

Population Trends in Seventeenth-Century Ireland

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POPULATION estimates, while often arbitrary, merit close attention. While the estimates, often amounting to mere guess-work, reflect belief in what was happening in economic society, once formed they are frequently employed to give hard edges to economic and social phenomena described by historians. They are by no means independent data which may corroborate conclusions arrived at from other sources.

Suggestions of a rapid growth of population are either implicit or explicit in all accounts of seventeenth-century Ireland. Where population figures for 1600 have been suggested, a figure of about half a million has been mentioned.¹ This, however, would imply a four-fold increase between 1600 and 1687 and an almost six-fold increase between 1600 and 1712. The rate of increase is all the greater if the demographic disaster of the early 1650s is allowed for.

The combination of rapid growth of population with intervening demographic disaster was related to the model of economic development made explicit by O'Brien [5] of succeeding phases of cataclysmic destruction and spontaneous and

1. Professor Beckett, for instance, states that the population in 1603 "cannot greatly have exceeded half" the figure of 1.1 million suggested by Petty for 1672 [1, p. 25]. Froude [2, p. 33] indicated a figure of half a million, a figure based apparently on a 1580 estimate of that magnitude [2, p. 78]. See also [3, p. 318] where A. Trollope states that Ireland had "not halfe a quarter of the number of those which England contynewally mayntayneth". I am indebted to Mr K. W. Nicholls for drawing my attention to this letter, of which a copy in the Irish Public Record Office would seem to be Froude's source. H. Wood [4, p. 224] indicated that Fines Moryson estimated the population at 700,000 at the end of the Elizabethan Wars but I have been unable to trace the statement. Professor Perceval-Maxwell has suggested a population of 25,000 to 30,000 for Ulster in 1600 [4A, p. 17], but such a figure would seem to be a very substantial underestimate. His book, however, provides the best account to date of data available for the Scottish population in Ulster in the first quarter of the century.

rapid recovery. The model, and its cataclysmic aspects, is not very plausible to the modern historian. Its demographic dimension is not well-founded, and as early as 1672 Sir William Petty [6, pp. 150-1] made a point of correcting or modifying, in the light of his own demographic calculations, contemporary estimates of the magnitude of population losses in the early 1650s. Referring to the native population, he wrote: "Wherefore those who say, that not one-eighth of them remained at the end of the wars must also review their opinions, there being by this computation near two-thirds of them." Prendergast, in his influential *Cromwellian Settlement of Ireland* [7, p. 307], on slender evidence, believed that five-sixths of the population had perished. His case [7, p. 139] rested on a few graphic but impressionistic comments and on a statement by Gookin in 1655 that scarce one-sixth of the population survived. In no respect is knowledge more tentative than in the demographic field. The basic data—registers of births and deaths and fiscal returns—do not exist,² although their absence does not exclude the formulation of some diffident assessments. But given the tentative character of demographic conclusions, even for the better-documented English context, there is little prospect of progressing beyond informed guesswork as to actual population numbers. But the collection and analysis of wage, price and rent data and study of the progress of settlement should, in the long run, provide some evidence from which trends may be inferred with more confidence than would attach to conjectures of actual population figures.

All that is at present certain is that population recovered in and after the 1650s. The earliest data for the population of Ireland are those given by Petty for 1672, 1676 and 1687. The next figures are for 1706 and 1712.³ Petty's estimates are 1.1 million inhabitants in 1672, 1.2 million in 1676 and 1.3 million in 1687; the estimates for 1706 and 1712 yield figures of 1.6 million and 2.1 million respectively. All these estimates are based on hearth-money returns; they are also dependent on assumptions about average household size. Petty's population figures in one respect tend to understate the population rise between 1672 and 1687 because he adjusted his average household figure downwards.⁴ The 1706 estimate is unsatisfactory for several reasons. Not only is the household multiplier low, but the total number of houses (308,124) is unduly so. The total number of houses in 1712 was actually 349,849, suggesting a sharper increase than the rise in the gross cash produce of the tax between 1706 and 1712. It seems likely that there was some significant omission in the figures used for 1706. Moreover, the likelihood of progressively greater administrative efficiency in subsequent years as a result of

2. Petty noted that parish registers were not kept in Ireland, but that of late they had begun in Dublin, though imperfectly kept [6, p. 210]. The Society of Friends has various registers of burials, marriages and births (see O. C. Goodbody [8]), the earliest from 1641, and it is possible that examination of them may furnish some pointers. On seventeenth-century attempts to institute registration, see H. Wood [4, pp. 219-220].

3. For all the estimates except that of 1706, see Connell [9, pp. 4-5]; for the 1706 estimate [10, p. 73].

4. An average of 5.5 persons in 1672; 5 in single-chimney houses—the vast majority of houses—and 6 in households with more than one chimney in 1687 [Connell, 9, p. 22].

the switch from farming to direct collection between 1705 and 1706 is borne out in the pronounced upward trend against a background of economic difficulties as compared with the more erratic performance of the figures between 1700 and 1705.⁵ Moreover, a rise of 0.5 million is inconceivable between 1706 and 1712, and the 1712 figure consistent with several subsequent aggregates in the 1710s and 1720s based on the hearth-money seems the more reliable of the two. Connell [9] in his classic analysis of Irish population data—which underlines all subsequent study—has revised the 1687 and 1712 estimates, to allow for the extensive evasion of the tax. His adjusted figures are 2.2 million for 1687 and 2.8 for 1712. The adjusted figure for 1712 seems plausible because it results in association with later figures and early nineteenth-century census data in a pattern of population growth consistent with contemporary European experience. Between 1687 and 1712, on the other hand, Irish population on the basis of these figures increased by 0.6 million or 27 per cent. While this increase relates to a period of twenty-five years, it seems unlikely that there was any net increase in Irish population between 1687 and 1695. There was successively extensive migration of Protestants and Catholics between 1687 and 1691, and it is not likely that the inflow of Protestants between 1691 and 1695 made good earlier losses. Moreover, there is no evidence of substantial immigration after 1700. Indeed, from the outset of the new century, the minds of Presbyterians in Ireland were already beginning to turn to the New World.⁶ Any net increase within the period as a whole would therefore have taken place not only in the seventeen years from 1695 to 1712, but predominantly in 1695–1700 when all the economic indices were more favourable than from 1701. Admittedly, immigration to Ireland in the 1690s was sizeable—contemporary estimates of the Scottish exodus to Ireland confirm this—but even allowing for this immigration and for more benign agricultural and weather conditions in Ireland than in other parts of Europe at this time, the population increase seems sharp.

It is possible that the population figure for 1687 understates the population at that date. This possibility is to some extent borne out in the relatively modest rise in the gross cash return from the hearth-money from £33,087 in 1685 [10, p. 73] to £40,366 in 1711–13,⁷ an increase of 22 per cent. The direct comparability of the hearth-tax for the two periods could, of course, be challenged. The figure for 1685 relates to a farmed tax, and could be a net return. However, it seems certain to be intended to be inclusive of management or collection costs. The near certainty of this can be seen in the fact that the 1685 return is larger or much larger, depending on the year, than the return for the hearth-money tax in the years 1695–1705 inclusive, which are clearly net yields of the farm. The figures for 1711–13 are gross returns of the collection, now no longer farmed, without

5. For the relevant data for this paragraph, see [9, p. 22] [10, p. 73] and hearth-money returns in the exchequer accounts in the *Journals of the House of Commons* [11].

6. See A. Lockhart [12, pp. 36, 39]. Harrison [13, p. 87] thinks that immigration ceased from the end of the century.

7. See details of hearth-money collection and, where it arises, discharge in accounts in [11].

deduction of charges. Comparison between the hearth-money produce in 1685 and 1712 is too speculative to warrant definite conclusions. The farthest we can go is to recognise that the data at first sight reveal a rise in the produce, and that the rate of increase in produce for what it is worth falls short of the rate of increase in population as adjusted by Connell. The likelihood of a limited increase in population is borne out in the modest increase in consumption of tobacco, already a staple, by 16 per cent from an average of 2,846,378 lb in 1683-86 to 3,302,884 in 1698-1701.⁸ There was no further increase in consumption by 1712, a persuasive but by no means conclusive evidence suggesting that there was little, if any, rise in population after the beginning of the century. This would throw the whole weight of responsibility for the increase on to a single decade, the 1690s.

Connell does not give an adjusted population figure for 1672, but on the basis of his adjustment principles, the revised figure for 1672 would amount to 1,693,334. Orrery's [16, p. 95] figure of 600,000 men fit to bear arms in 1666 would tend to corroborate this level of estimate. Petty's unrevised figures for 1672 and 1687, because, of his downward adjustment of the household multiplier between the two dates, understated the rise in population. The adjusted figures for the two years give an increase of 29 per cent. This figure is consistent with a rise in the cash produce of the hearth-money farm from £25,462 in 1672 to £33,087 in 1685 [10, p. 73] or 30 per cent. This is a sharp increase in population; it is difficult to conceive such a rate of natural increase in these years, and even allowance for substantial immigration does not make it more plausible. The likelihood is that revision within the period of the defective hearth-money collection inflated the apparent increase in population. Petty [17, pp. 496-8], discussing the city of Dublin, thought that "frauds and defects" existed in the former accounts, and that comparisons based on the hearth-money returns of 1671 and 1682 overstated the growth of the city.

It is not possible to develop the argument further without consideration of immigration. The size of the immigrant community has tended to be exaggerated by acceptance of the alarmist estimates made at the time, and repeated subsequently, of the numbers massacred in Ulster in the outbreak of rebellion in October 1641. If 100,000, 200,000 or 300,000 were massacred or expelled in the early 1640s clearly the community, on the eve of the rebellion, would have been enormous. Later accounts greatly diminished the numbers massacred: Lecky [18, p. 79] accepted evidence that the number of deaths from all causes was 12,000. But even he [18, pp. 58, 74] seems to have exaggerated the size of the Scottish community in the north: estimating the number of Protestants in the island at 200,000, he thought there were 100,000 Scots and 20,000 English in the north in 1640. Harrison [13, pp. 49-50, 60], in his study of the Scots in Ulster, suggested an immigration of 30,000 to 40,000 in ten years after 1608, and cites Brereton as stating in 1635 that 10,000 had migrated through Ayrshire to Ireland in the preceding two years. Harrison [13, p. 69] stresses that North Down, South

8. Statistics of tobacco imports from B.M., ADD. Ms. 4759 [14]; P.R.O. Customs 15 [15].

Antrim, and the areas of counties Donegal and Derry adjoining the Foyle were more thickly peopled with immigrants than natives. If Lecky's and Harrison's accounts are to be accepted, clearly the immigration would have been very large. These interpretations are not borne out by what evidence there is. Graham [19, p. 143] on South-west Donegal, Hunter [20, pp. 54-5, 78] on town development in Ulster, and Clarke [21] on the economy stress in contrast to earlier accounts how thinly peopled with immigrants the new society was. The Pynnar report [see Harrison, 13, pp. 49-50] in the Carew papers speaks of only 8,000 men of British birth and descent available for defence in the Plantation counties, and Wentworth [13, p. 62] in the 1630s refers to a mere 13,092 British men aged between 16 and 60 in Ulster. Such a figure would be consistent with a population of not above 40,000 British in the north. The small numbers are borne out also in the fact that while Petty [6, p. 141] estimated the number of Scots at 100,000 in 1672, his estimate [6, p. 149] of the immigration of new Scots is actually 80,000. In a crude sense this suggests that apart from the immigration in the 1650s and later, there were only 20,000 survivors of both Scots birth and descent in Ireland in 1652. Moreover, despite immigration in the 1650s, the poll-tax returns for 1660 show that for every one of the seven Ulster counties for which returns survive (all except Tyrone and Cavan), the English and Scots were in a minority.⁹ This situation in particular makes doubtful the proposition maintained by Harrison, for instance, that a generation earlier immigrants were in a majority even at regional level within the counties. Outside Antrim, Down and Derry the English and Scots in 1660 were, if we rely on the poll-tax, a third or less of the population. The situation could hardly have been thus if the immigration were large and sustained. As for the rest of the island, the migration was, judging by the proportion of English to Irish, smaller than in Ulster. County Cork—or more accurately the areas of Cork for which the returns survive—had a larger proportion of English than any other county outside Ulster apart from King's County/Queen's County, Carlow/Wexford, which had comparable proportions, and from County Dublin, thus illustrating a significant contrast between Cork and other southern counties. With no date or incomplete data for seven counties the total number of British paying poll-tax was 61,062 (7 Ulster counties: 25,509; the rest: 35,553). If one assumes a multiplier of three to equate poll-tax with population,¹⁰ the return would be the equivalent of 183,186 (7 Ulster counties: 76,527; the rest: 106,659). The term English or Scots in the context implies nationality by descent as well as by birth so that the figures should, if anything, tend to

9. Prof. Pender [22] regards the returns as an early census but other opinions and the returns themselves favour the view that the returns are those of the poll-tax.

10. The returns (counties Cavan, Tyrone, Wicklow, Mayo and Galway missing, Meath and Cork incomplete) give a total of 353,825 persons. This has been regarded as the crude equivalent of 500,000 if the returns were complete for the whole country (Hardinge, quoted [22, p. ix]). If one accepts, as is argued in this paper, that the population in 1672 was of the order of 1.7 million, this suggests in rough terms a multiplier of three. Comparison of estimates of town population with the poll-tax returns suggests a rather erratic level of multiplier, usually falling somewhat either side of two.

overstate immigration. For what they are worth, the available figures suggest that immigration had been small.

An estimate of a Scottish population of 40,000 in Ulster in the 1630s and the Petty-based figure of 20,000 in the island in the early 1650s can be associated with a Scottish population of 76,527 in seven Ulster counties (including those of major immigration) in 1660. For what they are worth the estimates are consonant with not only a recovery but a sharp rise in the Scottish population in the 1650s. The backward state of Ulster, the main centre of attraction for immigrants, in 1640 with rents and the price of land lower than in the other provinces seems to confirm that immigration at that stage had been too slight to alter things. Immigration in the 1650s must be regarded as unprecedented in scale, and more sustained than in the past. The numbers entering the country were no doubt swollen by people returning who had left in the 1640s (or as far back as 1637). But Petty's figure of 80,000 new Scots between the early 1650s and 1672 must represent something quite novel. Immigration to parts of Ireland outside Ulster, while on a much smaller scale, may also have been novel in character. The poll tax returns for 1660 which would still probably reflect the pattern of settlement created by pre-1641 immigration show, for instance, for Cork that English settlement was in the main strong only in or near towns. The pattern of Quaker settlement in the 1650s and 1660s with communities springing up in rural areas remote from established towns suggests not only a novel motivation for immigrants, but a novel organisation because it was not landlord-induced, and possibly a novel composition in social class and geographical origin. A greater proportion of immigrants may have been, as in the case of dissenters in the north, farmers both willing and financially able to set up away from towns and official sponsorship.

Fairly large though immigration may have been between 1652 and 1672 it is likely that one should not exaggerate its extent or overestimate its continuity. While Quakers and the families or social categories who became Quakers were evident in many areas from the 1650s, none of the communities seem to have been organised sufficiently for permanent records to survive until the end of the 1660s. However, the fact that permanent or continuous records of Quaker communities come into existence from the end of the 1660s¹¹ suggests that Quaker immigration had been continuous not only through the 1650s but more significantly, because Scots immigration faltered at that time, held its own relatively well through the 1660s. The crude figure of 40,000 Scots in Ulster in the 1630s or Petty's 1672 estimate of 20,000 "old" Scots apart from "new" or immigrant Scots when related to the poll-tax based estimate of 75,627 in seven Ulster counties in 1660 suggests a sharp rise in immigration in the 1650s. The 1660 figure compared with the estimate of 100,000 Scots, born and immigrant in Ireland in 1672, however, corroborates qualitative deduction from other sources that Scottish immigration fell off temporarily in the 1660s. In the case of the

11. See also A. C. Myers [23, p. 27], where it is stated that numbers had increased sufficiently to make organisation necessary only by 1668.

largest stream of emigrants, the Scots, mainly going to Ulster, the cumulative inflow had been too small to transform Ulster in the 1660s from a very backward province. In the six years ended 25 December 1669 no Ulster port was in the first seven ports in Ireland.¹² By contrast Galway in Connaught was still the third port.

The fact that immigration at large was comparatively small is illustrated [Cullen, 25, p. 10] also by the fact that economic recovery was long-drawn out in the 1650s and that revenue reached pre-1641 levels only in the early 1660s. By contrast in the 1690s revenue recovered very rapidly. The fact that revenue recovered slowly in the 1650s while reflecting the acute demographic crisis of the decade suggests that immigrants were limited in number because, in default of data for manpower, immigration can, to an extent, be reflected in the scale of the inflow of capital. Immigrants required some capital to set up and many of them were skilled artisans or farmers such as Thomas Crichtoune in 1661, "one of their most considerable tenants, intending to remove to Ireland" [26]. On the analogy with the 1690s, immigration if large, should have swelled imports, the main source of revenue. Imports in 1691 were of record proportions and they remained at a high level in subsequent years; they were manifestly not in the 1650s, even allowing for the fact that the duty-free admission of some goods in the earlier period heightened the contrast. The equation of wealth and immigration comes out again in the great influx of Scots in the 1690s, when hostile commentators dwelt not only on their number but their position in trade and the professions. The economic stagnation in the 1660s, measured by the revenue, would, if one accepts some direct relationship between economic growth and investment and immigrant capital, corroborate the evidence for a fall-off in immigration during that decade. Economic stagnation in reflecting poor economic prospects, also weakened the "pull" factor on potential immigration. By contrast, in the 1650s with religious tolerance, with population at a reduced level, wages high and rents abnormally low, there was a positive inducement to immigration. A higher population in the 1660s, higher rents and more static wages combined with falling agricultural prices reflected a dramatic reversal of the attractive conditions which Ireland held out to the immigrant, and cannot but have had an effect on immigration in the 1660s. Again, the religious tolerance of the 1650s broke down in 1660. Of 68 Presbyterian ministers (all save one in Ulster) in 1660, 61 left their churches, only 7 conformed [Harrison, 13, p. 83]. As ministers were a vital link between the Scottish communities in Ireland and Scotland, the consequent disruption in the normal chain of communications added to the forces militating against immigration.

The Irish economic situation worsened sharply in the early 1670s and reached its nadir in the war years from 1672 to 1674. It is extremely difficult to postulate any significant immigration between 1670 and 1674. However, in the post-war years from 1674 to 1680 Irish economic recovery was remarkably rapid and, with

12. B. M. Harl. MS. 4706, f. 8 [24]. Derry was equal seventh in 1668.

the exception of the 1650s, this seems to have been the only sustained period of economic growth between 1652 and 1689 [Cullen, 27]. The building of country houses and the creation of estate villages was often associated with some immigration. However, it is not easy at first sight to identify waves in this immigration. Moreover, this landlord-induced immigration, evident both before and after the 1670s, must have been predominantly Anglican. While this may have tended to reduce fluctuations, it serves to highlight its somewhat exceptional character and its quantitative insignificance compared with unsponsored immigration by the Scots especially. In particular the "pull" effect of the Irish economy on the Scots must have been considerable, if there was concurrently a "push" force on the Scottish side. Famine in Scotland in 1673 and 1674 [Smout, 28, p. 144] would have been one "push" factor likely to lead to an abnormal number of migrants to Ireland in 1674 and 1675. Dramatic events like famine apart altogether, there may have been some continuing difficulty in Scottish agriculture likely to encourage the farmer to contemplate movement to a more agreeable milieu, as the effort to exclude Irish victual, a fluctuating concern of Privy Council policy, [26, Vol. V, 1676-8, pp. xxiii-xxiv] was more determined in 1676-78 than in any previous period. Improving conditions in Ireland and economic problems in Scotland contributed to a substantial migration across the northern channel to Ireland. A return to greater tolerance of dissenters in the 1670s was also a relevant factor. In March 1678 the Privy Council was informed that "of late sundry tenants and other persons of mean quality have gone over from this kingdom to Ireland and that many others upon divers pretences are resolved to go thither, which, if not prevented, may tend to the great prejudice of heretours and others in some places of this kingdom who are thereby lyke to be left destitute of tenants and servants for labouring their lands". The Privy Council enacted that ships should not take tenants, cottars or servants to Ireland without a pass from a privy councillor or from three justices of the peace in their last place of residence [26, Vol. V, p. 397]. The effect of this influx may be reflected in the obvious economic improvement of Ulster evident even as early as 1681-82 compared with the 1660s. In the year 1681-82 Belfast, in the 1660s equal eighth port, had become fourth port [29]. On the other hand, Derry, long the strongest point of British settlement in Ulster, did not improve in relative importance. The contrast emphasises that immigration from the 1660s was concentrated on the hinterland of Belfast. However, the migration is also likely to have been concentrated in time rather than continuous. Between 1672 and 1682 the rise in hearth-money proceeds was unequal among the Ulster counties, only Donegal, Tyrone and Cavan rising very sharply; between 1682 and 1685 all the counties of Ulster lost impetus, with the exception of Armagh. While the hearth-money returns are suspect, more effective collection from the 1670s should have resulted in a more buoyant revenue, or at least in greater inter-county consistency, if immigration to the north was general or sustained in this period. On the Scottish side, the Privy Council showed no concern with emigration apart from vestigially in October, 1684 [26, Vol. X, 1684-5, pp. 610-11].

The really large influx is almost certainly confined to the 1690s. Low Irish rents were part of the attraction and contributed to an upturn in migration as soon as peace had been restored in Ulster. The presence of Scots-Irish refugees in Scotland who finally returned in 1690-91 may have helped to promote the emigration of other Scots or to advertise the attractions of a liberated Ulster. The passes for migrants to Ireland were again in the news, and the Privy Council of Scotland, having issued a proclamation against those "who run away from their landlords without giving satisfaction", prohibited vessels to transport yeomen without a pass, and sought the co-operation of the Irish authorities in December 1691 because "many procure boats from Ireland to transport them and their goods thither without passes, and are receaved to duell and take land there . . .". [26, Vol. xvi, pp. 651-2]. This influx became a swollen one with the bad Scottish harvest seasons between 1695 and 1698. One account in 1697 estimated that 30,000 had come to Ireland between the Revolution and 1696, and a further 20,000 following the bad harvest in 1696.¹³ A pamphleteer [32] in 1698 estimated that 80,000 Scots had come to Ireland since the Battle of the Boyne [32], an estimate that has been repeated in some modern accounts [see Dunaway, 33, p. 25]. Alarm at the Scottish influx was evident in Irish writing and opinion in 1698. All this was ahead of the disastrous failure in the autumn of 1698, which must have added enormously to the influx, and the belief may be hazarded that a record number arrived in 1699. One later opinion [Harrison, 13, p. 91] was that 50,000 families had arrived between the Revolution and 1715. This is probably an exaggeration, but there is no doubt that the influx was large. It was all the greater because Scotland in the 1690s was comparatively populous. The influx in the 1650s would have been limited by the fact that the population loss during the epidemic diseases in the 1640s and early 1650s was second only to that of the famine years at the close of the century [Smout, 28, pp. 152-3]. What makes the Scottish immigration in the 1690s exceptional is not that it had been large in some years but that an immigration in the early 1690s, which would have quickly lost impetus as on previous occasions, was boosted by a further and concentrated influx following the bad seasons of 1695-98 with no follow through into subsequent years. The general belief is that there was no Scottish immigration after 1700. It is highly unlikely, given the rent inflation between 1698 and 1701, and the acute economic difficulties of the next ten years, that Ireland, in the absence, moreover, of a repetition of disastrous harvests in Scotland, could have acted as a magnet with anything approaching the power of the late 1690s. The restless Scots, disillusioned, were themselves turning their attention to the New World, and when peace was restored in 1713 this current of emigration became significant. Surveying the period, one can see immigration as an intermittent flow, large in the 1650s, the late 1670s, and more particularly in the 1690s. In the latter period, it must have

13. B.M. ADD. Ms. 2902, f. 218 [30]. This copy is undated, and in the manuscript volume containing it, seems to relate to 1698 or 1699. A copy in P.R.O., C.O. 389/40, pp. 68-9 [31], however, is dated 27 September 1697. I am indebted to Mr David Dickson for drawing my attention to this second copy.

been a real factor in the population growth of Ireland. It was large and did not taper off abruptly from the level of the early 1690s for quite exceptional reasons—the fact that Scottish conditions were abnormal in 1695–99 and that after several relatively prosperous decades in Scotland the number of potential migrants was much larger than in the depleted population situation of the 1650s.

Petty's figure for 1672 as adjusted at 1,693,334 must be seen in relation to his estimate of 850,000 for 1653. The latter figure is calculated retrospectively on the basis of an assumed net natural increase of 80,000 in the interval plus an immigration of 170,000 in the same period. If we assume arbitrarily that Petty's figure of 80,000 net natural increase is understated by 50 per cent, a revised figure for 1652 would be the 1672 adjusted population of 1,693,334 less 290,000 (net natural increase 120,000, immigration 170,000). This would give a population of 1,403,334 in 1652. Compared with the adjusted figure for 1687, it gives a population increase of 57 per cent in 35 years. This is a sizeable rate of increase by contemporary European standards. It is, of course, open to us to question Petty's calculation on several grounds. In particular, we might question the accuracy of the 1672 population estimate because the hearth-money returns were more suspect then than later and his assumption about the size of the natural increase and immigration might also be challenged. We could assume understatement in the 1672 population estimate and in the case of estimated immigration and natural increase either understatement or overstatement. A figure of 170,000 immigrants in 1652–72 is sizeable; there is no reason to feel that there is understatement. It might indeed be regarded as too large both because an average immigration of 4,000 Scots per annum seems high as is the figure for returned Irish and returned and immigrant English at 90,000, or 4,500 per annum. The net natural increase with Petty's own figure augmented by 50 per cent averages 6,000. We might feel that it could be larger, especially in the context of underpopulation and high earnings in the 1650s, and the absence of plague or famine in 1653–1672. For a population of 1.7 million an average net annual increase of 6,000—between 3 and 4 per thousand—would have been attainable in sustained favourable circumstances and might even have been exceeded, as it probably was, in parts of Scandinavia for periods of significant length within the seventeenth century. But even a larger natural increase would not very materially affect the absolute total population suggested by the estimates. In so far, moreover, as it would imply a much sharper overall increase in population (net immigration and natural increase), it would make the Irish experience more out of line with European experience generally and on that account more difficult to accept. It is, however, likely that the estimates understate the rise in population between 1652 and 1672 and overstate the rate of increase in the subsequent fifteen years. They suggest a rise of 22 per cent or 1 per cent per annum between 1652 and 1672, and 29 per cent or 2 per cent per annum in 1672–1687. If allowance is made for the defective returns of the hearth-money in the 1660s and early 1670s, it seems certain that the higher rate of increase between 1672 and 1687 is purely apparent. Instead of the apparent higher increase in 1672–1687 than in 1652–1672, one would expect a slowing down in

the growth of population because population was already larger, economic prospects on balance less favourable, and immigration less sustained than in the 1650s at least. The figure for the island's population in 1672 must be considered as a probable understatement; the population was almost certainly larger, and the rate of increase sharper before 1672 than after 1672. However revision of the 1672 population would redistribute the increase within the period 1652-1687, it would leave the overall increase for the period untouched. It remains sharp. This consideration either suggests that the 1687 estimate is not an understatement—whereas elsewhere working back from 1712 there seems to be a case for regarding the 1687 figure as understatement of the population at that time—or that the preceding estimate for 1652 is an underestimate. Should the 1687 estimate be an underestimate, the case for a higher 1652 population is *a fortiori* strengthened. It is perhaps relevant to mention that Petty's calculation in 1687 [34, p. 610] put the 1652 population at a higher level than he had done in 1672. He gave a figure of 985,000. It was calculated on a more arbitrary basis than his calculation made in 1672. The case for a larger 1652 population would also draw some strength from the tendency to write down the incidence of bubonic plague.¹⁴ In particular, it has been pointed out that bubonic plague is more a town disease than a country disease. Earlier estimates of the havoc it created have tended to be reduced. On the other hand, coinciding with large population movements caused by military campaigns, its incidence is likely to have been much larger than in other countries where widespread military campaigns were not present at the same time as plague.

In trying to determine acceptable pre-1672 population estimates one must necessarily proceed from the premise that the data for them are even more tentative than for the 1672 or post-1672 estimates. The hearth-money—the sole concrete element in Irish population estimates—was instituted only in 1662. Estimates for population prior to 1662 must therefore rest on very large, not to say sweeping, assumptions. The manner—based in effect on guesswork about the size of immigration and natural increase—in which Petty arrived at his estimate for 1652 has already been outlined. Calculation of the 1641 population was even more arbitrary. Petty pointed out that exports of manufactures were lower in 1664 than in 1641. This would suggest underpopulation, and underpopulation would release food for export. As a comparison of exports of oxen, sheep, butter and beef in 1641 and 1664 suggested a rise of one-third, Petty [6, pp. 149, 197-8] concluded that the 1641 level of population was one-third above the 1672 figure of 1,100,000. This gives a figure of 1,466,666. On the strength of this figure compared with the independently arrived at figure for 1652, Petty calculated the net decrease in population between 1641 and 1652. Moreover, adding to the assumed net decrease, an estimate for natural increase, Petty had a figure for gross population losses. Petty's 1641 estimate is too arbitrary to rely on. However,

14. J. F. D. Shrewsbury [35, pp. 123-4]; A. B. Appleby [36, pp. 403-7]. The findings of the Demographic Research Unit in the University of Edinburgh also support this view.

fifteen years later Petty [34, p. 610] came back to the subject again, stating that the 1641 population was larger than the 1687 population, basing his assertion more widely on "the exportations, importations, tyths, grist mills, and the judgment of intelligent persons". If one accepts Connell's population estimate for 1687, there are some grounds, accepting Petty's stature as an informed contemporary, for postulating a higher population in 1641 than the 2.2 million level of 1687. To the extent that the 1687 figure is an underestimate the 1641 population would, of course, be even higher. A contemporary writing in 1673 [37, pp. 146-7] was prepared to envisage the possibility that Ireland contained two millions, although in a very tentative way: "whether Ireland did (in its prime) contain two millions of people, or what more, I will not take upon me to determine, but do submit the decision of so doubtful a matter to more knowing persons".¹⁵

There is some corroboration for such an estimate in the incidence of the 1652 plague. It seems unlikely, going on the known incidence of major attacks of plague in other countries, that mortality would have exceeded a third of the population. A death rate of one-third would, if a plague-decimated population of 1,403,334 in 1652 is accepted, make plausible a population figure of 2,105,001 in 1641. A higher level of mortality seems unacceptable for two reasons. First, it conflicts with what we know of plague incidence. Second, it would postulate a rapid rate of population growth subsequently and increase the problems of scholarly credibility enormously. A lower level of mortality may seem more plausible. A mortality rate of one-quarter, for instance, would suggest a 1641 population of 1,871,112. But war and migration are likely to have already reduced the Irish population below the 1641 level; internal population movements dictated by the military campaigns may have resulted in a wider diffusion of plague than modern interpretations of plague incidence regard as normal, and an assumption that Irish population was one-third below the 1641 level may be a crude reflection of reality.

The early decades of the century were prosperous. After the famine of 1602 [Moryson, 38, p. 353] good harvest years followed, and after 1607 the country was free of plague [Shrewsbury, 35, p. 433]. Taking the first four decades as a whole, trade grew rapidly until 1640. It is therefore easy to accept that population also grew rapidly. There are no estimates of population for the early seventeenth century, and any calculations of population at the outset of the century must necessarily rely on the application to the estimated 1641 level of population of crude guesswork about the rate of increase in population previously. A 50 per cent increase in population which would give a 1600 level of 1,403,334 would appear to be the outside limit of expansion. Even allowing for immigration, this leaves a rate of increase which is high by seventeenth century standards in Europe. It is difficult to get areas which afforded conditions comparable to contemporary

15. I am indebted to Mr David Dickson for drawing my attention to this reference. The author also expressed the view that "though Ireland was very populous before the last war, yet I dare not say that it contained half as many people as England".

Ireland in war-distorted Europe in these decades, and Ireland was also in the exceptionally favourable position of being free of plague from 1607. But in areas of re-occupation of formerly deserted lands, and of renewed clearing in sixteenth-century Germany, especially the east, an average annual increment of about four per thousand was typically experienced [see Helleiner, 39, p. 25]. These experiences would make plausible a 50 per cent population increase in Ireland between 1600 and 1640. The likelihood of heavy mortality in the Irish famine of 1602 [Moryson, 38, pp. 282-4] adds to the plausibility of the argument that the over-all increase between the pre-famine level and 1641 cannot have exceeded 50 per cent. It is, of course, open to argument that Ireland, relatively lightly settled, receiving immigrants, and experiencing a striking expansion in foreign trade offers a closer parallel with recorded rates of colonial population growth. These afford for America average rates of population growth of 34 per cent per decade between 1660 and 1790 [Potter, 40, p. 640n.]. But conditions in colonial America are not comparable with Irish conditions, the population was literate, all of immigrant stock (whereas in Ireland immigration was small in relation to population), there is some evidence [Potter, 40, p. 663] of an astonishingly low infant mortality rate, and it has also been suggested [Lockridge, 41, p. 334] that the death rate generally was lower than in Europe. With its low immigration and with the evidence of much cultural continuity, Ireland, unless powerful evidence to the contrary can be adduced, seems to fall more into the category of an old country than of the areas of early colonial development where, as Helleiner [39, p. 25] points out, growth rates of the order of 2.6 per annum over long periods have been attained. It may be possible to postulate a higher rate of increase than 50 per cent in Irish population between 1600 and 1641, but not much above that figure without raising very wide issues which are insoluble in the short-term, and in any event inherently unlikely in their application to Irish conditions.

Dietary changes are not likely to have been extensive. The emphasis on milk and butter in accounts of Irish diets in the second half of the century suggests a substantial continuity with the sixteenth-century pattern. But there is the possibility that dietary changes were more significant in terms of the advance of both grain and potatoes in the second half of the century than previously, and that in consequence regional contrasts in a dietary context sharpened. The potato was a supplementary foodstuff, hence used in the winter months with the better-keeping grain held for spring and summer. As a supplementary foodstuff, it was more likely to be resorted to more extensively by those lacking a grain surplus, hence significant social and regional contrasts in the degree of reliance on it. Population growth seems likely to have been sharper in fairly-well settled regions of Ireland than on the periphery in the seventeenth century. If diet is relative at all to population growth, the potato's significance may have rested in varying the diet rather than, as Irish historians have argued, supplanting other staples. The demographic effects, if any, of the potato may have been far greater in the most developed regions in supplementing seasonally and at lower social levels a diet already more abundant than that in the lightly populated periphery where,

despite growing reliance on the potato, subsistence was, undoubtedly, precarious and poverty stark right into the eighteenth century.

A population of 1,403,334 in 1600 implies in turn a larger population a century earlier than has perhaps been generally believed. While population almost certainly rose in the sixteenth century—both by analogy with demographic experience elsewhere and because the adverse factors have been overstated—the increase may not have been substantial. This implies that the population of Ireland in 1500 did not fall short of, and may have exceeded, a million. To assume a smaller population in the sixteenth century would be to postulate an even sharper rate of population increase in the seventeenth century. A figure of 1.4 million in 1600 already gives a sharp increase by comparison with 2.8 million in 1712. A doubling of population within this period of little over a century is high by European standards, all the more so if the population was, as seems likely, substantially reduced in the early 1650s. Immigration is relevant, but the evidence for immigration suggests that its scale was modest enough, and in the probable peak periods, the 1650s and the 1690s, the number of immigrants was swollen by the return of large numbers who had emigrated in the turmoil of the 1640s or in the deteriorating political climate of James II's reign.

A second and still more arbitrary way of making demographic estimates for Ireland is to assume a co-efficient relating Irish population to the better-established, though still tentative, estimates for England and Wales. For instance, in 1711 the population of England and Wales was perhaps 6.0 million; Ireland's population in 1712 was 2.8 million. As English population is believed to have been relatively static in this period, this suggests a co-efficient of 0.47. By 1800, an Irish population of 5 million and one of 9 million for England and Wales give a co-efficient of 0.56. A rising co-efficient for Ireland seems to be implied by the scope for settlement and expansion offered by its initial backwardness—reflected as in colonial countries certainly in immigration, and possibly in higher birth rates—and by the evidence of expansion in the seventeenth century. An unchanging co-efficient of 0.47 applied to English data for 1500 or 1603 to give estimates for Ireland would minimise the growth rate of the Irish economy in the seventeenth century. A co-efficient of 0.25 would give a reduced population level in 1603, and would imply a three-fold increase in population in the seventeenth century. Striking the balance between these two co-efficients, a rate of 0.35 would give a population of 1.44 million for 1603. It should be noted, however, that even a co-efficient of 0.25 gives a population of 1.05 million for 1603, a higher figure than that generally suggested.

Population trends receive some corroboration from consumption of products with an inelastic demand. There were few of these, but wine was one. Imports were 1,500 tons in 1614-15; they averaged 2,200 tons in 1683-6 [14] [Kearney, 45, p. 404]. This seems to be consistent with the rise in population between 1603 and 1687. Tobacco, after its diffusion, was a similar product, but only from the 1680s would demand have been sufficiently inelastic to warrant deductions about population growth.

| Year | Population of England and Wales* (millions) | Population of Ireland (millions) | | | |
|--------|------------------------------------------------------|----------------------------------|------------------------|------------------------|--------------------|
| | | co-efficient of .47 | co-efficient of .25 | co-efficient of .35 | other estimates |
| 1500 | 3.0 | 1.41 | 0.75 | 1.05 | |
| 1600 | | | | | |
| (1603) | 4.1 | 1.93 | 1.00 | 1.44 | |
| 1641 | | | | | 2.1 |
| 1672 | | | | | 1.7 |
| 1687 | | | | | 2.2 |
| 1711 | | | | | |
| (1712) | 6.0 | | | | 2.8 |

*For the 1500 and 1603 English population figure, see Tucker [42, pp. 209-11]. For the 1711 figure, see P. Deane and W. A. Cole [43, p. 6]. There are of course other estimates—2.3 million in 1522-25 (J. Cornwall [44, p. 44]) and 4.8 million in 1600 (Helleiner [39, p. 32]). Their application in the present context would, however, result in an impossibly sharp rise in population. Whatever about the obscure situation in the early sixteenth century, the lower estimate seems inherently more probable for 1600.

Irish population history in the seventeenth century has been characterised by the belief, implicit or explicit, in a rapid rate of growth, in fact in comparative terms a uniquely rapid growth for the century. At the same time, belief has been general in a demographic cataclysm in the early 1650s, the cautioning words of Petty himself on this score sometimes being overlooked. These two phenomena combined—rapid population growth and demographic cataclysm—are mutually exclusive. It is possible, of course, if one suggests a reduction in the incidence of mortality in the early 1650s, to predicate a faster increase in population. It is possible, for instance, to argue that mortality in the early 1650s was more limited than the level accepted in this paper. In fact, a close study of the economic, political and military events of the time with the demographic dimension in mind might pay rich dividends. But even revision in this direction would not greatly weaken the case for arguing that Irish population grew more slowly in the seventeenth century than has been generally believed—although even at the level suggested in this paper its growth rate would be much faster than that experienced in any other major political division in Europe in the seventeenth century. The historian is faced with the necessity, on what we know of human demographic patterns, of accepting a greatly reduced rate of growth for Irish population, or of even more inadmissibly arguing, against well documented evidence that the demographic difficulties of the early 1650s were almost nominal.

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