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PIOUS BEQUESTS IN WILLS: A STATISTICAL ANALYSIS

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Abstract

This paper employs maximum likelihood methods to analyze the increase in pious bequests in early modern French wills. Other historians have described the rise of pious bequests in wills, but no one has used multivariate statistical methods to explain the phenomenon. It turns out that at any level of wealth pious bequests rose over the course of the seventeenth century and that the bequests, were most pronounced among the literate and women. The paper argues that the increase in pious bequests was mark of growing support for the Counter Reformation, which attracted an inordinate number of supporters in educated circles and in the female population.

PIOUS REQUESTS IN WILLS: A STATISTICAL ANALYSIS

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Historical Background

On the 28th of May, 1678, Pierre Renillier, a prosperous farmer in the village of Longes in southeastern France, called a notary to his sickbed. He was gravely ill, and being of advanced age, he feared he might never recover. He therefore wanted to divide his estate and settle his affairs on this earth, and so he summoned Floris Lentilhon, a notary in the nearby market town of Sainte Colombe, in order that Lentilhon might transcribe his last will and testament.

When the notary arrived, Renillier at once began to dictate his will. Blessing himself, he said that "as a good Christian and Catholic I entrust my soul to God the Father Almighty and to his only begotten Son our Lord and Savior Jesus Christ." He then folded his hands in prayer and begged "the most glorious Virgin Mary Mother of God" to intercede for him and act as his "advocate" so that God would pardon his sins. He asked that he be interred in his family's grave at the parish church in Longes and requested his heirs to arrange for his funeral and for two anniversary masses after his death.

After addressing these religious concerns, Renillier settled down to the task we normally associate with a will - that of

distributing his estate to his heirs. Renillier had already given a considerable part of his property to his two married daughters in their marriage contracts, and in his will he gave each of them a small piece of land. He also left twenty livres to his only other descendant, a granddaughter. The rest of his estate went to his wife. These material legacies, though, were bound up with additional religious bequests. In return for the property they received, Renillier's daughters were to have forty masses said at two nearby friaries for the repose of their father's soul. Similarly, Renillier's wife was to set aside ten livres from the estate for another twenty masses for his soul at the parish of Longes. Finally, Renillier left twenty bichets of rye (worth about 30 livres) to the poor who attended his memorial masses and prayed for him.

All told, Renillier spent 60 livres on posthumous masses and charity. This was a considerable sum at a time when a poor rural day laborer might earn only 100 livres a year. Renillier was thus making a significant gesture when he reserved 60 livres for pious bequests instead of giving it to his heirs. He clearly believed it was worth spending this money on masses and charity in order to improve his lot in the next world. Of course, he had every reason to act this way. Catholic theology assured him that charity and masses would spare him pain in the hereafter; indeed, such good works could even improve his chances for salvation. In effect, Renillier was doing the impossible; by making pious bequests, he allowed his money to work for him even after death.

Strange as this behavior might seem to a modern reader, it was very common in late 17th-century France as well as elsewhere in Catholic Europe. Apparently, men and women were so committed to Catholicism that they almost invariably reserved a sum for masses and religious charity in their wills. What then do historians make of this widespread practice? At first glance, one might assume that it was merely an unvarying, rigid custom and therefore of little interest. But this is not what Michel Vovelle discovered in his celebrated work, Piété baroque et déchristianisation en Provence au 18e siècle. Vovelle, a historian of the French Revolution, found that the practice of making pious bequests in wills grew far more common in the 17th and early 18th centuries and then waned after 1750, at least in far southern France. Pierre Chaunu, a social historian and demographer, unearthed a similar pattern in Paris in his La mort à Paris. Both Vovelle and Chaunu interpreted the increase in pious bequests in the 17th century as a mark of the Counter Reformation: in their opinion, the massive campaign to attract the faithful undertaken by the Counter-Reformation Church in the 17th century had resulted in greater support for Catholicism and hence increased donations in the wills. Similarly, the decline in donations in the 18th century reflected growing anticlericalism on the eve of the French Revolution.

Most historians have accepted Vovelle's and Chaunu's interpretation enthusiastically and perhaps a bit uncritically. The enthusiasm of historians is readily explained. In the first place, the wills shed light on the religious behavior of numerous individuals

— behavior which would otherwise be unknown to us. In cities such as Marseille, approximately 40% of the population left wills in the 18th century; in market towns and the countryside, testaments survive for 60% or even 80% of the populations. The information these wills contain is obviously of great importance in the new social history and indeed in all early modern history, because religion dominated much of social and political life through the 19th century. More important, the wills allow historians to link religious behavior to a host of other variables — a testator's occupation, sex, or education, for example — and thereby isolate those sections of society where Catholic practices were strongest or weakest. Vovelle and Chaunu would go even further. For them, the wills give evidence not just of religious behavior but of religious attitudes. In their opinion, if a testator gave money to the Catholic Church or to the charities it extolled, then he was not simply a practicing Catholic but a devout one as well. Similarly, if he forgot the Church in his will, then his attachment both to Catholic ritual and to the Catholic faith were probably weak. Thus Vovelle considers the decline in pious bequests after 1750 as a mark of alienation from Catholicism, and he notes that this hostility to the Church was particularly pronounced among the middle classes — a harbinger of their anticlericalism during the Revolution.

It ought to be pointed out that drawing inferences about religious attitudes and religious commitments from wills, as Vovelle and Chaunu do, is fraught with some largely unrecognized difficulties.

A will may accurately record charitable donations and the bequests for masses, but reasoning from these gestures back to the testator's actual beliefs requires no small leap of faith. To his credit, Vovelle acknowledges this difficulty in Piete baroque: other historians, however, are a bit cavalier in their treatment of the problem. They ignore the fact that a will may describe only the motions a testator went through and that it may say nothing of his true preferences.

Nor is this the only difficulty with the works of Vovelle and Chaunu. Even if we consider their assertions simply as statements about the religious behavior recorded in the wills, their conclusions remain open to question. Did Catholic piety (in the narrow sense of behavior - that is, the founding of masses and the stipulation of other bequests associated with Tridentine Catholicism) really increase during the 17th century, as both Vovelle and Chaunu maintain? Did these same practices then fall in the 18th century? Both authors present graphs and charts which show that a growing number of testators requested masses during the course of the 17th century and that this practice disappeared after 1780. Neither author, however, asks whether the changes he observed were statistically significant, and so we have no way of knowing whether the differences in the wills are merely statistical aberrations. Lack of statistical technique also prevents Vovelle and Chaunu from distinguishing what is important from what is unimportant. As a result, they at times bury the reader with a confusing welter of charts and graphs, and their argument falls

victim to the mindless empiricism that afflicts much recent social history. Worse yet, Vovelle and Chaunu rarely consider multivariate explanations. We learn, for example, that sex and social class affected the religious gestures individuals made in their wills, but these separate factors and others are never weighed together.

Vovelle and Chaunu also ignore alternative explanations of the phenomena they observe. They both view the growing number of religious bequests in the 17th century wills simply as a mark of the Counter Reformation. The trend, however, could also have resulted from declining prices for food, which swelled peoples' disposable income and allowed them to purchase such luxuries as masses for their souls. Unfortunately, neither Vovelle nor Chaunu considers this possibility.

At the very least, then, early modern historians need a multivariate analysis of pious bequests made in the wills, an analysis that employs sophisticated statistical techniques to probe the differences in religious bequests among individuals and the change in pious bequests over time. Such an analysis would at least be far more efficient than the artisanal methods Chaunu and Vovelle employ, and it would allow researchers to confirm hypotheses and focus upon what is most significant.' In addition, the results could help give a much needed sense of direction to social historians working in this area.

I have undertaken such a study with my own sample of wills both to test Vovelle's and Chaunu's assertions and to verify several of my own beliefs concerning support for the Counter Reformation in

southeastern France. The wills I read come from a sample of microfilmed notarial registers from the department archives of the Rhone in Lyon. They were drawn up in the 16th, 17th, and early 18th centuries in the Lyonnais, the countryside west of Lyon on the banks of the Saone and Rhone rivers. While these testaments do not constitute a random sample of individual wills, this fact should not bias my conclusions.⁷

Like Vovelle and Chaunu, I labeled any demand for masses, any bequest to the Church, or any charitable donation a pious bequest.⁷ My reason for doing so is that all such acts were encouraged by the Counter-Reformation Church and all the testators in my sample were Catholic. Throughout most of this paper I shall consider these pious bequests not as evidence of religious attitudes but simply as religious behavior promoted by the Church. Only at the end of the paper (and then only briefly) shall I turn to the question of how these religious acts are to be interpreted and whether they do reflect actual belief in Tridentine Catholicism. For the present, then, piety and pious bequests will refer not to internal convictions but merely to the sort of behavior the Counter-Reformation Church encouraged. Whether true devotion, lust for status, or other sentiments drove men to leave money in their wills is another matter.

A number of hypotheses concerning the pious bequests need to be tested. First, did the bequests actually become more frequent over the course of the 17th century, as Vovelle, Chaunu and the literature on the Counter Reformation suggest? Second, did the value of the

bequests grow relative to individuals' wealth? If attitudes and preferences in fact changed, as Chaunu and Vovelle maintain, then the amount of money earmarked for pious bequests should grow relative to the total value of the testator's estate. Third, were women more likely to make pious bequests? Both Vovelle and Chaunu claim that women did give more frequently to the Church than men, and it can be argued that women in particular were drawn to Tridentine Catholicism because it offered them an outlet unavailable elsewhere in society.⁷ Finally, were the literate more likely to give money to the Church than the illiterate? Chaunu suggests that they were. In his opinion, the literate stood a very good chance of encountering the voluminous body of Counter-Reformation literature which described how a good Catholic ought to confront death. According to Chaunu's research, over 80% of all private libraries described in estate inventories contained one or more books describing the art of dying well.¹¹ In these ars moriendo, as they were called, the reader would learn that the making of a will was a spiritual exercise required by his faith and necessary to his salvation. Clearly, familiarity with such works might influence a testator. So too would familiarity with the whole body of literature which was produced by resurgent Catholicism and circulated among elites in the 17th century.

Testing the Hypotheses

In order to test the hypotheses concerning literacy and the other variables, we have to specify a relationship which describes how pious bequests are likely to vary from testator to testator. The

place to begin is the connection between bequests and the testator's wealth. If we make the eminently reasonable assumption that the richer a man is the more masses and other religious services he will purchase, then the amount M a testator allocates to pious bequests should be an increasing function of his estates's value W , for W acts as a budget constraint when the testator divides up his estate. The same should hold for the dummy variable P that equals 1 if the testator makes a pious request and is 0 otherwise. In order to test the hypotheses concerning sex (S), literacy (L) and the changes in pious donations over time, we can also suppose that M and P depend upon S , L and the year Y in which the testament was dictated. Finally, it is reasonable to expect that M and P also depend upon the testator's age A and the number of his children K . If attitudes and preferences did in fact change, for instance, older testators who were born before the shift in religious belief might well bequeath less to pious causes. Similarly, a testator with young, unmarried sons or daughters would in all likelihood feel compelled to provide for his children rather than to concern himself with his spiritual future.¹¹

As a first approximation, I assume that M and P are linear functions of W , Y , S , L , A and K and that there are no interaction effects.¹²

$$(1) \quad P_i = a + bW_i + cY_i + dS_i + eL_i + fA_i + gK_i + u_i$$

$$(2) \quad M_i = a' + b'W_i + c'Y_i + d'S_i + e'L_i + f'A_i + g'K_i + v_i$$

Here the subscript i refers to the values observed for the i -th individual; a through g and a' through g' are constants; and u_i and v_i

are error terms.

With this specification, the expected value of $\frac{\partial}{\partial Y} \left(\frac{M}{W}\right)$ is

$$E\left(\frac{\partial}{\partial Y} \left(\frac{M}{W}\right)\right) = E\left(\frac{1}{W} \frac{\partial M}{\partial Y}\right) = \frac{c'}{W}.$$

Thus, if $c' > 0$, $\frac{\partial}{\partial Y} \left(\frac{M}{W}\right) > 0$; or, in other words, if c' is positive, then the ratio of pious bequests to wealth increases over time.

Similarly, S and L will boost $\frac{M}{W}$ if d' and e' are positive. Hence we can reduce questions about the ratio $\frac{M}{W}$ to questions about the coefficients c' , d' , e' , etc.

Unfortunately, the specifications 1 and 2 suffer from some rather annoying drawbacks. First of all, P is clearly dichotomous and M turns out to be truncated at zero. Blindly applying ordinary least squares regression (OLS) to estimate the coefficients in equations 1 and 2 is therefore likely to be misleading. One solution to this problem is to employ maximum likelihood methods and use a probit specification for P and a tobit specification for M .¹³ Specifically, we suppose that our dummy variable P actually reflects an unmeasured random variable P^* . This unmeasured P^* is an index of the likelihood that a given testator will make a pious bequest, and we assume that it is a linear function of our independent variables. Formally,

$$P_i^* = a + bW_i + cY_i + dS_i + eL_i + fA_i + gK_i + u_i, \quad (1')$$

where the error terms u_i are independent standard normal. We observe $P = 1$ when $P^* > 0$, and $P = 0$ when $P^* \leq 0$. The tobit equation for M is similar. We assume that M simply reflects an unmeasured variable M^* ,

where

$$M^* = a' + b'W_i + c'Y_i + d'S_i + e'L_i + f'A_i + g'K_i + v_i \quad (2')$$

and where the error term v_i is also normal. Again, we observe M when $M^* > 0$, and in this case $M = M^*$. Otherwise, $M = 0$. With independent normal error terms, we can write down the likelihood functions for equations 1' and 2' for given values of P , M and the independent variables. Maximum likelihood estimates of the coefficients a through g and a' through g' can then be derived by means of an optimization algorithm. These estimates in turn permit a test of our hypotheses.

Estimating both equations 1' and 2' actually turns out to be unnecessary. Once we have an estimate for the tobit equation 2', we can use it to determine the behavior of P^* and hence of P . In fact, if our estimate of the tobit equation yields

$M^* = a' + b'W_i + c'Y_i + d'S_i + e'L_i + f'A_i + g'K_i + v_i$, and if the error term v_i has standard error S , then $P^* = \frac{M^*}{S}$ will serve as an index of the likelihood of a pious bequest in equation 1'. Moreover, the probability that a given testator makes a pious bequest (i.e. the probability that $P = 1$) will be $F\left(\frac{M^*}{S}\right)$, where F is the cumulative standard normal distribution. Since this index $\frac{M^*}{S}$ incorporates information about the amounts testators left the Church, it should provide a better measure of the relationship between P and the independent variables than the simple probit equation, which ignores the value of the pious bequests and takes into account only the fact that a bequest was made. We will therefore rely upon this index

$P^* = \frac{M^*}{S}$ derived from the tobit equation to analyze the changes in the behavior of the dummy variable P .¹⁴

While the problems with our dependent variables are readily surmounted, another difficulty with the two equations cannot be overcome so easily. This is the fact that the wills never actually mention W , the size of the testator's estate. In early modern France, a will normally disclosed the value of many of the testator's possessions, and it recorded his gifts to nearly all heirs. But it often omitted the price of pieces of real property, and it said nothing about the legacy of the "universal heir," the person to whom the testator left the remainder of his estate after all other bequests had been made.

Several possible solutions to this problem of the size of the estate suggest themselves. First, we could ignore the variable W , estimate the equation without it and use specification analysis to assess the effects of leaving W out. This method would permit a test of a number of the hypotheses despite our ignorance of the total value of the estate.¹⁵ The problem, however, is that specification analysis does not carry over easily to maximum likelihood estimation of limited dependent variables.¹⁶ Therefore leaving W out does not solve our problem. We have to find a proxy for it.

Three substitutes for W are available, and we shall try all three in order to verify that our conclusions are not overly sensitive to the choice of a proxy. The first is to invoke what we know about the testator's occupation. The wills invariably recorded what a man

or a single woman did for a living, and for married women or widows, the will gave the husband's work. Tax records provide an estimate of the average wealth for any occupation, since taxes were based, at least to a first approximation, upon a family's net worth. Evidence of familial wealth in marriage contracts tends to confirm the

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information in the tax records. And in the countryside, where most individuals worked the soil, the list of occupations was full enough to distinguish between landless agricultural laborers (ouvriers, journaliers), yeoman farmers (habitants), and wealthy landowners (sieurs villageois).

The tax records and marriage contracts indicate that the testators fell into three broad categories of wealth.¹¹ The wealthiest, which I term the elite, consist of nobles, officers, judicial officials, notaries, sieurs villageois, bourgeois and merchants from market towns. The second, which has come to be known in French as the coos du village, comprised prosperous farmers (habitants) artisans, and village merchants, who were in most cases indistinguishable from artisans. The third category, the peasants, contains the remainder of the populace, including laboureurs, vignerons, journaliers and domestics.

Dividing the testators into these three categories does provide a rough control over the value of the estates. In particular, it compensates for any oversampling from the poor group in one period and from the elite in another. Nevertheless, it is obviously open to criticism. To begin with, the tripartite division of fortunes is too

simplistic. The poorest wealth class lumps together both small farmers and agricultural wage laborers, while the elite group is even more disparate. And in a more general sense, even if the three categories manage to capture the distribution of fortunes at a given instant, they mask any changes in wealth over time. In particular, if the wealth of all occupations grew, the occupational categories might remain the same, and yet our increase in pious donations could then be the result of greater prosperity rather than a mark of heightened piety.

It is true that the tripartite division simplifies the distribution of fortunes. Yet the evidence from tax records and marriage contracts suggests that the relative rank of the various occupations remained fairly stable during the Old Regime.¹² More important, there is no evidence that wealth increased across the board during the seventeenth century. In fact, both real wages and real

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returns from land leases stagnated or declined slightly. In other words, the two major sources of income in the countryside — salaries and rents from ownership of land — failed to grow during the years 1600-1700. With incomes frozen, it is hard to see how fortunes could have swelled. One might argue that savings jumped, but no evidence supports this, and in fact the growing weight of taxation probably reduced the amount individuals could put aside.

Our second proxy for wealth stems from a discovery Chaunu made, and it poses a different set of problems. In Paris, Chaunu was able to find estate inventories for a number of his testators, and he

discovered that the worth of a testator's estate invariably fell between 3 and 4 times the total of all bequests given a cash value in
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the will. Although a value was often not assigned to real property and even to chattels in a will, a sum was almost always mentioned for bequests to inheritors other than the universal heir. The money due a legatee often represented the revenue from property holdings or a sum to be paid by the universal heir. These cash bequests were ultimately connected to the size of a testator's fortune, and it is thus no wonder Chaunu uncovered a relationship between the total of the bequests in a will and the value of an estate. Although he presents no statistical analysis which would make the relationship precise, he does claim that the multiplier applies equally to the 16th and 17th centuries.

Unfortunately, linking wills and estate inventories is not possible in the Lyonnais. Inventories are far too rare in the local notarial archives, and they are not indexed as in Paris. Nevertheless, a similar relationship between cash bequests and wealth is likely to hold for the wills drawn up in the countryside around Lyon. One bit of evidence that is consistent with such an assumption is the relationship between total cash bequests and the wealth classes. The mean value of total bequests is much higher for members of the elite than for the other two wealth categories (see table 1). The relative level of T for each class also tends to parallel what we know about wealth from tax records and marriage contracts, so it seems reasonable to assume that Chaunu's relationship carries over to the Lyonnais. We

TABLE I
AVERAGE VALUE OF THE SECOND WEALTH
PROXY T FOR WEALTH CLASSES

CLASS	AVERAGE VALUE OF T (<u>LIVRES</u>)
ELITE	3873.75
COQS DU VILLAGE	378.41
PEASANTS	241.27

TABLE 2
AVERAGE VALUE OF THIRD WEALTH
PROXY D FOR EACH WEALTH CLASS

CLASS	AVERAGE VALUE OF T (<u>LIVRES</u>)
ELITE	11130
COQS DU VILLAGE	1120
PEASANTS	790

will therefore assume that wealth W is proportional to total bequests

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T (in constant value livres).

Our third wealth proxy is derived from a simple assumption about doweries and inheritance practices. In the wills, testators with children commonly provided unmarried daughters with what were in effect doweries. In a family with several unmarried girls, each received a nearly identical amount. Unmarried sons enjoyed a similar, though smaller, inheritance, while married children (except for one who might be the universal heir) were usually given only a token legacy in the will.

Apparently, the men and women who dictated wills were trying to compensate for the varying endowments and earning power of their children. A typical testator made his largest bequests to his younger daughters, who had few remunerative skills and who could not marry without a dowery. He gave each unmarried daughter nearly the same amount. Similarly, the testator commonly gave sizeable and nearly equal legacies to his younger sons, who had not yet established themselves in occupations. The younger sons received less, though, than their unmarried sisters, presumably because they could expect to earn more once they were established. Finally, the average testator bestowed only a token sum upon his married children. These older married children had been provided for in marriage contracts, and they were had work and families.

This pattern of bequests suggest that testators were trying to treat all heirs equally. One might object, of course, that the

treatment of heirs could not possibly be egalitarian since each testator singled out one person as his universal heir. This universal heir, who received the remainder of the estate after all other bequests were satisfied, would presumably receive a larger share like the eldest son in a regime of primogeniture. Indeed, legal historians might argue that the very purpose of the written will was to allow the testator to leave all of his real property to his universal heir. By favoring this heir, a testator would avoid fragmenting his estate. Favoritism of this sort would be all the more likely in our wills, for the Lyonnais was an area of written law, and local legal practice gave the testator great latitude in the division of his estate. In contrast to regions of customary law, a testator in the Lyonnais could single out one of his heirs for special treatment when he drew up his testament.

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Upon closer inspection, however, this argument against egalitarian inheritance collapses. In the first place, the universal heir hardly played the role of the favored son under primogeniture. The universal heir could be a daughter, a son, a spouse, a nephew or a more distant relative or friend. He could be first born or last born, cousin or grandchild or even neighbor. More important, it is clear that the universal heir did not receive the bulk of the estate. He may have received most of the family's land, but he normally had to pay doweries and other large bequests to the other heirs out of his own inheritance. These obligations formed a significant fraction of the estate, and paying them would reduce the universal heir's

inheritance close to portion accorded the other heirs. In fact, in the few instances where historians have managed to track down a large set of family documents, the universal heir did not do much better than the others, once his share was adjusted for all of all the debts and obligations he owed.²⁴ It should also be pointed out that the law itself actually limited the favoritism a testator could show his universal heir. Despite the great freedom of legal practices in the Lyonnais, a testator had to leave each of his descendants a certain minimum fraction of his estate called the legitime. The legitime insured that a given testament could not depart radically from egalitarianism, and for our purposes the effects of any possible deviation from equal treatment of heirs would be relatively minor.²⁵ All things considered, the inheritance regime in the Lyonnais was surprisingly egalitarian.

Again, one might contend that such customs would fragment estates. They would, if families were large, but in the Lyonnais delayed marriage and the small family size made equal treatment of heirs possible.²⁶ So did the availability of labor intensive farming practices such as viticulture.²⁷ Given such an egalitarian pattern of inheritances, we can thus argue that each heir received an inheritance roughly equivalent to that bestowed upon younger daughters. Unmarried sons got a slightly smaller amount, but their greater endowments or greater human capital -- for example, a skill that a son might have learned from his father -- made up for the difference. As for older children, they had already taken their shares of the estate in

marriage contracts. We can therefore approximate the size of the estate by multiplying the total number of heirs by the cash value of the share accorded each one. The value of this share would be the amount given an heir who was bereft of assets, skills and human capital -- in short, the dowery given an unmarried daughter. In sum, for those wills which mentioned doweries, $W = D + i$ where D is the product of the average dowery time the total number of heirs and i is an error term.²⁸ Even if inheritances are not perfectly equal, D will in all likelihood provide an excellent index of the testator's wealth.²⁹

Before accepting this third measure of wealth, we would verify that it is consistent with the previous two. For those wills which mention doweries, D does agree with our first wealth proxy (see table 2). Similarly, D and the second proxy T are closely related. If our assumptions are correct, they should be linear functions of one another, and in fact the correlation coefficient between D and T is 97.5%. A regression of D on T and Y suggests, moreover, that the relationship between the two variables does not vary over time.

For each of three wealth proxies, I have tried both OLS and maximum likelihood methods (tobit) to estimate the relationship between M and the independent variables (table 3). Since the wills do not record a testator's age directly, I have used the presence of grandchildren, grandnephews, grandnieces, or second generation cousins as a proxy for age. Normally this would be a very poor substitute for age itself, but the late age of marriage makes it more accurate than

TABLE 3

OLS & MAXIMUM LIKELIHOOD ESTIMATES FOR M, THE AMOUNT
OF PIOUS BEQUESTS IN LIVRES (CONSTANT VALUE).

INDEPENDENT VARIABLE	WEALTH PROXY I		WEALTH PROXY II		WEALTH PROXY III	
	OLS	TOBIT	OLS	TOBIT	OLS	TOBIT
	CONSTANT	-1.855×10^3	-1.198×10^3 (-11.26)	-1.933×10^2	-1.148×10^3 (-10.91)	-1.344×10^2
WEALTH VARIABLES:						
X ¹	0.287×10^2 (3.85)	0.462×10^2 (3.35)	-----	-----	-----	-----
X ²	0.183×10^1 (0.53)	0.140×10^2 (1.76)	-----	-----	-----	-----
T	-----	-----	0.195×10^{-2} (1.57)	0.382×10^{-2} (1.72)	-----	-----
D	-----	-----	-----	-----	0.535×10^{-2} (3.23)	1.212×10^{-2} (3.97)
OTHER INDEPENDENT VARIABLES						
Y	0.116 (4.13)	0.701 (10.94)	0.121 (4.11)	0.674 (10.61)	0.082 (1.97)	0.678 (6.65)
S	0.075×10^2 (2.34)	0.135×10^2 (1.94)	0.100×10^2 (2.96)	0.192×10^2 (2.77)	0.096×10^2 (1.98)	0.206×10^2 (2.00)
L	0.230×10^2 (3.76)	0.267×10^2 (2.33)	0.358×10^2 (6.57)	0.477×10^2 (4.83)	0.243×10^2 (3.07)	0.293×10^2 (2.05)
A	-0.104×10^2 (-1.49)	-0.281×10^2 (-1.76)	-0.100×10^2 (-1.39)	-0.299×10^2 (-1.88)	-0.177×10^2 (-1.19)	-0.404×10^2 (-1.35)
K	-0.163×10^1 (-1.92)	-0.406×10^1 (-2.14)	-0.213×10^1 (-2.40)	-0.571×10^1 (-2.96)	-0.157×10^1 (-1.25)	-0.505×10^1 (-1.84)

TABLE 3
(CONTINUED)

	PROXY I		PROXY II		PROXY III	
	OLS	TOBIT	OLS	TOBIT	OLS	TOBIT
s	36.72	61.00	37.98	61.37	35.40	56.68
R ²	16.8%	----	15.5%	----	16.1%	----
F	16.34	----	16.47	----	7.57	----
	(7,568)df		(6,537)df		(6,237)df	
-2 x log of likelihood function	----	2.646 x 10 ³	----	2.625 x 10 ³	----	1.130 x 10 ³
N	576	576	544	544	244	244
Limit Observations	----	358	----	327	----	149
Non-limits	----	218	----	217	----	95

Note: Number in parentheses is the value of the coefficient divided by its estimated standard error.
All monetary amounts in deflated livres. Number of cases varies due to discarded missing values.

X¹ = 1 for members of elite; 0 otherwise

X² = 1 for coqs du village; 0 otherwise

T = Total bequests which are given a cash value in will

D = Total number of heirs times average dowery

Y = Year

S = 0 for males, 1 for females

L = 1 for those who can sign, 0 for those who cannot sign

A = Age dummy; equals 1 if testator has grandchildren, grandnephews and nieces, or second generation cousins

σ = Estimated standard deviation of equation error term

F = MSS_{reg}/MSS_{res} (regressions only)

N = Number of cases

we would usually expect. Similarly, I have used ability to sign the will as a mark of literacy.³⁰

What is most remarkable about the estimates in tables 3 and 4 is the stability of the coefficient c' of the year Y . The three wealth proxies yield $c' = .701, .674, \text{ and } .678$ for the tobit equation equation 2', and the OLS estimates of are also stable, though lower. One of the reasons the OLS estimates are smaller is that the coefficients in the regression equation do not have the same meaning they do in the tobit equation. In the regression equation, the coefficients simply measure the expected change in the dependent variable for a unit change in one of the independent variables. The OLS coefficient c' , for example, measures $\frac{\partial E(M)}{\partial Y}$, the change in the expected value of M with respect to Y . For the tobit equation, though, the coefficients no longer have this simple interpretation. The expected rate of change of M in the tobit equation has to take into account both the size of a bequest, if one is made, and the probability that there is no bequest. It turns out that the rate of change of M with respect to a given independent variable is no longer simply the corresponding coefficient, nor is it even a constant. Indeed, it depends on the value of the other independent variables.³¹

One way to render the tobit coefficients comparable to the regression results is actually to calculate how M responds to changes in the independent variables. I have performed this calculation for the expected rate of change of M with respect to Y and several other independent variables in equation 2' (table 4). In each case, I have

evaluated the rate of change while the various independent variables are set equal to their mean values. The figures in table 4 can then be compared directly to the OLS coefficients in table 3. In the case of the date Y , the values of $\frac{\partial E(M)}{\partial X}$ vary little from wealth proxy to wealth proxy. They are also close to the corresponding OLS estimates, but they always hover slightly above the OLS figures. In part, the higher value of the tobit estimates results from the fact that M is truncated. Y after all has a significant effect upon M , but OLS would understate this effect by fitting a straight line to what is actually a curve.

It is possible to make similar calculations for $\frac{\partial E(P)}{\partial Y}$, the expected rate of change P with respect to the date Y .³² Here $\frac{\partial E(P)}{\partial Y}$ measures how a change of the year affects the chances that a testator makes a pious bequest. Again, because the value of $\frac{\partial E(P)}{\partial Y}$ depends on the other independent variables, we have calculated $\frac{\partial E(P)}{\partial Y}$ with the independent variables set equal to their mean values. We have performed the same calculation for the rates of change of P with respect to the other independent variables as well (table 5).

The positive value of $\frac{\partial E(P)}{\partial Y}$ reflects the increasing frequency of pious bequests in the wills. From nobles to peasants, testators were more and more likely to remember the church over the course of the 17th century (table 6). The actual amount of money left to the Church also jumped, as the positive coefficient of Y in equation 2' indicates. Since the tobit equation with the various proxies yielded an estimate for $\frac{\partial E(M)}{\partial Y}$ between 0.157 and 0.174, we would expect that

TABLE 4

EXPECTED RATES OF CHANGE OF M WITH RESPECT TO
THE INDEPENDENT VARIABLES IN THE TOBIT EQUATION

INDEPENDENT VARIABLE	WEALTH PROXY I	WEALTH PROXY II	WEALTH PROXY III
<u>Wealth Variables</u>			
X ¹	0.112 x 10 ²	----	----
X ²	0.340 x 10 ¹	----	----
T	----	0.098 x 10 ⁻²	----
D	----	----	0.281 x 10 ⁻²
<u>Other Variables</u>			
Y	0.170	0.174	0.157
S	0.033 x 10 ²	0.049 x 10 ²	0.048 x 10 ²
L	0.065 x 10 ²	0.123 x 10 ²	0.068 x 10 ²
A	-0.068 x 10 ²	-0.077 x 10 ²	-0.094 x 10 ²
K	-0.098 x 10 ¹	-0.147 x 10 ¹	-0.117 x 10 ¹

NOTE: All independent variables have been set equal to their means.

TABLE 5

$\frac{\partial E(P)}{\partial X_i}$, THE RATE OF CHANGE OF P
WITH RESPECT TO THE INDEPENDENT VARIABLES

INDEPENDENT VARIABLE	WEALTH PROXY I	WEALTH PROXY II	WEALTH PROXY III
<u>Wealth Variables</u>			
X1	.237	----	----
X2	.072	----	----
T	----	0.103	----
D	----	----	0.652 x 10 ⁻⁴
<u>Other Variables</u>			
Y	0.359 x 10 ⁻²	0.355 x 10 ⁻²	0.365 x 10 ⁻²
S	0.069	0.101	0.111
L	0.137	0.251	0.158
A	-0.144	-0.157	-0.217
K	-0.021	-0.030	-0.027

NOTE: The numbers represent the expected change in P for a unit change in a given independent variable. All independent variables are assumed to be at their mean values.

the average donation by a typical testator would grow a little less

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than 2 livres each decade. Furthermore, since c' is positive, the ratio of pious donations to wealth should also increase, and if we divide M by the wealth proxies T and D , we do in fact observe marked growth after the sixteenth century (see tables 7 and 8). In short, pious bequests did grow relative to wealth.

The data in tables 3 to 5 also bear out Vovelle's and Chaunu's assertions about the role of literacy and sex. Apparently, being literate or being a woman increased both the likelihood of pious bequests and the amount given to the Church. For a testator of average wealth, literacy raised the chances of a bequest by 14 to 25 percentage points, and it boosted the expected bequest by 6 or 12 livres. If we believe the figures in tables 4 and 5. Chaunu, of course, would explain the predilections of the literate by citing the pervasive Counter-Reformation literature on death, and in a more general sense, the behavior of the literate testifies to the appeal the Counter-Reformation had among educated classes. As for women, they did bequeath more to the Church than male counterparts of equal worth. They were 7% to 11% more likely to leave pious bequests, if we believe the estimates in table 5, and what they did leave was typically 3 to 5 livres higher. The higher values of their pious donations are yet another sign of enormous appeal the Counter-Reformation had for women.

The negative coefficient for A in the equation for M suggests that pious giving was not a habit learned in the later years of life.

TABLE 6
PERCENT OF TESTATORS MAKING PIOUS
BEQUESTS BY WEALTH CLASS

DATE	ELITE	COQS DU VILLAGE	PEASANTS	TOTAL
BEFORE 1550	67% (3)	100% (2)	0% (0)	80% (5)
1550-74	0% (0)	4% (26)	10% (79)	9% (105)
1575-99	71% (7)	14% (28)	10% (79)	15% (114)
1600-24	67% (3)	55% (29)	26% (34)	41% (66)
1625-49	0% (0)	58% (12)	52% (42)	54% (54)
1650-74	60% (5)	36% (14)	50% (10)	45% (29)
1675-99	27% (11)	38% (21)	31% (72)	32% (104)
1700-24	89% (9)	88% (16)	90% (62)	90% (87)
AFTER 1725	100% (6)	100% (6)	100% (24)	100% (36)
TOTAL	66% (44)	41% (154)	38% (402)	41% (600)

NOTE: Upper figure is percent of wills in each category which contain pious bequests. Lower figure is number of cases per category. Total number of cases differs from regression tables because of exclusion of cases with missing values.

TABLE 7

AVERAGE VALUE OF RATIO OF PIOUS REQUESTS TO WEALTH
USING PROXY II AS A MEASURE OF RELATIVE WEALTH

DATE	ELITE	COQS DU VILLAGE	PEASANTS	TOTAL
BEFORE 1550	0.0 1	1.00 1	0.0 0	0.50 2
1550-74	0.0 0	0.00 24	0.00 52	0.00 76
1575-99	0.01 6	0.01 21	0.01 69	0.01 96
1600-24	0.00 3	0.05 25	0.03 25	0.04 53
1625-49	0.0 0	0.10 9	0.10 37	0.10 46
1650-74	0.04 5	0.02 13	0.16 9	0.07 27
1675-99	0.12 9	0.06 20	0.06 67	0.07 96
1700-24	0.37 9	0.19 16	0.26 61	0.26 86
AFTER 1725	0.38 6	0.20 5	0.20 22	0.23 33
TOTAL	0.18 39	0.07 134	0.09 342	0.09 515

NOTE: Upper figure is mean value of M/T. Figure in parentheses is total number of wills per category. Number of cases differs from regression tables because of exclusion of cases with missing values.

TABLE 8

AVERAGE VALUE OF THE RATIO OF PIOUS REQUESTS TO WEALTH
USING PROXY III AS A MEASURE OF WEALTH

	ELITE	COQS DU VILLAGE	PEASANTS	TOTAL
1550-74	0.00% (0)	0.08% (13)	0.01% (28)	0.03% (41)
1575-99	0.13% (3)	0.00% (5)	0.06% (26)	0.06% (34)
1600-24	0.11% (2)	0.27% (10)	0.03% (18)	0.11% (30)
1625-49	0.00% (0)	2.00% (3)	0.72% (19)	0.90% (22)
1650-74	4.76% (3)	0.91% (7)	0.17% (5)	1.43% (15)
1675-99	2.00% (3)	0.54% (9)	0.40% (30)	0.54% (42)
1700-24	0.36% (2)	3.77% (10)	8.07% (33)	6.77% (45)
AFTER 1725	8.55% (2)	10.37% (2)	3.31% (11)	4.95% (15)
TOTAL	2.58% (15)	1.35% (59)	1.95% (170)	1.84% (244)

NOTE: Upper figure in each box is mean of $\frac{100M}{D}$. Figure in parentheses is total number of wills per category.

The evidence is weak, however, for the t-statistics of the coefficient of A never exceed 1.88. A better measure of age might well improve matters here, since our proxy for A does little more than to distinguish middle aged adults from their elders. The negative coefficient for K, though, is much closer to being significant. Dependent children evidently did force a testator to choose between his offspring and his soul.

Refinements

So far we have ignored the fact that the use of proxy variables are likely to bias our coefficient estimates. If M were not a limited dependent variable, we could estimate the direction of this bias caused by the errors in observing W. It would turn out that under certain reasonable assumptions about the relationship between the independent variables, the coefficients of Y and S would be biased downward. So would the coefficient of L, at least with proxy I; with proxies II and III; it would be pushed upward." With the tobit equation, however, calculating the direction of the bias is not easy. Approximations for the asymptotic bias are available, but they shed no light on its sign. All we know is that the asymptotic bias will (to a close approximation) consist of two terms, one of the same sign and order of magnitude is that produced by OLS, and the other roughly the same size but of indeterminate sign.

Our interest, of course, is knowing whether the bias is large enough to reverse the signs of the coefficients for Y, S or L in equation 2' or whether it might make a coefficient near zero appear

safely positive. Three reasons suggest that this will not happen. The first is the robustness of the results. Nearly all the different wealth proxies yield similar values for the coefficients of S, L and especially Y. If the error term in the proxies affected the coefficients seriously, the values would presumably vary significantly from proxy to proxy, yet this is simply not the case. Another reason for suspecting that our coefficients are not seriously biased comes from an instrumental variables estimate for equation 2'. The instrumental variables estimate combines information from wealth proxies I and II and uses a two-stage estimator to derive coefficients

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(table 9). To the extent that we have a successful instrument, this procedure ought to reduce the bias of our coefficient estimates, yet in nearly every case the estimates remain about the same. This suggests that the bias is not serious. Finally, it is likely that the OLS estimates provide lower bounds for the coefficients c', d', and e' of Y, S, and L. Since all the OLS estimates of these coefficients are positive, the real values in the tobit equation probably exceed zero too. We can even argue that the bias of the tobit coefficients c', d' and e' will probably have the same direction as the bias in the corresponding OLS coefficients. Since the use of proxies will drive the OLS estimates of c', d' and e' toward zero (for e' this is true only with proxy I), the tobit procedure is will also underestimate these coefficients, especially in the case of Y."

One other matter also deserves our attention. So far, we have attributed the increasing likelihood of pious bequests simply to the

TABLE 9

INSTRUMENTAL VARIABLES
ESTIMATES USING WEALTH PROXY I AND II

INDEPENDENT VARIABLES	TSLS	TOBIT
Wealth Instrument	0.643×10^{-2}	0.950×10^{-2}
Y	0.147	0.735
S	0.111×10^2	0.197×10^2
L	0.286×10^2	0.380×10^2
A	-0.091×10^2	-0.275×10^2
K	-0.255×10^2	-0.554×10^2

NOTE: Coefficients in the Equation for P and M were derived by estimating the following equation system:

$$M_i = a' + b'T_i + c'Y_i + d'S_i + e'L_i + f'A_i + g'K_i + u_i'$$

$$T_i = h' + kX1_i + lX2_i + w_i'$$

Here T_i is wealth proxy II, $X1$ and $X2$ are dummy variables for membership in the first two wealth classes, and the other terms are as in equation 2'. To solve the two systems, we first regress T_i on the exogenous variables $X1$, $X2$, Y , S , L , A and K . We then use the resulting predicted value of T_i as an instrument in the equation for M , which has been estimated using both least squares and maximum likelihood methods. This two stage process provides consistent estimates for limited dependent variables just as in the ordinary regression case.

passage of time. But if the secular trend alone were responsible for the growing number of pious bequests, then we would expect the frequency of donations to the Church to rise smoothly over the course of the 17th century. So would the amount donated to the Church. For example, in the case an illiterate man whose total legacies amounted to 241.27 livres -- the average figure for a peasant -- the chances of giving would follow the steady increases set forth in column 1 of table 10.

This smooth and regular behavior, though, is not what we observed. The men and women who drew up the wills in our sample did not behave with such monotonous regularity, as tables 6, 7 and 8 show. Their donations rose through 1650-75 but then collapsed during the last quarter of the seventeenth century, when the percentage of wills with pious bequests plunged from 45% to 32%. Donations as a percent of wealth also dropped. Only after 1700 did pious giving recover.

What accounts for this precipitous decline in pious bequests at the end of the 17th century? And in a more general sense, what causes the observed values of P to rise so far above the predictions after 1700? For 1700-24 and the post 1725 period, the observed value of P exceeds 90%, but the predictions in column 1 are only 48% and 59% (table 10, columns 1 and 4). What produces this growing discrepancy?

Let us consider first of all the question of why donations plummeted in 1675-99. Several possible explanations immediately come to mind. In the first place, the predictions in column 1 of table 10 may simply exaggerate the discord between the results described by

TABLE 10

OBSERVED AND PREDICTED
VALUES OF P FOR PEASANTS

DATE	(1)	(2)	(3)	(4)
1550-74	0.04	0.07	0.05	0.10
1575-99	0.08	0.09	0.11	0.10
1600-24	0.13	0.14	0.17	0.26
1625-49	0.19	0.23	0.26	0.52
1650-74	0.27	0.38	0.44	0.50
1675-99	0.37	0.37	0.29	0.31
1700-24	0.48	0.52	0.53	0.90
AFTER 1725	0.59	0.67	0.73	1.00

NOTE: Column 1 is predicted P using wealth proxy II with $T = 241.27$ livres (average for peasants), $S = L = 0$, $A = .0551$, $K = 1.4743$ (overall averages for A and K). Column 2 is predicted P using wealth proxy II; all independent variables are set equal to their means for peasants during the period in question. Column 3 is predicted P using wealth proxy II and additional variables for economic expectation, population, and the price of a mass; all independent variables are set equal to their means for peasants during the period in question. Column 4 is observed P for peasants.

equation 2' and the actual evidence from the wills. Column 1 presupposes that all the independent variables except the year remain constant, and this is clearly not the case. In fact, the testators from 1675-1699 were older and more likely to be illiterate and they had large numbers of unmarried children. All of these differences could depress their pious bequests relative to the previous generation.

Taking these differences into account should reduce the gap between the predicted and the observed value of P at the end of the 17th century, but it does not. For a peasant, the predicted value of P stills hovers around 37%, well above the 31% actually observed. (table 10, column 2). Clearly, the shift in the values of the independent variables cannot account for the drop in pious bequests. Indeed, if we introduce into equation 2' a dummy variable Q which is 1 when $1675 \leq Y \leq 1699$ and 0 otherwise, the dummy variable's coefficient is negative and significant, whether we use OLS or tobit. (table 11). Thus the decline in donations is not simply the result of different values for the independent variables.

If we look at the wills from 1675-99 to see what brought pious donations temporarily to a halt, the evidence points to a break in the years 1679-80. In the first place, the wills from the period 1675-1699 tend to cluster in the years 1675-85; they are not spread out over the entire 25-year period. This suggests that there was something of a turning point at the end of the 1670s or the beginning of the 1680s. Upon closer inspection, it in fact turns out that

TABLE 11

SELECTED COEFFICIENTS IN THE
EQUATION FOR M WITH DUMMY VARIABLES Q ADDED

INDEPENDENT VARIABLE	OLS	TOBIT
Q	-9.772 (2.13)	-36.530 (4.05)
Y	0.145 (4.61)	0.720 (11.31)
S	.099 x 10 ² (2.93)	0.198 x 10 ² (2.87)
L	0.338 x 10 ² (6.12)	0.417 x 10 ² (4.21)
R ²	16.3%	-----

NOTE: Estimates have been made with wealth proxy II. Figures in parentheses are t-statistics or the value of the coefficient divided by its estimated standard error.

before 1680 testators regularly included pious bequests in their wills whereas after 1680 they ceased to do so, at least in a half dozen villages southwest of Lyon where a major portion of the wills from this period were drawn up.

None of the surviving records in these communities points to any peculiar local events that might have stopped pious giving in 1680, but one fact of royal politics at the time could conceivably have played a role: Louis XIV's persecution of the Protestants. In 1680 the sun king began to crack down upon the Huguenots in earnest. A number of professions and government offices were closed to Protestants, and the persecution only intensified over the next five years. Conceivably, a number of the testators after 1680 could have been former Protestants who had converted to Catholicism to escape persecution but who had no intention whatsoever of leaving money to a religion they secretly despised.

The problem with this explanation is that few Protestants actually lived in the Lyonnais at this time, though some did reside to the southwest of the city, not far from the villages where a number of the wills were drawn up. Furthermore, this explanation does not readily explain why Protestants suddenly flocked to a new Catholic notary in 1680. After all, in nearby Grenoble Protestants continued to use their old notaries and to identify themselves openly as Protestants in their wills up to the Revocation of the Edict of Nantes in 1685." The persecution evidently did not affect the way Protestants in Grenoble dictated their wills, and there is no reason

why Protestants in the Lyonnais would behave any differently.

The fitful pace of the Counter Reformation itself provides another possible explanation for the decline in giving in the 1680's. In Lyon, as elsewhere in Catholic Europe, institutional reform within the Catholic Church was far from a steady process. The local hierarchy sponsored missions and undertook parish visits at a furious pace though mid-century. The visits and missions then slackened off until the late 1680's and 1690's. The training of priests went through similar cycles. Enrollments of long term students in the major seminary in the diocesan seminaries rose to 55 in 1675-76 and then dropped to 15 in 1680. The number of students remained low until after 1694. " The pattern of all the hierarchy's activities - whether it be proselytizing or the education of trained clerymen - thus seems to have leveled off after mid-century and declined after the 1670s. Not until the 1690s did the Church return to the dynamism of the period before 1670.

Conceivably, the collapse of the Church's efforts could have caused pious bequests to drop in the years 1680-85. With fewer missions and fewer trained priests preaching in the villages, the impetus to remember the Church in one's will may well have slackened. The difficulty with this argument, though, is that it simply strains our credulity. It is hard to see how even a precipitous decline in the number of priests could have affected religious behavior so rapidly and so drastically and yet have left no long term consequences. It is simply unbelievable.

A far more likely explanation for the decline of pious bequests after 1680 was the traumatic agricultural depression that struck the Lyonnais at the end of the 1670s. Both leases on agricultural land and indexes of agricultural output dropped over 40%; they did not recover until 1690s." Rents and output had always fluctuated to a certain degree, but a depression of this magnitude was unknown from 1600 through the first decades of the 18th century. This sudden depression left some mark on our proxies for wealth, which were lower for the period 1675-1699, but the proxies or even exact knowledge of testator's wealth when he drew up his will could hardly register the full impact of such a sudden depression. The proxies, after all, merely suggest what a man's fortune was at one time. They do not tell whether his estate had been growing or diminishing, and they do not reveal his expectations for the future. For our testators in the early 1680s, though, consideration of growth rates and expected returns in the future were probably crucial. Unlike testators in other periods, the men and women who drew up wills in the early 1680s watched agricultural revenues plummet. They therefore had to revise drastically their estimates of what their estates could produce for their descendants. No doubt they cut their pious bequests because future looked so grim. When the rural economy recovered in the 1690s, though, they returned to making pious bequests in their wills.

To test this rigorously, of course, we would need an index of people's expectations. A good measure of economic expectations is hardly available for current problems, much less for the early modern

period, but changes in regional agricultural lease rates can serve as a rough substitute. While an index of lease rates is admittedly a poor measure of changing expectations, the fluctuations of the index should bear some relationship to expected agricultural profits. And when added to the tobit equation 2', the lease rate index has a positive coefficient and seems highly significant ($t = 2.64$). Adding the lease index does not disturb the other coefficients or their statistical significance, and the index drops enough in the late 1670s to explain explain a decline of approximately 10 percentage points in P during the last quarter of the 17th century (table 12).'' It thus seems clear that changing economic circumstances do explain much of the fluctuation in pious giving, fluctuations that Vovelle and Chaunu invariably attribute to purely religious causes.

Besides the index of lease rates, two other variables deserve to be added to the tobit equation for M: the minimum offering needed for a mass and the population of the community where the testator lived.''' In a sense, both of these variables reflect the ''supply'' of religious services available to the testator. The minimum offering needed for a mass was set by the diocese, and it obviously served as a ''price'' when the testator decided upon his pious bequests. It may of course seem anachronistic to impose this economic terminology upon a religious decision, but the testators themselves would not think so. They were terribly concerned with the process of paying for the masses, and they described in great detail the amounts to be paid for prayers and other services. The only reason that

TABLE 12
OLS AND TOBIT ESTIMATES FOR M
WITH ADDITIONAL INDEPENDENT VARIABLES

INDEPENDENT VARIABLE	OLS	TOBIT
CONSTANT	2.256×10^2 ----	1.259×10^3 (11.34)
T	0.237×10^{-2} (1.91)	0.466×10^{-2} (2.12)
Y	0.142 (4.46)	0.749 (10.93)
S	0.101×10^2 (3.01)	0.188×10^2 (2.73)
L	0.287×10^2 (4.97)	0.368×10^2 (3.60)
A	-0.106×10^2 (-1.48)	-0.302×10^2 (-1.90)
K	-0.196×10^1 (-2.21)	-0.513×10^1 (-2.70)
INDEX	0.584×10^{-1} (1.08)	3.034×10^{-1} (2.64)
POP	0.237×10^{-2} (3.20)	0.273×10^{-2} (2.31)
PRICE	-0.808×10^1 (-0.70)	-2.444×10^1 (-1.03)
S	37.63	60.14
R ²	17.5%	----
F	12.62 (9,534)df	----
-2 x log of likelihood function	----	2.610×10^4
N	544	544
Limit Observations	----	327
Non Limit Observations	----	217

NOTE: Figures in parentheses are t-statistics. Estimates have been made with wealth proxy II. Index, an index of agricultural lease rates, serves as a rough measure of economic expectations. Pop, the number of households in the testator's community at the end of the 17th century, is an indirect measure of population. Price is the minimum offering needed for a mass in constant value livres. Other variables are in Table 1.

the minimum offering for a mass was not included in equation 2' initially is that it varied only slightly in real terms. As it first approximation, it was therefore reasonable to treat it as a constant. When the price is added to equation 2', its coefficient has the expected negative sign, but the lack of variation keeps it from being statistically significant (table 12).

The population of a community also affected the supply of religious services. Market towns and small cities stood a greater chance of having a monastery or friary, and they often boasted more priests and more churches per capita. Furthermore, the bigger communities were more likely to call in holiday preachers and missions; residents of more populous communities thus experienced more frequent proselytizing. Since a larger population meant a greater and more varied array of alternatives for pious bequests, it is no wonder that population had a significant positive effect upon M (table 12).

Adding these new variables, though, does not explain why the observed values of P rose to such heights after 1700. Even when the lease index, the price of a mass and the population are added to equation 2', the predicted value of P after 1725 is only 73%, while the observed P reaches 100% (table 10, columns 3 and 4). Perhaps these high values of P testify to the Church's activity at the end of the 17th century, but they are equally likely to stem from a more mundane cause: the bias of the coefficient for Y. If (as we argued above) the coefficient is biased toward 0, then equation 2' will understate the increase in P over time, and the observed values of P

will tend to exceed the predictions as we move toward the end of the 17th century."

Conclusion

Generalizing from this sample of wills to any larger population is of course fraught with difficulty. Normally, the high t-statistics for S and L and the even larger t-statistics for Y would assure us that the relationships we unearthed extend beyond this sample." The use of the proxies for wealth, though, will affect the estimates of the t-statistics, and as a result we must generalize with caution. One source of confidence, through, is the robustness of the results. Different assumptions and different techniques yield similar values for the coefficients and nearly identical conclusions about the role of sex and literacy and about the shift in religious behavior over time." Moreover, to argue that pious bequests increased dramatically in the 17th century and that at all levels of wealth women and the literate gave more to the Church is consistent with Vovelle's and Chaunu's findings. If they lacked statistical sophistication, a highly quantitative study currently under way in Grenoble confirms their results." With all due caution, the relationships unearthed the sample from Lyon do seem to hold true in other areas of France.

What then do we make of the upsurge in pious bequests and our other findings? We have claimed that growing wealth does not explain the rise in pious bequests, although economic fluctuation may have caused the dip in the 1680s. What then was responsible for the

benificence toward to the Church?

One obvious candidate would be the status accorded the devout in Old Regime society. Moliere's Tartuffe serves as a reminder of the respect accorded those who could feign devotion, and a desire for such esteem, so one could argue, may have motivated the pious bequests in the wills. On closer inspection, however, this seems highly unlikely. Perhaps we can never decide whether it was lust for status or concern for salvation that spurred on our testators, but it is doubtful that questions of status lay at the root of the religious behavior in the wills. If a testator were primarily interested in status, why would he seek to purchase it in his will, with acts to be performed after his death? If we make the absurd assumption that status somehow accrued to the dead, why did testators waste their money on low masses, which were said in obscure chapels with scarcely a mention of the founder's name? A high mass or, better yet, a funeral procession would seem to do much more for a testator's status, yet few individuals chose these services. The testators, it appears, were more interested in anonymous low masses for the repose of their souls than in posthumous self glorification. Finally, if a desire for status played a major role in the will maker's decision, then there ought to be major differences between the wills which were dictated to notaries and others, called testements mystiques, which were drawn up in private and then hidden from everyone until well after the testator's death. Since the authors of the testements mystiques kept their bequests secret they would seem to have little concern for

status. Consequently, their testaments ought to be nearly devoid of pious bequests. Yet as Vovelle and Chaunu have discovered, the pious bequests in the testaments mystiques are no different from those in other wills.''

A related explanation for the rise in pious bequests is the claim that donations to the Church became fashionable in the seventeenth century. The difficulty here is that a will was basically a private, secret act, which testators sought to hide from the public." There were few witnesses, and even the pious bequests were not the sort of ostentatious gestures we normally associate with fashion. Again, the key is the evidence from the testaments mystiques unearthed by Vovelle and Chaunu. If fashion made a difference, these testators who hid their last will from everyone ought to have made fewer pious bequests, because they were clearly indifferent to fashion. Yet as Vovelle and Chaunu demonstrate, they were just as likely to leave money to the Church as others.

Similar difficulties rule out another explanation for the rise in pious bequests: that somehow it became easier to leave money for masses and the Church. If the 17th century witnessed the building of more churches (so one could argue) or if the minimum offering needed to found a mass declined, then religious services would become a relative bargain and we might expect an increase in bequests to the Church. The problem here is that while more churches were constructed in cities such as Lyon, their numbers did not increase in the villages where our wills were drawn up. Moreover, in real terms the minimum

donation needed for a mass remained roughly constant in the 16th century and then increased slightly in the 17th century. And when we add the price of a mass to the tobit equations, it does not eliminate the growth in pious bequests over time.

Conceivably, rising prices for certain commodities could have driven individuals to spend money on religion; too little is known about prices to exclude this possibility altogether. Nevertheless, this line of reasoning does seem unlikely, given what we do know about items whose demand curves were highly sensitive to price. Prices of luxuries such as wine and butter declined somewhat rather than rose in the 17th century, and consumption of these and other goods with elastic price curves actually increased."

We can also rule out changes in inheritance taxes as a cause of the variation in pious bequests. Strictly speaking, inheritance taxes did not exist under the Old Regime. There was a proportionate tax on sales and transfers of land, which was collected by the king and some seigneurs. but it did not affect most testaments. Even when it did apply, it was paid by the person who received a bequest of property, not the testator, and it therefore would not influence the testator's decision. In fact, none of the dues or taxes paid in the Old Regime had any bearing upon a testator's decision to give money to the Church."

The most likely explanation of the rise in pious bequests is a shift in attitudes toward religion. This does not mean that any one person's preferences with respect to religion suddenly changed.

Rather, it says something about the average configuration of preferences and the average set of religious attitudes in the early modern period, at least in the countryside around Lyon. If we divide individuals according to their wealth, sex, literacy, age and family status, then in any single category the fraction of individuals who seemed to prefer the solace of Counter-Reformation ritual was far larger in 1700 than one hundred years before. At any level of wealth (all other things being equal), the number of men and women who placed great value upon Tridentine Catholicism seemed to grow.

It is, of course, impossible to prove conclusively that attitudes and preferences shifted on average. To do so, we would have to know all the alternatives a typical testator faced in, say, 1600, and we would need the same knowledge of the situation in 1700. Finally, we would have to be able to say that the average testator in 1600 could have acted the way his pious counterpart in 1700 did but that he chose not to. In short, we would have to be able to make an argument about what economists call "revealed preference." The information needed for such an argument will obviously never be available. All we can say with certainty is that the evidence is consistent with a shift in preferences and attitudes. The number of testators who left pious bequests (when they could have given nothing) rose dramatically, and this upsurge in donations cannot be explained by increasing wealth. A mass of additional evidence also points to a shift of attitudes, from the comments of contemporary diarists to the changing themes of popular literature, which grew overwhelmingly

religious over the course of the seventeenth century. And of course many older histories also claim that attachment to Catholicism was on the rise.

Even if we avoid the knotty question of attitudes and preferences, it is still undeniable that external religious behavior changed. Increasing numbers of men and women left larger and larger sums to the Church, and this explosion in pious bequests had important financial consequence for ecclesiastical institutions. When testators began giving 2% or more of their estates for masses and prayers, the Church's income rose substantially. Already the largest single landlord in France, the Church saw its revenues jump by an amount equal to roughly 10% of the royal budget.¹³ The added funds in ecclesiastical coffers helped the Church to build numerous hospitals and other institutions in the 17th century. More important, those who dispensed the religious services which men and women prized so highly had an effective means of mobilizing individuals to collective action. The influential lay and clerical devouts who undertook political and social reforms in the 17th century made frequent use of this tactic.

The changes in behavior also shed light on the appeal of the Counter Reformation had in the countryside. The literate favored the rituals of Tridentine Catholicism and so did women. This reinforces what we know about the support the Counter Reformation received among the educated and the hostility it encountered among rural males. The religious split between men and women in the 17th and 18th centuries layed the groundwork for the far more bitter political divisions of

the nineteenth century, when male anticlerics battled the Church in the political arena and women became its chief supporters.

FOOTNOTES

1. Archives departementales du Rhone (henceforth AD Rhone), 3E8912, f. 121.
2. (Paris, 1973)
3. (Paris, 1978)
4. One sign of this acceptance is the fact that numerous projects involving wills are now underway not just in France but in Germany and Italy as well.
5. Vovelle, pp. 49-55, 313, 391-92, 424; Chaunu, p. 234.
6. At the very least, statistical techniques would keep researchers like Vovelle and Chaunu and their teams of graduate students from spending too much time on wills. Chaunu and his students read thousands of wills; so did Vovelle and his assistants. By using quantitative methods, they could have reached firmer conclusions with far fewer wills.
7. The wills were collected from microfilms made by the Mormon Church. The Mormons are in the process of microfilming all the notarial registers at the AD Rhone, and the notaries they selected to begin the project are not peculiar in any respect. From their list of microfilmed registers, I chose notaries from communities where a large number of records had been preserved and then selected notarial registers at random. This sort of

sampling scheme (it is actually a cluster sample) will not affect my analysis in any way provided that the criterion used for choosing the registers was not based upon the values of my dependent variable. This is in fact the case. My choice of a notarial register was related to some of the independent variables (the years which the register spans, for example), but this sort of relationship would not affect a regression. More important, there is no reason to believe that a direct relationship exists between the dependent variable (the value of pious bequests in a will) and the fact that a will was registered and ended up in a particular notarial register. Wills were registered with notaries for reasons unrelated to pious bequests: a will, whether it contained pious bequests or not, was simply invalid without notarial registration. Similarly, people chose notaries for reasons having nothing to do with their religious behavior. Thus, my selection of notarial registers is not related to my dependent variable, and there is no problem with sample bias. For a list of the notarial registers used, see appendix I. It should be pointed out that in the 18th century approximately 30% of the populace left wills in some areas of the Lyonnais and 70% in others; see Claude Aboucaya, Le testament lyonnais de la fin du XVe au milieu du XVIIIe siecle (Lyon, 1961), pp. 152-53. Like Vovelle and Chaunu, my sample of wills overlooks the poor, who did not leave testaments, and it overrepresents the rich. Again, however, this sort of

overrepresentation will not affect my results.

8. The only exceptions were small, involuntary fees paid the parish vestry (the fabrique). Since these were not a matter of choice, they were excluded. The number of wills affected was minor.
9. See Philip T. Hoffman, "Church and Community: The Parish Clergy and the Counter Reformation in the Diocese of Lyon (1500-1789)," (Ph.D. dissertation, Yale University, 1979), pp. 316-19.
10. Chaunu, pp. 331-37; Daniel Roche, "La mémoire de la mort," Annales E.S.C. (1976), number 2, pp. 76-119.
11. I have chosen K to be equal to the number of unmarried children in the household; the results would not change appreciably if K were the total number of children, married and unmarried.
12. This is clearly a better method than trying to specify a relationship involving the ratio of M divided by W. An equation involving the ratio would be difficult to interpret and subject to sample bias since wealth might have influenced the decision to draw up a will. And in any case, questions about the ratio can be reduced to questions about the linear equation for M, as I show below.
13. See, for example, G.S. Maddala, Econometrics (New York, 1977), pp. 162-182, or James Tobin, "Estimation of Relationships for Limited Dependent Variables," Econometrica 26 (1958): 24-36.

Note that with the tobit specification, the expected rate of change of $\frac{M}{W}$ with respect to Y still has the same sign as the coefficient c' . The same holds true for the rate of change of $\frac{M}{W}$ with respect to S, L, and the other independent variables, so we can still reduce questions about the sign of the ratio $\frac{M}{W}$ to questions about the signs of the tobit coefficients.

14. For purposes of comparison, I have included OLS and probit estimates of equation 1' in appendix II.
15. The method is outlined in Henri Theil, Principles of Econometrics (New York, 1971), pp. 548-550. If I were not dealing with limited dependent variables, the least squares estimate of c' would have expected value $c' + pb'$, where p is the coefficient of Y in the "auxiliary" regression of W on the other independent variables. I have made the reasonable assumption that $b' > 0$, and I argue below that wealth is not increasing over time, i.e., that $p \leq 0$. Hence, $pb' < 0$, and omitting W would lead to an underestimate of c' , if I were not dealing with a limited dependent variable. In this case, if the estimate of c' exceeded 0, I could be reasonably certain that c' was actually positive. Similar results would hold for S and L.
16. See, however, Adonis Yatchew and Zvi Griliches, "Specification Error in Probit and Logit Models," Harvard Institute of Economic Research Discussion Paper 717 (1979). Unfortunately, the results of this paper are not of great use in practice.

17. Information about taxes and marriage contracts comes from Georges Durand, Vin. viene et vianerous en Lyonnais et Beaujolais (Paris, 1979), pp. 351-53, 432-64.
18. I have excluded clergymen from the wealth hierarchy and from the analysis that follows. As might be expected, they are far more likely to make pious bequests than laymen.
19. In addition to information in Durand, which comes from the period 1500 to 1800, see the evidence concerning 18th-century marriage contracts in Maurice Garden, Lyon et les lyonnais (Lyon, 1970).
20. A good wage series for 17th-century Lyon is not yet available, so I used a series for Parisian carpenters published in M. Baulant, "Le salaire des ouvriers du batiment a Paris de 1400 a 1726," Annales E.S.C. 26 (1971): 463-83. Given labor's mobility, these wage rates in Paris should parallel those in and around Lyon, and evidence from the 16th century tends to bear this out. Figures on agricultural rents come from Durand, pp. 491-97. Both the wage and rental series were adjusted for inflation using a ten-year average series of grain prices. This technique is open to obvious objections, but for reasons I discuss below it seemed the best way to deflate the price series. In any case, alternative deflators, such as converting prices to grams of silver, lead to nearly identical results.
23. Chaunu, pp. 395-96, 414-17.

24. Formally, we adjust the units of T so that we can assume $W = T + e$, where e is an error term. The monetary figures in Table 1, like all the others in this paper, have been deflated using a ten-year moving average of local wheat prices to compensate for the changing value of the livre. Although using wheat prices as a deflator is common among social and economic historians, it is open to rather obvious criticisms, especially when it is used to compare fortunes across time. Unfortunately, it is one of the few alternatives available in the absence of a good consumer price index. The justification for using wheat is that along with other grains it formed a major part of the consumer budget under the Old Regime. It was also a major producer product. The ten-year moving averages should in turn eliminate the effects of short term fluctuations in the price of grain. An alternative method of deflation would be to convert livres to silver. I did this for all of the monetary variables in the paper, and although it changed some of the coefficients slightly, it did not affect any of the hypothesis tests. Overall, the grain index and the silver index move in parallel, and the fact that both methods yield similar results suggest that the conclusions are not sensitive to the choice of a deflator.
21. Aboucaya, pp. 21-24, 151-52. See also Marie Therese Lorcin, "Les clauses religieuses dans les testaments du plat pays au XI^{ve} et X^{ve} siecles," Le Moven Age 78(1972): 287-323; M. Gonon, Les institutions et la soclett en Forez d'apres les testaments

(Macon, 1960).

Durand, pp. 364-68, describes the case of the Damours, a large and prosperous family of 18th-century peasants. Francois Damour and his wife Jeanne Magnini had seven surviving children; their family was extraordinarily large for the time. If any family is likely to violate the assumption of equal treatment, it is a large one like this. However, if we examine the records of Francois Damour's succession and the various marriage contracts and other familial agreements he entered into before his death, it is clear that the egalitarian assumption yields a very good approximation for the total value of the estate. Francois does favor his eldest son Isaac, the universal heir, but once we subtract the obligations Isaac is saddled with, his advantage diminishes considerably. Basically, Isaac received the family's major piece of land, which Durand estimates to be worth less than 2600 livres. Assume it is worth 2600 livres. We should also include in the Damour fortune approximately 1600 livres already distributed to other siblings in money or land, and an indeterminate amount of cash and liquid assets. Let us make the generous assumption the liquid assests are worth 500 livres. the amount Isaac owed his relatives immediately upon his father's death. The net value of the estate is thus approximately 4700 livres. Now Isaac must pay his siblings and mother future doweries and pensions worth at least 1400 livres. Isaac's portion is thus less than $2600 + 500 - 500 - 1400 = 1200$ livres.

In other words, even under the most generous assumptions, Isaac's share is less than 1200 livres. which is twice the dowery accorded the unmarried daughter Marie. At most, then, Isaac gets a double share, and in fact he probably gets less. In any case, the egalitarian assumption leads to a very accurate estimate of the estate's total value. With eight heirs and a dowery of 600 livres. we would estimate the estate to be worth 4800 livres. The documents suggest that the estate was in fact worth 4700 livres. The egalitarian assumption leads to equally accurate predictions for the handful of wills in which an estate value is given.

25. For the legitime in the Lyonnais, see Aboucaya, pp. 119-21. For a family with four or fewer children, the children who were not universal heirs had a right to equal share of at least one third of the estate. For families with four or more than four children, they had a right to share at least one half the estate. Parents and certain other relatives also had legitime rights. This may seem like a significant departure from equal inheritance, but for my purposes all that matters is that the third wealth proxy not be misleading. As I show below, even the maximum possible inequality (namely, giving each heir his legitime) does not lead to a significantly different wealth proxy.
26. Durand. pp. 363-86.
27. Durand, pp. 249, 447-448, 508-09.

In what follows, I have included all family heirs mentioned in the will, including spouses, nephews, cousins, and godchildren. This may lead to an overestimate of the estate's value, but the alternative - restricting heirs to nuclear family members only - would ignore sizeable bequests to others. Moreover, the high estimate may compensate for any slight tendency to favor the universal heir. Fortunately, my results do not seem to be sensitive to this choice, for limiting the number of heirs to children or even to dependent children who had not yet been provided for in marriage contracts leads to nearly identical results. So does the assumption that wealth is simply a linear function of the dowery alone or of the dowery and the number of children. Strictly speaking, I should have added to D any amounts included in pious bequests, but since these are all relatively small, it is safe to omit them. Another minor problem with the three wealth proxies should also be mentioned: in effect, each one measures wealth at a different time. The first wealth proxy probably measures wealth averaged over the person's entire life. The second (T) assesses it at the moment he draws up his will. The third (D) approximates wealth at some time prior to the drawing up of the will, since it takes into account money that is disbursed for doweries before the will is actually drawn up. The question then is to decide which of these imperfect wealth measures actually serves as the budget constraint when the individual makes his will. One could make a

case for any one of them, but it is reassuring that in the end the choice makes no difference.

One final objection to the wealth proxies should also be faced. It could be argued that the proxies D and T measure not the size of a testator's fortune but rather the portion of his estate left to his family. From this point of view, the proxy based on doweries -D- is simply an index of a testator's generosity to his daughters, and the total value T of his bequests merely reflects his legacy to his children and other related heirs. The link between D and T is therefore hardly surprising (so one could argue), but instead of holding wealth constant, our equations in fact merely fix the amount of money a testator gave his family. Thus any increase in pious bequests we might observe would not necessarily be a sign of heightened religious fervor; rather, it could be a mark of the family's losses. If our testator spent more on his salvation, he did so because he simply cared less about his relatives.

The problem with this criticism is that it ignores the first wealth proxy. Based on occupation and information from tax records, the first measure of wealth has no direct connection with the testator's generosity to his family. And this first proxy, it turns out, yields nearly the same regression coefficients as the other two. Moreover, the argument against the proxies T and D completely ignores the links Chaunu established between the size of the estate and the value of

bequests in the will. It also neglects the evidence for egalitarian inheritances in the Lyonnais. Finally, while it is true that a testator had to divide his fortune between the Church and his heirs and that a pious bequest thus came at the expense of the family, the portion left the Church was in all cases a small fraction of the total fortune. Therefore we can readily substitute the remainder -- the familial bequests F -- for the total fortune W without seriously affecting the coefficients of W or any other independent variable. If, for example, the value of pious bequests M is a linear function of Y and W (we ignore error terms and the other variables for the sake of simplicity), then $M = a + bY + cW$ for constants a , b , c . Hence $M = a + bY + c(M + F)$, since $W = M + F$. Therefore $M = \frac{a}{1-c} + (\frac{b}{1-c})Y + (\frac{c}{1-c})F$. Since only a small fraction of pious bequests is spent on pious bequests, c is much smaller than one. (We have assumed $c > 0$.) Thus $\frac{c}{1-c}$ and $\frac{b}{1-c}$ are approximately equal to c and b respectively, and replacing W with F will hardly disturb any of the coefficients. They will remain close to the value they had in the original equation which included W .

29. If we make the worst possible assumption -- namely, that the testator gave only the legitime to legatees other than the universal heir -- we could derive another measure of wealth L . For families with K children,

$$\begin{aligned} L &= 3 \quad (k - 1)d && (2 \leq k \leq 4) \\ L &= 2 \quad (k - 1)d && (4 < k) \end{aligned}$$

where d is the average dowery there we have neglected the legitime of heirs other than children; their rightful portions would only bring the estate closer to equality. It turns out that L is closely correlated with the proxy D , and using L in place of D in our tobit equation does not change the coefficients significantly. This is true whether we choose K to be the actual number of children, the number of unmarried children, or even the total number of heirs. For example, if in the formula for L we let K equal total number of heirs, then L and D are very highly correlated ($r = .995$), and a regression shows that the relationship between L and D does not change over time. If we insert L into equation 2', the results are very close to what we obtain using D or any of the other wealth proxies. The same results hold if we let K equal the number of children or the number of unmarried children: L always behaves in much the same manner as does D .

30. Historians have generally accepted the ability to sign as a mark of literacy. Testators, incidentally, were asked if they could sign, at least after 1580. The only problem was therefore caused by a handful of wills in which the testator was said to be too weak to sign, and another small number (mostly from the early 16th century) in which the testator was not asked to sign. In both instances, I considered the testator illiterate (since this

was the norm in the countryside) unless he belonged to a literate profession, such as the judiciary. One more remark about literacy should be made. It could be argued that literacy itself is a random variable which changes over time. If so, then I really ought to be dealing with a simultaneous system, in which there is an equation for L as well as an equation for M. This argument, though, overlooks the fact that men and women learned to read long before they drew up their wills, and so any belief in simultaneity strains credulity. Even if I were to construct such a simultaneous system, it is reasonable to argue that it would be recursive, with literacy dependent on the exogenous variables only. In this case, I could go ahead and estimate equation 2' separately with single equation techniques even though it involves limited dependent variables (see James J. Heckman, "Dummy Endogenous Variables in a Simultaneous Equation System," *Econometrica* 46(1978): 931-959). Alternatively, I could ignore the recursiveness and apply either two-stage least squares or the more appropriate two-stage techniques described in Heckman. I have done so, and the coefficient estimates I obtain are very close to the results with single equation methods.

31. For a tobit equation $Y^* = Xb + e$, with

$$Y = Y^* \text{ if } Y^* > 0 \text{ and } Y = 0 \text{ if } Y^* \leq 0, \quad \frac{\partial E(Y)}{\partial x_i} = b_i F\left(\frac{Xb}{S}\right),$$

where X is the matrix of independent variable observations, b the vector of coefficients, e the error term, Y^* the latent variable,

s the standard deviation of e, and F the cumulative standard normal distribution.

32. For a tobit equation with latent variable $Y^* = Xb + e$,

$$\frac{\partial E(P)}{\partial X_i} = f\left(\frac{Xb}{s}\right) \frac{b_i}{s},$$

where P is the probability that Y^* is positive, X is the matrix of independent variables, f is the standard normal density, s is the standard deviations of e, and b_i is the coefficient of X_i .

33. This assumes that the independent variables are fixed at their mean values. For a large change in the date, this assumption obviously cannot hold true.

34. See Maddala, pp. 155-62, 292-302, or Theil, pp. 607-14, for the method of doing this.

35. See Yatchew and Griliches, p. 16, and David Levine, "The Impact of Small Errors-in-Variables on Maximum Likelihood Estimation," unpublished paper, M.I.T. Department of Economics, July, 1980. Neither paper presents results which immediately reveal the sign of the bias. However, they both contain approximations for the asymptotic bias, and if available tobit and probit computer programs were modified, it would be possible to calculate these approximations. Levine's formula, which uses a Taylor series expansion, would be the easiest to use, since it applies to any maximum likelihood estimator. Even so, the calculations involved

would be complicated.

For the two-stage estimator in cases with limited dependent variables, see Heckman, op. cit.: Forest Nelson and Lawrence Olson, "Specification and Estimation of a Simultaneous - Equation Model with Limited Dependent Variables," International Economic Review, vol. 19. no. 3 (1978): 695-709; and Takeshi Amemya, "The Estimation of a Simultaneous - Equation Tobit Model," International Economic Review, vol. 20, no. 1 (1979): 169-181.

The method I used is that described in Nelson's paper. The asymptotic t-statistics reported in the second stage of the probit and tobit equations are not correct, and they will not be reported here. For purposes of comparison, the corrected two-stage least squares t-statistics (which are only meant to be indicative) are as follows for the independent variables Y, S and L:

Variable	t-statistic
Y	3.33
S	2.46
L	3.78

I performed similar instrumental variables estimates using proxy III in place of proxy II, and once again the coefficients of Y, S, and L showed little change. One additional fact also deserves mention: omitting W from the equation does not affect the

coefficients for Y and S significantly, although it does boost the coefficient of L. Once again, we have evidence that our estimators are robust.

37. If the independent variables are assumed to be normally distributed, then dividing the OLS coefficients by the proportion of non-limit observation yields consistent estimates of the tobit coefficients; see William II. Greene, "On the Asymptotic Bias of the Ordinary Least Squares Estimator of the Tobit Model," Econometrica 49 (1981): 505-513. The bias induced in the tobit equation by the use of proxies will therefore be a positive multiple of the OLS bias, which can be deduced using specification analysis. It is clear, of course, that my independent variables are not normally distributed; Greene argues, however, that his results are quite robust.
38. Mary Kathryn Norberg, "Rich and Poor in Grenoble (1630-1800)" (Ph.D. dissertation, Yale University, 1978).
39. Hoffman, pp. 161-68, and passim.
40. Durand, pp. 495-97.
41. The index I used came from Joseph Goy and Emmanuel Le Roy Ladurie, Les fluctuations du produit de la dime (Paris, 1972), p. 158: rente fonciere from the Chapter of S. Paul. Durand, pp. 495-97, gives a much better index, but since it does not cover the entire period, I was forced to use the figures from S. Paul.

42. The price of a mass was fixed by the diocese and often mentioned in the wills; I have divided it by the price of grain to get a price in real terms. The population, measured in households (feux), comes from a late 17th-century inquiry conducted by the intendants; see Maurice Garden, et al, Paroisses et communes de France: Rhone. Dictionnaire d'histoire administrative et demographiaue (Paris, 1978). Several communities were not covered in the inquiry; since these were likely to be small, they were assigned 300 households, an average figure for a good sized village.

43. See appendix II for a probit estimate of P directly. The probit equation predicts a much higher level of P at the end of the 17th century. One further topic of interest would be to see if there are any interaction effects involving the independent variables. There is some slight evidence of a sex-wealth interaction, but multicollinearity rules out a clear test. The evidence (which is only marginal) for a sex-wealth interaction appears when we add an interaction term to an OLS or probit equation for P; it is absent, however, in the more important OLS or tobit equation for M. The sex-wealth effect is in any case difficult to discern because the interaction term and wealth are highly correlated. There is no evidence for wealth-time interactions.

The simple statistical model I am using also rules out any answer to another question: whether literacy gave individuals a greater dose of Tridentine indoctrination or

whether it simply exposed them to the Counter Reformation at an earlier date. Neither probit, tobit nor OLS can distinguish between the two possibilities in the linear equation 2'.

A final question of interest can be answered. The question is the following: does the upsurge in pious giving start more suddenly and end more abruptly than the linear equations suggest? Was there, in other words, an early period of no change in religious behavior and, at the end, a similar period when change halted? I answered this question by determining whether pious giving flattened out in the early period before 1625 and then again after 1700. Tests revealed no evidence for such flattening either before 1625 or after 1700. Indeed, giving appears to increase after 1700, which probably reflects the downward bias of our estimate of the coefficient of Y.

44. One additional benefit of the t-statistics is that we can decide when relationships are significant without having to assemble the sort of enormous samples Vovelle and Chaunu put together.

45. In addition to the various deflators and wealth proxies discussed in this paper, I also investigated using doweries alone as an index of wealth, and I did the same with gifts to sons. Again, the results were similar.

46. The Grenoble study, which is being conducted by Mary Kathryn Norberg, has the advantage of treating both Protestants and Catholics. Although the Grenoble Protestants could give either

to the Protestant consistory or to charity, pious bequests in their wills were far less frequent than in Catholic wills, and in contrast to Grenoble Catholics, bequests by Protestants actually dropped in the seventeenth century. Since the occupational differences between Protestants and Catholics are controlled for, the only difference between the two groups is religious. This fact lends further support to the contention that it was religion (and in particular the Counter Reformation) which drove pious bequests upward in the 17th century.

47. Vovelle, pp. 45-57; Chaunu, pp. 233-236. Unfortunately, nearly all of my wills were drawn up before a notary. It should be pointed out that even testaments mystiques had to be registered with a court or a notary. They were duly registered, but they remained sealed.
48. Aboucaya, p. 153.
49. See Henri Hauser, Recherches et documents sur l'histoire des prix en France de 1500 a 1800 (Paris, 1936), pp. 138, 204, 405-06, for butter and wine prices in various parts of France; see also Durand, op. cit., for wine prices in the Lyonnais. Cf. the similar argument in Jan de Vries, The Economy of Europe in an Age of Crisis. 1600-1750. (Cambridge, 1976), pp. 84-85.
50. The transfer taxes (which were really a tax on sales) did not apply to inheritances in which a child or spouse was the

universal heir. They were levied on real property only and were paid by the recipients of the property. Taxes on bequests of land to the Church (amortissement. etc.) were also paid by the religious institution receiving the property, not the testator. See Aboucaya, pp. 89-90, 135-38; Marcel Marion, Dictionnaire des institutions de la France aux XVIIe et XVIIIe siecles (Paris, 1923), s.v. 'Lods et ventes,' 'Mainmorte,' 'Amortissement,' 'Succession'; Roger Doucet, Les institutions de la France au XVIe siecle. 2 vols. (Paris, 1948), 1: 478. 484-85.

51. Chaunu, p. 418.

APPENDIX I

NOTARIAL REGISTERS USED IN SAMPLES

<u>NOTARY</u>	<u>AD RHONE COTE</u>
Bertrand	3E1028
Jaques	3E8901
Cluniet	3E8891-8892
Godebert	3E8895-8897
Bollioud	3E1004
Gotail	3E8721-8722
Lentilhon	3E8902, 8907, 8913
Demasso	3E1415
Gastible	3E1
Fabry	3E2
Chapuis	3E3
Michaud	3E4
Agnes	3E5
Dubost	3E38
Vincent	3E8588
Burlat	3E2190-2192, 2235-2239
Nichon	3E56-57
Mermet	3E1027

APPENDIX II

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OLS AND PROBIT ESTIMATES FOR P

(P=0 IF THE WILL CONTAINS PIOUS BEQUESTS, 0 OTHERWISE)

INDEPENDENT VARIABLE	WEALTH PROXY I		WEALTH PROXY II		WEALTH PROXY III	
	OLS	PROBIT	OLS	PROBIT	OLS	PROBIT
	CONSTANT	-7.507	-25.494 (-12.64)	-7.470	-25.205 (-12.36)	-7.540
WEALTH VARIABLES						
X ¹	0.919 x 10 ⁻¹ (1.12)	3.273 x 10 ⁻¹ (1.17)	-----	-----	-----	-----
X ²	0.393 x 10 ⁻¹ (0.97)	1.660 x 10 ⁻¹ (1.15)	-----	-----	-----	-----
T	-----	-----	0.183 x 10 ⁻⁴ (1.38)	1.079 x 10 ⁻⁴ (1.71)	-----	-----
D	-----	-----	-----	-----	0.479 x 10 ⁻⁴ (2.51)	1.532 x 10 ⁻⁴ (2.38)
OTHER INDEPENDENT VARIABLES						
Y	0.481 x 10 ⁻² (15.68)	1.532 x 10 ⁻² (12.50)	0.481 x 10 ⁻² (15.32)	1.521 x 10 ⁻² (12.25)	0.482 x 10 ⁻² (10.06)	1.559 x 10 ⁻² (8.04)
S	0.261 x 10 ⁻¹ (0.74)	0.826 x 10 ⁻¹ (0.64)	0.412 x 10 ⁻¹ (1.14)	1.393 x 10 ⁻¹ (1.08)	0.387 x 10 ⁻¹ (0.69)	1.382 x 10 ⁻¹ (0.69)
L	0.170 x 10 ⁻¹ (0.25)	0.445 x 10 ⁻¹ (0.19)	0.558 x 10 ⁻¹ (0.96)	1.772 x 10 ⁻¹ (0.87)	0.199 x 10 ⁻¹ (0.22)	0.415 x 10 ⁻¹ (0.14)
A	-0.127 (1.66)	-0.461 (-1.64)	-0.151 (1.95)	-0.539 (-1.91)	-0.263 (-1.54)	- .794 (-1.37)
K	-0.965 x 10 ⁻² (1.04)	-3.289 x 10 ⁻² (-0.98)	-1.854 x 10 ⁻² (1.95)	-7.065 x 10 ⁻² (-2.02)	-1.152 x 10 ⁻² (-1.05)	-5.036 x 10 ⁻² (-0.98)

APPENDIX II
(CONTINUED)

	WEALTH PROXY I		WEALTH PROXY II		WEALTH PROXY III	
	OLS	PROBIT	OLS	PROBIT	OLS	PROBIT
s	0.403	-----	0.405	-----	0.407	-----
R ²	32.5%	43.9%	32.8%	44.9%	32.8%	44.9%
F	33.98	-----	43.61	-----	19.28	-----
	(7,568)df	-----	(6,537)	-----	(6,237)df	-----
-2 x log likelihood ratio	-----	208.45	-----	200.70	-----	90.53
	-----	7df	-----	6df		6df
N	576	576	544	544	244	244
% Actual Yes	38.5%	38.5%	40.6%	40.6%	39.8%	39.8%
% Actual No	62.5%	62.5%	59.4%	59.4%	60.2%	60.2%
% Predicted Correctly	-----	72.7%	-----	72.1%		73.0%

Note: The number in the parentheses is the value of the coefficient divided by its estimated standard deviation. All monetary amounts in deflated livres. Number of cases varies due to discarded missing values. Values of all variables defined in Table 3.

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