

Abandoned spaces and technology displacement by labour: The case of hand car washes

Abstract.

The diffusion of hand car washes is in contradistinction to vogue arguments about automation and new technology. However, what is absent from the literature is a focus on abandoned spaces as a capitalist commodity and the displacement of technology by labour which is particularly associated with the emergence of low-cost informalized areas of work that occupy and self-regulate these spaces. The contribution of this research to new knowledge is a theoretically informed empirical derivation of abandoned spaces which low-cost businesses such as hand car washes occupy to inform two research propositions; one, *the spatial dimension to abandoned spaces derives from economic re-structuring from above*; this re-structuring informs re-structuring from below rather than as an independent development of migrant dominated sectors of work and employment such as hand car washes. Two, that *the application of new technology can be displaced by, operates in conjunction with or relies on low-cost labour intensive providers where labour practices tend towards informalization*.

Keywords.

Abandoned spaces, automation, displacement of technology, economic re-structuring, hand car washes, informal work, migrant and low-cost labour.

Introduction

An abandoned space represents a capitalist commodity which at its most crude generates rent as a return to landlords and premises owners. Recent public policy documents (Taylor, 2017 and Independent Future of Work Commission, 2017) suggest that the provision of new services within and beyond the gig economy appear economically feasible, are cost competitive for customers at least, reflect recent labour market trends and appear (superficially) to be social acceptable. More critically focussed academic research suggests that these services do though never the less create significant labour market exploitation, actively encourage the engagement of vulnerable (often migrant) workers and thrive because precarious cheap labour enables employers to dispense with higher cost equipment and associated technologies in the workplace. For example, food preparation and ‘fruit potting’ in particular, takes place in warehouses or small business spaces which house extremely labour intensive food processing (Bagwell, 2008, Hopkins, 2017). Similarly, Lawthorn and Kagan, (2016) report how in ethnic restaurants costly food preparation and food clean-up technology

is displaced by female migrant labour engaged under the auspices of community and family roles which structure their attitudes to accepting such work. In both of these examples landlords are able to extract revenue from their assets which reside in the formal economy by leasing them to organizations where some of the labour force is engaged under informalized business and employment practices.

The diffusion of hand car washes and the areas of job creation cited above appear in contradistinction to vogue arguments about automation and new technology. Theoretically innovations in work and employment derived from automation and new technology can bring about the permanent elimination of huge swathes of boring and demeaning work and make obsolete established social relations at work which centre on long hours, a development which the advocates of automation and post-capitalism encourage (Mason, 2014, Srnicek and Williams, 2015). However, as Howcroft and Taylor (2014) demonstrate successive waves of new technology are always accompanied by widespread speculation about their economic and social impacts most of which have proved to be wide of the original claims. The diffusion of hand car washes demonstrates this argument: the displacement of capital intensive mechanized car washes by intensive labour at hand car washes. This displacement demonstrates labour deepening at hand car washes which reverses capital deepening in mechanized car washes. Capital deepening sees output increase through better technology and higher output per worker, for example, new technology which makes capital more productive. Capital deepening will lead to rising labour productivity as workers become more productive when they combine with new technology. Labour deepening is the reverse of this process whereby labour substitutes for capital and operates intensively; there may be significant labour productivity at hand car washes but the point is intensive labour is operating at a lower scale of overall efficiency because cheap labour replaces technology.

This raises two research questions. Firstly, are material spaces constituted through every day practices which may or may not relate to new technology or technological advances? (see de Vaujany and Mitev, 2013). If so it is necessary to develop theory to inform evaluation of the processes which have created the spaces occupied by hand car washes as enablers and facilitators of technology displacement by low-cost labour. A second question centres on what does the diffusion of hand car washes reveal about the regulation of work and employment in the UK in the broader context of formalized and informalized business practice? In both contexts it is appropriate to view technology displacement by labour as a development which reflects ‘other’ priorities held by socio-economic power holders in the state. Moreover, (paraphrasing Howcroft and Taylor, 2014) the precise manner of the diffusion of hand car washes, the sectoral effects they create and the consequences of them for labour is the product of human agency derived from and enabled by strategic choices enacted by employers, regulators and consumers.

What is absent from the literature is a specific focus on the relationship between abandoned spaces as a capitalist commodity and the displacement of technology by low-cost informalized labour which is particularly associated with the emergence of hand car washes in the UK. Accordingly this article deploys a theoretically informed empirical derivation of the abandoned spaces which hand car washes now occupy and self-regulate. In turn at enterprise level this occupation and regulation ground the wider parameters of socio-economic re-structuring in the UK. Therein the lives of those who own these businesses and those who work at hand car washes are embedded within ‘spaces’ which are the domain of capital. These spaces inform social relations for labour in capitalist society that reflect both formalized or sometimes informalized business and employment practice. To deliver this derivation the article proceeds through four parts. Part one further elaborates on abandoned

spaces as a capitalist commodity and labour displacing technology therein. By drawing on the literature on space and technology part two develops two research propositions which inform an analytical framework. In turn this framework introduces spatial and technology dimensions to economic re-structuring through the theorization of economic re-structuring from ‘above’ informed by globalization and re-structuring from ‘below’ informed by informalization. Four connections between the research propositions are identified and reported on empirically by this study. Following on from this parts three and four draw on both primary research and secondary sources to inform the analytical framework. Part four also provides a discussion and conclusion on the two research propositions.

Informalization, Abandoned Spaces and Technology Displacement

To contextualize the notion of informalization in work it is necessary to position it within a discussion of regulatory space developed within the broadly defined employment relations literature. The aim of this is to outline how informalization operates along a continuum of practice; for example, business and employment practice may be formal but none the less employment status may be casualized and precarious (de Stefano, 2016, Standing, 2014). For some, precariousness is now the new ‘norm’ in work and accordingly employment systems and social protection must adjust to better protect workers against the use of zero hours contracts, other forms of casualization such as day labouring and the use of agency workers (see Rubery et.al. 2016). In addition to casualization in employment practice an employer may be formally constituted but deploy informalized business and employment practice. Here workers are paid cash-in-hand or work for favours and are more likely to be classified as self-employed contractors. Each of these are embedded employer strategies in firms using formal business and employment practices; hand car wash employers re-produce these practices less formally. So informal business and employment practices may occur where a business is

lawful, but employment practice may be unlawful and criminal, for example, where the payment of placement fees represents a form of debt bondage. Debt bondage involves the pledging of labour services as security for repayment of a debt or other obligation where a pledge may involve some degree of coercion that is gentrified and or disguised as a caste, collective family obligation or kinship obligation (Cockbain, 2018). The key point is that informalized business and employment practices are actually derived from those found in more formalized practice.

Debt bondage, in the modern guise of fee payment to informal agents – intermediaries – for travel to the UK or job arrangements that is paid by a migrant or their family, is in evidence at hand car washes. Evidence presented to the recent Parliamentary inquiry into hand car washes (<https://parliamentlive.tv/Event/Index/9b5e7389-5163-44a5-81e0-52eff37b2666>) suggested that many car wash workers were accepting of this form of exploitative informalization in order to get access to work within a local community. Some workers did though have agency in the sense that they were not trapped in this type of work but alternatively used it as a bridge to work at employers which utilise formal business and human resource strategies.

The theoretical derivation of abandoned spaces is usefully informed by the concept of regulatory capture in regulatory space. Therein the theoretical thrust is that new actors, be they employers or a de-regulated state, can capture and colonize regulatory space such as the employment relations framework to displace established actors. This capture enables these actors to create new roles for management and potentially new forms of management practice (MacKenzie and Martínez Lucio, 2014:190). This theoretical formulation leads Mackenzie and Martínez Lucio to suggest that it may be necessary to re-conceptualize regulation in

employment relations. To do so they draw on other disciplines such as criminology which accept the presence of and tolerate the role of actors that appropriate and occupy regulatory spaces but informally. Dundon et. al. (2014) take this theorization a stage further by demonstrating how employers have occupied specific regulatory spaces in liberal market economies to marginalize independent employee voice. This article suggests that hand car wash employers do this informally.

By following these approaches it is possible to theorize those actors that diffuse informalized business and employment practices as operating beyond the established regulatory framework for work and employment provided by the state. In this space it is necessary to go beyond the structural presence of new labour markets and focus on the work experiences of workers therein. The visibility of these spaces which now appear open to occupation by new actors has the potential to illustrate the extent to which such actors are able to mobilize resources to effectively self-regulate abandoned spaces. For example, hand car washes occupy abandoned spaces which were previously occupied by formally regulated businesses such as road-side petrol stations, public houses and tyre providers (Clark and Colling, 2017).

Theoretically the emergence of hand car washes can illustrate how new sectors of work and employment, within and beyond formalized business and employment practice, take over abandoned spaces occupying them to make them their own. Therein capital circulates between businesses that utilize formalized practices as either suppliers or landlords and less formalized business owners and workers to create profit from informalized social relations of work (Mitchell, 2018). For Mitchell (2003/2014, 2018) abandoned spaces become public spaces open to occupation and self-regulation by occupiers. Following this line of argument spaces that are abandoned, under partial or full occupation by those that deploy informalized

business and employment practices are a conflict bound capitalist commodity. This is the case because the space is tradeable as a pitch, capable of development, that is, sale, lease or barter where profit derives from wage labour and associated wage theft. To further develop these arguments part two of the article formalizes them into research propositions which then inform an analytical framework to understand the occupation of abandoned spaces by hand car washes and technology displacement by low-cost labour therein.

(How does) Narrative (flow) into research propositions (to fuse spatial and technological dimensions) and an analytical framework?

Now that the relationship between informalization and regulatory space has been established it can be utilized to further inform the impact of (abandoned) space and the availability but not necessarily the use of technology in particular sectors of work. That is, the relationship between space and work and the manner in which capital, either formal or informal, contains labour is open to evaluation across the social sciences. Accordingly the narratives on hand car washes and other areas of work which utilize informalized business and employment practices are separate from but must flow into the spatial and technological dimensions of abandoned spaces. To make sense of why such spaces - previously abandoned but now occupied - are regulated as part of broader changes and associated re-structuring in British capitalism it is necessary to locate the research propositions within the established literature on space and labour within and beyond work and employment. Therefore the content of this section can be read two ways; *as a narrative* and as a series of spatial and technological degradations that inform research propositions on space, work and employment practices in informalized businesses.

Abandoned spaces

Hand car washes exist in contemporary socio-economic conditions that structure 'space shocks' (Nathan, 2015). Space shocks can open up abandoned spaces triggering higher cost production regimes such as wind farms and solar panel farms on abandoned agricultural

spaces. Alternatively, lower cost regimes such as home parcel delivery, budget retailers, nail bars in city centre and suburban abandoned spaces are derived enablers for the provision of goods and services; in turn space and technology shocks may stimulate the creation of lower quality employment opportunities. These spaces and associated space shocks flow from the dynamics of economic re-structuring 'from above'. Therein concentrated large scale, global multinational, capital dominates across many sectors of the British economy where this dominance reflects the success of these firms in securing de-regulation. By association, the spaces which small firms such as local hand car washes occupy are most appropriately understood by reference to their external environment where small firms have a subordinate, if not marginal relationship to larger firms (Ram et.al. 2017a&b). Therefore theoretically firms which deploy informalized business and employment policies operate in a low-cost space informed by de-regulation (Sassen, 2009), globalization and associated economic re-structuring (Cumbers et.al. 2016:105). Empirically in informalized work these contexts generate conflict between informalized workers and informalized business owners as a portion of the rental return to formalized capital is paid indirectly by informalized labour in the forms of exploitative terms and conditions of employment (Clark and Colling, 2017). So re-structuring from above inspired by globalization and associated consolidation in particular sectors informs re-structuring from 'below' in what new economic geography describes as self-organizing spatial principles (Klugman, 1998). The latter diffuses through marginalized actors such as those on low incomes, those starting-up micro or small businesses and workers, both indigenous and migrants of any status who work in precarious and vulnerable employment (Slavnic, 2010). For example, beyond hand car washes Vershinina et.al. (2018:13-4) demonstrate how precariousness and vulnerability create a patchwork of lawful and unlawful working for migrant workers. These workers recognise their marginal status but use it to help them acquire legal status to pay the cost of this transition via wage theft which

they suffer. The analytical underpinning to these narratives informs the first research proposition: *the spatial dimension to abandoned spaces derives from economic re-structuring from above*; this re-structuring shapes re-structuring from below. That is, re-structuring produces abandoned spaces which flow from dis-investment and related obsolescence of space in particular sectors (Massey, 2005). In this case dis-investment in road-side petrol stations, public houses and smaller retail units create abandoned spaces which informalized businesses turn into living spaces as a ‘right to the city’ development in accordance with some of the arguments developed by Harvey (2008), for example, those which see the right to the city as a right to re-shape the process of work and urbanization. - what this article terms informalization. Harvey also views these developments as a form of liberty. It is though important to recognize re-shaping as superficially informing what may appear as an independent development of *migrant dominated sectors of work and employment* such as hand car washes. However, hand car washes re-produce the tenets of private property and associated social relations but informally.

Technology Displacement by Labour

Abandoned space shocks may in turn stimulate ‘technology shocks’. For researchers of work and employment and in particular those who focus on the labour process the application of new technology in defined spaces is frequently presented as an enabler and facilitator of job consolidation and the de-skilling of remaining workers where cost-cutting drives the diffusion of new technologies in the workplace. However the growth of new sectors of employment (either formal or informal) and the development of countervailing factors such as social democracy in the post-war state, associated collective bargaining and organized class resistance prevented technological displacement of labour in production and the full application of disruptive technologies in Britain’s ‘flawed Fordism’ (Clark, 2000, Streck, 2016:95-100). In the contemporary period whilst many commentators argue that new

information technologies and artificial intelligence will rapidly undermine middle class jobs and capitalism more generally such approaches are much thinner on what will happen to labour as a class and in particular sectors (see for example Collins, 2013:27-69). Other contributors fall back on the catch-all solution of a re-distributive universal basic income (Srincek and William, 2015). In contrast to this more circumspect contributions question whether work will be reduced or improved in quality by technology (Spencer, 2018).

In a recently developed area of work such as hand car washing whilst labour is degraded and potentially de-skilled the application of new technology is not the primary cause of these developments. Similarly, on-line retailers have invested in fully automated warehouses but they do not utilize them in the UK beyond a 'ghost' status because the regulatory space within which casual and informalized agency labour operates provides them with cost advantages (Bloodworth, 2018:26-8). Fully automated fulfilment centres are built around robotic shelving which moves to product pickers and aims to combine with labour to increase productivity (Knight, 2015). However, the best robots and robotic shelving have a 16% failure rate per hour, far greater than the minimal failure rates of low-cost agency workers (Correll et.al. 2016:13). Accordingly tech. fronted sectors such as on-line retailers are compatible with the evidently significant differences in the organization of work and employment across sectors which deviate from normative claims about automation and the application of new technology (Thompson and Briken, 2017:253-257). So it is necessary to be sceptical about the benefits of automation and worker autonomy which are most likely to be confined to more skilled employees and workers (Padavic, 2005, Standing, 2014). Hence a second research proposition suggests that *technology can be displaced by, operates in conjunction with or relies on low-cost labour intensive workers where labour practices*

tend towards informalization. This is the case because of the low cost of labour in both formal work and employment and informalized work and employment.

An analytical framework to connect the two research propositions

A spatial dimension to the analytical framework provides structure for conflict in work and employment on abandoned spaces which in turn derive from ‘above’ economic re-structuring. It is economic re-structuring from above that creates abandoned spaces within which technology displacement by low-cost labour or low-cost labour in competition alongside the diffusion of technology occurs. Accordingly there are four connections between the two research propositions that a study of hand car washes may distil; firstly, as living spaces hand car washes may be a form of progressive social relations shaped by labour struggle over the distribution of surplus in economic re-structuring or a product of worker repression and economic re-structuring which disrupts established social relations by the tendency to informalization (see Bair and Werner, 2015:119-125 on these potential distinctions). The latter contrasts with say community gardens which occupy abandoned spaces as a form of community empowerment, re-generation and local sustainability (Cumbers, et.al. 2018). A second connection between the two propositions relates to the re-constitution of abandoned but now living spaces and the potential for capital to operate both formally, (as landlords, equipment and utility suppliers) and informally as hand car wash businesses. That is capital as a class remains as capital even when a portion of it operates informally and labour remains the essential element in the creation of surplus (Cumbers et.al. 2008:372). A third connection relates to how washing cars by hand makes value obsolete in fixed capital such as roll-over and drive through washes. That is, technological progress stalls because of a reliance on cheap labour rather than capital investment; what economists would term a fall in total factor productivity (Solow, 1956). For Solow total factor productivity is the portion of output that is not explained by the amount of inputs used in production. Increases and decreases in total

factor productivity are determined by how effectively inputs are used and combined in production. Therein long-run growth is driven by growth in total factor productivity, for example, Dolphin and Hatfield (2015) report on Britain's comparatively low labour costs and poor productivity performance since 2008. In many sectors including services such as car washing they found that deteriorating productivity is explained by productivity differences within sectors. These developments (re-) structure within sector differences where the loss of productivity growth across sectors such as car washing between 2008 and 2015 resulted from sector developments associated with low-cost labour; that is the abandonment of drive through and roll-over washes. A final accumulated connection relates to how large-scale multi nationalized global capital necessarily de-values and abandons smaller business units across sectors, (such as petrol, retail, alcohol consumption and car maintenance). That is, how does re-structuring from above stimulate re-structuring from below to impact on labour in particular sectors? (see Cumbers 2015:147 on this point).

Methods and Findings: Narratively informing the analytical framework?

The symbiotic relation between abandoned spaces and labour displacement of technology create a frontier of control for new employers that informs the emergence of sectors of work based on low-wage precarious informalized work. To inform the analytical framework material is drawn on from two sources. Firstly, primary source material from studies of informalized employment in hand car washes conducted by the author. Secondly, evidence from further primary source material is drawn on from presentations made to the Parliamentary inquiry into hand car washes and in particular the sessions in June and July 2018 where all stakeholders, academics, practitioners and regulators reported their findings and positions. Studies of regulatory space such as these frequently report on social processes which assume the character of communal regulation (McDowell, et.al. 2014); in this case

how labour displacement of technology is enabled by broader economic re-structuring that informs the formation of distinct groups of informalized workers. As hard to reach areas of work the sensitivity of research on car wash workers obliges the author to report the findings in a format which is not attributable to named individuals or particular workplace spaces. Here it is necessary to follow the arguments of Petriglieri et.al. (2018:4-5) and go beyond just the structure and economics of new labour markets to report on the experiences of workers engaged in these markets.

Hand car washes

Empirical work on hand car washes has reported in detail on the industrial relations and labour process aspects of this area of work and employment (Clark, and Colling, 2017). As the current focus of research is on the derivation of the space occupied and self-regulated by hand car washes there is no need to rehearse these findings but note that research took place between April 2014 and July 2017 and involved forty-six hand car washes across two cities. Twenty of these occupied spaces were abandoned by road-side petrol stations, three trolley washes occupied space in car parks of national brand supermarkets, ten car washes occupied former pub spaces, either car parks or following demolition of buildings a larger area and three occupied waste ground space in alleys adjacent to open petrol stations. In addition a further ten hand car washes occupied space on still open national brand petrol stations alongside mechanized car wash units.

Photographs 1 and 2

The forty-six hand car wash spaces demonstrate a clear-cut shift from capital intensity to low-cost labour intensive displacement of technology. This displacement reverses capital deepening which in theory makes capital and labour more productive, in favour of capital

shallowing and greater labour intensity. At many hand car wash spaces on or adjacent to open petrol stations higher technology jet and rollover washes lay redundant whilst customers queued for a hand car wash. Thirty-six of the forty-six hand car wash spaces displayed direct or indirect structural technology displacement by labour. All twenty washes that occupied space on abandoned petrol station sites are examples of direct structural displacement of technology by low-cost labour. Similarly the ten car washes that occupied space on open petrol stations and those that operated on waste ground adjacent to open petrol stations illustrate indirect displacement as they undercut drive through and rollover washes. Here the evidence suggests that this competition over time leads to the closure of these units (PRA 2015). Trolley washes which occupy space on supermarket car parks re-produce these effects at larger supermarket petrol stations but only partially so as they are in competition with high quality drive-through and jet washes.

Discussion: analytically informing the narrative on hand car washes

This part of the article analyses how economic re-structuring creates the space for hand car washes and informs and makes feasible technology displacement therein by labour. This is followed by an evaluation of how re-structuring inspired by globalization and consolidation in particular sectors such as retailing has informed re-structuring from below. Therein the labour supply utilized by car wash employers reflects general labour market trends associated with the shift from casualization to informalization. Thirdly, the discussion examines how low-labour cost informs exploitation and forestalls technological innovation in the context of more determined efforts towards effective regulation.

Deriving the space for and feasibility of technology displacement by labour at car washes

De-regulation in automobile retailing, alcohol, grocery and tobacco sales, in conjunction with the smoking ban on social spaces such as pubs, bingo halls and dance clubs combine to create abandoned spaces. These spaces, formerly pub and club car parks and forecourt spaces occupied by independent auto and petrol retailers, are suitable for community initiatives, micro or small start-up businesses. These uses range from community gardens, artisan markets, local supermarkets, car boot sales through to hand car washes. In addition, new build supermarkets have large car parks where 'trolley washes' feature as satellite marginal businesses which rent space from a larger formalized business while competing with supermarket jet washes or rollover washes (see photograph 4). Supermarket retailers lobbied the state to de-regulate alcohol and petrol retailing with the result that they now drive market competition in alcohol and petrol retailing (where the latter is often a loss leader), which consequently undercuts road-side petrol stations and motorway service stations. In 2016 the top four supermarket brands controlled approximately 50% of the combined fuel market (petrol, diesel and electric chargers) despite operating only 17% of retail sites for fuel (Statistica, 2018).

Furthermore, a decline in smaller car dealerships and road side garage numbers has further contributed to a steady supply of city centre and suburban abandoned spaces. This has partly resulted from the popularity of personal finance plan options for car purchases combined with technological advances associated with computer box controlled cars. Personal finance plans often include service packages resulting in the sale of more autos by manufacturer sponsored main dealers. The effects are evident in areas such as the east midlands where the primary research for the growth of hand car washes was conducted between 2012 and 2018 and which showed that 5,656 retail spaces (including petrol stations, pubs and food outlets) were abandoned to represent a closure rate of 28% over the six year period (Centre for retail research, 2018).

The theoretical derivation of these spaces reflects the dynamics of economic re-structuring from above. In petrol retailing before the entry of supermarkets oil-company owned outlets (BP, Esso and Shell and associated brands such as Gulf, Jet and Texaco) dominated the market and represented the retail end of a vertically integrated sector (oil extraction, refining and retailing). The entry of supermarkets into petrol retailing disrupted this and undercut independent but branded road-side petrol station franchises leading to the closure of many such units during the late 1990s and early 2000s and the associated abandonment of on-site mechanized car washes. Supermarkets further invested in hypermarket sites in the mid-2000s which often included a twenty pump multi access (diesel, petrol, higher performance fuels and gas and electricity charging points) this investment put further pressure on road-side oil-company franchises. Road-side petrol franchises responded by further re-structuring to focus on retail outlets rather than investment in mechanized car washing; small on-site supermarkets generate much more revenue than mechanized car washes especially if they fronted by national brands (PRA, 2015).

Over a ten year period from 2004 to 2014 the evidence suggests that the train of derivation described above has enabled hand car wash employers (amongst others) to capture and regulate abandoned spaces previously occupied by petrol stations (see photographs one and two), pubs and bingo halls (Ipsos Mori, 2012:25, Haynes, 2015, Clark and Colling, 2016). The informalized business and employment practices followed by these employers has made it feasible for hand car washing to become a visible presence in city centres and suburbs as they out-compete mechanized car washes on cost and personal service.

More recently whilst it remains the case that informalized hand car wash businesses dominate the market, formalized capital has begun to enter the market. For example although hand car washes have a presence on many supermarket car parks, a leading supermarket has recently banned all independent hand car washes from its car parks. The supermarket has introduced

their own liveried hand car washes in a partnership agreement with an established national chain car wash provider and has begun to run-down its contracts with mechanized wash providers (see photograph four). This development represents a form of sub-contract capitalism where formalized capital seeks to re-produce the feasibility of hand car washing but on a formalized basis, not necessarily focussed on employment but rather franchise deals. Consequently, informalized businesses that created the sector are being squeezed out of particular supermarket locations and surrounding areas. This development represents a form of conflict over space. Capital, either informalized or formalized, navigates, occupies and regulates abandoned spaces. However, once a practice such as hand car washing appears feasible and becomes socially acceptable, formalized capital often seeks to (re)-enter the space pushing out informalized actors. For informal hand car washes this operates where liveried supermarket hand car washes frequently undercut those on nearby abandoned spaces.

Photographs 3 and 4

Labour market trends towards informalization

Evaluation of areas of work such as hand car washes that utilize informal business and employment practices is often confined to evaluation of 'Britain's informal economy'. This confinement frequently presents informalized work and employment as marginal minority arenas and fails to place organizing concepts such as technology displacement by labour more firmly in the wider structural conditions of contemporary British capitalism. The social relations of production that inform these dynamics both create and sustain informal business

and employment practice. Moreover they connect these firms to the mainstream economy where many of the labour practices which they use informally, for example, zero hours contracts, worker or self-employment statuses, were pioneered. This connection is so because businesses that deploy informal practices are subject to 'mixed embeddedness' where economic, social and institutional factors must be foregrounded to structure appreciation of the supply and demand for labour in so-called informal spaces. To achieve this foregrounding it is necessary to locate informalization in hand car washes in a wider context of mixed institutional embeddedness. By doing so it is possible to examine the concrete experiences of work in hand car washes beyond a confinement to the informal economy.

Technology displacement by labour in the context of mixed embeddedness

Migrant businesses and labour are often associated with the emergence of new areas of employment that utilize informal business and employment practices and which displace technology with low-cost labour. However, a key challenge is to examine low-margin, low-growth sectors of employment beyond the marginal minority status they are often characterized as representing. To go beyond this it is essential to draw on Kloosterman et.al. (1999) who demonstrate that new developments associated with labour supply must be embedded in established patterns of external business context. These patterns foreground institutional and socio-economic relations between owners, workers and other actors such as regulators which in the British economy are essentially flexible and liberal. So businesses that use formalized practices and those which use informal practices are embedded in a mixed framework of essentially voluntary, open, lightly regulated relationships. For example, the regulatory regime for work and employment in the UK is comparatively permissive, indeed the Taylor review on modern work practices (2017:17) celebrates the flexibility of the British labour market which the world economic forum recently ranked as the fifth most flexible in the world. Labour market flexibility operates within widespread de-regulation that aims to

open up market spaces in many sectors of the economy. Comparatively then regulation in the British labour market provides a lower level of protection for workers than other European economies. Both flexibility and permissiveness enable and facilitate the exploitation of precarious labour in organizations deploying formalized or informalized business and employment practices.

Grounding mixed embeddedness

The mixed institutional embeddedness of economic re-structuring informs technology displacing employment practices at hand car washes as a specific development in three ways. Firstly, the primary reasons for the growth of employers such as hand car washes derive from broader patterns of state led economic re-structuring in the UK focused on de-regulation and retail and labour market flexibility, particularly in supermarket retailing, petrol and alcohol retailing and auto sales as discussed above. Secondly, specific meso level developments such as a diverse migrant population are embedded in a mixed institutional pattern of socio-economic regulation focussed on flexibility and permissiveness particularly in the labour market. So whilst hand car washes in the UK are overwhelmingly associated with diverse migrant-owned businesses and migrant labour those car wash employers which utilize informal business and employment practices are not independent of established patterns of labour market permissiveness. Thirdly, institutional embeddedness informs technology displacement by labour in its legacy effects. These effects structure the conditions that migrant labour encounters rather than migrant labour encouraging flexibility, permissiveness and technology displacement in the labour market. Therein precariousness in labour market exploitation centres not on labour displacement by technology but the reverse of this; the low cost of labour in hand car washes displaces technology where a ready supply of labour is available.

The social acceptability of informalization?

In the main those who use hand car washes appear unconcerned about the possibility of labour exploitation. Indeed evidence recently presented to the environment audit committee in Parliament suggested that this indifference was one reason for the proliferation of labour exploitation by employers (<https://parliamentlive.tv/Event/Index/9b5e7389-5163-44a5-81e0-52eff37b2666>) for several reasons. For customers informalization is ‘hidden’ or tolerated because it results in the provision of a price competitive service. Hand car washes often go to great lengths to mimic formalized regulated providers and display professionally manufactured awnings, signage and price listings (see photograph 1). So whilst the vast majority operate in spaces abandoned by more formalized capital they appear as legitimate providers, even though their application of employment and environmental regulations may be quasi compliant. Secondly, interviews with customers revealed that they preferred a hand car wash because they could observe their car being washed and watch over those washing it. Moreover, hand washing provided what is termed a ‘detail’ finish, whereby alloy wheels are meticulously cleaned, a finish that cannot be provided by mechanised washes alone. No customers reflected on the labour conditions or the environmental conditions which hand car wash workers worked in. A third reason for social acceptability is the voluntary nature of broadly defined employment regulation in the UK. There is the potential for a licensing regime (DLME 2018:100-102) for hand car washes but currently no barriers exist and anyone can set-up an outlet. The availability of and occupation of abandoned spaces that flow from formalized economic re-structuring represent a form of class struggle for marginalized workers and business owners in that these are often the only way they can initially enter a business sector or the labour market. A fourth reason for the social acceptability of informalized labour which either enables or displaces technology is the side-lining of labour law as a remedy for labour abuse and exploitation and its replacement with an acceptance of flexible labour markets. Therein the application of labour law has been replaced by regulatory

tools such as licencing which critics argue concentrate on a narrow law and order agenda (Fudge, 2017). The agenda is designed to protect compliant employers whilst concentrating on a very narrow range of egregious forms of labour abuse suffered by migrant labour at the hands of migrant employers

An alternative way to view externalized flexibility in hand car washes and other informalized business areas is that these labour markets represent a new economic regime which is not marginalized or isolated but is instead dynamic in its mechanics and its relationship to more formalized capital. It is the very segmentation of the formalized market that creates a demand for informalized precarious labour which is often met by migrants. However, in contrast to the optimism of this alternative and the wider arguments of Harvey (2008) the evidence on the lived experiences of precarious workers suggests that they are structured by and embedded within the broader socio-economic re-structuring in the formal economy. Across these lived experiences at hand car washes three developments are in evidence; permanent underpayment of time referred to as wage theft, insecure unsafe working conditions and lastly, inappropriate or unlawful use of self-employment status (Clark and Colling, 2017). All three reduce labour costs for employers as erstwhile employer costs and associated social costs are passed onto workers where the removal of employment protection is a key indicator of precariousness (Vosko, 2006). In hand car washes this is clearly evident in the development of outsourcing labour requirements where informal agencies or intermediaries source labour for employers.

Conclusions

By following the theoretical framework for regulatory capture laid out by Mackenzie and Lucio Martínez (2014) this article suggests that approaches to work and employment and the

application of new technology therein need to focus beyond the relationship between (formalized) actors and (formalized) institutions. Instead, it is necessary to focus on understanding the spaces where informalized employers operate, that is, those which diffuse informalized business and employment practice. These spaces re-shape interaction between informalized employers and workers and the manner in which the former dominate new regulatory spaces. Accordingly on the first research question which theorizes the occupation and regulation of such spaces both appear feasible for informalized businesses such as hand car washes. In turn hand car wash owners appear enthusiastic about, operate within and are able to take advantage of recent labour market trends, thus providing a service which appears socially acceptable to potential customers in a new market.

The occupation and self-regulation of abandoned spaces by hand car washes demonstrates the theorization of regulatory capture where the continuing feasibility of hand car washing displaces technology. However, in 2018 the unilateral regulatory capture that informalized providers hold over the hand car wash sector is under threat as traditional businesses seek to formalize aspects of regulatory practice such as displays of insurance certificates, compliance with health and safety regulations, working time, environmental regulations and pay and conditions. This intervention by formalized capital further re-configures the sector and roles therein. The imposition of first informalized regulatory processes and then more formalized regulatory processes illustrates the positional power of new employers (both informalized and formalized) over labour and the conjoining of formalized landlords and formalized capital in this processes which inform who owns abandoned spaces.

Moving to the second research question the theorization of abandoned spaces is complemented by what informalization reveals about the regulation of work and employment

in contemporary British capitalism. Here hand car wash owners mimic the social relations of employment but via a mode of informalized precariousness which informs significant or partial technology displacement by labour. Research on hand car washes suggests that car wash spaces were sustained informally where in all cases the control of labour performance by business owners informs substantial or partial labour displacement of available technology.

Regarding the first research proposition on the spatial derivation of abandoned spaces resulting from economic re-structuring in the formalized economy, this article demonstrates both theoretically and empirically the arguments pioneered by Sassen (2009) on worker payment, Mitchell (2014, 2018) on occupation of abandoned spaces and Cumbers (2015) on the centrality of wage labour and repressive labour regimes in capitalist re-structuring. In respect of the second proposition on the relationship between technologies, technological advances and low-cost often informalized labour there is a variety of relations. In hand car washes there is full displacement of technology by informalized labour and partial displacement where hand car washes operate in direct competition with higher technology rollover washes. In terms of the connections between the two research propositions, on the first, the growth and diffusion of first hand car washes results from broader patterns of economic re-structuring in large scale capital. On the second connection between the two propositions; formerly abandoned spaces are now living spaces fusing capital that utilizes both formal and informal business and human resource strategies. Therefore the third connection on the obsolescence of fixed capital and the fourth connection on the centralization and concentration of capital are each a necessary outcome of broader sectoral re-structuring in retailing that have stimulated low-cost informalization in new uses for abandoned spaces. Accordingly, then the contribution of this article to new knowledge is that

spaces that are now occupied by hand car washes do not represent individual liberty and access to urban resources as outlined in the ‘right to the city’ thesis. Rather than this hand car washes represent a less optimistic form of re-structuring centred on worker repression where at this time no collective agency identity in labour has formed. In turn repression and an absence of collective agency in informalized work relations enable and inform the extremes of flexibility and permissiveness, each of which are long been embedded features of the British labour market and employment relations. Flexibility and permissiveness are embedded employer strategies in firms using formal business and employment practices; hand car wash employers and other areas of work drawn on by this article re-produce these practices to displace technology but less formally. The structural embeddedness of permissiveness in British labour market regulation informs labour use in hand car washes (and elsewhere). A further contribution is the consolidation of existing knowledge that it is the state which structures the abandonment of space and associated strategies for product and labour market de-regulation within which formalized and informalized businesses operate. Therefore apparent tolerance of informalization in work and informalized occupation of abandoned business space and the associated use of low-cost labour is determined by the boundaries of state regulation.

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