	Oct. 2001	0.005	April 2007	0.006		
	(0.001)*		(0.001)*		(0.001)*		(0.001)*		
Apr. 2007	-0.007	Feb. 2006	0.008	Sept. 2006	-0.004				
	(0.001)*		(0.001)*		(0.001)*				
Constant	0.004		0.003		0.004				0.002
	(0.001)*		(0.001)*		(0.001)*				(0.001)*
Adj. R^2	0.71		0.62		0.42		0.48		0.70

Table 6. Difference-in Difference Estimates of Relative Price Responsiveness of Minimum Wage Goods (Yearly Inflation Rate)

1997-2003	All NMW Goods	Take-Away food	Hair Services	Canteen Meals	Pubs: Beer	Pubs: Wine /spirit	Domestic Services	Restaurant Meals	Dry Cleaning	Hotels (UK)	Industry Cleaning
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
					i) Relative to RPI						
Constant	3.03	3.09	3.05	3.04	3.05	3.05	3.10	3.08	3.05	3.01	3.00
	(0.19)*	(0.19)*	(0.20)*	(0.25)*	(0.18)*	(0.18)*	(0.18)*	(0.18)*	(0.20)*	(0.31)*	(0.17)*
Min. Wage	1.12	0.33	2.60	1.80	1.07	0.48	1.24	0.73	0.80	1.05	-2.27
	(0.17)*	(0.18)	(0.20)*	(0.19)*	(0.18)*	(0.17)*	(0.17)*	(0.18)*	(0.26)*	(0.28)*	(0.59)*
April 99+	-0.91	-0.92	-0.93	-0.92	-0.92	-0.92	-0.91	-0.92	-0.93	-0.92	-0.62
	(0.21)*	(0.21)*	(0.21)*	(0.22)*	(0.21)*	(0.21)*	(0.21)*	(0.22)*	(0.21)	(0.21)*	(0.22)*
Min. Wage*	0.71	0.70	0.32	1.43	-0.44	0.50	2.21	0.52	0.05	1.11	1.19
April 99+	(0.24)*	(0.26)*	(0.28)	(0.31)*	(0.25)	(0.24)*	(0.24)*	(0.25)*	(0.33)	(0.46)*	(0.64)*
					ii) Relative to RPI ex. Housing						
Constant	2.10	2.16	2.13	2.11	2.12	2.12	2.17	2.15	2.13	2.08	2.40
	(0.13)*	(0.10)*	(0.13)*	(0.19)*	(0.09)*	(0.11)*	(0.09)*	(0.10)*	(0.13)*	(0.28)*	(0.08)*
Min. Wage	2.06	1.27	3.54	2.74	2.00	1.41	2.17	1.66	1.74	1.98	-1.68
	(0.09)*	(0.09)*	(0.17)*	(0.11)*	(0.11)*	(0.09)*	(0.07)*	(0.09)*	(0.22)*	(0.25)*	(0.58)*
April 99+	-0.64	-0.64	-0.65	-0.64	-0.65	-0.64	-0.63	-0.64	-0.65	-0.64	-0.87
	(0.07)*	(0.08)*	(0.08)*	(0.08)*	(0.07)*	(0.07)*	(0.08)*	(0.07)*	(0.08)*	(0.08)*	(0.10)*
Min. Wage*	0.44	0.43	0.05	1.16	-0.71	0.23	1.93	0.25	-0.22	0.84	1.45
April 99+	(0.13)*	(0.16)*	(0.20)	(0.24)*	(0.14)*	(0.12)	(0.11)*	(0.13)	(0.26)	(0.41)*	(0.60)*
					iii) Relative to non-min wage goods						
Constant	4.48	4.48	4.47	4.47	4.47	4.47	4.48	4.48	4.47	4.47	1.23
	(0.31)*	(0.38)*	(0.38)*	(0.38)*	(0.38)*	(0.38)*	(0.38)*	(0.38)*	(0.38)*	(0.38)*	(0.23)*
Min. Wage	-0.34	-1.14	1.14	0.34	-0.40	-0.99	-0.23	-0.74	-0.66	-0.42	-0.51
	(0.29)	(0.29)	(0.32)*	(0.29)	(0.30)	(0.29)	(0.28)	(0.29)	(0.35)	(0.36)	(0.62)
April 99+	-1.06	-1.07	-1.07	-1.07	-1.07	-1.07	-1.07	-1.07	-1.07	-1.07	0.19
	(0.33)*	(0.34)*	(0.34)*	(0.34)*	(0.34)*	(0.34)*	(0.34)*	(0.34)*	(0.34)*	(0.34)*	(0.38)
Min. Wage*	0.85	0.85	0.47	1.57	-0.30	0.64	2.35	0.66	0.20	1.26	0.38
April 99+	(0.35)*	(0.37)*	(0.38)	(0.40)*	(0.35)	(0.35)	(0.35)*	(0.35)	(0.41)	(0.52)*	(0.71)

Notes. Newey-West lag(1) group specific standard errors in brackets. All regressions include monthly dummies. * significant at 5% level.

Table 7. Difference-in Difference Estimates of Relative Price Responsiveness of Minimum Wage Goods (Yearly Inflation Rate), 1999-2007

1997-2007	All NMW Goods	Take-Away food	Hair Services	Canteen Meals	Pubs: Beer	Pubs: Wine /spirit	Domestic Services	Restaurant Meals	Dry Cleaning	Hotels (UK)	Industry Cleaning
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
					i) Relative to RPI						
Constant	3.06	3.05	3.05	3.10	3.01	3.00	3.04	3.08	2.98	2.98	3.00
	(0.19)*	(0.18)*	(0.19)*	(0.24)*	(0.17)*	(0.18)*	(0.18)*	(0.17)*	(0.19)*	(0.19)*	(0.30)*
Min. Wage	1.12	0.33	2.60	1.80	1.07	0.48	1.24	0.73	0.80	1.05	-2.27
	(0.17)*	(0.17)	(0.22)*	(0.19)*	(0.18)*	(0.17)*	(0.16)*	(0.17)*	(0.25)*	(0.27)*	(0.43)*
April 99+	-0.61	-0.61	-0.61	-0.61	-0.62	-0.62	-0.61	-0.61	-0.62	-0.62	-0.45
	(0.21)*	(0.19)*	(0.19)*	(0.19)*	(0.19)*	(0.18)*	(0.19)*	(0.19)*	(0.19)*	(0.19)*	(0.36)*
Min. Wage*	0.29	0.19	-0.30	0.33	-0.59	-0.01	1.73	-0.06	0.18	1.17	1.19
April 99+	(0.21)	(0.23)	(0.27)	(0.30)	(0.22)*	(0.21)	(0.20)*	(0.22)*	(0.30)	(0.37)*	(0.50)*
					ii) Relative to RPI ex. Housing						
Constant	2.13	2.13	2.13	2.18	2.09	2.09	2.17	2.15	2.06	2.06	2.41
	(0.11)*	(0.10)*	(0.12)*	(0.19)*	(0.10)*	(0.11)*	(0.10)*	(0.10)*	(0.13)*	(0.23)*	(0.28)*
Min. Wage	2.06	1.27	3.54	2.74	2.00	1.41	2.17	1.66	1.74	1.98	-1.69
	(0.09)*	(0.09)*	(0.17)*	(0.11)*	(0.11)*	(0.09)*	(0.07)*	(0.09)*	(0.21)*	(0.24)*	(0.39)*
April 99+	-0.54	-0.55	-0.55	-0.54	-0.55	-0.55	-0.55	-0.54	-0.54	-0.55	-0.68
	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.09)*	(0.32)*
Min. Wage*	0.23	0.13	-0.36	0.27	-0.66	-0.07	1.66	-0.13	0.12	1.10	1.42
April 99+	(0.13)	(0.15)	(0.21)	(0.24)	(0.14)*	(0.13)	(0.12)*	(0.14)	(0.26)	(0.33)*	(0.46)*
					iii) Relative to non-min wage goods						
Constant	4.54	4.54	4.54	4.56	4.53	4.53	4.54	4.55	4.53	4.53	1.23
	(0.31)*	(0.31)*	(0.37)*	(0.36)*	(0.37)*	(0.37)*	(0.37)*	(0.36)*	(0.37)*	(0.37)*	(0.23)*
Min. Wage	-0.34	-1.13	1.14	0.34	-0.40	-0.99	-0.23	-0.74	-0.66	-0.42	-0.51
	(0.29)	(0.29)	(0.32)*	(0.30)	(0.30)	(0.29)	(0.29)	(0.29)	(0.35)	(0.36)	(0.62)
April 99+	-1.20	-1.20	-1.21	-1.20	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	0.19
	(0.32)*	(0.32)*	(0.33)*	(0.33)*	(0.33)*	(0.33)*	(0.32)*	(0.33)*	(0.33)*	(0.33)*	(0.38)
Min. Wage*	0.89	0.89	0.29	0.93	-0.01	0.59	2.32	0.53	0.77	1.76	0.38
April 99+	(0.33)*	(0.34)*	(0.37)	(0.39)*	(0.34)	(0.33)	(0.33)*	(0.34)	(0.40)	(0.45)*	(0.71)

Notes. Newey-West lag(1) group specific standard errors in brackets. All regressions include monthly dummies. * significant at 5% level

Data Appendix

Figure A1. Price Changes of Minimum Wage Goods Relative to Retail Price Excluding Housing Index, 1996-2006

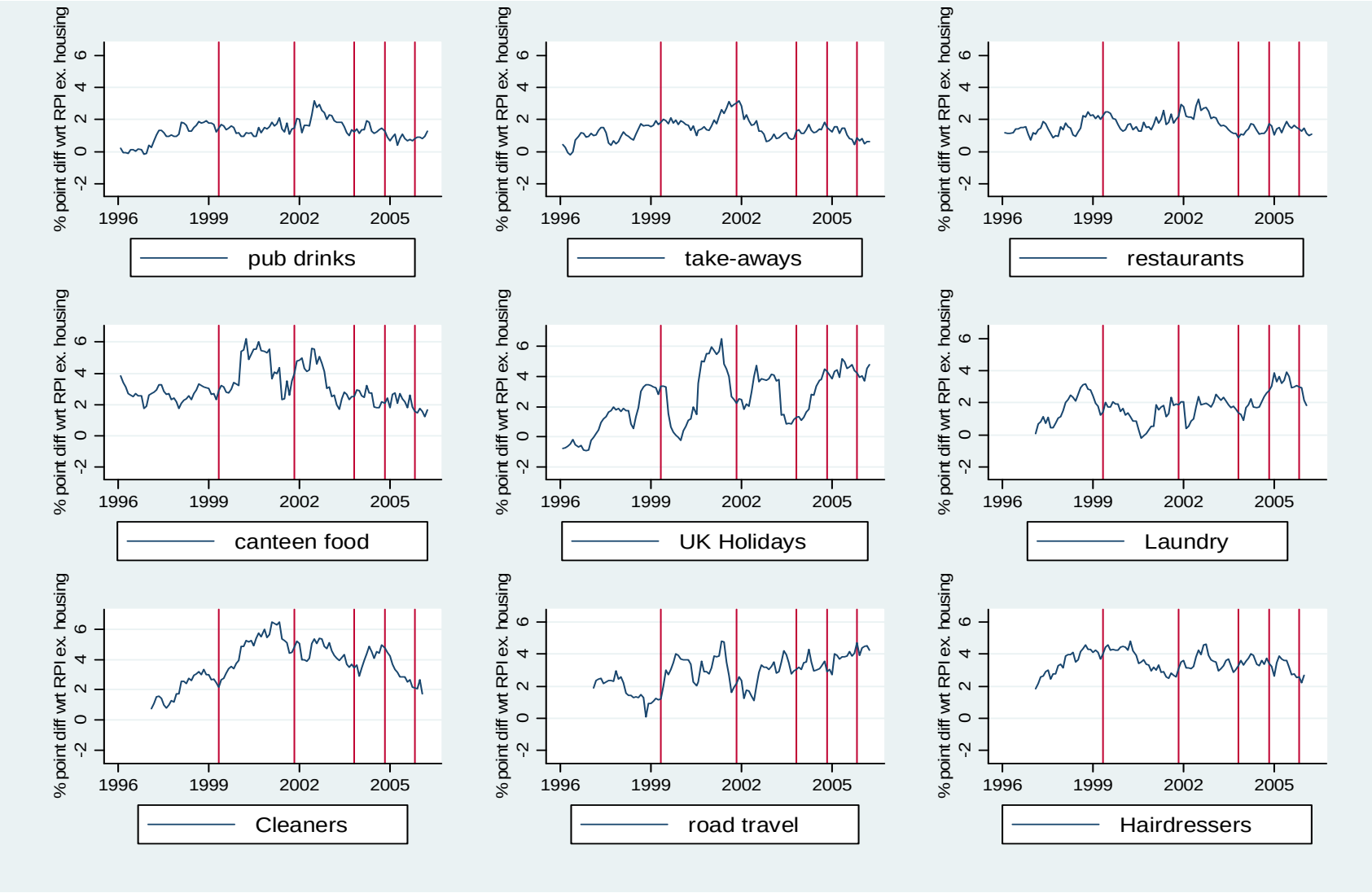

Figure A2. Inflation Rates of Selected Non-Minimum Wage Goods, 1996-2005

Table A1. Top Ten Low Paying Sectors (ASHE)

	1998					1999			
Rank	Industry	% <= adult NMW	Wage bill share (%)	% of all adult NMW workers	Labour share (%)	Industry	% <= adult NMW	Wage bill share (%)	% of all adult NMW workers	Labour share
1	Pubs	38.8	14	7.4	66	Retail:Non-Specialist (local)	30.2	19	0.5	73
2	Retail:Non-Specialist (local)	37.5	18	0.3	69	Pubs	24.6	10	7.9	55
3	Cleaners:firms	36.0	14	5.3	92	Cleaners:firms	22.3	9	4.5	93
4	Hairdressing	31.6	18	0.9	93	Manufacture: Other apparel	20.8	11	0.5	73
5	Retail:Tobacco	31.4	13	0.2	71	Retail: Meat	20.3	10	0.5	75
6	Retail: Meat	30.7	16	0.5	69	Hardware& computer Consultancy	19.4	7	0.2	80
7	Manufacture: Other apparel	29.6	17	0.4	75	Hairdressing	19.0	10	0.8	93
8	Take Away food	29.0	16	0.5	74	Retail:Fruit&Veg.	18.2	12	0.2	74
9	Catering	26.2	11	2.4	84	Membership organisations	17.4	5	1.7	78
10	Restaurants	26.1	11	2.0	75	Catering	16.5	7	2.3	88

Source: ASHE & FAME. ASHE Sample adult employees aged 22 and over. FAME sample all firms with positive labour share. Minimum wage defined as £3.60 in both years. Labour share defined as wage bill over valued added (profit before interest plus wage bill).

Table A2. SIC & CPI Codes for Minimum Wage Goods and Control Group Goods & Services

Sector	SIC code	CPI code
Minimum Wage Goods		
Take Away Food	55.303	11.1.1.2
Mini Cabs	60.22	7.3.2
Pubs (Beer, Wines &Spirits)	55.40	11.1.1.3, 11.1.1.4
Restaurants	55.301	11.1.1.1
Cleaners:firms	74.70	----
Hairdressing	93.02	12.1.1
Cleaners:homes	95.90	5.6.2
Canteens	55.5	11.1.2
Hotels	55.1	9.6.1
Dry Cleaners	93.01	3.1.4
Primary & Nursery Education:non-maintained	80.10	12.4.2
Non-Minimum Wage Goods		
Repair Services (electrics, plumbing, decorators)	95.2	4.3.2
Vehicle Services	50.20	7.2.3
Recreation Services	92.6, 92.7	9.4.1
Household Appliance Repairs	52.72	5.3.3
Audio-Visual Repairs	72.50	9.1.5
Gardening Services	81.30	5.6.2
Beer: Off Sales	52.25	2.1.3
Wines/Spirits: Off Sales	52.25	2.1.2

Table A3. Autocorrelation in Residuals & Stationarity Tests: Minimum Wage Goods

	RPI: All Items	RPI: Ex. Housing	Canteens	Restaurants	Take-Away	Beer: Pubs	Pubs: Wine/Spirits	Dry Cleaning	Dom.Servs.	UK Hols.	Hair-dressing
Residuals t-1	1.095	-0.033	-0.126	-0.022	0.018	-0.039	-0.129	0.065	-0.011	0.165	-0.113
	(12.03)**	(0.094)	(0.091)	(0.094)	(0.094)	(0.096)	(0.096)	(0.093)	(0.102)	(0.094)	(0.093)
Residuals t-2	-0.034	-0.172	0.000	0.059	0.312	-0.070	0.084	0.175	0.053	0.188	-0.032
	(0.25)	(0.094)	(0.092)	(0.093)	(0.094)**	(0.096)	(0.096)	(0.092)	(0.101)	(0.095)	(0.094)
Residuals t-3	0.125	0.122	0.038	0.023	-0.014	0.038	0.053	-0.079	-0.126	0.028	0.036
	(0.91)	(0.094)	(0.092)	(0.092)	(0.094)	(0.096)	(0.096)	(0.092)	(0.101)	(0.097)	(0.094)
Residuals t-4	-0.261	-0.052	0.240	0.085	0.123	0.085	0.155	0.094	-0.060	-0.008	-0.021
	(2.78)**	(0.095)	(0.091)**	(0.092)	(0.094)	(0.096)	(0.096)	(0.092)	(0.103)	(0.096)	(0.093)
Constant	0.009	0.004	-0.001	-0.002	0.000	-0.004	-0.004	0.001	0.000	-0.001	-0.005
	(0.41)	(0.022)	(0.043)	(0.018)	(0.017)	(0.022)	(0.015)	(0.030)	(0.018)	(0.047)	(0.023)
N	119	119	119	119	119	119	119	119	119	119	119
R-squared	0.92	0.05	0.07	0.01	0.14	0.01	0.05	0.05	0.02	0.08	0.02
Dickey-Fuller	0.93	2.06	2.25	1.95	1.91	1.61	1.66	2.20	2.44	2.32	1.48

Based on item-specific regressions of (1). Dickey-Fuller tests based on univariate time series.

Table A4. Item-Specific Estimates of Log Monthly Price Effects of Minimum Wage

Month	Restaurant Coffee:	Sandwich: Pub	Hot Meal: Pub	Burger: Eat-In	Restaurant Main Course	Restaurant: Sweet
Min. Adjust$_t$	0.002	-0.001	0.002	-0.001	0.001	-0.000
	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
Min. Adjust$_{t+1}$	0.002	-0.001	0.004	0.000	-0.001	0.000
	(0.001)	(0.002)	(0.001)**	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t+2}$	-0.000	0.001	0.000	-0.001	-0.000	0.004
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Min. Adjust$_{t-1}$	0.002	0.001	-0.001	-0.003	-0.001	0.001
	(0.001)**	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Min. Adjust$_{t-2}$	-0.000	-0.001	0.001	-0.004	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)**	(0.001)
Constant	0.004	0.005	0.003	0.002	0.001	0.001
	(0.001)**	(0.001)**	(0.001)**	(0.003)	(0.001)**	(0.001)
N	132	151	151	139	107	107

Note All regressions include year and month dummies. Newey-West standard errors robust to 1 lag in brackets. ** significant at 5%

Month	Restaurant: Lunch	Dinner: Primary School	Cafeteria: Primary School	Dinner: Secondary School	Cafeteria: Secondary School	Staff Canteen: Main
Min. Adjust$_t$	-0.000	0.004	0.004	0.021	0.003	0.003
	(0.001)	(0.003)	(0.008)	(0.012)	(0.008)	(0.002)
Min. Adjust$_{t+1}$	-0.003	0.001	0.000	0.002	0.002	-0.001
	(0.002)	(0.003)	(0.004)	(0.004)	(0.003)	(0.002)
Min. Adjust$_{t+2}$	-0.002	0.001	0.001	0.004	0.001	-0.002
	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)
Min. Adjust$_{t-1}$	-0.003	-0.001	0.001	-0.000	0.008	-0.000
	(0.001)**	(0.002)	(0.008)	(0.007)	(0.006)	(0.002)
Min. Adjust$_{t-2}$	0.002	-0.001	-0.000	0.002	-0.000	-0.001
	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.002)
Constant	0.006	0.006	0.003	0.013	0.005	0.007
	(0.000)**	(0.003)*	(0.006)	(0.007)	(0.004)	(0.002)**
N	107	96	96	96	96	151

Table A4 (continued)

	Staff Canteen: Sweet	Take-Away: Fish & Chips	Take-Away: Sandwich	Take-Away: Coffee	Take-Away: Tea	Pub: Bitter (pint)
Min. Adjust$_t$	0.005	-0.001	0.002	0.005	0.006	0.001
	(0.004)	(0.001)	(0.002)	(0.002)**	(0.003)**	(0.001)
Min. Adjust$_{t+1}$	-0.000	0.002	-0.002	0.001	0.001	0.001
	(0.002)	(0.001)*	(0.002)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t+2}$	-0.001	0.000	0.002	0.002	0.001	0.000
	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t-1}$	-0.001	0.002	0.000	0.002	0.002	-0.002
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Min. Adjust$_{t-2}$	-0.001	0.000	-0.002	0.001	0.003	0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)
Constant	0.012	0.006	0.003	0.002	0.002	0.001
	(0.006)*	(0.002)**	(0.002)	(0.001)*	(0.001)	(0.001)
N	120	151	151	151	151	151

	Pub: Lager (pint)	Pub: Stout (pint)	Pub: Cider (bottle)	Pub: Lager (bottle)	Pub: Whisky	Pub: Vodka
Min. Adjust$_t$	0.001	-0.001	0.001	-0.001	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t+1}$	0.002	0.001	0.001	0.000	0.001	0.001
	(0.001)*	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t+2}$	0.000	-0.000	0.001	0.001	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Min. Adjust$_{t-1}$	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t-2}$	0.001	-0.000	0.000	0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.002	0.001	0.002	0.003	0.002	0.002
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)*
N	96	151	151	108	151	151

Table A4 (continued)

	Pub: Wine (glass)	Pub: Wine (bottle)	Pub: Mixer	Pub: Liqueur	Domestic Cleaner	Laundrette: Wash
Min. Adjust$_t$	0.003	0.001	-0.001	0.001	0.001	0.003
	(0.001)**	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Min. Adjust$_{t+1}$	0.001	0.001	0.001	0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t+2}$	-0.001	-0.000	0.000	0.000	0.000	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Min. Adjust$_{t-1}$	-0.001	-0.000	-0.001	0.000	-0.001	0.002
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Min. Adjust$_{t-2}$	0.001	-0.001	-0.001	0.001	-0.001	-0.002
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Constant	0.003	0.001	0.002	0.003	0.010	0.004
	(0.001)**	(0.001)	(0.001)**	(0.001)**	(0.002)**	(0.001)**
N	96	132	126	126	151	96

	Dry Cleaning Suit	Haircut: Men	Haircut: Women	Highlights Women	Minicab Fare
Min. Adjust$_t$	0.001	0.001	0.002	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Min. Adjust$_{t+1}$	-0.000	-0.000	0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Min. Adjust$_{t+2}$	0.001	-0.001	0.002	-0.000	0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Min. Adjust$_{t-1}$	0.003	-0.000	0.001	-0.000	0.001
	(0.001)*	(0.001)	(0.001)	(0.001)	(0.002)
Min. Adjust$_{t-2}$	-0.000	-0.002	-0.000	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Constant	0.006	0.004	0.003	0.003	0.015
	(0.001)**	(0.001)**	(0.001)**	(0.001)*	(0.003)**
N	151	151	151	151	151

Table A5. Pulse Dummy variable Estimate of Significant Monthly Price Changes in Minimum Wage Items

	Restaurant Coffee:	Sandwich: Pub	Hot Meal: Pub	Burger: Eat-In	Restaurant Main Course	Restaurant: Sweet	Restaurant: Lunch	Dinner: Primary School	Cafeteria: Primary School	Dinner: Secondary School	Cafeteria: Secondary School	Staff Canteen: Main	Staff Canteen Sweet	Take-Away: Fish & Chips	Take-Away: Sandwich	Take-Away: Coffee	Take-Away: Tea
1998Jan.			0.005		-0.002				-0.014	0.025							
			(0.002)**		(0.001)**				(0.004)**	(0.004)**							
1998Feb.														-0.004			
														(0.001)*			
1998Mar.																0.006	
																(0.002)**	
1998April						0.005		0.022	0.044	0.028			0.008				
						(0.002)**		(0.002)**	(0.004)**	(0.004)**			(0.004)*				
1998May		0.008															0.009
		(0.002)**															(0.002)**
1998 June			-0.007											0.004			
			(0.002)**											(0.001)*			
1998July						0.005											
						(0.002)**											
1998Aug.				0.022								0.007					
				(0.002)**								(0.003)*					
1998 Sept.								0.019	0.02	0.019	0.026						
								(0.002)**	(0.004)**	(0.004)**	(0.002)**						
1998Oct.			0.004			0.004									-0.007		
			(0.002)*			(0.002)*									(0.002)**		
1998Nov.		0.005															
		(0.002)*															
1998 Dec.						-0.005							-0.007	0.004			-0.005
						(0.002)**							-0.004	(0.001)**			(0.002)*
1999Jan.			-0.004				-0.008										
			(0.002)*				(0.002)**										
1999Mar.			-0.004														
			(0.002)*														
1999April			0.004		0.002	0.004		0.016		0.055	0.025		0.017			0.006	0.007
			(0.002)*		(0.001)*	(0.002)*		(0.002)**		(0.004)**	(0.002)**		(0.004)**			(0.002)**	(0.002)**
1999May	0.006																

	(0.002)**																		
1999 June			-0.004		-0.002	0.007	-0.005												
			(0.002)*		(0.001)**	(0.002)**	(0.002)*												
1999July					0.003										-0.006				
					(0.001)*										(0.001)**				
1999Aug.					-0.003										0.005				
					(0.001)*										(0.001)**				
1999 Sept.			-0.004					0.023		0.013	0.02				-0.007				
			(0.002)*					(0.002)**		(0.004)**	(0.002)**				(0.001)**				
1999Oct.													0.008		0.005				
													(0.004)*		(0.001)**				
1999Nov.																-0.008			
																(0.002)**			
1999 Dec.						-0.004							-0.008			0.006			
						(0.002)*							(0.004)*			(0.002)*			
2000Jan.			-0.004	-0.022	0.004							0.019	0.053					-0.006	
			(0.002)*	(0.002)**	(0.001)**							(0.003)**	(0.004)**					(0.002)**	
2000Feb.				0.029			-0.005								-0.003				
				(0.002)**			(0.002)*								(0.001)**				
2000Mar.					-0.003								0.007		-0.003				
					(0.001)*								(0.004)**		(0.001)**				
2000April																			
2000May		0.006	0.004									0.01				0.008	0.006		
		(0.002)**	(0.002)*									(0.003)**				(0.002)**	(0.002)**		
2000 Jun.													0.007		-0.003				0.006
													(0.004)**		(0.001)*				(0.002)**
2000July					0.005	0.004													
					(0.001)**	(0.002)*													
2000Aug.																			
2000 Sept.								0.019			0.037								
								(0.002)**			(0.002)**								
2000Oct.															-0.003				
															(0.001)*				

2000 Dec.																	
2001Jan.																	
2001Feb.			0.006			-0.005	0.032	0.035	0.027	0.042							
			(0.002)**			(0.002)*	(0.002)**	(0.004)**	(0.004)**	(0.002)**							
2001Mar.			0.006														
			(0.002)**														
2001April	0.005	0.006				0.005					0.013		0.006				
	(0.002)**	(0.002)**				(0.002)*					(0.003)**		(0.001)**				
2001May	0.005	0.006	-0.004				-0.024	-0.027	-0.02	-0.036			0.004	0.009	0.007		
	(0.002)*	(0.002)**	(0.002)*				(0.002)**	(0.004)**	(0.004)**	(0.002)**			(0.001)*	(0.002)**	(0.002)**		
2001 Jun.				0.003								0.012					
				(0.001)*								(0.004)**					
2001July		0.005									0.007						
		(0.002)*									(0.003)*						
2001Aug.															0.01	0.026	
															(0.002)**	(0.002)**	
2001 Sept.		-0.006				-0.005	0.02	0.046		0.037							
		(0.002)**				(0.002)*	(0.002)**	(0.004)**		(0.002)**							
2001Oct.											0.007						
											(0.003)*						
2001Nov.		0.009															
		(0.002)**															
2002 Dec.		-0.005															
		(0.002)*															
2002Jan.										0.013	0.008		-0.003				
										(0.002)**	(0.003)*		-0.001				
2002Mar.				0.003		0.004											
				(0.001)**		-0.002											
2002April						0.006											
						(0.002)**											
2002May	0.004		0.004														
	(0.002)*		(0.002)*														
2002 Jun.		0.005	0.005												-0.004		

		(0.002)*	(0.002)**																(0.002)*	
2002July																				
2002Aug.																				
2002 Sept.									0.021	0.021	0.03	0.03								
									(0.002)**	(0.004)**	(0.004)**	(0.002)**								
2002Oct.						0.004									-0.004	-0.004				
						(0.002)*									(0.001)**	(0.002)*				
2002Nov.													-0.008							
													(0.003)**							
2003 Dec.							0.005													
							(0.002)*													
2003Jan.																				
2003Feb.						-0.005							-0.009							
						(0.002)**							(0.003)**							
2003Mar.																				
2003April	0.004															0.005				
	(0.002)*															(0.002)*				
2003May					0.003		-0.005									-0.004				
					(0.001)*		(0.002)*									(0.002)*				
2003 Jun.													0.008							
													(0.003)*							
2003July																				
2003Aug.																				
2003 Sept.																-0.007	0.006			
																(0.002)**	(0.002)**			
2003Oct.				-0.022									0.008				0.015	0.026		
				(0.002)**									(0.003)**				(0.002)**	(0.002)**		
2003Nov.			0.004															0.006		
			(0.002)*															(0.002)**		

2004 Dec.												-0.005	
												(0.002)*	
2004Jan.				0.02			-0.007			-0.012			
				(0.002)**			(0.002)**			(0.003)**			
2004Feb.													
2004Mar.													
2004April	0.006									-0.008		-0.011	
	(0.002)**									(0.003)**		(0.002)**	
2004May	0.004	-0.01	-0.004							0.008		0.008	
	(0.002)*	(0.002)**	(0.002)*							(0.003)**		(0.002)**	
2004 Jun.												0.01	
												(0.002)**	
2004July													
2004Aug.	-0.005											-0.006	
	(0.002)*											(0.002)*	
2004 Sept.	-0.004		-0.004	-0.007								-0.007	0.004
	(0.002)*		(0.002)*	(0.002)**								(0.002)**	(0.002)*
2004Oct.					0.004								0.016
					(0.001)**								(0.002)**
2004Nov.						0.005	0.005			0.008		-0.006	0.005
						(0.002)**	(0.002)*			(0.003)*		(0.002)*	(0.002)*
2004 Dec.										-0.007			0.008
										(0.003)*			(0.002)**
2005Jan.													
2005Feb.							-0.005						
							(0.002)*						
2005Mar.													
2005April		0.012	0.005									-0.006	
		(0.002)**	(0.002)**									(0.002)*	
2005May					0.003		0.008						

					(0.001)*		(0.002)**										
2005 Jun.	0.004	-0.007					-0.009					-0.006					
	(0.002)*	(0.002)**					(0.002)**					-0.003					
2005July																0.005	
																(0.002)*	
2005Aug.												0.018			-0.012		
												(0.003)**			(0.002)**		
2005 Sept.												-0.007					
												(0.003)*					
2005Oct.	0.011	-0.007													0.012		
	(0.002)**	(0.002)**													(0.002)**		
2005Nov.															-0.009		
															(0.002)**		
2006Jan.	-0.013														-0.012		
	(0.002)**														(0.002)**		
2006Feb.															0.007		
															(0.002)**		
2006Mar.				-0.011											-0.005		
				(0.002)**											(0.002)*		
2006April		0.006													-0.012	0.006	0.006
		(0.002)**													(0.002)**	(0.002)**	(0.002)**
2006May				0.007										0.006			
				(0.002)**										(0.001)**			
2006Aug.																	
2006 Sept.				-0.011										0.004	-0.005		
				(0.002)**										(0.001)**	(0.002)*		
2006Oct.			0.006	0.008													0.006
			(0.002)**	(0.002)**													(0.002)**
2006Nov.																-0.004	
																(0.002)*	
2007 Dec.																0.006	
																(0.002)**	
2007Jan.															-0.009	0.006	
															(0.002)**	(0.002)**	

2007Feb.												0.009				0.005	
												(0.003)**				(0.002)**	
2007Mar.			0.004														
			(0.002)*														
2007April														0.007			
														(0.001)**			
2007May																	
2007 Jun.																	
2007July												-0.006		0.005			
												(0.003)*		(0.001)**			
2007Aug.														0.003			
														(0.001)*			
Constant	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.001	0.001	0.001	0.001	0.003	0.004	0.004	0.003	0.003	0.003
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)*	(0.001)*	(0.001)*	(0.001)*	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
N	109	128	128	128	107	107	107	73	73	73	73	128	97	128	128	128	128
R^2	0.64	0.7	0.6	0.88	0.63	0.56	0.64	0.97	0.94	0.92	0.97	0.67	0.73	0.67	0.74	0.72	0.74

Table A5 continued

	Pub: Bitter (pint)	Pub: Lager (pint)	Pub: Stout (pint)	Pub: Cider (bottle)	Pub: Lager (bottle)	Pub: Whisky	Pub: Vodka	Pub: Wine (glass)	Pub: Wine (bottle)	Pub: Mixer	Pub: Liqueur	Domestic Cleaner	Laundrette: Wash	Dry Cleaning Suit	Haircut: Men	Haircut: Women	Highlights Women	Minicab Fare
1998Jan.				0.007	0.007	0.005	0.004					0.008	0.005	0.009				
				(0.002)**	(0.001)**	(0.001)**	(0.001)**					(0.002)**	(0.002)*	(0.002)**				
1998Feb.										0.004			0.005	0.005				
										(0.001)**			(0.002)**	(0.002)**				
1998Mar.																	0.004	
																	(0.002)*	
1998April													0.007		0.007	0.006		
													(0.002)**		(0.002)**	(0.002)**		
1998May	0.008	0.008	0.008		0.006	0.004	0.004			0.003	0.003							
	(0.002)**	(0.001)**	(0.002)**		(0.001)**	(0.001)**	(0.001)**			(0.001)*	(0.001)**							
1998 June													0.008					
													(0.002)**					
1998July								0.008									0.004	
								(0.002)**									(0.002)*	
1998Aug.															0.003	0.004	-0.005	
															-0.002	(0.002)*	(0.002)**	
1998 Sept.								-0.004		-0.004	-0.003							
								(0.002)*		(0.001)**	(0.001)*							
1998Oct.																		
1998Nov.									0.003									
									(0.001)*									
1998 Dec.																		
1999Jan.		0.004	0.004	0.007	0.006									0.004				0.013
		(0.001)**	(0.002)**	(0.002)**	(0.001)**									(0.002)**				(0.003)**
1999Mar.			-0.003															
			(0.002)*															
1999April													0.011		0.008	0.011	0.006	
													(0.002)**		(0.002)**	(0.002)**	(0.002)**	
1999May		0.004	0.004						0.004	0.003	0.003							
		(0.001)**	(0.002)**						(0.001)**	(0.001)*	(0.001)*							

1999 June																		0.007		
																		(0.002)**		
1999July																				
1999Aug.	-0.005		-0.004	-0.006		-0.003		0.004				0.005								
	(0.002)*		(0.002)*	(0.002)**		(0.001)*		(0.001)**				(0.002)*								
1999 Sept.												-0.004								0.008
												(0.002)*								(0.003)*
1999Oct.				-0.003																
				(0.002)*																
1999Nov.										-0.004										
										(0.001)*										
1999 Dec.																				
2000Jan.	-0.004										0.016									0.008
	(0.002)*										(0.002)**									(0.003)*
2000Feb.												0.009								
												(0.002)**								
2000Mar.												-0.004					0.008			
												(0.002)*					(0.002)**			
2000April		0.006			0.005		0.003	0.003		0.006	0.003				0.005					
		(0.001)**			(0.001)**		(0.001)**	(0.002)*		(0.001)**	(0.001)*				(0.002)**					
2000May	0.005	0.006	0.005		0.004			0.004												
	(0.002)*	(0.001)**	(0.002)**		(0.001)**			(0.002)*												
2000 Jun.													-0.003							
													(0.002)*							
2000July						-0.003					-0.003	0.006	-0.006							
						(0.001)**					(0.001)*	(0.002)**	(0.002)**							
2000Aug.							0.006					-0.006		-0.005		-0.006	0.007			
							(0.002)**					(0.002)**		(0.002)**		(0.002)**	(0.003)*			
2000 Sept.	-0.005												0.006							
	(0.002)*												(0.002)**							
2000Oct.							0.004													
							(0.002)**													
2000 Dec.							-0.005													

								(0.002)**											
2001Jan.	-0.005											0.014		0.012	-0.004		-0.006	0.014	
	(0.002)*											(0.002)**		(0.002)**	(0.002)*		(0.002)**	(0.003)**	
2001Feb.																			
2001Mar.				0.004															
				(0.002)*															
2001April	0.01	0.005	0.008	0.006	0.008	0.005	0.006			0.006	0.006								
	(0.002)**	(0.001)**	(0.002)**	(0.002)**	(0.001)**	(0.001)**	(0.001)**			(0.001)**	(0.001)**								
2001May									0.004	0.004						0.004			
									(0.001)**	(0.001)*						(0.002)*			
2001 Jun.								0.003											
								(0.002)*											
2001July	-0.004																		
	(0.002)*																		
2001Aug.									-0.004									0.008	
									(0.001)**									(0.003)**	
2001 Sept.																			
2001Oct.				-0.003									0.008			0.004	0.007		
				(0.002)*									(0.002)**			(0.002)*	(0.002)**		
2001Nov.																	-0.004		
																	(0.002)*		
2002 Dec.																	0.007		
																	(0.002)**		
2002Jan.			-0.004		-0.006	-0.003						0.013						0.014	
			(0.002)*		(0.001)**	(0.001)*						(0.002)**						(0.003)**	
2002Mar.		0.007	0.004							0.005									
		(0.001)**	(0.002)**							(0.001)**									
2002April						0.008	0.008			0.006							0.004		
						(0.001)**	(0.001)**			(0.001)**							(0.002)*		
2002May																			
2002 Jun.								0.004	0.003	0.004									
								(0.002)*	(0.001)*	(0.001)**									

2002July												0.003								
												(0.001)*								
2002Aug.																		0.006	0.006	
																		(0.002)**	(0.002)**	
2002 Sept.					-0.005				-0.002								-0.003			
					(0.001)**				-0.001								(0.002)*			
2002Oct.																				
2002Nov.																				
2003 Dec.			-0.003					0.003												
			(0.002)*					(0.002)*												
2003Jan.					-0.003			-0.008	-0.003	-0.003		0.007		0.006			-0.004		0.024	
					(0.001)*			(0.002)**	(0.001)**	(0.001)*		(0.002)**		(0.002)**			(0.002)*		(0.003)**	
2003Feb.																				
2003Mar.	0.006		0.004	0.005								0.003								
	(0.002)**		(0.002)*	(0.002)**								(0.001)*								
2003April																	0.004	0.007		
																	(0.002)*	(0.002)**		
2003May			0.004						0.003	0.005				-0.004						
			(0.002)*						(0.001)*	(0.001)**				(0.002)*						
2003 Jun.																				
2003July	-0.005									-0.003										
	(0.002)**									(0.001)*										
2003Aug.					-0.006		-0.004					-0.003								
					(0.001)**		(0.001)**					(0.001)*								
2003 Sept.																				
2003Oct.					-0.004					-0.003										
					(0.001)*					(0.001)*										
2003Nov.																				
2004 Dec.																				

2004Jan.				-0.004			-0.005			0.013	0.011	-0.004				
				(0.001)*			(0.001)**			(0.002)**	(0.002)**	(0.002)*				
2004Feb.					-0.003	-0.003			-0.003					-0.004	-0.007	
					-0.001	(0.001)**			(0.001)*					(0.002)*	(0.003)*	
2004Mar.	0.01		0.006	0.006	0.004	0.004	0.003	0.008	0.003							
	(0.002)**		(0.002)**	(0.002)**	(0.001)**	(0.001)**	(0.001)*	(0.001)**	(0.001)*							
2004April	0.005		0.006	0.006			0.005					0.004	0.006			
	(0.002)*		(0.002)**	(0.002)**			(0.001)**					(0.002)*	(0.002)**			
2004May					-0.003	-0.003			-0.003							
					(0.001)*	(0.001)**			(0.001)*							
2004 Jun.							-0.003									
							(0.001)**									
2004July											-0.004					
											(0.002)*					
2004Aug.																
2004 Sept.					-0.005	-0.007		-0.003	-0.002							
					(0.001)**	(0.001)**		(0.001)*	-0.001							
2004Oct.							-0.002									
							-0.001									
2004Nov.							-0.004									
							(0.001)**									
2004 Dec.						-0.002	0.003	-0.003			0.011					
						(0.001)*	(0.001)**	(0.001)*			(0.002)**					
2005Jan.			-0.003				-0.005		-0.003					0.005	0.009	
			(0.002)*				(0.001)**		(0.001)*					(0.002)**	(0.003)**	
2005Feb.			0.005				-0.003	-0.004				0.004				
			(0.002)**				(0.001)*	(0.001)**				(0.002)*				
2005Mar.							0.004									
							(0.001)**									
2005April	0.011		0.008	0.01	0.007	0.007		0.007	0.004			0.005				
	(0.002)**		(0.002)**	(0.002)**	(0.001)**	(0.001)**		(0.001)**	(0.001)**			(0.002)**				
2005May												-0.004				
												(0.002)*				

2005 Jun.															-0.004			
															(0.002)*			
2005July											-0.005							
											(0.001)**							
2005Aug.																		
2005 Sept.																		
2005Oct.									0.002									0.009
									(0.001)*									(0.003)**
2005Nov.										-0.003					-0.005		-0.006	
										(0.001)*					(0.002)**		(0.002)**	
2006Jan.						-0.003					0.003							0.008
						(0.001)*					(0.001)*							(0.003)*
2006Feb.			0.005															
			(0.002)**															
2006Mar.			0.004			0.003	0.003			0.004	0.003							
			(0.002)*			(0.001)*	(0.001)**			(0.001)*	(0.001)*							
2006April			0.004			0.004				0.004								
			(0.002)*			(0.001)**				(0.001)**								
2006May	0.005					0.004	0.004				0.004			0.006				
	(0.002)**					(0.001)**	(0.001)**				(0.001)**			(0.002)**				
2006Aug.										-0.003								
										(0.001)*								
2006 Sept.															-0.004			
															(0.002)*			
2006Oct.																		
2006Nov.																	-0.005	
																	(0.002)*	
2007 Dec.																		
2007Jan.	-0.004		-0.004									0.006						
	(0.002)*		(0.002)*									(0.002)**						
2007Feb.						0.003												

						(0.001)*												
2007Mar.	0.007		0.007	0.005		0.005	0.004				0.004							
	(0.002)**		(0.002)**	(0.002)**		(0.001)**	(0.001)**				(0.001)**							
2007April	0.01		0.007	0.008		0.007	0.006			0.004	0.007					0.004	0.006	
	(0.002)**		(0.002)**	(0.002)**		(0.001)**	(0.001)**			(0.001)**	(0.001)**					(0.002)*	(0.002)**	
2007May											0.003	-0.005						
											-0.001	(0.002)**						
2007 Jun.														0.008	-0.004			
														(0.002)**	(0.002)*			
2007July																		
2007Aug.																-0.004	-0.004	
																(0.002)*	(0.002)*	
Constant	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.003	0.002	0.004	0.003	0.002	0.004	0.004	0.004	0.003
	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**	(0.001)**
N	128	73	128	128	85	128	128	73	109	126	126	128	73	128	128	128	128	128
R^2	0.67	0.74	0.76	0.71	0.76	0.66	0.77	0.67	0.69	0.74	0.64	0.72	0.77	0.73	0.59	0.59	0.72	0.68

Table A6. Difference-in Difference Estimate of Inflation Effects – Item Level (1997-2003)

	Restaurant Coffee:	Sandwich: Pub	Hot Meal: Pub	Burger: Eat-In	Restaurant Main Course	Restaurant: Sweet	Restaurant: Lunch	Dinner: Primary School	Cafeteria: Primary School	Dinner: Secondary School	Cafeteria: Secondary School	Staff Canteen: Main	Staff Canteen Sweet	Take-Away: Fish & Chips	Take-Away: Sandwich	Take-Away: Coffee	Take-Away: Tea
Constant	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*
Min. Wage	1.58	1.98	0.67	-1.00	-0.55	0.66	0.75	1.72	2.19	6.33	2.04	0.95	2.12	0.50	1.07	1.41	1.63
	(0.25)*	(0.16)*	(0.21)*	(0.43)*	(0.21)*	(0.24)*	(0.30)*	(0.21)*	(0.34)*	(0.81)*	(0.27)*	(0.23)*	(0.20)*	(0.41)	(0.19)*	(0.25)*	(0.31)*
April 99+	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99
	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*
Min. Wage	0.77	-0.04	0.51	1.71	1.20	0.76	0.03	-0.31	-0.47	-4.56	0.52	2.32	2.80	1.95	0.55	0.33	0.80
* April 99+	(0.32)*	(0.27)	(0.31)	(0.50)*	(0.27)*	(0.30)*	(0.35)	(0.36)	(0.58)	(0.96)*	(0.42)	(0.33)*	(0.55)*	(0.48)*	(0.28)	(0.36)	(0.45)

	Pub: Bitter (pint)	Pub: Lager (pint)	Pub: Stout (pint)	Pub: Cider (bottle)	Pub: Lager (bottle)	Pub: Whisky	Pub: Vodka	Pub: Wine (glass)	Pub: Wine (bottle)	Pub: Mixer	Pub: Liqueur	Domestic Cleaner	Laundrette: Wash	Dry Cleaning Suit	Haircut: Men	Haircut: Women	Highlights Women	Minicab Fare
Constant	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*	(0.15)*
Min. Wage	1.05	0.87	0.55	0.81	1.93	0.58	0.57	0.77	-0.55	1.04	0.27	1.48	2.45	0.54	2.72	2.88	3.03	2.91
	(0.17)*	(0.18)*	(0.20)*	(0.23)*	(0.17)*	(0.18)*	(0.18)*	(0.23)*	(0.17)*	(0.28)*	(0.18)	(0.23)*	(0.43)*	(0.22)*	(0.30)*	(0.28)*	(0.21)*	(0.34)*
April 99+	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99	-0.99
	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*	(0.21)*
Min. Wage*	-0.31	-0.30	-0.03	-0.24	-1.04	0.53	0.47	0.21	1.29	0.43	0.60	2.59	-0.74	0.41	0.62	0.90	-0.16	1.43
April 99+	(0.25)	(0.24)	(0.25)	(0.29)	(0.25)*	(0.24)*	(0.25)	(0.29)	(0.23)*	(0.33)	(0.25)*	(0.32)*	(0.48)	(0.30)	(0.37)	(0.35)*	(0.27)	(0.43)*

CENTRE FOR ECONOMIC PERFORMANCE
Recent Discussion Papers

946	David Marsden	The Paradox of Performance Related Pay Systems: 'Why Do We Keep Adopting Them in the Face of Evidence that they Fail to Motivate?'
945	David Marsden Almudena Cañibano	Participation in Organisations: Economic Approaches
944	Andreas Georgiadis Alan Manning	One Nation Under a Groove? Identity and Multiculturalism in Britain
943	Andreas Georgiadis Alan Manning	Theory of Values
942	Kristian Behrens Giordano Mion Yasusada Murata Jens Südekum	Trade, Wages and Productivity
941	David Marsden Richard Belfield	Institutions and the Management of Human Resources: Incentive Pay Systems in France and Great Britain
940	Elhanan Helpman Oleg Itskhoki Stephen Redding	Inequality and Unemployment in a Global Economy
939	Norman Ireland Robin A. Naylor Jeremy Smith Shqiponja Telhaj	Educational Returns, Ability Composition and Cohort Effects: Theory and Evidence for Cohorts of Early-Career UK Graduates
938	Guy Mayraz Jürgen Schupp Gert Wagner	Life Satisfaction and Relative Income: Perceptions and Evidence
937	Nicholas Bloom Raffaella Sadun John Van Reenen	The Organization of Firms Across Countries
936	Jean-Baptiste Michau	Unemployment Insurance and Cultural Transmission: Theory and Application to European Unemployment
935	João M. C. Santos-Silva Silvana Tenreyro	Trading Partners and Trading Volumes: Implementing the Helpman-Melitz-Rubinstein Model Empirically
934	Christian Morrisson Fabrice Murtin	The Century of Education

933	João M. C. Santos-Silva Silvana Tenreyro	Further Simulation Evidence on the Performance of the Poisson Pseudo-Maximum Likelihood Estimator
932	João M. C. Santos-Silva Silvana Tenreyro	On the Existence of the Maximum Likelihood Estimates for Poisson Regressioin
931	Richard Freeman John Van Reenen	What If Congress Doubled R&D Spending on the Physical Sciences?
930	Hector Calvo-Pardo Caroline Freund Emanuel Ornelas	The ASEAN Free Trade Agreement: Impact on Trade Flows and External Trade Barriers
929	Dan Anderberg Arnaud Chevalier Jonathan Wadsworth	Anatomy of a Health Scare: Education, Income and the MMR Controversy in the UK
928	Christos Genakos Mario Pagliero	Risk Taking and Performance in Multistage Tournaments: Evidence from Weightlifting Competitions
927	Nick Bloom Luis Garicano Raffaella Sadun John Van Reenen	The Distinct Effects of Information Technology and Communication Technology on Firm Organization
926	Reyn van Ewijk	Long-term health effects on the next generation of Ramadan fasting during pregnancy
925	Stephen J. Redding	The Empirics of New Economic Geography
924	Rafael Gomez Alex Bryson Tobias Kretschmer Paul Willman	Employee Voice and Private Sector Workplace Outcomes in Britain, 1980-2004
923	Bianca De Paoli	Monetary Policy Under Alterative Asset Market Structures: the Case of a Small Open Economy
922	L. Rachel Ngai Silvana Tenreyro	Hot and Cold Seasons in the Housing Market
921	Kosuke Aoki Gianluca Benigno Nobuhiro Kiyotaki	Capital Flows and Asset Prices
920	Alex Bryson John Forth Patrice Laroche	Unions and Workplace Performance in Britain and France

The Centre for Economic Performance Publications Unit
Tel 020 7955 7284 Fax 020 7955 7595 Email info@cep.lse.ac.uk
Web site http://cep.lse.ac.uk