

Occupational structure in Ireland in the nineteenth century: data sources and avenues of exploration

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I.

There is broad agreement that Ireland's GDP per head grew more rapidly than that of Britain in the seventy years between the Famine and the outbreak of the Great War. While a part of this performance can be ascribed to the positive effects of emigration on average productivity and hence wages, the great bulk of post-Famine Irish economic growth is explained by standard neo-classical growth forces such as capital accumulation and total factor productivity growth (Geary and Stark, 2002; Williamson, 1994, 1995; O'Rourke and Williamson, 1997, 1999; Begley et al., 2014; Blum et al., 2017). Economic growth can be considered not just in terms of labour markets (emigration) and the goods market (upward shifting production function) but also in terms of structural change. Structural change can be thought of as an integral part of economic development. Cullen for example relied on structural indicators to conclude that by the end of the nineteenth century Ireland was comparable to a handful of highly developed nations (Cullen, 1972).¹ Indeed structural change forms an important part of the way in which modern economic growth has been described and analysed: Lewis' two-sector model of economic development with unlimited supplies of labour; Kuznets' famous six characteristics of modern economic growth; and Chenery and Syrquin's identification of a typical pattern of change in economic structure as countries experience economic development, for example, all seek to explain and analyse economic development as a set of inter-related structural changes as economies move through higher levels of GDP per head (Lewis, 1954; Kuznets, 1971; Chenery and Syrquin, 1975; Chenery, 1979). These common patterns of development have been outlined and analysed for a set of nineteenth century European economies by Crafts (1985).

Structural change manifests itself both in the market for goods, with changes in sector output, and in the market for labour, in changes in the employment of the labour force across sectors. A consideration, then, of the changing sector allocation of the Irish labour force can shed light on the development transition in Ireland in the post-Famine decades. This paper proposes to consider structural change in post-Famine Ireland through an examination of changes in the allocation of the labour force across three broad production sectors: primary, secondary and tertiary. The employment series is constructed from the aggregate occupation returns of the Irish Census: the most complete source of information available on male and female labour force activity and occupations in Ireland over the 90 years between 1821 and 1911. In section II we outline the occupation data returned in each of the Irish censuses; section III indicates some of the problems with the census returns, outlines their resolution and presents aggregate series on primary, secondary and tertiary employment in Ireland between 1841 and 1911. Section IV briefly considers structural change in Ireland in a European context following Crafts' identification of the pattern and diversity of structural change in European economies as levels of GDP per head increased in the nineteenth century (Crafts, 1984). Considered through the lens of structural change, Ireland can indeed be seen to be comparable to a handful of developed nations.

II.

The Census of Ireland was always conducted separately from those of England and Wales and Scotland.² One result is that there are differences in the system of classification within the UK censuses before 1871. Considering Ireland there were changes in the method of collection of data, the set of occupation data returned, and in the system of classification of occupations over the century. All of this means that the occupation

returns as presented in the various censuses are of limited value in comparing within Ireland over time and in comparing between countries within the UK. The solution to this problem is to aggregate the numbers in the occupation returns into some common system of classification such as the Standard Industrial Classification (SIC) or the Primary, Secondary, Tertiary (PST) system of Leigh Shaw-Taylor and Tony Wrigley where this is possible (Lee, 1979; Wrigley and Taylor, 2017).

1821 and 1831

The first two Irish censuses were taken in 1821 and 1831 (P.P. 1822, XIV; P.P 1824, XXII). Data was collected in both cases by enumerators who made returns on the basis of *viva voce* enquiry. The occupation data returned is of limited value. The 1821 census returned all persons active. The 1831 census returned families mainly occupied in three activities, occupied males upwards of 20 years of age (except servants), all male servants aged below 20 and 20 and above, and female servants (age unspecified). Considering the system of classification, the 1821 census returned persons occupied in 3 orders: persons chiefly employed in agriculture, persons chiefly employed in trades, manufactures or handicrafts, and other persons occupied. There is no return of the numbers returned in the occupations making up these orders and no return of occupations by gender.³

The 1831 census returned the number of families chiefly engaged in 3 orders: agriculture; retail trade and handicraft; others not in the first two. There is no return of the numbers in occupations making up these orders. There is also a return of males upward of 20 years of age in one main order (Agriculture) and eight sub-orders of which three are in agriculture. There is a return of male servants under 20 years of age and 20 years of age and over and a return of female servants (age unspecified). There is no return of the numbers returned in the occupations making up these orders except in the case of the sub-Order,

‘Employed in retail trade or in handicraft as masters or workmen’ where returns are made of the numbers in some 214 occupations contained in this sub-Order. The returns are set out in Tables 1 and 2 for clarity. In brief the occupation data returned in both the 1821 and 1831 census are not susceptible to reclassifying to conform to either an SIC or to the PST system. For purposes of making comparison over time with the post-1831 returns they are of only limited value.

[TABLE 1 HERE]

1841-61

The 1841 census differed from its predecessors in method of data collection, in the set of occupation data returned and in its system of classification (P.P. 1843, XXIV). The 1841 commissioners issued a ‘Form of Family Return’ to be completed by the head of the family rather than, as in 1821 and 1831, estimation by the enumerator. The census returned the occupations of all persons active in the labour force by gender and age (below 15 years and 15 years and above). Around 450 occupations were classified as belonging to one of nine orders: ministering to food; clothing; lodging, furniture, machinery etc.; health; charity; justice; education; religion; unclassified. The compilation, method of estimation and system of classification of 1841 was repeated in 1851 and the number of occupations returned increased to 600 (P.P. 1856, XXXI). In 1861 this system of classification was retained though the number of orders increased to 13 and 13 sub-orders were introduced subdividing the orders food, clothing and lodging etc. The number of occupations returned increased to about 900 (P.P. 1863, LXI). The return of males and females was retained but the return by age group was abandoned. The returns are summarised below.

[TABLE 2 HERE]

[TABLE 3 HERE]

[TABLE 4 HERE]

1871-1911

On grounds of convenience and uniformity the Irish commissioners were obliged to adopt the classification system in use in the other two Censuses of the United Kingdom in 1871. They did so under protest (P.P. 1876, LXXXI). The British system of occupation classification was divided into six Classes: I professional; II domestic; III Commercial; IV agricultural; V industrial; VI indefinite and non-productive. The classes were subdivided into 18 Orders. The 18 Orders were then further subdivided into 80 sub-Orders. In total some 800 occupations were allocated to these classes, orders and sub-orders in the Irish census of 1871. Returns are for males and females by age⁴, religion⁵ and education.⁶

The 1881 Census increased the number of orders to 24 though the number of sub-Orders remained at 80. The number of occupations returned fell to around 700. Returns are for males and females: the age intervals altered;⁷ the return for religious persuasion and education remained the same. The 1891 Census retained the classification system of 1881 though there was an amalgamation of what the Commissioners felt were 'kindred occupations' with the result that the number of occupations returned fell to 600. The 1901 and 1911 Censuses retained the

classification system of 1891 though the number of occupations returned increased to around 700 in 1901 and 1000 in 1911. Table 4 summarises the information returned.

III.

Since the system of classifying occupations in the Irish census changed over time, in order to generate employment series that are consistent it is necessary to reclassify the occupation returns to a common system of classification. However, whatever system is used – whether SIC or PST – there are three major problems with the returns that must be resolved. The first relates to the return as a separate order for ‘Wives (of specified Occupations)’ made in the 1871 census; the second relates to the number of males in the occupations returned as ‘Agricultural Labourer’ and ‘General Labourer’; the third relates to the number of females in the sub-order ‘Domestic Service’.

The return of females in 1871

The system of classification of occupations adopted in the Irish census of 1841 was made up of nine orders and the returns for 1851 were tabulated under these same orders. In 1861 the number of orders was increased from nine to thirteen. At the direction of the Irish government, the Irish Census Commissioners in 1871 (most reluctantly) adopted the British system of Classes, Orders and Sub-Orders (P.P. 1876, LXXXI, pp. 62-94). In the process a problem, specific to 1871, arose over the occupational classification of females, which is perhaps best set out in the words of the Irish Commissioners, themselves:

“Deferring simply to the will of the Government, and conforming strictly to the English methods as set out in the Book of Instructions compiled for the tabulators in the English Census Office, we referred...all wives of specified occupations to Order IV of the

Domestic class, although nothing, as it occurred to our judgement, could be more erroneous in principle than such a classification. A wife of specified occupation may be a milliner or dressmaker, a draper, a governess or schoolmistress, a mill hand in a linen or cotton factory, a folder in a printing establishment, a bookbinder, or a seamstress. In all these capacities - and we have enumerated but a few at random - she belongs, unless as a governess or schoolmistress, to what would be called the Industrial class, while the governess and schoolmistress, or music or drawing mistress, would belong to the Professional class. The Domestic class, however, under the scheme in hand, abstracts, at a clean sweep, every wife of a professional or industrial calling from the class to which she is naturally referable, and transfers her to a class which represents in great part not so much a calling as a relation..." (P.P. 1876, LXXXI, p. 62)

The reasoning behind this procedure was that, 'in the English classification wives of husbands following certain callings are presumed to be assistants in the husband's business (P.P. 1876, LXXXI, p. 67).' In 1881 and in subsequent years females returned as wives of butchers, innkeepers etc. were placed in Class VI (Persons Not Producing) along with those females returned as wives of no specified occupation; in the 1861 Census females returned as wives were returned outside the total of occupations.

The 1871 Census returned some 362.6 thousand females in Sub-Order 1, Order 4, Class II (Domestic service) 'wives (of specified Occupations)'. This total included wives defined by their husband's occupation and those following a specific occupation. Clearly the Irish commissioners were not happy with this procedure which they felt had been forced on them; they recognized that it tended to both misallocate and to inflate the female work force. Their preferred solution was to treat wives described as following their husband's calling equally with wives of no specified occupation and return them in Class VI while locating females returned as wives, but also following a specific occupation, in the order and sub-order of their occupation (P.P. 1876, LXXXI, pp. 67 and 71). In order to rectify this omission in the

published tables, it is a simple enough matter to remove those females returned as wives following their husbands calling to the not occupied category, however this leaves the 86 thousand females returned as ‘wife following other specified occupation’ who, although active, do not necessarily belong in Class II (Domestic Service).

Fortunately the commissioners returned an additional table of occupations of wives in which those wives following specific occupations are referred to the class, order, and sub-order under which the occupation which they followed was classified;⁸ it would be possible to remove all of the 362.6 thousand females in Class II, Order 4, Sub-order 1, ‘wives (of specified occupation)’ from the main summary table and then to add back the 86 thousand active females who were wrongly included in that sub-order referring them (using the summary table of occupations of wives mentioned above) to the particular Order and Sub-order to which the occupation which they followed properly belongs.

In the event, there is an easier approach; the commissioners provided a further summary table showing, by province and in the aggregate, occupations in Ireland according to the Irish classification of 1841 in which wives following their husbands occupation were either returned as not occupied or returned as such, and wives following specified occupations were located in the appropriate order and sub-order to which their occupation properly belonged.⁹ It is this table which has been used here to generate a revised classification of Irish occupations in 1871.

Agricultural labourers and general labourers

The second problem relates to the numbers (the great majority males) returned as agricultural labourers and general labourers. In each census between 1871 and 1911 the commissioners attached to the return for the occupation 'Agricultural Labourer' a note to the effect that the reader should 'see 'General Labourer'...the majority of whom may be assumed to be Agricultural Labourers, although not having returned themselves as such.' The nature of the problem may be illustrated by examining the proportion of the labour force returned in the two occupations 'Agricultural Labourer' and 'General Labourer' between 1851 and 1911.

[FIG 1 HERE]

The problem may be seen clearly in the dramatic fall in the share of the labour force returned as agricultural labourers between 1851 and 1861 and the equally dramatic rise in the share returned as general labourers in the same decade. It seems reasonable to suggest that these changes arise, in some part, from a reallocation of some of those who had been allocated to the occupation 'Agricultural Labourer' in 1851 to the occupation 'Labourer' in 1861. Similarly the fall in both between 1861 and 1871 is in some part due to the addition of two new occupational categories in 1871: 'Farm Servant (In-door)' and 'Farmer's, Grazier's - Son, Grandson, Brother, Nephew'. Figure 2 shows the effect of combining the return of agricultural labourers with the two new post-1871 Sub-orders. The continuing decline after 1861 in the share of agricultural labourers is offset by an increase in Farm Servants and in Farmer's Relatives, though again the effect of allocating agricultural labourers to the Sub-order 'General Labourers' is visible, especially in the decade 1851 to 1861.

[FIG 2 HERE]

For purposes of the present exercise reallocation of labour within one of the global sectors is not important (we are interested in total employment within agriculture) however allocation between sectors is important so we must seek to resolve the problem of the allocation of labourers between the two occupations, ‘Agricultural Labourer’ and ‘General Labourer’.

The 1881 Commissioners made the common sense observation that, ‘the majority of persons in rural districts who returned themselves as ‘labourers’ and who are tabulated under the head ‘General Labourer’...may be assumed to be agricultural labourers (P.P. 1882, LXXVI, p. 22).’ In seeking to establish how many of those returned as general labourers should be located in the agricultural sector as agricultural labourers we assume that those returned as general labourers living in towns were general labourers and that those returned as general labourers living outside towns should be regarded as agricultural labourers. The proportion of the Irish population living in towns of 2000 or more increased from about 17 per cent in 1851 to about 34 per cent in 1911 (Vaughan and Fitzpatrick, 1978, Tab. 9, p.27); we shall regard this group as the urban population. Of this urban population the population of the towns and cities returned in the census occupation returns, accounts for about 50 per cent in 1851 increasing to about 60 per cent in 1911. Considering the population of these towns and cities, the proportion returned as general labourers ranged from a high of 5.6 per cent in 1851 to a low of 4.7 per cent in 1891 rising to 5.3 per cent in 1911. If the proportion of the population returned as general labourers in this (large) sample of Ireland’s urban population returned in the census is assumed to be the same as that for the total of Ireland’s urban population then an estimate of the numbers of

general labourers in each census year may be derived with the remainder assumed to be agricultural labourers. The resulting revised figures for the share of general labourers in the labour force are graphed in Figs. 2 and 3.¹⁰ The effect is to reduce the share of general labourers in the labour force and to increase the share of agricultural labourers and the agricultural labour force.

Female domestic servants

The remaining problem lies with the number of females returned as domestic servants. Between 1881 and 1891 the number of female domestic servants returned in the census fell from 372 thousand to 199 thousand; the reason given by the 1891 commissioners was that, 'In 1881 there were tabulated under the heading of 'others engaged in service', 139,092 females almost all of whom - being cases of wives and other near relatives of the heads of families returned as 'housekeepers' - have on this occasion been placed in Order 24, the Indefinite and Non-productive class (P.P. 1882, LXXVI, p. 23).' Clearly inclusion of these females would inflate the size of the female work force and this appears to have affected earlier returns. The problem is illustrated in Fig. 3; from around 25 per cent of the active female population in 1851, the proportion of female domestic servants apparently jumped to 39 per cent in 1861 peaking at 58 per cent in 1881 before falling in 1891 to 34 per cent. Fig. 3 suggests that there are three problem years, 1861, 1871 and 1881.

[FIG 3 HERE]

The solution adopted here is to exclude the 139 thousand females returned in 1881 as 'others in service' and to exclude in 1871 some 100 thousand returned as

‘housekeepers’. To obtain an estimate of the true number of female domestic servants in 1861 an average of the ratio of female domestic servants to female population in 1851 and (revised) 1871 was used to generate an estimate of 208 thousand female servants in 1861.¹¹ The revised estimates of numbers of female domestic servants are graphed in Fig. 3.

Primary, Secondary and Tertiary Sector Employment

We have reclassified the aggregate Irish occupation returns following the reclassification of the occupation returns for England, Wales and Scotland employed by Lee to derive an employment series for these three countries based on the twenty-seven industrial orders of the SIC as revised in 1968.¹² Primary, secondary and tertiary employment is derived from this series by reducing the 27 industrial orders of the SIC to the three global sectors: primary (agriculture and mining); industry (manufacturing, construction and utilities); services (transport, distribution, financial, professional and scientific, miscellaneous, public administration and defence, and not classified).

The inclusion of those not classified in the service sector will tend to inflate its numbers by those general labourers and others who were probably engaged in the secondary sector. It is not possible to consider the likely effects on Ireland separately since there are no independent estimates of the Irish labour force and sector employment; however some idea of the likely impact on the sector shares of employment may be gained by comparing the UK employment shares generated by combining the Irish estimates with Lee’s GB estimates (1979), with those reported by Maddison (1991) and by Deane and

Cole (1967). If anything, the sector shares generated by including those not classified in the tertiary sector appear to overestimate the share of the labour force in industry.

[TABLE 5 HERE]

The changing sector allocation of the Irish labour force between 1841 and 1911 is set out in Figs. 4 to 6. It is important to note that Irish population fell in these years from about 8.2 million to about 4.4 million and that what is illustrated in these graphs is the sector shares of the labour force given this fall in population. The shares are set out as the change over time but we might expect them to be related rather to changes in Ireland's stage of development. A common pattern of structural change relates changing sector shares to changes in GDP and to income elasticity of demand for sector output. Dividing the economy into primary, secondary and tertiary sectors low income economies are dominated by primary production, then as income increases demand for manufactured goods increases and resources move into secondary production then as income grows further tertiary production increases in response to increasing demand for professional and leisure activities (Fisher, 1939; Clark, 1940). However there are forces which will alter this pattern of shifts in labour resources. Rising productivity may, for example, limit the increase in labour demand in a given sector.¹³ Similarly comparative advantage will encourage economies to specialise in sectors in which they have an advantage either as a result of resource endowments or acquired skills.

[FIG 4 HERE]

[FIG 5 HERE]

[FIG 6 HERE]

Males dominated the primary sector labour force: they made up 92 per cent of the total in 1841 and the same proportion in 1911. The share of the labour force allocated to the primary sector declined from 54 per cent to 47 per cent between 1841 and 1911. The share of the female labour force in the primary sector remained broadly constant, while the share of the male labour force in the primary sector fell from 74 per cent to 57 per cent.

Females made up about 64 per cent of the secondary sector labour force in 1841; 70 years later this was 38 per cent. The share of the labour force allocated to the secondary sector fell from 31 per cent to 22 per cent. This is entirely due to a decline in the share of the female labour force engaged in the secondary sector from 61 per cent to 35 per cent. The share of the male labour force in the secondary sector increased slightly from 17 per cent to 18 per cent. There were absolute increases in a number of industries: food, drink and tobacco; chemicals; engineering; shipbuilding; vehicles; bricks, pottery etc.; paper, printing etc. Almost all of this fall in the share of the female labour force in the secondary sector is accounted for by the fall in the number of females in textiles.

This decline in female activity in textiles reflects technical and organisational change in the linen industry. Before the invention of the wet-flax process in 1825 almost all flax yarn was spun by hand and cloth woven on handlooms. The manufacture of flax yarn and linen cloth in Ireland was dominated by independent producers: spinners exposing their yarn for sale brought it to the public yarn market, weavers bought their yarn in the market, wove for themselves, then exposed their cloth for sale in the public cloth market after having it sealed and stamped by sealmasters appointed by the Linen

Board. Putting out was carried on at the fine end of the trade, among a small number of manufacturers of damask and cambric, and at the coarse end of the trade where (subsidised) mill-spun yarn was put out in the manufacture of coarse cloth such as ducks, sacking, canvas and sailcloth. Bleaching and finishing of the brown cloth was organised differently. It was carried out in closed establishments owned and run by capitalists with the production process hierarchically controlled and labour rewarded with a contractual wage (Crawford, 1988; Geary, 2005).

The decades after 1825 witnessed significant changes in both the technology and the co-ordination of linen production. The market system of co-ordination based on independent producers selling in public markets was steadily replaced by co-ordination of production by firms. These newly emergent firms adopted the wet flax-spinning process, organising spinning production around a central power source and organising cloth production through putting out of yarn to weavers. Ireland's share of mechanised flax spindles in the UK was 46 per cent by 1850 and by 1890 this was 74 per cent (P.P. 1850, XLII; P.P. 1890, LXVII). This had implications for the capital-labour ratio and hence employment (contractual and non-contractual) in the spinning sector as hand-spun yarn was replaced by mill-spun yarn and in the weaving sector as power weaving replaced the handloom (Geary, 1998; James, 2007, Ch.2).¹⁴

The share of the tertiary sector in the Irish labour force increased from 15 per cent of the labour force to 31 per cent if 'Not Classified' is included or from 14 per cent to 23 per cent if 'Not Classified' is excluded. It is important to distinguish between types of tertiary industry: traditional (perhaps pre-industrial) service activities such as domestic service and other service activities such as Professional and Scientific

Services or Insurance and Banking associated with the modernising sectors of the economy. The share of the labour force in Miscellaneous Services remained static at about 10 per cent indicating increases in the shares of the remaining sectors. In fact Transport, Insurance and banking, Professional and Scientific Services and Public Administration etc. all experienced absolute increases in numbers. Miscellaneous Services declined in numbers from 356 thousand in 1841 to 187 thousand almost all of the fall being in domestic servants and 'others engaged in service'.

The picture generated then by the occupation returns of the Irish census is of an economy undergoing a development transition: modernising albeit slowly. The primary sector was diminishing in importance. By 1911, in the secondary sector, pre-industrial manufacturing organisational forms and technology had disappeared and the labour force employed in a number of secondary industries had increased despite the decline in Ireland's population. In the tertiary sector again pre-industrial service activity was diminishing in share to be replaced by modern-sector service activity. How does this pattern of development fit into the development transition experienced by other European economies?

IV.

Estimates of Irish GDP per head indicate that while Ireland was the poorest of the four countries that made up the United Kingdom (and the poorest region in the United Kingdom) it was by no means the poorest in Europe and the gap in GDP per head between Ireland and Europe's richest region, Great Britain, was closing albeit slowly. Nor did Irish economic growth in the second half of the nineteenth century rely on emigration: somewhere between seventy and eighty per cent of Ireland's labour productivity gain may be accounted for by an upward shift in the aggregate

production function - capital accumulation, structural change and TFP gain, in short (Geary and Stark, 2015; Geary and Stark, [forthcoming]).

GDP estimates suggest that Ireland was undergoing a transition from a low income to a high income economy in the second half of the nineteenth century. The estimates of sector labour force allocation suggest that this transition was accompanied by structural change. How does Ireland's development transition compare with that of other European economies? Crafts (1984), following the work of Chenery and Syrquin (1975), has identified an expected or average path of structural change among European countries during the course of their economic development (as indicated by GDP per head) in the nineteenth century and of course the variation around this expected path in the set of European countries in his dataset. As he points out, in nineteenth century Europe there was more than one path to a higher level of GDP per head: the inter-related structural changes of the development transition and their timing varied across countries. Countries arrived at levels of GDP per head at different times and at these levels exhibited differences in their patterns of resource allocation and sector output conditioned by resource endowments, comparative advantage and economic policy among other constraints.

Allen has suggested that European economies wishing to make this transition adopted a package of policy measures: abolition of internal tariffs and improved transportation; an external tariff to protect infant industries; creation of a banking system to stabilise the currency and as a source of investment finance; investment to improve human capital (Allen, 2009; 2011, pp. 41-2). The completion of the Union between Britain and Ireland between 1800 and 1825 abolished intra-Union barriers to

trade, established a common external tariff, consolidated the British and Irish exchequers, and Ireland adopted sterling as its currency. This offered the Irish economy many of the advantages of Allen's development strategy: access to a large national market, a stable banking system and currency, improved transportation and access to the leader country's technology, but meant that Ireland, the least industrially developed of the UK regions, after the UK unilaterally adopted free trade between the 1840s and the 1860s, was forced to rely on the exploitation of comparative advantage in its transition from low to higher GDP per head: in the secondary sector this was food processing, shipbuilding and engineering and textiles. Allocation of resources to these sectors was combined with change in the tertiary sector, from low-productivity to high-productivity services, to advance Ireland's GDP per head.

Following Crafts (1984), Table 6 sets out the range of country experiences at a level of GDP per head of 500 1970 United States dollars, which he characterises as a level at which development is well under way, and locates Ireland within this framework. The Irish arrived at this level of GDP per head in 1881 which, in terms of timing, locates Ireland about the middle of the pack of countries catching up on Britain. In terms of urbanisation Ireland appears broadly in line with other countries at this level of income with the exception of Great Britain. As regards labour force allocation to the primary sector Ireland is below the average (and by implication above average for labour force allocation to the secondary and tertiary sectors) and below the average for many of the later arrivals at this level of GDP per head. However when the share of the male labour force in agriculture is considered, Ireland is above the European norm and more like some of the later arrivals at the \$550 level. The sector productivity gap – the ratio of non-primary sector labour productivity to primary

sector labour productivity¹⁵ – is above the European norm. Indeed, at 3.5, it is the highest of those countries for which the data allows its calculation. Only Sweden with a productivity gap of 3.1 is similar. This high productivity gap is a result of high labour productivity outside the primary sector combined with low labour productivity in the primary sector. These are numbers that are broadly consistent with the sector wage distribution in Ireland between 1881 and 1911 but perhaps bear further investigation (Begley *et al*, 2014). Finally, considering school enrolment rates, which might be a better predictor of future rather than current performance, at 45 per cent Ireland sits among the lead countries.¹⁶ It is as a region of the United Kingdom that Ireland appears impoverished: when considered against the club of European economies in process of catching up on Britain, Ireland appears a modernising economy.

[TABLE 6 HERE]

V.

The Irish census offers a valuable and under-exploited source of information on occupations in nineteenth century Ireland. Exploitation of the occupation data is not without its problems but it seems clear that reclassifying the occupation returns into a common system of classification across time can shed light on changing resource allocation and Ireland's development transition in the second half of the nineteenth century.

The results of the exercise reported here suggest that Ireland was undergoing a development transition. The transition was not particularly rapid. There were changes

both between the global primary, secondary and tertiary sectors and changes within these sectors. The between-sector change may partially obscure the degree of change within sectors: for example limited growth in the secondary sector obscures the disappearance within the secondary sector of pre-industrial labour-intensive textile production. When Ireland is considered in a European context it is seen to be one of the richer European economies and undergoing a development transition not dissimilar to that of other European economies. It is only when compared to the British economy which, with its early start, as Crafts has long pointed out was not at all typical of the nineteenth century European experience that Ireland appears to be an impoverished and backward economy.

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Tables

Table 1. Occupation Statistics Returned in 1821 Census

Occupation Returns, 1821		
No. of persons chiefly employed in agriculture	No. of persons chiefly employed in trades, manufactures or handicrafts	No. of other persons occupied and not comprised in the two preceding classes
Component occupations	No	
Gender	No	
Areas returned	Ireland, Provinces, Counties, Baronies, Parishes, Cities	

Source: Census of Ireland, 1821 (P.P. 1822, XIV)

Table 2. Occupation Statistics Returned in 1831 Census

Occupation Returns, 1831										
Families chiefly employed in agriculture					Families chiefly employed in trades, manufactures and handicrafts			All other families not comprised in the two preceding classes		
Component occupations					No					
Gender					No					
Areas returned					Ireland, Provinces, Counties, Baronies, Parishes, Cities					
Males 20 years of age										
Agriculture								Male Servants		
Occupiers employing labourers	Occupiers not employing labourers	Labourers employed in agriculture	Employed in manufacture or in making manufacturing machinery	Employed in retail trade or in handicraft as masters or workmen	Capitalists, bankers, professional and other educated men	Labourers employed in labour not agricultural	Other males 20 years of age (except servants)	20 years of age	Under 20 years	Female Servants
Component occupations			No, except in the case of sub-Order, 'Employed in retail trade or in handicraft as masters or workmen' where returns are made of the numbers in some 214 occupations contained in this sub-Order							
Gender			No, except servants							
Areas returned			Ireland, Provinces, Counties, Baronies, Parishes, Cities							

Source: Census of Ireland, 1831 (P.P. 1831, XXXIX).

Table 3. Occupation Statistics Returned in Census, 1841-1861

1841.												
Main Orders (9). Ministering to:												
Food	Clothing	Lodging, Furniture, Machinery etc.		Health	Charity	Justice	Education		Religion		unclassified	
Component occupations				Yes, 450 occupations returned								
Gender				Yes								
Age				Yes, 15 years old and upwards, under 15 years of age								
Areas returned				Ireland, provinces, counties, cities								
1851.												
Main Orders: As for 1841												
Component occupations				Yes, 600 occupations returned								
Gender				Yes								
Age				Yes, 15 years old and upwards, under 15 years of age								
Areas returned				Ireland, provinces, counties, cities								
1861.												
Main Orders (13, with further 13 sub-Orders in Food, Clothing and Lodging etc.). Ministering to:												
Food	Clothing	Lodging, furniture and machinery	Conveyance and travelling	Banking and agency	Literature and education	Religion	Charity and Benevolence	Health	Justice and government	Amusement	Science and art	Unclassified
Component occupations				Yes, 900 occupations returned								
Gender				Yes								
Age				No								
Areas returned				Ireland, provinces, counties, cities								

Source: Census of Ireland, 1841 (P.P. 1843, XXIV); Census of Ireland, 1851 (P.P. 1856, XXXI); Census of Ireland, 1861 (P.P. 1863, LXI).

Table 4. Occupation Statistics Returned in Census, 1871-1911

1871.	
Classes (6); Orders (18); Sub-Orders (80)	
Component occupations	Yes, 800 occupations returned
Gender	Yes
Age	Yes, Under 10, five-year intervals 10 to 25, 10-year intervals 25 to 75, aged 75 and over.
Religious Persuasion	Yes, Roman Catholic, Protestant Episcopalian, Presbyterian, Methodist, All other Persuasions.
Education	Yes, Read and write, Read only, Neither
Areas returned	Ireland, provinces, counties, cities
1881.	
Classes (6); Orders (24); Sub-Orders (80)	
Component occupations	Yes, 700 occupations returned
Gender	Yes
Age	Yes, Under 15, five-year intervals 15 to 25, 20-year intervals 25 to 65, aged 65 and over.
Religious Persuasion, Education	As for 1871
Areas returned	Ireland, provinces, counties, cities
1891. As for 1881 (number of occupations returned, 600)	
1901. As for 1881 (number of occupations returned, 700)	
1911. As for 1881 (number of occupations returned, 1000)	

Source: Census of Ireland, 1871 (P.P. 1876, LXXXI); Census of Ireland, 1881 (P.P. 1882, LXXVI); Census of Ireland, 1891 (P.P. 1892, XC)
Census of Ireland, 1901 (P.P. 1902, CXXIX); Census of Ireland, 1911 (P.P. 1912–13, CXV)

Table 5. Sector Shares of UK labour force

		Agriculture	Industry	Services.
Maddison	1870	22.7	42.3	35.0
Begley <i>et al</i>	1871	20.8	43.7	35.6
Deane and Cole	1881	16.6	39.5	43.9
Begley <i>et al</i>	1881	17.9	44.6	37.5
Deane and Cole	1911	11.4	42.1	46.5
Begley <i>et al</i>	1911	11.3	49.3	39.4

Source: Maddison, 'Dynamic Forces', Tab. C5, p. 248-9; Deane and Cole, 'British Economic Growth', Tab. 33, p. 147 and see text.

Table 6. Nineteenth Century European Economies at 1970 \$550

	Great Britain				Netherlands		France		Austria	Sweden	Norway	Hungary	Finland	Portugal	Italy	Spain
	\$550	1881	1840	1850	1860	1870	1870	1870	1880	1900	1890	1900	1910	1910	1910	1910
Crude Birth Rate	34	24.5	35.9	30	31.6	30.3	38.5	25.9	37.5	27	30.4	40.7	31.7	31.7	33.3	32.7
Crude Death Rate	23.7	17.5	22.3	21.2	24.8	19	27.4	28.4	29.7	16.8	18	32.5	17.4	19.2	19.9	23.1
Urbanization	30.5	24.1	48.3	na	na	25.2	36.1	31.1	na	21.5	23.7	na	na	na	na	na
% Lab Force in Primary Sector	54.6	50.2	25	48.9	37.4	47.8	50	49.3	55.6	53.5	49.6	64	69.2	57.4	55.4	56.3
% Male Lab Force in Agriculture	55.9	63.5	28.6	51.4	41.3	48.2	na	50.6	57.6	53.1	56	69.3	69	61	54.2	59.6
% Male Lab Force in Industry	24.6	17.2	47.3	34.4	30.1	22.5	na	28.7	26.3	24.9	24	15.4	12.5	21.7	26.5	13.3
% Income in Primary Sector	38	22.2	24.9	27	na	49	39.9	33.5	na	27.2	27.2	na	47	na	38.2	na
% Income in Industry	24.8	21.1	31.5	24	na	20	29.7	36	na	30.1	22.5	na	25.3	na	23.9	na
School Enrolment Ratio	26.2	45	na	38.5	40.6	na	na	47.6	37.4	48.6	43.5	37.7	21.2	na	32.6	36.6

Sources: Ireland, Rows 1-3 Vaughan and Fitzpatrick, 'Irish Historical Statistics'; rows 2-6 authors' calculations; row 7 O'Rourke and Williamson, 'Around the European periphery', pp.153-190. All other, Crafts, 'British Economic growth', ch. 3.

Figures

Fig. 1. Agricultural Labourers and General Labourers as percentage of Labour force, 1851 – 1911.

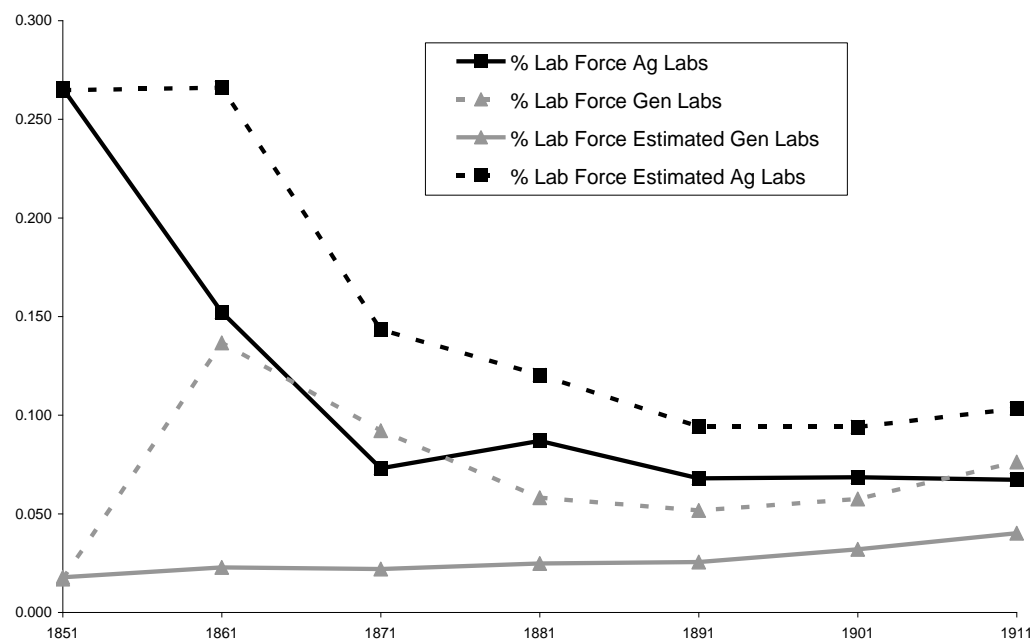


Fig. 2. Agricultural Labourers, Farm Servants and Relatives and General Labourers as percentage of Labour force, 1851 – 1911

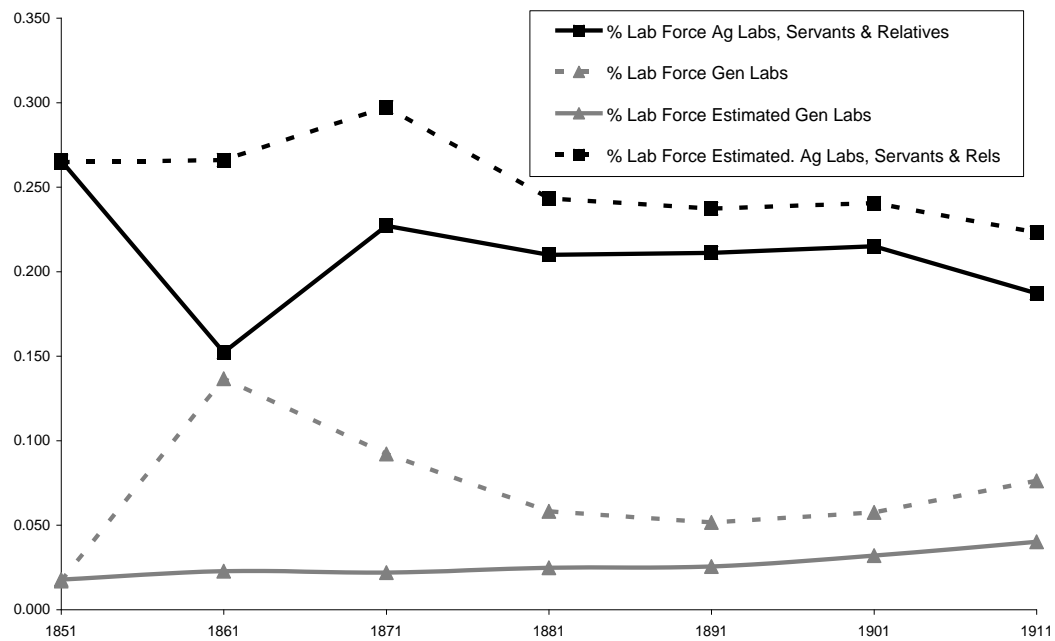


Fig. 3. Number of female domestic servants returned and estimated, 1841 – 1911

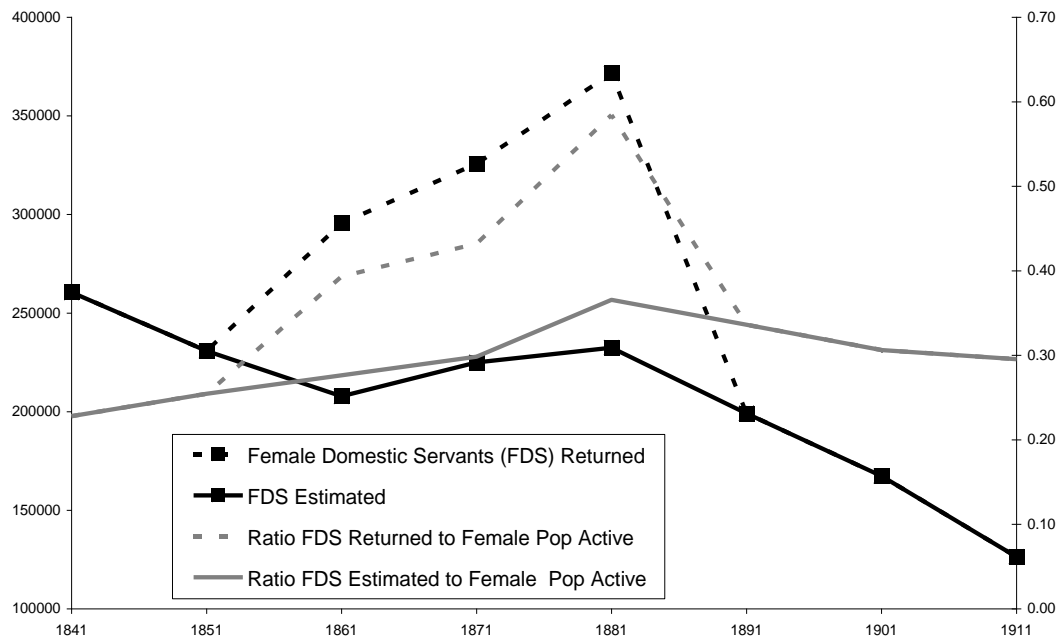


Fig. 4. Male Labour Force allocation, 1841 -1911

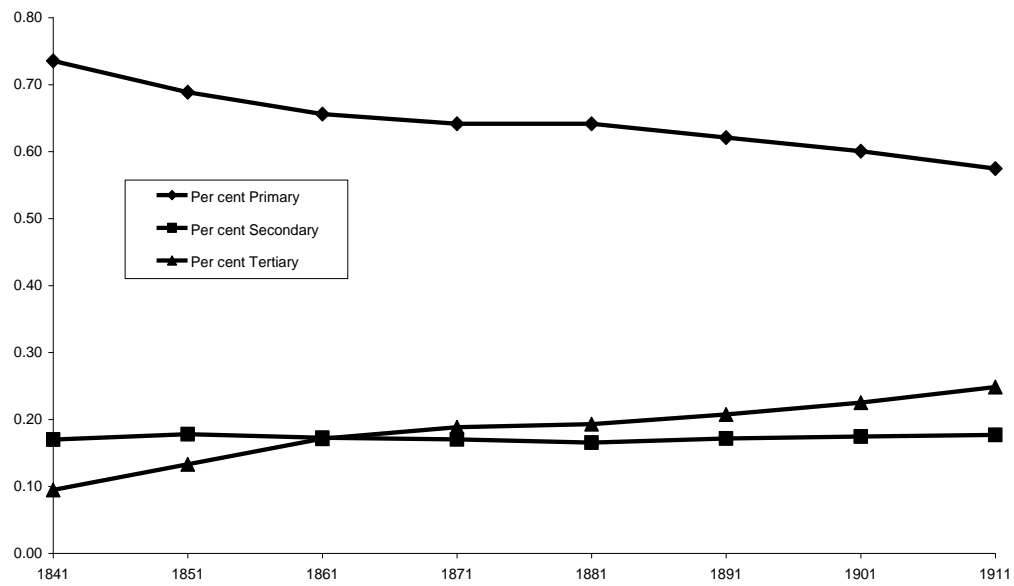


Fig. 5. Female Labour Force Allocation 1841-1911

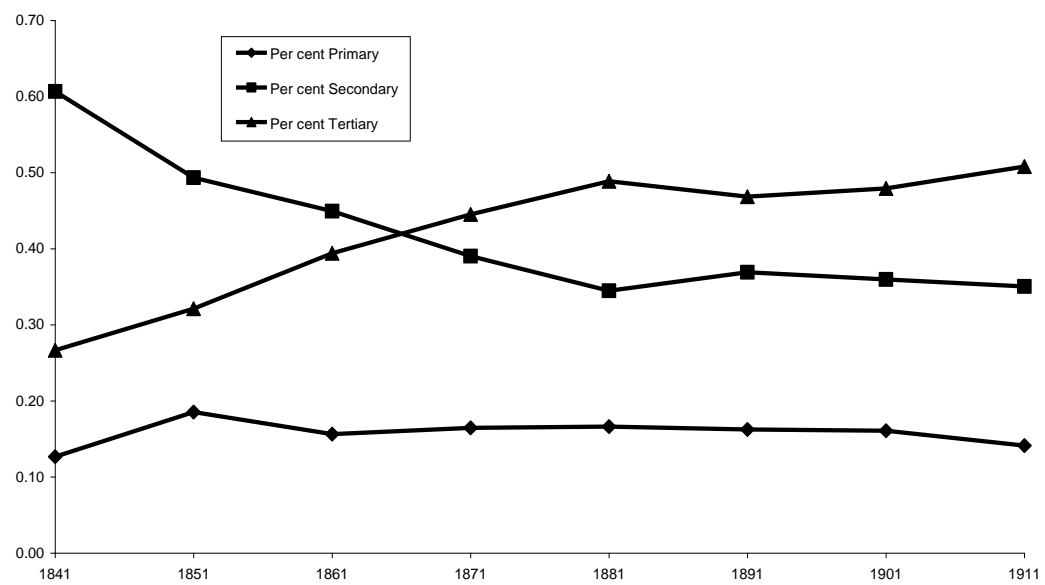
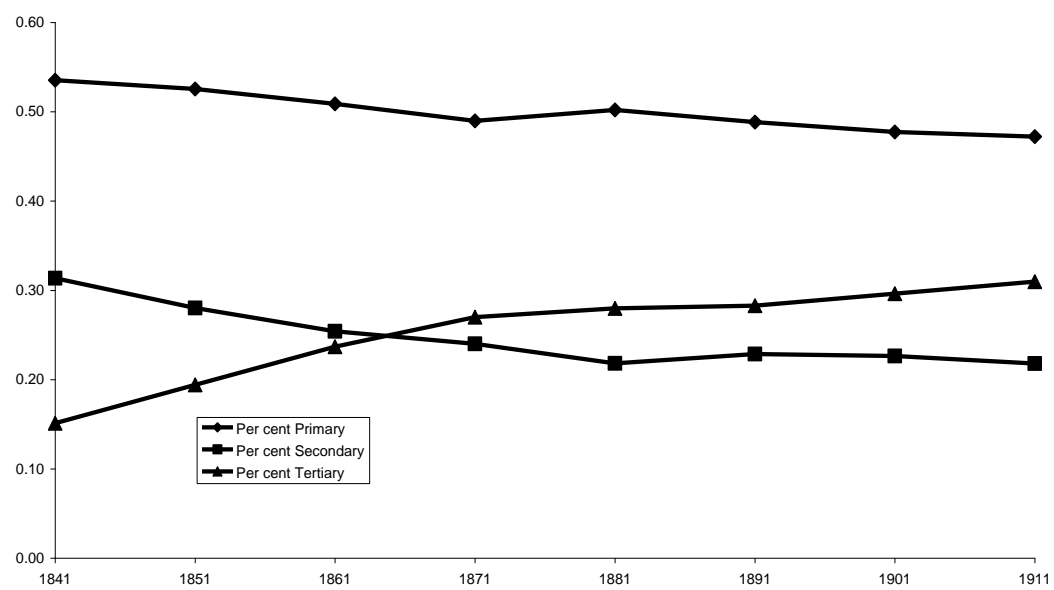


Fig. 6. Total Labour Force Allocation, 1841 - 1911



Footnotes

1. "... its large foreign trade, its export-oriented industries, its highly developed infrastructure of banking, commerce and railways, and its foreign investment yielding a sizable income made Ireland comparable in some respects to a handful of highly developed nations."
2. For England, Wales and Scotland up to and including 1851 the census area was Great Britain. From 1861 there have been separate censuses for England and Wales and for Scotland.
3. In the appendix to the *Abstract of Answers and Returns* (P.P. 1824, XXII) there is a list of occupations returned by the enumerators from which the main orders were calculated. There are no returns of the number returned in these occupations.
4. Under 10, five-year intervals 10 to 25, 10-year intervals 25 to 75, aged 75 and over.
5. Roman Catholic, Protestant Episcopalian, Presbyterian, Methodist, All other Persuasions.
6. Read and write, Read only, Neither
7. Under 15, five-year intervals 15 to 25, 20-year intervals 25 to 65, aged 65 and over.
8. See P.P. 1876, LXXXI, Tab. 20, p. 242. This tables is available only at the aggregate level so, even after removal of those females returned as following their husband's occupation, all county returns are out by each county's share of the 86 thousand females wrongly located in Class II as 'wife of other specified occupation'.
9. See P.P. 1876, LXXXI, Tab. 24, p. 299. Once again this table is only available at the aggregate level so the problem of allocating these 'wives of specified occupation' at county level remains.
10. We have a simple check on the reliability of the estimated figure for general labourers. The one year in which we have a return which differentiates between agricultural and non-agricultural labourers is 1851. The return of 'labourers (not agricultural)' for 1851 was 59 thousand; the estimate for 1851 is 62 thousand. The error arising from wrongly assuming that all labourers were agricultural (which we would do in subsequent years if all general labourers were regarded as agricultural labourers) would be to overestimate those in agriculture by 59 thousand; the error arising from using the estimate for General Labourers of 62 thousand is to underestimate the number of agricultural labourers by 3 thousand. A third possibility would be to treat only those general labourers returned in towns and cities as 'general labourers'; in 1851 there were 31 thousand general labourers returned in the towns and cities covered by the census so this procedure would lead to an overestimate of the agricultural labour force in that year of about 28 thousand.
11. The average of the share of female domestic servants in 1851 and 1871 in the active female population is 28%. If we assume that this was the proportion of the female population active as domestic servants in 1861 then the number of domestic servants in 1861 was 208 thousand. The number returned in the census was 296 thousand so that 88 thousand have been excluded on the grounds that they were wives and other near relatives of the heads of families who were classified as domestic servants.
12. Lee, 1979. With the issues outlined above resolved, for the most part this is a fairly straightforward task; Lee has provided a list of the component occupations which make up the industries of his series and this may be supplemented by the appendix to volume ten

of the 1911 census of England and Wales which provides a classified list of occupations showing the order and sub-order in which each is to be located.

13. By definition, output (O) in any sector is employment (L) times output per worker (O/L) that is $O = L \times (O/L)$. Employment in any sector is $L = O/(O/L)$. Growth of employment in any sector is $\Delta L/L = \Delta O/O - \Delta(O/L)/(O/L)$. Change in employment in any sector is made up of change in effective demand for that sectors' output less the loss of jobs caused by labour productivity growth.
14. This was not an overnight event it took a couple of decades at least in the case of flax spinning and a little longer in the case of weaving.
15. $[(100 - \% \text{ income in primary sector}) / (100 - \% \text{ labour force in primary sector})] / [(\% \text{ income in primary sector}) / (\% \text{ labour force in primary sector})]$
16. Again this, together with Ireland's relatively high non-primary sector labour productivity, is broadly consistent with the recent findings of Blum *et al.* (2017) that "Ireland probably graduated to Europe's club of advanced economies thanks in part to rapid advances in female human capital."