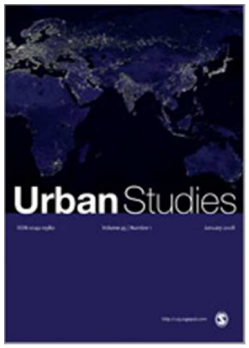

Local economic development opportunities from NHS spending: Evidence from Wales

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Abstract

The paper examines the local and regional economic impacts of NHS spending. The research is set in the context of tensions between buying economies, process efficiencies and local economic development impacts of public sector procurement, and contributes to the evidence base on supplier proximity and income retention at the local and regional level. The scale, scope and spatial distribution of NHS spending in a South Wales case is analysed using detailed purchasing information provided by a local health board. The paper then uses an economic modelling framework to quantify the supply chain impacts of this spending to determine the full regional economic impacts of operational and capital expenditures. The analysis shows that NHS Wales spending supports significant levels of regional economic activity in terms of output, employment and gross value-added. The paper also explores scenarios on the potential economic significance of import substitution of selected purchases. The implications of the changing procurement environment, with new EU directives, and a reorganisation of procurement functions within NHS Wales, are explored, and suggestions are made for further research.

Keywords

NHS Spending, local and regional economic impacts, public sector procurement, supplier proximity, Wales

Introduction

This paper examines and quantifies the regional economic activity supported by National Health Service (NHS) spending. The paper is set in a context of tensions between a search for savings in more efficient public procurement contracts based on buying economies and process efficiency, regulatory frameworks placing constraints on how far local content can be specified in public service procurement, but then the potential economic development benefits from local purchasing. While there is a strong regulatory and professional procurement emphasis on value for money, the value equation may need to address the more subtle consequences of increases in locally directed NHS spending.

The analysis meets a need identified by Thatcher and Sharp (2008) that: "In the current UK policy environment, quantifying actual local economic gains could add much needed weight to arguments in favour of local procurement in the NHS and other public bodies."(p.253). This gap in terms of quantitative analysis was also identified by Preuss (2009) who looked specifically at local authorities in England, and how they used their procurement activities to further sustainable development objectives. Cabras (2011) also identified a need for research on public procurement impacts at a regional and sub-regional level, and contributed towards addressing the research gap through a spatial analysis of the procurement activities of a peripheral local authority in England. Furthermore, in relation to the health sector specifically, there is limited evidence on the economic effects related to NHS supply chains for goods and services, set beside economic effects associated with the wage spending of NHS staffs. These questions have been brought into a sharper focus with NHS budgets coming under increasing pressure in a time of austerity (see Murray, 2009 on

the use of public procurement to stimulate the local economy following economic crisis).

The Welsh NHS is a useful lens through which to study these issues with health sector spending of £6.47bn in 2014-15 (Wales Governance Centre, 2016) or around one fifth of total identifiable public expenditure on services in Wales. The Welsh Government has noted the requirement to lever better quality local socio-economic outcomes from public procurement (Welsh Government, 2010a), and stressed connections between health sector public procurement and economic growth.

The paper uses the case of the Aneurin Bevan Health Board (ABHB) in South East Wales to examine the scale, scope and spatial distribution of supply chain spending, and to quantify the indirect and induced impacts in other parts of the local economy.

The next section of the paper provides some background on the literature connecting public procurement and local economic development. This section explores the connections between the spatial proximity of suppliers and public procurement contracts and highlights the tensions between process efficiency and local economic development outcomes. The third section outlines the case study and the methodology. The fourth section provides the analysis of the local health board's spending and how this supports economic activity in other parts of the economy. The discussion and conclusions relate to the changing procurement environment within NHS Wales, the potential to lever socio-economic outcomes from changes in local purchasing patterns, policy implications and future research needs.

Public procurement and local economic development

The Gershon Review (1999) identified a series of public procurement problems including neglect, waste, variability in standards, duplication and ignorance. The

immediate outcome of the Review was the creation of the Office of Government Commerce in 2000, which was charged with the twin tasks of modernising the public procurement process and securing better value for money outcomes for the taxpayer. This 'value' goal is reinforced by a raft of multi-level procurement regulations – from the European Union level down to the local government level – which requires public bodies to pursue best value and to do so in a transparent and non-discriminatory manner, treating all firms within the EU in a uniform way (see National Audit Office, 2010).

While progress has been achieved in the past decade, the story of UK public procurement remains one of untapped potential. The huge amounts that the public sector spends annually on goods, services and works, constitutes a real power, but with this dependent on whether this force can be channelled in an efficient manner (Morgan, 2010).

The changing environment around procurement comes together with growing interest in the potential role of public purchasing patterns in local economic development. Research in the 1980s and 1990s on embeddedness and local sourcing propensities in UK regions tended to be focused on multinational firms, and the privatised utilities, and developed in the context of concerns about a developing branch plant syndrome. In a similar vein it has been recognised that the distribution of public spending, defence spending, and government procurement can have important economic and social policy impacts (see for example McCrudden, 2004 for an international historical review of social outcomes from public procurement, and McLean and McMillan, 2003, who examine methods for allocating UK public expenditure to the UK regions and their equity and efficiency consequences). However, Morgan (2008) argues that inadequate attention has been given to the role

of public authorities and their local spending in addressing problems of uneven economic development. Mackay (2001, 2003) also shows how relatively higher levels of public spending in some areas can reduce national inflationary pressures, and moreover that local authorities can, through their spending, ameliorate some of the impacts of recession in their areas (see also more recently Jones et al., (2015) on the uneven impact of austerity on public services delivery in more deprived parts of the UK).

The changing environment around public procurement, and calls for greater professionalism in purchasing, can, however, create tensions between levering socio-economic outcomes and value for money. For example Peck and Cabras (2011) (see also Cabras, 2010, 2011) provide an analysis of local authority spending in the North West of the UK. This research showed that contracts with the public sector provided an important source of business stability to many local SMEs. However some of these SMEs also noted an increase in formal bureaucratic procedures, with an extended range of information required from the firms, together with an emphasis on a narrow definition of 'value for money' that overly focused on price. These factors in general impacted disproportionally on smaller suppliers. Peck and Cabras (2011) make the point that: "One of the contradictions concerns the juxtaposition of value for money and the efficiency of procurement processes alongside the emerging requirement to support local employment and small and medium sized enterprises (SMEs) in particular as part of the Government's approach to sustainable communities." (p.308). In consequence 'narrow' ideals on value for money in public purchasing could work against the achievement of socio-economic objectives at local level.

More generally, and linked to the above issues is research connecting public sector procurement, supplier proximity and local income retention. Cabras (2011) in an

investigation of this issue, using procurement data for local authority suppliers in the north of England, sought to examine their expenditure patterns and the consequent retention (or leakage) of income from a local authority area. For example, public sector suppliers with local headquarters, and in sectors such as construction and social care, were more likely to have higher local purchasing propensities, compared with those suppliers headquartered outside the locality and in sectors such as consultancy and business services.

The sectoral or market dimension was also significant in the work of Mamavi et al, (2014), who examined spatial proximity in supplier selection in French public procurement. They examined whether proximity was important in procurement decision-making, with proximity considered an 'important dimension of supplier relationship management' (p.490). Mamavi et al assert that there has been some rediscovery of the 'virtues of spatial proximity in effective governance of inter-organisational relationship' (p.492). The proximity issue was tied to the degree of flexibility and adjustments needed in the management of the supplier and public contractor relationship. Then activities in the construction and civil engineering market were more likely to be sourced close to the buyer, require more frequent adjustments and communications between supplier and customer, and were perhaps more likely to involve transactions specific assets, and with the potential for hold-up. Here then was a suggestion that relationship management factors linked to proximity should be integrated alongside traditional competencies in calls for tenders. This finding is particularly interesting in an EU regulatory environment that does not explicitly allow local preferencing (see Thatcher and Sharp, 2008).

Within the US, public procurers have more discretion regarding supplier selection, and research has examined the local economic development aims of public

procurement, through specific 'buy-local' schemes, and as a driver of innovation (see Nijaki and Worrel, 2012 for a review). There is however debate as to whether such discretion, and local preferencing can aid or hinder the decision-making process in relation to supplier selection (see Williams, 2014, for a summary of the issues).

The tensions between value for money in procurement (linked to process efficiency and demand aggregation) and the potential economic development benefits linked to local purchasing, can be usefully explored using an NHS case example, given the scale of its spending and the pressures for efficiency and best value in procurement. Watson et al. (2013) show that research on NHS purchasing practice has been quite critical. One issue relates to fragmentation of NHS demands for similar goods and services across large numbers of suppliers, increasing transaction costs, and reducing opportunities for purchasing economies and NHS leverage over suppliers. Watson et al. note one means of improving the situation is demand consolidation with smaller numbers of preferred suppliers, but that this process creates winners and losers within NHS organisations, and has political as well as technical and practical ramifications.

A further issue is a potential tension between encouraging local firms to become players in the NHS supply chain and the acquisition of purchasing economies on complex supply chain frameworks that could benefit larger firms outside the locality (see Loader, 2013). In addition the NHS procurement process will be concerned with different priorities when they procure goods and services. Demand aggregation makes more sense where the NHS wants to drive down costs, but low cost needs to be distinguished from best value. This is not an easy concept to define when public procurement is expected to deliver so many different political priorities – like local sourcing and SME support for example (Morgan, 2010). For example, in catering and food, the aggregation of demand could create problems where it leads to the

aggregation of supply, and large firm monopolies in the supply of food to the NHS. Moreover, in many UK regions there is mounting policy pressure to use as much local food as possible in NHS catering contracts, and there is also a desire to try to open up these contracts to SMEs (see Welsh Government, 2010b).

In summary there are rules to the game governing public purchasing in the EU. These rules have ramifications for the extent to which public purchasing by organisations such as the NHS can 'support' local economic activity. However, alongside this seemingly rigid paradigm there appears to be an element of flexibility in that organisations such as the NHS are not obligated to select "the lowest price" tender. Indeed, new EU rules for public procurement (Cabinet Office, 2013) discourage price as a single criteria, and show the need to consider environmental and social issues. These directives also aim to improve SME access to public sector contracts by encouraging division of contracts into lots, reducing burdens with respect to proof of financial capability, and with relatively high thresholds which determine whether some public sector contracts (e.g. in clinical services) need to be advertised at cross border level. The rules also introduce more potential to allow organisations, such as the NHS, to negotiate more fully with suppliers in determining and adapting products and services to meet its specific needs (NHS Confederation, 2014). The new EU procurement directives then have some particular relevance for the NHS, and for its potential to procure more sustainably. For example this might be in terms of awarding a contract to "the most economically advantageous tender", in which case they can use criteria linked to the subject-matter of the contract in question (such as quality, price, technical merit, aesthetic and functional features, after-sales service, delivery date and completion date).

The review above suggests that public purchasing, including that in the NHS, has a potential role in improving development prospects in the local economy, but that this role is prescribed somewhat by the need for efficiency in public spending and a drive for public sector cost savings. Notwithstanding, a contention of this paper is that there needs to be a better understanding of the spatial pattern of NHS purchasing, and consequent levels of income retention within localities. Such analysis will enable estimation of local economic activity supported through this procurement, both directly and indirectly, together with the impacts of marginal changes in purchasing patterns on selected categories of goods and services. Then the results of this paper reveal something of the nature of economic gains from local purchasing activity in the NHS.

Case study and methodology

The analysis in this paper is based on the case of the Aneurin Bevan Health Board (ABHB) in Wales. The Board is responsible for the delivery of health care services to more than 600,000 people living in the Gwent area of Wales including Blaenau Gwent, Caerphilly, Monmouthshire, Newport and Torfaen. This area contains general and community hospitals, specialist health centres, local clinics and primary care facilities providing medical, dental, pharmacy and optometric services.

This section explains the methods used to analyse the nature, scale and spatial distribution of ABHB's supply chain spending for one year of activity (2009-10), and to quantify the economic activity in Wales supported by ABHB spending. The 2009-10 year is taken for a number of reasons. This was the first year of operation for the newly formed NHS boards within Wales, and ABHB was engaging in major capital expenditure within that year with the building of new hospitals. This provided an

opportunity to undertake a detailed analysis of the local economic impacts that could be linked to such significant capital projects in the region. ABHB had not undertaken any large scale capital works in the period since then, although a new hospital build at Llanfrechfa (Monmouthshire) is now underway and expected to be completed during 2019.

A spatial and sectoral mapping of the 'direct' spend of the ABHB, in its local area and region was undertaken. This was followed by a modelled analysis of how this spend supported further activity across the Welsh economy. The analysis of expenditure was informed by detailed records provided by ABHB showing their spending with identified companies and institutions. Initially the ABHB database was analysed by examining individual supplier addresses within Wales, and then within the more local ABHB area, and classifying the various suppliers of goods and services in terms of industries (i.e. standard industrial classifications). This classification also enabled the economic modelling element of the research to identify how direct spending of the defined industries led to economic outcomes in other Welsh industries (i.e. indirect and induced economic effects in Wales). The procedure was undertaken again for firms and institutions outside of Wales that supplied the Board. All ABHB transactions were then aggregated into 25 defined sectors.

The analysis of ABHB spending in geographical and sectoral terms was not straightforward. A series of issues had to be confronted. First was the definition of local. This was taken to mean the ABHB area in terms of the local authority areas of Blaenau Gwent, Caerphilly, Monmouthshire, Newport and Torfaen. Regional was taken to mean the whole of Wales. A reason for the local and region approach was that there were key areas of spending interest in local areas close to the ABHB hospitals, other centres and clinics. Other purchasing linkages existed in close

proximity, but outside of the immediate ABHB area, and with the research interested in exploring the regional as well as local impacts of spending.

Second (and see also Cabras, 2011), there were some large purchases made through supply hubs such as Welsh Health Supplies and NHS Supply Chain. In such cases it was possible that spending could be directed to an extra-regional hub but that in actuality the final supply chain contract was with a firm in Wales. These specific cases were discussed with Board officers to identify, as far as possible, the flow of expenditures which were ultimately to local firms.

Third, it was necessary to separate capital spending from that relating to 'day-to day' operations. The analysis aimed to examine capital spending on construction separately. This was because of interest in how far large capital projects for hospital development let to managing contractors outside of Wales, still provided opportunities for local firms as subcontractors. In the analysis extra information was made available from a large managing contractor (involved in building a local hospital in 2010) relating to the geographical spread of sub-contracting packages for the capital works.

Fourth, there was a research interest in examining the effects connected to ABHB spending on staff, compared to that on goods and services. Given the labour intensity of ABHB activities (and general NHS activity in the region) there was an expectation of significant indirect economic activity locally, and within the region, supported through direct staff spending.

Finally, a difficult issue for the analysis was that the 'health sector' in Wales undertakes a great deal of trade with itself. Elements of this relate to transactions between the NHS and the private health sector, but also where, for example, one health board buys services from other parts of the NHS within (or outside) Wales. For

these reasons part of the analysis that follows in the next section concentrates on operational spend excluding internal health sector transactions. A rationale for this approach was to identify goods and services purchases which involved the private as opposed to the public sector.

As highlighted above one of the objectives was to assess economic benefits from local NHS procurement. While the analysis of ABHB records permitted the identification of direct effects in the local and Welsh economy, the analysis of this operational spend would not permit the identification of wider supply chain effects linked to this spending. ABHB spending directly supported economic opportunities in local and Welsh suppliers, however, these suppliers also spent in the local economy supporting further economic output and employment. ABHB employees also spend wage income in the local economy and this also supports regional economic output and jobs. These 'multiplier' effects, which arise through local and regional income retention within the supply chain and household sector, are termed indirect and induced-income effects respectively.

The scale of these multiplier effects could be estimated in a number of ways. They could be partially measured, using a primary survey of public sector suppliers, to establish the levels of re-spend within the defined area (see Cabras, 2011). This information, together with the initial expenditures of the organisation could then also be combined into an LM3 (Local Multiplier 3) method. This method, which captures the most significant early rounds of spending, can provide an indicator of the potential full local impact of expenditures, and has been used to estimate multipliers for a number of projects in both the public and private sectors (Sacks, 2002).

In this case, and following the estimation of ABHB spending with local and regional suppliers, the impacts further along the supply chain, and those arising

through induced-income effects in Wales were modelled using an existing economic model of the Welsh economy. The impacts connected to construction activity (capital spending linked to a new hospital) were examined separately from general operational spending. The modelling framework used was derived from the Input-Output tables for Wales (Jones et al., 2010). The Input-Output tables provide a useful and detailed financial map of Wales plotting the flow of goods and services between industries, consumers and government, highlighting the intricate inter-relationships between industries in the Welsh economy. The impacts of spending with regionally based suppliers can therefore be traced along all the supply chains, with the multiplier then providing an estimate of *all* rounds of impact within the regional economy. This type of analysis would not be possible in all regions due to the general unavailability of such a modelling framework.

The modelling process involved the incorporation of ABHB expenditure data within the Welsh Input-Output framework to develop an 'ABHB' sector (subtracting this from the existing 'Health and Social care' sector). In this way, the spending of the ABHB on its suppliers and staff was fully incorporated within the model of the Welsh economy, and the economic significance of its purchasing activity for the regional economy could be estimated using (Input-Output) multiplier analysis. This process relies on the standard Leontief-inverse multiplication to obtain the final regional production outputs necessary to meet the regional demand requirements supported by ABHB expenditures on suppliers and staff. This enables estimation of effects along notionally infinite rounds of supply-chain purchases. Such an approach does, however, rely on a set of assumptions about how industries, consumers and the economy in general respond to changes in demand (see Miller and Blair, 2009, for a further explanation of the method, and its strengths and weaknesses). Hence this is a

modelled estimate of supply chain impacts arising from the identified supplier and staff expenditures. Figure 1 provides a schematic representation of the methodology used for estimating the economic significance of ABHB spending in Wales. The main data sources and stages of the analysis are shown, together with some signposting to the results tables discussed later.

Figure 1 about here

One issue that needed to be addressed in the modelled assessment was to estimate the economic impacts of the ABHB's local spending in terms of employment and value-added. A challenge in this respect was the treatment of expenditure on the goods provided by wholesalers. Inevitably this spend category includes the value of goods supplied by the wholesaler (which may or may not be local or regional), as well as the wholesale margin (or add-on element). In terms of measuring impacts, only the wholesale (or retail) margin was counted for the analysis, with the other component allocated as the output of producers (either local, regional or imported). To assist in this task information was obtained from selected wholesalers regarding their purchases of supplies. For a number of suppliers, even a very broad estimate of how much of a diverse product range is sourced from within Wales is extremely difficult. However, in other cases, for selected products, some estimates were possible. A further complication, was that a number of wholesalers with invoice addresses outside of Wales serve the ABHB through Welsh depots. In these known cases, some of the wholesale margin from outside of Wales, was allocated to the Welsh wholesale sector.

Health Board spending analysis

This section briefly summarises ABHB headline spending in 2009-10, before focusing in on the spatial and sectoral distribution of supply chain spending by ABHB

area, rest of Wales and then spending outside Wales. The analysis then compares total expenditure within and outside Wales to identify the main categories of goods and services that are imported.

In terms of headline expenditure figures for ABHB in 2009-10, a significant amount of total spending was related to the wages and salaries of staff, at nearly £406m. This wage spending directly supported an estimated 10,754 full time equivalent (FTE) jobs (around 14,000 employees), representing around 7% of total employees, and just over 70% of health employees in the ABHB area. During 2009-10 non-pay operational spending was around £529m. There was an estimated total capital spend through the year of £125m, largely relating to the construction of the Ysbyty Ystrad Fawr and Ysbyty Aneurin Bevan hospitals within the ABHB area (see later).

Table 1 shows the spatial distribution of total ABHB non-pay operational supply-chain spending by sector. The first column shows that by far the greatest element, accounting for nearly £416m out of the total £529m (79%), is health spending and this includes a large element of 'transfer' payments. This includes instances where adjacent health boards have cardiology units to which ABHB patients were referred; similarly ABHB also receives referrals from other areas resulting in a health 'trade balance' between board areas (with almost 70% of heath spending within Wales and around 30% outside Wales). These health sector expenditures also refer to payments to private sector providers for items such as domicile care, nursing homes and mental health care.

Table 1 about here

Other large items relate to chemicals and pharmaceuticals manufacture (£14.3m), and medical control equipment (15.2m) (each of which has been aggregated into the primary and manufacturing sector in Table 1), and professional/other business

services (£15.6m). In both of these cases, the majority of expenditures were outside of Wales, for example at over 90% for primary and manufacturing purchases. Assuming that much of the spending on health and social care represents a form of intrasectoral transfer payment, then it is the remaining elements of operational spend (i.e. just over £113m) which might be of more interest in examining prospects for increasing levels of local purchasing.

Table 1 reveals that around 24% or £124m of total ABHB operational supply chain spend was payments to firms and institutions in the local area, and with over 90% of this on health and social care activity. Of the small remainder of £9.2m around 35% was payments to the public and local authority sector. Total ABHB spending in Wales as a whole (including within the local ABHB area) in 2009-10 was £306.5m or 58% of total operational spending. Once again, discounting for spending in the health and social care sector, leaves £25.2m. Of this £6.2m (24.6%) is payments for utilities, £4.0m payments to public administration and local authorities, and then with £3.2m and £3.3m respectively going to the primary and manufacturing sector, and then to real estate, renting and other business services.

One observation from this initial analysis is the relatively small proportion of overall supply chain spending that is made outside of the health and social services sector in Wales. Moreover, the level of imports from outside Wales, particularly in terms of goods and services outside the health and social care sector, is of some interest given potential for increasing local sourcing.

Figure 2 provides a visualisation of this issue with an extended number of manufacturing sectors included to give additional detail on the level of purchases made by ABHB outside of Wales. For many sectors the percentage of total operational spending outside of Wales is greater than 90%. High import propensities

are not surprising as Wales is a small open economy and with selected very specialist NHS demands (see also Walker and Brammer, 2009). Figure 2 shows a greater probability of regional purchasing outside of these specialist demand areas, in food and drink, printing and publishing, utilities, construction (operational not capital spending here), hotels and catering, transport and communications, and other services. This result is consistent with research by Mamavi et al, (2014), although noting that Mamavi et al. investigated the numbers of contracts in spatial proximity, compared with this analysis of expenditure values. An issue of economic development interest is the likelihood of reducing import dependence in selected sectors in Figure 2, and how far the import propensities exemplify real supply gaps in the local and regional economy. Another point of interest from this analysis is the significant amounts of spend directed to wholesalers and distributors both inside and outside of Wales. Previous research (see North West Development Agency (NWDA), 2009) noted the potential role of wholesalers in promoting local goods and services, and the related local economic development outcomes. In respect of the NHS supply chain examined here, there is scope to encourage wholesalers, particularly those in Wales, to investigate local sources of supply where they are available. Moreover, and following NWDA (2009), wholesalers can be well placed with knowledge of local supply opportunities, and are useful antennae for local potential, particularly in terms of food products, and basic commodities.

Figure 2 about here

The information above suggests that it is high value-added products that are sourced outside of the local area. This possibly tells us more about the contemporary structure of the local economy, but even small levels of import displacement in selected niches within these sectors, such as in engineering, equipment and chemicals, could have

important effects in terms of the support of good quality employment. This has become a more important issue with several of the suppliers analysed subject to greater pressure to outsource production or elements of production to lower cost locations, and with these moves tending to take higher quality employment outside the region.

A small number of interviews were undertaken with ABHB officials both to gain assistance with interpreting spending information but also to better understand the 'environment' surrounding procurement. These interviews revealed some interesting issues in increasing local purchases even where goods and services were available. For example, while there was understanding of the value in improving levels of local purchases it was noted that the spending environment was very tight, with the NHS under severe pressure to work collaboratively in its procurement, with the other home countries. This meant that for a large series of classes of goods and services it was mandatory to use established supply contracts, and use existing portals to check on nation-wide availability, and with local suppliers not always aware of the nation-wide portals through which local business could be won. The use of larger portals and established agreements also meant that there could be less legal challenges to procurement decisions. Procurement officers concluded that very little business routinely went to local firms, but that processes allowed, and never excluded, the involvement of smaller and local firms. Indeed to help suppliers there were periodic meet the buyer events to explain opportunities and requirements. Officers noted that trends towards e-tendering and e-auctions, potentially improved information flows to local firms but also those further afield which could intensify competition (see also Cabras, 2010 on these issues). All suppliers have to go through the same portals.

The analysis so far has focused in on operational supply-chain spending. The year 2009-10 was an interesting one to analyse because of construction of two new hospitals. An initial analysis of ABHB purchasing records, showed that construction (capital) spending of the Health Board was in entirety in the rest of the UK, due to the location of the managing contractor. A corollary would be that a straightforward analysis would simply allocate this spend as a leakage from Wales, with no local or Welsh effect.

However the managing contractor (a large international firm) provided ABHB with information on sub-contracted work packages i.e. in terms of the description and value of the 'package' (for example, in terms of ground works, external walls and roof, internal partitions etc.) and the location of the sub-contractors. Analysis of this data revealed that significant sums of construction spend 'return' to Wales and the ABHB area through the sub-contractor packages. Indeed analysis of these figures suggested that just over 60% of the total construction expenditure was with Welsh suppliers (including 9% which was within the ABHB Area), hence a relatively high rate of local income retention was achieved in the case of this capital expenditure, despite the main contractor being headquartered outside the region (see Cabras, 2011).

As with operational (revenue) expenditure, identifying local spend provides some indication of economic impact (see later) but also enables identification of key expenditure leakages from the locality. This can then facilitate an investigation of methods for limiting such leakages, as a route to enhancing local economic impacts. For a total of 26 sub-contract packages awarded outside of Wales, the managing contractor revealed that in just over half of these cases (14) the reason related to lowest competitive tender, but that these contracts accounted for over 90% of contract

values awarded outside of Wales. Examples of the sub-contract packages awarded outside Wales for this reason include external walls and roof, external windows and doors, furniture, fixtures and fittings, and intruder prevention systems. For a further 9 sub-contract packages, the reason of 'specialist supplier not in Wales' was given, however these contracts only accounted for less than 5% by value. Examples of these packages include, buffer rails, entrance canopies and audiology. Whilst closer working relationships might be expected with suppliers in this sector (Mamavi et al, 2014), this illustrates that in some cases, and depending on the nature of products required, the drive for cost savings may outweigh any benefits of spatial proximity. However in this case, it should be noted that due to the location of the ABHB, in the south east of Wales, a number of contractors may be 'close' in terms of geographical proximity, but be just over the regional boundary (for example in Bristol).

As discussed in the methodology section, the key drivers of the regional economic significance of Health Board activity, are spending on health services, and the spending on wages and salaries. Table 2 reveals the results from the modelled assessment of ABHB's operational spending in 2009-10. The first column shows the output (or spending) effects. The top line of Table 2 shows the direct ABHB impact within the region. In terms of output, this is total revenue expenditure for 2009-10. The rows beneath show the indirect and induced (multiplier) effects on other parts of the Welsh economy (the sectors used in Table 2 are aggregated versions of those in Table 1). These effects arise along regional supply chains as a result of the spending within Wales on suppliers (shown in Table 1), and as a consequence of the spending of ABHB employees which is retained in Wales.

Unsurprisingly the highest levels of economic effects are seen in the health sector. Table 2 reveals that ABHB supported around £400m of output in the Welsh health

sector. Table 2 also shows that output is supported within manufacturing and private sector services, as well as in the utilities and construction sectors. The total output effect of the Health Board is estimated to be almost £1.7bn on the Welsh economy. By comparing the final row with the top row of Table 2, one general conclusion is that every £1m of total direct expenditure by the Health Board supports a further £0.78m within the Welsh economy.

The output effects are translated into employment effects (in terms of full-time equivalents, FTEs) and value-added in the second and third columns of Table 2. ABHB directly employed over 10,700 FTEs, with an associated gross value-added of £406m. Almost 1,800 jobs are estimated to be supported within the wholesale, retail, hotels, catering sector (some of this impact is from the direct spend with wholesalers (margin only), whilst other impacts on this sector come through the wage spending of the ABHB employees, and the spending of employees within supplier firms).

Table 2 about here

The almost £400m of output supported within the health sector, translates into approximately 4,500 FTE jobs, with the total employment impact summing to over 19,500. For every 1 full-time ABHB employee, a further 0.82 FTEs are estimated to be supported within the rest of the economy. Table 2 estimates the significance of ABHB's supplier linkages, and as noted, the main effects are in other parts of the Health sector. ABHB 'buys' the services of other health boards (as well as from private sector providers) on behalf of patients, and can thus be said to be supporting activity in other parts of the health sector. However, ABHB will in turn be providing services to other health boards, such that some of the 10,700 direct employees may be supported by the spending of other health boards. The exact 'balance' of within-NHS trade is difficult to identify, however with this information, some judgement could be

made about the relative size of any adjustments to the results to account for such trade flows.

To estimate impacts associated with non-health related purchases, the health sector spending of just over £281m was removed from the modelling framework in order to identify the Welsh non-health sector spending effects. The results showed that even in the absence of this health sector spending, that ABHB supported an extra 2,900 FTE jobs and £133m of value-added within other sectors of the Welsh economy.

The analysis in Table 2 focuses on operational and wage spending. The capital spend linked to hospital development also supports activity indirectly in the regional economy. It is important to note that capital spend effects will vary tremendously from year to year unlike operational and wage spend. However it was estimated that the capital spending supported an estimated 1,026 FTE jobs in total in the region.

Table 3 uses sectoral multiplier information obtainable from the economic modelling framework (see Figure 1), to examine the potential impact of changes in Health Board spending patterns, using some of the sectors identified earlier which could have high potential for import substitution. For example, the first row shows food and drink *manufacturers* (again as distinct from food *wholesalers*). Table 3 shows that if supply chain spending on the food and drink sector in Wales increased by £1m, then that spending would multiply to an estimated total of up to £1.65m in the Welsh economy (depending on which part of the food sector received the extra demand). The related employment impact of each £1m of spending, is up to 20.9 FTEs in food and drink (including multiplier effects). The higher of this employment range is the dairy sector, whilst the lowest is the drinks sector. In the wholesale sector, each additional £1m of spending would ultimately support 22 jobs, compared with 13 in financial services.

Table 3 about here

Discussion

The paper has contributed to the evidence base on the spatial distribution of NHS spending and the amount of economic activity that is supported by this spending within a local economy. While there has been interest in how changes in public purchasing might lever socio-economic outcomes, this has not always been accompanied by case evidence of how precisely NHS spending supports local economic activity, and how changes in the spatial distribution of spending could impact on the regional economy. There are challenges in analysing the local spending patterns of NHS organisations, however, the analysis reveals the potential significance of NHS procurement and staff expenditures to the region. The case studied here is just one of seven Welsh health boards, and whilst the health boards vary in terms of populations served and services provided, an approximate 'scaling up' of the ABHB findings for all of Wales would result in significant levels of economic activity supported (and further activity potentially supported through import substitution), across many sectors, throughout the region.

It was not possible, with the information available, to examine the size distribution of firms that supplied the ABHB i.e. the extent to which, where local contracts were awarded, that SMEs benefited over and above subsidiaries of larger firms. While the analysis confirms the large amounts of local economic activity that are indirectly supported by the spending of the case Health Board, any attempt to increase levels of local purchasing and/or increase participation of local SMEs in the case examined are restricted by limits in the supply side of the local economy, but also by increasing pressures for more efficient procurement processes and to gain best value. Even

where local opportunities might be enhanced, a narrow conception of value for money would tend to counter moves to think more strategically on how the local spending power of organisations such as the NHS can be used to promote local socio-economic outcomes such as employment and SME support. Then while economic strategy in Wales stresses innovation in the way public procurement is used to lever economic and environmental outcomes, the case examined here would suggest that there would be significant challenges and rigidities to be overcome in the process, and limits on where local procurement can be meaningfully increased.

This analysis supports the contention of Peck and Cabras (2011) on a fundamental juxtaposition of the efficiency of procurement processes set aside an emerging strategic imperative to better embed the spending of public sector organisations in their local economies. However, the case reveals that the type of transactions tracking undertaken is an important first step in revealing the specific local purchasing opportunities which have potential to lever indirect effects on the local economy. Where these opportunities are available, a local socio-economic paradigm might be developed alongside the dominating best value approach in terms, for example, of the carbon footprint of delivered goods, after sales service and issues of quality, and the aesthetic value of locally produced goods and services. In terms of capital spending in particular contracts could specify a requirement to advertise sub-contracting requirements through the region. A more joined up perspective in health sector purchasing at the local and regional level is important. For example, where socio-economic outcomes can be leveraged in terms of employment opportunities then there could be rebound effects on to the demands for the services of the health sector.

Within the Welsh public sector, some of the identified problems and restrictions on maximising the economic benefits of public spending have been recognised. In June

2015, the Wales Procurement Policy Statement (WPPS) reported progress in terms of regional procurement capability, with more and better trained procurement officers, and that government programmes, providing guidance to local firms on bidding for public sector contracts (for example on joint bidding), had contributed to a reported increase in the share of all Welsh public spending won by Welsh-based businesses from 35% on 2004 to 55% (Welsh Government, 2015a).

Within NHS Wales, the most significant recent development in terms of procurement practice has been the reorganisation of the individual health board procurement functions, and other related organisations, such as Welsh Health Supplies, into the NHS Wales Shared Services Partnership (NWSSP), a product of the NHS Wales Shared Services Programme. This followed a report commissioned by the Welsh Government (Lewis et al, 2009) to consider how best to make progress towards shared services in NHS Wales. The NWSSP aimes to reduce bureaucracy and achieve greater efficiency, through centralising procurement functions. There are a range of possible consequences of this procurement reorganisation. For example, whilst there is a policy desire to increase local firm's ability to supply the NHS, now that demands have been aggregated, the drive for efficiency may add increasing pressure to focus on lowest cost, although the new EU public procurement rules, outlined earlier, could mitigate against such impacts. Indeed some positive sector specific impacts have been observed, for example in the case of NHS Wales food procurement, where the value of Welsh origin food purchases has reportedly increased since 2009, largely due to the NWSSP which 'has actively encouraged the supply chain to make greater use of local products and local suppliers' (Morgan, 2015, p.13).

This reorganisation coincides with a post economic crisis environment of austerity. Therefore disentangling the organisational change effects from changes resulting from austerity considerations would be extremely difficult. Roberts and Charlesworth (2014) noted that in response to the global recession and fiscal consolidation, funding for the NHS in Wales fell by an average of 2.5% in real terms in the period from 2010/11 to 2012/13. Following an increase in funding in 2013/14, Roberts and Charlesworth predicted that funding was likely to fall in real terms the period to 2015/16. Scenarios were explored, based on different levels of funding. However under each scenario a substantial funding gap was predicted for NHS Wales by 2025/26. This was due to demand and subsequent spending pressures generated primarily by increases in population, long-term chronic conditions, and staff pay. In response to this research, and to information gathered from the health boards, the Welsh Government announced extra funding for the Welsh NHS in 2015/16, and in 2016/17 (Welsh Government, 2015b, p. 19).

Issues relating to the benefits of buyer-supplier proximity have focussed around the transactions cost economics literature and then gains through reduced agency problems, improved governance, productivity spillovers in co-makership, and accelerated material flows in manufacturing. These types of issues may be less important in public as opposed to private sector procurement, but the role of NHS procurement and spatial proximity of suppliers in driving local economic development outcomes is an area where there has been a paucity of research. The changing institutional arrangements, regulation around purchasing, and pressure in terms of funding cuts means that public officials have to be more careful in making the local economic development case, and base it on hard quantitative evidence such as that produced in this paper.

Given the organisational changes within NHS Wales, and the adoption of the new EU public sector procurement rules, an interesting and useful development of this research would be to extend the analysis to the rest of Wales. This research could explore the extent of income retention and economic activity supported within Wales over time. Any particular sectoral changes in procurement and its impacts on different types of firms (e.g. SMEs) could be investigated, to identify opportunities for increasing the impacts of NHS procurement within the regional economy. In addition, future research questions could relate to whether trends and impacts identified within the NHS are replicated in other areas of public services in Wales and in other, larger and less open regional economies.

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Figure 1: Key data sources and steps in the estimation of the economic significance of ABHB operational spending in Wales

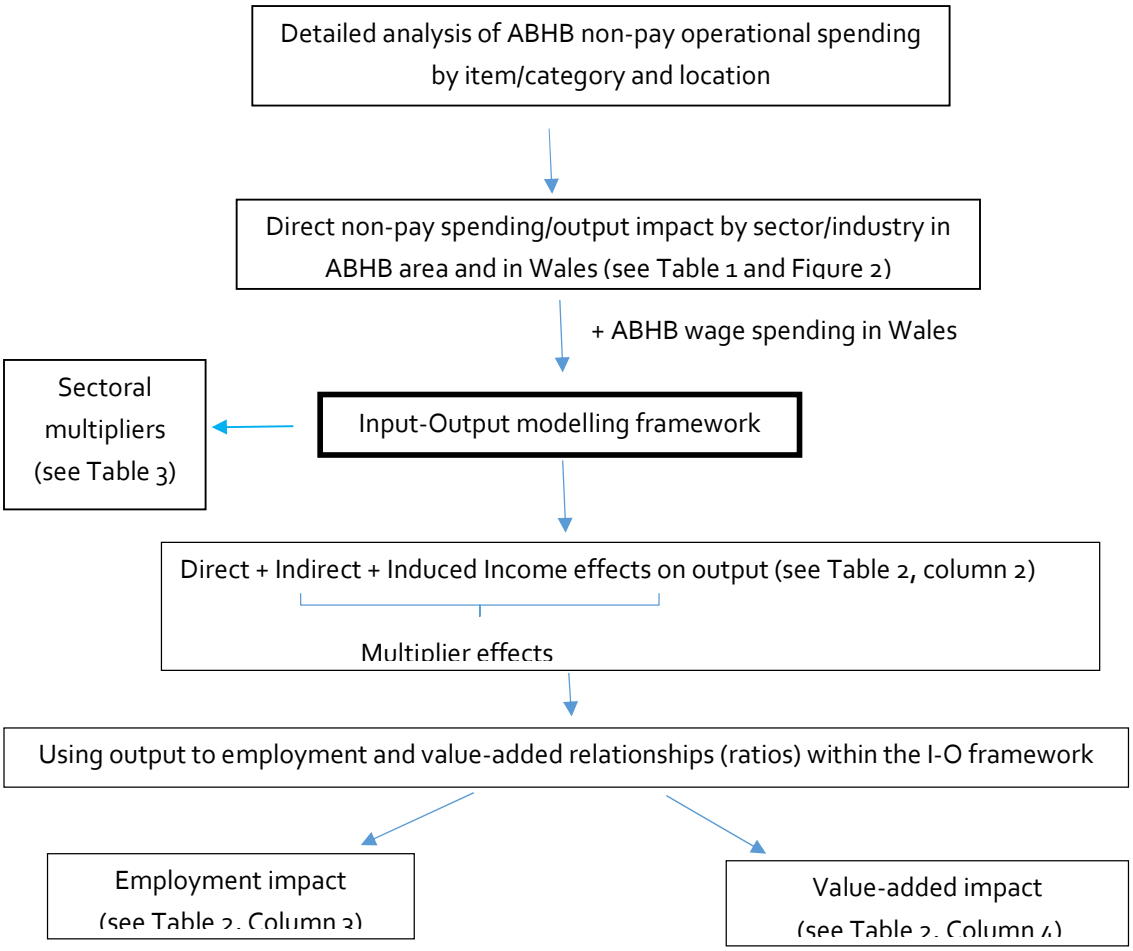

Table 1: Spatial distribution of ABHB (non-pay) operational supply chain spending in 2009-10

	£000s				%		
	Total	**ABHB area**	**All Wales (Incl ABHB area)**	**Outside Wales**	**ABHB area**	**All Wales (Incl ABHB area)**	**Outside Wales**
Primary and manufacturing	36,999	1,002	3,186	33,813	2.7	8.6	91.4
Electricity, gas, water	6,743	0	6,206	537	0.0	92.0	8.0
Construction	1,500	692	1,082	418	46.1	72.1	27.9
Repairs and retail	3,018	383	473	2,544	12.7	15.7	84.3
Wholesale – Food	2,418	29	1,297	1,121	1.2	53.6	46.4
Wholesale – Pharmacy	7,490	14	74	7,416	0.2	1.0	99.0
Wholesale – Other	14,324	416	677	13,647	2.9	4.7	95.3
Hotels, restaurants	41	28	31	10	68.3	75.6	24.4
Transport	235	192	193	43	81.7	82.1	18.3
Post & telecommunications	2,646	1	1,432	1,214	0.0	54.1	45.9
Banking, finance & insurance	1,518	182	225	1,293	12.0	14.8	85.2
Real estate, renting, other business & professional services	15,589	2,475	3,345	12,244	15.9	21.5	78.5
Legal services	3,862	0	76	3,786	0.0	2.0	98.0
Computer & related services	4,228	51	425	3,804	1.2	10.1	90.0
Public administration	4,086	3,260	3,971	115	79.8	97.2	2.8
Education	1,142	53	929	214	4.6	81.3	18.7
Health & social care	415,593	114,820	281,343	134,250	27.6	67.7	32.3
Recreation & sanitary services	330	9	18	312	2.7	5.5	94.5
Other services	6,912	409	1,537	5,375	5.9	22.2	77.8
Total	**528,674**	**124,015**	**306,519**	**222,155**	**23.5**	**58.0**	**42.0**
(Total less health spending)	*113,081*	*9,196*	*25,176*	*87,905*	*8.1*	*22.3*	*77.7*

Note: Column totals may not sum due to rounding

Table 2: The economic significance of ABHB's operational supply chain expenditure on the Welsh Economy.

	Output (£m)	Employment (fte)	Value-added (£m)
ABHB direct	**952.8**[1]	**10,754**[2]	**405.7**[3]
Multiplier impacts on other industries in Wales[4]*:*			
Producers/manufacturers	53.4	511	16.5
Energy & water	37.4	39	7.2
Construction	11.9	183	4.4
Wholesale, retail, hotels & restaurants	80.1	1,798	42.6
Transport, post & telecommunications	24.4	293	11.6
Finance, business & professional services	121.6	951	86.1
Health & social care	387.9	4,532	139.4
Other public & private services	28.4	488	16.3
Total (direct plus multiplier) impacts[5]	**1697.9**	**19,548**	**729.6**

Notes:

1. This is the estimated as the sum of total non-pay operational expenditure (incl. depreciation) plus wage spending (employment costs).
2. Direct employment within ABHB
3. Estimated as wage costs linked with direct employment
4. Multiplier impacts estimated using the Input-Output modelling framework
5. Column totals may not sum due to rounding

Table 3 Effects of supply chain expenditure switching[1]

	Output/spending multiplier	Total employment (fte) generated (including multiplier effects) per £1m direct spend
Food & drink	1.47 - 1.65	9.4-20.9
Plastics	1.5	15
Wholesale	1.58	22
Financial services	1.52	13

Note

1. Sectoral multipliers derived from the Input-Output Tables for Wales.

Figure 2: ABHB supply chain - import propensities 2009-2010 (% of total imports by sector).