A Human Capital Interpretation
of the Economic History of the Jews

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Abstract

This paper studies one of the most remarkable examples of successful economic performance in which religion, education, and human capital accumulation seems to have played a critical role: the economic history of the Jews. The main question we aim to address is to what extent a human capital model of occupational choice can explain the trends in Jewish population and their observed residential and occupational distribution. Some scholars have emphasized the role of persecutions, expulsions, restrictions, and heavy taxation. We add a new argument based on a human capital approach. We present a model in which the conversion of Jews to other religions and their occupational choice is affected by the larger and larger emphasis that Jewish religion placed on children’s education starting from the first century of the Christian era. The model predicts that as the importance of children’s education grows, a faster conversion of Jewish farmers to non-Jewish religions should occur; moreover, a higher rate of Jews will work as merchants in cities. Higher taxes on Jews cause a higher conversion rate, more investment in education, and a shift of the Jewish population away from agriculture and toward trade. Preliminary historical evidence provides support to these predictions.

1 Introduction

Recent work by economists emphasizes that high literacy rates and the accumulation of human capital can be powerful engines for economic growth and development (Becker 1962, 1993; Lucas 1988; Becker, Murphy, and Tamura 1990; Barro 1991, 1999; Eckstein and Zilcha 1994; Heckman 2000). Economic historians are contributing to this debate by showing that economically successful countries are those in which investment in education and human capital accumulation played a major role (Easterlin 1981; Goldin and Katz 1997; Goldin 1999). From a similar though slightly different perspective, other scholars have investigated

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the impact of cultural values on resource allocation and economic performance. Societies with different cultural values (individualistic versus collectivist) can display significantly divergent paths of economic development (Greif 1994; Kuran 1997; Temin 1997). Also, according to De Long (1988, 1146–48), the positive coefficient of a regression of growth rates on a religious establishment variable might suggest that for the “once-rich twenty-two nations, a country’s religious establishment has been a surprisingly good proxy for the social capability to assimilate modern technology.”

Our paper aims to add to both strands of literature by studying one of the most remarkable examples of successful economic performance in which religion, education, and human capital accumulation seems to have played a critical role: the economic history of the Jews.

Three features characterized the economic history of the Jews starting from the later centuries of the Roman empire. First, there is their peculiar residential and occupational choice. While Jews in biblical times were mainly farmers who lived in villages, from the fourth century of the Christian era on (C.E. henceforth), Jews settled mainly in cities and worked in profitable non-agricultural occupations, such as moneylenders, traders, and craftsmen; they were seldom farmers while the majority of the population held agricultural occupations. Second, while these changes were occurring, the size of the Jewish population experienced a sharp decline everywhere. Five to eight million Jews were estimated to live in Europe, Middle East, and North Africa at the height of the Roman empire; in the thirteenth century when the world population was growing, there were only 1.5 million Jews. It is only in the seventeenth century that the Jewish population started increasing again.

Third, the modern Jewish educational system is almost the same as the one established around the first century of the C.E. Writing at that time, the famous Jewish warrior and then writer Flavius Josephus stated that “Our principal care of all is this to educate our children well.” Judah ben Tema, one of the late Tannaim, laid down the structure of Jewish education. By the age of five Jewish children had to learn the Mikra, by 10 the Mishnah, and when they were 15 years old they were taught the Gemara or Talmud. Children were initiated into religious practices long before reaching adulthood, at the age of thirteen when Bar Mitzvah was celebrated. The crucial period in which Jewish education took a completely different path is at the end of the Second Commonwealth. While in earlier times education and full knowledge of the Torah was restricted to a select few, in the first century of the C.E. reformers considered a priority to extend literacy among all Jews (Drazin 1940, 18; Baron 1948, 1952). For the first time in history, a system of universal and compulsory primary education for boys was established.

The main question we aim to address is to what extent a human capital model of occupational choice can explain the trends in Jewish population and their observed residential and occupational distribution from the first to the thirteenth centuries. Some scholars have emphasized the role of persecutions, expulsions, and restrictions (Roth 1960a; Abrahams

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1 This variable takes on the value of 0 for Catholic nations, 1/2 for mixed, and 1 for Protestant nations.

2 In an influential though very controversial work, Werner Sombart (1913) argued that the impersonal, rational, materialistic commercialism characteristic of the capitalist spirit can be traced back to Jewish religion and philosophy.

While expulsions were the cause of fluctuations in the Jewish population of certain cities or countries due to migrations, they cannot account for the decrease in the world Jewish population. Similarly, restrictions on the occupations that Jews were allowed to practice may explain their occupational choice for the later Middle Ages, the early modern and modern era in Europe when these prohibitions were enacted. Yet, restrictions cannot explain the occupational choice of Jews in the classical period (in Babylon and in the Roman empire) and during the Arab expansion in the seventh and eighth centuries when they were free to choose any occupation. Other scholars argue that heavier taxation on Jews and especially on those who derived their wealth from agriculture made them convert to other religions (Baron 1972; 1975).

Our explanation for the sharp reduction in the size of the Jewish population from the demise of the Roman empire up to the modern era, for their increasingly urban character and occupational choice from about 300 C.E. to 1300 does not contradict the hypothesis based on heavier taxation of Jews and especially Jewish farmers. However, we add a new argument based on a human capital approach. We present a model in which the conversion of Jews to other religions and their occupational choice is affected by the larger and larger emphasis that Jewish religion placed on children’s education starting from the first century of the C.E. The main predictions of the model are as follows. As the importance of children’s education grows, a faster conversion of Jewish farmers to non-Jewish religions should occur; moreover, a higher proportion of Jews will work as merchants in cities. Higher taxes on Jews cause a higher conversion rate, more investment in education, and a shift of the Jewish population away from agriculture and toward trade.

We expect to find that the concentration of Jews in urban, skilled occupations has been a long process that started during the later centuries of the Roman empire and reached its peak between the twelfth and the seventeenth centuries. This process was related to both the migrations of Jews and their high human capital compared to the non-Jewish population. The selection in and out of the Jewish community was related to the occupations and the human capital level of the Jews in each country. We aim to show that their occupational distribution as well as their level of human capital were determined endogenously and were consistent with a simple maximization model of human capital accumulation and occupational choice. The human capital advantage enabled the Jews to work in a limited set of occupations that provided them with a better income than the alternative occupation as farmers.

We present preliminary evidence that is consistent with these predictions.

This paper is organized as follows. Section 2 outlines the model. Section 3 presents historical evidence that supports the predictions of the model. Section 4 concludes.

2 A Model of Religion and Occupational Choice

We consider the choice problem of an adult Jewish individual at the turn of the first millennium. At that time, the majority of Jews were farmers cultivating land and living in villages in Israel, Babylon, Egypt, Syria, and Persia (Abrahams 1896; Baron 1952; 1962). A small proportion of Jews lived in cities and worked as merchants, craftsmen, and artisans in both
the Middle East and the Roman empire.

2.1 Setup

To model the occupational choice of Jews, we adopt Roy’s (1951) model and incorporate the parents’ choice on their children’s education as in Eckstein and Zilcha (1994). In order to make the analysis as simple and insightful as possible, we assume that there are two occupations: agriculture \((A)\) and trade (merchant = \(M\)). Farmers live in villages and merchants live in cities. Therefore, the choice of occupation is equivalent to the choice of location. Let \(W_A\) and \(W_M\) be the earnings in the two occupations, which represent the productivity in each occupation. Working in agriculture does not demand any education, while becoming a merchant requires some education (literacy). As such,

\[
W_A = W_M(E = 0, E^s) < W_M(E > 0, E^s)
\]  

where \(E\) is the education of the individual and \(E^s\) is his son’s education.\(^\text{4}\) By assumption, \(W_M\) is increasing in both education levels and the cross effect is positive. We choose a particular functional form for the wage of a merchant, \(W_M = W_A[1 + E(1 + E^s)]\), such that the above conditions on the derivatives hold.

Education is not required for farming and has no impact on productivity in agriculture. However, Jewish farmers are expected to be educated with \(E > 0\). The main reason is that Jewish religion requires a certain level of literacy in order to read the Bible and to understand the prayers. As a result, an educated Jewish farmer or merchant is endowed with \(E > 0\) due to investment in literacy made by his parents to provide him with proper Jewish education. A Jew who is not educated at all \((E = 0)\) is called “am haaretz.” Since the beginning of the millennium Jews are required to spend resources to teach their sons to read and write and to have a positive level of education \((E > 0)\). Hence, given the level of \(E\) that his parents provided to him, an adult Jewish individual has to decide whether to work in \(A\) or \(M\).

The cost of providing education to children is \(e(E^s)\), such that for a minimal level of education \(E^s_m > 0\), the required cost is \(e_m > 0\), with \(e'(E^s) > 0\), \(e''(E^s) > 0\), for \(E^s > E^s_m\). The budget constraints of Jews in agriculture and in urban occupations are, respectively:

\[
C^{AJ} = W_A - e(E^s) - T^{AJ}
\]

and

\[
C^{MJ} = W_M(E, E^s) - e(E^s) - T^{MJ}
\]

where \(C\) is the consumption and \(T\) is the tax for a Jewish individual in a given occupation. Taxes can be either land taxes (proportional to the size of land holdings) or lump sum taxes per head or per household. Non-Jews \((NJ)\) can also be farmers or merchants. Similarly, if

\(^4\)The number of sons (children) is taken as given and the same for all Jews. If a Jewish household has more than one child, all children receive the same education.
a Jew converts and becomes Christian or Moslem, he can be a farmer or a merchant. The budget constraints of non-Jewish farmers \((ANJ)\) and merchants \((MNJ)\) are, respectively:

\[
C^{ANJ} = W_A - T^{NJ}
\]

and

\[
C^{MNJ} = W_M(E, E^s) - e(E^s) - T^{MNJ}
\]

Preferences \((U)\) of an adult Jewish individual are assumed to be linear:

\[
U(C, E^s; u, E^s) = C + u(E^s + E)
\]

where \(u\) is a positive exogenous preference parameter that weights the value of being a Jew in the utility function; that is, it indicates the marginal value of being a Jew. If \(u = 0\), the individual derives no utility from being a Jew. High values of \(u\) imply that the individual has a high level of utility from being a Jew. This parameter affects the individual decision only if it affects consumption and children’s education, which are determined endogenously. Education here represents a certain level of literacy; the preference parameter \(u\) is interacted with the level of education, that is, the utility from being a Jew is increasing with the sum of the individual’s education and of his son’s education. This is because the Jewish religion emphasizes the importance of learning and reading as part of the Jewish practice; an observant Jew has to teach his son to read and write at a very early age (see section 3.2). The interaction between \(u\) and \((E^s + E)\) provides a simple specification for these observations on Jewish religion. Lastly, the level of \(u\) has a particular distribution across the population. A Jew who follows the rules established by Jewish religion has to provide at least a level \(E_m\) of education to his son at the cost of \(e_m\).

### 2.2 Analysis

**Children’s Education.** Let us first consider individuals who are farmers. Given that non-Jews are assumed to have the utility parameter \(u = 0\) and that literacy does not increase productivity in farming activities, they have no incentives to provide their children with education. Therefore, for a non-Jewish farmer the optimal education level of his children is equal to zero \((E^s = 0)\).

In contrast, since for a Jewish farmer \(u > 0\) (literacy has a positive value in Jewish religion), the optimal choice of \(E^s\) is such that \(u = e'(E^s)\); at the optimum, the marginal cost of children’s education is equal to the marginal utility of being a Jew. There exists a lower bound level of \(u\) equal to \(u_m\) such that \(u_m = e'(E^s_m)\). Jews with a utility parameter smaller than \(u_m\) \((u < u_m)\) will not invest in their children’s education \((E^s = 0)\), as the model predicts for non-Jews. Meanwhile, Jewish farmers with \(u > u_m\) will invest in their children’s education. The level of children’s education for Jewish farmers is given by

\[
\begin{align*}
    u &= e'(E^s) & \text{for } u \geq u_m \\
    E^s &= 0 & \text{for } u < u_m
\end{align*}
\]
As for merchants, if they are Jewish, the optimal education level of their children is given by

$$W_A(1 + E) + u = e'(E^*)$$

where $$W_A(1 + E) = W_{ME^*}(E, E^*)$$ is the marginal effect of children’s education on the wage of the Jewish merchant. From (7) and (8) it follows that a Jewish merchant with the same level of $$u$$ as a Jewish farmer will invest more in his children’s education because the returns to this investment are higher for a merchant than for a farmer. Moreover, it is possible that a Jewish merchant with a lower than $$u_m$$ will invest in his children’s education since the returns to this investment for a merchant are higher.

For non-Jewish merchants, the optimal education level of their children is the same as in (8) but $$u = 0$$. Hence, a non-Jewish merchant will invest less in his children’s education since in equation (8) for each given $$E$$ the left hand side is smaller and $$e''(E^*) > 0$$.

The results regarding the investment in children’s education can be summarized as follows:

$$0 = E^*(NJ \text{ farmer}) = E^*(J \text{ farmer}; u < u_m) < E^*(J \text{ farmer}; u \geq u_m) < E^*(J \text{ merchant})$$

and

$$E^*(NJ \text{ merchant}) < E^*(J \text{ merchant})$$.

The Occupational Choice of Jews. Conditional on being an educated Jewish adult with $$E > 0$$, the individual prefers to be a merchant rather than a farmer if

$$U^{AJ}(E > 0) < U^{MJ}(E > 0)$$

that is, if

$$W_A - T^{AJ} < W_M(E > 0; E^*) - T^{MJ}$$

Given assumption (1) that the wage in agriculture is lower than the wage for an educated merchant, an educated Jew will choose to be a merchant if taxes in agriculture are equal to, or larger than, taxes in cities. This is a sufficient condition for the transition to agriculture. Yet, we are interested in the necessary condition. The occupational choice of a Jew is determined by a reservation level of his education, $$E^*$$, which solves the equation

$$W_M(E^*, E^*) = W_M = W_A[1 + E^*(1 + E^*)] = W_A + T^{MJ} - T^{AJ}$$

For all $$E \geq E^*$$, Jews choose to be merchants and live in cities. Using the specific formulation above we get that the lower value of education for which all Jews prefer to be merchants is given by

$$E^* = \frac{T^{MJ} - T^{AJ}}{W_A(1 + E^*)}$$

If taxes on Jews are the same in agriculture and in urban occupations, then $$E^* = 0$$. Therefore, for all educated Jews ($$E > 0$$), the optimal choice is to be merchants. Furthermore, from (14) one can see that even if taxes on Jews in urban occupations are higher than taxes on Jewish farmers, Jews’ optimal choice is to be merchants.
The Conversions of Jews. Conditional on being an educated Jewish farmer ($AJ$), the choice to convert to a non-Jewish religion ($NJ$) is given by $U^{AJ} < U^{NJ}$. For the general case, where the non-Jewish wage is given by $W^{NJ}$, the condition for converting is

$$W_A - e(E^s) - T^{AJ} + u(E + E^s) < W^{NJ} - T^{NJ} \quad (15)$$

The case where work opportunities are independent of religion ($W^{NJ} = W_A$) is the most reasonable to assume. In this case the conversion condition is

$$u(E + E^s) - e(E^s) < -T^{NJ} + T^{AJ} = T_n \quad (16)$$

where $T_n$ is the tax difference between a Jew and a non-Jew working in the same occupation and location. Therefore, a Jew will convert to another religion if the benefit of being a Jew is less than the cost of educating the children and the tax difference between being a Jew and a non-Jew.

Consider the case where the Jewish farmer has the minimal education, $E_m$, and he is supposed to provide this minimal education level to his son at the cost of $e_m$. Assuming that the utility indicator for preference from being Jewish has a continuous distribution, there exists a level $u^*$ that makes the Jewish farmer indifferent with respect to conversion; this level is given by

$$u^* = \frac{T^{AJ} - T^{NJ} + e_m}{E_m + E^s_m} \quad (17)$$

For $u < u^*$, the Jewish farmer converts to a non-Jewish religion. The proportion of conversions of Jewish farmers to a non-Jewish religion is given by $Pr(u < u^*)$. Note that even if taxes for Jews and non-Jews are the same, there exists a level of $u^*_0 = \frac{e_m}{E_m + E^s_m}$ (equal to the cost of a unit of minimal education), which determines the proportion of Jewish farmers who convert and become non-Jewish.

**Results.** The theory delivers the following predictions:

1. the larger the taxes on Jewish farmers, the higher the $u^*$ at which a Jewish farmer is indifferent between converting and remaining a Jew, and therefore the higher the conversion rate (see equation 17).

2. The larger the taxes on Jewish farmers, the lower the education level $E^*$ at which a Jew is indifferent between being a farmer or becoming a merchant, and therefore the higher the proportion of Jews who choose to become merchants and live in cities (equation 14).

3. As the importance of education and investment in children’s ability to read and write increases, a faster conversion of Jewish farmers to non-Jewish religions (Christianity and Islam) occurs; in other words, as the emphasis on education in the Jewish religion increases by imposing higher requirements, $\frac{e_m}{E_m + E^s_m}$ goes up. Therefore, $u^*$ increases and, consequently, the proportion of conversions goes up (equation 17).
4. As the emphasis on education in the Jewish religion increases by imposing higher requirements, $E^*$ goes up. Therefore, $E^*$, the education level at which a Jew is indifferent between being a farmer or becoming a merchant, decreases and, consequently, more Jews choose to become merchants and live in cities (equation 14).

To sum up, as the importance of education and investment in children’s ability to read and write increases, a faster conversion of Jewish farmers to non-Jewish religions (Christianity and Islam) occurs; moreover, a higher rate of Jews will work as merchants in cities. Higher taxes on Jews in general cause a higher conversion rate, more investment in education, and a shift of the Jewish population away from agriculture and toward trade.

**Equilibrium Implications.** Suppose further that the equilibrium potential supply of non-agricultural jobs in which there is a positive return from the knowledge of reading and writing is determined by the state of the economy, as well as by the growth rate. The latter determines the size of the urban population. This equilibrium supply of potential merchants causes the Jews to keep their number fitting the supply of jobs. Since the Jewish population in the second century of the C.E. was much higher than the potential number of jobs as merchants, the theory predicts that the Jews would put further emphasis on the role of education; in this way, $u^*$ will increase, the proportion of Jews who convert to other religions will augment, and the number of Jewish merchants will fit the number of potential jobs.

Another prediction is that the Jews will migrate to areas where cities are formed and the demand for merchants is increasing.5

3  **Historical Evidence**

The previous section outlined a model that delivers predictions on the Jews’ decision to invest in their children’s education, on their occupational choice, and on the rate of conversion of Jews to other religions. This section presents preliminary evidence from Jewish history that is consistent with the predictions of the model.

3.1  **Trends in Jewish Population**

The estimation of the size of any population living in a given place at a given time is always difficult, and the more so when we go back in the far distant past. The problem becomes enormous for the Jews who throughout history were often foreigners in the places where they lived, and therefore, they often failed to be recorded in the standard sources such as censuses and other official statistics. Roth (1950) admitted that “no problem in Jewish history in the Dark and the Middle Ages is more difficult of solution than that of determining with any degree of certainty the number and distribution of the Jewish population at any given time.” This problem, however, does not seem to be restricted to the Middle Ages.

5 Due to space we omitted the analysis of the occupational choice of non-Jews.
While bearing in mind the possibility that demographic data may be defective or incomplete, it is nevertheless important to attempt and outline the main facts regarding the size of the Jewish population that seem to find support in different sources. Tables 1 and 2 illustrate the basic trends of the Jewish population in the world from biblical times up to the nineteenth century. A clear pattern emerges from these data. The Jewish population, which experienced a substantial growth from the biblical to the classical period, underwent a sharp reduction starting from the later centuries of the Roman empire until the beginning of the modern era. It is only in the seventeenth century that the Jewish population started growing again.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Biblical Population</th>
<th>World Population</th>
<th>( \frac{A}{B} \times 100 )</th>
<th>Historical Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biblical</td>
<td>1.5–1.8</td>
<td>75</td>
<td>2.40</td>
<td>Roman empire</td>
</tr>
<tr>
<td>Classical</td>
<td>5–8</td>
<td>170</td>
<td>4.70</td>
<td>Mishnah, Talmud</td>
</tr>
<tr>
<td>3rd–6th centuries</td>
<td>?</td>
<td>190</td>
<td>?</td>
<td>Arab expansion</td>
</tr>
<tr>
<td>Feudal (7th century)</td>
<td>?</td>
<td>200</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Feudal (12th century)</td>
<td>1.5</td>
<td>340</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Early modern (15th century)</td>
<td>1</td>
<td>387</td>
<td>0.26</td>
<td>Commercial revival</td>
</tr>
<tr>
<td>Early modern (16th century)</td>
<td>1</td>
<td>485</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
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<td>2.5</td>
<td>755</td>
<td>0.33</td>
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<tr>
<td>Nineteenth century</td>
<td>4.25</td>
<td>1262</td>
<td>0.33</td>
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<table>
<thead>
<tr>
<th>Time Period</th>
<th>Biblical Population</th>
<th>Classical</th>
<th>7th</th>
<th>12th</th>
<th>16th</th>
<th>17th</th>
<th>18th</th>
<th>19th</th>
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<td>1</td>
<td>many</td>
<td>0.002</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>1</td>
<td>many</td>
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<td>many</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Alexandria/Egypt</td>
<td>1</td>
<td>many</td>
<td>0.015</td>
<td>many</td>
<td>0.12</td>
<td></td>
<td></td>
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<tr>
<td>Syria</td>
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<td></td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Asia Minor</td>
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<td>many</td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Western Europe</td>
<td>some</td>
<td>0.3</td>
<td>0.05</td>
<td>0.02</td>
<td>many</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Eastern Europe</td>
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<td></td>
<td></td>
<td>many</td>
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<td>0.55</td>
<td></td>
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<tr>
<td>TOTAL</td>
<td>1.5–1.8</td>
<td>8</td>
<td>?</td>
<td>1.5</td>
<td>1</td>
<td>1.15</td>
<td>2.5</td>
<td>4.25</td>
</tr>
</tbody>
</table>

Up to the tenth century of the C.E., Jewish history is identified with the history of the Middle East (Palestine, Egypt, and Babylonia). In the biblical period about 1.5 to 1.8 million Jews were estimated to live in Palestine; in the period of the Israelitic kings the population grew enormously (Baron 1937, 1962, and 1975; Ruppin 1946). In the classical period, it has been calculated that there were 5 to 8 million Jews, about 5 percent of the world population. Of these 8 million Jews, 4 million were Jews by descent and the rest were converted pagans. Before the rise of Christianity, Judaism was attracting proselytes among the poor as well as the wealthy. The poor enjoyed the benefits of Jewish communal relief; rich merchants found profitable to join a religion whose members formed a network of relationships in many places (Baron 1937, vol. 1, 175). In the Roman empire, where the Jews formed about eight to 10 percent of the population, most of them lived in Italy, Greece, Spain, and North Africa, some in Gaul and Rhineland, and few in Britain and other regions. The other 4 million Jews lived evenly spread in Babylonia, Syria, Egypt (especially in Alexandria), and Asia Minor. A key feature of the Jewish communities in this period is their predominantly urban character: most Jews in both the western and eastern regions were concentrated in cities and towns (Kahan 1975; Schurer 1973–87). In the first century of the C.E., Jews constituted nearly two-fifths of the population of Alexandria.

The debacle of the Roman empire and the subsequent political and military turmoil in Europe made Jews spread all around the former empire and migrate eastwards in the Persian empire and especially in Babylon. During the third and fourth centuries, the center of gravity of Jewish life gradually moved from Palestine to Babylon where the demand for technical skills and experience in commercial undertakings was growing under the somewhat milder Sassanian regime (Raphael 1985). The centuries between the fifth and the ninth are those for which it is most difficult to assess the size of the Jewish population. In the seventh century strong repressions of Jews occurred in the Byzantine empire. The Arab expansion led Babylonian Jews to migrate to Palestine, northern Africa, and Europe (Lewis 1976; 1984; 1995). At the end of the eight century, the Jewish population in the Muslim regions was almost entirely urban (Ben-Sasson 1976, 393). In the ninth century the decline of the Baghdad caliphate and the revival of urban centers on Europe increased the stream of Jews from the Middle East to Western Europe.

The Jewish population decreased sharply during the Middle Ages. Describing his travels, Benjamin of Tudela reported that in the twelfth century, the world Jewish population was about 1.5 million. Most of them lived in Iraq, Iran, Yemen, Syria, Palestine, and northern Africa, and less than one-third in Europe. Although the numbers cited by Benjamin of Tudela cannot be taken at face value, they indicate some striking differences: around 1170, Baghdad was estimated to have 40,000 Jewish households, Tilmas and Tanai each 100,000, Basra 10,000, Alexandria 3,000, while in Rome and Marseilles there were only 200 and 300 Jewish households, respectively.

The declining trend continued in the following three centuries. In the fifteenth century there were fewer than 300,000 Jews in Europe (mainly in Spain and some in Italy), and fewer than 1 million in the world (Engleman 1960). Around 1550, there were no Jews lawfully resident in England or France, the Netherlands, Spain, Portugal, and the Scandinavian coun-
tries. At this time, most European Jews lived in Poland, and some in Italy. Even considering the large settlements under Muslim rule, the total number of Jews was rapidly declining to the lowest level of the history of the Diaspora.

The Jewish population started growing again in the seventeenth century. In 1650, when the population of Europe was 100 million (one-fifth of the world population), there were 650,000 Jews in Europe. Most of them lived in eastern Europe (especially in Poland), while there were only a few thousands concentrated in Western Europe (some German cities, Austria, Bohemia, northern and central Italy, Avignon and Provence, and Holland). There were 250,000 Jews in Turkey and Egypt, and 250,000 in the rest of the world (Roth 1960b; Halpern 1960; Menes 1960).

At the end of the eighteenth century, Jews were between 2 and 2.5 million. After 1848, the size of the Jewish population increased substantially: compared to a world population of more than a billion, there were 4,250,000 Jews in the world; 3,700,000 lived in Europe, which had a population of 250 million people (Lestschinsky 1946).

Thus, the most significant features of the population history of the Jews are the dramatic decline that occurred between the last centuries of the Roman empire and the beginning of the modern era, and the increasingly urban character of the Jewish communities. Jews became far less numerous, and at the same time, they settled mainly in cities.

The sharp decline of the Jewish population has been attributed to different factors. Roth (1960a) stressed the role of religious and political persecutions. Expulsions were the cause of fluctuations in the population of certain cities or countries. For example, the expulsions of the Jews from England in 1290 and from Spain in 1492 explain the absence of Jews in those countries from then on. However, expulsions cannot account for the decrease in the European and world Jewish population: the Jews that left England and Spain migrated to other places. In contrast, Baron (1952) and Engleman (1960) argue that the large reduction in the size of the European Jewry was the result of the negative shock from readjusting to a new occupation. In the classical period, Jews were concentrated in urban activities. With the fall of the Roman empire, once agriculture became the most important and almost exclusive economic activity for almost six centuries in Europe, Jews found themselves at disadvantage, and therefore, they converted to Christianity or Islam. Moreover, heavier taxation on Jews and especially on those who derived their wealth from agriculture made them convert to other religions (Baron 1972; 1975).

We agree that heavy taxation on Jews and especially Jewish farmers played a role in accelerating their conversions to other religions. However, our explanation for the sharp reduction in the size of the Jewish population from 300 C.E. to 1650 adds a new argument based on a human capital approach. The model outlined above predicts that conversions of Jews to other religions are accelerated by the larger emphasis placed by Jewish religion on education in general and more specifically on children’s education. As the importance of education and investment in children’s ability to read and write increased, a faster conversion of Jewish farmers to non-Jewish religions occurred. Indirect evidence that some Jews converted to Christianity is provided by an imperial decree in 426 C.E. The decree established the annulment of any Jewish last will in which a baptized son, daughter or grandchild,
were left less than their intestate share (Baron 1937, vol. 2, 253). At the same time when Judaism was imposing more requirements on education, it was also facing the competition of the emerging Christian religion that advocated the equality of all human beings, rich and poor, ignorant and educated. As Arthur D. Nock (1969) emphasizes, “Christianity gave a way of life and made men at home in the universe; and did it for the ignorant as well as for the lettered.” Baron (1937, 237), while admitting that it is very difficult to establish the numerical relation between Christians of Jewish and Gentile descent, suggests that the majority of the early Jewish converts to Christianity were uneducated and poor Jews. Moreover, unlike in previous times when Judaism sustained proselytism, after the destruction of the Second Temple the rabbis tried to discourage conversions, and Palestinian leaders showed contradictory attitudes toward proselytism (Neusner 1980; 1994). Jews did not want to make proselytes even when they were not prohibited to do so in the Roman empire. Even when they moved to Persia and Babylon in the third and fourth centuries under the more tolerant Sassanian regime, Jews preferred to isolate themselves from the official religion.

3.2 Jewish Religion and Education

The modern Jewish educational system is almost the same as the one established around the first century of the C.E. (Goldberg and Rayner 1987; Telushkin 1991). Writing at that time, Flavius Josephus stated that “Our principal care of all is this to educate our children well.” Judah ben Tema, one of the late Tannaïm, laid down the structure of Jewish education. By the age of five, Jewish children had to learn the Mikra, by 10 the Mishnah, and when they were 15 years old they were taught the Gemara or Talmud (Baron 1937, vol. 2, 274).

Religion and education seem to have been strictly connected since early times. Moses is credited with saying “Let the children also learn the laws, as the first thing they are taught, which will be the best thing they can be taught, and will be the cause of their future felicity.” Unlike in ancient Greece where the pursuit of knowledge was the ultimate objective, the emphasis of Jewish education was on conduct. To observe all the laws of his faith, a Jew had to be highly educated. “An empty-headed man cannot be a sin fearing man, not can an ignorant person be pious” wrote Hillel (Drazin 1940, 16). Yet, while learning the Torah, children also acquired knowledge of other topics. For example, learning the Jewish calendar provided them with knowledge of astronomy, while the stories in the Bible supplied notions of history and geography.

Compared to the pagan celebrations of the Greeks and the Romans, and even to Christianity, Judaism was based on religious duties that were educationally oriented. A good Jew had to read sections of the Pentateuch four times a week at the services, twice on the Sabbath and once every Monday and Thursday mornings. Children were initiated into religious practices long before reaching adulthood, at the age of thirteen when Bar Mitzvah was celebrated (Drazin 1940, 25).

The crucial period in which Jewish education took a completely different path occurred at the end of the Second Commonwealth. While in earlier times education and full knowledge of the Torah was restricted to a select few, in the first century of the C.E. reformers considered a priority to extend literacy among all Jews (Drazin 1940, 18). For the first time in history,
a system of universal and compulsory primary education for boys was established. The development of the Jewish schooling system went through three stages.

The Soferim Period (515 BCE—200 BCE). Around 515 B.C.E. the Second Temple was built. During the Soferim (scribes) period, academies for higher learning in Jerusalem were founded; since they had to prepare the priests, these academies were restricted to a very small group of people. Children were taught to read and write mainly by their parents. This system worked well in an agrarian society, such as the Jewish one during the period of the First Temple, because the seasonal character of agricultural activities left parents enough time to educate their children. However, after the Babylonian captivity, when more and more Jews were involved in trade and mercantile activities, parents had to work all year and had few time to provide their children with primary and secondary education. Schools for higher education (Bet Hillel and Bet Shammai) were founded in Babylon and Jerusalem and later in other towns. The admission fees, the living and transportation costs, and the tough entry requirements, however, turned out to be serious obstacles, and these secondary schools were not attended by many students as the reformers had hoped.

The Zugot Period (200 BCE—10 CE). To overcome this poor attendance of secondary schools, after the Maccabean victory free secondary schools were established throughout Palestine and were to be attended by young adults (16 or 17 years old). Around 75 B.C.E., a two-level school system came into existence. In Jerusalem a college for advanced students had to prepare them to higher academies, while across Palestine were founded preparatory schools, which provided free and compulsory education for all male adolescents.

The Tannaim Period (10 CE—200 CE). This secondary schooling system, though impressive for the period, suffered of a fundamental problem: orphans and children whose fathers were busy with crafts or trade activities and had not time to provide them with some basic education, did not receive the necessary primary education required to meet the standards of admission to the secondary schools. To solve this problem, in the year 65 of the C. E. Joshua ben Gamla ordered that “teachers of children shall be appointed in every district and in every town, and they shall be sent to school from the age of six or seven” (Stern 1976, 283–84). Few years before the destruction of the Temple by Titus, Jews had a system of compulsory primary schooling for all Jewish boys without any distinction of social or economic status. Whenever there were 25 or more children of school age, a teacher had to be supplied by the community. Teachers were paid by the parents when they gave private instruction at home, and by the communities when they taught at a community school. If parents could not afford to contribute to their children’s education, the children were educated at community’s expenses; funds for schools were raised through a special education tax. Education was almost compulsory in every Jewish community and school attendance started with a solemn ceremony when the child was very young, at the age of four or five (Greenberg 1960, 1270). In contrast to other areas in which Jewish law imposed many
restrictions and prohibitions, Jewish religion favored competition in the teaching of Torah (Carlton and Weiss 2000).

**Religion and Human Capital.** The impact of Jewish religion on educational reforms is clear. In order to be a good Jew, parents had to teach their children to read Mikra, Mishnah, and Talmud. The reform introduced by Joshua ben Gamla freed parents from the need to teach their children if they had no time. By sending their children to school, Jewish parents could meet the religious duty to teach their children to read. Those who refused to send their children to school were ostracized to a certain extent by the Jewish community who nicknamed them "am haaretz" (which in Hebrew means “people of the land, common, ignorant people”).

This was the first instance in history in which a system of universal and compulsory primary education was established. What is more remarkable is that this reform was introduced in a period when the majority of the population in the Roman and other empires lacked any education at all (Grant 1984, 62). This human capital advantage continued in the following centuries. In the early Middle Ages in Western Europe, where learning virtually disappeared and monks remained the only educated people, Jews kept their educational institutions. In Poland in the seventeenth and eighteenth centuries, formal schooling for Jewish children was compulsory from the age of six to 13, while the rest of the population remained illiterate as late as 1790 (Maller 1960).

### 3.3 Occupational Choice of the Jews

Throughout history, Jews have been always associated with urban and skilled occupations, especially trade and financial activities (Kuznets 1960). However, this was not the case at the very beginning of Jewish history. The issue is determining when and why the selection of Jews into high-skill urban occupations took place.

**Biblical Times, Classical Period, and Arab Expansion.** Unlike in later centuries, in biblical times Jews were mainly farmers who lived in villages (Browne 1936; Malamat 1976; Tadmor 1976; Fuchs 1995).

Already in Rome before the fourth century, Jews held non-agricultural and urban occupations, such as merchants, painters, actors, poets, singers, butchers, tailors, and smiths (Safrai 1976). The Christianization of the Roman empire introduced the first restrictions on the economic activities of the Jews (Roth 1960a). They could not own slaves, and therefore, they were unable to practice agriculture on large scale. At the same time, the crisis of the Roman empire gave the Jews special advantages because of their better trade and commercial skills. At the beginning these advantages were shared with other groups, e.g. the Syrians.

The Talmudic period seems to have been the crucial stage for the transition from agriculture to trade and banking (Baron 1937, vol. 2, 244). Agriculture remained the main occupation of Jews living in the border areas of the Moslem empire and in Africa. However,
in Palestine and Babylonia it became less and less important as a source of income and wealth for Jews after 200 C.E.; Jews became more involved in trade.

Baron (1952; 1975) lists several factors that contributed to this transition. The growing hostility towards Jews both in Palestine and Persia made them abandon sparse settlements in the countryside in favor of safer urban locations. Due to the general economic decline associated with the later centuries of the Roman empire, Greek merchants left trade in Palestine to local traders who were mainly Jews. Also, with the disintegration of the Roman empire into smaller and more isolated regions (Syria, Palestine, and Babylonia) which had to produce their own goods, Jewish craftsmen began to play a leading role; the same artisans had to face less competition because of the decline of slavery that had sustained large scale and cheaper production of goods. Agriculture itself seems to have become a less profitable activity. A rabbi in the fourth century claimed that “A merchant with a capital of 100 zuz could afford meat and wine daily, while a farmer owning land of the same value had to be satisfied with salt and roots” (Baron, 1937, vol. 2, 250). Lastly, Roman taxation was very heavy on Jewish farmers and the more so after the destruction of the Second Temple in 70 C.E. Jews had to pay both a tax on land and a tax per capita. According to Baron, in the Talmudic period, most Jews abandoning agriculture became small shopkeepers and artisans in the tanning, linen, silk, and dyeing industries, and in glassware making. Some Jews became wealthy traders and merchants. For example, in Alexandria, which was the center of trade between the Far East and the Western world, Jewish traders became organized in a powerful guild that obtained privileges by the Christian emperors.

The subsequent Moslem expansion divided the Mediterranean world into two parts: those regions speaking Roman-Greek and those regions speaking Arabic. The Jews gained a position of special prominence in trade because they had a foot in either one (Agus 1965). Knowledge of the Arabic language made Jews important translators of Arabic books in Western Europe (Singer 1960). Moslems, who favored commerce, held a leadership in the Mediterranean trade and the long-distance trade in the spices and silks of the Far East (Lewis 1984). By the end of the classical period, Jews were employed in various branches of crafts and trade. A Moslem writer bitterly wrote that “among the Jews one finds only dyers, tanners, barbers and surgeons, butchers and waterskin repairers” (Ben-Sasson 1976, 395). Other sources list Jewish blacksmiths, gold and silversmiths, shoemakers, and other shopkeepers. Jews were also involved in long-distance trade; in the ninth century another Moslem writer mentioned Jewish traders who from southern France travelled to Islamic lands, and then went to India and China. Furthermore, Jews became involved in money lending and became bankers to the rulers. Wealthy Jewish merchants were cited as bankers to the caliph in Baghdad in the tenth century.

In 1169–71, during his travels Benjamin of Tudela found scholars devoted to the study of the Talmud and learned people among Jews in most of the places he visited. He also mentions Jews as officials of Pope Alexander in Rome, a physician of a prince in Amalfi, dyers in Brindisi, artisans in silk in Thebes and Salonika, merchants, tanners and the king’s physician in Constantinople. Jews were glassmakers in Antioch and in Tyre, where they also owned maritime vessels, and were handicraftsmen and dyers in Sidon, Jerusalem, Bethlehem,
Middle Ages, Early Modern and Modern Era. The main focus of this research project is on the period between the first and the thirteenth centuries because it is at the end of the classical period and during the Arab expansion that the transition of Jews from agriculture to trade and urban occupations took place. After the thirteenth century, restrictions on the occupations that Jews were allowed to practice became enforced and the study of their occupational choice, thought very interesting, is left to future extensions of this research. Here we briefly mention that the selection of Jews into high-skill urban occupations continued and became stronger in the Middle Ages and in later centuries. In many Western European countries Jews became moneylenders and pawnbrokers (Shatzmiller 1990; Katz 1993; Botticini 2000). When the persecutions and expulsions from Western Europe from the fourteenth to the sixteenth centuries led many Jews to migrate to Poland and adjacent countries, they had the same urban occupations they held in western countries.

Occupational Choice of the Jews: Explanations. Scholars like Roth (1960a) and Abrahams (1896) argued that the occupational choice of Jews into high-skill jobs was mainly the result of restrictions. While restrictions might explain the selection into urban skilled occupations in some European countries in the Middles Ages and the early modern era, they fail to account for the occupational choice of Jews in the classical period (in Babylon and in the Roman empire) and during the Arab expansion in the seventh and eighth centuries when they were free to choose any occupation. With the majority of the population having agricultural occupations, Jews could choose to be farmers; yet, many of them from the fourth century on in both the western world and in the East chose to have urban, skilled occupations. Other scholars maintained that heavier taxation on Jews, and especially on those who derived their wealth from agriculture, made them abandon agriculture and become craftsmen and merchants (Baron 1972; 1975). Jews who owned land but were seldom tenants, were more affected by land taxes, which sharecroppers and fixed-rent tenants did not have to pay.

Our explanation for the occupational choice of Jews from 300 C.E. to 1300 does not contradict the hypothesis based on heavier taxation of Jewish farmers. However, we add a new argument based on a human capital approach. Our model predicts that, as the Jewish religion puts more emphasis on education and impose higher requirements on education, Jews invest more in their children’s education. As a consequence, educated Jews choose to become merchants and craftsmen, and to live in cities. Higher taxes on Jews cause a higher conversion rate, more investment in education, and a shift of the Jewish population away from agriculture and toward trade. These predictions seem to find support in the historical evidence we presented above.

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6See also Grayzel (1933, 1989); Wolf (1934); Roth (1938, 1946, 1951, 1959, 1960a, 1960b, 1975a, 1975b, 1978); Vogelstein (1941); Reich (1949); Noonan (1957); Rabinowitz (1960); Baer (1961); Milano (1963); Shulvass (1964, 1973); Synan (1965); Wurmbauerd (1966); Marcus (1969); Nelson (1969); Poliakov (1977); Little (1978); Neuman (1980); Katz (1980); Lewis (1980, 1997); Stow (1982, 1992); Brande and Lewis (1982); Shmuelevitz (1984); Johnson (1987); Toaff (1987); Simonsohn (1988); Langmuir (1990); Bonfil (1994); Cohen (1994); Katz (1994); Romero (1994); Edwards (1995); Luzzati (1996); Gampel (1997); Glick (1999).
4 Concluding Remarks

With many countries in the world still plagued by low literacy rates and with their populations living near or below subsistence levels, we aim to add a very convincing piece of evidence that an educated population is a key ingredient to achieve economic development. The economic history of the Jews is a remarkable success story with policy implications for contemporary developing and developed countries. It shows that investment in education and human capital accumulation is a paramount asset for a country and its citizens. Moreover, by studying the features of Jewish education (how children were educated, at which age, the role of the family in the educational process, and the role of formal schooling), we hope to learn the critical link between education and economic performance. In turn, this can help foster and improve specific aspects of the process of human capital accumulation.

References


