

Was there ever a Ruling Class? 1,000 years of Social Mobility in England

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(this paper also reports on joint work with Neil Cummins, Economics, Queens College, CUNY).

Using surnames we follow the socio-economic status of elites and underclasses in England all the way from 1066 to 2011. Paradoxically we find two things. The first is that England does not have, and never had, a persistent ruling elite. Social mobility in the long run for the indigenous English and western European migrants has been complete. The second, however, is that mobility rates are much lower than social scientists conventionally measure, and have increased little between the middle ages and now. There is one big change between the years before and after 1850. Before then elites had higher fertility than the poor. Since then elite groups display much lower fertility, so that the permanent effect of a period spent at the social summit is a reduction in number of descendants, even when the group returns to average status.

Introduction

What is the fundamental nature of human society? Is it stratified into enduring layers of privilege and want, with some mobility between the layers, but permanent social classes? Or is there, over generations, complete mobility between all ranks in the social hierarchy, and complete long run equal opportunity?

Specifically, will the unemployed youths of the French banlieues, the English council estates, and the American projects, be the founding fathers of unending lineages of want? Are the students at Choate, Hotchkiss and Groton, or at Eton, Harrow and Rugby, representatives of a timeless elite? To ordinary opinion it is near axiomatic that privilege perpetuates privilege, and want breeds want. The wealthy orbit social circles distinct from those of the poor. They marry their peers. They invest enormous time and money in the care and raising of their children. These children, in consequence, inherit not just wealth, but education, socialization, and

connections. Richard Herrnstein and Charles Murray argue, for example, in *The Bell Curve* that modern America will acquire both an entrenched meritocratic elite, and an entrenched underclass, with prospect of little future mobility between these strata. And when people think of class ridden societies, England strikes them as a particularly clear example.

Take, for example, the history of the Earls of Derby in England. Figure 1 shows the current holder of the earldom, Edward Richard William Stanley, 19th Earl of Derby, pictured below in festive mood with Lady Derby. Also shown in figure 2 is the Stanley family home, Knowsley Hall, which sits 15 minutes from the council estates of Liverpool in 2,500 acres of parkland.

The current Earl of Derby can trace his ancestry all the way back to Ligulf of Aldithley who was an English landowner in the Domesday Book of 1086. The family adopted the name Stanley in the early twelfth century, and by the time of John Stanley (1350-1414) they were knights. The modern ascent of the family was secured by Thomas Stanley, who playing an important role in the Tudor victory at the Battle of Bosworth Field, was created first Earl of Derby in 1485. Since then important members of the family included Edward Smith-Stanley, 14th Earl, who was conservative Prime Minister of the United Kingdom three times, in 1852, 1858-9, and 1866-8. The town of Stanley, capital of the Falkland Isles was named in Smith-Stanley's honor.

The assumption of persistent class privilege also underlies the public provision of education, demands for inheritance taxes, and affirmative action programs in hiring and education.

Social sciences such as economics and sociology have frequently measured the connection between children and parents. But they have been unable to measure the long run dynamics of class, because modern social science databases have existed for only a couple of generations, and following the same families over three generations is not possible with the design of most such panels.

Here we exploit a new method of tracing social mobility over many generations, surnames, to measure the persistence of classes over nearly 1,000 years, 33 generations. In England surnames were inherited, unchanged, by children from fathers. In such cases they thus serve as a tracer of the distant social origins of the modern population (and interestingly also as a tracer of the Y chromosome in the population).

Figure 1: Earl and Lady Derby in Festive Mood



Figure 2: Knowsley Hall, Home of the Stanleys



In this role surnames are a surprisingly powerful instrument for measuring long run social mobility. The results they reveal are clear, powerful, and a shock to our casual intuitions.

- In England, where we can trace mobility to 1066 using surnames, there was never persistent ruling and lower classes for the indigenous population: not in medieval England, and not now. Elites are unable to protect their position, and with enough time fall to average status. For the English class is, and always was, an illusion. Histories such as those of the Stanley family turn out to be rare exceptions, not the rule.
- Paradoxically, while England reveals complete long run mobility, the rates of social mobility per generation, better measured by looking over multiple generations, are much lower than is conventionally estimated. But the mathematics of mobility is such that even slow regression to the mean, over time, completely erases initial advantage and want.
- The rate of social mobility in England was as high in the middle ages as since the Industrial Revolution, despite major social and political changes since 1800 and the extension of the political franchise. The huge social resources spent on publicly provided education and health since 1870 have seemingly not increased the rate of social mobility. The modern meritocracy is no better at achieving social mobility than the medieval oligarchy. Instead that rate seems to be a constant of social physics, beyond the control of social engineering.
- Though parents at the top of the economic ladder in any generation in pre-industrial England did not derive any lasting advantage for their progeny, there was one odd effect. There was a permanent increase in the share of the DNA in England from rich parents before 1850. But after 1850 a frequency effect operated, but in reverse. Surname frequencies show the DNA share of families in England who were rich in 1850 declined significantly relative to that of poor families of the same generation by 2011.
- The different demographic correlates of social status before and after 1800 mean that in the modern world social mobility tends to be predominantly upward, while in the pre-industrial world it was mainly downward.
- There is tentative, but disquieting, evidence that after 1000 years of complete

long run social mobility, modern England, is becoming more stratified by class. The children of groups of recent immigrants to the UK – specifically those from Bangladesh and Pakistan – have levels of wealth, income, and education that are substantially below those of the general population. Even if the same rate of social mobility that we observe for the indigenous population applies to these groups then it will be many generations – perhaps centuries – before they achieve status equality with the rest of UK society. But these groups face additional handicaps that may further slow mobility. The poor of England 1086-1940 were mainly identical in terms of appearance and religion to the rich. But these new disadvantaged groups differ in both in race and religion from the mass of society, potentially creating further barriers to mobility.

What is the meaning and explanation of these results? This is a much more contentious and difficult area. Why can't the ruling class in a place like England defend itself against downwards mobility? If the main determinants of economic and social success were wealth, education and connections then there would be no explanation of the consistent tendency of the rich to regress to the society mean. Only if genetics is the main element in determining economic success, only if nature trumps nurture, is there a built-in mechanism that ensures the observed regression. That mechanism is the intermarriage of the rich with those from the lower classes. Even though there is strong assortative mating, since this is based on the phenotype created in part by chance and luck, those of higher than average innate talent tend to systematically mate with those of lesser ability and regress to the mean.

This in turn has three implications. (1) The world is a much fairer place than we intuit. Innate talent is the main source of economic success, not inherited privilege. (2) The upper classes have tended to vastly over-invest in the care and raising of their children, to no avail in preventing long run downwards mobility. The wealthy Manhattan attorneys who hire coaches for their toddlers to ensure placement in elite kindergartens cannot prevent the eventual regression of their descendants to the mean. (3) Government interventions to improve social mobility are unlikely to have much impact, unless they impact the rate of intermarriage between the levels of the social hierarchy.

Racial, ethnic and religious differences allow long persisting social stratification through the barriers they create to this intermarriage. Thus for a society to achieve complete social mobility it must achieve cultural homogeneity. Multiculturalism is the enemy of long run equality. The existence in England of complete social mobility before the Industrial Revolution further shows that institutional barriers do not explain the long delay in the timing of the Industrial Revolution. Even medieval England was not a society where most of the talent was trapped under the yoke of serfdom, but a place where abilities and skills constantly rose to the top.

Measuring Social Mobility

Existing studies of social mobility generally look at the income, education, or occupational status of children compared to their parents examined just over a generation. Such studies typically use data from modern social science panels such as the PSID in the USA, or from income tax records, and so concern just the last 40-60 years. These studies typically try and estimate b , the rate of persistence of income, from the expression

$$y_1 = a + by_0 + e \quad (1)$$

where y_1 is the log income of sons or daughters and y_0 the corresponding log income of parents. The range of values for b , the persistence of income, is 0.1-0.6 depending on the country, the period over which income is averaged, and controls for age.¹ There will be measurement error in y , however, even when income is averaged over many years. Another source of measurement error is that income will always be an imperfect measure of the true social status of people (since people trade off income for other work aspects such as status). So these studies will tend to underestimate the true persistence of social status.

Economists such as Gary Becker have argued that whatever the exact value of b such studies show that in the long run – meaning 2-3 generations – we live in a world of complete and rapid social mobility. For if all that predicts the income or status of children is that of their parents, then by iteration over n generations

¹ Solon (1999, 2002), Muzumdar (2005), Harbury and Hitchens (1979), Nimubona and Vencatachellum (2007). For a recent literature survey see Black and Devereux 2010.

$$y_n = a + b^n y_0 + u_n \quad (2)$$

even if $b = 0.5$, then $b^2 = 0.25$, $b^3 = 0.125$, $b^4 = 0.06$, $b^5 = 0.03$. Thus within a few generations most of the advantages and disadvantages of earlier generations get wiped out. All that matters for income in generation n is the cumulative random component u_n . Indeed if the income distribution is stable then the amount of the variance in y that is explained by inheritance will be b^2 . Thus Becker and Tomes conclude:

Almost all earnings advantages and disadvantages of ancestors are wiped out in three generations. Poverty would not seem to be a “culture” that persists for several generations (Becker and Tomes, 1986, S32).

However there are reasons to suspect this reasoning on both theoretical and empirical grounds. The theoretical doubt is that the Becker argument assumes that the *only* information relevant for the prediction of the economics success of the current generation is the success of the previous generation. If there are important genetic elements determining economic and social success then this assumption will not hold. The economic and social position of grandparents, and even earlier ancestors will all be predictive of current outcomes.² The assumption also will not hold if membership of a social group or caste is an important determinant of outcomes.

The empirical reason to doubt Becker’s reasoning is that in the USA where we can distinguish families by race or ethnicity, we find that children in these groups are in fact regressing to means that are different from the population mean. This shows if we instead estimate the expression

$$y_1 = a_i + b y_0 + u_0 \quad (3)$$

where a_i is estimated separately for different sub-groups of the population. If all subgroups in the population are regressing to a common mean, a_i will be the same for all groups.

Thomas Hertz carried out exactly such an exercise in a recent study of the link between parental and child income in the USA where he grouped people by race – white, black and Latino – and by religion. Table 1 reports his estimated regression

² That is why breeders of thoroughbred racing horses maintain elaborate pedigrees for the animals.

coefficients, with and without dummies for race, for a sample of 3,568 parental incomes in 1967-71, and the income of adult children in 1994-2000. Simply knowing the race of someone in the USA has a powerful effect on the ability to predict their income, even controlling for the family income of the parents. It also significantly increases regression to the mean, though this time to the group mean. This holds true even controlling for all other measured attributes of parents in 1967-71 such as education, occupation, and household cleanliness.³ These results suggest that indeed the modern USA is a society divided by class, where there is no sign of the ultimate regression to the mean and social mobility that Becker expected.

Hertz's study looked just at the identifiable correlates of class: race and ethnicity. There may be within these populations further hidden divisions of class – but divisions that are not marked by such outward signs such as race or religion. All societies might thus have groups persistently at the top, and those persistently at the bottom, that the simple analysis of regression to the mean cannot capture. If such families are otherwise indistinguishable from the general population, then only by observing them over many generations would we know whether there was for such groups complete long run social mobility.

A simple example of society with hidden classes would be the following, where income depends on parental income, but also an unobserved fixed class or group membership effect, a_i , so that

$$y_1 = a_i + by_0 + e_1.$$

In this case if we estimate the connection between y_1 and y_0 , using the misspecified expression, $y_1 = a + by_0 + u_0$, we will observe classic regression to the mean. But the estimated coefficient \hat{b} will relate to the true b through the expression

$$\hat{b} = 1 - (1 - b) \frac{\sigma_u^2}{\sigma_a^2 + \sigma_u^2}$$

where

$$\sigma_u^2 = \sigma_e^2 \left[\frac{1}{1-b^2} \right]$$

³ Hertz, 2005.

Table 1: Regression to the mean controlling for race, USA

Independent Variable	No controls	Only Race	All Observable Parental Characteristics
Ln Family Income Parents	0.52**	0.43**	0.20**
Black	-	-0.33**	-0.28**
Latino	-	-0.27**	-0.15
Jewish	-	-	0.33**

Notes: ** = significant at the 1 percent level. Only 3 percent of the sample was Latino.

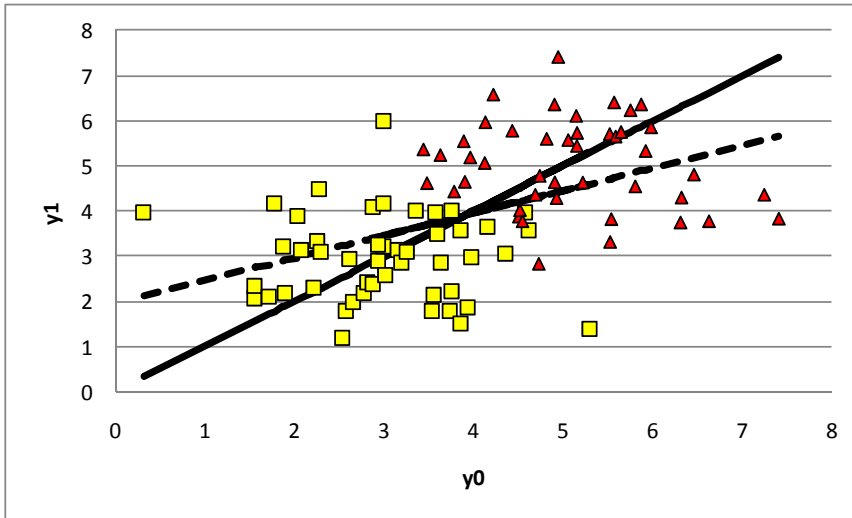
Source: Hertz, 2005, table 6.

Now over many generations the estimated coefficient between current and earlier income will not converge on 0, but instead on $(1 - \frac{\sigma_u^2}{\sigma_a^2 + \sigma_u^2})$.⁴

Figure 3 shows a simple simulation of a society of hidden classes, where there are two social classes, with the first (shown by the squares) having an underlying inherited component of income 3, and the second (the triangles) an inherited component of 5, and where the true b is 0. In this case there are social classes that persist – because of access to education, or exclusion of a different religion, or a caste system. But if we

⁴ The regression coefficient for descendants n generations distant will be $\hat{b}_n = 1 - (1 - b^n) \frac{\sigma_u^2}{\sigma_a^2 + \sigma_u^2}$.

Figure 3: Regression to the mean with different social classes



just pool the raw data and estimate the coefficient b , then the estimated value is 0.5. The dashed line shows the estimated connection with the incorrect specification.

In this example, the estimated b linking grandparents and grandchildren, and even more distant generations will always be close to 0.5. After one generation there will be no further regression to the mean. As can be seen in figure 1 the two groups can never merge in income with this specification, because the groups are regressing to different mean incomes. In the example, once we included separate intercepts for each class, the estimated b becomes close to the true 0 (-0.04 for this simulation). There are persistent classes.

If, however, we do not know a priori what the social strata are – because, for example, they are distinguished by race or religion - then there will be no way of disentangling the various social classes. Presented with the raw data we would incorrectly observe just the general regression to the mean of the world of complete long run mobility. So to observe whether there are persistent social classes in any society we must look at families across multiple generations. By tracking specific groups over many generations we can correct for the potential mis-measurement of intergenerational correlations, and test whether families/groups are in fact regressing to different means.

Common Surnames

The idea of this paper is not to look at specific family linkages across generations, but instead to exploit naming conventions as a way to track families across many generations. We can track economic and social mobility using surnames in a society like England because, from medieval times onward, children inherited the surname of their father. Surnames thus trace the patrilineal descendants of men of earlier generations.⁵ Adoption in England before the nineteenth century was rare, so surnames also trace the path of the Y chromosome, and their later frequency can also measure reproductive success.⁶

In looking at mobility from surnames in England we can use two types of analysis. The first concerns common surnames – those held by many people – such as *Smith*, *Clark* and *Jones*. These surnames attached to the population in the Middle Ages, starting with the upper classes in 1086 in the Domesday Book, and moving down to the general population by the thirteenth century. By 1381 surnames were near universal.⁷

At the time of establishment many surname types were a marker of economic and social status. Thus there is a class of surnames that show the original bearer was an artisan or petty trader: *smith*, *carpenter*, *mason*, *cooper*, *shepherd*, *baker*, *chapman*. This group was not at the bottom of society, but lay outside the landed elite and the educated elite in the thirteenth century.

There are various sources that give the names of the English elite in the late middle ages and later. Alfred Emden, for example, published a complete listing of all known members of Oxford and Cambridge Universities for the years 1180-1500 (Emden, 1957, 1974). From 1180 to 1499 this records 14,654 faculty and students at Oxford. The overwhelming majority of these university members, even from the earliest years, had surnames. Other sources record all members of these universities 1500-1998.

⁵Illegitimate children in England bore the mother's surname. Thus there is still a linkage through the surname to ancestors, just a different ancestor in this case. But illegitimacy was uncommon for most of English history.

⁶ Adoption did not become legally sanctioned until 1926 (McCauliff, 2006).

⁷ Surnames developed because of the limited variety in forenames. Four or five common male and female first names covered the majority of people before 1800. Surnames became essential to identification in England because it was commercial and mobile by the thirteenth century.

Figure 4 shows the percentage of university members, by the year of their first appearance in the record, who had artisan surnames. There is a clear and sharp rise in such members from near 0 percent before 1260 to 7 percent and over by the 1440-59 interval. Thus by the 1450s the share of those of artisan origin attending Oxford university is close to the estimated share of those of artisan origin surnames in the general population in later years. Oxford by the thirteenth century was a prestigious and well known center of learning, and a vehicle for access to the upper levels of the medieval church. By 1450-79 the share of artisan surnames at the ancient universities was within 10 percent of its long run level. A group of lower class origin is here being absorbed into the upper reaches of medieval society with what looks like remarkable rapidity.

Another source for the diffusion of artisan names into the upper classes, is the records of the Exchequer and Prerogative courts of the archdiocese of York in the north of England from 1267 to 1501. Until 1858 church courts were where wills were proved in England. There was a hierarchy of such courts, beginning with archdeaconry courts, then bishop's courts, then the archbishop's courts of York and Canterbury. The appropriate court for filing for probate of a will was theoretically determined by where the real property of the deceased lay. If it was in more than one bishopric then it should be filed in the Archbishopric Courts. So the archbishopric courts dealt with the elite amongst property owners. The Exchequer court dealt with people lower down in the social scale – such as clergy without benefices (endowed positions).

Figure 5 shows the percentage of testators in these courts with artisan names. To establish a baseline, the percentage in the Prerogative Court of York with such names is shown for 1825-49. Interestingly by 1400-24 the share of testators in these courts with artisan surnames had already risen to that of the general population. Social mobility again seems rapid in the late middle ages.

Figure 4: Artisan Names among Members of Oxford University, 1180-1499

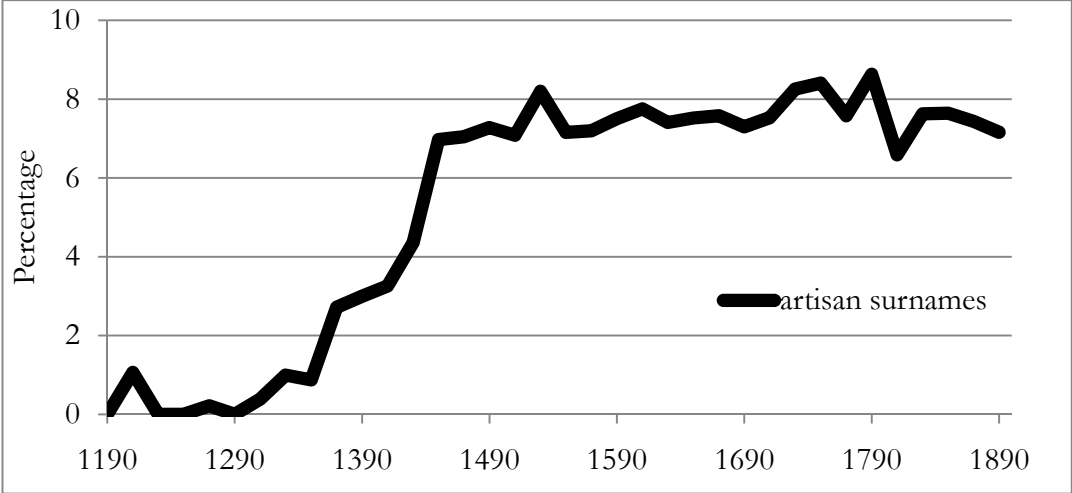
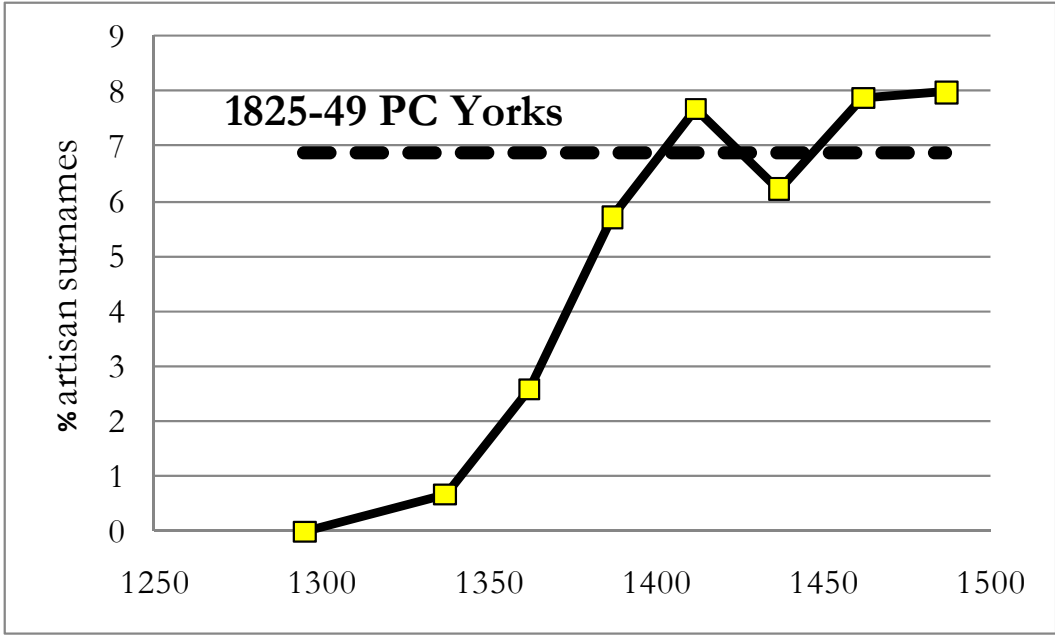


Figure 5: Artisan Names in the York Courts Wills



Source: Index of the Exchequer and Prerogative Courts of York, Borthwick Institute, York.

We also have available an index of surviving wills filed in the Prerogative Court of Canterbury (PCC) 1384-1858. Canterbury was the most important of the ecclesiastical courts that probated wills, dealing with relatively wealthy individuals living mainly in the south of England, and Wales.

More than 1 million of these wills survive, with table 2 showing the frequency in terms of distribution by century. Normalizing by the number of adult deaths per year gives an impression, in the last column, of the share of the population they covered. By the eighteenth century 4 percent of those dying in England and Wales would leave wills probated in the Canterbury court. Allowing for those dying intestate, and the fact that will makers were more likely male, represented perhaps the top 10 percent of wealth distribution. In earlier years PCC wills represented a much smaller fraction of deaths, so they may represent a smaller share at the top of the wealth distribution.

Over time, particularly over the years 1400-1500, the distribution of names in the Prerogative Court of Canterbury wills also changed markedly in favor of artisan surnames. Such names were not found in any PCC wills before 1400, but by 1500 they had risen to what was likely close to the shares of these names in the general population (based here on just a subset of artisan names), as figure 6 shows. Since the PCC measures wealth at death, averaging age 55, and the Oxbridge membership measures status at age 15-20, these two data sets are very consistent. They both imply the large scale movement of the artisan class into the top 2-5% of the wealth/status distribution by 1460-79.

We can get an even finer slice of the rich from the PCC wills by focusing on those labeled with “gentleman,” “sir,” “lord” and other such honorifics. This came to stabilize at about 16 percent of all those leaving PCC wills by 1550 and later.⁸ These individuals represented the richest of the PCC testators, and thus typically the top 1% of less of the wealth distribution of England. Figure 6 also shows the fraction of all “gentleman” testators with lower artisan surnames. Again there is convergence of a stable share of such surnames, though the convergence takes much longer and is not complete until after the 1660s. This implies that in the course of 260 years the artisan class of the middle ages moves from the lower end of the income distribution to

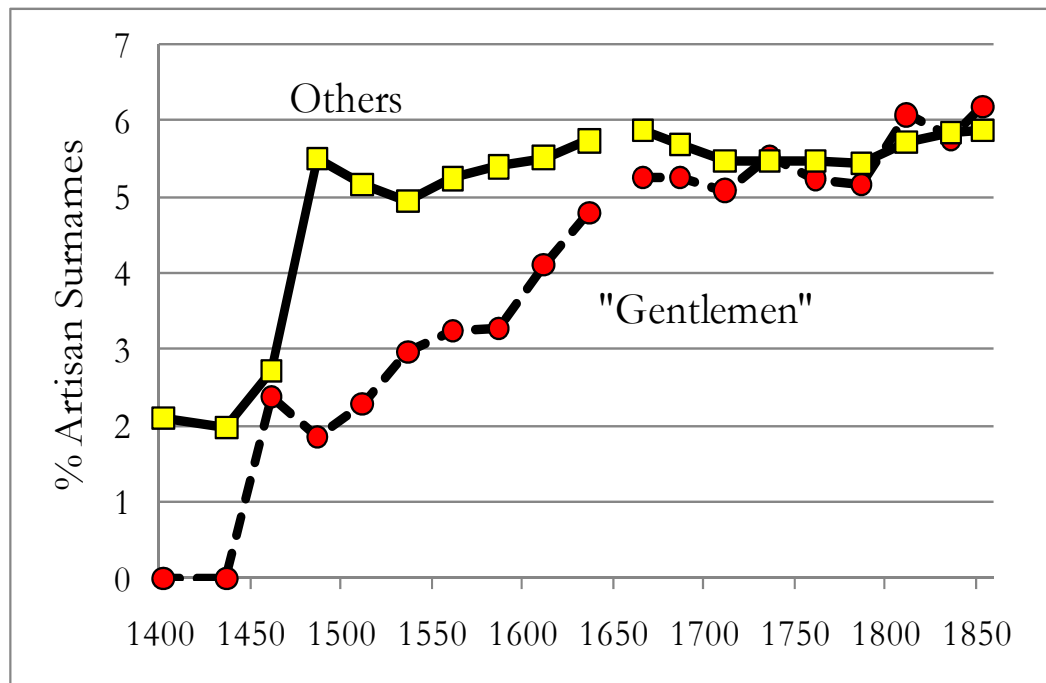
⁸ Earlier most wills have no indication of the occupation or status of the testator.

Table 2: Distribution of Prerogative Court of Canterbury Wills

Century	PCC wills	Population (millions)	Wills/year/death
1384-99	87	2.5	.0002
1400-99	5,915	2.3	.002
1500-99	45,555	3.3	.010
1600-99	218,624	5.2	.029
1700-99	361,827	6.7	.040
1800-58	384,119	14.6	.036

Source: *Index to the Prerogatory Court of Canterbury Wills.*

Figure 6: Artisan Names in Prerogative Court of Canterbury Wills



Source: *Index to the Prerogatory Court of Canterbury Wills.*

Notes: This graph is drawn for a subset of all artisan surnames.

being fully represented among the richest in the society. There is complete long run mobility in medieval and early modern England.

While we see here signs of complete mobility to all ranks of society by the original artisan class, what is the rate of that mobility? The speed of convergence of any elite or subordinate group to the general distribution of wealth, income or status, where relative representation becomes 1 everywhere in the wealth distribution, is dependent on two things: b , which measures the extent of regression to the mean over a single generation, and σ_y^2 the variance of wealth, income or status. The bigger that variance, the longer it will take for an advantaged or disadvantaged group to have a wealth or income distribution the same as that of the general population.

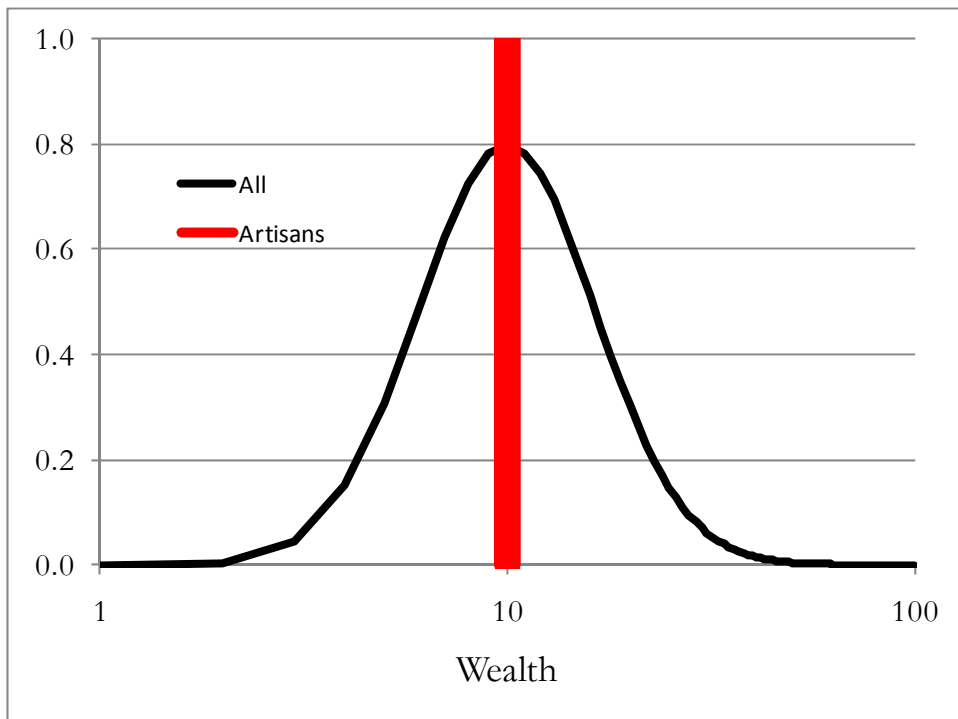
Thus to measure the implied speed of this mobility, the b of medieval England, we thus need to know just three things: where did the artisan group start in the wealth/income/status distribution, how elite a share of the population was Oxbridge, and what was the dispersion of (log) wealth/income/status σ_y^2 .

How elite a share of the population were students and faculty at Oxford and Cambridge? The number of men born per year in England 1480-99, and surviving to age 15, would be about 20,600.⁹ 179 men per year are recorded first at Oxford and Cambridge in 1480-99 (this number depends on record survival, so will be a lower bound). Thus entrants to the university represented 0.9% of the male cohort in these years. Entry to the university was a prelude in these years to service at the university, in the church, in law, or in government. The students of Oxford and Cambridge thus constituted an elite of between the top 2% and 5% of the population (not all the social elite attended the universities).

The second thing we need to know is where those of artisan surnames started in the rank of socio-economic status in society. Here I assume that they were at the median status level, as is shown in figure 7. They outranked the large population of landless agricultural laborers, and of domestic servants. The third element is the variance of log wealth in pre-industrial England. I assume that wealth overall is distributed log normally with a variance of 3.24 (based on data on wealth at death 1550-1750).

⁹ Assuming a total population of 2.4 million, a crude birth rate of 35, and that 60% of males survived to age 15.

Figure 7: The Original Position of Artisans in a Hypothetical Wealth Distribution in 1250



A measure of the movement of a group into or out of an elite position in society is its *relative representation* at different points in the wealth distribution. This is just defined as

$$\text{relative representation} = RR = \frac{\text{share of group } x}{\text{share of population}}$$

A subgroup of the society that has wealth or status distributed the same as the society as a whole will have a relative representation at all levels of the society of 1. And elite group will have a relative representation at the top x% of the income or wealth distribution that is greater than one. A lower class group will have a relative representation that is less than one. Thus in 1260 the relative representation of artisan surnames at Oxbridge was 0. By 1460-79 that relative representation was 0.9, and by 1580-99 it was 1.

With these assumptions the implied b , the degree of persistence of status or wealth in medieval England can be calculated by simulating the movement of the relative representation of the artisans at Oxbridge with different assumed values of b . Figure 8 shows the actual movement of the relative representation of artisan names at Oxbridge, as well as the path that we would see with the assumptions above if $b = 0.5$, and if $b = 0.75$. As can be seen the $b = 0.75$ simulated path of convergence, with the assumptions above, is close to the actual path.

This implies that while there was complete social mobility in medieval England for these lower social classes, the speed of that mobility was actually quite slow by the expected standards of the modern world. This simulated path is based on the assumption that Oxbridge represented the top 2% of the English population. If instead we assumed that Oxbridge was less elite, and represented a draw from a full 5% of the top wealth and incomes in English society, then the b will be somewhat lower, though the difference is not great. Now the best fitting b would be close to 0.8.

The artisan surnames show the ascent of the lower classes. What about the decline of the ruling class? Figure 10 shows the relative representation at Oxbridge of two groups of medieval elite from 1180 to 1900. The first set of elite surnames we can examine are those of the Norman conquerors of 1066, who took over much of the wealth of England from the earlier Anglo-Saxon nobility. This group was among the first in England to bear hereditary surnames, though not all their descendants adopted these original surnames.¹⁰ These surnames are first recorded in the Domesday Book of 1086 and associated charters and other documents (Keats-Rohan, 1999).

These surnames identified people by their village of origin in Normandy (and also Brittany and Flanders, since some of the conquering army was drawn also from these regions). These names include such well known English names as Balliol, Baskerville, Bruce, Darcy, Glanville, Lacy, Mandeville, Percy, Sinclair, and Venables. Thus Baskerville is from the village of Bacqueville in Normandy, Venables from

¹⁰ Some of the Domesday elite had children that took another surname. For example, Ernald de Nazanda had children who did not use the surname “de Nazanda.” But those with the Domesday surnames we can assume the descendants of this elite (Keats-Rohan, 1999, 190).

Figure 8: Simulated Convergence of Artisan Names to the Oxbridge Elite under different values of b (top 2%)

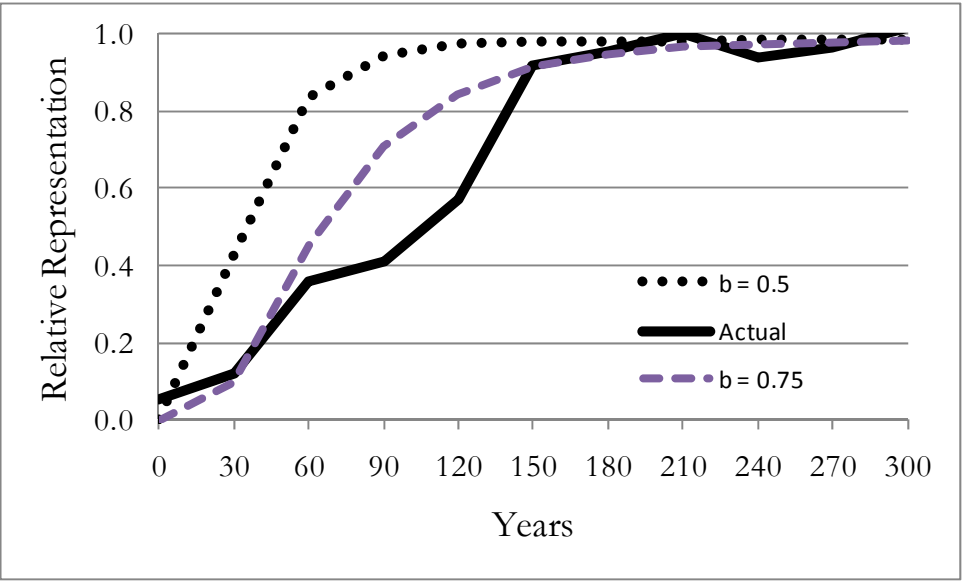


Figure 9: Simulated Convergence of Artisan Names to the Oxbridge Elite, Elite being top 5%

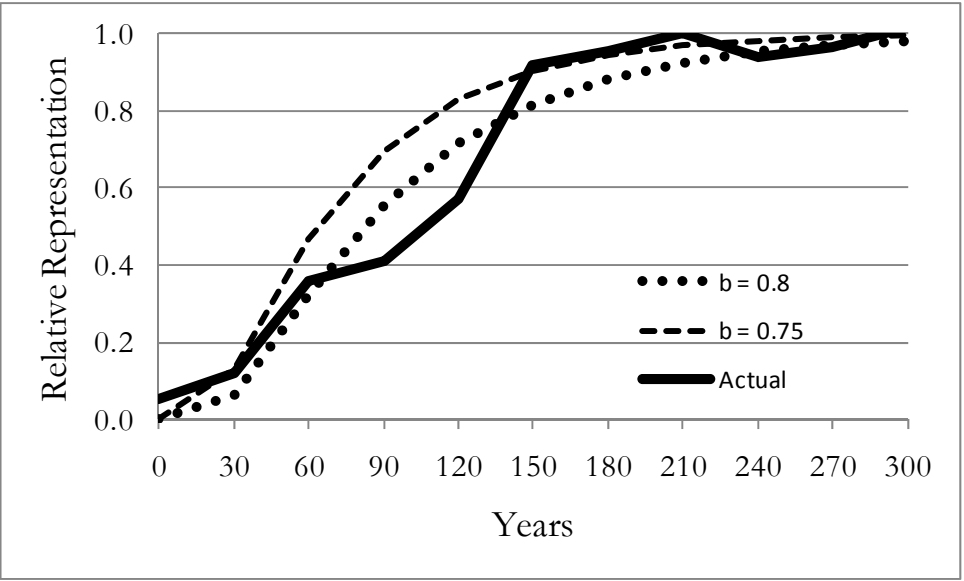
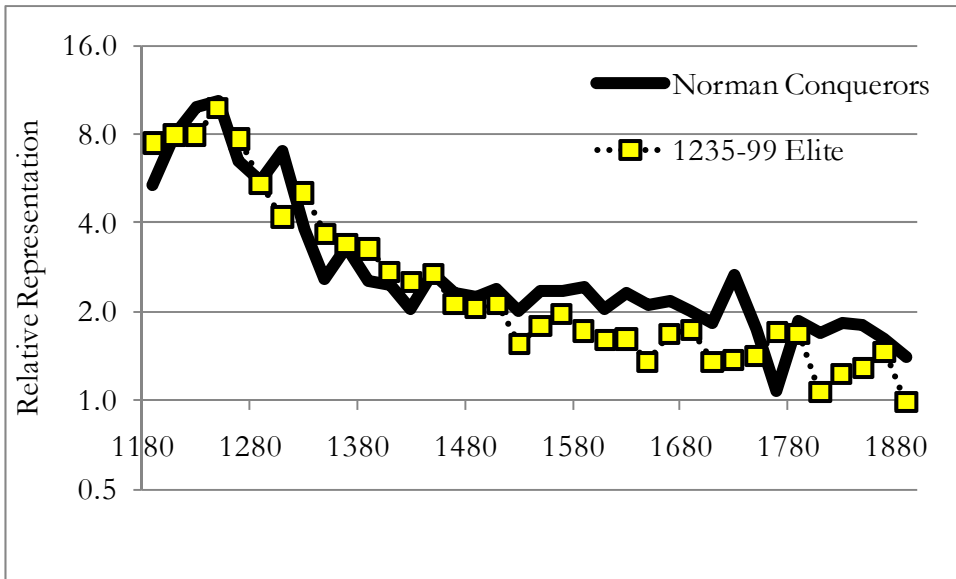


Figure 10: Relative Representation of Medieval Elites at Oxbridge, 1180-1900



Venables, Ivry from Ivry-la-Bataille. As the ruling class imposed by force in 1066, did this group remain a distinct upper class in medieval England thereafter?

For the Norman elite a group of 236 names of this form, appearing in the Domesday book, was compiled. The frequency of these names in the later medieval population was estimated at 0.4 percent in 1538-1599 from Boyd's marriage register, though by 1881 it had risen to 0.521%. What was the relative representation of this conquering elite at Oxford university by the thirteenth century, assuming their name share in the general population was 0.4 percent? Figure 10 shows this by 20 year periods from 1180. In the thirteenth century these surnames were on average eight times as frequent at the university as in the general population. However, their representation fell rapidly in the fourteenth century, so that by the early fifteenth century these names were only a bit more than twice as common at the university than in the general population.

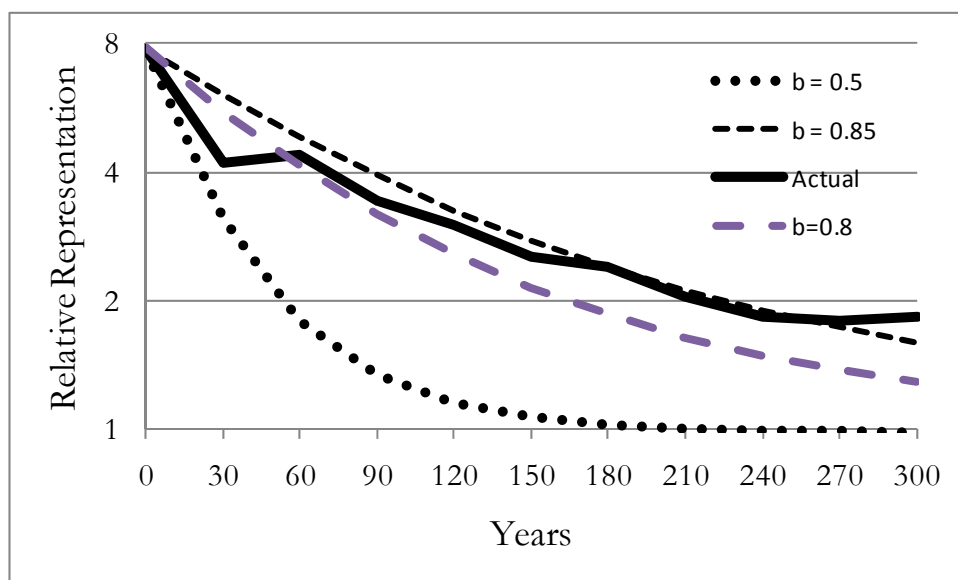
Also shown figure 10 are the percentage of students and faculty at Oxbridge with surnames the same as a 10 percent sample of the medieval elite identified though the *Inquisitions post Mortem* of 1236-99. *Inquisitions post mortem* were inquiries at the death of feudal *tenant in chief* (direct tenants of the crown), to establish what lands were held,

and who should succeed to them. The holders of these properties were typically members of the upper classes of medieval England. With rarer names typical of this group there is a problem of their mutation over time. Since they are not anchored to a well known form, like “smith”, they can and will mutate, especially for names of foreign origin if their original meaning and significance is lost. Thus in forming a 10 percent sample of the upper class names of 1236-1299 from the *Inquisitiones Post Mortem* I deliberately favored those names that correspond to places in England since this will tend to anchor the form of the name over time, or two names so distinct that even if they mutated their mutations would be discernable. Names in this sample included Baskerville, Berkeley, Beaumont, Essex, Hilton, Lancaster, Maundeville (Mandeville), Neville, Normanville, Percy, Somerville, Wake. This sample thus includes many from the original Norman elite, but also a variety of new rich emerging between 1086 and 1235.

In the thirteenth century this 10% sample of elite names constituted 5.2 percent of university members, implying that the whole of the elite identified in the Inquisitions Post Mortem could have been as much as 52 percent of the members of Oxford then. But as we see their relative representation declined in a similar manner to that of the Norman elite (this sample surname group was 0.67% of the population in 1538-99).

Assuming Oxbridge was the top 2% of the population, what was the b implied by the subsequent decline of the relative representation of this group? Figure 11 shows the relative representation of this 1235-99 elite at Oxbridge over 10 generations, where generation 0 is 1236-1299. Also shown is the implied representation, given the starting point in generation 0, for a b of 0.5 and 0.85, and the assumption that Oxbridge was the top 2% of the population. The assumption here is that the elite had the same variance of status as the general population, but a higher mean status in the original generation. At a b of 0.5, with these assumptions the advantage of the elite would be gone in 5 generations. In order to fit the data we need instead to assume a b of 0.85, which is even higher than the 0.75 we estimated for artisan surnames. Though here what shows is that the initial convergence towards the mean seems higher than that observed as the group becomes less distinct. Thus over the first 3 generations the implied b is 0.8, close to the artisan persistence measure.

Figure 11: Simulated b for the 1236-99 Elite at Oxbridge



However, when we look at the end of the data on Oxbridge, in 1880-1900 we do see an extraordinary residuum of the medieval past. It is still the case for this generation that Norman origin surnames are still 51% more frequent than they are in the general population, though those of the 1236-99 elite are just 22% more frequent. This is a relatively inconsequential overrepresentation. If 2% of the population were then at Oxford or Cambridge, then among the Norman elite surnames the share would be 3%, hardly a noticeable difference. This old elite has effectively become average – testament to the slow but inevitable forces of regression to the mean. But it is testament to the slowness of these processes that 800 years after the Norman Conquest you can still discern this residual effect.

Rare Surnames

By 1650 common surnames lost most information on economic and social status, as a result of the extraordinarily complete social mobility of the English in the years 1200-1650. To trace mobility through surnames after this we turn to rare surnames.¹¹

¹¹ See the interesting study of Güell, Rodríguez Mora, Telmer (2007) which also measures social mobility through rare surnames, but using cross-section data.

In England there always has been a significant fraction of the population holding rare surnames. We have good measures of what surnames were rare in England after 1540 from various sources: 1538-1840 Boyd's marriage index (together with various supplements) which lists 7 million surnames of people married in England, and the manuscript censuses of 1841-1911. Figure 12, for example, shows the share of the population holding surnames held by 50 people or less, for each frequency grouping, for the 1881 census of England. The vagaries of spelling and transcribing handwriting mean that, particularly for many of the surnames in the 1-5 frequency range, this is just a recording or transcription error. But for names in the frequency ranges 6-50 most will be genuine rare surnames. Thus in England in 1881 5 percent of the population, 1.3 million people, held 92,000 such rare surnames. Such rare surnames arose in various ways: immigration of foreigners to England, such as the Huguenots after 1685 (example, "Bazalgette"), spelling mutations from more common surnames (example, "Bisshopp"), or just names that were always held by very few people, such as "Binford" or "Blacksmith."

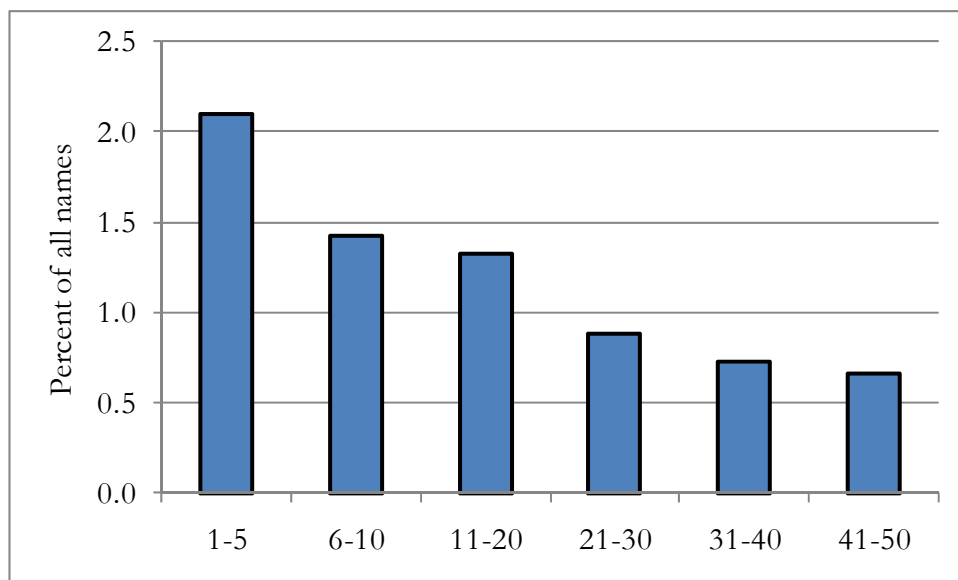
Through two forces – the fact that many of those with rare names were related, and the operation of chance – the average wealth levels of those with rare surnames will vary greatly at any time. We can thus divide people post 1600 into constructed social and economic classes by focusing on those with rare surnames.

We can follow the economic and social success of those with rare surnames 1858-2011 using a number of sources. First probate records which give an indication of the wealth at death of everyone in England and Wales by name.¹² We can also measure social status using the death register which allows us to calculate the age at death of most people with rare surnames dying in England 1841-66, and of all people 1866-2008.¹³ Average age at death in all periods is a good index of socio-economic status. The third source we use are the public records of address and occupation, such as the electoral register, which become available for 1998 and later. The last source is the records of those admitted to elite institutions such as Oxford and Cambridge, available 1200-1998.

¹² Those not probated typically have wealth at death close to 0.

¹³ For people dying 1841-1866 with rare names we can infer age at death for most of them from the censuses of 1841, 1851 and 1861, and the birth register 1837-1866.

Figure 12: Relative Frequency of Rare Surnames, 1881 Census, England



Rich and Poor in 1858-1887¹⁴

Taking a generation length as 30 years, we construct first samples of rich and poor rare surnames in 1858-1887. For the rich sample we take surnames with 40 or fewer holders in the 1881 census where the average wealth of those dying (measured as personalty) was £1,260 or higher, taking those with no probate aged above 21 as having a wealth of £5, since the requirement then for probate was a wealth of £10 or above. This minimum corresponds to 22 times the average annual wage earnings in England in these years.

To identify a poor sample we started with similarly rare surnames from three sources. First there was the 1861 list of paupers who had been in workhouses across England and Wales for at least 5 years. Then there were people convicted of crimes in Essex courts 1860-1862. Finally there were those convicted of crimes in the Old Bailey in London in these same years. These surnames were included in the sample of poor surnames only if the average probate value 1858-1887 was less than £400, again counting missing probates at £5.

¹⁴ This section from Clark and Cummins, 2010.

Table 3: Summary of the 1858-2009 Rare Name Sample

Period	Rich Surnames	Rich Probates	Rich Deaths	Rich Deaths 21+	Poor Surnames	Poor Probates	Poor Deaths	Poor Deaths 21+
1858-87	64	412	800	636*	294	77	3,291	1,720*
1888-1917	59	331	661	541	279	231	3,048	1,789
1918-1947	57	456	720	675	269	461	2,636	2,152
1948-77	47	428	625	615	283	921	3,177	2,966
1978-2008	51	289	523	518	273	1,116	3,503	3,431

Note: * Estimated from 1866-87 ratio of deaths 21+ to all deaths for 1858-65.

The surname database then consisted of everyone dying with these surnames in the interval 1858-2008, 5 generations of 30 years, plus a last of 31 years, as well as their ages at death and probate values where they were probated. Table 3 gives a summary of the data.

Figure 13 shows the probate rates of the rich and poor surnames by decade, for those dying 21 and older. Also shown as a measure of the general indigenous English population are the probate rates for the surname “Brown.” The extreme difference in probate rates narrows over time. But even by 2000-2008 probate rates for the rich surname group are above average by at least 10%.

Figure 14 shows the average of the log value of the probates of those probated among rich and poor by decade, as well as for the control group, the “Brown” surname, until 1930-9. Probate values here in £ are normalized by dividing them by the average annual wage in England in the year of probate. Thus the normalized values are bequests expressed in multiples of the average annual wage.

Figure 13: Probate Rates of Rich, Poor and “Brown” samples, by decade

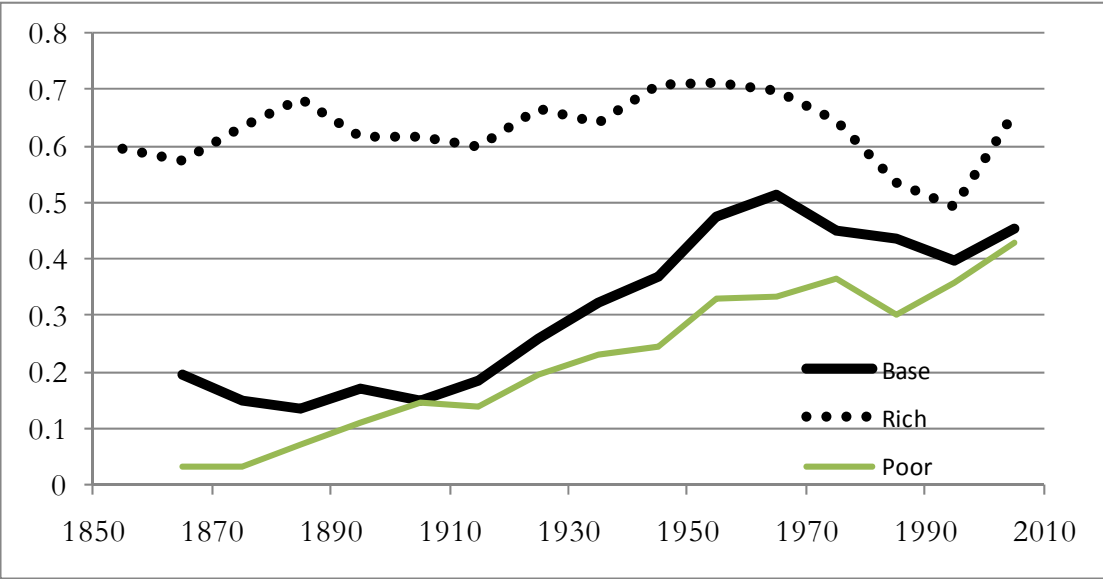


Figure 14: Ave Log Value of Probates, those probated, by decade

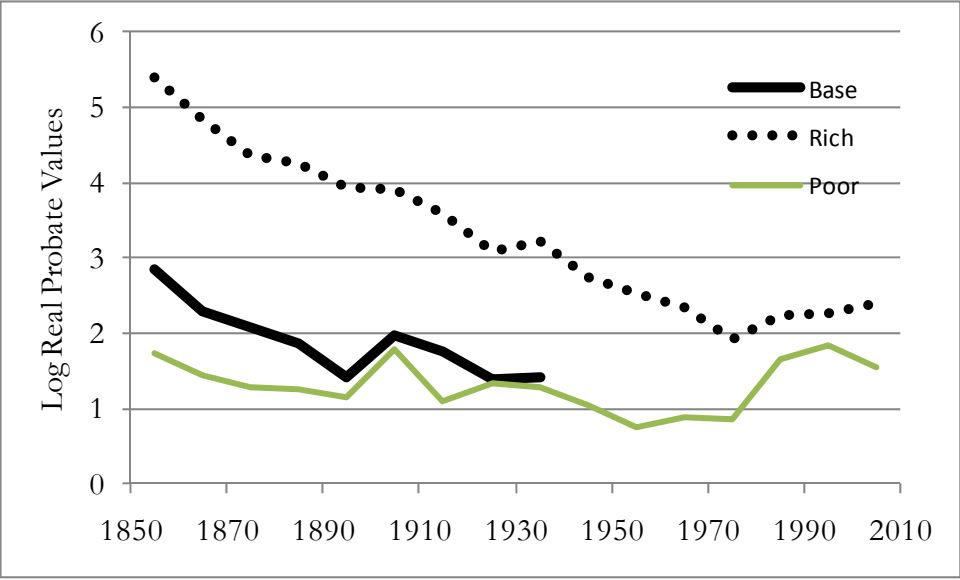
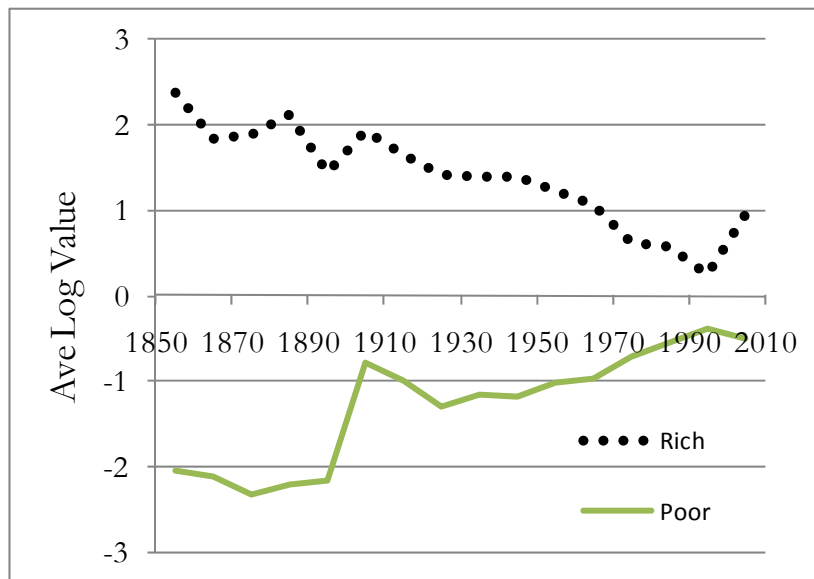


Figure 15: Average Log Probate value, including those not probated, by decade



The average values for those probated among the rich approach those of the poor surname group over time, but are still higher in 2000-7. Finally figure 5 combines the information in figures 3 and 4 to produce an estimate of the average wealth at death of the rich and poor surname groups by decade, all normalized by annual wages in pounds. The fact that generally only a minority of those dying aged 21 and above are probated means that we have to infer wealth at death for those not probated to get average wealth levels. The measure we use for these inferred probates is half the estate value at which probate was required. These minimum values for required probate were £10 (1858-1900), £50 (1901-1930), £50-500 (1931-1974), £1,500 (1975-1983), and £5,000 (1984-2011) (Turner, 628). Figure 15 shows that there is clearly a process of long run convergence in wealth of the two surname groups, and that process continues generation by generation, so that eventually there will be complete convergence in wealth of the two groups. For the indigenous population in England there are no permanent social classes, and all groups are regressing to the social mean. But this process of convergence turns out to be much slower than recent estimates of β s for income, earnings and education would suggest. Average wealth at death in 2000-8 was still significantly higher for the group identified as rich in 1858-1887. Indeed the average wealth of the “rich” surname group from 1858-1887 was still 4.2 times that of the “poor” surname group in 2000-8.

It is also evident in figure 15 that the estimated rate of convergence will be influenced by the need to infer the value of the missing probates. The jump upwards in the relative average log wealth of the poor in 1900-9 is purely an artifact of the raising of the probate cutoff value to £50 in this period, which led missing values under our procedure to be inferred as £25, compared to £5 before. We hope to find better ways of inferring these missing values in future work.

Another way we can observe this convergence is through average age at death. Life expectancy in England, for example, has since at least the nineteenth century been dependent on socio-economic status. In 2002-2005 life expectancy for professionals in England and Wales was 82.5 years. For unskilled manual workers it was only 75.4. Thus another way to observe whether the rich and poor of 1858 converge, and how quickly, is using the death register for England and Wales, which for 1866-2005 shows the age of death of everyone in England by name.

If we take just the overall average age of death by group then the differences in 1857-1887 are dramatic: 50.7 for the rich, 31.7 for the poor. As figure 16 shows these average ages at death converged steadily over time, but had not completely converged by 1978-2008. Average age at death for the rich surnames was still 78.0 for the rich surnames, compared to 74.1 for the poor, a difference of 3.9 years. The reason for the extreme difference in life expectancy in the first generation is actually a combination of lower death rates for the rich at each age, but also differences in fertility which expose more of the poor population in the early years to high child mortality risks.

Since we do not know the age structure of the population, measuring fertility accurately is not possible. However, given the average age at death of those 21+ we can estimate for each group in each decade the stock of the population in the 25-45 age group if we assume (counterfactually) a uniform age distribution. Then we can calculate a rough measure of the numbers of children born per woman. This is shown in figure 17.

As can be seen there are substantial differences in the estimated fertility of rich and poor surname groups which while narrowing over time are still present in 2000-8. In the nineteenth century the higher fertility of the poor was partially counterbalanced by substantially higher infant and child mortality. Thus child mortality in the poor

Figure 16: Average Age at Death, by Generation

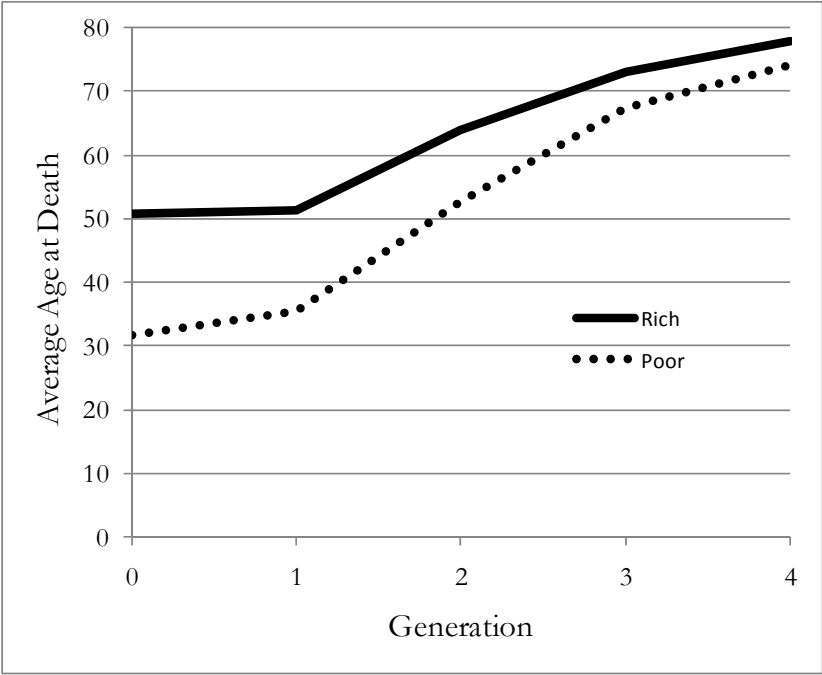
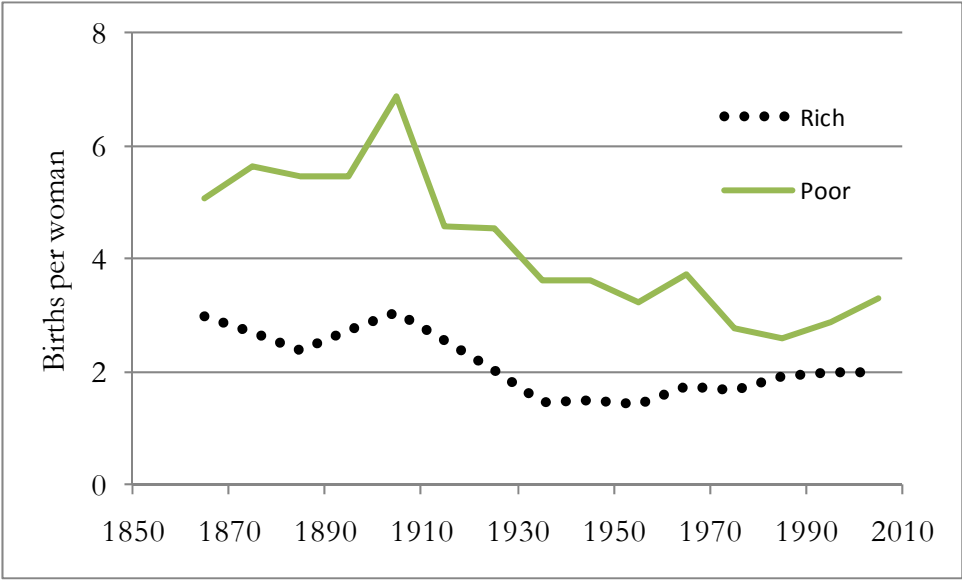
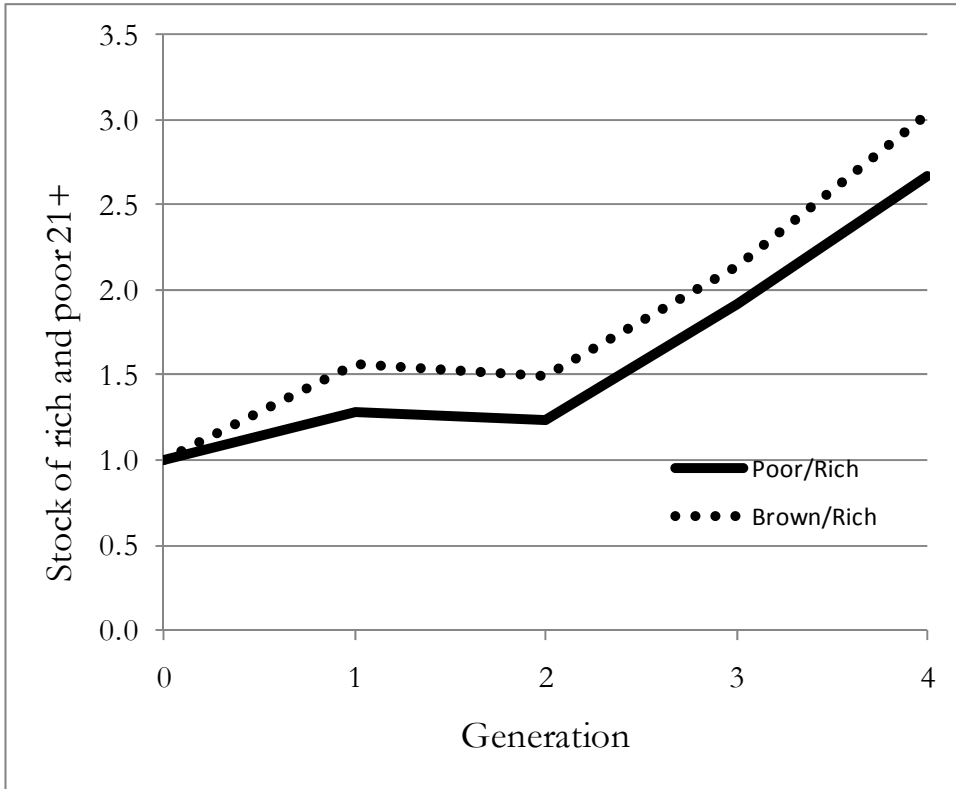


Figure 17: Estimated births per woman by decade, rich and poor surnames



Note: By construction this will overestimate fertility in a stable population since the 25-45 cohort will be larger than is estimated here.

Figure 18: Numbers of Poor 21+ Relative to the Rich, 1858-2009



group before 1900 was 138 per 1000 more than for the rich. But the relative population of the poor surname group has increased substantially over time relative to that of the rich group. To measure the population of those aged 21+ in each group we used the formula

$$stock = \frac{deaths\ per\ year}{(average\ age\ at\ death - 21)}$$

where the average age of death is that of those dying 21+. Figure 18 shows the relative size of the stock of “poor” surname people, and the stock of “brown” surname people, compared to the stock of the “rich” surname group. The relative poor stock rose more than 150 percent between 1858-87 and 1978-2008. But the brown stock increased even more, by 200 percent.

Thus in this period, instead of survival of the richest, and the growing share of

the rich descendants in population, we see the decline of the rich class even as it regresses towards the social mean. It must be emphasized that these stock estimates are subject to much error, but they are underlain by a basic fact that the numbers of those dying with rare rich surnames declined substantially relative to those with rare poor surnames, and even more substantially relative to a common name like *Brown*.

Estimating bs

We can estimate the bs, the measure of persistence in wealth, in several different ways. If we define y_{Ri} and y_{Pi} as the average of ln wealth for generation i for the rich and poor surname groups, then the b linking this generation with the nth future generation can be measured simply as

$$y_{Ri+n} - y_{Pi+n} = b(y_{Ri} - y_{Pi})$$

This estimation has an advantage that after the first generation, when rich and poor samples were chosen partly based on wealth, there is no tendency for the b estimate to be attenuated by measurement error in wealth, since the average measurement error for both rich and poor groups will be zero. Also as long as wealth is linked to true underlying social status, even imperfectly, this measure will show how rapidly the two groups are moving towards each other. However, there is a disadvantage that there is no associated standard error with the estimated b. Figure 9 shows the mean log wealth of each group by generation, and table 3 the implied bs.

Another advantage of this estimate is that by construction,

$$b_{04} = b_{01} \cdot b_{12} \cdot b_{23} \cdot b_{34}$$

so the individual period b estimates are consistent with the observed long run mobility.

It is striking how high the b estimates are in table 4. It is also striking that over 4 generations the b is still 0.26, though as figure 19 shows there will be eventual convergence in wealth. The fact that the b between generations 3 and 4 was only 0.53 might give some hope of faster regression to the mean in future. But if you look at figure 15, you will see that for those dying in 2000-8 there is no sign of any faster convergence, though this may just be random error. Wealth at death now may be

much more subject decade to decade to the vagaries of the housing market and stock market.

Suppose we count complete regression to the mean as the two groups of descendants having average wealth within 10 percent. If we assume the b from now on is the one between the last two generations of 0.53, it will take 8 generations (the generation of 2098-2127) to achieve this. But if the future b is the average of the between generations b s for 1858-2008, then complete convergence will require 12 generations (2218-2247).

The more conventional way to estimate b is by taking the average wealth of each surname in each generation as the unit of observation, and then estimate by OLS the b values (weighting by the average number of observations in each surname group).

The regressions run are

$$y_{i+n} = a + b^n y_i + u_{i+n} \quad (4)$$

where here y_{n+i} is the average log wealth by surname in period $i+n$. As noted this measure is always subject to attenuation bias because of the errors in measuring wealth, and the imperfect link between wealth and true underlying social status. The first set of regression coefficients are reported in table 5, along with standard errors. We included controls for the fraction of testators in each surname group who were female in each generation.

Figure 19: Average Log Probate value, by generation

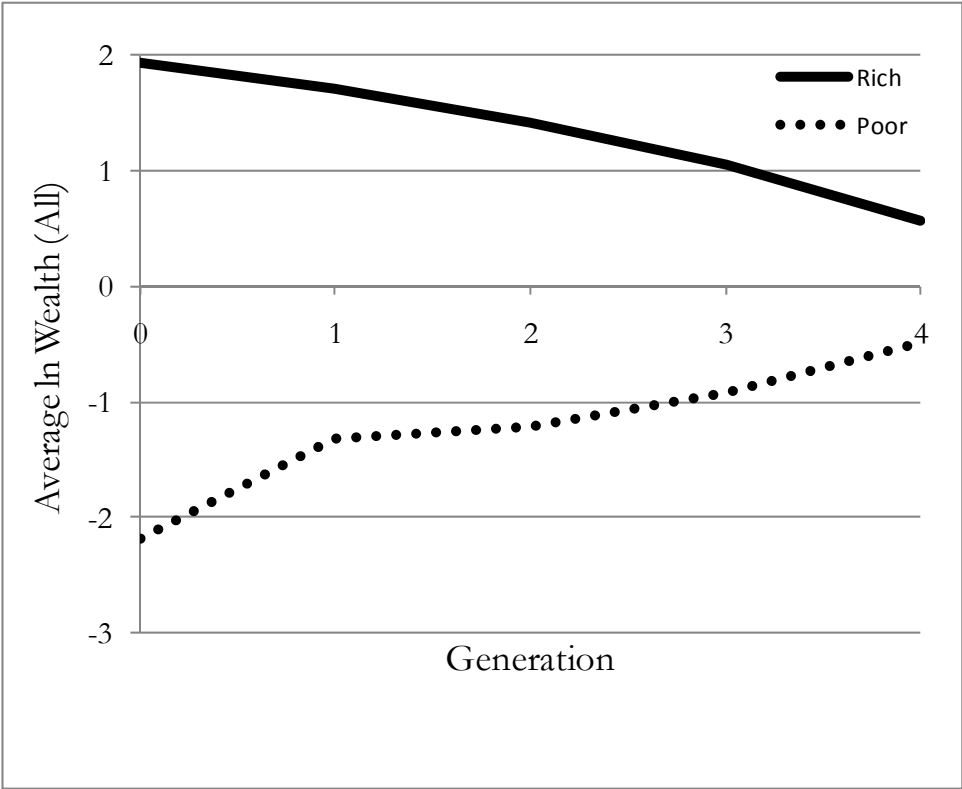


Table 4: Wealth Persistence measures

	Generation 1	Generation 2	Generation 3	Generation 4
Generation 0	0.74	0.64	0.48	0.26
Generation 1		0.87	0.65	0.35
Generation 2			0.75	0.40
Generation 3				0.53

Table 5: Estimated b values between generations, conventional estimates

	Generation 1	Generation 2	Generation 3	Generation 4
Generation 0	0.662 (.030)	0.604 (.027)	0.469 (.028)	0.308 (.032)
Generation 1		0.748 (.034)	0.567 (.035)	0.379 (.041)
Generation 2			0.684 (.034)	0.441 (.041)
Generation 3				0.501 (0.044)

Note: Standard errors in parentheses.

As predicted the one-period b estimates here are always lower than with the estimates in table 4, though not dramatically so. However, we do see evidence in table 4 that the b's either are being estimated as too low, or the rich and poor groups are regressing to different means. For if the process was the Markov one that most studies of social mobility assume, then

$$b_{04} = b_{01} \cdot b_{12} \cdot b_{23} \cdot b_{34}$$

In fact we see in table 4 that

$$\hat{b}_{04} = 0.31 > \hat{b}_{01} \cdot \hat{b}_{12} \cdot \hat{b}_{23} \cdot \hat{b}_{34} = 0.67 \times .75 \times .68 \times .50 = 0.17$$

The long run regression to the mean is slower than the one period bs would predict. One possibility is that measurement error in wealth is leading to b estimates that are too low. If there is the same measurement error in estimating the bs, an attenuation factor θ , between any two generations, then

$$E(\hat{b}_{04}) = b_{04}\theta > E(\hat{b}_{01} \cdot \hat{b}_{12} \cdot \hat{b}_{23} \cdot \hat{b}_{34}) = b_{01}\theta \cdot b_{12}\theta \cdot b_{23}\theta \cdot b_{34}\theta = b_{04}\theta^4$$

In this case we can get better estimates of the true bs between periods by taking the ratios of the estimated bs. Thus

$$\frac{E(\hat{b}_{02})}{E(\hat{b}_{12})} = \frac{b_{02}\theta}{b_{12}\theta} = \frac{b_{01}b_{12}}{b_{12}} = b_{01}$$

This method suggests the following “true” values of b across each generation of

$$b_{01} = 0.89, b_{12} = 0.83, b_{23} = 0.88, b_{34} = 0.66.$$

Another possibility, however, is that the rich and poor surname groups are regressing to different means, so that they will never converge. To test for this possibility we estimate (4), but with a separate intercept term for the rich surnames. Table 6 shows the results of this estimation. Now the b estimates fall very substantially, and at the same time the rich are estimated across all generations to be regressing to a higher mean than that of the poor (DRICH, the indicator for the rich surnames, is positive). If we were just to estimate wealth mobility across two generations with this method we would conclude that rich and poor would never converge.

However, while DRICH is always positive and significant, it is clear from figure 19, and from the associated evidence on measures such as average years lived, that the rich and poor surnames groups will eventually converge. And in table 6 we see that the separate intercept term for the rich surname group is always declining in size as we go across more generations. This suggests that Hertz’s finding that Jews and Blacks in the US were regressing to means different from the general population in the long run may be just an artifact of the estimation method, and that instead there is a much slower general regression to the same social mean (Hertz, 2005).

All this suggests that there is no substitute for observing the long run outcomes in trying to observe the process of social mobility. Regressions run on the characteristics of just two adjacent generations will not be able to statistically predict the nature and the rate of the long run mobility regime. Our conclusion here is that while the bs were high, very high, there is no sign that the upper class will persist in advantage for ever, or the lower class persist in disadvantage.

Table 6: Intergenerational b, Distinct Intercepts for Rich and Poor

	Generation 1	Generation 2	Generation 3	Generation 4
Generation 0	0.360 (.072)	0.450 (.065)	0.246 (.068)	0.147 (.075)
Generation 1		0.429 (.057)	0.331 (.057)	0.195 (.064)
Generation 3			0.472 (.055)	0.320 (.065)
Generation 4				0.398 (.058)
DRICH 0	1.663 (.329)	0.861 (.303)	1.074 (.317)	0.680 (.342)
DRICH 1		1.184 (.213)	0.963 (.215)	0.783 (.239)
DRICH 2			0.809 (.182)	0.514 (.216)
DRICH 3				0.467 (.172)

Will Universal Regression to the Mean Continue in England?

What the rare surname dataset implies is somewhat paradoxical. On the one hand the Beckerian vision of ultimate regression to the social mean seems to apply to modern England as well as late medieval England. In the long run no social class, at least among the indigenous English and immigrants from western Europe, is able to stop from regressing to the mean. The poor similarly regress upwards. There are no permanent upper classes and under classes, but instead long run equality. On the other hand these processes are occurring at a very slow pace, as slow as in medieval England.

There is evidence, however, that England's period of complete social mobility will potentially end as a result of the immigration in the last 100-200 years of new groups to England who are more heterogenous in terms of religion and ethnicity. Table 7 thus shows the median wealth of families from a variety of religious and ethnic backgrounds in England in 2006/8. This snapshot of wealth in one cross section does not reveal the underlying dynamics of wealth in England. But it does suggest that these new immigrant groups are experiencing radically different social situations in England, with Jews and Bangladeshi's forming groups at the polar opposite. Given the rates of convergence to the mean we observe for the indigenous population, even if we assume these rates of regression would apply to these immigrant groups, it would take 6-10 generations for Bangladeshi and Jewish median wealth to equalize. But more likely there are characteristics of these groups that would imply even slower rates of convergence, implying that for England in the next 200-300 years there will be quite clear and identifiable persistent upper and lower classes, not observed since the times of the Norman Conquest to 1460.

Table 7: Total wealth inequality between groups in Britain, 2006/08

Religion/Ethnicity	Median wealth (£)
Jewish	422,100
Sikh	228,700
Christian	222,900
Hindu	206,100
Other Religion	161,100
No religion	138,500
Buddhist	74,800
Muslim	41,600
Pakistani	96,900
Black Caribbean	75,500
Black African	20,600
Bangladeshi	15,000
ALL	204,500

Source: Wealth and Assets Survey 2006/08.

Conclusions

What should we think of these results? Does it imply a society of enduring privilege, with limited opportunities for the lower class? Assuming the b estimates here survive greater amounts of data, the problem is that we have no clear idea of what b would be in a society of complete opportunity and access. Indeed Richard Herrnstein and Charles Murray in *The Bell Curve* argue that recent creation of a meritocracy, combined with assortative mating, will lead to an ever more stratified society, but stratified by intellectual abilities that are strongly inherited (Herrnstein and Murray, 1996).

It is also likely that most of the strong correlation of wealth across generations does not come from direct transfers of assets from parents to children. In other work Clark has shown that only about a third of the correlation of wealth between fathers

and sons in England 1550-1850 is explained by bequests from fathers (Clark, 2007). Rich fathers have rich sons mainly because the sons are inheriting other characteristics of the fathers, such as their genetics, which are transmitted independently of how many surviving children father's have at death.

The fact that by 2000-8 there was still a difference in average age at death between the rich and poor surname groups does suggest that other types of transmission of characteristics that create socio-economic advantage, social and genetic, are important. Years lived is not going to be directly a function of wealth, but much more a function of lifestyle, aptitudes, and attitudes. There is no expectation that in England, with its open access National Health Service, wealth would create much direct benefit in terms of years lived. Wealth must thus just be correlated with other attributes that promote longer lives. So the plausible cause of the intergenerational correlation of wealth is not inheritance of wealth, but of these other attributes.

It matters to people's sense of the fairness of society whether the high correlation of wealth across generations is largely the product of home environment, or of genetics. The *bs* we find here for wealth are equivalent in magnitude to those for the most strongly inherited genetically controlled human traits. The *b* for human height for example between parents and children in modern high income societies is 0.8-0.9, with most of this from genetics and not environment (height differences by social class are now modest). But we see nothing problematic in this high height *b*, since it is mainly genetic. So what matters in our attitude to the *bs* found here is whether they turn out to be largely explained by genetics. Twin studies reveal that both earnings and education are strongly influenced by genetics, but there is no equivalent study for wealth.

We also have to do more in looking at the startling divergence in the numbers of those with the rich rare surnames compared to those with poor rare surnames and the indigenous population (represented by the name *Brown*). Our data suggests that starting with the generation born around 1860, the poor and the general population had much greater reproductive success than our rich group, resulting in much larger numbers of poor deaths in the generations 3 and 4. Indeed at a time when English population tripled, the rich surname group barely increased its numbers. This might, however, in part arise from greater migration of the rich from England to the USA, to the British Empire, and to Europe in the late nineteenth century. And indeed there is

evidence in the probates that a significant number of the rich were dying abroad. If the wealthy are in general more cosmopolitan and polyglot, so that they end up spread around the globe, then this would explain their surprisingly small numbers in later years.

But the crude estimates of fertility shown in Figure 17 control for out migration, in that it looks at deaths in England compared to births in England. And these suggest consistently low fertility rates by the rich surname group, though again with a tendency to converge on the poor. This, however, does mean that while all wealth is ultimately transitory, and there is no enduring ruling class, the ruling group of any moment in the modern world is likely to see a permanent reduction in their share of the population. Wealth does have persistent effects, but only through demography.

Since some of the rich surnames were distinctive and aristocratic in their sound, could it be that as people in this group moved down they changed surname? The names in our rich sample include Willoughby de Broke, Bazalgette, Du Cane, and Champion de Crespigny. With a larger sample of rich surnames we will be able to check if the relative frequency of such aristocratic surnames declined over time, as a possible indicator of name changing. However, these four names were 6.6 percent of rich surname deaths in 1858-87, and 6.1 percent of deaths in 1978-2008. So there is no indication so far that elite names are being abandoned as people become less elite.

One interesting issue that this raises, however, is with the quality-quantity tradeoff theory that dominates modern discussions of fertility. The rich had fewer children, yet in the end they were condemned to regress to the social mean. The poor had many children yet moved up to the social mean. So interestingly there was no strategy of investing more in fewer children that could keep the elite in the same social position permanently. The forces of regression are stronger than any family strategies could overcome. In that sense though regression to the mean is slow here, its inexorable power on elites and under classes is surprising in light of the ability of elites to trade off quantity for quality in children, and to endow their children with considerable wealth.

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