

DEMOGRAPHIC RECONSTRUCTION OF THE *CAMP DE TARRAGONA* AREA (SPAIN), 1547-1877¹

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INTRODUCTION AND BACKGROUND

From the tower of Tarragona Cathedral, in the late sixteenth century, the observer could see a broad plain open to the Mediterranean Sea, which was heavily populated, carefully cultivated, and which had good connections with the inland regions of Catalonia. In peacetime this prime geographical position made for strong commercial growth, whereas in years of military conflict it was a disputed area, which meant that its major crises occurred in wartime.

This area, known as the *Camp de Tarragona*, was a densely populated habitat with a large number of settlements. It experienced major commercial growth at an early stage, which led to intense agricultural specialization. During the second part of the Modern Age, the area became heavily involved in the wine industry, as well as producing liqueurs, silk, and from the late eighteenth century onwards, nuts.

The population of 20,000 inhabitants at the end of the fifteenth century grew to about 140,000 around 1877, that is, it increased sevenfold in that period. This gives us a clear idea of the dramatic change that this area underwent in the period under analysis in this study, and

provides some indication of the importance of our research for understanding the dynamics of major demographic change.

This area was organized around two small cities where the urban facilities were concentrated: Tarragona (the cathedral city of the most important diocese in Catalonia) and Reus (a flourishing centre for crafts, trades and commerce, which experienced the strongest growth in the entire area during the eighteenth century) both of which aspired to being the region's capital. A third city, some distance away, was Valls, which was further inland, and did not enjoy the privileged position of the other two, even though it was a trading centre for its own area.

Our understanding of the demography of Catalonia has not changed greatly since the state of the question was set out by Vincent (1977). References to research on the historical demography of Catalonia are still scarce, despite the excellent material resources and abundant data from parish registers. On the other hand, the excessive thematic and methodological dispersion of Catalan research in this area has been pointed out (Simón Tarrés, 1990 and 1992; Muñoz Pradas, 1990). Studies

based on parish registers have been substituted by use of other databases which make it possible to go further back in time, although the conclusions are not entirely reliable as yet. This is the case, for example, with the research based on lists of surnames from the population counts or *Fogatges* (Jordà Sánchez *et al.*, 2013).

The results of the research presented here link with other studies conducted since the mid-20th century by researchers such as Jordi Nadal (1953, 1978, 1983), Jordi Nadal and Emilio Giralt (1960), Antonio Moreno Almarcegui *et al.* (1986) or Antonio Simón Tarrés (1990 and 1992). The aim of the present study is to analyse whether mortality played the leading role in the crisis of the 17th century, and how influential the migratory flows were in the periods of major demographic growth from the 16th to 18th century.

METHODOLOGY AND SOURCES

Backward population projection

In 1981, Wrigley and Schofield published their *magnum opus: The population history of England, 1541-1871*, which was a true landmark in historical demography. Using the Back Projection (BP) technique starting from a 19th century census, they were able to calculate the population total, age distributions, and birth, death, migration and marriage rates for the entire period of their study. However, the validity of this technique has been questioned by various authors (Lee, 1985; Oeppen, 1985; Van Vianen, 1988). Oeppen (1993) developed a new algorithm, the Generalized Inverse Projection (GIP), which

added certain refinements to Back Projection. Oeppen (1993) himself acknowledged that readers may be misled into thinking that the model (*i.e.* BP-GIP) somehow captures the true populations from the data available, but it does not. Subsequent methodological developments in this field have brought other techniques into widespread use such as Differentiated Inverse Projection (DIP) and Stochastic Inverse Projection (SIP) (Bertino and Sonnino, 2003 and 2004; McCaa and Barbi, 2004; Rosina, 2004; Ediev, 2011; Wheldon *et al.*, 2013).

Different backward population projections have been used to construct population histories of states (England, 1541-1871; Norway, 1735-1974; Sweden, 1750-1875; Denmark, Philippines, Italy, 1750-1911; Chile, 1855-1964; Bulgaria, Costa Rica and Cuba 1900-1959), regions (Northern Italy, 1650-1881; Sardinia, 1862-1921; Tuscany, 1640-1940; Scania, 1650-1760; the Piedmont region in Italy XVII to XIX Centuries), cities and parishes or missions (Colyton, 1545-1834; Pays de Caux, 1530-1700; Lucerne, 1700-1930; Berne, 1720-1920; Amsterdam, 1680-1921 and Velletri, 1595-1740).²

In recent decades there have been major contributions in the field of historical demography in Spain, which have made it possible both to broaden and deepen our knowledge of the demographic dynamics in this country. The geographical, economic, cultural and social diversity within this country have all had a bearing on the demographic patterns within its regions. There is a solid tradition of historical demographic research in the Mediterranean areas, particularly in Catalonia (Nadal, 1984; Nadal and Giralt, 1960; Cabré, 1999;

Torrents Rosés, 1996; Muñoz Pradas, 1990 and 1991; Moreno and Fuentes, 1986; Camps, 1995; Marfany, 2012). These studies have enabled us to outline the main situations through which the Catalan population has passed since the late 16th century. However, few researchers in Spain have used Back Projection techniques to transform raw data into sophisticated demographic indicators. In 1991 four studies were published using this type of technique (Back Projection) on different regions of Spain: Reher (1991) in Castilla La Nueva; Macías Hernández (1991) for Gran Canaria, Ardit (1991) for Valencia and Muñoz Pradas (1991) in the Catalan region of El Penedés.

Although we are aware of the difficulties and limitations inherent in using this technique, we believe that its application to the *Camp de Tarragona* could shed considerable light on the – as yet mainly unknown – demographic dynamics of this sizeable area over a lengthy period of time.

This technique offers a means for projecting the population back in time. Starting from a census, births and deaths, the mortality levels that fit with this situation are calculated, which enables us to calculate deaths for each age group. It is understood that deaths behave in accordance with a set of life tables which are proper to the region under study. This distribution of deaths by age group makes it possible to calculate the previous census. Once the census for a particular year is known, the process is repeated for each five-year period, until we reach the origin of the series of births and deaths. By estimating the data for all the five-year periods in the series, these censuses are used, along with the births, deaths and

marriages, to calculate the rates of fertility, mortality and nuptiality.

This method can be used to estimate the migratory balance in each cohort, which is essential for studying longer historical periods. In fact, in the short term, migrations usually account only for small percentages of the population. However, their medium-term effect is cumulative, which may lead to major deviations when long-term reconstructions are attempted.

The initial census: 1877

Our starting point was the census of 1877. We had two particular difficulties in correcting the census data. The first had to do with the statement of age, owing to the well-known tendency to round off ages so that they end in 0 and 5. This lack of precision is accentuated as people get older (the highest age groups may have significant errors), which has major consequences for the technique of backward population projection. The second problem is the sub-registration of newborn babies. The corrected census data and detailed explanations of the correction technique applied are set out in Appendix 1.

Vital rates: 1547-1877

Our demographic reconstruction is based on the series of baptisms, marriages and deaths of around 40 towns and villages, the full list of which is included in Appendix 2. This is all the material of this kind that is extant in this region.³

Whenever possible, we collected the data by month, as was done for England (Wrigley and Schofield, 1981). Computational errors are thereby reduced, and any minor temporary lacunae in the

information – temporary absence of the parish priest, loss of pages from registers, gaps in the information – can be detected more accurately. The series that have been preserved are often incomplete because of carelessness, loss of register books, and above all, deliberate systematic destruction at times of social instability. One priority of our study was to try to make the most of the surviving material, which meant that we also used the incomplete series.

To gather the information about baptisms, marriages and deaths, we had to apply novel methodological adaptations which are described in Appendix 2.

Life tables

The life tables we used were built on the basis of Coale and Demeny's South pattern (1983), following the adaptation proposed by Muñoz Prada (1990) in his study of the Penedés region, which is very close to the *Camp de Tarragona* area. These tables, which we applied to our area in the backward population projection, are shown in Appendix 3.

Estimate of the migration rate

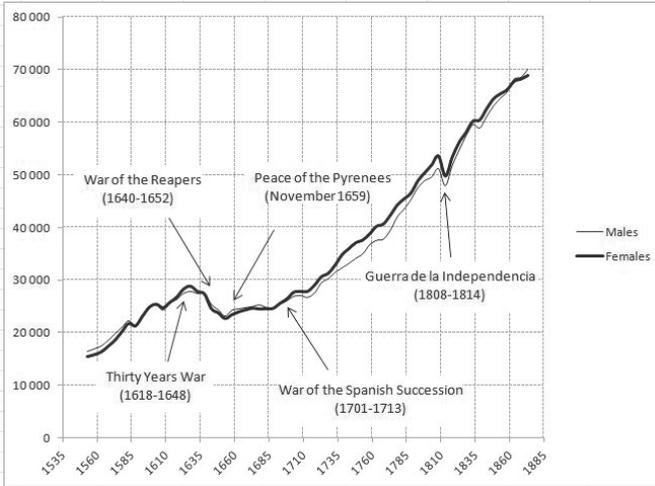
It is necessary to have an estimation of the amount of migration at the beginning of the reconstruction. To this end, we calculated the migration rate from the difference between real growth and natural growth between the census of 1877 and that of 1857, and then between 1857 and 1787. We distributed this using a migration structure by age which we calculated from the information gathered in a study of a small town, Plasencia del Monte, in the Spanish province of Huesca, in the

seventeenth and eighteenth century. The structure based on age describes how migration is distributed proportionally over a cohort (this structure is explained in detail in Appendix 4). We ruled out the possibility of using the statistics on migration from the Spanish cities of Santiago de Compostela (Galicia) (Pose Antelo, 1989 and López López, 1989) or Sabadell (Catalonia) (Camps, 1995) because of their migratory profile (the main bulk of emigrants were around the age of 25-34, but there were also many emigrants aged 0-4 years, a balance between men and women, and a certain number of very old migrants). We think that this emigration mainly involved whole families and that it was therefore very different from that observed in the sixteenth, seventeenth, eighteenth and early nineteenth centuries, which consisted mainly of young men.

ANALYSIS OF RESULTS: EXPLANATION OF DEMOGRAPHIC GROWTH

Fig 1 shows the tendencies in the population of *Camp de Tarragona* between 1538 and 1877. There is a sharp rise in the sixteenth century and early seventeenth century; an intense crisis from the 1620s to the 1650s (Thirty Years War and War of the Reapers) and slow recovery in the second half of the seventeenth century until the War of the Spanish Succession which broke out in 1701. From then on, growth rose dramatically, not to be checked until the 1860s, except during the Peninsular War. That is, the two long growth cycles (the sixteenth century and the eighteenth and nineteenth century) were separated by almost one hundred years of marked

Fig. 1 Trends in the population of Camp de Tarragona area



demographic stagnation (the seventeenth century). According to our estimates, the area went from somewhat more than 30,000 inhabitants at the start of the period to 140,000 at the end, that is, the population grew 4.7-fold over 350 years.

Economic development in the area doubtless had an extremely significant effect on demographic patterns. The analysis carried out in an early study on Reus (Moreno Almarcegui, 1981), the most important city in the area, is conclusive on this point. At the beginning of the seventeenth century, the city's most important manufacturing sectors, the wool textile industry and the production of leather goods, went into a crisis. In the decade 1641-1650 they collapsed completely. The halt in demographic growth and the crisis in the wool and leather sectors clearly went together in time. When trade and industry picked up again during the eighteenth century, they did so on completely different bases: crafts related to the wine industry, liqueurs and silk textiles.

NATURAL GROWTH VERSUS MIGRATIONS

The technique of backward population projection enables us to analyse which demographic factors had the greatest effect on demographic patterns in the *Camp de Tarragona* region. First, we assessed the effects of natural growth and migration on demographic growth. One of our main findings is that the demographic increase in the sixteenth, eighteenth and nineteenth centuries was essentially due to natural growth. Backward population projection demonstrates that the growth of the population, at least in the *Camp de Tarragona* area, was of an endogenous kind.⁴ In fact, the migratory balance was clearly negative: over the entire period of this study, the real net loss of population as a result of migratory movements in this region comprised over 34,000 men and 29,000 women. These results are shown in Fig 2, in which natural growth is compared with figures for migration. The demographic growth in the *Camp de Tarragona* was

therefore basically due to the natural growth of the area's population.

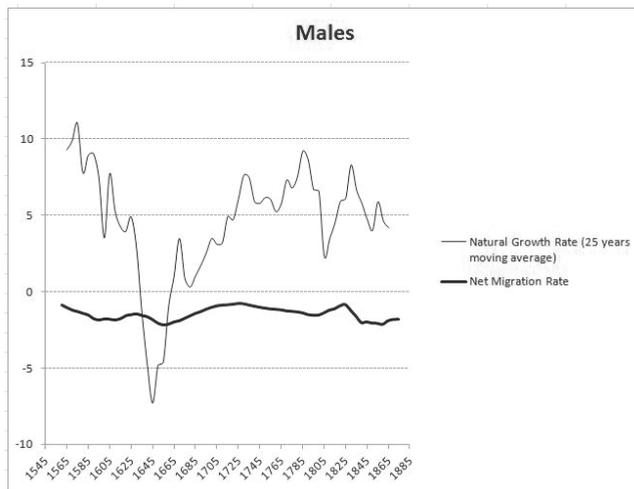
The migratory balance was only positive during a few short periods of time: in the 1560s and 1570s, and in the mid-eighteenth century. The rest of the time, emigration predominated, particularly at the end of the sixteenth century and beginning of the seventeenth century, and from the Peninsular War onwards. The migratory balance was positive at times of maximum demographic growth. Migrations therefore act as a gentle safety valve that eases demographic pressure. Fig 2 shows the secondary role of migrations with respect to natural growth. We were able to observe that in the long term it is natural growth that determines the largest variations in population. In other words, demographic growth depended on the internal dynamics of the region.

Unexpected mortality patterns

If we can rule out migratory movements as the variable that explains demographic growth, we must focus our attention on mortality and fertility. Spain has generally been thought to have been a country with a low life expectancy, and in general historiography it has usually been assumed that the demographic crisis of the seventeenth century was mainly caused by a rise in mortality, particularly as a result of catastrophes such as plagues, wars and famines (Nadal, 1984). Our data enabled us to investigate whether this really was the case in the population in this particular region.

Backward population projection allows us to calculate life expectancy. Fig 3 (see also Appendix 5) shows two moments in which mortality was singularly important, which coincided

Fig. 2 *Natural population growth and migratory balance (%) in the Camp de Tarragona area*



with the years in which warfare escalated in this region. We refer to the long period 1628-1652, and the Peninsular War (1808-1812). During both these periods, mortality clearly affected

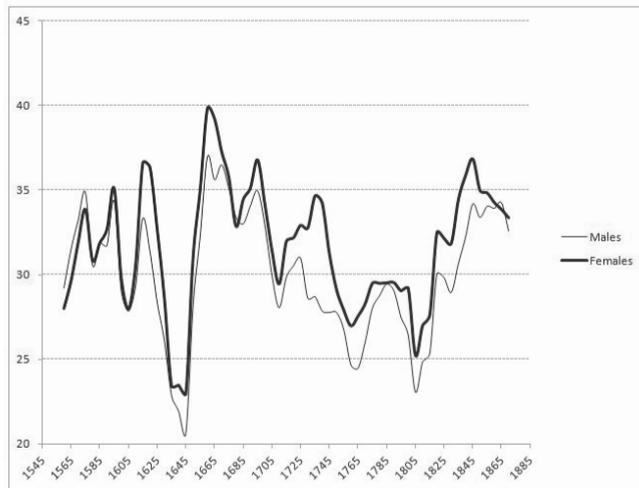
demographic growth. Except in those two time-spans, surprisingly, life expectancy was higher in the periods of little or no demographic growth (particularly in the second half of the

seventeenth century when it rose to 38 for women and 35 for men). Conversely, at the points of greatest demographic growth (particularly in the second half of the eighteenth century and in the early nineteenth century), life expectancy tended to drop. During the nineteenth century, (with the only exception of the years of

the Peninsular War and the First Carlist War), life expectancy improved steadily, until it reached the age of 35 for women and 34 for men.

Over the period of this study, there are eight crises of mortality. Half of these are linked to wars: the cycle 1628-1652 (Thirty Years War and the War of the Reapers), the period 1708-1712

Fig. 3 *Developments in life expectancy at birth, Camp de Tarragona (15 years moving average)*



(War of the Spanish Succession), 1808-1812 (Peninsular War) and 1833-1837 (First Carlist War). A further three were due to outbreaks of plague: 1545-1546, 1563-1567, 1583-1587, 1603-1607, 1629-1631, 1650-1652.⁵ In the eighteenth century, there was only one major crisis, that of 1763-1767, which led to a general deterioration in life expectancy associated with a long cycle (at least until 1783) of “putrid and malign fevers” which affected the whole Principality of Catalonia, which was possibly associated with a decline in standards of hygiene as a result of the intense demographic growth of the previous years.⁶

In conclusion, plague only had some influence in the *Camp de Tarragona* area until the mid-seventeenth century. From then on, only wars caused significant peaks in mortality, with the sole exception of the general crisis of 1763-1767. Famine rarely made its presence felt in this area. This helps to explain the reasonably high levels of life expectancy (between 31 and 33 years). But the most significant conclusion that can be drawn from the life expectancy patterns is that life expectancy itself cannot satisfactorily account for the demographic growth in this region,⁷ since it tended to be higher in periods of low demographic growth and lower in those when demographic

growth was slowing down. So if neither migratory movements nor mortality rates – which are traditionally regarded as the key to explaining growth in the long term – were responsible for the increase in population, what was the explanation?

Relations between nuptiality and fertility

The “European marriage model” defined by Hajnal (1965) is a system in which natural fertility is regulated through marriage. A delay in the age of marriage significantly reduces fertility, which contributes to slowing down population growth. Wrigley and Schofield (1981) showed how this worked in the case of England, at least from the mid-sixteenth century onwards, explaining the variations in nuptiality as a consequence of the variations in real wages. The periods of high real wages stimulated marriage (a larger percentage of people got married, and they did so at a younger age), which resulted in an increase in the mean number of children per woman and thus boosted demographic growth. Conversely, when real wages were falling, nuptiality rates also slowed down (fewer people married, and those that did were older), which brought down the mean fertility rate and halted population growth. These authors showed that in the long term, the variations in fertility were more important in explaining general demographic growth than were variations in mortality. Did this also happen in the *Camp de Tarragona* region?

On the basis of the data compiled by Feliú Montfort (1991) for Catalonia in the sixteenth, seventeenth and eighteenth

centuries,⁸ we estimated the wages and compared them with the first marriage rates in the *Camp de Tarragona* (Fig 4). We found that there was indeed a certain relationship between the patterns in these two variables.⁹ As Wrigley and Schofield (1981) observed in the case of England, here in the *Camp de Tarragona* the marriage rates also seemed to reflect the levels of wages in the region (albeit lagging a few years behind). Moments of low real wages led to low nuptiality rates some years later. The economic problems of the seventeenth century seem to have discouraged a large percentage of young people from marriage. On the other hand, the rise in real salaries from the late seventeenth century onwards encouraged people to marry, a trend which continued through the eighteenth century.

In Fig 5 we see the comparative development of the first marriage rate and the total fertility rate (TFR). Variations in the marriage rate can be seen to explain the changes in TFR, as suggested in Hajnal’s European model. In 1603-1607, the marriage rate was around 30-31%, below the mean for the period. It then plummeted after 1638-1642 (the lowest point of the seventeenth-century crisis), and did not reach 30% again until the early eighteenth century¹⁰.

This profound decline in the marriage rate was accompanied by a fall in the TFR (see Appendix 5). The crisis of the seventeenth century was doubtless associated with a persistent crisis in the marriage rate, which affected fertility and general population growth (despite the high life expectancy observed in that period).

On the other hand, during the eighteenth and early nineteenth century, the marriage rate remained high, which led

Fig. 4 Changes in first marriage rate and real wages in the Camp de Tarragona



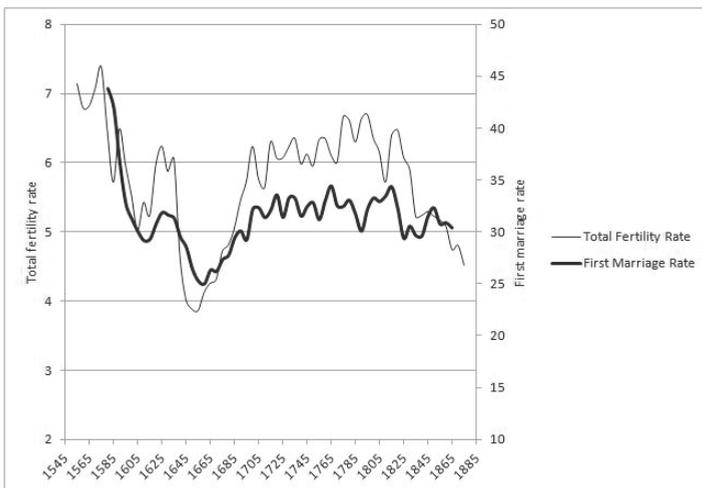
Note: Real wages are expressed as index numbers. Base 100 = period 1598-1602.

to a rise in TFR which accounted for the sustained high population growth throughout this period (despite the deterioration of life expectancy that characterized the same years). The First Carlist War, which shook Spain between 1833 and 1840, ushered in a new situation with a somewhat lower

rate of marriage and a slight setback in the TFR, resulting in slower population growth in the region.

The marriage rate therefore proved to be the most important factor in determining the total fertility rate in this area, which in turn shaped the general growth in the population.

Fig. 5 Development of the Total Fertility Rate and first marriage rate of women of reproductive age (15-49 years) in the Camp de Tarragona area



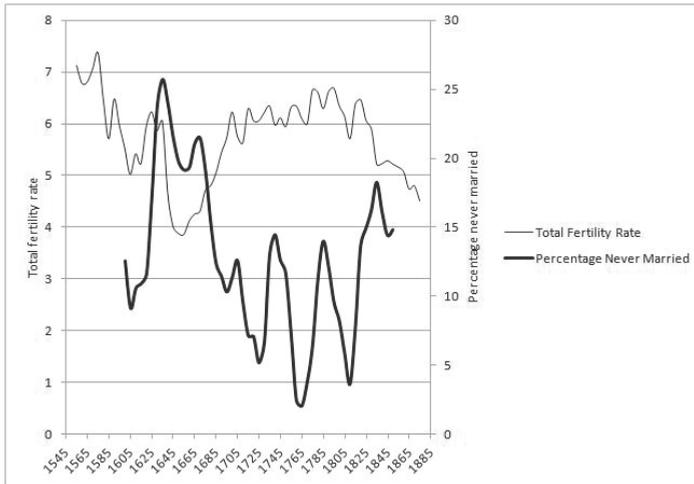
Using the available data, we performed an estimate of definitive female celibacy (the percentage of women in a generation who never married) using the method suggested by Livi Bacci (1993, 212-15). The results are shown in Fig 6, superposed onto the total fertility rate.

This graph suggests that the most important factor that reduced the rates of marriage during the seventeenth-century crisis was the increase in the number of women who did not marry. According to our estimates, almost one third of the women in the generations that came of age at the nadir of the crisis remained single. Economic hardship was accompanied by social and political

unrest, which heightened the sense of uncertainty and discouraged people from marrying. Although the number of women remaining single fell in the second half of the seventeenth century, it remained relatively high: around 12-14% of the women in the generations that lived in the second half of the century never married.

On the other hand, definitive celibacy fell steeply during the eighteenth century, bringing a spectacular rise in fertility and general population growth. The nineteenth century again saw significant rates of people remaining single (from 7 to 15%) which, as we might expect, was linked to a drop in fertility.

Fig. 6 *Total fertility rate and definitive female celibacy (%) in the Camp de Tarragona region (15 year moving average)*



What are the reasons behind these variations in the percentage of women who remained single? One possible reason might be migration. We know that under the Ancien Régime, male migration was more intense. Men emigrated more and went longer distances than women. At moments of intense migration, this differential factor

might affect the balance between the sexes, which would end up by influencing the number of women who married. We found that the intensity of the cause (the drop in the proportion of men) had little to do with the intensity of the response (the number of women who never married). It would therefore seem that this was not a decisive factor

that might account for changes in the rate of definitive celibacy, and therefore in the marriage rate. So what other factors might justify these enormous changes in nuptiality?

*The change in the “marriage model”:
variations in second marriages.*

The data concerning nuptiality in the *Camp de Tarragona* show radical changes over cycles which last around a century each: the sixteenth century was generally expansive, the seventeenth had very restrictive marriage patterns, then a dynamic eighteenth century was followed by a somewhat less confident nineteenth century. We observed that this cyclical pattern concerning nuptiality was an important factor in long-term population growth. This made us focus our attention on nuptiality. What was the reason for these variations? Why were the changes so marked? Was there a change in the marriage model?

We have qualitative data about marriage from a massive reconstruction of families performed in the town of El Vendrell during the period 1575-1910, which overlaps with the years in our study.¹¹ El Vendrell is very close to the *Camp de Tarragona* area, and it experienced much the same economic and social transformations following a similar chronology. We consider that by analysing the information from El Vendrell, we may be able to shed light on the transformations in marriage patterns in our own study.

Let us look at nuptiality in El Vendrell from the point of view of second marriages. A widow or widower who wishes to marry (and who wishes to marry someone who is single) in practice is seen as competing with young people

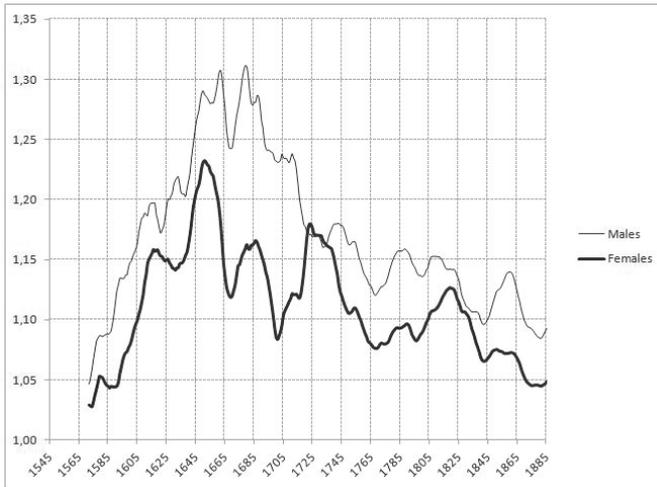
who want to attain the married state. At least, this is the common perception in many places. Such second marriages often meet with opposition or fierce criticism from young people (Burguière, 1998), who think that such second marriages actually reduce their own chances of marrying. Older people ‘take away’ someone from the younger generation, and thus lessen the opportunities for other young people.

If this were the case, the periods with higher percentages of second marriages ought to coincide with high percentages of definitive celibacy. In the opposite case, a reduction in second marriages ought to be linked to a drop in the number of people remaining unmarried.

Fig 7 reflects the proportion of second marriages in comparison with that of marriages between single people in the town of El Vendrell. For example, for men, this is the coefficient between the total number of marriages and the number of marriages of bachelors (unmarried man and unmarried woman, unmarried man and widow). An index of 1.3 would mean that 30% of the men who married at least once did so in a second marriage. An index close to 1 would mean that there were hardly any second marriages.

The results of Fig 7 left no room for doubt: during the seventeenth century, a time when nuptiality in the region fell and definitive celibacy increased, the index of second marriages rose surprisingly. That is, the generations that were most affected by the crisis were also those that were more likely to marry a second time. However, in the eighteenth century, which was characterized by a general rise in nuptiality and a reduction in the rates of definitive celibacy, there was a major fall in the index of second marriages.

Fig. 7 Intensity of second marriages in El Vendrell (5 year moving average)



It is hard to account for the intensity of second marriages only in terms of mortality, because as we know, in general terms the life expectancy in the seventeenth century was actually higher than in the eighteenth. Variations in mortality thus fail to explain the changes in marriage behaviours.¹²

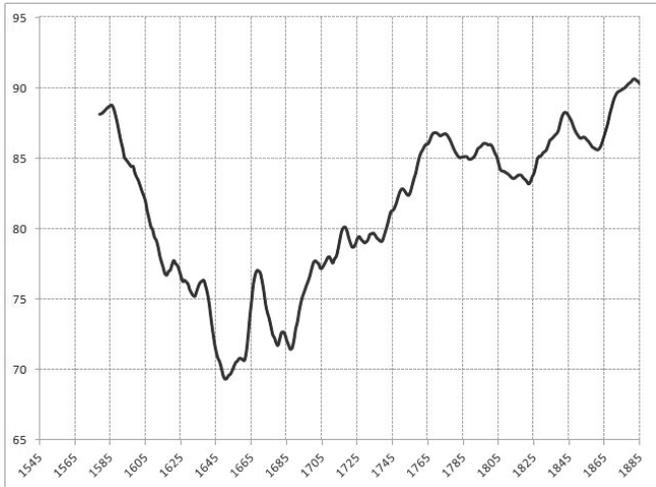
Fig 8 shows the percentage weight of marriages between single people in the total number of marriages. We chose this indicator because it best reflects the expansion of nuptiality among young people. Again, there is no room for doubt: in the seventeenth century, particularly in the worst years of the crisis, the type of marriage that was most affected was that between single men and women. On the other hand, at times when nuptiality was rising (eighteenth and nineteenth century) this latter type of marriage was the one that grew most.

In conclusion, in the area under study, the trend in second marriages was a highly significant explanatory factor that helped us to understand variations in nuptiality in general and definitive celibacy in particular.

Why could an older person, less attractive, with lower vitality, and sometimes even burdened with children, aspire to a second marriage when other people in the fulness of youth could not? The underlying reason is incontrovertible: wealth. Widowers were generally mature people: they might have received an inheritance from their parents, and after years of marriage and hard work, they had accumulated a significant amount of property.¹³ In a world that was still essentially rural, the ownership of farm land was the most important source of financial security. The attraction of a mature partner undoubtedly lay in material possessions as a guarantee of financial security, particularly at times of general uncertainty when there were few other opportunities.

Young people and their families faced a hard dilemma: should they marry someone of their own generation in the full bloom of youth, or should they accept a marriage of convenience with a mature partner (perhaps a widower) with substantial property and a position in life. At a time of great uncertainty,

Fig. 8 Percentage of marriages between single people among all marriages in El Vendrell (5 year moving average)



fear of the future may make families seek alliances with partners who enjoy economic security, whereas when times are booming, optimism about the future may lead young people to take more daring decisions about their future. In other words, the choice of an unmarried man or a wealthy widower might serve as an indicator that can tell us whether a particular generation is coming of age in an atmosphere of confidence or uncertainty about the future.

If our hypothesis is right, what was the cause of the uncertainty in the seventeenth century? What factors fostered a climate of confidence in the eighteenth century, which greatly increased young people's chances of becoming independent and founding a family? There are two possible reasons. The first is a change in the patterns of land ownership and use: these were more rigid in the seventeenth century (which gave landowners a privileged position regarding access to marriage) and more flexible in the eighteenth and nineteenth century, which gave young people greater access to land.

In the case of El Vendrell, it has been shown that there was an active land market as early as the seventeenth century (Moreno Almárcegui and Caralt, 2008). In this region, in modern times the economy was based mainly on the expansion of wine growing, the associated industry, and the trade that arose around these activities. Vineyards led the way for a major growth in the "industrial" sector (carpenters, smiths, metal workers, coach makers, liqueur manufacturers, and so on) and in commerce (Cardó, 1983). From the late seventeenth century onwards, the *Camp de Tarragona* focused on a single crop, the vine, which led to thorough-going social and economic changes and spectacular financial growth.

The instrument which made this expansion of the vineyards possible was the development of a type of contract that is typical in Catalonia, which is half-way between emphyteusis and sharecropping, and which is known locally by the term *rabassa morta* (or dead vinestock). This contract assigned

a portion of land to a winegrower so that he could cultivate vines on that land for as long as the stock that he planted should last. The signatories to these contracts made sure that they would last as long as possible by planting shoots to regenerate the stock, thus extending the term of the contract almost indefinitely (Moreno Claverías, 1995), resulting in the massive use of intensive labour.¹⁴ The effect seems to have been that access to land was opened up to a wide sector of society, and that the people who held land on these terms enjoyed a reasonable degree of stability. The final outcome was a radical transformation of the agricultural landscape in the *Camp de Tarragona* in the eighteenth and much of the nineteenth century.

The other reason for a growth in confidence among young people may have been the development of stable types of salaried work, with real wages that were higher, and a well-supplied market with constant prices that guaranteed the availability of the basic necessities of life. One of the most remarkable changes from the eighteenth to the nineteenth century was the expansion of a network of small, specialized shops (butchers, greengrocers, bakers) in El Vendrell which guaranteed that people could obtain a wide variety of products (Moreno Almarcegui and Caralt, 2008). On the other hand, the proximity of the sea made it possible to get access to other sources of primary goods (Pérez Carrión, 1984). Without this, the wholesale specialization in the wine industry, which meant that the population was no longer self-sufficient in wheat, would not have been possible.

The fact that large sectors of the population were dependent on trade may explain why young people were less likely

to marry at times of general uncertainty, and the proportion of second marriages (involving people with safe sources of income, that is, landowners) paradoxically increased. The return to the land as a source of security is a reflection of the insecurity of the markets.

On the other hand, the agricultural and industrial expansion of the eighteenth century (linked to more flexible structures governing the use of property) and the growth of trade (leading to the development of a dense network of distribution companies selling to the public and generalized access to a much wider range of products), increased the possibilities of young people, large numbers of whom were now able to marry, and reduced the number of second marriages with widowers who owned land.

CONCLUSIONS

The *Camp de Tarragona* provides a case study of great interest. First, the spectacular demographic growth is worthy of analysis in itself. Second, the alternation of periods of rapid growth and periods of intense crisis makes it an interesting scenario for observing the mechanisms of demographic adjustment to socio-economic changes. Third, this area was singularly dynamic in its responses to social and economic phenomena. The crisis of the seventeenth century triggered a profound transformation in the foundations of the economy which led to the rise of a lively manufacturing industry and booming trade in the eighteenth and nineteenth century. From the late eighteenth century onwards, the commercial scene also changed completely: a dense network of specialized shops ensured that increasing numbers of people could get hold of a wide variety of products.

Since this is a plain which is open to the sea, it enjoyed contact with the outside world from an early stage. However, since it is strategically situated on the coast, with good inland communications, it was a prime military target in a number of wars, which led to some of its gravest crises. The periods 1628-1652 and 1808-1812 were the only ones in which mortality played a major role and eroded the population.

What were the reasons for its striking demographic growth? The results obtained using the technique of backward population projection suggest a rather different interpretation to that which is commonly applied to the modern era. Growth was not due to immigration, at least after 1640, as Nadal and Giralt (1960) pointed out. Although during the War of the Reapers there were moments of exceptional hardship the medium-term life expectancy in the seventeenth century was not low. Our reconstruction shows an extraordinary mechanism by which demographic growth is adjusted by the marriage rate, as has been observed in some other areas of Europe. Nuptiality was certainly the most important factor in regulating growth in the medium and long term. Marriage was severely restricted in the seventeenth century, almost universal in the eighteenth, and fell again in the nineteenth. It was access to marriage that mainly explained the periods of demographic decline and expansion in this region.

What factors influenced these profound changes in marriage patterns? We found that definitive celibacy was a variable which played a key role in the regulation of nuptiality. During the seventeenth century, marriage was far from universal. A significant percentage of young people could not marry. In this context, the

instructions issued by the Archbishop of Tarragona in the 1770s are of interest: “Similarly we also order that no one shall witness marriages unless the marriage contract has first been drawn up, and the contracting party, his parents or proxy, disposes of sufficient goods for this purpose”.¹⁵ The reason for this rule is clear: people should not form new families without accumulating enough wealth to guarantee a certain degree of economic security. However, the model that this rule aimed to defend was superseded by changing historical circumstances.

From our analysis of second marriages in El Vendrell, we discovered that older landowners gradually lost control over access to marriage as young people became able to obtain land in new ways, particularly through the arrangement known as *rabassa morta*, which gave them higher real wages (in a context in which the market ensured permanent availability of basic goods thanks to a good retail distribution system). During the period under analysis, a new class of young people came into being who brought about a thorough agricultural transformation which gave rise to expansion in both trade and industry within the region.

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NOTES

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2. Balthasar, 1989 and 1990; Brunborg, 1976; Galloway, 1994; González Quiñones and Ramos Piñol, 1996; Leeuwenn and Oeppen, 1993; McCaa, 1989a, 1989b and 1993; Oeppen and Bengtsson, 1993; Rosina, 1995; Smith and Nu, 1982; Del Panta, Reginato and Scalone, 2002.
3. This research was based on the work of various working groups made up of students from Rovira i Virgili University (Spain) who collected the data from the parish registers of the Archdiocese of Tarragona over more than thirty years under the direction of Professor Luis Navarro Miralles. We would also like to thank computer scientist Antonio Moreno Pérez, who supervised the computer programming for this project.
4. Nadal and Giralt (1960: 80-81, 88, 245-248 and 274-282) have already shown that migration from France had little impact in the *Camp de Tarragona*.
5. We used the records of the "Consell Municipal" (municipal council) of Reus to find out the incidence of these plagues in the population and the preventive measures that were taken. The information provided by Morena Llauradó (1897) and Bofarull Brocà (1866) was also useful to assess the impact of climatic factors.
6. The importance of epidemics at that time is demonstrated in the book published by Doctor Masdevall (1797) after the epidemic of 1783, and by the studies by Olivé (1989).
7. The only exceptions were the two periods of hostilities mentioned above (1628-1652 and 1808-1812).
8. The data refer to prices and wages in the city of Barcelona, which is around 100 kilometers from the *Camp de Tarragona* and is the economic and political capital of the Principality (Feliú Montfort, 1991).
9. In our region there is a significant proportion of salaried day labourers. According to the Floridablanc census (1787), 48% of the population of the *Baix Camp* and 34% of that of the *Camp de Tarragona* worked as farm labourers.
10. Broadly speaking, similar marriage rates were observed in the neighbouring region of (Muñoz Pradas, 1990).
- 11 As we mention above, we used unpublished family reconstruction data from El Vendrell started by Salvador Caralt (who unfortunately died unexpectedly) to which Vicenç Cabré kindly gave us access.
12. This behaviour regarding second marriage was widespread in other geographical areas around the *Camp de Tarragona* (Muñoz Pradas, 1990: 208-209 and Gual Vilà, 1993: 50-60).
13. Thanks to the family reconstruction work carried out in El Vendrell (Moreno Almarcegui and Caralt, 2008), we were able to establish the age of a significant percentage of landowners in the years 1693, 1694 and 1755. We found that as the head of the family grew older, the quantity and quality of his property become greater. Younger landowners, on the other hand, possessed little land, and this was often of poor quality.
14. The *rabassa morta* contract obliged the *rabasaire* to plant vines. Most of these contracts are known to have pertained to infertile land which was often inconveniently sited. In the case of the Penedès area, 76.4% of the agricultural contracts signed in the eighteenth century were of the *rabassa morta* type (statistics compiled by authors using data obtained from Moreno Claverías, 1995).
15. Cambrils, Llibre de Visites, May, 10th 1776, in Rius Jové (2002, 231, vol. I, note 384).

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APPENDIX 1

Table A1.1. *Corrected population structure for the Camp de Tarragona area, 31 December 1877*

	Men	Women	Total
0 - 4	8,328	8,233	16,561
5 - 9	7,327	6,929	14,255
10 - 14	6,190	6,736	12,924
15 - 19	6,478	6,57	13,048
20 - 24	5,811	6,364	12,175
25 - 29	5,645	5,943	11,588
30 - 34	4,748	4,895	9,644
35 - 39	4,457	4,443	8,900
40 - 44	4,012	3,906	7,917
45 - 49	4,111	4,146	8,257
50 - 54	3,273	3,067	6,340
55 - 59	2,967	2,91	5,877
60 - 64	2,456	2,464	4,920
65 - 69	1,702	1,768	3,470
70 - 74	1,210	1,289	2,499
75 - 79	679	746	1,425
80 - 84	320	341	660
85 - 89	93	113	206
90 - 94	17	20	37
95 - 99	1	1	2
Total	69,821	70,883	140,704

We corrected the census data by following the method used by Wrigley and Schofield (1981) in their study of England. Starting from the births of the respective five-year cohorts that make up the population aged 50 and over, we calculated the survivors recorded in 1877 by applying the probability of reaching the ages of 50-54, 55-59, 60-64, up to 90-94 years. The life tables that we used were those observed for the area in the middle of the century, in particular, those from the period 1857-1864 (Muñoz Pradas, 1990).

To counteract the effect generated by rounding ages off to end in 0 and 5 on the distribution of

the population in the census in age groups below 50, we proceeded as follows: we divided the population of these ten-year groups into two five-year groups according to the proportion of their birth cohorts deflated by the probability of survival. To perform this operation we used the same life table from the period 1857-1864 (Muñoz Pradas, 1990).

Finally, we also had to correct the data concerning children aged less than one year on the basis of births and the probability of dying in the first year of life, using the life tables mentioned above and our own birth estimates.

APPENDIX 2

Table A2.1. *List of towns and villages with parish records used*

District	Village/town	Baptisms	Deaths	Marriages	Type*
Alt Camp	Aiguamúrcia	x	X	x	1
	Alcover	x	X	x	2
	Alió	x	X	x	1
	Brafió	x	X	x	2
	Cabra del Camp	x	X	x	1
	Figuerola	x	X	x	1
	Mont-ral	x	X	x	1
	Montferrí	x	X	x	1
	Pont d'Armentera	x	X	x	2
	Vallmoll	x	X	x	1
	Valls	x	X	x	3
	Vila-rodona	x	X	x	2
	Vilabella	x	X	x	2
Baix Camp	Aleixar	x	X	x	2
	Alforja	x	X	x	2
	Almóster	x	X	x	1
	Argentera	x	X	x	1
	Botarell	x		x	1
	Cambrils	x		x	2
	Capafons	x	x	x	1
	Castellvell	x		x	1
	Duesaigües	x		x	1
	L'Albiol	x	x	x	1
	La Selva del Camp	x	x	x	3
	Les Borges	x	x	x	1
	Reus	x	x	x	3
	Riudecanyes	x	x	x	2
	Ruadom	x		x	2
	Vilana d'escorn. y Arbocet	x		x	2
Vinyols i els Arcs	x	x	x	1	

* 1 = village of <800 inhabitants,

2 = town of 800 – 3,200 inhabitants

3 = town of >3,200 inhabitants in 1787.

Table A2.1. *List of towns and villages with parish records used (suite)*

Tarragones	Constanti	x	x	x	2
	El Catllar	x	x	x	2
	El Morell	x		x	1
	Garidells	x			1
	La Canonja	x	x	x	1
	Perafort	x	x	x	1
	Pobla de Montornes	x	x	x	1
	Renau	x	x	x	1
	Tamarit	x	x	x	1
	Tarragona	x	x	x	3
	Torredembarra	x		x	2
	Vespella	x	x	x	1
	Vilallonga		x		2
	Vilaseca	x	x	x	2
	TOTAL	43	35	42	

There are fewer series of deaths because we discarded those which did not distinguish between deaths of children and adults, which made it impossible for us to test their accuracy. The sample collected is very large and, importantly, it is spread fairly evenly across the entire geographical area of the study.

Our study incorporates several novel features in the way data were collected from parish records. First, whenever possible, we classified baptisms and deaths by sex. We did so with a view to doing a double reconstruction: that of the male and the female population. This yields a much more realistic picture of the demographic situation, which allows us to understand the past in much greater detail (for example, it serves to research the effect of migration on the balance between the sexes and on nuptiality).

Another innovative aspect of our methodology is that we distinguish between children and adults in the deaths. On the basis of information gathered in

the town of Plasencia del Monte (in the province of Huesca, Spain), we took children to be aged 10 years or less, while those over this age were adults. Systematic study of the lists of people who fulfilled their Easter observance showed us that in practice this is so.¹ The fact that we obtained this information naturally also affected the way we calculated the five-year censuses.

Another of the methodological challenges that we had to face was related to the extent to which the towns and villages in our sample can be said to be representative of the population as a whole. The places chosen were those where the records survived the vicissitudes of history, and therefore do not constitute a randomly selected sample. Table A2-2 shows the distribution of the population of the *Camp de Tarragona* in the census of 1787. The total population and that of the sample used in our study are compared, and the type of settlement is classified into three categories according to population size: <800, 800 – 3,200 and >3,200 inhabitants.

1. See Appendix 4.

Table A2.2. *Size of total population and sample studied (Camp de Tarragona), 1787*

Type of settlement	Total number of population centres	Number of centres in sample	Percentage of population represented in sample
<800	104	75	72.1
800 – 3,200	22	17	77.3
>3,200	4	4	100
Total	130	96	73.8

Source: Compiled by authors using the census of 1787.

Note: One parish may have several centres of population, and one town may have several parishes. For this reason, the number of parishes does not coincide with the number of places.

Our sample can be seen to represent the larger towns fairly well, but the smaller settlements are under-represented. To adjust the size of our sample to reality we had to give a different weighting to each kind of settlement. This coefficient was calculated on the basis of the demographic weighting of each kind of settlement obtained from census data (1787, 1860 and 1877) hearth taxes² (1497, 1553 and 1719) of the day. We were able to reconstruct the relative importance of each kind of place for every month during the period of the study.

Another serious problem facing scholars working on historical demography is the under-representation of baptisms and infants who died soon after birth. Children who were not baptized shortly after birth might die young, and might never figure in the records either in the births or the deaths. A detailed study of this area (Rius Jové, 2002) which analyses this problem indicates that during the period from 1768 to 1877 children were generally baptized shortly after birth, and so our series of baptisms and infant deaths can be considered to be highly reliable.

To assess the quality of the information from the period predating 1768, we carried out a series of tests based on the proportional effect of deaths in childhood on the total number of deaths, and on patterns in the percentage of deaths in childhood with respect to the total number of baptisms. The

analysis of these two indicators suggests that there was under-registration of deaths in childhood in the first half of the seventeenth century. This might seem surprising, since these were the years immediately after the Council of Trent (1545-1563). The explanation that we can suggest is that the registers containing deaths in childhood in the sixteenth century mainly came from the parish of Tarragona Cathedral, which was staffed by educated, well-trained priests. After the Council of Trent, the register of sacraments came into use in the other parishes as well. It is very likely that in the first few decades after the Council, the quality of the records of baptisms and deaths in childhood was not very high. After some time had passed, once the new clergy who had been trained in the precepts of the Council had taken over the parishes, the quality of registers of baptisms, marriages and deaths improved greatly.

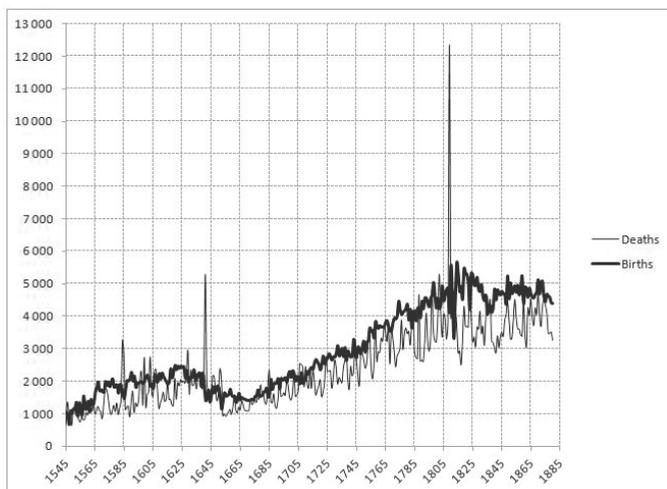
We therefore deemed it necessary to correct the records of baptisms and deaths in childhood in the first half of the seventeenth century. Using the levels of mortality observed in the second half of the century in an unpublished family reconstruction carried out in a town near the *Camp de Tarragona*.³ we raised the proportion of deaths in the first year of life to 15% of baptized children.

Once these corrections had been made, the final results of the life tables were as shown in Fig. A2.1.

2. In the Middle Ages, hearth tax or fougage (from the Latin focagium) was a census of fires or homes, that is, family units, carried out for the purpose of charging direct taxes.

3. We thank Vicente Cabré for allowing us to use the data about El Vendrell which had been gathered patiently by Salvador Caralt, whose premature death unfortunately prevented him from finishing his Ph.D. research.

Fig. A2.1. *Corrected absolute numbers of births and deaths in the Camp de Tarragona area*



APPENDIX 3Table A3.1. *Mortality tables (nqx x 1,000) applied to the Camp de Tarragona area in the backward population projection*

Males	1	2	3	4	5	6	7	8	9
0	310.2	287.7	267.4	248.9	231.9	216.3	201.8	188.3	175.7
1	460.7	419.7	382.8	349.1	318.2	289.7	263.3	238.8	215.9
5	80.0	72.7	66.2	60.3	54.8	49.8	45.1	40.8	36.7
10	37.6	34.4	31.5	28.8	26.4	24.2	22.1	20.2	18.6
15	56.7	51.8	47.4	43.5	39.8	36.4	33.3	30.4	27.7
20	87.2	79.8	73.1	67.0	61.4	56.3	51.5	47.1	42.9
25	61.8	56.5	51.8	47.4	43.5	39.8	36.4	33.2	30.3
30	74.7	68.6	63.2	58.2	53.6	49.4	45.5	41.9	38.5
35	92.3	84.9	78.3	72.2	66.6	61.5	56.7	52.3	48.2
40	109.4	101.0	93.4	86.5	80.2	74.3	68.9	63.9	59.2
45	130.0	118.7	110.3	102.6	95.6	89.1	83.1	77.6	72.3
50	157.1	146.4	136.8	128.0	119.9	112.5	105.6	99.3	93.3
55	207.9	194.6	182.6	171.7	161.6	153.4	143.8	135.9	128.4
60	292.9	274.7	258.3	243.4	229.7	217.1	205.4	194.5	184.3
65	371.0	349.2	329.6	311.7	295.2	280.1	266.1	253.0	240.8
70	522.7	495.1	470.0	447.3	426.4	407.2	389.3	372.7	357.2
75	575.9	557.8	541.4	526.4	512.7	500.1	488.4	477.5	467.3
80	700.4	684.8	670.8	658.0	646.2	635.4	625.4	616.0	607.3
85	826.7	815.8	806.0	797.0	788.8	781.3	774.3	767.8	761.7
90	910.6	904.5	899.0	894.0	889.5	885.2	881.3	877.7	874.3

Table A3.1. *Mortality tables (nqx x 1,000) applied to the Camp de Tarragona area in the backward population projection (suite)*

Females									
	1	2	3	4	5	6	7	8	9
0	278.4	258.0	239.5	222.7	207.3	193.2	180.0	167.8	156.3
1	500.1	454.5	413.3	375.8	341.4	309.7	280.3	253.0	227.4
5	92.3	83.6	75.8	68.6	62.1	56.1	50.5	45.3	40.4
10	48.8	44.4	40.3	36.6	33.3	30.2	27.3	24.6	22.1
15	66.3	60.3	54.9	50.1	45.6	41.4	37.6	34.0	30.7
20	64.4	58.7	53.5	48.8	44.5	40.5	36.8	33.3	30.1
25	69.4	63.3	57.8	52.8	48.2	44.0	40.0	36.4	33.0
30	80.3	73.2	66.9	61.1	55.8	50.9	46.4	42.2	38.2
35	92.7	84.7	77.5	71.0	64.9	59.4	54.3	49.5	45.0
40	100.2	91.9	84.5	77.7	71.5	65.7	60.4	55.4	50.8
45	113.7	104.7	96.6	89.3	82.5	76.3	70.5	65.2	60.1
50	143.9	133.0	123.0	114.0	105.7	98.1	91.0	84.4	78.2
55	182.8	169.1	156.8	145.6	135.3	125.8	117.0	108.8	101.1
60	271.5	251.3	233.1	216.6	201.4	187.4	174.4	162.4	151.1
65	393.2	365.6	340.7	318.1	297.3	278.1	260.4	243.8	228.4
70	565.5	529.5	497.1	467.6	440.5	415.5	392.4	370.9	350.8
75	550.3	533.8	518.9	505.3	492.8	481.4	470.7	460.9	451.6
80	678.4	664.3	651.5	639.9	629.2	619.4	610.3	601.8	593.9
85	811.3	801.4	792.5	784.4	777.0	770.1	763.7	757.8	752.3
90	902.0	896.5	891.5	887.0	882.8	879.0	875.4	872.1	869.1

Table A3.1. *Mortality tables (nqx x 1,000) applied to the Camp de Tarragona area in the backward population projection (suite)*

Males	10	11	12	13	14	15	16	17	18
0	164.2	153.9	143.9	134.2	124.7	115.5	1066	97.9	89.6
1	195.9	173.5	152.8	133.7	116.0	99.6	84.3	70.0	56.5
5	32.6	28.8	25.4	22.1	19.1	16.3	13.7	11.3	9.0
10	16.7	15.0	13.5	12.1	10.8	9.5	8.3	7.1	6.0
15	25.3	22.9	20.5	18.3	16.3	14.3	12.4	10.7	9.0
20	39.4	35.7	32.0	28.5	25.2	22.2	19.3	16.6	14.0
25	27.8	25.1	22.6	20.1	17.9	15.7	13.7	11.8	10.0
30	35.6	32.8	29.8	27.0	24.3	21.8	19.4	17.1	14.9
35	44.7	41.3	37.8	34.3	31.1	28.0	25.0	22.2	19.5
40	55.2	51.4	47.5	43.6	40.0	36.4	33.0	29.8	26.7
45	67.9	63.8	59.5	55.4	51.4	47.5	43.7	40.1	36.6
50	88.1	83.3	78.6	73.9	69.4	65.0	60.7	56.6	52.5
55	121.9	116.1	110.3	104.6	99.0	93.6	88.2	83.0	77.8
60	175.5	167.6	159.7	151.9	144.3	136.8	129.4	122.2	115.2
65	230.5	221.0	211.5	202.2	193.0	183.9	175.0	166.3	157.8
70	344.1	332.4	320.5	308.6	296.9	285.2	273.8	262.5	251.4
75	457.9	449.7	441.6	433.7	426.0	418.6	411.4	404.4	397.7
80	599.3	592.2	585.3	578.5	571.9	565.6	559.4	553.4	547.6
85	756.1	751.1	746.3	741.6	737.0	732.6	728.2	724.1	720.0
90	871.2	868.4	865.7	863.1	860.5	858.0	855.6	853.3	851.0

Table A3.1. *Mortality tables (nqx x 1,000) applied to the Camp de Tarragona area in the backward population projection (suite)*

Females									
	10	11	12	13	14	15	16	17	18
0	145.7	136.5	127.5	118.7	110.1	101.8	93.8	86.0	78.5
1	203.0	179.1	157.0	136.6	117.7	100.1	83.6	68.3	53.7
5	35.3	30.7	26.6	22.8	19.3	16.1	13.1	10.3	7.7
10	19.8	17.5	15.3	13.3	11.4	9.7	8.1	6.6	5.2
15	27.9	24.6	21.7	18.9	16.3	14.0	11.8	9.7	7.8
20	27.3	24.3	21.5	18.9	16.4	14.1	12.0	10.0	8.1
25	30.0	26.8	23.8	21.0	18.4	16.0	13.7	11.5	9.5
30	34.6	31.1	27.8	24.6	21.7	18.9	16.3	13.8	11.5
35	41.0	37.0	33.3	29.7	26.4	23.2	20.2	17.4	14.6
40	46.6	42.7	38.9	35.3	31.8	28.5	25.3	22.3	19.4
45	55.6	51.5	47.4	43.6	39.8	36.2	32.8	29.4	26.2
50	72.3	67.4	62.7	58.0	53.5	49.1	44.9	40.8	37.0
55	94.0	87.9	82.0	76.2	70.5	65.1	59.8	54.7	49.8
60	140.2	131.4	122.8	114.3	106.1	98.1	90.3	82.8	75.9
65	214.0	202.0	190.2	178.6	167.2	156.1	145.4	134.9	124.9
70	332.5	317.1	301.8	286.7	271.8	257.2	242.9	228.9	215.2
75	443.1	435.6	428.3	421.2	414.3	407.6	401.1	394.8	388.7
80	586.5	580.1	573.9	567.8	561.8	556.1	550.5	545.1	539.9
85	747.2	742.7	738.3	734.1	730.0	725.9	722.1	718.3	714.7
90	866.2	863.7	861.3	858.9	856.6	854.3	852.2	850.1	848.0

APPENDIX 4Table A4.1. *Structure of migrations by age, from Plasencia del Monte (17th and 18th centuries)*

0 - 4	0.00000
5 - 9	0.03280
10 - 14	0.21894
15 - 19	0.19925
20 - 24	0.23256
25 - 29	0.11828
30 - 34	0.11537
35 - 39	0.04331
40 - 44	0.02943
45 - 49	0.01006
Total	1.00000

To calculate the structure of migrations by age, we performed a family reconstruction in Plasencia del Monte (Huesca, Spain) and related it to the annual lists of Easter Observance between 1600 and 1808. Family reconstruction enables us to establish the precise age of those who were born in Plasencia. The Easter Observance lists enable us to know how many young people were present from one year to the next over these two centuries.⁴ The results tell us exactly when residents aged over 8-12 left home.⁵

4. For a more detailed description of the method, see Moreno Almarcegui (1990).

5. It is very likely that, given the nature of our sources, our migratory structure by age underestimates migration by children under the age of 8.

APPENDIX 5Table A5.1. *Demographic indicators for the Camp de Tarragona are*

Life expectancy at birth e0		Total Fertility Rate	Gross birth rate	Gross death rate
(15 years moving average)				
Men	Women			
1553 - 1557		7,1	47,1	39,4
1558 - 1562	29,2	6,8	48,1	39,7
1563 - 1567	31,5	6,8	48,4	33,9
1568 - 1572	33,2	7,1	50,3	34,5
1573 - 1577	34,9	7,4	52,4	35,0
1578 - 1582	30,6	6,5	45,9	29,1
1583 - 1587	31,9	5,7	40,9	45,7
1588 - 1592	31,7	6,5	48,7	28,6
1593 - 1597	34,4	6,0	46,6	28,3
1598 - 1602	29,0	5,5	43,0	35,3
1603 - 1607	27,8	5,0	39,1	42,4
1608 - 1612	29,3	5,4	42,8	29,4
1613 - 1617	33,3	5,2	41,2	30,5
1618 - 1622	31,4	6,0	44,8	30,5
1623 - 1627	28,4	6,2	43,5	35,9
1628 - 1632	26,1	5,9	38,0	39,0
1633 - 1637	22,9	6,1	39,2	36,5
1638 - 1642	21,9	4,7	32,4	48,3
1643 - 1647	20,6	4,0	31,1	33,9
1648 - 1652	28,1	3,9	32,8	37,6
1653 - 1657	32,3	3,9	33,0	20,6
1658 - 1662	37,0	4,1	33,1	25,4
1663 - 1667	35,6	4,3	31,0	24,9
1668 - 1672	36,5	4,3	29,2	23,9
1673 - 1677	35,1	4,7	31,1	27,7
1678 - 1682	33,4	4,8	32,3	31,3
1683 - 1687	33,0	5,1	35,2	33,0
1688 - 1692	34,1	5,4	39,1	30,1
1693 - 1697	35	5,7	41,0	32,9
1698 - 1702	32,9	6,2	43,2	33,3
1703 - 1707	30,0	5,8	38,9	36,7

Table A5.1. *Demographic indicators for the Camp de Tarragona are (suite)*

	Life expectancy at birth e0		Total Fertility Rate	Gross birth rate	Gross death rate
	(15 years moving average)				
	Men	Women			
1708 - 1712	28,1	29,5	5,6	38,5	38,1
1713 - 1717	29,8	32,0	6,3	45,4	36,5
1718 - 1722	30,5	32,2	6,1	45,9	31,7
1723 - 1727	31,0	32,9	6,1	46,3	39,9
1728 - 1732	28,6	32,8	6,2	46,4	35,7
1733 - 1737	28,7	34,7	6,4	45,9	35,4
1738 - 1742	27,9	34,3	6,0	42,3	34,5
1743 - 1747	27,8	31,3	6,1	43,5	35,8
1748 - 1752	27,8	29,1	6,0	43,4	38
1753 - 1757	26,8	27,9	6,3	48,1	38,3
1758 - 1762	24,7	27,0	6,4	50,1	41,8
1763 - 1767	24,5	27,6	6,1	48,8	45,2
1768 - 1772	26,0	28,3	6,0	48	37,7
1773 - 1777	28,0	29,5	6,7	52,1	38,7
1778 - 1782	28,8	29,5	6,6	49,7	40,9
1783 - 1787	29,4	29,5	6,3	45,8	36,6
1788 - 1792	29,1	29,5	6,6	47,3	34,9
1793 - 1797	27,5	29,1	6,7	47,7	39
1798 - 1802	26,4	29,2	6,4	46,3	39,3
1803 - 1807	23,1	25,2	6,1	46,3	37,4
1808 - 1812	24,8	27	5,7	43,6	57,1
1813 - 1817	25,3	27,6	6,4	49,7	32,2
1818 - 1822	30,0	32,5	6,5	50,5	36,6
1823 - 1827	29,8	32,2	6,1	45,8	34,9
1828 - 1832	29,0	31,9	5,9	43	32,9
1833 - 1837	30,7	34,5	5,2	37,1	34,5
1838 - 1842	32,2	35,9	5,2	37,7	26,3
1843 - 1847	34,2	36,9	5,3	38,7	28,2
1848 - 1852	33,4	35	5,2	38	30,3
1853 - 1857	34	34,9	5,2	37,4	30,4
1858 - 1862	33,9	34,3	5,1	37	27,1
1863 - 1867	34,3	33,9	4,7	34,8	30,6
1868 - 1872	32,6	33,4	4,8	35,6	30,4

SUMMARY

We reconstruct the demography of an area on the Mediterranean coast of Catalonia (Spain) over a period of 350 years reflecting considerable changes as a result of the commercial revolution of the Modern Age. To do so, we apply the technique of backward population projection using parish registers.

Our data suggest that nuptiality played an important role in the control of demographic growth in the medium and long term. We find that variations in the intensity of

nuptiality move in the same direction as trends in real wages.

Finally, we consider that these developments in nuptiality were associated with the introduction of more flexible formulas in land use which allowed relatively stable access to arable land on a massive scale, leading to a rise in real wages, which encouraged marriage and fostered the economic transformations of the eighteenth and nineteenth centuries.

RÉSUMÉ

Dans cet article, nous reconstruisons la démographie d'une région de la Catalogne sur la côte méditerranéenne sur une période de 350 ans, théâtre de changements considérables à la suite de la révolution commerciale de l'époque moderne. Pour ce faire, nous utilisons la technique de reconstruction de la population par rétroprojection à partir des registres paroissiaux. Nos données suggèrent que la nuptialité a joué un rôle important dans le contrôle de la croissance démographique dans le moyen et long terme. Nous constatons

également que les variations de l'intensité de la nuptialité ont suivi une évolution similaire à celle des salaires réels.

Enfin, l'article établit que ces évolutions de la nuptialité ont été associés à l'introduction de formes plus souples dans l'utilisation des terres permettant un accès relativement stable aux terres arables à une échelle massive, conduisant ainsi à une hausse des salaires réels, ce qui a encouragé le mariage et favorisé les transformations économiques des XVIII^e et XIX^e siècles.