Shirtsleeves to Shirtsleeves?

Income Persistence, Family Firms, and Aristocratic Dynasties

Lorenzo Pessina

April 2022

I document that present-day descendants of aristocratic dynasties enjoy high economic status in Italy, several decades or centuries after their ancestors first received a title. Over this period of time, Italy experienced wars, annexations, political reforms, and a structural transformation of the economy. Yet, the income distribution of noble taxpayers living in Milan in 2005 is shifted to the right relative to the one of all other taxpayers. On average, noble descendants obtain €41,125 (or 1.77 times) more, controlling for observables. Moreover, aristocrats are three times more likely to be involved in firms, either as shareholders or company officials. This paper shows that process of income transmission within families has longer memory than suggested by traditional measures of intergenerational mobility.

Key words: Intergenerational mobility, Persistence, Dynasties, Family Firms, Nobles.
JEL codes: J62, N33, D31

[1]ZEW Mannheim. Email: Lorenzo.Pessina@zew.de. I thank Wojciech Kopczuk, Michael Best, and Arun Advani for their comments and guidance on this project. I benefited from comments and questions from seminar participants of the Columbia Applied Micro Colloquium, ifo Conference on Genes, Social Mobility, and Inequalities across the Life-Course, SIEP Annual Conference, NTA Annual Conference. All mistakes are my own.

1 Introduction

Understanding the sources of inequality is a widely debated topic among economists, politicians, and society at large. Family background is one of the factors that has received special attention in the economic literature because it allows to "distinguish between equality of opportunity and equality of outcomes" (**?**). If all children have the same chance of attaining economic success regardless of the family they were born into, everyone enjoys equality of opportunity. The distribution of income might nonetheless be unequal because of the influence of other factors (such as effort and luck), but the society is perceived as fair. If instead family characteristics play a role in determining economic status later in life, then unequal outcomes are less desirable.

Recent studies find that the family influences future generations' income to a varying degree, depending on the setting and the time horizon considered. The vast majority of papers focuses on the persistence of income across two adjacent generations within the same family (**??**). In developed countries, estimates of mobility, even those at the low end of the range, imply a relatively quick reversal of fortunes after few generations.[1] A handful of studies, instead, take a longer-run perspective. They find a higher degree of income and wealth transmission across generations that are several decades or centuries apart (**??**). Long-run estimates show a much higher degree of transmission than the one implied by studies focused on adjacent generations.

This paper finds that present-day descendants of aristocratic dynasties enjoy a high economic status in Italy, several decades or centuries after their ancestors received a title. To do so, I combine information on descendants of all noble families, administrative data on taxable income, and the public registry of shareholders and company officials. I use detailed information on family trees of noble dynasties that have been continuously updated from 1910 to the present day. To measure economic status, I use administrative data on taxable income for the universe of taxpayers living in Milan in 2005 and the public registry of shareholders and company officials for all corporations, limited liability companies, and limited partnerships registered in Italy. I then match these sources by name and date of birth, resulting in a sample of 528 noble descendants out of 888,720 taxpayers (0.06 percent).

I present three findings. First, I show that descendants of noble dynasties obtained a significant income premium relative to the average taxpayer living in Milan in 2005. The income premium is visible throughout the distribution and, in particular, in the upper half

[1] Some studies provide evidence that income transmission in the short run is much higher at the top of the income distribution (**?**).

of the distribution. Second, to analyze one of the factors that contributes to this advantage, I examine the prevalence of noble descendants among shareholders and company officials. I find that noble descendants are three times more likely to be shareholders or company officials in any firm registered in Italy from 2009 to 2018. While noble and non-noble taxpayers in the top decile of the overall income distribution own firms at roughly the same rate, noble taxpayers in the bottom 9 deciles are clearly distinct from the rest. In addition, I find that firms with a noble shareholder exhibit a worse return on assets and on equity, relative to comparable firms. Finally, I measure income transmission among father-son pairs in the sample and find a moderate degree of income persistence, in line with the literature that focuses on two adjacent generations.

The analysis proceeds in three steps. I first quantify the advantage enjoyed by present-day descendants of noble dynasties. They obtained between €41,125 and €49,710 more in 2005 than the average taxpayer living in the city of Milan. This income premium is statistically different from zero at any common level of significance. Even at the low end of the range, it is economically sizable as it amounts to 1.77 times the mean income in the sample (€23,165). Moreover, the entire income distribution of noble descendants is shifted to the right, with the gap increasing with income. Using a linear quantile regression model, I estimate that the gap between the two distributions is around €44,000 at the median yet it increases to €101,000 at the 90th percentile of the distribution. While the observables available in the dataset are limited, I then show that age and the composition of income explain only a small fraction of the overall difference in average earnings. Similarly, a counterfactual distribution of all taxpayers remains close to the observed distribution with the gap between nobles and the other taxpayers remaining distinctly visible.

These first set of descriptive results shows that noble descendants command a sizable income premium that increases at the top of the distribution. While striking, these results do not support a causal interpretation of the link between family background and economic success later in life. It is possible that these individuals would fare as well if they were born in a different family or that their family would create the same environment conducive to economic success even without a noble title. Yet, a placebo exercise shows that the chances of observing such a high income-premium in a random sample of individuals are extremely low (Figure 1). Moreover, Italy is an interesting context for studying income transmission within dynasties because these titles do not give rise to any legal privilege or economic benefits since the end of World War II. Before that, Italy experienced significant political, institutional, and economic transformations over the previous centuries that would normally be associated with the destruction of private property and a re-ranking of individuals across the income distribution (**?**).

Second, I investigate one of the factors that contribute to the income premium of noble descendants: control over family businesses. I document that noble descendants are more likely to be shareholders or company officials than the rest of the population.[2] Almost a fifth of noble individuals are either a shareholder or an official, a proportion that is more than three times higher than the base rate among all other taxpayers. Focusing on ownership alone, 12.7 percent of noble individuals own shares in a business, while only 4.1 percent of non-noble taxpayers do. Among company roles, member of the board of directors is the most common among nobles. While noble and non-noble taxpayers in the top decile of the income distribution own firms at roughly the same rate, noble taxpayers in the bottom 9 deciles of the distribution are clearly distinct from the rest of the population. These results show that noble descendants are more likely to be involved in companies, therefore exerting control over their operations and their profits.

Turning the analysis to firms, this paper shows that firms with at least one noble shareholder are more predominantly active in real estate. In addition, they report higher assets and equity on their balance sheet relative to a comparable set of firms. But they do not obtain higher turnover nor do they post higher profits. As a result, firms with noble shareholders exhibit a lower return on assets and equity. The difference in total assets is mainly driven by fixed tangible assets.

Finally, I find moderate intergenerational transmission among father-son pairs. The rank-rank slope is 0.21 for all pairs of noble fathers and sons, which is in line with the recent estimates that focus on adjacent generations among the broad population. For example, **?** find a rank-rank slope of 0.22 for the entire Italian population and of 0.18 for the province of Milan. The degree of income transmission between adjacent generations of noble dynasties does not appear to be higher than in the broader population. Yet, descendants of these dynasties enjoy a significantly higher economic status relative to the broader population, even though they are far apart from the ancestor that first received the title. This difference echoes the discrepancy between estimates that focus on two adjacent generations and those that take a long-run perspective.

The rest of the chapter proceeds as follows. Section 2 links the paper to the existing literature. Section 3 presents the data sources, discusses the potential biases that could affect the results, and provides some background information on the evolution of noble titles in Italy. Section 4 quantifies the income premium enjoyed by present-day noble descendants. Section 5 discusses the role of family firms and Section 6 computes intergenerational

[2]Most of company officials in the dataset are C-level managers, members of the board of directors including the chair, and other executives. Roles that are reported less frequently include auditors, legal counsels, and court-appointed liquidators.

mobility among noble dynasties. Finally, Section 7 concludes.

2 Related Literature

This paper speaks to three main strands of literature. First, it is related to a vast literature on income transmission among generations within the same family. While most of the literature focuses on transmission between two adjacent generations (see **?** and **?** for a survey), this paper complements a handful of studies that take a long-term perspective. For example, **?** show that grandsons of former slaveholders in the US South surpassed their counterparts in 1940, despite the end of the Civil War had eliminated the slave wealth of their ancestors. In Italy, **?** use pseudo-family links to document that individuals at the top of the housing wealth distribution in the 15th century in Florence are more likely to be at the top of the present-day income distribution. Across a range of developed countries, **?** measures the persistence of economic status among individuals that share rare last names. This paper uses actual descendants from dynasties that first reached elite status decades or centuries ago and it shows that they still enjoy elite status today.

Second, this paper adds to the broad cross-section of literatures on the role of dynasties in politics and the economy (**??**). **?** shows the importance of family connections in the search for jobs.

Finally, I find that the present-day economic success of some noble families goes through closely-held businesses. This complements the recent literature that provides new evidence on firm ownership at the top of the income distribution (**???**). These papers show that closely held businesses generate a large share of total top income and represent a sizable fraction of the assets of individuals at the top of the wealth distribution. I show that firm ownership is one of the channels through which noble taxpayers differ from the rest of the distribution. Moreover, this paper contributes to the corporate finance literature that connects the performance of family firms and the appointment of family members as managers (**?**).

3 Background and Data

In this section, I describe the context and the data sources used to quantify the economic status of present-day descendants of noble dynasties. I also discuss the potential limitations of the archival and administrative datasets used in the paper.

3.1 Nobility in Italy

Noble titles codify elite status reached by one individual at some point in the past and they allow for the hereditary transmission of privileges that accompany them. Bestowing noble titles is a common practice adopted by several governments throughout history and across geographies. The motivations that call for a title range from benign and virtuous (such as an act of generosity or heroism in combat) to shrewd and transactional (some titles were granted in exchange for money, political support, etc.).

In Italy, noble titles were passed on to the younger generation of the same families over centuries.[3] From the Middle Ages to World War II, those ruling Italian regions continued to bestow new titles. These titles and their privileges survived regime changes, wars, annexation, etc. Upon the unification of Italy in 1861, these titles were formally recognized by the new national government. In the 19th and 20th centuries, the titles did not grant additional privileges but they came with property rights over land.

The Italian constitution established that noble titles ceased to have any legal effect from 1948.[4] The new constitution was written during the transition from monarchy to a republic as provided for by a popular referendum in 1946. Lawmakers decided to eliminate privileges and rights stemming from noble titles, but they did not encroach on property rights over land and the real estate of nobles.[5] While nobles were not allowed to use titles in their names, they kept territorial designations (*predicati*) as part of an individual's last name.[6] As a result, these designations were passed on from the father to his children, following the general rules on the transmission of last names.

3.1.1 Family Trees of Noble Dynasties and Potential Selection

To identify present-day descendants of Italian noble families, I use data from "*Libro d'oro della nobiltà italiana*." This book contains information on all noble dynasties and it has been updated every two to five years since 1910 by *Collegio Araldico*, a private association aimed at promoting the history and record-keeping of noble dynasties. The first edition of the book was based on the official list prepared by the Italian government.[7] Since the unification of Italy, the new government compiled a list of families who had obtained titles under previous jurisdictions and it updated it to include families that obtained later on.

[3] See see **?** for a legal analysis of Italian noble and other hereditary titles.

[4] This is provided for in *Disposizioni Finali e Transitorie XIV* and Article 3 of the Italian Constitution.

[5] The new republican government did not introduce special taxes targeted at their assets.

[6] For example, the nobleman *Mario Cordero Marchese di Montezemolo* legally became *Mario Cordero di Montezemolo*, as he dropped the title *Marchese* (Marquis) but he kept the local designation *di Montezemolo* as part of his last name.

[7] The official list prepared by the Italian government was also named *Libro d'oro*.

Libro d'oro provides biographical information for each member of a dynasty: first and last name, date of birth and, in some cases, educational attainment, job and place of residence at the time of publication. It also reports all children descending from a male member of the dynasty. I use this information to create father-son and siblings pairs to quantify income transmission among adjacent generations. Figure A.1 shows a sample page of *Libro d'oro* where information about noble descendants is provided as text. I systematically look for noble individuals among taxpayers living in the city of Milan and I hand code information on family trees where available.[8]

Potential Selection. While aiming to be comprehensive, *Libro d'oro* could suffer from the potential selection that could bias the results presented in the paper. Selective inclusion in the sample could occur at the dynasty level and the individual level.

The first source of potential selection comes from the coverage of dynasties in the book. The book aims to keep track of all noble dynasties in Italy as its first edition uses the universal registry maintained by the government as a starting point. Yet, subsequent editions of the book –including the one I use for this paper– might not provide the same coverage as the first edition because some dynasties failed to provide information to *Collegio Araldico* or the editors of the book did not find enough information about the heirs. In addition, selection occurs naturally as dynasties that are not able to reproduce themselves are less likely to be included in the book.[9] If dynasties that experience a decline in economic status are less likely to be included in the sample, then the results of the paper will likely overstate the income premium enjoyed by nobles.

The second potential source of bias comes at the individual level. For each family, *Libro d'oro* reports descendants from male members only. While this does not directly alter the gender balance of the sample of nobles,[10] it might affect the result of the paper depending on the allocation of resources among siblings within a dynasty. For example, parents might provide unequal investment in education among their children or they might decide on an unequal distribution of assets. If male members of a dynasty obtain better economic outcomes that can in turn give an advantage to their offspring, the results of the paper could overstate the true income premium enjoyed by all descendants of noble dynasties, including offspring of female members. Finally, similarly to the survivorship bias at the dynasty level, the likelihood of appearing in the book might also be systematically related to the individual's economic status. Family members who experience a decline

[8] I have hand-coded data for dynasties whose first letter of the last name is from A to L included.

[9] The book reports some of the dynasties without heirs.

[10] In fact, male descendants are slightly over-represented as they account for 55 percent of the sample of noble individuals.

in their income or assets might be less keen on being included in the book, although the book itself does not include information on the economic status of each individual. These concerns notwithstanding, the sample of noble descendants is relatively balanced with male individuals making up 55 percent of it.

3.2 Economic Outcomes

I measure the economic status of noble descendants using two data sources. The first dataset contains a cross-section of income tax returns for all taxpayers living in the city of Milan in 2005. The second one is the registry of shareholders and managers for all limited liabilities companies active in Italy, updated to 2019. In this section, I describe the data sources and explain how I construct the sample for the main analysis of the paper.

3.2.1 Income tax returns

To understand the economic success of descendants of noble dynasties, I use the universe of tax returns filed by residents of the city of Milan in Italy for the year 2005. The Italian tax authority published this data, including names and date of birth of individuals, on 30 April 2008 on its institutional website.[11] While tax returns of Italian taxpayers are considered to be public information, they are usually made available upon request subject to regulations.[12] As a result, the Italian Privacy Authority took issue with the online mass publication and ordered the removal of tax returns from the tax authority's website. However, "the Authority also clarified that whoever had obtained the data through the Ministry's website had done so legally" (**?**).

The dataset contains the universe of taxpayers living in Milan which amounts to 888,720 individuals. However, the law provides for some exceptions. First, individuals with annual income below thresholds that range from €3,000 to €7,500 are not required to file. Second, dependants, such as children or other family members, are also exempted as long as they report less than €2,800 in annual income.

I define income as fiscal income, which includes income from employment, businesses and sole proprietorships, rents from properties, royalties, and other small sources. Interests and dividends are not reported on tax returns if they are subject to exact withholding. The

[11] Decision by the director of the Italian Tax Authority taken on 5 March 2008available at https://www.agenziaentrate.gov.it/portale/web/guest/archivio/normativa-prassi-archivio-documentazione/provvedimenti/altri-provvedimenti-non-soggetti/provvedimenti-2008/marzo-2008. Accessed on 2021-04-25.

[12] To be more precise, Italian residents may ask to see no more than ten tax returns each year. Inspecting tax returns in bulk is not allowed.

definition includes capital gains which are reported on the tax form upon realization. For individuals that obtain business income, the dataset reports business income separately from other sources and the 5-digit industry code.

The dataset contains some information that allows me to infer the most important source of income for each individual. To do this, I use a categorical variable that reports the section of the tax form with the largest amount of income. Another categorical variable specifies which tax form an individual used for filing. Individuals may choose among three types of returns. First, individuals who obtain labor income only are subject to exact withholding, and their employer file the return (*CUD*) on their behalf. Second, individuals that earned income from employment, rents from property, and few types of business income file a simplified form (*Modello 730*). Finally, the last form (*Unico Persone Fisiche*) is used by individuals with incomes that do not fall in the previous categories. This form is divided into sections corresponding to broad categories of income, such as rents, business income, capital gains, etc.

Table 1 reports descriptive statistics for all taxpayers in Milan and taxpayers residing in Italy.[13] The average income for individual taxpayers in Milan was €23,165 which is 68 percent higher than the Italian average. A significant proportion of taxpayers (16.2 percent) reports zero income. Turning to the income composition, the main source of income is employment for 82.9 percent of individuals, whereas a combined 10.0 percent report self-employment or business as their main source of income (Table 3).

3.2.2 Businesses Financial Accounts and Registry of Shareholders and Managers

To quantify the involvement of noble descendants in businesses, I use the *Amadeus* dataset provided by Bureau Van Djiik. This dataset contains financial statements for firms and information on their shareholders, managers, directors, and other company officials.[14] The data is collected by Cerved Group from mandatory information reports that all registered firms have to file annually with the local Public Registry (*Registro delle Imprese*).[15]

The dataset covering financial accounts of businesses is structured as a panel where each observation is a firm-year. For each firm, it includes the ten most recent filings as the oldest data point is dropped when a new year is added. Figure A.2 shows the distribution of firms in the sample grouped by the year of their most recent filing. The dataset includes a financial account from either 2017 or 2018 for around 86 percent of the sample of active firms. This implies that for the vast majority of firms, *Amadeus* contains relatively recent

[13] The statistics for the whole country come from **?**.

[14] Other officials include auditors, legal counsels, court-appointed liquidators, etc.

[15] This data is accessed via Wharton Research Data Services provided by Columbia University library.

financial statements. Yet, around 15 percent of active firms did not file recent financial statements. I, therefore, exclude active firms that have not filed any new financial accounts since 2016. That said, the sample likely contains bias at the extreme years of the panel because filing deadlines vary by type of firm and larger firms tend to file sooner. Therefore, I consider the central years from 2010 to 2017. Finally, I include firms with at least 6 years of data.[16]

The dataset with information on shareholders and managers contains the most recent filing only and, as such, does not have a time dimension. For shareholders, the dataset contains the name, date of birth, and the share of direct ownership of each firm.[17] For company officials, the data has the name, type and date of appointment.

3.3 Linking Datasets

To quantify the economic advantage enjoyed by descendants of noble dynasties, I match individuals across all datasets by name and date of birth. The resulting analysis sample contains 528 present-day noble descendants that have a matched observation in the personal income tax statistics. Matching by name and date of birth is precise as none of the noble descendants are matched to more than one taxpayer.

To assess the prevalence of noble descendants among shareholders and company officials, I match the universe of taxpayers living in Milan to the *Amadeus* datasets. I find that 36,609 taxpayers are shareholders of at least one firm and 33,896 are listed as company officials.[18]

4 Quantifying the Advantage

In this section, I quantify the advantage of descendants of noble families relative to the rest of the population. I show that the income premium is large and equal to 1.7 times the average taxable income in Milan. Moreover, I show that the advantage of noble descendants remains high after conditioning on observables. Finally, I find markedly different premia for male and female descendants. While the income premium is high for men, it becomes negative for noblewomen.

To quantify the advantage of present-day descendants of noble families, I use the following specification:

[16] Figure A.3 shows the number of observations is stable around 580,000 between 2013 and 2017, while it increases from 491,000 since 2010.

[17] In few cases, the dataset contains information on total ownership shares.

[18] The *Amadeus* dataset covers all firms (and their shareholders and officials) registered in Italy.

$$y_i = d_i\mu + X_i\beta + \varepsilon_i \tag{1}$$

where y_i is annual income of individual i, d_i is a dummy variable that is equal to one for individuals that are descendants of a noble family, X_i contains individual characteristics, such as age and income composition. The coefficient μ captures the economic advantage that noble descendants enjoy with respect to the rest of the population. Table 4 shows estimates from equation 1. Each column provides results for a different specification. Column (1) shows the unadjusted difference, while columns (2)-(4) include additional sets of covariates.

The main empirical finding is that noble individuals reported between €41,123 and 49,710 more in annual income than the average taxpayer in Milan in 2005. The unadjusted difference shows the largest gap between noble descendants and the average taxpayers. The difference remains stable in the specification that controls for age (column 2) or self-employment income (column 3), but it declines to €41,123 in the specification with dummies that captures the main source of income for each individual (column 4). This suggests that a small part of the income premium is due to the different income composition of noble and non-nobles. In all specifications, the income gap between noble descendants and the average taxpayer is statistically different from zero at any common level of significance. Using robust standard errors, I can exclude an income premium for nobles smaller than €27,900. The point estimate is quantitatively large as it amounts to 1.77 times the average taxable income in Milan.

Given that the distribution of income is heavily skewed to the right, Table 5 reports estimates using Log taxable income as the dependent variable. The income premium remains large and it ranges from 105 log points in the specification without controls (column 1) to 80 log points in the one with the largest set of control variables (column 4). All the estimates are statistically different from zero at any common level of significance. Moreover, confidence intervals around these estimates are relatively tight. The 95-percent confidence interval around the point estimate excludes an income premium smaller than 68 log points.

To provide additional evidence that the difference is not driven by chance, I test the Fisher sharp null. Under the null hypothesis, the noble do not earn an income premium relative to the non-nobles. To perform this test, I randomly assign noble status to taxpayers. While it is theoretically possible to record the pseudo difference for all permutations, the large sample size renders this impractical. Following **?**, I perform 10,000 permutations and compare the actual income premium with the distribution of pseudo-differences. I provide the results for three test statistics: (i) the difference in average income, (ii) the difference

in log annual income, and (iii) the difference in median income. Figures 1(a), 1(b), and 1(c) show the results of this exercise. The graphs show that the actual income premium of noblemen is large and unusual. In all cases, it is larger than the 95th percentile of the distribution of pseudo differences. Therefore, the graphs demonstrate that there is enough evidence to reject the null hypothesis of no income differences between the two groups.

Moving to analyze the full income distribution, Figure 2 shows that the income premium of the nobles is not driven by a few outliers, it is a visible shift in the entire distribution. The distribution of taxable income for noble individuals is shifted to the right relative to the one of non-noble individuals. This is confirmed by the Kolmogorov-Smirnov test which rejects the null hypothesis of equality of the two distributions. I obtained p-values less than 0.001 when I perform the test on the distribution in levels and in logs. In addition, to quantify the difference between the two distributions, I estimate the following linear quantile model:

$$Q_{y_i|X_i}(\tau, X_i) = d_i\mu_t + X_i\beta_\tau \tag{2}$$

where $Q_{y_i|X_i}(.)$ is the quantile τ of the (conditional) distribution of $y_i|X_i$. The vector of covariates is the same as in the main OLS specification (equation 1). Standard errors are computed using the "wild" bootstrap method (**?**) with 100 repetitions.

Table 6 presents the differences in conditional quantiles for the 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 99th percentiles. The shift of the income distribution of noble descendants to the right is sizable and rising with income. The difference in the two distributions is €6,470 at the 25th percentile, a shift that is more than 2.5 times the value of the unconditional quantile for the distribution of the rest of the population. This difference is statistically significant at the 5 percent level. The premium at the median is €22,033, which is around half the average premium estimated by OLS. In the upper half of the distribution, the shift to the right keeps increasing in absolute terms, reaching more than €100,000 at the 90th percentile and surpassing €200,000 at the 99th percentile. The estimates of the quantile model in logs show an increasing income premium as a percentage of taxable income. The premium is larger than 95 log points above the 90th percentile. All coefficients are statistically significant.

4.1 The Role of Individual Characteristics

In this section, I investigate whether observable characteristics of the noble can explain part of the income premium. While the number of observable is limited in the dataset, it still contains some characteristics (such as income composition or industry for self-employed)

that could shed light on the mechanisms at play. To do this, I control for observables using a non-parametric approach. I show that the income premium remains high for men within relatively small cells of individuals with similar characteristics (such as age, main income source, etc.). Therefore, most of the income premium remains unexplained.

Starting from age, I show that the income premium of noble descendants manifests from age 35 and it remains relatively stable throughout the rest of the working life of individuals. The premium slightly declines for the oldest individuals. Figures 3(a) and 3(b) show the mean and the median income premium for individuals within 5-year age groups. These results show that the age composition of noble individuals cannot explain the advantage.

To quantify the fraction of the income premium attributable to observed variables, I decompose the difference in an unexplained and explained components following **?**, **?**, and **?**:

$$\Delta y = (\bar{X}_n - \bar{X}_c)\hat{\beta}_c - (\hat{\beta}_c - \hat{\beta}_n)\bar{X}_c \tag{3}$$

where and $\hat{\beta}_g$ is the estimated coefficient from equation $y_g = X_g\beta_g + v_g$ for each group $g \in \{\text{noble}, \text{non-noble}\}$ and $\bar{X}_g$ is the average of observables. The first term on the right hand side of equation (3) is the composition effect, while the second term represents the unexplained (or "wage structure") effect.

Table 8 reports the result of the decomposition. The overall income premium is €49,710. The decomposition yields that the part that is explained by the gap is €8,980 (or 18 percent), yet the vast majority (82 percent) of the average gap remains unexplained by the observables. Standard errors are reported in parenthesis and are bootstrapped.

While the Oaxaca-Blinder decomposition allows me to isolate the contribution of observables on the average difference, I now investigate their effect on the entire distribution. To do so, I reweight the probability density function of income for non-noble taxpayers following **?**. Estimates for the actual and the counterfactual distributions of income are obtained from:

$$\hat{f}_{Y_c} = \frac{1}{hN_c}\sum_{i\in C} K\left(\frac{y_i - y}{h}\right) \tag{4}$$

$$\hat{g}_{Y_c} = \frac{1}{hN_c}\sum_{i\in C} \hat{\Psi}(X_i)\cdot K\left(\frac{y_i - y}{h}\right) \tag{5}$$

where $K(.)$ is the Gaussian kernel function and $\hat{\Psi}(X_i)$ are the reweighting factors. Defining $Pr(D_c = 1|X_i)$ as the probability of being a noble descendant conditional on X_i and $Pr(D_c = 1)$ the corresponding unconditional version, I estimate this probability via a

probit model and obtain an estimate for the reweighting factor as follow:

$$\hat{\Psi}(X_i) = \frac{\hat{Pr}(D_B = 1|X_i)/\hat{Pr}(D_B = 1)}{\hat{Pr}(D_B = 0|X_i)/\hat{Pr}(D_B = 0)} \tag{6}$$

Figure 4 shows that observables can explain a small part of the right shift in the income distribution of noble descendants. The figure plots kernel density estimates for each group and an estimate of the counterfactual distribution of income for non-noble taxpayers had they the same observables as noble descendants. The actual and the counterfactual distribution for non-noble taxpayers lie very close to each other, while the distribution for noble descendants remains visibly shifted to the right. While the set of observables available in this paper is limited, it nonetheless includes some of the key correlates of income, such as age and the sources of income. Yet, these variables can explain a small part of the difference in economic fortunes between noble and non-noble taxpayers.

Finally, to test whether the composition of individual income can explain the results, I compute the income premium for individuals that report the same main income source on their tax returns. As the source of income correlates with the level of income, it is natural to wonder whether the composition of individual income could explain part of the nobles' advantage. Table 9 reports the coefficient μ from the specification with controls estimated on a series of subsamples. Each sample contains individuals with the same main income source. The first row reports the coefficient on the full sample for reference. Column 2 reports the magnitude of the income premium measured in logs, regardless of the gender of the individuals. The income premium is positive in all income categories, although the magnitude differs. Relative to the premium on the full sample, noble descendants whose main income source is employment or rent obtain a higher premium. The premium is smaller, albeit still positive and sizeable, for all other income categories (self-employment and capital). The fact that noble descendants obtain the largest income premium when they are employed suggests that the advantage is not due mainly to passive investment income obtained from family assets. Rather, noble descendants can obtain a premium in the labor market even when they compete against other workers.

The source of the income premium enjoyed by noble taxpayers can be explained by a range of unobserved factors. This paper does not provide causal evidence that being born in a noble family determines the future economic success of an individual, but it shows that the two are positively correlated. In other words, I cannot rule out the possibility that noble descendants would have been as successful (or more) were they born in a random family. However, my results still point towards a strong association between family background and economic success later in life.

4.2 Gender Differences

In this section, I explore whether the income premium of noble descendants is different for males and females. To quantify the gender difference, I augment the linear specification in equation 1 to include an interaction term between the noble dummy d_i and a female dummy that is equal to 1 for women. This specification allows me to measure the income premium for noblemen and noblewomen separately. As the administrative dataset does not include the gender of the taxpayer, I assign the gender of an individual based on their first name. For all noble descendants, I manually classify the gender of each individual. For the non-noble taxpayers, I classify the gender of individuals using a machine learning algorithm (see Appendix A for more details).

Table 10 shows that noblewomen do not obtain any income premium relative to other women in the sample. In fact, they receive less income than non-noble women on average. The difference amounts to 45 log points on average (column 3) and the point estimate is large and statistically significant. To further elaborate on the composition of this difference, Table 9 quantifies the income difference between noble and non-noble women conditional on which income source they list on their tax return. The fourth column of the table shows that the income premium is negative for employment and self-employment income, while it is positive for the other categories more related to passive income. In terms of inference, the negative point estimates are statistically significant at the 5 percent level, while the others are indistinguishable from zero.

The different patterns of the income premium for men and women are significant and it shows that only noblemen obtain higher income than non-nobles. This might be due to a host of factors and choices that families or individuals made (differential parental investment in their children, marriage decision and within-household labor supply decisions, gender bias in social skills, etc.). However, this paper does not speak about which factors are responsible for this difference.

5 The Role of Family Firms

Recent evidence from the US shows that more than half of all individuals in the top 1 percent of the income distribution are business owners (**?**). Moreover, the most common firms owned by high-income individuals are "single establishment firms in professional services [...] or health services." To better understand the sources of the advantage of noble descendants, I focus on business owners. I show that noble descendants are more likely to be owners or company officials of firms relative to the rest of the population. These firms

are mainly active in the real estate industry, suggesting that some of the family assets are held within businesses.

5.1 Characteristics of Noble Owned Firms

Table 11 shows that noble descendants are more likely to be shareholders and managers of firms, relative to the rest of the population. They are 3 times more likely to be shareholders compared to a base rate of 4.1 percent among the general population. A similar difference appears for positions of company officials, such as C-level managers, administrators, and members of the board of directors. Moreover, 9.1 percent of noble individuals are members of the board of directors of a company, which is 7.5 percentage points higher than the base rate in the sample. These statistics show that noble descendants are more likely to exert control over business assets, not only as owners but also as managers and directors.

Turning the analysis to firms owned by noble descendants, I find that these firms are predominantly active in real estate (7 out of 15 businesses). Moreover, all but one of them are family firms,[19] suggesting that dynasties exert tight control over businesses. Figure 6 summarizes the main difference in observables between firms with at least one noble shareholder relative to all the other firms in the sample. In addition, they exhibit higher assets and shareholders' equity relative to the median firm in the sample. But, they are not different in terms of average turnover or median number of employees. As a result, usual metrics of returns on the investment, such as return on assets or return on equity, are lower.

6 Intergenerational Mobility within Noble Dynasties

Noble descendants enjoyed a sizeable income premium in 2005 relative to the average taxpayer. This advantage manifests several decades or centuries after one of their ancestors first received a title. In this section, I quantify the relation between two adjacent generations. Estimating income transmission between two generations, I find noblemen exhibit similar values of intergenerational mobility as the rest of the population. To explore the role of family background on the success of their descendants, I leverage the information on family trees contained in *Libro d'oro* to link adjacent generations and siblings belonging to the same family. In this section, I show a strong association of incomes both within and across generations of the same dynasty.

[19] Family firms are defined as firms where shareholders with the same last name own more than 50 percent of all shares.

6.1 Measures of Relative Mobility

To measure the relationship between the income of two members of the same family, I use the following specification

$$\log y_i = \alpha + \beta \log y_i^r + X_i\gamma + e_i \tag{7}$$

where $\log y_i$ is the log taxable income for individual i, while the superscript r in $\log y_i^r$ denotes a relative. When the two individuals come from different generations of the same family, the parameter β is defined as the intergenerational income elasticity (IGE) and it is one of the canonical measures of relative mobility (**??**). Estimating the IGE on a cross-section presents important challenges. First of all, observing father and sons pairs at the same time implies that these individuals are at different points in their careers and life cycles. The most recent studies in the literature use datasets that span several decades to observe adjacent generations at the same point in their life cycles. In this paper, however, we are constrained to use a single cross-section, which will reduce the measured association across different generations. Second, a single observation in time does not allow to smooth out transient idiosyncratic shocks that affect individual income profiles. While these fluctuations happen throughout the income distribution, they are particularly pronounced at the top, where most of the nobles in my sample are located[20].

To partially address these issues, I estimate an age-adjusted the rank-rank slope from

$$R_i(c_i) = \delta + \gamma R_i^r(c_r) + e_i \tag{8}$$

where $R_i(c_i)$ is the percentile rank of individual i among all taxpayers belonging to the same birth cohort c_i, while the superscript r in $R_i(c_i)$ denotes a relative of individual i. The coefficient γ is the rank-rank slope. As in **?** where they compute the rank of children and parents using separate distributions[21], I rank parents and children within their birth cohorts to obviate some of the concerns discussed above.

6.2 Results

Table 12 reports the rank-rank slopes estimated via OLS on the sample of son and father pairs. Using all pairs, I find that an increase of 1 percentage point (pp) in the percentile

[20] For a more detailed analysis of the pitfalls of the techniques currently adopted to estimate the IGE using panel data, please see **?**.

[21] **?** compute the rank-rank slope $\rho_{PR} = Corr(P_i, R_i)$ by regressing the child's rank R_i on his parents' rank P_i, with R_i is defined as "child i's percentile rank in the income distribution of children" and P_i as "parent i's percentile rank in the income distribution of parents."

rank of noble fathers is associated with an increase of 0.210pp in the child's mean rank, as shown in row 1 of Table 12. This estimate is marginally significant at the 5 percent level. When I focus on the subsample of children aged 20-40 and on those aged 40-60 separately, the slopes increase to 0.237 and 0.284 respectively. However, as the sample size declines, these coefficients individually are not statistically different from zero.

The rank-rank slope for noble families in Milan is higher relative to recent comparable estimates, suggesting a higher degree of income persistence across generations within noble families[22]. **?** calculate a rank-rank slope of 0.182 for the entire population living in the province of Milan, 13 percent lower than the slope for noble individuals[23]. The estimate for noble families lies within the range of estimates computed for countries. **?** compute a rank-rank slope of 0.341 for the US and they provide estimates of 0.180 for Denmark and of 0.174 for Canada[24]. **?** report a rank-rank slope of 0.25 for Italy as a whole. They also highlight the substantial geographic heterogeneity across Italian provinces, with a clear North-South gradient. Using a broad set of measures, they conclude that "the level of upward mobility in Northern Italy exceeds that of Scandinavia." With the cards stacked against us, finding a relatively high degree of persistence within noble families in an area where the general population is upwardly mobile might suggest even stronger transmission within noble dynasties in other parts of the country. To be more concrete, the rank-rank slope of 0.180 places the province of Milan 50th out of 110th provinces, yet the value estimated off of noble families comes in at the 85th place.

Turning to the IGE, Table 13 presents the estimates from equation 7 where I control for the age (and its square) of the father and the son. The point estimate is 0.066, imprecisely estimated. As a measure of relative mobility, IGE suffers from many drawbacks even in settings where researchers can observe adjacent generations at the same point in their life cycle. In this paper, with a single cross-section, estimates of IGE suffer from attenuation bias because I observe fathers and sons at different points in their careers or when the older generation is retired while the younger is near the apex of their careers. Similarly to the rank-rank specification, I divide the sample based on the age of the child. In both subsamples, the point estimate of IGE increases substantially to 0.110 for children aged 20-40 and to 0.440 for children aged 40-60.

[22] All these studies

[23] While pertaining to different years, the data sources for this paper and **?** are the same. The dataset used in this paper contains the universe of tax returns for the municipality of Milan, which is one of the municipalities included in the province of Milan.

[24] **?** estimates rank-rank slopes for Denmark using data from **?** and for Canada using data from **?**.

7 Conclusions

In this chapter, I document a high degree of persistence in economic status among present-day descendants of Italian noble dynasties. These individuals belong to generations that came several decades or centuries after their ancestors received the title. Despite the long time gap, in 2005 noble descendants obtain around €41,000 more than (or 1.77 times) the average taxpayer living in Milan. Moreover, I find that part of their higher economic status involves control over closely held businesses. Noble descendants are three times more likely to be owners or company officials. Therefore these results show that present-day descendants of noble dynasties form a positively selected group and they suggest that income transmission can be high and persistent in families that achieved elite status in the past.

This chapter contributes to the literature on intergenerational mobility by providing new evidence on income transmission over the long run. Most of the papers in this literature focus on transmission between two adjacent generations. They present estimates of the rank-rank slope that are consistent with a full reversal of fortunes within few generations, even in countries with relatively low mobility. Yet, a handful of papers show that income transmission can be high within families in the long run. The results presented in this chapter reflect this contrast. Among noble families, the rank-rank slope between fathers and sons is moderate and in line with recent estimates for the entire Italian population. At the same time, noble descendants enjoy a higher economic status in the present day. This chapter adds to the evidence that the income process across generations within elite families has long memory and therefore it is not very well captured by standard measures of mobility. In other words, short-run measures of intergenerational mobility are not a sufficient statistic, at least for capturing transmission within elite families.

Finally, this chapter provides some suggestive evidence about the channels that allow such a high degree of transmission among noble families. Some papers have highlighted the role of social networks (**?**) in helping descendants preserve a high economic status. This paper provides some preliminary evidence that control over family businesses plays a role in the preservation of status.

References

8 Tables

Table 1: Descriptive Statistics

	Milan	Italy
Mean	23,165	15,737
Standard dev.	105,651	42,993
Min	0	0
Max	44,963,206	101,255,692
Observations	888,720	38,514,292

Notes: This table reports descriptive statistics for taxable income obtained in 2005. The unit of analysis is an individual taxpayer aged 16-100 years old. The column labeled "Milan" uses the sample of taxpayers residing in the city of Milan, while the column labeled "Italy" uses the sample of all Italian taxpayers and comes from **?**.

Table 2: Descriptive Statistics

	Non-noble	Noble
Demographics		
Age	52.67	51.78
Female	0.52	0.45
Income		
No taxable income	0.16	0.12
Taxable income (excl. 0s)	27,615	82,893
Self-empl. income > 0	0.08	0.16
Self-empl. income (excl. 0s)	37,092	94,029

Notes: This table reports descriptive statistics for noble and non-noble taxpayers separately. The unit of analysis is an individual taxpayer aged 16-100 years old. The upper panel reports key demographics of taxpayers. The gender composition of the sample is currently available for noble taxpayers. The lower panel reports statics about income variables. The row labeled "No taxable income" computes the proportion of taxpayers with zero taxable income. The row labeled "Taxable income (excl. 0s)" provides the average taxable income computed among those with strictly positive income. The row labeled "Self-empl. income > 0" reports the proportion of taxpayers with income from self-employment and from professional services (such as, lawyers, doctors, engineers, architects, etc.). The row labeled "Self-empl. income (excl. 0s)" computes the average self-employment income calculated among those with strictly positive self-employment income. The final row reports the total number of taxpayers in each group.

Table 3: Main Source of Income

Main source of income	Non-noble	Noble
Capital/Business	0.076	0.125
Employment	0.829	0.561
Other	0.010	0.019
Rent	0.049	0.193
Self-employed	0.036	0.102
Observations	888,192	528

Notes: This table shows the proportion of taxpayers by main source of income. Proportions are calculated as group-wise proportions for noble and non-noble taxpayers separately. Sources of income are classified in five categories based on two variables that record the tax form used and the section of the tax form with the highest reported amount of income. "Capital/Business" refers to income from partnerships, corporations, and limited liability companies. It does not include dividends distributed by listed companies. "Rent" includes income from real estate, including imputed rent for owner-occupied real estate. "Self-employment" includes income from self-employment activities and professional services (such as lawyers, architects, engineers, etc...). "Employment" contains income from labor, finally "Other" includes the remaining sources of income not already categorized.

Table 4: Quantifying the advantage of noble descendants

	Annual Income			
	(1)	(2)	(3)	(4)
Noble	49,710	48,509	47,131	41,124
	(6,668)	(6,635)	(6,607)	(6,612)
I(Self-employment)			19,477	8,575
			(633)	(756)
I(CUD)				-13,008
				(94)
I(Unico)				9,173
				(440)
Age		2,303	2,135	1,530
		(25)	(25)	(23)
Age squared		-21	-19	-13
		(0)	(0)	(0)
R^2	0.000	0.005	0.007	0.013
Observations	888,720	888,720	888,720	888,720

Notes: This table reports the estimates of coefficients from regression specification 1 where the dependent variable is taxable income in euros. The unit of analysis is an individual taxpayer. "Noble" is a dummy variable equal to 1 for noble descendants. "I(CUD)" and "I(Unico)" are dummy variables for each tax form used to file taxes. The excluded group is the tax form *Modello 730*. "I(Self-Employed)" is a dummy equal to 1 for individuals with positive self-employment income. Standard errors are robust to heteroskedasticity.

Table 5: Quantifying the advantage of noble descendants using Log income

	Log Annual Income			
	(1)	(2)	(3)	(4)
Noble	1.0483	0.9818	0.9494	0.7992
	(0.0640)	(0.0619)	(0.0621)	(0.0616)
I(Self-employment)			0.4132	0.1496
			(0.0055)	(0.0064)
I(CUD)				-0.9270
				(0.0037)
I(Unico)				0.0102
				(0.0039)
Age		0.1196	0.1159	0.0775
		(0.0006)	(0.0006)	(0.0005)
Age squared		-0.0011	-0.0010	-0.0007
		(0.0000)	(0.0000)	(0.0000)
R^2	0.000	0.069	0.076	0.161
Observations	744,583	744,583	744,583	744,583

Notes: This table reports the estimates of coefficients from regression specification 1 where the dependent variable is Log taxable income. The unit of analysis is an individual taxpayer. "Noble" is a dummy variable equal to 1 for noble descendants. "I(CUD)" and "I(Unico)" are dummy variables for each tax form used to file taxes. The excluded group is the tax form *Modello 730*. "I(Self-Employed)" is a dummy equal to 1 for individuals with positive self-employment income. Standard errors are robust to heteroskedasticity.

Table 6: Differences in Quantiles

Quantile, τ	Unconditional Quantile, $Q_y(\tau)$	Difference in Conditional Quantile, $\Delta Q_{y\|x}(\tau,\, x)$	Std. err.
5	0	0	(377)
10	0	0	(371)
25	2,547	6,470	(1,493)
50	12,564	22,033	(2,844)
75	25,806	44,026	(3,875)
90	48,297	101,010	(13,254)
95	72,700	144,736	(18,902)
99	176,789	230,811	(50,353)
Observations	100,528		

Notes: This table shows selected percentiles of the inc ome distribution for a sample of taxpayers living in Milan in 2005. For computational reasons, the table is based on a random sample of 100,000 taxpayers (or 11.52 percent of the universe) and all 528 noble taxpayers. The unit of analysis is an individual taxpayer. The second column represents the unconditional percentile of the income distribution. The third column represents the difference in the conditional quantile of the income distributions of noble descendants and non-noble taxpayers. It is calculated from a linear quantile model, as specified in equation 2, where the dependent variable is taxable income and the regressors include a dummy variable equal to 1 for noble descendants, the individual's age and its square, indicator variables for tax forms and for positive self-employment income. Standard errors are computed using the "wild" bootstrap method using 100 repetitions.

Table 7: Differences in Quantiles for Log Income

Quantile, τ	Unconditional Quantile, $Q_y(\tau)$	Difference in Conditional Quantile, $\Delta Q_{y\|x}(\tau,\, x)$	Std. err.
5	6.89	0.73	(0.19)
10	7.79	0.78	(0.10)
25	8.94	0.63	(0.09)
50	9.67	0.83	(0.05)
75	10.30	0.83	(0.06)
90	10.89	0.95	(0.08)
95	11.29	0.96	(0.09)
99	12.18	0.97	(0.10)
Observations	100,464		

Notes: This table shows selected percentiles of the income distribution for a sample of taxpayers living in Milan in 2005. For computational reasons, the table is based on a random sample of 100,000 taxpayers (or 11.52 percent of the universe) and all 528 noble taxpayers. The unit of analysis is an individual taxpayer. The second column represents the unconditional percentile of the income distribution. The third column represents the difference in the conditional quantile of the income distributions of noble descendants and non-noble taxpayers. It is calculated from a linear quantile model, as specified in equation 2, where the dependent variable is taxable income and the regressors include a dummy variable equal to 1 for noble descendants, the individual's age and its square, indicator variables for tax forms and for positive self-employment income. Standard errors are computed using the "wild" bootstrap method using 100 repetitions.

Table 8: Oaxaca-Blinder Decomposition of Annual Income

	LHS: Income
Mean	
Non-noble	23,135
	(112)
Noble	72,846
	(6,674)
Overall decomposition	
Difference	49,710
	(6,669)
Explained	-8,584
	(437)
Unexplained	-41,126
	(7,392)
Observations	888,720

Notes: This table reports the results of the two-fold Oaxaca-Blinder decomposition, as specified in equation 3 using **?**. The unit of analysis is an individual taxpayer. The dependent variable is taxable income and the regressors include a dummy variable equal to 1 for noble descendants, the individual's age and its square, indicator variables for tax forms and for positive self-employment income. "Non-noble" and "Noble" refer to the simple average taxable among each group of taxpayers. "Explained" and "Unexplained" report the results of the two-fold Oaxaca-Blinder decomposition of "Difference". Standard errors are bootstrapped.

Table 9: Quantifying the advantage by source of income

Main Source	All	Male	Female	N. Obs.
Full sample	0.799	0.931	-0.450	744,583
	(0.062)	(0.077)	(0.120)	
Employment	0.874	1.027	-0.565	413,476
	(0.069)	(0.073)	(0.142)	
Rent	0.810	0.712	0.153	14,535
	(0.149)	(0.290)	(0.336)	
Self-employment	0.245	0.545	-0.879	17,619
	(0.199)	(0.223)	(0.382)	
Capital	0.463	0.315	0.354	33,386
	(0.186)	(0.274)	(0.350)	
Other	2.877	1.608	2.573	727
	(0.806)	(0.148)	(0.126)	

Notes: This table reports the coefficient μ from regression specification 1 where the dependent variable is Log taxable income. The coefficient represents the income premium obtained by noble individuals. Each row represents the main source of income used to subset the full sample. The column labeled as "All" reports the income premium between nobles and non-nobles, regardless of gender. The columns labeled as "Male" and "Female" report the income premium between nobles and non-nobles, conditional on gender. The unit of analysis is an individual. Standard errors are robust to heteroskedasticity.

Table 10: Quantifying the advantage by gender

	Log Annual Income		
	(1)	(2)	(3)
Noble	0.7645	0.7443	0.9313
	(0.0619)	(0.0598)	(0.0767)
Noble × Female			-0.4496
			(0.1197)
Female		-0.3779	-0.3774
		(0.0034)	(0.0034)
I(Self-employment)	0.1502	0.0889	0.0889
	(0.0080)	(0.0080)	(0.0080)
I(CUD)	-0.8246	-0.8443	-0.8443
	(0.0044)	(0.0043)	(0.0043)
I(Unico)	0.0304	0.0266	0.0267
	(0.0048)	(0.0047)	(0.0047)
Age	0.0714	0.0640	0.0641
	(0.0007)	(0.0007)	(0.0007)
Age squared	-0.0006	-0.0006	-0.0006
	(0.0000)	(0.0000)	(0.0000)
R^2	0.143	0.164	0.164
Observations	479,743	479,743	479,743

Notes: This table reports the estimates of coefficients from regression specification 1 where the dependent variable is Log taxable income. The unit of analysis is an individual taxpayer. "Noble" is a dummy variable equal to 1 for noble descendants. "Female" is a dummy variable equal to 1 for women. "I(CUD)" and "I(Unico)" are dummy variables for each tax form used to file taxes. The excluded group is the tax form *Modello 730*. "I(Self-Employed)" is a dummy equal to 1 for individuals with positive self-employment income. Standard errors are robust to heteroskedasticity.

Table 11: Prevalence of Noble Descendants among Company Officials

	Non-noble	Noble	T-stat
Proportion of taxpayers who are			
Company Official	0.038	0.129	6.22
Shareholder	0.041	0.127	5.92
Either	0.057	0.199	8.19
Proportion with at least one role as			
Manager	0.018	0.045	2.99
Director	0.008	0.038	3.60
Board Member	0.018	0.093	5.89
Other	0.009	0.030	2.84
Observations	888,220	528	

Notes: This table shows the proportion of taxpayers who are shareholders or company officials for noble and non-noble taxpayers separately. In the upper panel, "Shareholder" indicates anyone who owns shares in a corporation or in a limited liability company, or who is a partner in a partnership. "Company Official" includes anyone who is a director, manager, or board member of a company. In the lower panel, "Manager" identifies C-level managers or sole administrators, "Board Member" refers to members of the board of directors, including the chair and the deputy chair. "Director" refers to other executive officials, while "Other" includes the remaining roles, such as other managers, auditors, legal counsels, court-appointed liquidators, etc. The column "T-stat" reports the t-stat for testing the null hypothesis of equal proportions across the two groups, obtained from a regression where the dependent variable is a dummy equal to 1 for each company role and the regressor is an indicator variable that is equal to 1 for noble descendants. Standard errors are robust to heteroskedasticity.

Table 12: Intergenerational rank-rank slope

Sample	Rank-rank slope	Standard error	Observations
Full sample	0.210	(0.115)	61
Age of child			
16-40	0.252	(0.135)	40
41-60	0.127	(0.199)	21

Notes: This table shows the estimated rank-rank slope as specified in equation 8. The sample includes all noble father-son pairs. The unit of analysis is an individual taxpayer. The rank is defined as the percentile rank of each individual computed using the full distribution of taxpayers with the same year of birth. The bottom section of the table presents the estimation results obtained from splitting the sample in two groups according to the age of the child. Standard errors are robust to heteroskedasticity.

Table 13: Intergenerational income elasticity

Sample	IGE	Standard error	Observations
Full sample	0.066	(0.104)	51
Age of child			
16-40	0.123	(0.082)	33
41-60	0.438	(0.498)	18

Notes: This table shows the estimated intergenerational income elasticity (IGE) as specified in equation 7. The sample includes all noble father-son pairs where both individuals have strictly positive income. The unit of analysis is an individual taxpayer. The dependent variable is the log of taxable income of the child and the regressors include the log of taxable income of the father, the age (and its squared) of both child and father. The bottom section of the table presents the estimation results obtained from splitting the sample into two groups according to the age of the child. Standard errors are robust to heteroskedasticity.

Table 14: Rank-rank slope among brothers

Sample	Rank-rank slope	Standard error	Observations
Full sample	0.113	(0.254)	41
Age of younger brother			
16-49	-0.158	(0.155)	25
50-100	0.952	(0.402)	16

Notes: This table shows the estimated rank-rank slope as specified in equation 8. The sample includes all pairs of noble brothers. The unit of analysis is an individual taxpayer. The rank is defined as the percentile rank of each individual computed using the full distribution of taxpayers with the same year of birth. The bottom section of the table presents the estimation results obtained from splitting the sample into two groups according to the age of the younger brother. Standard errors are robust to heteroskedasticity.

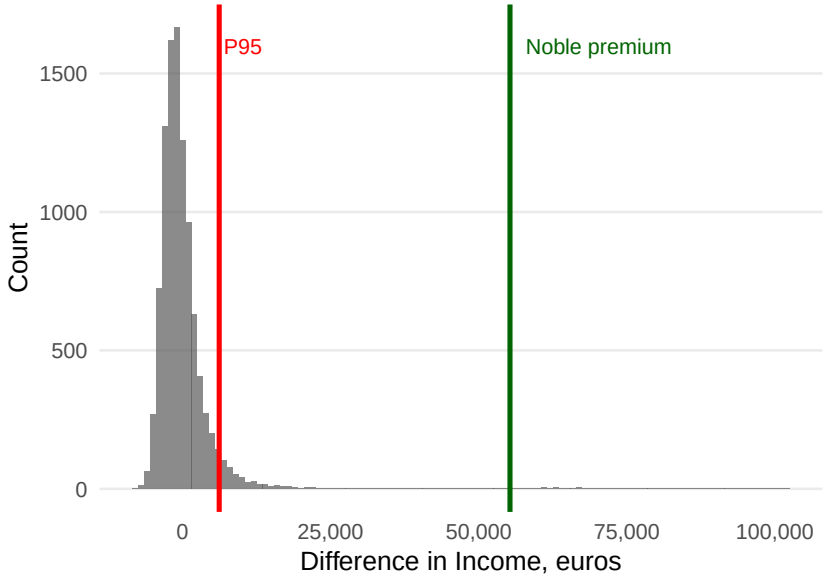
Table 15: Intragenerational income elasticity

Sample	β	Standard error	Observations
Full sample	0.179	(0.163)	37
Age of younger brother			
16-49	0.116	(0.193)	23
50-100	0.270	(0.381)	14

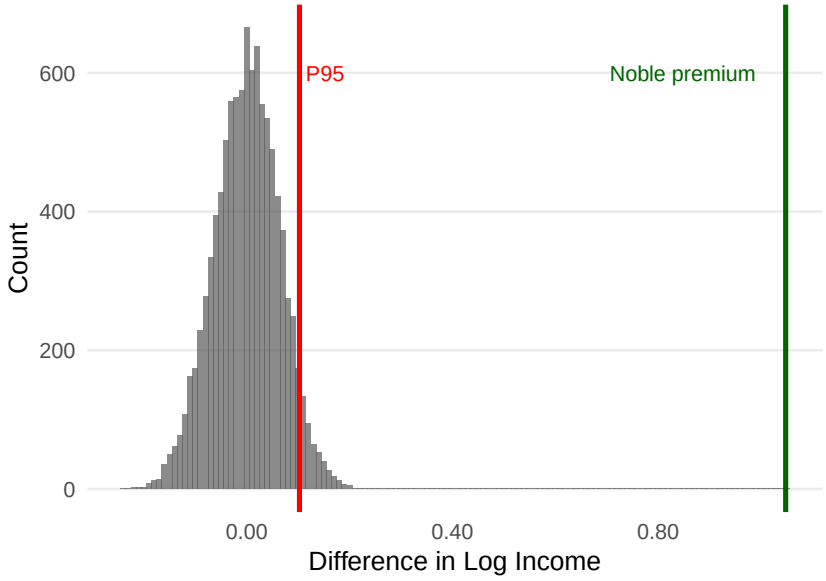
Notes: This table shows the estimated intergenerational income elasticity (IGE) as specified in equation 7. The sample includes all pairs of noble brothers where both individuals have strictly positive income. The unit of analysis is an individual taxpayer. The dependent variable is the log of taxable income of the younger brother and the regressors include the log of taxable income of the older brother, the age (and its squared) of both brothers. The bottom section of the table presents the estimation results obtained from splitting the sample in two groups according to the age of the younger brother. Standard errors are robust to heteroskedasticity.

9 Figures

Figure 1: Randomization Inference

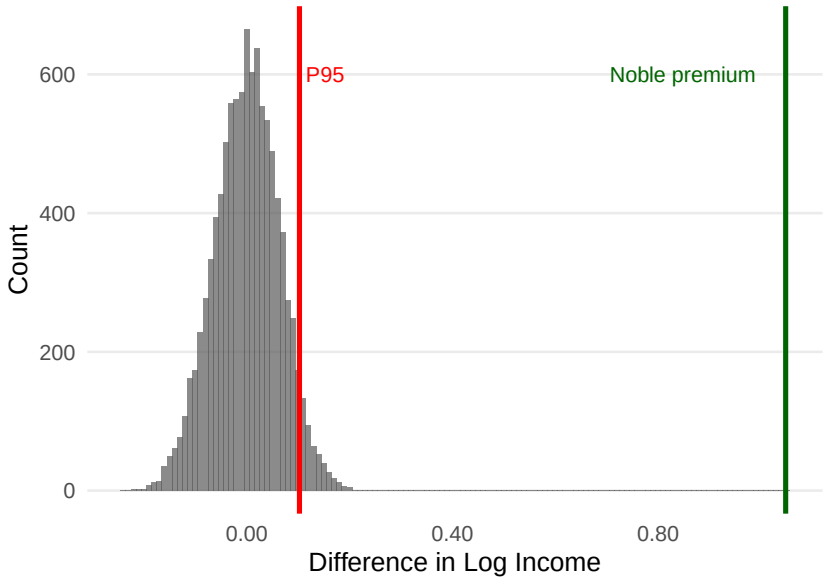


(a) Difference in annual income



(b) Difference in Log annual income

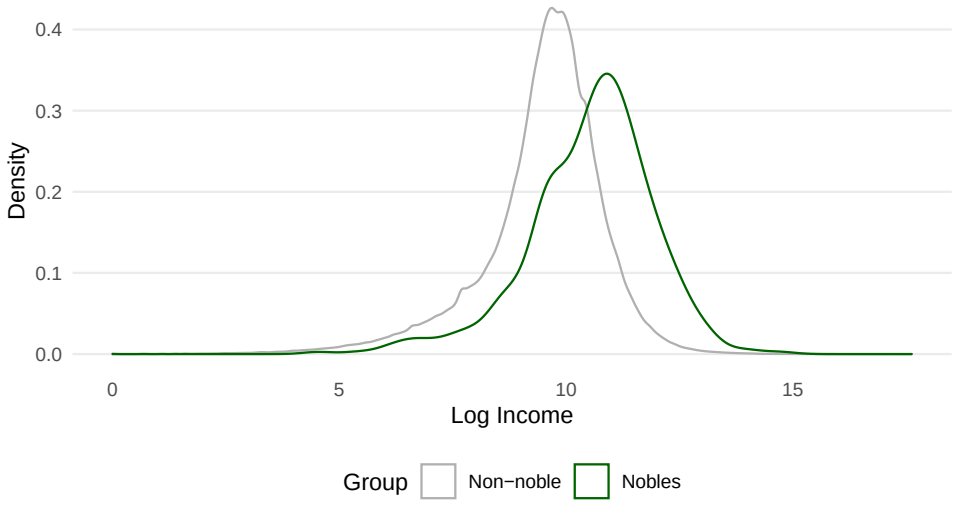
Figure 1: Randomization Inference (cont.)



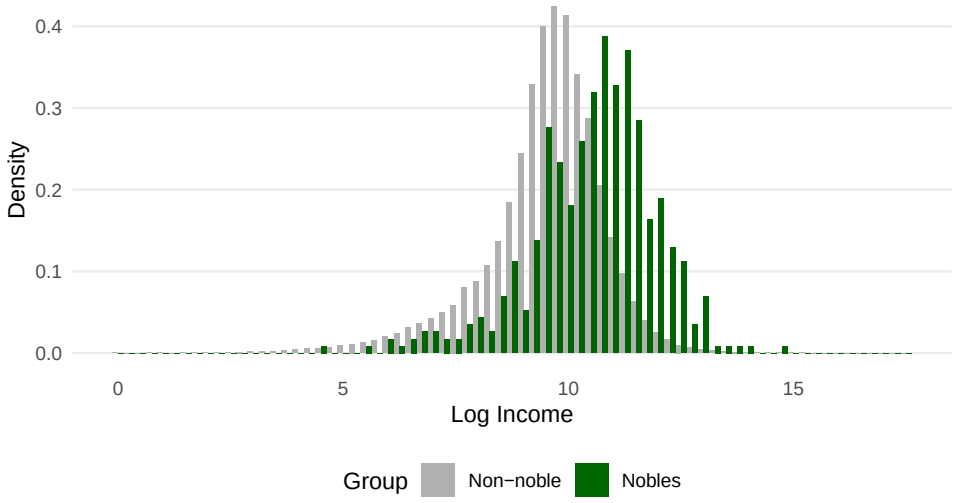
(c) Difference in Log annual income

Notes: The figures report the results of testing the Fisher null through randomization inference. To build these figures, I randomly assign noble status to 464 individuals out of the full sample. Panel (a) reports the difference in annual income; panel (b) reports the difference in log annual income; panel (c) reports the difference in median annual income. The red vertical line labeled "P95" reports the 95th percentile of the distribution and the green vertical line labeled "Noble premium" reports the measured difference between noble individuals and non-noble individuals. The unit of observation is an individual. The number of simulations is 10,000.

Figure 2: Distribution of Income by Group



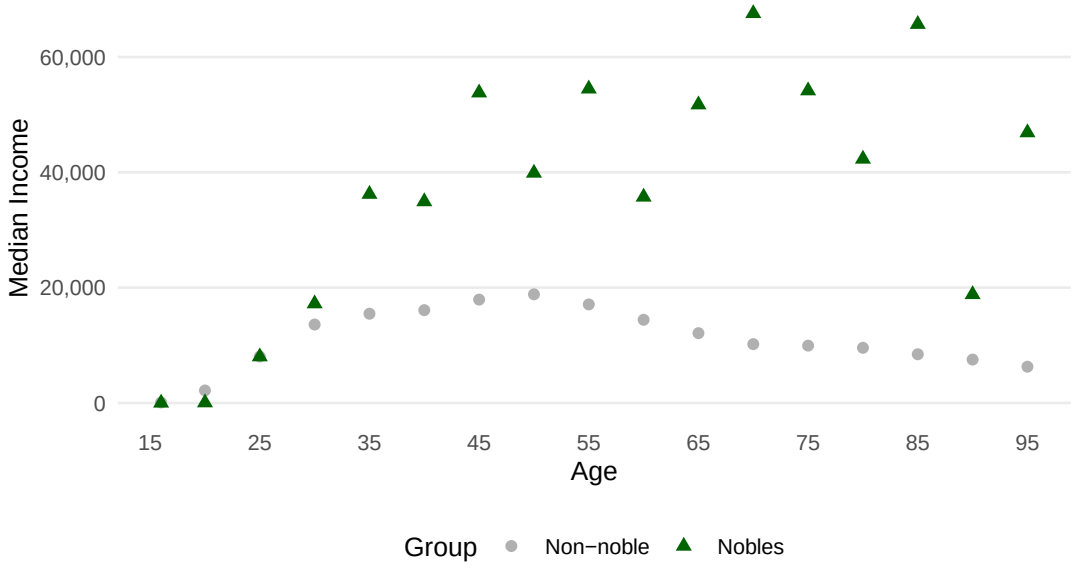
(a) Kernel density estimates



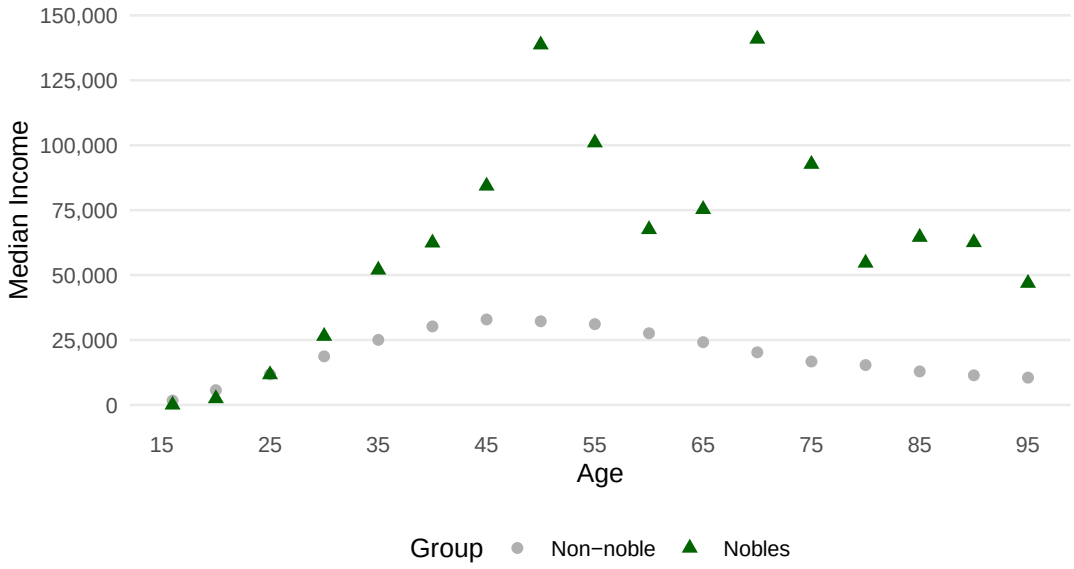
(b) Histograms

Notes: These figures show the distribution of the log of taxable income for noble and non-noble individuals separately. The sample includes all taxpayers with strictly positive taxable income. The sample size is 744,119 (of which 464 are noble descendants). Panel (a) shows an estimated probability density function using a Gaussian kernel. Panel (b) shows histograms where the width of each bin is equal to 25 log points.

Figure 3: Age Income Profile by Group



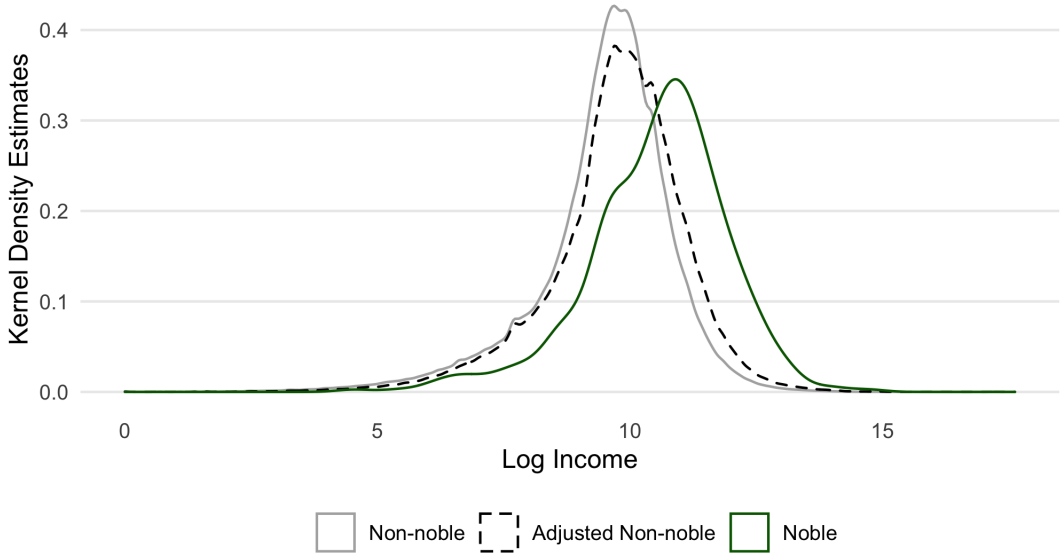
(a) Median Income by Age Group



(b) Mean Income by Age Group

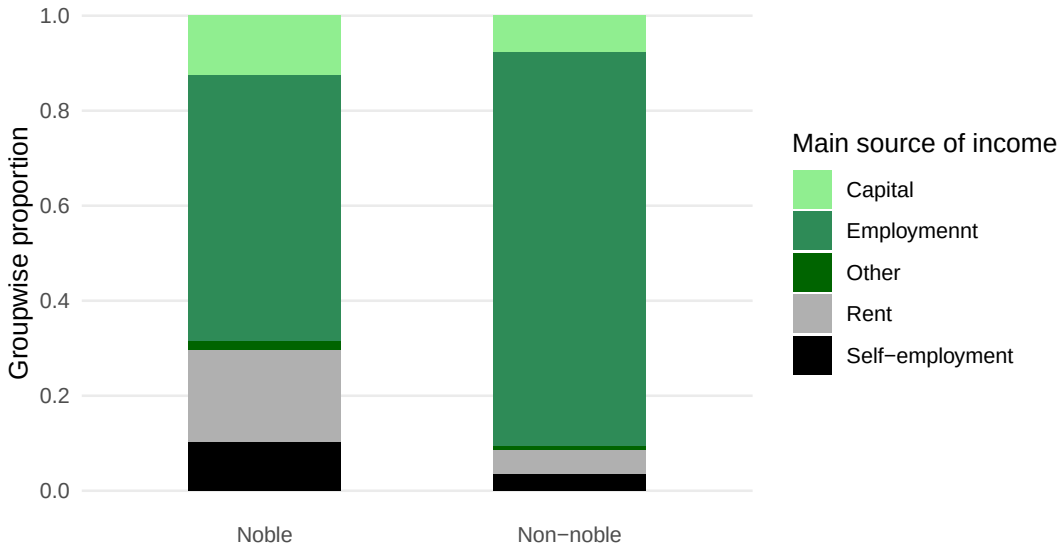
Notes: These figures show the income-age profile for noble and non-noble taxpayers separately. The sample includes all taxpayers. The sample size is 888,720. The sample is divided in 5-year age bins. Panel (a) reports the median taxable income for noble and non-noble taxpayers in each age bin, while panel (b) reports the mean taxable income.

Figure 4: Density Re-weighting



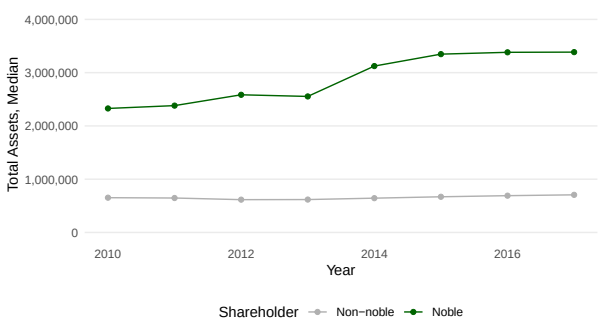
Notes: This figure shows the results of the decomposition of the difference in the distribution of taxable income between noble and non-noble taxpayers. The dashed line labeled "Adjusted Non-noble" refers to the counterfactual distribution of non-noble taxpayers if they had the same observables as noble taxpayers. The counterfactual distribution is based on reweighting the unadjusted distribution of non-noble taxpayers using the method proposed by **?** based on the propensity score. The propensity score is obtained from a logit model of the noble dummy (equal to 1 for noble descendants) on age and its squared, dummies for the tax forms, and a dummy for positive self-employment income. The solid lines are estimates of the probability density functions of the distribution of taxable income obtained using a Gaussian kernel. The gray line pertains to non-noble taxpayers, while the green line to noble taxpayers. The sample includes all taxpayers with strictly positive taxable income. The sample size is 744,119 (of which 464 are noble descendants).

Figure 5: Main Source of Income

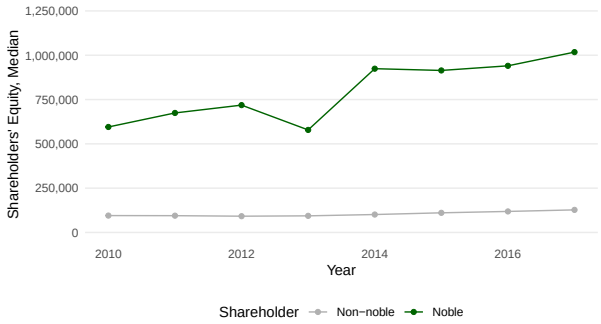


Notes: This figure shows the proportion of taxpayers by main source of income. Proportions are calculated as group-wise proportions for noble and non-noble taxpayers separately. Sources of income are classified in five categories based on two variables that record the tax form used and the section of the tax form with the highest reported amount of income. "Capital" refers to income from partnerships, corporations, and limited liability companies. It does not include dividends distributed by listed companies. "Rent" includes income from real estate, including imputed rent for owner-occupied real estate. "Self-employment" includes income from self-employment activities and professional services (such as, lawyers, architects, engineers, etc...). "Employment" is equal to income from labor, finally "Other" includes the remaining sources of income not already categorized.

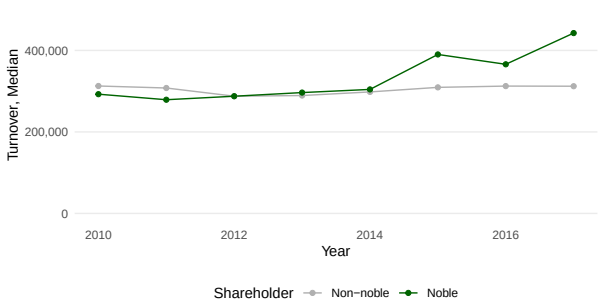
Figure 6: Characteristics of Firms by Shareholders' Type



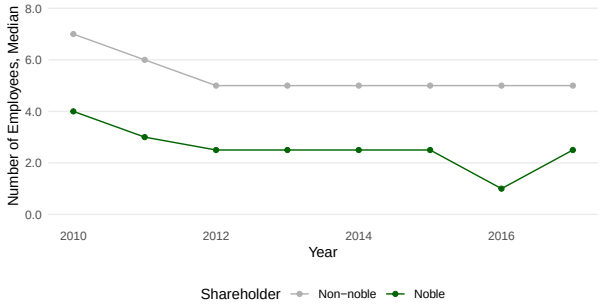
(a) Median total assets



(b) Median equity



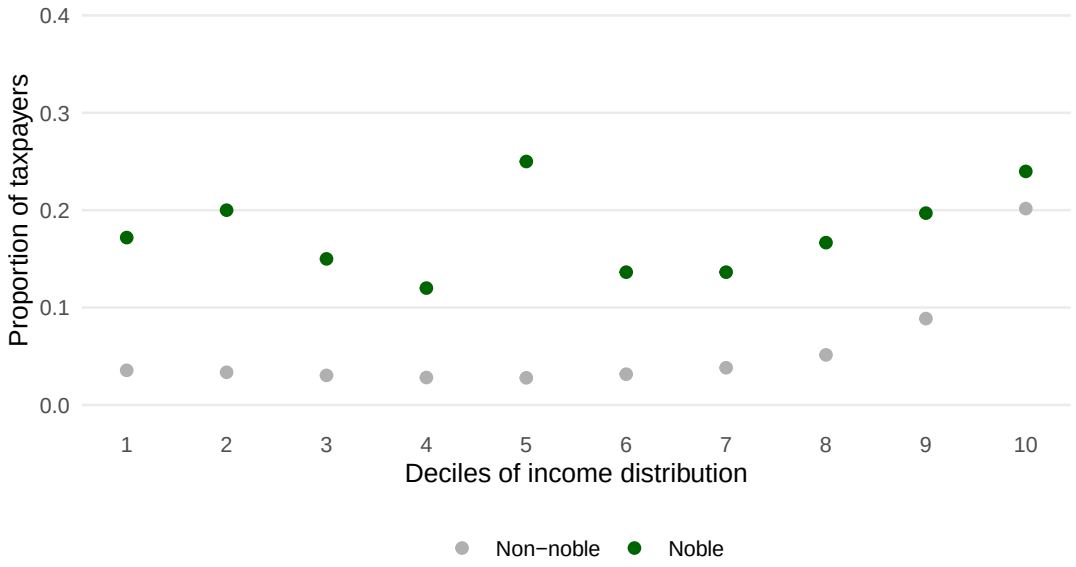
(c) Median turnover



(d) Median number of employees

Notes: These figures show the median of total assets (panel a), shareholders' equity (panel b), turnover (panel c), and number of employees (panel d) in each year from 2010 to 2017. The unit of analysis is a firm. The sample includes all firms registered in Italy over those years. The green line labeled "Noble" refers to all the firms that have at least one noble shareholder listed among their shareholders, while the gray line labeled "Non-noble" refers to all remaining firms.

Figure 7: Managers and Shareholders by Income Decile



Notes: This figure shows the proportion of individuals that are either shareholders or company officials in each decile of the income distribution for noble and non-noble taxpayers separately. The unit of analysis is an individual taxpayer. Deciles of the income distribution are determined using the universe of tax filers living in Milan in 2005. A shareholder is defined as any taxpayer who holds shares in a corporation, limited liability company, or limited partnership and is registered in the public registry of shareholders. A company official is defined as any taxpayer who holds an official role within a company, such as C-level managers, members of the board of directors, other executives, etc. The size of the sample is 888,720 individuals.

A Algorithm Used to Predict Gender

In the administrative tax data, the gender of taxpayers is not coded. Yet, it is possible to infer gender from other individual characteristics. Italian first names contain enough information to make a relatively precise prediction of gender. Here, I describe the process of assigning gender to around 87% of individuals in the sample.

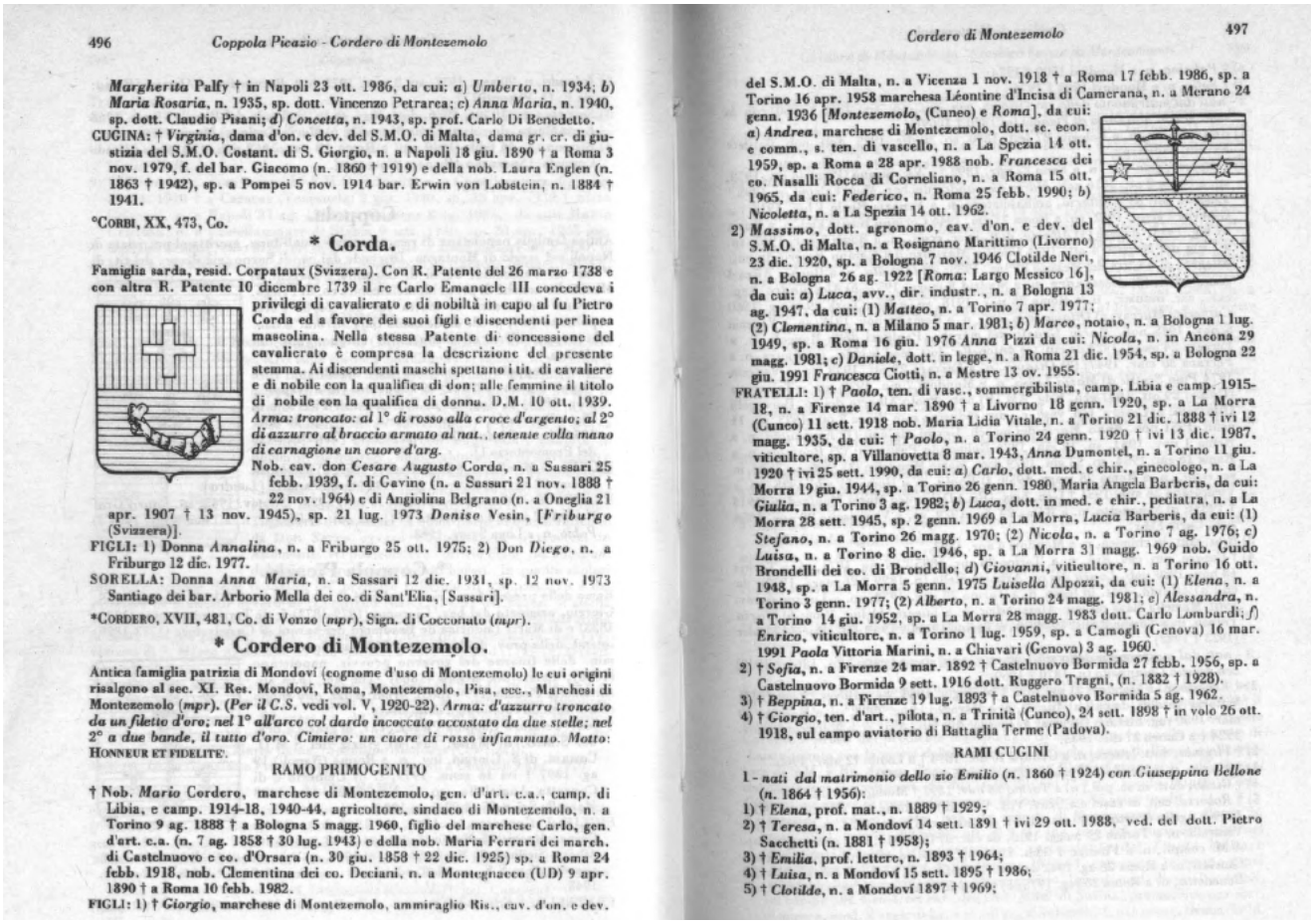
For noble descendants, I manually code gender based on their first name and information contained in *Libro d'oro*. With this information, I can assign gender to the full sample of noble descendants, whose resulting sample is 55 percent male. For non-noble individuals, I use a logistic regression trained on a subset of first names.

The classifier model I select is relatively parsimonious, yet it exhibits relatively high accuracy on a test set of first names. The variables used in the model are the following: the first and last letters of each first name, and the number of characters in the first name. To avoid less frequent first names and names that are potentially hard to classify, I perform the exercise using first names with at least 100 observations. This includes 767 unique first names, covering 87% of all individuals. The choice of using the most common first names tilts the composition of the sample toward Italians and away from individuals who have foreign first names. Table A.3 shows that individuals with a predicted gender dummy and those without have very similar average values of total taxable income and self-employment income. Individuals without a gender dummy are 3pp more likely to report zero taxable income.

To train the algorithm, I manually classify the gender of 200 first names. I then use a random 75% sample to fit the machine learning algorithm. Finally, I test the performance of the model on the remaining 25% of them. I fit two models: logistic regression and K-nearest neighbor classifier. Both models achieve high levels of accuracy, with the logistic regression performing slightly better on the test set. Logistic regression achieves .9592 accuracy on the training set and .9400 on the test set; K-nearest neighbor obtains .9660 on the training set and .88 on the test set. As a result, I construct the gender dummy using the logistic regression model trained on the manually coded dataset.

B Additional Exhibits

Figure A.1: Pages from *Libro d'oro della Nobiltà italiana*



496 *Coppola Picazio - Cordero di Montezemolo*

Margherita Palfy † in Napoli 23 ott. 1986, da cui: *a*) ***Umberto***, n. 1934; *b*) ***Maria Rosaria***, n. 1935, sp. dott. Vincenzo Petrarca; *c*) ***Anna Maria***, n. 1940, sp. dott. Claudio Pisani; *d*) ***Concetta***, n. 1943, sp. prof. Carlo Di Benedetto.

CUGINA: † ***Virginia***, dama d'on. e dev. del S.M.O. di Malta, dama gr. cr. di giustizia del S.M.O. Costant. di S. Giorgio, n. a Napoli 18 giu. 1890 † a Roma 3 nov. 1979, f. del bar. Giacomo (n. 1860 † 1919) e della nob. Laura Englen (n. 1863 † 1942), sp. a Pompei 5 nov. 1914 bar. Erwin von Lobstein, n. 1884 † 1941.

°CORBI, XX, 473, Co.

* Corda.

Famiglia sarda, resid. Corpataux (Svizzera). Con R. Patente del 26 marzo 1738 e con altra R. Patente 10 dicembre 1739 il re Carlo Emanuele III concedeva i privilegi di cavalierato e di nobiltà in capo al fu Pietro Corda ed a favore dei suoi figli e discendenti per linea mascolina. Nella stessa Patente di concessione del cavalierato è compresa la descrizione del presente stemma. Ai discendenti maschi spettano i tit. di cavaliere e di nobile con la qualifica di don; alle femmine il titolo di nobile con la qualifica di donna. D.M. 10 ott. 1939. ***Arma: troncato: al 1° di rosso alla croce d'argento; al 2° di azzurro al braccio armato al nat., tenente colla mano di carnagione un cuore d'arg.***

Nob. cav. don ***Cesare Augusto*** Corda, n. a Sassari 25 febb. 1939, f. di Gavino (n. a Sassari 21 nov. 1888 † 22 nov. 1964) e di Angiolina Belgrano (n. a Oneglia 21 apr. 1907 † 13 nov. 1945), sp. 21 lug. 1973 ***Denise*** Vesin, [***Friburgo*** (Svizzera)].

FIGLI: 1) Donna ***Annalina***, n. a Friburgo 25 ott. 1975; 2) Don ***Diego***, n. a Friburgo 12 dic. 1977.

SORELLA: Donna ***Anna Maria***, n. a Sassari 12 dic. 1931, sp. 12 nov. 1973 Santiago dei bar. Arborio Mella dei co. di Sant'Elia, [Sassari].

*CORDERO, XVII, 481, Co. di Venzo (*mpr*), Sign. di Cocconato (*mpr*).

* Cordero di Montezemolo.

Antica famiglia patrizia di Mondovì (cognome d'uso di Montezemolo) le cui origini risalgono al sec. XI. Res. Mondovì, Roma, Montezemolo, Pisa, ecc., Marchesi di Montezemolo (*mpr*). (*Per il C.S.* vedi vol. V, 1920-22). ***Arma: d'azzurro troncato da un filetto d'oro; nel 1° all'arco col darde incoccato accostato da due stelle; nel 2° a due bande, il tutto d'oro. Cimiero: un cuore di rosso infiammato. Motto:*** **HONNEUR ET FIDELITE'.**

RAMO PRIMOGENITO

† **Nob. *Mario* Cordero, marchese di Montezemolo, gen. d'art. c.a., camp. di Libia, e camp. 1914-18, 1940-44, agricoltore, sindaco di Montezemolo, n. a Torino 9 ag. 1888 † a Bologna 5 magg. 1960, figlio del marchese Carlo, gen. d'art. c.a. (n. 7 ag. 1858 † 30 lug. 1943) e della nob. Maria Ferrari dei march. di Castelnuovo e co. d'Orsara (n. 30 giu. 1858 † 22 dic. 1925) sp. a Roma 24 febb. 1918, nob. Clementina dei co. Deciani, n. a Montegnacco (UD) 9 apr. 1890 † a Roma 10 febb. 1982.**

FIGLI: 1) † ***Giorgio***, marchese di Montezemolo, ammiraglio Ris., cav. d'on. e dev.

del S.M.O. di Malta, n. a Vicenza 1 nov. 1918 † a Roma 17 febb. 1986, sp. a Torino 16 apr. 1958 marchesa Léontine d'Incisa di Camerana, n. a Merano 24 genn. 1936 [*Montezemolo*, (Cuneo) e *Roma*], da cui:

a*) *Andrea, **marchese di Montezemolo, dott. sc. econ. e comm., s. ten. di vascello, n. a La Spezia 14 ott. 1959, sp. a Roma a 28 apr. 1988 nob. *Francesca* dei co. Nasalli Rocca di Corneliano, n. a Roma 15 ott. 1965, da cui: *Federico*, n. Roma 25 febb. 1990; *b*) *Nicoletta*, n. a La Spezia 14 ott. 1962.**

2) ***Massimo***, **dott. agronomo, cav. d'on. e dev. del S.M.O. di Malta, n. a Rosignano Marittimo (Livorno) 23 dic. 1920, sp. a Bologna 7 nov. 1946 Clotilde Neri, n. a Bologna 26 ag. 1922 [*Roma*: Largo Messico 16], da cui: *a*) *Luca*, avv., dir. industr., n. a Bologna 13 ag. 1947, da cui: (1) *Matteo*, n. a Torino 7 apr. 1977; (2) *Clementina*, n. a Milano 5 mar. 1981; *b*) *Marco*, notaio, n. a Bologna 1 lug. 1949, sp. a Roma 16 giu. 1976 *Anna* Pizzi da cui: *Nicola*, n. in Ancona 29 magg. 1981; *c*) *Daniele*, dott. in legge, n. a Roma 21 dic. 1954, sp. a Bologna 22 giu. 1991 *Francesca* Ciotti, n. a Mestre 13 ov. 1955.**

FRATELLI: 1) † ***Paolo***, **ten. di vasc., sommergibilista, camp. Libia e camp. 1915-18, n. a Firenze 14 mar. 1890 † a Livorno 18 genn. 1920, sp. a La Morra (Cuneo) 11 sett. 1918 nob. Maria Lidia Vitale, n. a Torino 21 dic. 1888 † ivi 12 magg. 1935, da cui: † *Paolo*, n. a Torino 24 genn. 1920 † ivi 13 dic. 1987, viticultore, sp. a Villanovetta 8 mar. 1943, *Anna* Dumontel, n. a Torino 11 giu. 1920 † ivi 25 sett. 1990, da cui: *a*) *Carlo*, dott. med. e chir., ginecologo, n. a La Morra 19 giu. 1944, sp. a Torino 26 genn. 1980, Maria Angela Barberis, da cui: *Giulia*, n. a Torino 3 ag. 1982; *b*) *Luca*, dott. in med. e chir., pediatra, n. a La Morra 28 sett. 1945, sp. 2 genn. 1969 a La Morra, *Lucia* Barberis, da cui: (1) *Stefano*, n. a Torino 26 magg. 1970; (2) *Nicola*, n. a Torino 7 ag. 1976; *c*) *Luisa*, n. a Torino 8 dic. 1946, sp. a La Morra 31 magg. 1969 nob. Guido Brondelli dei co. di Brondello; *d*) *Giovanni*, viticultore, n. a Torino 16 ott. 1948, sp. a La Morra 5 genn. 1975 *Luisella* Alpozzi, da cui: (1) *Elena*, n. a Torino 3 genn. 1977; (2) *Alberto*, n. a Torino 24 magg. 1981; *e*) *Alessandra*, n. a Torino 14 giu. 1952, sp. a La Morra 28 magg. 1983 dott. Carlo Lombardi; *f*) *Enrico*, viticultore, n. a Torino 1 lug. 1959, sp. a Camogli (Genova) 16 mar. 1991 *Paola* Vittoria Marini, n. a Chiavari (Genova) 3 ag. 1960.**

2) † ***Sofia***, **n. a Firenze 24 mar. 1892 † Castelnuovo Bormida 27 febb. 1956, sp. a Castelnuovo Bormida 9 sett. 1916 dott. Ruggero Tragni, (n. 1882 † 1928).**

3) † ***Beppina***, **n. a Firenze 19 lug. 1893 † a Castelnuovo Bormida 5 ag. 1962.**

4) † ***Giorgio***, **ten. d'art., pilota, n. a Trinità (Cuneo), 24 sett. 1898 † in volo 26 ott. 1918, sul campo aviatorio di Battaglia Terme (Padova).**

RAMI CUGINI

1 - *nati dal matrimonio dello zio Emilio* (*n.* 1860 † 1924) *con Giuseppina Bellone* (*n.* 1864 † 1956):

1) † ***Elena***, **prof. mat., n. 1889 † 1929;**

2) † ***Teresa***, **n. a Mondovì 14 sett. 1891 † ivi 29 ott. 1988, ved. del dott. Pietro Sacchetti (n. 1881 † 1958);**

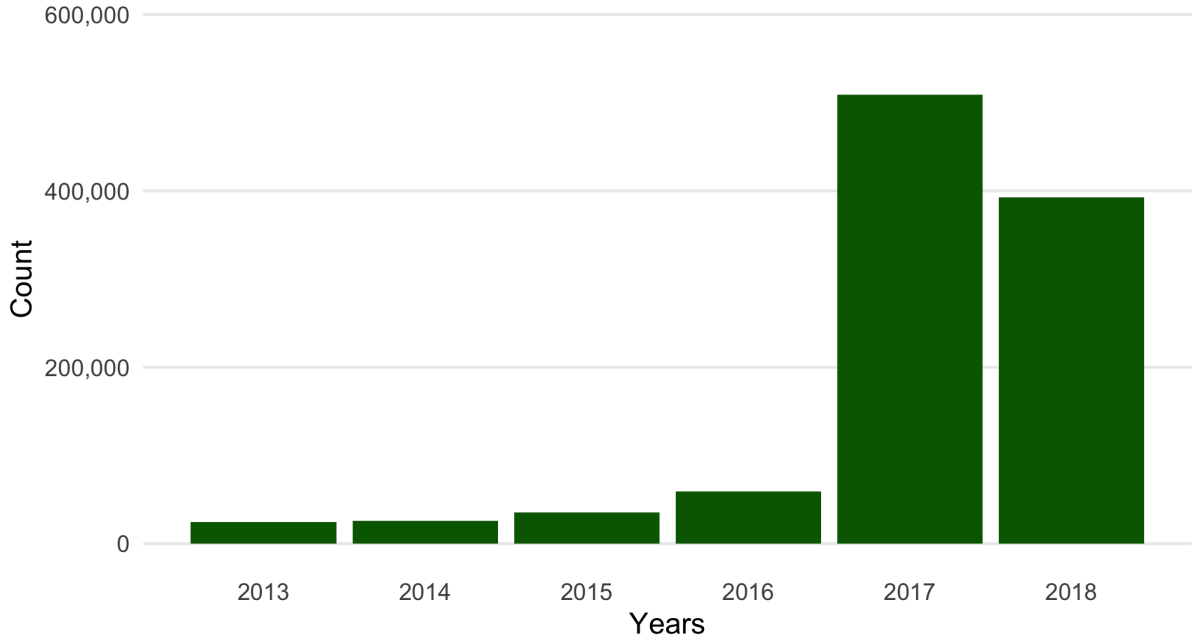
3) † ***Emilia***, **prof. lettere, n. 1893 † 1964;**

4) † ***Luisa***, **n. a Mondovì 15 sett. 1895 † 1986;**

5) † ***Clotilde***, **n. a Mondovì 1897 † 1969;**

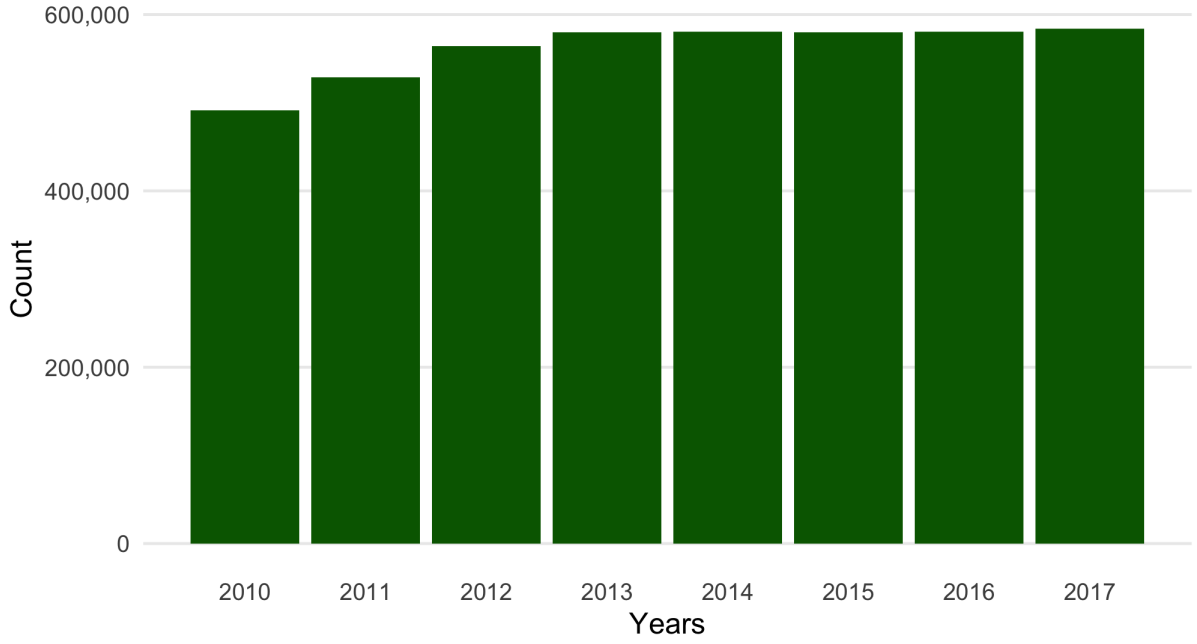
Notes: This figure shows two pages of *Libro d'oro della nobiltà italiana*, Issue XX, Volume XXI, used to obtain biographical information on noble descendants and on family trees of dynasties.

Figure A.2: Distribution of firms by last year of filing



Notes: This figure shows the number of firms grouped by their last filing year. The unit of analysis is a firm. The sample includes all firms registered in Italy that are required to file mandatory financial accounts. The source is the *Amadeus* dataset by Bureau van Dijk.

Figure A.3: Observations in the sample



Notes: This figure shows the number of observations in each year. The unit of analysis is a firm. The sample is the analysis sample and it includes firms (1) that are active, (2) whose latest financial statement was filed in 2017 or 2018, (3) that have at least six years of data. The source is firms grouped by their last filing year. The unit of analysis is a firm. The sample includes all firms registered in Italy that are required to file mandatory financial accounts. The source is the *Amadeus* dataset by Bureau van Dijk.

Table A.2: Difference in Median and Mean Income by Age Bin

	Median Income		Mean Income	
Age Bin	Non-noble	Noble	Non-noble	Noble
$[16, 20)$	0	84	0	1,681
$[20, 25)$	46	2,164	2,450	5,671
$[25, 30)$	8,027	8,047	11,674	11,776
$[30, 35)$	17,216	13,597	26,470	18,688
$[35, 40)$	36,206	15,473	51,972	25,034
$[40, 45)$	34,922	16,092	62,408	30,223
$[45, 50)$	53,790	17,923	84,313	32,896
$[50, 55)$	39,871	18,835	138,682	32,201
$[55, 60)$	54,470	17,086	100,961	31,097
$[60, 65)$	35,723	14,426	67,570	27,592
$[65, 70)$	51,720	12,101	75,308	24,165
$[70, 75)$	67,550	10,196	140,898	20,247
$[75, 80)$	54,153	9,940	92,696	16,711
$[80, 85)$	42,304	9,562	54,647	15,342
$[85, 90)$	65,672	8,444	64,584	12,890
$[90, 95)$	18,818	7,522	62,551	11,397
$[95, 100]$	46,879	6,290	46,879	10,494

Notes: This table represents the median and mean taxable income for all taxpayers falling into the specified age bins. The statistics are reported separately for non-noble and noble taxpayers. The unit of analysis is an individual taxpayer. This table presents the underlying data from Figure 3.

Table A.3: Descriptive Statistics

	Gender Not Predicted	Gender Predicted
Demographics		
Age	49.27	54.61
Female		0.52
Income		
No taxable income	0.18	0.15
Taxable income (excl. 0s)	27,816	27,557
Self-empl. income > 0	0.09	0.08
Self-empl. income (excl. 0s)	35,495	38,268
Observations	323,437	565,283

Notes: This table reports descriptive statistics for individuals with and without a gender dummy. The gender dummy is obtained following the algorithm described in Appendix A. The unit of analysis is an individual taxpayer aged 16-100 years old. The upper panel reports key demographics of taxpayers. The gender composition of the sample is currently available for noble taxpayers. The lower panel reports statics about income variables. The row labeled "No taxable income" computes the proportion of taxpayers with zero taxable income. The row labeled "Taxable income (excl. 0s)" provides the average taxable income computed among those with strictly positive income. The row labeled "Self-empl. income > 0" reports the proportion of taxpayers with income from self-employment and from professional services (such as, lawyers, doctors, engineers, architects, etc.). The row labeled "Self-empl. income (excl. 0s)" computes the average self-employment income calculated among those with strictly positive self-employment income. The final row reports the total number of taxpayers in each group.