



Identifying the employment effect of invoking and changing the minimum wage: A spatial analysis of the UK. ☆



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HIGHLIGHTS

- We explore the impact of the National Minimum Wage (NMW) on employment in the UK.
- We identify the effects of both the NMW introduction and its incremental changes.
- Several econometric issues of former studies are addressed.
- There are no discernable effects of the NMW introduction or its uprating.
- More naïve estimation strategies may induce widely different contradictory effects.

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ABSTRACT

This paper assesses the impact of the National Minimum Wage (NMW) on employment in the UK over the 1999–2010 period explicitly modelling the effect of the 2008–2010 recession. Identification of invoking a NMW is possible by reference to a pre-period (prior to 1999) without a NMW. Separate identification of the effect of incremental changes (and year interaction effects) in the NMW is facilitated by variation in the bite of the NMW across local labour markets. We address the issues of possible endogeneity and dynamic structure of employment rate changes, regional demand side shocks induced by the recession, and take account of the spatial dependence of local labour markets. Using system GMM, we conclude that there is no discernable effect of the NMW introduction or its uprating on employment but show how more naïve estimation may have revealed the various widely different positive and negative effects found in the literature.

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1. Introduction

The introduction of a minimum wage (MW) could have important implications for employment levels in an economy. Likewise, the uprating or changing of a MW on an annual basis could also have separate incremental effects on employment levels in the

economy. Up to now, the literature rarely distinguishes between the imposition of a new MW and its uprating, simply because in most countries we do not observe the pre-period prior to the introduction of a MW to set a benchmark from which to measure the effect of the introduction. The introduction of a new National Minimum Wage (NMW) in Britain in 1999 and its subsequent annual

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uprating provide a unique opportunity to distinguish between these two effects.¹

The important concern of how the MW should be changed in times of recession, when most wages are declining in real terms, is a current and pressing problem. The problem is compounded by the consideration of what effects the MW itself may have on employment during the biggest recession since the 1930s. Since inception, the UK NMW has been administered on a national basis, with both adult and youth rates applying to all parts of the country. However, the issue of whether a MW adequately reflects regional variation in the regional cost of living, the relative balance of industrial regional growth, and the growth and variation in regional productivity, is questionable. Clearly, long-standing geographic variation in wage rates across the UK have a direct effect on the 'bite' of the NMW in different areas. As the NMW reaches further up the wage distribution in poorer parts of the country than in others (Stewart, 2002), this study makes use of both this geographical variation and the variation in the real level that the NMW has been set at over time, in order to see how changes in the local area NMW incidence over several years of the minimum wage's existence are correlated with changes in local area performance. We are also concerned that all of our geographic locations are not independent labour markets but interconnected contiguous markets. The very fact that the comparative prosperity of the South East of the country is conditioned by the economic gravity that is induced by proximity to London means that we should not treat local labour markets as independent observations in any statistical model. As Dube et al. (2010) recognize, the likely consequences of erroneously doing so induces an underreporting of the standard error of the estimates and hence makes it likely that there will be mistaken positive or negative inferences regarding the relationship between the MW and employment.

This paper builds on that literature by examining the impact of the NMW in the UK over the period 1997–2010, comparing the period two years before its introduction with the subsequent history of the NMW and its upratings. This enables us to provide an additional insight by distinguishing between effects in a NMW policy off period compared to each incremental uprating of the NMW in subsequent years. Hence, instead of using a simple policy on–policy off, difference-in-difference model, we examine a model in which each year's change in the NMW is considered as a separate interaction effect. This 'Incremental Diff-in-Diff' (IDiD) estimator (Dolton et al., 2012)² introduces a yearly interaction term for each change of the NMW, so that we may gauge the year-on-year impact of the uprating of the NMW on employment.

Most existing UK studies have focused on the impact of the introduction of the NMW, finding broadly that, the aggregate employment effects of the introduction were zero or small and positive (Stewart, 2002, 2004a,b; Dolton et al., 2009, 2010, 2012). Arguably, this counter-intuitive employment effect could be due to the fact that any long run effects have not been captured by previous studies or that the problem of identifying the introduction of the NMW has not been separated from the effects of the annual uprating of the NMW. Clearly, the overall effect of having a MW in the labour market may induce a long run impact whereas small changes in the uprating of the level of the NMW in any given year may induce short run adjustment effects. In this paper, we take a medium to long run look at the impact of the NMW in the UK and its upratings and assess whether these two separate processes may have had a differential impact across heterogeneous geographical areas.

There is a large literature on the employment effects of a minimum wage (see Brown et al., 1982; Card and Krueger, 1995; Brown, 1999; Neumark and Wascher, 2008 for extensive reviews of the literature).

In recent years, there has been a growing literature attempting to identify the effects of a MW on employment by using geographical variation in the bite of the MW in spatially separated markets (see Card, 1992; Lee, 1999; Neumark and Wascher, 1992, 2007; Card and Krueger, 1994, 2000; Burkhauser et al., 2000; Dube et al., 2007, 2010; or Baskaya and Rubinstein, 2012 for the United States; Baker et al., 1999 for Canada; Bosch and Manacorda, 2010 for Mexico; Stewart, 2002, 2004a,b; and Dolton et al., 2009, 2010, 2012 for the UK). This literature has not concerned itself with what happens to employment effects of the MW in times of macro-economic recession. This paper focuses on the modern era in the UK from 1997 to 2010 with the introduction of the NMW in 1999 and then leading into the current 'great' recession of 2008–2010. Hence, we focus on the important question of what impact the MW has in an era when the economy is contracting, unemployment is rising, and real incomes are falling for many people in the economy. We do this explicitly by controlling for regional demand shocks using data on gross value added, which is a direct measure of the level and shocks to economic activity over time at a regional level.

A second feature of nearly all the literature on the MW to date which uses geographical variation to identify the impact of the MW is that it has made the assumption that the geographical units of observation are geographically separate and unrelated to one another.³ This assumption is unwarranted for many important reasons—we focus on just two. Firstly, in reality, a job vacancy is never posted with the condition that nobody outside the immediate geographical vicinity need apply. Clearly, being able to travel to the job location is the problem of the individual and the resulting commute is never considered in whether someone gets the job. This means that labour markets are not independent units of observation that bear no relation to one another. Economists frequently consider local labour markets as if each geographical area consists only of people who both live and work in the same location. Accordingly, they model all such areas as a set of independent, unrelated observations. In reality, such a notion is false as all geographical areas have people who live in them but work in other locations. This pattern of commuting is then, in some sense, the realized form of all the subtle interrelationships between different geographical locations. A second flaw with treating such geographical units as independent is that spatially located phenomena like plant closures have an effect not just in the geographical location it occurred in, but also in the immediate neighbouring areas. The degree of contiguity of neighbouring locations is therefore an important factor in the spread of unemployment, poverty, wage rises and other labour market phenomena. The extent of spillover effects from one location to another will depend on transport links, the spatial distribution of related industries and many other factors. It is well known that if we model an econometric relationship under the mistaken assumption that the units of observation are independent of one another (spherical)—when in reality, they are not—then we may get biased and inconsistent estimates of the resulting economic relationships. This means that if we estimate a model of the effects of the MW using geographical data under the assumption of non-spatially related units, when they are indeed spatially related, then we will get estimates of the effects which are different from what they should be and also more or less statistically significant than they ought to be. Hence, the assumption of spatial independence is a very important one in this context which should be tested.

An important problem that has been a preoccupation with papers in this literature is how to capture the autoregressive process of employment determination. Many papers have adopted the practice of attempting to control for this by using unemployment or various lags of employment (see Neumark and Wascher, 1994, or Burkhauser et al., 2000). Clearly, such variables are endogenous to the employment dependent variable. To overcome this problem, we adopt an Arellano Bond system GMM IV estimator which explicitly controls for the lagged

¹ There is voluminous literature on the inequality and other effects of the NMW. These are referenced, e.g., in Dolton et al. (2012). In this article, we focus exclusively on the econometric estimation of the employment effects of the MW.

² This IDiD estimator is a logical corollary of the econometric model suggested by Wooldridge (2002) and Bertrand et al. (2004).

³ One exception is the study by Dube et al. (2010), who consider cross-state border spillovers of the MW in the fast food industry in the US.

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