

# Identification of business partnerships in the British population censuses 1851-1911 for BBCE

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Working Paper 18:  
Working paper series from ESRC project ES/M010953:  
**Drivers of Entrepreneurship and Small Businesses**

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September 2019

Comments are welcomed on this paper: contact the authors as above.

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Robert J. Bennett, Harry Smith, Carry van Lieshout and Piero Montebruno (2019) *Identification of business partnerships in the British population censuses 1851-1911 for BBCE*. Working Paper 18: ESRC project ES/M010953: 'Drivers of Entrepreneurship and Small Businesses', University of Cambridge, Department of Geography and Cambridge Group for the History of Population and Social Structure.

**Keywords:** Partnership, Entrepreneurship, Employers, Self-employment, Small businesses, Census

**JEL Codes:** L14, L22, L26, L25, D13, D22

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### 1. Introduction

This paper describes the process of identifying and coding business partners and partnerships using information in the British population censuses 1851-1911. This gives an additional set of codes that are available in the *British Business Census of Entrepreneurs* (BBCE) data deposit at UK Data Archive (UKDA). The transcripts of the censuses are derived from the UKDA data deposit of *The Integrated Census Microdata* (I-CeM), and the BBCE and I-CeM can be linked through the individual identifiers for each entrepreneur identified in the censuses. The analysis and data deposit are an outcome from the ESRC-supported project ES/M010953 '*Drivers of Entrepreneurship and Small Businesses*'. This project uses I-CeM as its main source.<sup>1</sup> However, I-CeM does not identify and code any entrepreneurial elements. Partnership was a key mechanism of business organisation in the 19th century and remains so today. The capacity to look at partner organisation using the information on people's age, family, and household structure is a valuable research resource that the census provides, even if there are some limitations to the partnership information that the census data contain. This paper describes how some of the population of business partners that can be identified in the censuses have been coded in BBCE using respondents' occupation strings.

This paper sets out how business partners were identified and coded for England and Wales, and Scotland. The general framework for identifying different types of business proprietor is outlined in Working Paper 1. The census data that survives is contained in the original Census Enumerators Books (CEBs) for 1851-1901, and for 1911 in the individual

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<sup>1</sup> Higgs, E. and Schürer, K. (University of Essex) (2014) *The Integrated Census Microdata (I-CeM)* UKDA, SN-7481; Higgs, E., Jones, C., Schürer, K. and Wilkinson, A. (2015), *Integrated Census Microdata (I-CeM) Guide*, Colchester: Department of History, University of Essex. Schürer, K., Higgs, E., Reid, A.M. and Garrett, E.M. (2016), *Integrated Census Microdata, 1851-1911, User Guide version V. 2 (I-CeM.2)*, Second edition, Colchester: Department of History, University of Essex.

householder census returns (see WPs 2, 3, 4). These are the source for I-CeM. These were obtained from the census transcripts for 1851-61 and 1881-1911 by FindMyPast (FMP), and for 1881 from Genealogical Society of Utah (GSU). Additionally, BBCE uses S&N as a source for 1871 in England and Wales.

There are several gaps in I-CeM that affect analysis (see WP 1):

- The 1871 census data for England and Wales is not yet available in I-CeM and if deposited it will have no occupational strings. The 1871 information used here and in BBCE is a special data extraction made for this project by S&N from their census data base (see WP 12). This extraction includes all employers but is less complete for own-account entrepreneurs and hence the number of partners identified is smaller.
- I-CeM has no data for 1911 for Scotland. This has not been infilled for BBCE.
- There are gaps and truncations in the FMP transcripts used in I-CeM census for 1851 and 1861, and lesser gaps and coding issues for all years. These have been infilled in BBCE in England and Wales and also in Scotland (see WP 3, WP 20). These considerably expand the range of partner information available that would otherwise be omitted.

Working Paper 2 gives an overview of how the different census questions sought information on business people, the format of the partner question, and the challenge this presents for identifying partners and partnerships. A previous analysis and development of the partner coding methodology for the 1881 census year for England and Wales is discussed as a pilot of the methods used in Bennett (2016). This is extended to all years and to Scotland in this Working Paper. A full list of Working Papers is included at the end of this paper. This Working Paper first summarises the census enquiry, then in Section 3 discusses how partners are identified and coded into the BBCE.

## **2. The census enquiry relating to partnerships**

The census had questions that sought limited information on business people which allows identification of some partners and partnerships. These data provide substantial basis for analysis, but users should be aware that its representativeness for different research questions should be tested so as to avoid misinterpretation by using the data beyond its capacity.

The census questions are summarised in Working Paper 2. The first year to include something explicit on partnerships was 1861, where the question was:<sup>2</sup>

‘In TRADES, MANUFACTURES, or other Business, the Employer must, in all cases, be distinguished. – *Example: ‘Carpenter – Master, employing 6 men and 2 boys;’* inserting always the number of persons of the trade in their employ, if any, on April 8th [the time of the Census]. **In the case of Firms, the number of persons employed should be returned by *one partner only*’.**

This question recognised that for businesses that were firms of several people the organisational status of the different partners was salient to how the data were collected and tables by GRO. The GRO purpose of this piece of the question was solely an outcome of the first part of the question which sought information on the employees of an employer. The partner wording recognised that if all partners gave the same information on the partnership there would lead to duplicate census entries. The question on employers with the employees was introduced in 1851 and GRO must have recognised that analysis of these data was confused by the multiple entries received; hence the encouragement for only one return of the firm to be made. There was, hence, no motive for the inclusion of the partner question other than to control the responses from the employer responses. As a result, no published information on partners is recorded in any census reports and there was no effort to increase the accuracy of whether partners recorded this status or not. However, it is clear that many partners recorded their status irrespective of the instructions, since there were many replies in 1851 including the statement ‘partner’ even though there was not request in that year. As a result it is possible to code partnerships recorded for all census years 1851-1911.

The additional wording on partners in firms used in 1861 continued as an addition to the employer question until 1881, after which this question was removed as part of the later census redesign (see WP 4). There was no explicit mention of partners in any other census up to 1911, but many people still provided the information.

From 1891 there is the advantage that those identifiable as partners have an employment status as employers and own account, whilst those who were explicitly workers can be removed from any entrepreneurial analysis. Some might be identifiable in 1911 using the

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<sup>2</sup> ‘General Instruction’, Census of England and Wales, *Householder’s Schedule*, 1861; bold emphasis added.

‘industry’ variable introduced in that year, where some respondents stated their business’ name; however, this is incomplete in the census data with a very high non-response rate, and also has many difficulties in the I-CeM coding that make analysis difficult. Analysis and re-coding of the industry variable was not included in BBCE; it could be useful as a future addition to the coding for partners and other entrepreneurs if its deficiencies can be overcome.

The information on partnerships recoverable from the census records clearly has limitations. First there was an explicit statement about partner status only in three years (1861-81), which can be expected to result in larger numbers being identified in those years than other years. Second, even for the three years when the question was included, the census instruction did not explicitly ask for partnership to be identified, but for the partners to make different types of return. They could comply with the instruction to return employee numbers without explicitly identifying their partner status. This would have resulted in a reduced level of responses than if a full question on partner status for all individuals had been included. Third, although there is no reason to believe that the partners identified are unrepresentative as individuals, responses have major sector variations in response rates. As well as the census question in 1861-81 which mentions partners, the census cover sheet listed different instructions for different categories of householders of different ‘rank, profession, or occupation’; for example, there were 24 different categories in 1881.<sup>3</sup> Although the employer instruction was general and supposed to apply to all businesses, the phrasing it used with the explicit instruction for the senior partner to make the employee return mentioned only ‘trades and manufacturers, or other business’. This should have included all employers, but it appears that many did not perceive themselves as covered by the instructions. Responses were particularly low for all those categories that had a specific alternative census instructions, especially the legal and medical professions; professors, teachers, and writers; miners; engineers; and ‘persons engaged in commerce as merchants, brokers and agents’. However, response numbers and rates of partnership reported were high in farming, despite not having any explicit mention of partnerships in the instructions. This means that the partners and partnerships identified from the census must be interpreted primarily as covering trade, manufacturers and farming. Subsequent use of the partnership data in BBCE must therefore exercise care to ensure representativeness and work primarily with partnership proportions.

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<sup>3</sup> *Census of England and Wales, 1881, Volume IV, General Report, Parliamentary Papers*, 80 (1883), 116.

The origin of the partner question in many ways gives an unpromising start for analysis of partners. However, despite the limitations, each census year contains valuable information in the occupational strings for thousands of individuals that allows their business associates and business structure to be subjected to useful large scale research for this period, as demonstrated for 1881 in Bennett (2016) pilot of the methodology.

### **3. Identifying and coding partners and partnerships**

Over 1861-81 partnership details should have been returned by the senior and/or one partner. The other partners should have given only their occupational information: e.g. the other partners of a butcher, where one partner had given the requested information on employee numbers, should have only stated 'butcher'. However, the instruction was ambiguous, and many non-senior partners also returned themselves as partners, while some of these also gave employee numbers leading to various difficulties that have to be managed in data analysis. Hence, the census data give a far fuller set of information than senior partners alone. The pilot analysis of partnerships in England and Wales using the CEBs for 1881 showed that the census has a wide range of other partners and operating relationships that can be identified (Bennett, 2016). This provides the basis for the identification and coding to be extended in BBCE to all years and to Scotland.

The objectives of the BBCE data are:

- To identify and code all possible partners as individuals, as well as other relationships akin to partnerships (such as 'joint' or implicit partnerships),
- To identify as far as possible the related individuals to each partner, and
- To give all individuals associated with the same firm the same partnership code identifying the firm (as well as its members).

#### ***3.1 BBCE Search strategy***

The 1881 pilot analysis for England and Wales used a search strategy that identified all those with 'partner', 'joint' and similar titles, or where entries were duplicated and can be matched with each other as implicit or 'de facto' partnerships operating the same business. Much of

this identification and subsequent coding was done clerically by hand, although based on the algorithmic identification of the main candidate firms from the extraction process for the CEBs described in WP 3. For the BBCE the extension to all years and Scotland required a greater level of automatic identification.

*The first stage* was to search all those in the census that were candidate business partners because they had entrepreneur characteristics. This was done in two different ways:

(1) For 1851-81 the search was over all the extracted individuals within the CEBs for the extraction Groups 1-6 (as defined in WP1, WP 9 and WP 9.2):

**Group 1:** anyone with stated employees,

**Group 2:** anyone stating 'emp' but with no employees stated,

**Group 3:** anyone described as 'master', cleaned for spurious masters,

**Group 4:** 'farmer' not stating 'emp' or acres,

**Group 5:** 'farmer' giving acres but with no stated employees,

**Group 6:** owners or proprietors of business assets: e.g. mine/quarry owners, shipowners, but not land/housing.

(2) For 1891-1911 the search was over all those who gave an employment status of employer or own account.

These searches were automated to identify the terms 'partner', 'joint', 'with', , and spelling variations and abbreviations. Some of these individuals were already automatically in the extraction Groups (e.g. partner with employees would be in Group 1; and all farmers were in Groups 1, 2, 4 and 5). These searches were carried out on the economically active population only, as defined in WPs 1, 3 and 4, which included only people with stating an occupation and over the age of 15. However, some people below the age of 15 were included for 1851-1881 if they provided workforce size data or subsequently were mentioned in the partners searches (e.g. 'partner with son' would be included even if the son was 15 or less).

*A second stage* was then to clean these data by hand: reading all the descriptor strings was an essential way to make decisions on whether the activity looked most probably a business association or not, and to code appropriately. This secondary cleaning process also allowed the imposition of various other controls:

- Sleeping, retired and salaried partners, (and a few deceased) were included, and coded separately (see below). There were no salaried or sleeping partners identified in Scotland.
- Further examples of partner non-entrepreneur categories not cleaned in stage 1 were removed; e.g. partner of housekeeper, partner of maid.
- Individuals with business portfolios were included in the candidate search set, but the ‘with’ search term resulted in including a lot of spurious partners which were removed.
- Most ‘assistants with’ were removed as not business partners but employees; however, some ‘assisting’ were included where the description was indicative of an implicit partner relationship that looked more intensive than merely be an employee; but these were coded separately as assistants (see below). This mainly occurred in 1911 where the category is more numerous as a result of having the householder census returns rather than the CEBs, but was also more common in Scotland for 1851.

It should be noted that while 1891-1911 data allow the use of employment status (as employer or own account) to identify how far partners were truly *business* partners or really workers in the business, this does not always line up well. This is because of the ambiguities in the design of the 1891-1911 census questions that led to non-response and misallocation biases (see Bennett et al. 2019). But also, because some responses were very loose or confused, using worker status to describe an business operation with another; e.g. ‘two painters and decorators working together as partners’, but ticking the census ‘worker’ status column. Employment status can therefore only be used as a guide to cleaning and was mainly beneficial to verify how far an ‘assistant with’ was a partner or really just a worker. For all years assistants, after data cleaning, that look like real partners have been coded accordingly; but for 1911 ‘with’ alone is assumed spurious in most cases. Nevertheless, there are more ‘with xxx’ as partners in 1911, although the number of assistants included in this way is very small for all years. As summarised in Table 1, this added only 28 in 1911 in England and Wales, these were mainly own-account entrepreneurs.

**A *third stage*** was to add to the cleaned information those individuals that could be identified as being part of the same activity, by having a relational statement, such as ‘partner of above’, ‘joint with brother’. This was not always successful, and those that were ‘above’ had a failure rate because they often referred not to the immediately above listed person in the

CEB, or to the head, but to someone else in the household or somewhere else in the CEB in another household, or were not apparently anywhere in the records in I-CeM.

<b>Employment status code</b>	<b>1891</b>	<b>1901</b>	<b>1911</b>
1 Worker			135
2 Employer	<i>1</i>	<i>1</i>	<i>5</i>
3 Own account		<i>1</i>	<i>23</i>
Blank (-1)	1		155
<b>Total</b>	<b>2</b>	<b>2</b>	<b>318</b>

**Table 1.** ‘Assistant with’ but without other qualifier such as partner etc. in England and Wales 1891-1911; *bold italics* are those included in BBCE

As a result of the way the census was conducted, those most frequently found with a codeable relational link were those with the head of the household, since relationships with others outside the household are not recorded in the census. The individuals were then identified automatically by searching within households and supplementing based on RELA information. In the process of identifying these additional individuals they were given the same partnership code as the original partner used in the identification process.

An individual with partner relationship links *outside* the household was only identified where they were explicitly stated in the occupation description; e.g. ‘partner with brother’, and the brother was not present in the same household but living elsewhere. In this case a partner relationship code could be given, but the other partner could not be added to the database.

*The fourth stage* of the coding then cleaned and checked all the additional partners identified from the third stage and gave them the all the same partnership codes and number. Where an individual explicitly stated ‘with brother’ or some other relationship, this could be used to code that partnership, for cases where the actual individual partner could not be identified.

To give some examples at the individual level:

- 'With' and 'assistant' were not included unless appearing to be equal status e.g. 'blacksmith with father', but not 'clerk with father';
- 'With' not included unless a specific sector, even if rather complex; e.g. two individuals with records that are close or adjacent such as 'plumber in part of with tother' and 'plumber master (employ men)' is included as an explicit partnership (reading 'part' as an abbreviation for partner); simply 'with father' with no entrepreneurial activity of the father is excluded (such as 'with father' who was an 'annuitant').
- No 'worker with' is included.
- 'In the business with John Lawson and Son' is coded as partner
- 'occasional help' excluded
- 'Householder with' etc., is not a business
- 'joint maker', which was a numerous category, is assumed to be an electrical or plumbing trade and is excluded
- 'joint head masters', 'joint farmer', and other joint in a specific trade included
- 'Joint manager' included in a small trade (not a larger firm; e.g. joint manager of blacksmith), but not other managers unless the other shown is of explicit partner status
- Identification of the other partner(s) must have the same or similar occupation; thus two individuals in the same house as 'joint lodging house keeper' and the other as 'dressmaker' are not believed to be joint with each other (the lodging house keeper is joint with someone else and coded as an implicit partnership, but the dressmaker is not in a partnership); but entries together in the same household, such as 'hotel proprietress partner' and 'hotel proprietor', are partners.
- 'Partner of [specific trade]' but with a non-entrepreneur as the other identifiable individual as a possible partner is coded to include the partner but exclude the non-entrepreneur; e.g. 'tailor, partner with above' is included if the above is identifiable as 'tailor', but excluded in the above cannot be properly identified because the possible candidates of the above that have been found have an occupation such as 'labourer', 'military officer', 'housekeeper' or 'annuitant', or are blank occupational entries.

### ***3.2 Improved coding to occupation/business sector***

In many cases the partnership coding method identified individuals whose occupational coding could be improved. For example, individuals who gave the occupation ‘partner’, or similar, were coded in I-CeM to 761 ‘Manufacturers, managers, superintendents, foremen (unspecified)’ or to 777, the occupation category ‘Owners of Companies’. This did not include the business sector of activity at all. When such an individual can be identified in a partnership with someone who gave more specific sector/occupation information, they can be re-coded to their partner’s occupation code. For example, for ‘partner with above’, ‘partner with father’, the individual ‘above’ or ‘father’ can be identified and their full Occode can be used to code all members of the partnership to the appropriate business field with a common Occode. For using BBCE this new Occode can generally be identified from the partner coded as the senior or the reference person for the partnership (PARTREF: see below). A full re-coding of these new Occodes for all partners has not been included in the BBCE, but could be enhanced as a later development.<sup>4</sup> Hence, in BBCE Occodes can differ between one partner and another, but the partnership Occode can be recovered using the PARTREF.

### ***3.3 Coding partners and partnerships***

The codes assigned to each individual are listed below (also see *BBCE User Guide*). Where more than one partner of the same firm was identified all the codes for the firm are repeated for that individual so that each individual carries the partnership information. The partnership is identified by its own partnership ID, which is unique to that year (separately for England and Wales, and Scotland) – but not unique across all years. An analysis of partnerships by type requires each year to be treated separately, the partnership IDs to be extracted, and then duplicate entries of the different partners filtered using the desired type of reference person. All partnership variables have been checked for consistency with each other (all have the same code in the same partnership), but PARTREF is an exception so that partners that can have different codes in the same partnership in a few cases (although these can be readily filtered if required: see below).

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<sup>4</sup> This differs from Bennett (2016) where the occupation codes were changed for the analysis.

- PART identifies that an individual is a Partner of some type in a business: as 1/0.
- PARTID is an identifier for each business partnership, or firm. All partners in the same firm have the same PARTID.
- PARTREF is a code to identify within each partnership a reference person by level of seniority, and others that are not senior (PARTREF 1 for senior; PARTREF 2 for non-senior). This is the senior partner where identified explicitly by the census response, whether or not all other partners are known. Senior is identified in many cases from the statement ‘senior’ or similar. It is also coded as senior when the individual makes the statement of ‘employing xxx’, which in accord with the census instructions that this would ‘normally’ be the senior partner (where more than one partner gives an ‘employing’ statement and workforce numbers, senior is coded to the head of household, or if this does not apply, to the oldest). A consistency check was run to confirm that all who had the ‘employing’ statement and gave workforce numbers were coded as senior (unless someone else claimed to be senior). In other cases, where there is no ‘senior’ or ‘employing’ statement, cases were coded as senior or junior where the relationship was obvious (for example a large age difference with a young junior, or in a statement such as ‘partner with father’, the assumed senior is coded as such). However, in many cases there will be partnerships with no senior individual identifiable, usually because only one partner’s record is known (the others reply elsewhere and cannot be connected). The partner who can be used to represent each firm can be found by first filtering on PARTID and selecting all PARTREF 1 (for senior), and then filtering on the rest of PARTID to select PARTREF 2 (to give a non-senior representative of the firm).

**Note:** PARTREF for *joint* relationships is particularly difficult to code as senior and other (as inevitable in many joint operations); hence, users may prefer in analysis to treat all these to be of equal status.

- PARTYPE gives the type of partner, deduced from their descriptor. This uses all partners/individuals identified with the firm, not just one individual’s entry. Where the statements of two (or more) people in a partnership are inconsistent with each other, the strongest link is chosen as the PARTYPE code (e.g. one stating ‘partner’ and another stating ‘in company with’ is coded as P; two statements, of ‘partner’ and ‘joint’, is coded to P). These conflicting statements are rare.
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P	Explicit 'partner' or 'co-partner' statement; includes 'company with', 'conjunction with', 'in firm with', and 'employing X men with another'
J	'Joint' operator with others as explicit joint statement
D	de facto partner operating with others: 'with' statement, or duplicate or near-duplicate descriptor (often 'ditto'); includes 'master/mistress assisting with'
A	'Assistant/ing with' but no mention of partner/joint status or master/mistress ('master/mistress assisting with' is taken as partner); differs from 'operating with' above; but 'assistant' with no extra descriptor is excluded. This category is ambiguous and can be excluded if desired; it is small in number, mainly occurs for 1911: see Table 1
O	Land owners operating together (only coded in 1881 pilot; <i>should usually be excluded</i> from analysis)
R	'Retired' where explicitly stated (a small number)
S	'Sleeping' where explicitly stated (a small number, none found in Scotland)
Sal	Only where 'Salaried' was explicitly stated (very rare statement, none found in Scotland)
Dec	Partner of recently deceased other person identified by explicit statement; very rare, coded to allow former partner status to be identified

**Note:** all other partnership variables are consistent with each other except PARTREF (all have the same code for the partnership as a whole), but PARTYTYPE can take a different value where the type of R, S, SAL, and Dec occurs. These types are retained in the coding of partnerships, so that they count in coding of PARTN, PARTGEN and PARTRELA.

***PARTYTYPE for R, S, and SAL can be used in three ways:***

- (1) They can be retained and used as different subjects of analysis (though their numbers are small);
- (2) They can be removed altogether focusing only on full partners P;

(3) Some or all of R, S, SAL, and Dec can be recoded as being all P types.

*Land owners operating together* (PARTYPE O in 1881) and *assistants* (PARTYPE A) can be retained or excluded from analysis as desired, but for consistency between years PARTYPE O should be excluded for most purposes.

- PARTN gives the number of partners in a partnership where known or deducible. This includes S, SAL, and Dec (PARTYPE), which could be excluded if preferred.
- PARTGEN gives the gender mix of the partnership where all partners can be confidently identified as the whole partnership, or enough information is given to deduce the gender of the partnership. The coding is conservative, so that if gender is not explicitly known for one of the partners this PARTGEN is coded as unknown even though the gender of the others is known.

M	All partners male
F	All partners female
X	Partners of both genders (at least one of each). Even if all partners are not known, if one female and one male is identified then this is mixed, but males with unknown others, and females with unknown others are coded as unknown U. Partners with an unknown other, but stating 'with father', 'with daughter', etc., are coded to gender
U	Gender mix unknown where not all, or insufficient, partners are identified, or descriptor is unclear: e.g. male 'with proprietor' as an unknown other does not have clear gender. This also occurs where I-CeM has a 'U' code for gender; users can fill in these codes by inspection of the CEBs if desired.

- PARTRELA gives the family, kin or other relationship between partners in the partnership. This is deduced from the RELA codes in the household of the partner where it is clear that it is household member(s) who are the partner(s) referred to, or from other information given in the occupational descriptor (so that statements such

as ‘partner with brother’ can be coded even if the brother is not present in the same household). Note that RELA only partly aids direct coding; e.g. two brothers in partnership together but not with the head may have a RELA code as sons, but their PARTRELA code will be as brothers. The same PARTRELA code is given to all partners in the firm; it relates solely to those who are identified as partners and not to any others in the household. The coding is based solely on the census information. It will certainly be the case that more detailed research could potentially reveal more relationships, or different relationships in some cases. This would be particularly likely where an individual is identified as a partner in a different household. The census gives no information of relationships between people in different households. A common feature is two heads of household that live adjacent or nearby who can be confidently identified as partners of each other, but the household RELA code gives no idea of how they are related to each other if at all. Having the same family name in this situation is not used as a criterion to assign relationships as it is prone to false positives, especially in small communities with common local names, and particularly in Wales and Scotland.

blank	Unknown relationships (usually where not all partners are identified)
1	Father-sons, and/or MALE grandchildren, great grandchildren
2	Father-daughters, and/or FEMALE grandchildren, great grandchildren
3	Mother-sons, and/or MALE grandchildren, great grandchildren
4	Mother-daughters, and/or FEMALE grandchildren, great grandchildren
5	Husband & wife together; also 2 spouses with all genders of children, grandchildren, great grandchildren (excluded from 1-4 and 12-13)
6	Brother-brothers
7	Sister-sisters
8	Extended family (other than or additional to children, grandchildren, great grandchildren)
9	Extended family with others (as 8, but with non-family members as well)
10	No obvious family connection for any partners (though they may

	well be strong family ties that are not evidenced in the census (RELA)
11	Brothers-sisters
12	Father with sons AND daughters and/or mixed gender grandchildren, great grandchildren
13	Mother with sons AND daughters and/or mixed gender grandchildren, great grandchildren
14	Parent (gender unknown) with any children (used only for 1871 to cover codes 1-4, and 12-13 where full population data not available)

All variables were checked for consistency within partnerships, but PARTYTYPE can take a different value where the type of R, S, and SAL occurs (as noted above: R, S, and SAL can be used in different ways, included or not, depending on the purpose of the analysis).

### ***3.4 BBCE compared to the 1881 pilot***

The method of identifying partners in the BBCE differs from that used in the 1881 pilot in two small respects:

- BBCE is more restricted compared to the pilot because:
  - Duplicated or near duplicate descriptors are not as fully used to identify people who operated in the same business as in the 1881 pilot (called ‘de facto partners’ in Bennett, 2016).
  - Owners of assets that were operated by two or more people together were included in the 1881 pilot for all cases identified, even if this was purely and activity of renting out land or housing. In BBCE these were only included for non-land and housing (see WP 1).
- BBCE is more encompassing than the pilot because:
  - The search terms that attempted to infill partners for ‘partner of above’, or other cross-references, were employed over the whole data set, whereas this was only partially done in the 1881 pilot which mainly used only those extracted as employers and masters (Groups 1-6 of data extraction: see WP 3);
  - The data cover all years and Scotland.

- Improvements to coding accuracy were also made; hence the BBCE data for 1881 have been upgraded from the pilot.

For the BBCE for 1881 the pilot data on partners was used as a starting point, but it was supplemented using a fresh search of the whole population to infill partners for ‘partner of above’, etc., to make it consistent with the other years. The BBCE partner information should be consistent across all years, but it is likely that more implicit/de facto partners are identified in 1881 than for the other years. The coding for land owners operating together used in the 1881 pilot is retained in the data deposit to allow comparison with the published pilot results in Bennett (2016), but is coded separately and should be excluded when comparing with the other years.<sup>5</sup>

#### 4. Conclusion

This working paper has described the procedures for identifying and coding the data on partners and partnerships contained in the censuses and deposited in the BBCE. It is recognised that this is not a complete database of the partners in all firms. The way the census question was asked restricted the information that was gathered and biased it towards greater coverage of farming, trade and manufactures than other sectors. The professions, commerce and mining are much less well covered. Nevertheless, the census does allow useful samples of partners to be extracted for 1851-1911. But because of the differences in the size and representativeness of the ‘samples’ available for different sectors subsequent analysis has to be carefully managed to avoid the effect of non-response biases and unrepresentative samples.

#### Acknowledgements

This research has been supported by the ESRC under project grant ES/M010953: **Drivers of Entrepreneurship and Small Businesses**. For partnerships in Scotland some additional support was provided by Isaac Newton Trust Grant 18.40(g): **Business proprietor succession and firm size change 1851-1881**. Piloting of the research for 1881 draws from

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<sup>5</sup> The additional search strategy used for the 1881 BBCE increased the number of de facto partners identified, and also added a few more partnerships, so that numbers differ from those published in Bennett (2016); however, the differences are small.

Leverhulme Trust grant RG66385: **The long-term evolution of Small and Medium-Sized Enterprises (SMEs)** with the assistance of Gill Newton. The input of the census data for 1871 in England was supported for the coding of the S&N 1871 census transcripts by the ESRC project, with additional support for data coding and cleaning by Joe Day from Isaac Newton Trust research grant 17.07(d): **Business Employers in 1871**. We are grateful to S&N for making the 1871 data available for this research.

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