Britain’s last industrial district? A case study of ceramics production

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Abstract

This paper contrasts the theoretical model of flexible specialisation (FS) with recently collected empirical data from the UK ceramic tableware ‘industrial district’, located in Stoke-on-Trent, North Staffordshire. Whereas there are facets of the industry that match the FS thesis, countervailing arguments can be found that discount much of their significance. There is a lack of association between the FS model and the conduct of interorganisational relations, development of production technology and ‘impannatore’ co-ordination. However, elements of productive organisation, work processes, product variety and regional infrastructure give partial support to the model. In summary, at best partial support can be found for the claim that the tableware ‘industrial district’ has witnessed large-scale productive and organisational restructuring over the past 10 years. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Flexible specialisation; Industrial districts; UK ceramic tableware industry; Production organisation

1. Introduction

There has been debate in recent years regarding how ‘best’ to preserve the UK ceramic tableware manufacturing industry. This is a particularly important issue for North Staffordshire as the majority of suppliers and manufacturers in the UK are located in and around Stoke-on-Trent. When taken at face value, the productive and organisational structure of tableware manufacturing appears to mimic Piore and Sabel’s [1] model of flexible specialisation (FS). However, the model itself has not escaped critical interpretation. Piore and Sabel argue that for organisations to survive in turbulent markets, they should organise production using the guiding principles of flexible specialisation. Their interpretation of productive and organisational change attracted criticism for being conceptually error-bound and offering a misleading view of industrial and workplace organisation [2,3].

This paper will contribute to the area by taking a contemporary view of the FS debate and capitalising on the current interest in ‘partnerships’ between organisations in the same supply chain.
Both Bresnen and Fowler [4] and Schary and Skjøtt-Larsen [5], for example have alluded to the connection between ‘supply chain management’ and the mass production, FS debates.

A number of ceramic manufacturing sectors have been used to test the theory of the industrial district (see [1,6–10]). This paper will revisit the tableware sector of the ceramics industry to chart what has happened to the industry during the 1990s, so that a more comprehensive overview is obtained. Two previous studies in the industry by Imrie [6] and Rowley [8] are used as secondary evidence. The paper will wed primary data with the previous studies and, by taking this approach, will show continuity and change in the composition of this mature ‘industrial district’.

The first task however will be to conduct a brief review of the FS literature. This will illuminate the approach taken and add some conceptual weight to the case material.

2. The flexible specialisation debate

Piore and Sable’s text ‘The Second Industrial Divide’ draws together a meta-historical analysis of the late nineteenth and twentieth century capitalist mode of production. It is argued that a crisis developed in the capitalist regime of accumulation during the 1970s as a result of a number of complex factors. In answer to the fundamental issues surrounding mass production, Piore and Sabel propose that flexible specialisation forms a solution to the problems of standardised mass manufacturing. Table 1 illustrates the practical and conceptual differences between flexible specialisation and mass production.

Whist arguing that mass production had been the ‘prevailing mode of industrial efficiency’, Hirst and Zeitlin [11] clarify a number of issues in the debate. Most notably they highlight the difference between flexible specialisation and

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Mass production</th>
<th>Flexible specialisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Market conditions</td>
<td>Market stability with supply equalling demand</td>
<td>Market instability, innovation and product development are key to securing market share. Flexible and multi-use machinery</td>
</tr>
<tr>
<td>2. Production technology</td>
<td>Purpose built machinery, dedicated to a particular task</td>
<td>Semi-customised and mass variety goods, niche markets. Flatter organization structures, centralised planning and control system, dispersed production across the network, sub-contracting and franchising</td>
</tr>
<tr>
<td>3. Products</td>
<td>Low variety, standardised range of products</td>
<td>Core and periphery of workers, multi-skilled artisans and semi-skilled operatives linked by a chain of sub-contractors Co-operative collaborative, based on trust and dependence</td>
</tr>
<tr>
<td>4. Productive organisation</td>
<td>Managerial hierarchies, span of control, large and centralised factories</td>
<td>Obligational contacting relations, joint problem solving Local and regional infrastructure central to industrial district development, co-operation between many non-industrial institutions</td>
</tr>
<tr>
<td>5. Work processes, operative skills</td>
<td>Rigid divisions between metal and manual labour, semi-skilled workers, predominantly unskilled labour</td>
<td>Competition based on innovative products and processes, responds to falling market by diversification, innovation or contracting to core business</td>
</tr>
<tr>
<td>6. Inter-organisational relations</td>
<td>Adversarial, little communication or inter-company projects</td>
<td></td>
</tr>
<tr>
<td>7. Supplier relationship</td>
<td>Arm’s length and adversarial, negotiation on price the norm</td>
<td></td>
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<tr>
<td>8. Regional infrastructure</td>
<td>Importance placed on wider macroeconomic policies to ensure supply equals demand</td>
<td></td>
</tr>
<tr>
<td>9. Competitive strategy</td>
<td>Competition on price, economies of scale; over production compensated by stock piling or mark downs</td>
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</tr>
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Source: Adapted from Phillimore [12]
Mass production:  
Mass production can be characterised by the manufacture of standardised products using dedicated machinery operated by predominantly unskilled labour. Craft production or flexible specialisation, conversely, can be defined as the manufacture of a wide and changing array of customized products using flexible, general purpose machinery and skilled, adaptable workers. [11, p. 9]  
The market conditions for mass production resulted from the rise in the Keynesianist welfare state, large-scale industry working on economies of scale and the availability of a collectivised labour pool. However, as Piore and Sabel argue [1] ‘Starting in the late 1960s, the industrial world entered a time of troubles’. This crisis in part was caused by the saturation in world markets that rendered the mass production of standardised goods untenable. In addition to Western productive capacity, the third world embraced mass production with zeal, contributing to global over-production.  
In contrast to the failing epoch of mass production, Piore and Sabel offer a way out of the dilemma with a re-emergence of the small firm economy. Phillimore [12] argues that the return to this type of manufacturing structure is based on two major factors; the break up of firms into decentralised production units and the change in the nature of market demand for diversified goods. In addition to market based factors, the development of new technologies such as computer numerically controlled machines (CNC) enables small firms to produce efficiently in competition with mass producers. Although taken as explicit productive and organisational arrangements, Hirst and Zeitlin [11, p.6] argue that flexible specialisation and mass production are ideal-typical models. They argue that descriptive hypotheses or empirical generalisations are not key features of the debate. Rather, the flexible specialisation thesis is to be used as a means of charting shifts in industrial organisation.  
The alternative form of productive efficiency proposed by Piore and Sabel is based around two institutional frameworks. Hirst and Zeitlin illuminate the physiology of the two types of industrial district:  
...geographically-localised networks of small firms that sub-contract between one another and share a range of common services beyond the economic or productive capacity of the single firm... Within the district there may be differing roles played by the firms, from productive units through to trade associations, credit unions and local government agencies... In large, decentralised companies, on the other hand, the relatively autonomous productive units often resemble small, specialised firms or craft workshops, while obtaining research, marketing and finance from other divisions of the parent enterprise [11, p. 4]  
Further variations of the industrial district have been proposed by Markusen [13] who argues that a single structure does not correspond to empirical reality. Three additional types of industrial district are proposed that give a wider field of inclusiveness for the structure of the ‘new regional’ agglomerations, the hub-and-spoke industrial district, the satellite platform and the state-anchored district. Although this deviation from the central theme of flexible specialisation may be fruitful, her characterisation of the different forms of industrial district will be limited in applicability when discussing the productive and organisational arrangements for flexible specialisation.  
The role of inter-firm organisation in FS is brought to the fore in a number of studies. In particular, clear and effective communication of information relating to production and consumer choice is significant. Jarillo [14] and Johnson and Lawrence [15] note that the role of the impanatore in the Italian textile sector is crucial for maintaining productive and allocative efficiency between the different players in the district. In this respect, FS can be contrasted with more recent trends in purchasing and supply chain management that extol the virtues of long-term agreements, partnerships1 and information sharing. Trust and  
1The term partnership is rather a nebulous concept. Sako et al. [16] briefly review the various definitions for the term. They quote Cousins [17] who argues that there has been little agreement over a definition.
co-operation between firms within the small firm industrial district are central to its existence. In order for firms to live within a creative and innovative environment they must share their expertise and proprietary information with others. This mix of trust and dependence creates an atmosphere where competitors are also collaborators. This type of trust and dependence creates an atmosphere and proprietary information with others. This mix of arrangement between organisations has been termed ‘community as a medium for joint action’ by Best [18], who extends this concept into other areas such as securing joint financing for projects.

In order for the network of small firms in an industrial district to flourish, a certain type and level of infrastructural support must exist. Amin [19] provides case evidence from the ‘third Italy’ to show how state, regional and local support enterprises contribute to the functioning of the network as a whole. The role of the state is to act as a facilitator for the industrial district to thrive within a geographically close region. The type of support offered can be in the form of economic regeneration zones, grant-aided assistance for research and development, provision for training staff and funding for research agencies. The main aim here is to foster an environment in which firms can innovate within a supportive atmosphere. However, the extent to which local government supports a culture for flexibly specialised industrial districts to develop is challenged by Zeitlin [20]. Using evidence from other case studies, he argues that although local government intervention is important for economic development, it was not found to be an important or sufficient condition for development of other industrial districts in Italy. Although the role of local government has been tempered, macroeconomic policies still have a powerful influence over local agglomerations of small firms and large decentralised organisations. While the role of national economic management is underplayed in the FS literature, businesses do benefit from a stable external environment.

Benetton, the clothing firm, is probably the most frequently cited case study of a company operating in an industrial district [14,21]. The core-company sub-contracts all textiles production to a group of small firms, and only performs the process of dyeing the multi-coloured garments and marketing the final product. Indeed, the various regions of the ‘third Italy’ are heralded as bastions of flexible specialisation [1,18].

In contrast, Phillimore [12] investigated some UK-based cases to discover if evidence can be found of FS in the sectors of clothing, machine tools and machine shops, motor vehicles and printing. ‘Confusion and uncertainty’ dominate the conclusions of the study. Although there are facets of congruency between certain industrial cases and theory, there are an equal number that contradict the FS thesis. Phillimore relates this inconsistency to the original arguments that question the theoretical and empirical foundations of FS.

There have been two previous studies of FS in relation to ceramics production in Stoke-on-Trent. Both Imrie [6] and Rowley [8,9] reached the conclusion that an array of Fordist, post-Fordist and mass production arrangements exist in the industry. A strong point of contention between the two authors is derived from finding an agreed way to represent the precise nature of the situation. Rowley [8] found inconclusive evidence when he examined the case for flexible specialisation in the domesticware sector of the UK ceramics industry. The factors that correlated with the model of FS were equally matched by ones that fitted with other explanations of the changing industrial landscape of the “Potteries”.

By taking into account the various facets of the FS and mass production models, it will now be possible to take the theoretical model of the industrial district proposed by the FS thesis and test its relevance in relation to empirical evidence collected from the ceramic tableware supply chain. To accomplish this, the data will be broken into different categories that cover separate aspects of the model. The previous studies by Rowley [8–10] and Imrie [6,22] will be used to contrast the current situation with historical data.

3. The empirical analysis

The UK ceramics industry manufactures a diverse range of products used in a host of different
applications and the term ‘ceramic’ covers a large range of materials. This paper is concerned only with the tableware-manufacturing sector. Tableware is segmented into different categories, the main product types being earthenware, bone china, stoneware, porcelain and vitreous china. A number of companies also produce more decorative articles such as figurines and flower vases. For the purposes of this paper, the term tableware refers to earthenware, bone china, stoneware, porcelain and vitreous china plus ornamentalware and giftware.

As noted, the industry is predominantly based in and around the city of Stoke-on-Trent, an area known as ‘the Potteries’. Commercial potting has been practised in the area since the fifteenth century. It is not surprising therefore that the industry should be labelled as ‘mature’. There are a host of famous companies in the industry including Waterford Wedgwood and Royal Doulton. Both produce a range of medium to high-quality bone china and earthenware products. Other lesser-known names such as Steelite International and the Dudson Group manufacture hard, vitreous tableware that is used by the hotel and catering trade.

The data for this paper was collected between October 1996 and November 1998. The primary objective of the study is to analyse the complex interorganisational relations between firms in the sample. Participant observation and semi-structured interviewing plus document analysis were used to collect primary data. The firms involved in the study operate at the upstream end of the supply chain for tableware. Fig. 1 shows the network of organisations that has been studied in depth. Further data collection has been undertaken in the wider tableware industry to supplement the core sample.

4. Industry structure

According to Keynote [23] there were 335 UK tableware manufacturing units registered for value-added tax (VAT) liability in 1996. Of all manufacturers, 79% had a turnover of less than £1m. The combined turnover of the two largest UK-based firms, Royal Doulton and Waterford Wedgwood, account for over 50% of the industry’s sales. Of these units, 92% can be regarded as small to medium sized enterprises (SMEs) which employ less than two hundred and fifty workers. 55% of the companies from the Keynote sample employ less than nine workers. The ten largest firms in terms of turnover employ over 66% of all workers in tableware manufacturing.
This snapshot shows that small firms predominantly populate the industry. This would appear to be a characteristic of the theoretical 'industrial district' where small firms combine in a closely-knit geographical area. To understand the size of the tableware industry, some key statistics are presented in Figs. 2 and 3. Fig. 2 shows the combined turnover of the tableware industry in the UK. About 80% of the total sales figure for each year is composed of the turnover from the top fifteen companies.

From around the late 1970s, the industry has been beset by strong price and design-based competition from the lower wage economies of the East Asian region. This global shift in the manufacturing base for ceramic tableware has contributed to a gradual shrinkage of the larger UK tableware organisations, and a sharp rise in the number of small organisations. In light of this renewed emphasis on price and design at the lower end of the earthenware market, many UK manufacturers now find it difficult to compete, thus losing market share to imported goods. Fig. 3 shows the extent to which this has occurred in the market for tableware. It is evident to see that from 1971, the share of imports arriving for sale in the UK market has risen, reaching a peak in 1992 where over 40% of domestic sales were accounted for by imported goods.

With the closure of a number of the larger factories in the Potteries area, associated job losses have impacted heavily on the overall level of employment in the industry. One consequence of this is a sharp decline in number of members in the trades union for the ceramics industry, the ceramic and allied trades union (CATU). The union has witnessed a 50% drop in membership between 1977 and 1998, although parts of the industry such as tableware still retains a high rate of union density.\(^2\)

In order to examine the nature of industrial organisation within the tableware industry, a selection of the factors outlined in Table 1 will be used to examine whether there is a fit between the model of FS and empirical reality in the tableware industry.

\(^2\) Union membership statistics available by application to the Ceramic and Allied Trades Union, Hillcrest House, Garth Street, Hanley, Stoke-on-Trent.
5. Products

The manufacturing process for tableware has changed little over the past three decades. The wide variety of shapes and the transfer patterns applied to the ware give most manufacturers an extensive product range. Offering a wide variety of products is indicative of FS. However, this type of product policy has come under attack as it is simply too costly in terms of stock holding and production. Only recently, Royal Doulton announced that it is to discontinue 200 patterns from its 325-strong range [24]. Further rationalisation of product choice has been forced on the industry as the cost of stock holding adversely affects cash flow and profitability. In terms of the standard mass-market products, the variety of products and shapes is strictly controlled. In one large mass manufacturer, the product policy is to produce one profile for all shapes, but use innovative and appealing designs to sell the product. Therefore, although a number of product strategies appear to be indicative of FS on the surface, the forced rationalisation of product lines and the standardisation of mass market tableware serve as counter evidence to the FS thesis.

6. Productive organisation

The majority of manufacturing units still organise production starting with raw materials mixing through to selling the decorated product. In automotive production, this is akin to the in-house manufacture of steel for the car body and engine components whilst buying in the paint and finishing trim. A growing number of companies have opted to buy-in the ‘blank’ shape and only perform the decorating process. Fears over quality and the loss of control over the first half of production have deterred other manufacturers from going down the same route.

The main debate in the industry at present is whether to keep production in the UK or build plants in other areas of the world. Rowley [10] shows that this decision is based on a number of factors. This strategy of moving production is the preferred option of Royal Doulton who have built a factory in Indonesia. Johnson Matthey, a substantial supplier of raw materials to the industry, has followed this trend and built its own production complex in Pacific Asia where the factors of production are more favourable for labour-intensive tableware manufacture; they see the
production in Stoke-on-Trent as the expensive option. This has serious ramifications for the 'industrial district'. Firstly, the cost of building a new factory outside the UK is not a viable option for the majority of SME manufacturers. They are essentially survivors, or what Rowley [10] terms 'survivalists' that have little money to spend on investment, let alone a new factory. But more significantly, the re-located manufacturers do not adopt other forms of production organisation. They simply mass manufacture ware using modern machinery, employing lower cost labour to slash the price per piece. This, they believe, will put them on a par with other East Asian manufacturers, who can sell ware at significantly cheaper prices than the UK-based manufacturers.

7. Production technology

The imperative in tableware production for some years has been to cut the cost of a finished piece to compete against lower cost imports. This means reducing the cost of direct labour, which usually accounts for between 30% and 50% of a finished piece. The strategy used in the industry has been to introduce machinery that jointly de-skills and cuts the number of production staff. The key to this strategy is to use semi-skilled operatives to perform a set of simplified tasks, and cut as many high paid, skilled workers as possible.

The concepts behind the technology employed to produce tableware have not altered a great deal for about three decades. Recently, there have been some initiatives to build machinery that is flexible and cost effective. Some previous innovations have given the manufacturer little scope for using machinery in a manner that is conducive to multiple changeovers on a daily basis. Equipment such as the dust press, which is used to press flat shapes such as dinner plates, requires a longer production run to cover set-up time and produce an economic batch. Technological innovation in the industry is often geared towards process change. The introduction of multi-purpose robotic machinery has been piecemeal. The intricate manoeuvres that human operatives perform in many processes render the purchase and commissioning of a robot infeasible for most manufacturers. Simple tasks such as stacking plates have been robotized in a small number of plants, with a minimum outlay of £50 000 commonly needed for the equipment. It is often the case that paying the operative to perform the tasks by hand is still a more attractive investment option than installing machinery to do the same job. Whilst process machinery is relatively inflexible, the industry is getting to grips with introducing computer aided design (CAD) and rapid prototyping machinery. This type of equipment is used in the design of new shapes. The cost and time savings accrued from using this method of design are still to be fully appreciated. However, it may prove invaluable for the design and production of shapes and decorative patterns in the future.

It can be seen from the productive and technological arrangements in the industry that there are areas that hint at flexible specialisation. With closer examination however it is apparent that, in certain respects, the organisation of manufacturing follows the defining characteristics of batch production.

8. Work processes and operative skills

The process of tableware manufacture is highly labour intensive, with many tasks such as the decoration of ware with colour and transfer prints still being largely accomplished by hand. The craft and artisan skill involved in some of these process tasks is highly specialised, with a range of tasks taking many years to learn. In light of recent attacks on home and export markets, the strong task divisions throughout the industry have been gradually broken down. This has aided the flexible use of labour when manufacturing such a wide variety of product shapes and decorations. In some senses, the use of labour in the process mimics that of FS. There is a proportion of the workforce that is able to perform a variety of semi and highly skilled tasks, while less skilled jobs are performed by labourers. In summary, the work patterns of shopfloor workers show partial support for the FS model.
9. Buyer–supplier and interorganisational relationships

The history and close geographical nature of the tableware industry in Stoke-on-Trent has created a tight-knit community of manufacturers and suppliers. Often, a firm’s major world rival may be located in the same town, with their suppliers positioned within a few miles of each company. This close geographical relationship between firms in an industrial district does contribute to its success. Companies feed off each other in terms of goodwill, co-operation and innovation. Other bodies such as research establishments, finance houses and local government also play their part in the functioning of the district. Although Stoke-on-Trent scores highly on the geographical proximity of firms, other aspects of this network seem at odds with the industrial district arrangement.

Sub-contracting is used extensively in the model of the industrial district. Both Jarillo [14] and Amin [19] highlight the use of such an arrangement. The evidence for this type of commercial contract is less obvious in the tableware industry. Although there is some sub-contracting, most large manufacturers produce the bulk of ware themselves. Other smaller producers often buy-in prepared raw materials and manufacture from clay through to finished piece. Whether this buying-in of prepared material is deemed to be sub-contracting is a point of contention. Future signs of this behaviour between companies may be evident where white ‘blanks’ are imported from overseas plants and decorated in the UK. The role of the impannatore, or middleman is seen as crucial to the operation of the textile industry in the ‘third Italy’ (see [1,19,25]). This type of production regulator has no equivalent in the tableware industry. Instead, the top twelve companies deal directly with end-users or via retailers, mail order catalogues and factory shops.

Inter-firm relations both between competitors and the firms that supply them, on the whole, are characterised by an adversarial approach. There are strong links between manufacturers and suppliers in the area of technical support, but more integrative activities such as joint R&D are not a feature of these relationships. An example of this may be in the production of machinery. Tableware manufacturers have often commented that UK-based machinery producers have failed to produce new equipment that satisfies their needs. However, joint research and development, funding and co-operation from the tableware producers has been lacking in the past.

10. Regional infrastructure

The role of other bodies in the industrial district provides some interesting insights. In terms of R&D, CERAM Research (formerly the British Ceramic Research Association) is a major conduit for product and process innovation for manufacturing and supplier organisations. The organisation is funded by a mix of membership subscription, government funding and commercial activity. In terms of research, this collective pool of resources allows CERAM to pursue a mix of ‘blue sky’ research and basic developmental work that is allied to troubleshooting specific problems. CERAM has been criticised in the past for being aloof and out of touch with the commercial needs of the tableware industry. However, CERAM’s role has had to change as reduced central government funding and a shrinking home market has forced it to take a more commercial approach to winning new business both at home and abroad. This change has given CERAM renewed impetus to respond proactively and aid manufacturers and suppliers to set up joint projects.

A mixed relationship exists between the industry and local government. Although the City Council acknowledges the importance of the industry to support the social and economic infrastructure of the City, it often pursues an uneasy agenda of collaboration and conflict. The often contradictory relationship between industry and the local government can be illustrated with a brief case example: On one hand, in response to lobbying by the industry for funding to set up a central design facility, the local council part-financed the Hothouse, a centre of excellence in ceramic design that uses the latest computer-aided design (CAD) and other technology to design shapes and patterns, cutting the lead-time from design to manufacture. On the other hand,
Table 2
Contrasting tableware production with the FS model

<table>
<thead>
<tr>
<th>Strong association to FS model</th>
<th>Partial association to FS model</th>
<th>Lack of association to FS model</th>
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<tbody>
<tr>
<td>Products</td>
<td>X</td>
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<tr>
<td>Productive organisation</td>
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<td>Production technology</td>
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<tr>
<td>Interorganisational relations</td>
<td>X</td>
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<tr>
<td>‘Impannatore’ co-ordination</td>
<td>X</td>
<td></td>
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<tr>
<td>Regional infrastructure</td>
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</table>

the Council is currently acting as Devil’s advocate over a number of environmental and health and safety issues that the industry views at times as misguided diligence.

It is apparent from the review of the tableware industry that piecemeal evidence can be found for labelling the productive and organisational practices witnessed as a model of FS. The issue here is not to prove Piore and Sabel’s model as misguided in terms of tableware production, but to find evidence that supports the argument that change has occurred. From the evidence collected, it appears that the effect of cheap imports and a heightened emphasis on design has caused some of the larger manufacturers to rethink their strategy for the production of tableware in Stoke-on-Trent. The effect of a changing environment on smaller firms is less certain. Many are what Rowley [10] termed ‘survivalists’, which dictates to them a basic strategy of keeping their head above water.

11. Conclusions

This analysis shows that it is incorrect to assert that tableware manufacturing in Stoke-on-Trent can be labelled as an industrial district using Hirst and Zeitlin’s [11] definition. Table 2 gives a summary of the main issues in the industry that relate to the FS model.

Whereas there are facets of the industry that match the FS thesis, countervailing arguments can be found that discount their significance. The industry is composed of a large number of small firms. However, apart from the twelve major manufacturers, the majority of small firms are entrenched at the lower end of the market. There is also an absence of UK-based sub-contracting. It has been shown that the trend by the two major manufacturers (Royal Doulton and Wedgwood) to invest overseas may alter their tableware manufacturing operations in the local area. Rather than being an industry-wide phenomenon, flexible specialisation appears to be concentrated in pockets. Equally, the thesis for mass production in the industry is built on shaky ground with only limited empirical proof of its existence. Given these conclusions, further analysis will need to consider the effect of shifts towards globalisation, increased foreign direct investment to enable production overseas and the possible growth in non-UK sub-contracting arrangements.

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