



Money changes everything? Education and regional deprivation revisited



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ABSTRACT

A long line of literature has sought to explain the relationship between regional deprivation and education outcomes. To date, however, this literature has struggled to advance notions of deprivation beyond the purely economic. Focus has fallen on attempts to isolate causality using experimental and quasi-experimental approaches, yet the transfer mechanism of financial deprivation remains unclear and under-explained. Employing a multi-domain deprivation measure for Northern Ireland, this paper revisits the question and confirms a negative relationship between regional deprivation and education outcomes. Using random effects and error-component 2SLS models and employing the spatial variation of historical violence as an instrument we find no unique effect of financial deprivation over and above the effect of other deprivation metrics. This confirms the limitations of using wealth as a proxy for deprivation, whilst suggesting that policies focusing only on income redistribution will be unsuccessful in improving educational outcomes.

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1. Introduction

A long line of research has sought to explain the relationship between regional deprivation and educational outcomes, with high levels of adversity often shown to have a deflationary impact on achievement. However, a questionable leitmotif of this literature, stretching back to, e.g., Tolley and Olsen (1971), is the use of economic variables to reflect deprivation. Whilst understanding of the relationship has developed significantly in recent years, with causality isolated through experimental and quasi-experimental methods, measurement of deprivation by economic proxies remains prevalent. In a large percentage of cases, a negative impact is confirmed, but transfer mechanisms and policy recommendations remain under-explained. It is, for example, theoretically ambiguous why exogenously increasing income

should have a singular and direct effect on improved educational performance.

In this vein, this article challenges the wisdom of a causal link stemming from financial deprivation. We propose that deprivation is a much wider phenomenon, implying that the real relationships have, so far, only been approximated. Instead of a direct effect, we suggest that the real impact stems from an array of adverse social conditions that are often, although not always, highly correlated with financial deprivation. To this end, we ask three research questions. First, fitting with the literature to date, we ask whether or not there is a causal relationship between deprivation and schooling outcomes. Second, we ask whether or not financial poverty acts as a valid proxy for neighbourhood deprivation. Finally, we ask whether there is a unique impact of financial deprivation, by conducting an analysis that includes both financial deprivation metrics and an aggregate measure of other deprivation indicators.

To do so, we employ the Northern Ireland Multiple Deprivation Measure (NIMDM), which captures variations in

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neighbourhood deprivation through seven domains. In addition to those expected, such as financial or employment deprivation, the NIMDM includes five subsequent indicators. The first is education deprivation, which looks at the prevalence of skills and achievements in the local population. Next is health deprivation, which, amongst other things, includes metrics for disabilities, expected life span and prevalence of mental health issues. The next two domains measure various aspects of local neighbourhood quality through living environment indicators, such as house over-crowding, quality of heating, etc., and through a neighbourhood's proximity to important services, such as healthcare facilities, post offices, food stores and so on. Crime is the final sub-component of the NIMDM and measures, amongst other things, the prevalence of various forms of theft and property damage.

By using this measure, this paper constitutes one of the first major attempts to employ a wider deprivation measure and is certainly the first to use such data to question the use of economic proxies in studies to date. We focus on Northern Ireland, rather than the United Kingdom as a whole, as we infer causality through a unique instrumental variables approach, which links historical conflict to current levels of deprivation. Within the developed world, Northern Ireland is one of the few countries to have experienced such a conflict in recent years. Perhaps more importantly, it is also the only case where the conflict can be argued to be truly exogenous to current primary school outcomes. Violence was low-intensity, most commonly involving small arms. As a result, comparatively little property damage occurred and, to the best of the authors' knowledge, no schools were destroyed. Similarly, the relatively abrupt end of violence in 1994 provides a strict measurement point for the cessation of violence, which is not always available in other conflicts. As violence ended over 20 years ago, we study a large cohort who were educated after the violence ended. In other conflicts in the developed world, such as that in the Basque Country for example, multiple cohorts are not available. Despite this uniqueness in the history of Northern Ireland, however, the state remains highly comparable to the United Kingdom as a whole.¹

We use a bespoke dataset drawing on [Sutton \(1994\)](#) that links each conflict fatality to one of Northern Ireland's 582 electoral wards – the highest geographic disaggregation of violence data ever produced for Northern Ireland. The spatial variation of this violence ([Fig. 1](#)) is highly correlated with contemporary deprivation but can reasonably be assumed to be uncorrelated with our outcome of interest. We match this data to school attainment using the performance of each primary school in Northern Ireland in the standardised Key Stage II exams for the academic years 2000/2001–2010/2011.

We show a negative causal relationship between deprivation and school performance in our baseline analyses, where we use the net NIMDM. Once we disaggregate the NIMDM into its sub-components, we find that neither financial, nor employment, deprivation are significant drivers of school performance when we include an aggregated measure of the

other domains. However, both exhibit a negative and significant coefficient when included in isolation. Thus, financial and employment deprivation act as valid proxies for wider neighbourhood deprivation in this case but cannot alone explain the causal mechanisms at play. This implies that the findings of the literature to date are conditional on the strength of the correlation between actual neighbourhood deprivation and the economic proxies employed. Similarly, they also imply that policy interventions that aim only to redistribute income will prove less successful in mitigating the negative impacts of deprivation than policies that tackle a wider array of sources of deprivation.

The remainder of this article is set out as follows: in the next section, we review the literature relevant to this study. In [Section 3](#), we describe the data we use. In [Sections 4](#) and [5](#), we describe our methodology and present our results. We provide a discussion of the Northern Ireland-specific context and the external validity of the findings in [Section 6](#) and conclude in [Section 7](#).

2. Literature review

The positive role played by good primary school performance on the formation of human capital and of individuals' future labour market outcomes is uncontroversial ([Sparkes, 1999](#)). When coupled with the long history of literature showing the relationship between regional deprivation and education outcomes (e.g. [Tolley and Olsen, 1971](#)), however, two important questions arise. First, if there is a link between deprivation and primary school outcomes then concern must arise about cycles of poverty. Those children who grow up and are educated in the most deprived regions are those most likely to spend their adulthood living in poverty. Second, should such a cycle exist, it is important to understand the causal mechanisms by which the effect is transmitted, in order to allow the development of suitable policy interventions. If, for example, financial poverty can explain the relationship, then income redistribution could play a joint role in alleviating both current and future deprivation. Alternatively, if, as [Tolley and Olsen \(1971\)](#) suggest, the effects are less direct, then more specific and nuanced policies would be required.

[Tolley and Olsen \(1971\)](#) argue that the effect is based on richer regions simply having the greatest ability to invest in education infrastructure, suggesting richer parents gain access to the best schools. In such a setting, deprivation only plays an indirect role and suitable policy interventions would require greater investment in schools in impoverished areas. Although the notions this raises of endogeneity and reverse causality are important considerations in subsequent literature, these findings still imply that there is a causal relationship that runs between deprivation and education outcomes.

Measuring deprivation at either the household or neighbourhood level is notoriously complex, however. To this end, a series of proxies have been developed in the economic literature. These include parental education ([Cremer, Pestieau, & Rochet, 2003](#)), family income ([Blau, 1999](#)) and parental occupation ([Oreopoulos, Page, & Stevens, 2008](#)) in studies looking at individual outcomes. At the regional level, the proportion of social housing ([Weinhardt, 2010](#)), number of house demolitions ([Jacob, 2004](#)) and the proportion of

¹ [Dorsett \(2013\)](#), for example, simulate Northern Ireland's economy using a composite of other UK regions and although there are small differences in the education and health systems, they are broadly similar in organisation, quality and availability.

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