From Farmers to Merchants: 
A Human Capital Interpretation 
of Jewish Economic History*

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Abstract

Since the Middle Ages the Jews have been engaged primarily in urban, skilled occupations, such as crafts, trade, finance, and medicine. We argue that this distinctive occupational selection was the outcome of the widespread literacy among Jews prompted by an educational reform in the first century C.E. Based on the nexus between education and Judaism, which is our only assumption, we build a model in which Jewish men choose education, occupation, religion, and location. The model predicts that when urbanization expands, Jews move to new cities due to their comparative advantage in urban, skilled occupations. Furthermore, before urbanization a proportion of Jewish farmers are predicted to convert to other religions. The predictions of the model are consistent with the historical evidence presented by the historians.

1 Introduction

Why since the Middle Ages have the Jews been engaged primarily in urban, skilled occupations such as crafts, trade, finance, and medicine? Why were the Jewish people a minority in many urban centers and towns? When and why did this occupational selection and demographic characteristics become the distinctive mark of the Jews? Is there an economic theory that can explain these facts and pass the test of its other implications? In this paper we provide an answer to these questions based on a human capital theory which is consistent with facts collected, described, and interpreted by historians.¹

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¹Our model combines the human capital approach developed by Becker and Lewis (1973) and Becker (1975; and 1976) with Roy (1951)’s model of occupational choice. At the same time, we use the historical evidence provided in the academic works of historians.
The distinctive occupational and residential structure of the Jews has attracted the attention of scholars of Jewish history. Israel Abrahams (1896) and Cecil Roth (1938) promoted the well-accepted view that the Jews were not engaged in farming like the rest of the population because of the restrictions and prohibitions imposed by the local rulers. Since the late Middle Ages, in many countries Jews could not own land and, in certain areas they were prohibited from living in rural areas. Furthermore, guilds excluded them from working in certain crafts within urban areas.

Simon Kuznets (1960) also addressed these questions. Like Reich (1960), he established the fact that at the end of the nineteenth century and the beginning of the twentieth century, the Jews in Europe and North America were not engaged in agriculture independently of the size of the agricultural sector in a given country. Furthermore, although engaged in almost all urban occupations, the Jews specialized in trade and finance. Kuznets explained this fact as the outcome of an endogenous decision within an economic theory of small minorities. Taking the minority status as exogenous, he claimed that the minority’s noneconomic goal of maintaining its identity made the Jewish minority specialize in certain occupations. The restrictions imposed on the minority may or may not be binding, but according to Kuznets they are not crucial to the outcome of having the minority specialized in few occupations.

In stating their arguments, both Roth and Kuznets were influenced by the observed economic structure of the Jews in the nineteenth and early twentieth centuries. However, the transition of the Jews away from agriculture into crafts, trade, and finance occurred in the eighth century mainly in Mesopotamia and the entire Muslim empire, and later in western Europe where the Jews migrated. At the time when the occupational transition was occurring, none of the restrictions and prohibitions discussed by Abrahams and Roth existed. Jews owned land but were not engaged at all in agricultural work. Narrative evidence also indicates that at this time, the Jews were aware that their new urban occupations enabled them to improve their standard of living. Hence, the restriction theory cannot account for the occupational transition. As for Kuznets’ theory, notice that before the occupational transition, in the first half of the millennium the Jews were farmers and were also a minority in the lands of the Roman and Persian empires.2 Given that they were a minority even when they were farmers, Kuznets’ theory would predict that they should stay in this occupation to preserve their group identity which had been built at that time for a farming society.3 Yet, Jews did not remain farmers despite their minority status.

The historians Salo Baron (1937; 1952), Haim Hillel Ben-Sasson (1976), and Moshe Gil (1992; 1997), who described and analyzed the transition from farming to crafts, trade, and finance in urban centers in Mesopotamia, Palestine, and the rest of the world during the eighth and ninth centuries, maintained that deteriorating agriculture and urbanization in the Muslim empire made almost all the Jews move into urban occupations. The question is: Why did the Jews move into these occupations whereas almost all other inhabitants remained engaged in agriculture?

Our thesis is that the distinctive characteristic of the Jews at that time was that almost

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2In Palestine Jews became a minority from the fourth century on (Table 4 in the Appendix). The name Palestine appeared for the first time after the Bar Kokhba Revolt in 135 C.E. when the name Iudaea was replaced by Syria Palestina.

3The geographic dispersion and minority status of the Jews just before the transition to urban occupations were similar to those of the Jews in the nineteenth and twentieth centuries. For example, in Babylon from the fifth to the eighth century the Jews were a minority like in Poland in the early twentieth century.
all Jewish men were literate. The Jews had a comparative advantage in the skilled, high-paid occupations demanded in the new urban centers developed by the Muslim rulers.

Why were Jewish farmers (and Jews in general) literate whereas the rest of the rural population was illiterate at the beginning of the seventh century? The Jewish religion made primary education mandatory for boys in the first century when the high priest Joshua ben Gamala (64 C.E.) issued an ordinance that “teachers had to be appointed in each district and every city and that boys of the age of six or seven should be sent.” In the first century C.E., the Jewish warrior and writer Flavius Josephus underlined that children’s education was the principle care among the Jews. After the destruction of the Temple in 70 C.E., Judaism changed from a religion which was mainly concerned with sacrifices and ceremonies performed by priests in the Temple to a religion whose core was centered around learning the Torah. The synagogue became the center of this activity. From the second to the sixth century, Jewish leaders promoted farther the learning and reading of the Torah and the recently compiled Mishnah and Talmud by degrading the status of those who remained illiterate (“am ha-aretz”). The compulsory education for the children and the reading of the Torah, Mishnah, and Talmud became the essence of Judaism. The monumental work of Schlomo Goitein (1967—1988) from the documents of the Cairo Geniza provides extensive evidence of the full implementation of mandatory primary schooling for boys in the Jewish communities in the Mediterranean at the turn of the millennium.

Based on this nexus between education and Judaism, which is our only assumption, we model the Jewish religion as a direct effect on individual utility that increases with the individual’s education and his son’s education. We assume that an adult Jewish man chooses the level of education for his children, his occupation (trade or farming), religion (Jewish or non-Jewish), and location (migration). We further postulate that Jewish education (literacy) has a positive effect on a merchant’s income but not on a farmer’s income. Obviously the model predicts that Jews invest more in their children’s education, and given that, that they always prefer to be merchants. Yet, the demand for merchants restricts the proportions of the Jews employed in urban occupations. When urbanization expands (as it did in the early Muslim empire), the Jews move to the cities where the returns to their human capital are high. Hence, our answer to the main question raised in this paper is that the occupational selection of Jews into urban, skilled occupations was mainly the outcome of (i) the Jews’ investment in literacy, and (ii) urbanization.

The model’s other important implication is that the cost of children’s education for farmers

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1 It is a popular view that Jews (and people belonging to other diasporas) invested in human capital because, unlike physical capital, it is portable and cannot be expropriated. See, for example, Brenner and Kiefer (1981) and the critical discussion of their thesis by Ayal and Chiswick (1983). However, the decision by Jews to invest in human capital came before the migrations and was motivated mainly by religious reasons.

2 Flavius Josephus, Against Apion, Book I, sec. 12, and Book II, sec. 19.

3 The Mishnah consists of six volumes of rules. It was written in Hebrew during several hundred years and was redacted in Israel in about the year 200 C.E. by the Patriarch Judah haNassi. The six volumes of the Mishnah are: Zeraim deals with the rules for land cultivation, Moed with feasts, Nashim with wedding, divorce and intimate relations, Nezikin with financial issues, Kedeshim and Teharot with sacrifices and other Temple related issues. The Gemara consists of interpretations of the Mishnah, debates and allegories told and written by Jewish scholars and rabbis in Israel and Babylon from the third to about the end of the sixth century. Mishnah and Gemara together form the Talmud. There is an Eretz-Israel Talmud and a Babylonian Talmud.

4 The Cairo Geniza documents refer to the thousands of contracts (sales, marriage deeds, loans, business partnerships), last wills, letters, and courts records that were found in a synagogue in Old Cairo in Egypt. The documents marvelously depict the economic, demographic, and social life of many Jewish communities in the Mediterranean from about the ninth throughout the thirteenth century.

makes a certain proportion of Jewish farmers convert to non-Jewish religions in each generation.\footnote{Jewish farmers with a low level of preference for Judaism either for objective or subjective reasons (for example, those who live in villages away from centers of Jewish life) will be likely to convert.}

The question is whether historically these conversions were significant. According to historians (Baron 1952, 210; 1971) and demographers (DellaPergola 2001), the key demographic fact in the first millennium was the sharp decrease in the world Jewry from about 4.5 million in the first century to about 1-1.5 million in the sixth century.\footnote{Baron gave a figure of 8 million Jews at the beginning of the first century C.E. After talking with Sergio DellaPergola and other scholars, and after reading and evaluating various sources, we decided to choose the lower bound of the estimates which have been provided on the size of world Jewry in the first century. Still, this does not change the general trend of a sharp decrease in the size of the Jewish population from the classical period to the time of the Arab expansion.} This is the period when Jews worldwide were still farmers and, yet, education became the center of the Jewish religion. At the same time, Christianity emerged as a segment of Judaism that did not assign the same importance to literacy and education. Historical sources indicate that about one million Jews lost their lives during the revolts against the Romans in Eretz Israel (70 and 135 C.E.) and in Egypt (115 C.E.). There is also evidence of some forced conversions to Christianity, but the description of these episodes of conversions from the fourth to the sixth century cannot account for the remaining reduction (2 million) of the Jewish population. Therefore, the model’s prediction of a slow process of decrease in the Jewish low-educated population due to conversions seems to be consistent with the historical evidence.

The model’s prediction regarding migrations is that Jewish farmers with high preference for Judaism would migrate to centers of Jewish life if in their own country economic conditions deteriorate. The large migrations from Egypt and Palestine to Babylon in the second and third centuries provide evidence in favor of this prediction. Another prediction related to migration is that once Jews become merchants (as they did in Mesopotamia where about 70 percent of the world Jewry lived in the second half of the millennium), they would have an incentive to migrate to new urban cities where crafts, trade, and finance provide high returns to their high human capital. The fast migration of Jews during the ninth and the tenth centuries to western Europe and the high standard of living acquired by them in these locations is consistent with this prediction. The evidence also supports the model’s prediction that these Jewish traders were among the most educated Jews, who learned the logical thinking provided by the enormous amount of debates and daily life analysis in the Mishnah and Talmud.

The paper is organized as follows. Section 2 describes the main facts of Jewish economic history whereas Section 3 presents the theories set forth to explain the occupational selection of the Jews into crafts and trade. Section 4 highlights the nexus between Judaism and education. Section 5 outlines the model and section 6 discusses the predictions of the model in light of the historical evidence. Section 7 concludes.

## 2 Main Facts

The first millennium is the period when the Jews moved away from agricultural into urban occupations, Judaism was transformed to take the form one still sees today, the world Jewish population decreased significantly, and a lot of Jewish migrations occurred.
**Occupations.** Throughout the first millennium, most of the world population lived in villages and were engaged in agriculture. In biblical times and during the classical period, Jews like the rest of the population, were mainly farmers (Table 1).11, 12

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Farmers</th>
<th>Crafts</th>
<th>Merchants</th>
<th>Moneylending</th>
<th>Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–200 C.E.</td>
<td>Palestine</td>
<td>many</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Mesopotamia</td>
<td>many</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Egypt</td>
<td>many</td>
<td>many</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Roman Empire(a)</td>
<td>many</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td>200–638</td>
<td>Palestine</td>
<td>many</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Mesopotamia</td>
<td>many</td>
<td>many</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Egypt</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Roman/Byzantine(a)</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td>638–1170</td>
<td>Palestine</td>
<td>few</td>
<td>some</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td></td>
<td>Muslim Empire(b)</td>
<td>few</td>
<td>many</td>
<td>many</td>
<td>many</td>
<td>many</td>
</tr>
<tr>
<td></td>
<td>Western Europe</td>
<td>very few</td>
<td>many</td>
<td>many</td>
<td>many</td>
<td>many</td>
</tr>
</tbody>
</table>


\(a\) It does not include Palestine and Egypt.

\(b\) It includes all lands under Muslim rule, including Mesopotamia and North Africa, but not Palestine.

Although in Jerusalem, Rome, Alexandria, and Babylon, some Jews held non-agricultural occupations, up to the time when the Mishnah was compiled around the end of the second century, the occupation of almost all Jews in both Palestine (where they were a majority) and in the Diaspora (where they were a minority) remained farming (Baron 1952, 244).13

The transition of Jews from agriculture to crafts, trade, and moneylending started in the Talmudic period (Baron 1937, vol. 2, 244). Agriculture remained the main occupation of Jews living in numerous countries. Yet, in Palestine and Babylonia agriculture became less and less important as a source of income and wealth for Jews after 200 C.E. According to Baron, most

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11 The history of the Jews in the classical period is closely intertwined with the history of two empires: the Roman Empire (with Palestine, Egypt, and Italy being the main centers of Jewish settlement), and in the east the Parthian Empire, with Babylon hosting a very large Jewish population.

12 Flavius Josephus (Contra Apionem 1.60 cited in Stern (1976, 268)) remarked that “Ours is not a maritime country; neither commerce nor the intercourse which it promotes with the outside world has any attraction for us. Our cities are built inland, remote from the sea, and we devote ourselves to the cultivation of the productive country with which we are blessed.”

13 These urban occupations included: merchants, painters, actors, poets, singers, butchers, tailors, potters, weavers, blacksmiths, and goldsmiths (Browne 1936; Malamat 1976; Tadmor 1976; Safrai 1976a; and Fuchs 1995).
Jews abandoning agriculture moved into the towns, and became small shopkeepers and artisans in the tanning, linen, silk, and dyeing industries, glassware making, and moneylending. 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 which obtained privileges by the Christian emperors (Baron 1952, 249). It is clear from many discussions in the Talmud that although the Jews deemed important to own land, they were aware that trade was more profitable than agriculture (Beer 1974, 38).

The key period of urbanization occurred in Islam during the Abassides rulers from the eighth to the tenth century. Many cities developed and the main center became Baghdad (Lewis 1976). A small proportion of the Jewish population remained engaged in farming in both Babylon and Israel. Urbanization in the Muslim empire led Jews to migrate from country to country and from small villages to cities. At the end of the eighth century, the Jewish population in the Muslim regions was almost entirely urban (Ben-Sasson 1976, 393; and Gil 1997, 593–96).

The movement of the Jews to the cities brought to a full-fledged stage their transition away from agriculture into urban and skilled occupations. Jews were attracted to many occupations within the cities including handicrafts, tanning, dying, ship building, corn and cattle dealing, bookselling, and tax farming. Jews were also engaged in long-distance trade; in the ninth century, a Moslem writer mentioned Jewish traders who from southern France travelled to Islamic lands, and then went to India and China. Jews were also involved in moneylending and became bankers to the rulers.

By the time Benjamin of Tudela wrote in the twelfth century, the transition of Jews away from agriculture into urban occupations was almost complete.14 Almost all Jews were farmers in the first century C.E.; ten centuries later, almost all Jews were urban dwellers with skilled occupations whereas the rest of the population remained engaged mainly in agriculture. These urban, skilled occupations remained the distinctive mark of the Jews throughout history.

Religion. The destruction of the Second Temple brought a deep change in the religion. The core of Judaism consisted no longer of the rituals and ceremonies performed by the priests in the Temple. The reading and teaching of the Torah became the essence of the Jewish religion. Rabbis and scholars emerged as the prominent leaders in the communities, and the synagogue became the center of learning (Greenberg 1960, 1277). Within the academies the sages known as Tannaim organized in a systematic way the vast body of Jewish oral law accumulated through the centuries. Their work was brought to completion by the Patriarch Judah the Prince with the redaction of the Mishnah around the year 200 C.E.

At the same time, Christianity grew within Judaism, but in the first two centuries the two religions did not differ significantly as they did later (Cohen 1987; and Neusner 1990c).

The Tannaim were succeeded by the Amoraim, who were commentators on the set tradition. Their opinions were collected in the Gemara until the end of the sixth century. Together, the Mishnah and the Gemara formed the Talmud (Eretz-Israel Talmud and Babylonian Talmud). Under the influence of the Amoraim, a stronger emphasis was put on the reading and the study of the Torah, Mishnah, and Talmud. Membership in the Jewish community became more and

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14Benjamin 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, and Jaffa.
more identified with the knowledge of the Torah. In earlier times up to the time of the Mishnah, *am ha-aretz* referred to a Jew who disregarded tithing and the norms of ritual purity (*am ha-aretz lemitzvot*). In contrast, from the third to the sixth century (the Talmudic period), the word acquired the new meaning of “one who is illiterate,” someone who did not know and did not teach his sons the Torah (Safrai 1968; Oppenheimer 1977; and Haas 1989, 149). To be an “*am ha-aretz letorah*” in a Jewish community meant to be considered an outcast.

Christianity and Judaism, which at the beginning of the millennium were not very dissimilar, departed farther and farther away from each other during the Talmudic period. Also, Christianity became a mass religion in the lands belonging to the Roman Empire. In 315 the emperor Constantine decreed that Christianity was the official religion in the empire (Neusner 1987). During the Byzantine period, in the fifth and sixth centuries, anti-Jewish legislation gained momentum. The spread of Christianity became one of the main goals of the rulers.

Babylon, however, did not belong to the Roman Empire and, therefore, Jews did not face the same strong competition of Christianity there.15

**Restrictions.** Before the destruction of the Second Temple in 70 C.E., the attitude of Roman emperors was characterized by tolerance and protection of the Jews living in various parts of the empire. There were neither restrictions on the occupations that Jews could be engaged in, nor prohibitions against slave ownership.16

In contrast, in the late Roman Empire some restrictions on slave ownership by Jews were enacted.17 Similar prohibitions were decreed in fifth-century Spain by Visigothic rulers (Juster 1912). In the late Roman Empire, in the Byzantine empire, and even in the Visigothic reign, two occupations became prohibited to both Jews and Samaritans: the civil service and the legal profession (Juster 1912; 1914; and Jones 1964).

In Babylonia, under both the Parthian rulers (250 B.C.E.—224 C.E.) and the Sassanian rulers (224 C.E.—579), Jews like other minorities were made to live in designated quarters of the Persian cities, but were permitted to engage in both agriculture or trade without discrimination and to own landed property and slaves (Neusner 1965—70; and Osman 1976, 94).

During the Muslim period, when the Jews entered into urban occupations, there were no restrictions on their occupational choice. The documents from the Cairo Geniza show that Jews were engaged in all crafts, as well as in trade and agriculture (Goitein 1967; Gil 1997). Also, the non-Muslim population (Jews included) living in Palestine kept the right to own land from 638 C.E. until the eleventh century at the time of the Crusades (Gil 1992).

**Taxes.** Three types of taxes were levied in Palestine in Roman times. Except during the sabbatical year, each inhabitant had to pay a tax for the city of Jerusalem, and the tithes to the Temple for the priests (Momigliano 1967, 21). An annual contribution of half shekel was

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15 Christianity started spreading in North Mesopotamia in places like Edessa and Nisibis during the third century but in the fourth century the Persian rulers limited the emergence of Christianity in both North and South Mesopotamia by persecuting the Christians (Segal 1990).


17 In the early fourth century, the emperor Constantine prohibited Jews from owning non-Jewish converted slaves (Juster 1914, II, 72f). Constantius II made the circumcision of a slave a capital offense, and forbade Jews from buying slaves of any other religion. This rule was relaxed by Honorius in 415 C.E., and by Theodosius II in the East in 417. Later, Justinian forbade the possession of Christian slaves by Jews, freeing the slave and fining the owner 30 lb. gold (Jones 1964).
also paid by Diaspora Jews to the Temple. What went into the Roman treasury was a land tax equal to one-quarter of the agricultural produce every two years (that is, one-eighth every year). A head tax was collected in Judea only after the destruction of the Second Temple in 70 C.E. when each Jew was ordered to pay two drachmas to the temple of Jupiter in Rome. This poll tax was not in addition to, but in substitution of, the half-shekel contribution to the Temple in Jerusalem. Therefore, it was more a humiliation than a financial burden (Stern 1976, 317). Moreover, it probably lapsed during the third century inflation (Jones 1964, Vol. I, 947).

In general, it seems that land taxes in Palestine became heavier after the destruction of the Second Temple, because Rome stationed more troops and employed a larger civil service to gain a better control of the turbulent region (Stern 1976, 317). The increased tax burden apparently fell mainly on the farmers (Baron 1952, 263). Taxation of Jews underwent continuous changes as different emperors adopted diverse policies toward them. After Justinian, however, there was no longer a reference to a poll tax levied on Jews (Sharf 1971, 190-97).

In Babylonia, under the earlier Sassanian rulers (from 224 C.E. up to 488), an annual land tax ranging from one-tenth to one-third of the agricultural produce was levied on each farmer (Jewish or non-Jewish). Under the later Sassanian rulers (up to 579 C.E.), the land tax became proportional to the area cultivated instead of being a percentage of the annual agricultural produce (Osman 1976, 81). In addition, Jews, like other non-Parsees (for example, the Christians), had to pay an annual poll tax ranging from 4 to 12 dirhems according to the individual’s wealth. However, in the sixth century this poll tax was extended to all the subjects except the three privileged classes (nobility, priests, and government officials) (Baron 1952, 184). Throughout the Sassanian period, custom dues were also levied on foreign trade regardless of whether the merchants were Persian or members of minorities.

Similarly, during the Muslim period, in Palestine both Jews and Christians paid an annual tax of 1 dinar per adult household head. Taxes on agricultural income differed according to the type of products grown on the land. In the eighth century, the ruler Umar II decreed that any person who converted to Islam was to be exempted from the Jizya (individual poll tax) but had to keep paying the Kharāj (land tax), as long as the individual lived in Muslim lands (Dennet 1950; 1973).

**Population.** Table 2 indicates the population by the area in which the Jews were living during the first millennium: Palestine, North Africa (especially Alexandria and Egypt), Near East (Babylon, Mesopotamia, Persia, Cyrenaica, Asia Minor, and Arabian peninsula), the Ro-

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19 Inhabitants in Egypt paid an average tax per capita ranging from 10 to 40 drachmas a year (Momigliano 1967, 29).

20 In the third century, under Constantius II the Jews were required to pay special levies (discriptiones), which later were abolished by Julian. In 399, Stilicho in the western part of the empire ordered that the dues collected from the synagogues located in the places under Honorius’ dominion in the eastern part of the empire should no longer be transmitted to the patriarch, but should be confiscated and sent to the imperial treasury. This law was revoked in 404. In 429, Theodosius II ordered that the Jews should pay to the largitiones the contribution that in earlier times all the synagogues (in the eastern and in the western parts of the empire) had made to the patriarch in Tiberias (Jones 1964, Vol. I, 432; Vol. II, 947).

21 The unit of measure was the jarb. One dirham per jarab was paid on land growing wheat, eight dirhams for grapevines, seven for clover, and one dirham on every six olive trees.

22 The tax rate was 40 percent for wheat and 33 percent for fruits and vegetables (Gil 1997).
man Empire and (after its fall) western Europe.  

<table>
<thead>
<tr>
<th>Time Period</th>
<th>0-70 C.E.</th>
<th>70-135</th>
<th>2-3rd</th>
<th>6th</th>
<th>12th</th>
<th>Late 15th</th>
<th>Early 18th</th>
<th>Early 19th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palestine</td>
<td>2</td>
<td>1.5</td>
<td>0.7</td>
<td>0.2</td>
<td>0.002</td>
<td>few</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mesopotamia</td>
<td>1</td>
<td>1.2</td>
<td>1.2</td>
<td>many</td>
<td>0.768</td>
<td>many</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Africa</td>
<td>1</td>
<td>0.1</td>
<td>few</td>
<td>few</td>
<td>0.07</td>
<td>many</td>
<td>0.187</td>
<td>0.26</td>
</tr>
<tr>
<td>Syria</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.024</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Asia Minor</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.024</td>
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<td>0.187</td>
<td>0.26</td>
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</tr>
<tr>
<td>Roman Empire</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td></td>
<td></td>
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<td>Western Europe</td>
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<td>few</td>
<td>0.108</td>
<td>0.507</td>
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<td></td>
<td></td>
<td>0.048</td>
<td>0.089</td>
<td>0.574</td>
</tr>
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<td>Rest of the world</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>0.156</td>
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<tr>
<td>Total Jews</td>
<td>4.5</td>
<td>3.3</td>
<td>2.5</td>
<td>1-1.5</td>
<td>1.2</td>
<td>1.3</td>
<td>1.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Total Population</td>
<td>82(^a)</td>
<td>82(^a)</td>
<td>67(^a)</td>
<td>50(^a)</td>
<td>90(^a)</td>
<td>135(^a)</td>
<td>285(^b)</td>
<td>380(^c)</td>
</tr>
<tr>
<td>Jewish Population (%)</td>
<td>5.5</td>
<td>4.0</td>
<td>3.73</td>
<td>2.0</td>
<td>1.3</td>
<td>0.96</td>
<td>0.38</td>
<td>0.84</td>
</tr>
</tbody>
</table>


\(^a\) The numbers include: Europe, North Africa, the Near East, and the Middle East.

\(^b\) The numbers include all world regions except China and India where the Jews never settled with very rare exceptions.

A clear pattern emerges from these data. The Jewish population, which grew from the biblical to the classical period, decreased significantly in both absolute and relative terms starting from the later centuries of the Roman Empire (Baron 1971; DellaPergola 2001).

In the classical period, it has been estimated that there were about 4.5 million Jews, about 5.5 percent of the world population. Of these 4.5 million Jews, half were probably Jews by descent and the rest were converted pagans. Conversions to Judaism occurred in the first century C.E. and then stopped at the end of the second century when Christianity started emerging as the dominant religion.

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23 We thank Sergio Della Pergola for a very helpful discussion on Jewish demographic history and for sharing his work. We built this table after a careful reading of the references listed in the table’s footnote. In some cases, as the references provide conflicting data, we had to make a decision about what evidence to accept and reject. The numbers in Table 2 should be considered as ranges of values, instead of exact figures. Also, since there is no direct evidence on population in this period, one might be skeptical regarding these numbers. However, all the studies published on Jewish and world population (see the footnote of Table 2) agree with the pattern that emerges from Table 2.

24 In the biblical period about 1.5 to 1.8 million Jews were estimated to live in Palestine (Baron 1971).
For the Jews in the Roman Empire, the key events were the two rebellions against Rome. The rebellions and subsequent repressions reduced the Jews in Egypt from about one million to few thousands and the Jewish population in Palestine by about one-third (see table 4 in Appendix). Mass migrations of Jews from Palestine to Syria and Babylonia ensued after 70 C.E. The Jewish community in Babylonia grew in importance and size (Baron 1952, 210).

The world Jewish population greatly decreased from 2.5 million in the third century to about 1–1.5 million on the verge of the Arab expansion. Jews became few, spread all around the former Roman Empire, and migrated eastwards to the Persian empire and especially to Babylon. The center in Egypt vanished and Jews became a minority also in Palestine. The third and fourth centuries witnessed the economic decline of Palestine and the emergence of Babylon under the Sassanian regime as the main economic and religious center for Jews (Neusner 1965–1970).

The Arab expansion in the seventh century led Babylonian Jews to migrate to Palestine, northern Africa, and southern Europe. In the ninth and tenth centuries, the decline of the Baghdad caliphate and the revival of urban centers in Europe increased the stream of Jews from the Near and Middle East to western Europe. Also, from the fourth to the tenth century, Jews migrated from Italy and southern France and established the first group of Ashkenazic Jewry in northeast France and northwest Germany.

During the Muslim expansion until the Middle Ages, the Jewish population remained at the level attained during the era of the Talmud. Describing his travels, Benjamin of Tudela reported that in twelfth century the world Jewish population was about 1.2 million. More than 70 per cent of the world Jewry still lived in Mesopotamia and Persia. The movement to the west and Europe accelerated in the next centuries.

To sum up, the Jews represented the majority of the population in one instance only: in Palestine from biblical times throughout the fourth century C.E. In contrast, they were a minority in all other places where they lived even before the Diaspora (Stern 1976, 279). Therefore, the minority status of the Jews was not determined by the migrations that ensued from the Diaspora. Moreover, during the first millennium there were other minorities besides the Jews in the Roman Empire, Persian Empire, and later in the Muslim Empire (Cohen and Frerichs 1993).

3 Main Explanations

There are three main explanations for why since the Middle Ages very few Jews were engaged in agriculture: the “restrictions argument,” the theory based on the economics of small minorities, and the argument relying on declining profitability in agriculture and urbanization.

25 The former rebellion and the destruction of the Temple in 70 C.E. caused the death of thousands of Jews, the countryside was ravaged, and some towns were razed. In 115, the emperor Trajan had to fight Jews revolting in various parts of the empire; the community living in Alexandria was almost completely destroyed (Safrai 1976a, 370–73). In 135, the Jews were able to wage the Bar Kokhba Revolt in Israel and then in Egypt (Stern 1976, 314). The outcome of this war was a reduction of the Jewish population in Palestine by half a million; some were killed and most of them migrated to Babylon and other locations away from the Roman Empire. The same occurred in Alexandria where the wealthy and numerous Jewish community almost disappeared (Tcherikover 1945; 1961).

26 Although the numbers cited by Benjamin of Tudela cannot be taken at face value, they indicate some significant differences: around 1170, Baghdad was estimated to have 40,000 Jewish households, Basra 10,000, Alexandria 3,000 whereas in Rome and Marseilles there were only 200 and 300 Jewish households, respectively.
The Restrictions Theory. A common view among scholars, prominently advanced by Cecil Roth, maintains that the occupational choice of the Jews as they observed it historically was mainly the outcome of restrictions and prohibitions. Quoting from Roth (1938, 228),

The Jew was driven by the unfortunate circumstances of his history to be predominantly a townsman. He had to seek an outlet, despairingly, in every branch of urban economy. Yet even here he found himself hampered at every turn by repressive legislation—whether in buying, selling, or manufacturing.

Israel Abrahams (1896, 249), quoting the scholar Isidor Loeb, claimed that

When the medieval Jews devoted themselves largely to commerce and moneylending, there were not obeying a natural taste nor a special instinct, but were led to these pursuits by the force of the circumstances, by exclusive laws, and by the express desire of kings and people. The Jews were constrained to adopt these modes of obtaining a livelihood by the irresistible material and moral forces opposed to them.

According to the “restrictions argument,” from the Middle Ages until modern times, Jews did not engage in agricultural occupations because they were prohibited from owning land. Moreover, guilds’ regulations excluded non-members, such as Jews, from the occupations regulated by the guilds. Moneylending, the medical profession, and the diamond industry were the few occupations in which Jews were allowed to engage.

The explanation based on restrictions and prohibitions rules out the possibility that the economic structure of the Jews was the result of an endogenous choice.

The Economics of Small Minorities. Kuznets (1960) highlighted that in those countries with the largest Jewish communities in the nineteenth and twentieth centuries (the U.S., the Soviet Union, eastern Europe, and Israel), independently of the proportion of Jews to the local population, a negligible percentage of them were employed in agriculture; most Jews were engaged in trade and finance, and next in industry and handicrafts (Table 3).

<table>
<thead>
<tr>
<th>Country (year)</th>
<th>Jewish workers in nonagr. jobs (%)</th>
<th>Non-Jewish workers in nonagr. jobs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland (1931)</td>
<td>96</td>
<td>47</td>
</tr>
<tr>
<td>Soviet Union (1926)</td>
<td>96</td>
<td>27</td>
</tr>
<tr>
<td>U.S.A. (1940)</td>
<td>98</td>
<td>82</td>
</tr>
<tr>
<td>Latvia (1930)</td>
<td>99</td>
<td>47</td>
</tr>
<tr>
<td>Germany (1933)</td>
<td>99</td>
<td>83</td>
</tr>
<tr>
<td>Czechoslovakia (1930)</td>
<td>91</td>
<td>73</td>
</tr>
<tr>
<td>Hungary (1930)</td>
<td>97</td>
<td>52</td>
</tr>
<tr>
<td>Rumania (1930)</td>
<td>96</td>
<td>37</td>
</tr>
<tr>
<td>Bulgaria (1926)</td>
<td>99</td>
<td>31</td>
</tr>
<tr>
<td>Canada (1931)</td>
<td>99</td>
<td>71</td>
</tr>
</tbody>
</table>

Source: This table reproduces Table 2 in Kuznets (1960, 1608).
For example, in Poland in 1931, 96 per cent of the Jews were engaged in non-agricultural occupations whereas the percentage dropped to 47 for non-Jews. In both the U.S. and Europe the Jews were not prohibited from being farmers at this time. These data on modern economies supplied by Kuznets are consistent with the data on earlier periods we provided in Table 1: Jews moved into urban occupations in countries where the overwhelming majority of the local population were farmers.

The explanation presented by Kuznets for this occupational selection is based on endogenous choice—what he called “the economics of small minorities.” In his theory, the minority status of the Jews is exogenous to their occupational choice, but the occupational choice is endogenous. A minority can be large in absolute numbers but small in terms of relative proportion to the population. For noneconomic reasons a minority group has distinctive cultural characteristics within a larger population. Thus, the noneconomic goal of maintaining cohesion and group identity can lead minority members to prefer to be concentrated in selected industries and selected occupations, with the consequence of ending up living in cities where these occupations are available. Therefore, while the occupational distribution within the total population is “normal,” by definition the economic structure of a small permanent minority must be “abnormal,” otherwise the minority cannot survive as a distinctive group.27, 28

Before Kuznets, Max Weber (1917, 363–64) had claimed that the Jews voluntarily chose to segregate and to become an urban population in order to maintain their ritualistic correctness, dietary prescriptions, and Sabbath rules, which would have been impossible to follow in rural areas. Kuznets, though, pointed out that his argument was general and applied to any minority like the Italians in Brazil, the Indians in Africa, or the Chinese in Southeast Asia. In his view, “the economics of Jews is thus one case of many with similar characteristics” (p. 1604).

Declining Profitability in Agriculture and Urbanization. While providing evidence of the movement of Jews from agriculture to crafts and trade during the eighth century in the Muslim empire, Baron, Ben-Sasson, and Gil advanced two explanations for this transition. First, high taxes in agriculture and declining yields had already made agriculture unprofitable in the late Roman Empire (Baron 1952, 245). Later, the new Arab and Moslem rulers ruined the agriculture of Babylonia by taxing according to area, instead of yield, and by neglecting the irrigation network during the early years of the conquest. Moreover, the kharaj (land-tax) levied on ‘infidel’ peasants weighed heavily on Jewish farmers. The outcome was the abandonment by Jews of rural areas and the movement into urban occupations (Ben-Sasson 1976, 393).

Second, increasing urbanization occurring during the Islamic period led Jews to move to the newly established cities (Gil 1997, 595-6).

3.1 Discussion

From the detailed evidence in Section 2, it is a well-established fact that the Jews moved away from agriculture into urban occupations during the Muslim period. Therefore, the explanations

27 The selection of the minority into some industries and occupations occurs at a greater extent for a migrating minority. An immigrating minority would move into growing occupations in the new location because the new growing occupations are not filled yet by the local population.

28 Rapoport and Weiss (2002) present a model based on the economics of small minorities and in-group cooperation to explain the main demographic features of pre-modern Jewish Diaspora.
for their occupational selection advanced by Roth (“the restrictions theory”) or by Kuznets (the “economics of the small minorities”) should hold for the Jews in that period.

The restrictions theory does not hold during the Muslim period for at least three reasons. First, none of the economic restrictions highlighted by Roth were imposed on the Jews at that time. There were no restrictions on occupations, on land ownership, and, in general, no restrictions on any other factors affecting the choice of being farmers (for example, slave ownership). The documents from the Cairo Geniza illustrate the great variety of occupations (including farming) which Jews appear to have held in all the lands of the Muslim empire, and therefore, demonstrate that no restrictions existed at the time Jews moved away from agriculture into urban occupations (Goitein 1967; and Gil 1997).

Second, the restrictions theory maintains that Jews did not engage in agriculture because they were prohibited from owning land in many places where they lived. Even when there were no legal prohibitions, material insecurity would have made the Jews prefer to invest in portable assets instead of land. However, it should be noted that a large percentage of the non-Jewish population were landless peasants working as sharecroppers, fixed-rent tenants, or wage workers throughout history. Even if the Jews could not own land or found it disadvantageous to cultivate their own land, they could have worked as tenants for non-Jewish landowners. In fact, this is what happened just after the revolts against the Roman Empire in the first and second centuries. When in Palestine a portion of the land holdings belonging to Jewish farmers were confiscated, some of the Jews who were previously owner-farmers, became tenant-farmers (Heinemann 1990, 269). They could have kept working as tenant-farmers in later centuries, yet they did not. Also, in the late Roman and early Byzantine Empire other groups were discriminated against land ownership and, yet, they did not become merchants. For example, the Samaritans, who were disqualified from bequeathing property, did not move into urban, skilled occupations but they remained engaged in agriculture (Osman 1976, 138).

Third, people engaged in handicrafts, trade, and finance earned, on average, more than farmers throughout history (Kuznets 1960, 1621). This held true even more during the first millennium. 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). Hence, restrictions paradoxically pushed Jews into more profitable occupations. If the purpose of these restrictions was to somehow discriminate against the minority, one wonders why these prohibitions made Jews end up in occupations which provided them with higher incomes and wealth. It seems reasonable to conclude that other economic motives and not restrictions by local rulers determined the transition of Jews into urban, skilled jobs in the seventh-ninth centuries.

Still the question remains: what economic motives can explain why almost none of the Jews remained engaged in farming and almost all moved into urban jobs, and why did most non-Jews remain farmers? Kuznets’ explanation recognized that the occupational selection of Jews was the outcome of choice, but he claimed that the minority status and the desire to maintain cohesion and group distinctiveness were the main reasons for the observed occupational distribution. His argument faces two objections. First, the Jews were a minority in all locations (Roman Empire, Babylon, and Egypt) except in Palestine in the first and second century, and yet almost all of them were farmers (Section 2, p. 5–6). When Jews also became a minority in Palestine (in about 250 C.E. they were less than half the population, and at the end of the fourth century they became less than a third), most of them remained farmers (Har and Oppenheimer 1990,
Later, in the Byzantine empire, there were urban areas but Jews were mainly living in northern Israel as farmers. Therefore, the historical evidence clearly indicates that the Jews were a minority well before becoming merchants in the eighth century. Therefore, their minority status could not have been the main economic motive behind their occupational transition.

Second, during the first millennium in the places where the Jews lived there were many other minorities who kept their distinctive characteristics yet living in villages or towns as farmers. For example, in the Byzantine period, there were in Eretz Israel 1.5 million people (Jews, Christians, Hellenistic pagans, Samaritans, and some Arabic tribes). The pagans themselves were a minority in Palestine and yet they were farmers. All these minorities were not segregated in any occupation. It is not clear why the Jews could not keep their distinctive minority status and cohesion by being farmers and living in villages as they did in Galilee and Babylon before the eighth century. The Samaritans and Christians did. Why not the Jews?

The related claim (advanced, for example, by Weber) that the Jews voluntarily chose to segregate and to become an urban population in order to maintain their ritualistic correctness, dietary prescriptions, and Sabbath rules, which would have been impossible to follow in rural areas, is contradicted by groups, such as the Amish in the U.S., who remained engaged in agriculture and yet maintained their cohesiveness (Kuznets 1960, 1605).

As for the arguments suggested by Baron, Ben-Sasson, and Gil based on declining profitability in agriculture, discriminatory taxation, and urbanization, it should first be noted that taxation was not heavier on Jewish farmers than Jewish merchants because the poll-tax was levied on Jews regardless of occupation. Moreover, in the Muslim empire Samaritans were also required to pay a land tax and a poll-tax of 2 dinarii like the other non-Muslims; yet, they never became merchants but remained farmers (Gil 1992, 821). Lastly, declining profitability in agriculture and urbanization should have made everybody prefer to live in cities, not just the Jews. Yet, in early Islam, most pagans and Christians who converted to Islam remained in farming, while the Jews in Israel and Babylon moved to the urban centers controlled by the Islamic rulers.

Thus, the question remains: why did the Jews become merchants and the non-Jews did not despite similar changes in economic conditions? We argue that the distinctive characteristic of the Jews with respect to other minorities is that by the sixth century, their religion was centered around education, as we explain in details in the next section. Our claim is that this distinctive feature, and not their minority status, is the main reason for why from the eighth century they chose to be merchants when they could choose to be farmers.

4 Education in Judaism

If a satellite sent back to the distant past could spy the populated world in the first millennium, what picture would it bring? Jews dressed, looked like, and spoke the same language of the rest of the population. The key difference between Jews and non-Jews was that at the beginning of the millennium, a large percentage of male Jews were already able to read (and some to write). At the end of the millennium, virtually all male Jews were literate (and only few were farmers). At the same time, almost the entire population in the places where the Jews lived was illiterate.

29 Even in the nineteenth and twentieth centuries in Iraq, Syria, and Palestine there were many minorities such as Druses and Christians, who lived for centuries as farmers in separate villages and town communities.

30 Most of the pagans and Arabic tribes became Christians later (Dan 1990, 239).
(and most of them were engaged in agriculture).31

**From Biblical Times to the Era of the Mishnah (200 C.E.).** Today’s Jewish religious education is almost the same as the one established around the first century C.E.32 Judaism made primary education universal and mandatory for boys almost two millennia before a similar development occurred in the rest of the world.33 Only in modern times in Europe, the first laws making primary education universal and mandatory can be found.34 In the 1830s, the enrollment rate in primary schools in England was still a low 27.4 percent (Lindert 2001, 45).

After the president of the Sanhedrin, Simeon ben Shatah (65 B.C.E.), established schools of advanced studies for adolescents in every district, one century later the high priest Joshua ben Gamala issued an ordinance which made primary education universal and compulsory for boys over six or seven.35 Each community was required to provide one teacher if there were twenty-five pupils or less, one teacher and one assistant if there were between 25 and 50 pupils, and two teachers if there were 50 pupils (Swift 1919, 95).

We stress that the educational reform (from the schools of higher education to the elementary school) occurred in Palestine from about the third century B.C.E. up to the first century C.E. when most Jews were farmers. In other words, it occurred before the destruction of the Temple and the ensuing Diaspora. Moreover, this educational structure was adopted by Babylonian Jews who were also mainly farmers at that time. The destruction of the Temple and the revolts enhanced this decision to invest in human capital but other religions were “persecuted,” and yet, they did not place such an emphasis on literacy and education.

A unique feature of Judaism is that learning and reading the Bible was considered the central aspect of being Jewish. After the defeats against the Roman Empire and the consequent Diaspora, leadership in the Jewish communities passed from the high priests to the rabbis, whose

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31 We do not have a direct source on literacy rates in the world population at the end of the first millennium. However, literacy rates even in modern times are known to have been very low. For example, in Poland 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). Second, most of the population in the first millennium was rural, which by definition means that their literacy was zero. We are currently reading works on literacy and schooling in the Muslim empire and early medieval Europe.

32 Here we refer to the religious education as it is studied in Orthodox Jewish schools and Yeshivas today. See Berman (2000) for an insightful economic analysis of Ultra-orthodox Jews in contemporary times.


34 The earliest examples of mandatory primary education are those of Prussia in 1763 and 1773 under Frederick the Great and Maria Teresa of Austria, France in 1860-80, and England in 1870 (West 1970).

35 A quote from the Talmud indicates the stages toward the establishment of universal primary education among Jews: “However, that man is to be remembered for good, and his name is Joshua ben Gemala; for were it not for him Torah would have been forgotten in Israel. For at first he who had a father was taught Torah by him, and he who had no father did not study Torah. It was then decreed that teachers of children should be appointed in Jerusalem. However, he who had a father, the father would bring him to Jerusalem and have him taught, while he who had no father, would not come to Jerusalem to study. It was then decreed that teachers of the young should be appointed in every district throughout the land. But the boys would be entered in the school at the age of sixteen and seventeen and if the teacher would rebuke one of them, he would resent it and leave. Thus it was until Joshua ben Gemala decreed that teachers of children should be appointed in every district and every city and that boys of the age of six and seven should be entered.” [Baba Batra 21a, cited in Greenberg (1960, 1261).]

A post-Talmudic treatise, listed as an appendix to the Talmudic treatise Aboth (Aboth v. 21) outlines the typical Jewish educational pattern: “At five years old (he comes) to the reading of Scripture, at ten to the Mishna, at thirteen to the practice of the commands, at fifteen to the Talmud, at eighteen to marriage” (Schurer 1891, 52, fn. 39).
distinguished mark was not wealth but scholarship. The rabbis stated even more strongly that worship of God was achieved not only by prayer but also by study (Sombart 1913, 158). To observe all the laws of his faith, a Jew had to be educated. A good Jew had to read sections of the Pentateuch four times a week at services, twice on the Sabbath and once every Monday and Thursday mornings (Drazin 1940, 25). The main purpose of the Sabbath day meetings in the synagogue was not public worship in the usual sense, but religious instruction. In contrast to other areas in which Jewish law imposed many restrictions and prohibitions, Jewish religion favored competition in the teaching of the Torah (Carlton and Weiss 2001).

Early mandatory primary education and the emphasis on education in general were almost unique of Judaism at this time. The pagan celebrations of the Greeks and the Romans did not assign a high value to learning. In the Hellenistic regions, primary schools became widespread although they were not universal. In classical Rome, among the prominent families children went to primary school at the age of seven, to the grammaticus at eleven, and to the rhetor from fifteen to twenty years old. However, lower classes and rural districts were left out (Marrou 1982).

The Talmudic Period (200–638 C.E.). Literacy became more widespread among male Jews in the centuries when the Talmud was being compiled. A major goal of the rabbis was to eliminate illiteracy among Jews in both Palestine and Babylon (Aberbuch 1993, 32). Goitein (1962) maintains that there are many references in the Talmud that fathers had to pay for their sons’ education and to teach them an occupation. Moreover, the requirements on Jewish education became more demanding from the third century on with the compilation of the Talmud, when the written texts Jews were supposed to learn and the number of commands and prohibitions a Jew had to observe grew in number and complexity (Perlow 1931; Safrai 1976b).

In the Talmudic period Judaism transformed into a religion whose membership was based more and more on literacy and education. Worship became identified with reading the enormous amount of discussions in these texts. From the third to the sixth century, am ha-aretz, which in earlier times referred to a Jewish individual who did not observe the norms of ritual purity (am ha-aretz lemitzvot), acquired the new meaning of “one who is illiterate,” someone who did not know and did not teach his sons the Torah (Oppenheimer 1977).

Judaism and Christianity departed from each other at this time. Under the influence of Paulus’s doctrine, faith had replaced obedience to the Law as the core of Christianity whereas Judaism moved in the direction of becoming a club based on literacy (Neusner 1987; 1990c). One may only speculate why this occurred in Judaism. Rabbis might have favored literacy for purely religious purposes, or because it increased their revenues as teachers. Regardless of the motivation, the outcome of the educational reform was the same: more and more male Jews were becoming literate.

From the Arab Expansion to the Middle Ages. The wealth of documents from the Cairo Geniza, which illustrates the economic and social life of many Jewish communities in the Mediterranean during the Muslim period, indicates that by the tenth century, among Jews

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36 A law enacted during the first century allowed a community to transform a synagogue structure into a Bet Ha-Midrash (institution of higher learning for studying and interpreting the Torah), but prohibited the sale of a Bet Ha-Midrash for exclusive synagogue use; the Bet Ha-Midrash was considered to have a higher state of sanctity than the synagogue itself (Greenberg 1960, 1277; and Goldin 1960, 158).
virtually all male children had primary education. The requirement to send boys to primary schools was observed by most Jews independent of wealth or social status. A wife who wanted to prove that the husband did not act as a proper father for their children claimed in court that he did not pay for the school fees.\(^37\) School fees were regularly entered into the budgets of wealthy, as well as humble, households. For example, in a partnership contract, the two parties agreed that expenses for food were to be covered with money from the business venture, while each partner had to personally pay for rent and school fees (Goitein 1971, 174; 1978).\(^38\)

One schoolteacher usually taught to a variety of children of different ages attending the same class. Rich households also hired private tutors. While the main goal was to prepare the male child to pray at the synagogue, the schools also taught basic mathematics and Arabic. Inhabitants of every town who had resided there for twelve months or longer, regardless of whether they had children or not, had to pay an education tax to finance the schools for orphan and/or poor children.\(^39\)

**Literacy and Beyond.** The knowledge of the Torah, Mishnah, and Talmud has become the utmost achievement of a Jew during his entire life.\(^40\) The worship of God for Jews has been identified with reading many sections of the Talmud and with understanding the logic, the rules, and the arguments made by the scholars who are quoted in these books. The Jewish religion required all observant Jews to learn these texts; therefore, mandatory primary education was just a prerequisite. From this viewpoint, Judaism is unique relative to other religions, which require learning of the texts by priests and religious leaders but not by the entire community.

Moreover, the sophisticated logical and argumental structure of the Talmud that is related to daily life and economic pursuits was certainly an important input in the ability of Jewish men to engage in handicrafts and trade. In following the rules established by Judaism, Jews not only gained literacy, but also learned the rules regarding agriculture and trade, and acquired the logical thinking of the rabbis who were often traders and merchants (Sombart 1913, 149).

Looking at the existing literature, it appears that the nexus between education and Judaism has been neglected when explaining the main trends in Jewish economic and demographic history. Meanwhile, it is our claim that the emphasis of Judaism on education was a powerful mechanism, which affected the selection of the Jews into urban and skilled occupations, and the selection of Jews in and out the Jewish communities themselves.

The nexus between education and Judaism, and the increasing importance of education among Jews in the first half of the first millennium, prior to the migrations to Europe and to other urban centers, is the central aspect of the specification of the model below. Our aim is

\(^{37}\) See Goitein (1971, 173–74). Goitein (1962) also mentions schools for girls and female teachers. For women, however, it is less clear the degree of universality of primary education.

\(^{38}\) Further evidence corroborates the claim that education was deemed extremely important among Jews at that time. In a letter sent from Cairo in the twelfth century, a Jew writes “Your boy Faraj now reads the Targūm accompanying the lections—as I guaranteed you he would” (Goitein 1971, 175). In a letter, a man in Alexandria writes to a relative traveling that “your children are well and go to school every day.” A boy writes to an uncle: “I am writing you this letter with my own hand. My brother Nabāt still attends school; he is now thirteen. You mentioned in your letter that your boys studied the Sacred Law and Arabic and Hebrew calligraphy. We thank God for this.” Many letters from fathers who were traveling also contain instructions for their wives and relatives with regard to the education of their children. A wife claimed that the husband paid for all the expenses, including food, clothing, and children’s education (Goitein 1971, 173–74).

\(^{39}\) Greenberg (1960, 1270), and Zeitlin (1978, 303).

\(^{40}\) From that time until today Orthodox Jewish men continue to learn pages in these texts throughout their life.
not to explain why Judaism became a religion centered around education. We take this nexus as given (this is our only assumption) and we proceed in analyzing the impact of this nexus on the choice of occupation, investment in children’s human capital, conversion, and migration.

5 The Model

The model analyzes the choices of both Jewish and non-Jewish adults regarding their occupation, religion, migration, and the level of their children’s education, taking the number of children in a household as given. The main assumption, which distinguishes Jews, is their higher utility from their children’s education (literacy).

Without indicating at the outset the location, we consider individuals making these choices during the first millennium at one of the four locations where Jews mainly settled during this period—Palestine, North Africa, Near East, and western Europe.

The model specifies the supply of labor for two occupations: farmers and merchants, where farmers are located in villages and merchants in cities. The demand for merchants is assumed to be exogenously given by the development of cities and commerce in the world, as well as by regulations that are set by the rulers. Unless there are explicit restrictions set by the rulers, Jews are assumed to be free to choose being farmers or merchants in all times and locations.

5.1 Setup

We adopt an occupational choice model (Roy 1951) and incorporate the parents’ choice for their children’s education (quality) following the theory of Becker and Lewis (1973) and Becker (1975). An individual is assumed to live for two periods. In the first period, he is a child (son) living with, working for, and receiving an education $E^s$ from, his family. In the second period, the child is now an adult who makes decisions regarding his religion, occupation, the education level of his children, and migration.

In the second period, each individual is assumed to be given an exogenous preference parameter, $u$, which 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 whereas an individual with high $u$ derives high utility from being a Jew. If parents were non-Jewish, the individual is assumed to have $u = 0$; in contrast, for an individual of Jewish descent, the value of $u$ is taken from a given distribution $(F(u))$ with zero mass on $u = 0$. To simplify the analysis, the level of $u$ is assumed to be sampled for each individual independently.

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41 In the previous section, we established that Judaism imposed literacy for the children in the first half of the millennium. This change in the religion happened for exogenous reasons well before the occupational transition occurred (eighth-tenth centuries). Thus, it is not the goal of our theory to explain why Judaism imposed literacy for the children. We take this nexus between education and Judaism as given. Then we follow Becker and Lewis (1973)’s and Becker (1975)’s theory of children’s quality: we introduce children’s literacy and education as a parents’ decision variable, which affects their utility. See also Chiswick (1988) for a discussion of tastes, investment in children’s education, and earnings across ethnic groups.

42 We set the simplest possible model to address the issues. Hence, unlike Eckstein and Zilcha (1994), we do not employ an overlapping generations model: savings are not taken into consideration and children overlap with their parents for one period only.

43 Here we do not distinguish between general human capital and Jewish-specific human capital. Carmel Chiswick (1999) makes this important distinction to explain the survival of Judaism. In our setup, a Jew who learns to read the Bible acquires literacy in the general sense as well.
of his education level $E$, as well as of his father’s level of $u$ and education. The parameter $u$ affects the individual’s decision only if it affects consumption and children’s education, which are determined endogenously.

Given the strong evidence of the importance of education in the Jewish religion presented in the previous section, we set the preferences of an adult individual to be such that, when he and his son have no education at all, the individual derives no utility from being a Jew. For simplicity, preferences ($U$) of an adult Jewish individual are assumed to be linear as follows:

$$U(C, E^a; u, E) = C + u(E^a + E)$$

where $E$ is the education level of the adult individual, and $C$ is the family consumption. Notice that 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 at a very early age (see section 4 above). The interaction between $u$ and $(E^a + E)$ provides a simple specification for these observations on Jewish religion. A Jew (farmer or merchant) who follows the rules established by the Jewish religion has to provide at least a minimum level $E^m$ of education to his son at a cost $e_m$. A Jew who is not educated at all ($E = 0$) is called am ha-aretz. These assumptions are a simple way of incorporating into the model the role of education in Judaism.

There are two occupations: farming (agriculture = $A$) and trade (merchant = $M$), and the choice of occupation is equivalent to the choice of location within the same geographical area. Let $W_A$ and $W_M$ be the earnings in agriculture and trade, which are equal to the productivity in each occupation. These earnings represent the income that a family derives from the father’s occupation and includes the son’s input if he works with his father.

Working in agriculture does not demand any education, and education does not affect a farmer’s productivity. A merchant with no education earns the same as a farmer; but for merchants, the education (literacy) of both an adult individual and of his son have a positive marginal product. As such, earnings in the two occupations are set by

$$W_A = W_M(E = 0, E^a) < W_M(E > 0, E^a).$$

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, $W_M = W_A[1 + E(1 + E^a)]$, such that the above conditions on the derivatives hold. Therefore, $E(1 + E^a)$ is the total return on the family education, which includes that of the father and the son.

The cost of providing education to children is given by $e(E^a)$, such that for a minimal level of education $E^m > 0$, the required cost is $e_m > 0$, with $e'(E^a) > 0$, $e''(E^a) > 0$, for $E^a > E^m$.

The budget constraints of Jews in agriculture ($AJ$) and in urban occupations ($MJ$) are, respectively,

$$C_{AJ} = W_A - e(E^a) - T_{AJ}$$

$$C_{MJ} = W_M(E, E^a) - e(E^a) - T_{MJ}$$

\[44\] Later we will change this assumption such that the mean value of the distribution of $u$ increases with the individual’s education, and his father’s education and $u$. Recall that at the beginning of the first millennium about half of the Jews were converted pagans.

\[45\] This is an extreme assumption, which can be replaced with the milder assumption that the marginal product of education is higher for merchants than for farmers.
where \( C \) is the family consumption and \( T \) is the tax for a Jewish individual in a given occupation. Taxes can be either land taxes or lump-sum taxes per head or per household.\(^{46}\)

Non-Jews (\( NJ \)) can also be farmers or merchants. The budget constraints of non-Jewish farmers (\( ANJ \)) and merchants (\( MNJ \)) are, respectively,

\[
C_{ANJ} = W_A - T_{NJ} \tag{5}
\]

\[
C_{MNJ} = W_M(E, E^s) - e(E^s) - T_{MNJ} \tag{6}
\]

5.2 Analysis

5.2.1 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 his son’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 \( u_m = e'(E^s_m) \). Jewish farmers with \( u < u_m \) will not invest in their sons’ education (\( E^s = 0 \)), as the model predicts for non-Jewish farmers. Meanwhile, Jewish farmers with \( u > u_m \) will invest in their sons’ education. Therefore, the optimal education level of male children of Jewish farmers is given by

\[
\begin{align*}
    u &= e'(E^s) \quad \text{for } u \geq u_m \\
    E^s &= 0 \quad \text{for } u < u_m
\end{align*}
\]

(7)

As for merchants, if they are Jewish, the optimal education level of their children is given by

\[
W_A(1 + E) + u = e'(E^s) \tag{8}
\]

where \( W_A(1 + E) = W_{ME}(E, E^s) \) 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 son’s utility of being a Jew. There exists a lower-bound level of \( u \) equal to \( u_m \) such that \( u_m = e'(E^s_m) \). Jewish farmers with \( u < u_m \) will not invest in their sons’ education (\( E^s = 0 \)), as the model predicts for non-Jewish farmers. Meanwhile, Jewish farmers with \( u > u_m \) will invest in their sons’ education since the return on this investment for a merchant is higher than for a farmer.

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

**Result 1.** The first result is built into the model and it says that Jews will invest more in their children’s education than non-Jews.\(^{47}\)

\(^{46}\)The land tax can be either a tax on the agricultural income or a tax that depends on the size of the land holding. In our model, we do not distinguish between these two types of taxes, and we refer to the land tax in both senses.

\(^{47}\)Result 1 and those in the next section are the implications from the model. We mark them to make the discussion in Section 6 easier to follow.
5.2.2 The Occupational Choice of Jews

Conditional on being an educated Jewish adult with $E > 0$, an individual prefers to be a merchant rather than a farmer if

$$U_{AJ}(E > 0) < U_{MJ}(E > 0)$$

(9)

that is, if

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

(10)

Given assumption (2) that the wage in agriculture is lower than the wage of an educated merchant, an educated Jew will choose to be a merchant if taxes in agriculture are equal to, or greater than, taxes in trade. This is a sufficient condition for the transition from agriculture to trade. 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

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

(11)

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

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

(12)

Equation (12) is built into the model by the assumption on the role of education in the Jewish religion. This equation provides three predictions.

**Result 2.** If taxes on Jewish farmers are greater or equal than taxes on Jewish merchants, then $E^* = 0$. Therefore, for all educated Jews ($E > 0$), the optimal choice is to be merchants.48

**Result 3.** As Judaism puts greater emphasis on education by imposing more demanding requirements, $E^*$ goes up. Therefore, the education level at which a Jew is indifferent between being a farmer or a merchant, $E^*$, decreases, and, consequently, more Jews choose to become merchants and live in cities.

**Result 4.** At any given time and in any location where the opportunities for merchants become available, Jews move into urban occupations earlier than non-Jews because they have a higher level of education as a result of their religion.

5.2.3 Conversion

**Jewish Farmers.** Conditional on being an educated Jewish farmer ($AJ$), the choice to convert to a non-Jewish ($NJ$) religion 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

$$W_A - e(E^*) - T_{AJ} + u(E + E^*) < W_{NJ} - T_{NJ}$$

(13)

48Even if taxes on Jews in urban occupations are higher than taxes on Jewish farmers, for some educated Jews (those with $E > E^*$) the optimal choice is to be merchants.
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

\[ u(E + E^s) - e(E^s) < -T_{NJ} + T_{AJ} = T_n \]  

(14)

where \(T_n\) is the tax difference between a Jew and a non-Jew working in the same occupation and location. Therefore, a Jewish farmer will convert if the benefit of being Jewish 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 level of 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 for 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

\[ u^* = \frac{T_{AJ} - T_{NJ} + e_m}{E_m + E_m^s} \]  

(15)

For \(u < u^*\), the Jewish farmer converts. Thus, the proportion of conversions of Jewish farmers is given by \(Pr(u < u^*)\) and the model predicts a constant rate of conversion if the parameters in the right hand side of (15) are constant. Even if taxes for Jews and non-Jews in agriculture are the same, there exists a level of \(u^*\) (\(= \frac{e_m}{E_m + E_m^s}\) = the cost of a unit of minimal education), which determines the proportion of Jewish farmers who convert.

From equation (15) we derive the following results.

**Result 5.** Conditional on the exogenous parameters, conversion is a slow dynamic process with a constant rate of conversions of Jewish farmers in the population. The higher the taxes imposed on Jewish farmers, the higher the \(u^*\) at which a Jewish farmer is indifferent between converting and remaining a Jew, and therefore the greater the conversion rate of Jewish farmers.

**Result 6.** As the importance of education and investment in children’s ability to read and write increases, a faster conversion of Jewish farmers occurs; in other words, as the emphasis on education in the Jewish religion increases by imposing more demanding requirements, \(e_m\) goes up. Therefore, \(u^*\) increases and, consequently, the proportion of conversions also increases. However, if the cost of mandatory education diminishes either because the Jewish community provides support or because of a better institutional setting, the rate of conversion decreases.

**Changes in the Distribution of \(u\)**

Let’s assume that the mean distribution of \(u\) for an individual Jew depends on the level of his father’s \(u(E + E^s)\). Suppose also that initially there are Jews with \(E = 0\). Then, the selection of the Jews out of the Jewish communities due to conversion increases the mean level of \(u(E + E^s)\) for the Jewish population, given that the Jewish adults with low levels of \(u\) are those who left the Jewish faith. Suppose that, in addition, the Jewish religion increases the required (minimum) level of education \((E_m)\), but the cost of education has stayed constant. Under these conditions the proportion of conversions, \(Pr(u < u^*)\), decreases over time such that the Jewish population can stabilize even if the conversion rate is slightly positive.

To sum up, the model provides a quantitative equation for the rate of conversion \(Pr(u < u^*)\) that can be estimated based on conversion rates among Jews, the tax differentials between Jews and non-Jews, the cost and requirements of education and assumptions on the distribution of
If the distribution is assumed to be constant, then the conversion rate is constant. If the mean of the distribution is assumed to increase with the level of the individual’s $uE$, then the conversion rate decreases over time.

**Jewish Merchants.** Conditional on being a Jewish merchant ($MJ$) with education $E$, the choice to convert to a non-Jewish ($MNJ$) religion is given by $U_{MJ} < U_{MNJ}$, such that,

$$W_M(E, E_{MJ}^s) - e(E_{MJ}^s) - T_{MJ} + u(E + E_{MJ}^s) < W_M(E, E_{MNJ}^s) - e(E_{MNJ}^s) - T_{MNJ} \quad (16)$$

The critical level of $u$ for the Jewish merchant is given by $u < u^*$, where $u^*$ is given by,

$$u^* = \frac{W_M(E, E_{MNJ}^s) - W_M(E, E_{MJ}^s) - (e(E_{MNJ}^s) - e(E_{MJ}^s)) - (T_{MNJ} - T_{MJ})}{(E + E_{MJ}^s)} \quad (17)$$

where the optimal choice of children’s education for Jews and non-Jews is given by, respectively,

$$W_A(1 + E) + u = e'(E_{MJ}^s)$$
$$W_A(1 + E) = e'(E_{MNJ}^s).$$

The rate of conversion depends on the value of $u^*$; if $u^* \leq 0$, then the rate of conversion is zero. The return from being merchant is larger for Jews since they invest more in their children’s education. Hence, the first term in the numerator in (17) is less than or equal to zero. The second term is positive and the sum of the two terms may be positive or negative.

**Result 7.** If we assume that the Jews have a well-organized educational system and that Jewish and non-Jewish merchants pay the same taxes, then $u^* \leq 0$ and none of the Jewish merchants is predicted to convert.

**The Conversion of Non-Jews to Judaism.** The model does not allow conversion by choice of non-Jews to Judaism. Non-Jews are assumed to have $u = 0$, and the model predicts that those with $u = 0$, do not convert by choice to Judaism. Therefore, in this context a non-Jew will convert to Judaism only if forced to do so. We can summarize this implication with the following:

**Result 8.** Conversions of non-Jews to Judaism can occur only by coercion.

5.2.4 Migration

Migration from villages to cities within the same location is determined by the occupational choice. The above model is set for each individual in a given location.

The migration decision from one location (country) to another is solved by comparing the utility at any location given the education level of an adult individual ($E$), the value of his $u$, the taxes, and the optimal choice of occupation, conversion, and children’s education. We assume that the wage in a given occupation is the same in all locations. Hence, conditional on occupation the difference in utility for Jews from living in different locations depends on the cost of education, taxes, moving costs, and the availability of jobs. Working as farmers is possible in all locations but the availability of jobs as merchants is restricted as we describe below.
Conditional on the occupation, it is clear from the model that Jews would migrate from one location to another if the differences in the costs of education and in taxes are greater than the cost of moving and conditional that the optimal choice is to remain Jewish. The choice of remaining Jewish implies that the individual has a high level of $u$ and, therefore, he provides a high level of education for his children and he has a preference for living in the city and for being merchant.

The implications of the model regarding Jewish migrations are:

**Result 9.** Deteriorating economic conditions and higher taxes in a given location will make Jews migrate to another location.

**Result 10.** Jews will migrate to locations with high Jewish density because educational costs will be lower.

**Result 11.** Over time, the mean level of $u$ for Jews is higher and, therefore, Jews are more likely to migrate.

### 5.2.5 Urbanization and Migration

So far we described the labor supply by occupation for Jews and non-Jews. The observed outcome also depends on the demand for these occupations. We assume that the aggregate growth and, in particular, the growth of cities in the ancient world is an exogenous process, which provides urban and nonagricultural occupations to all individuals who can migrate to cities. Thus, the equilibrium potential supply of nonagricultural 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.

The assumption of an exogenous demand for merchants implies that there will be periods for which the number of Jews exceeds the demand for merchants in urban locations. As such, we start the analysis by assuming that only a fraction of the Jewish population can live in cities. Therefore, the return from education is lower and the model predicts that the Jews would put further emphasis on the role of education; in this way, $u^*$ increases, the proportion of Jews who convert increases, and the number of Jewish merchants fits the number of potential jobs. In contrast, in periods of urban and economic growth, the Jews would abandon agriculture since they have a significant comparative advantage in the merchant-urban occupation, and at the same time they also migrate from the original location to places where new cities are established.

These are the predictions of the model regarding urbanization and migration:

**Result 12.** As new urban locations are developed, highly educated Jews will move to these locations.

**Result 13.** As merchants, the number of Jews in a city is limited by the number of jobs in which the Jews can profit from their high human capital.

Notice that Result 13 is in the spirit of Kuznets' argument. However, the rationale is completely different. Our view is that the uniqueness of the Jews as people with high human capital made them concentrate into these new occupations which provided high return on their
characteristics. Their unique characteristic made them to be in minority-type occupations. The outcome—minority and urban, skilled occupations—is the same as described by Kuznets, but the economic reasoning is different.

6 Historical Evidence and the Model

In this section we discuss whether the historical evidence is consistent with the predictions from the model.

Result 1 is built into the model whose assumptions are based on the discussion in Section 4, which motivates the structure of the model itself. There we explain that Judaism is assumed to provide utility only for those who are educated. As a result, Jews invested more in their children’s education than non-Jews.

Results 2, 3, and 4 give the main predictions regarding the occupational transition under the assumption that Jewish farmers are educated. The historical evidence clearly shows that Jews invested in education and then moved to urban occupations. The educational reform in Judaism, which made primary education compulsory for male children, started in the first century C.E., was fueled by the negative attitude at the beginning of the second century in Palestine and then in Babylon against the ammei ha-aretz, and was reinforced by the development of the Mishnah and Talmud (second-fifth centuries). When the educational reform was implemented, most Jews in Palestine and Babylon were still farmers. The transition from agriculture to crafts and trade occurred between the sixth and the ninth century. Hence, the occupational transition occurred after primary education was made compulsory for male children, as Table 1 shows. This sequence supports results 2, 3, and 4.

Key to results 2–4 is the assumption that merchants earn more than farmers. With the returns from education being higher in crafts and trade than in agriculture, the educated Jews found it more profitable to switch from agricultural to nonagricultural occupations. Data from Roman Palestine and other regions of the Roman Empire indicate that wages were higher for urban, skilled occupations. Also, the Jews in Eretz-Israel from the first to the fourth century were poorer than the Jews living in Babylon (Jacobs 1990). Jews in Palestine before the Arab conquest (638 C.E.) and those in western Europe remained engaged in farming. In contrast, in the Persian Empire although agriculture remained the main occupation, the Jews, particularly the Amoraim (the scholars and the leaders of the communities) held a greater number of nonagricultural occupations. The Mishnah and the Talmud provide evidence of the divergence in the occupational structure of the Jews in Palestine and in Babylonia (Jacobs 1990, 333). In the Talmud Jews appear to have been engaged more in nonagricultural activities than those in Palestine described in the Mishnah (Neusner 1998). Also, in the Babylonian Talmud there is more material dealing with civil law than in the Eretz-Israel Talmud.

An alternative model in which Jews first became merchants (for some exogenous reasons) and then decided to invest in their children’s education is not consistent with the historical evidence.

Around the early first century C.E. in Palestine, the daily wage of a vineyard worker was 1 denarius, a doctor’s fee 2 denarii; the wage of a scribe was 2 denarii per day (Sperber 1965, 250–51). In Egypt in the first century C.E., men on farm work earned a daily wage varying from 1/8 to 1/6 denarius, a plasterer’s assistant 1/5, a bricklayer 1/4, a pruner 1/6, a ploughman 1/5, a man who harvested 1/12, a household servant 1/10, a weaver 1/7, and a teacher 1/4 (Sperber 1966, p. 187; 1968; 1970; Frank 1938, 86; and Duncan-Jones 1974, 1976).

Baron (1937), Grayzel (1965, 307), Dan (1990), Har and Oppenheimer (1990), and Safrai (1994).

When urbanization expanded as it did in the early Muslim Empire, poll-taxes on Jewish merchants and Jewish farmers were the same, and therefore (as predicted by results 2 and 4), all Jews preferred to move to urban occupations, which is exactly what happened in Babylon and Palestine during the eighth century under the Muslim rule.

The Jews were the only religious group who moved entirely to urban centers, while the rest of the population remained mostly engaged in agriculture during the first millennium. We maintain that, first, the investment in education prompted by religious leaders, and then, the urbanization that occurred mainly from the seventh throughout the eighth century explain the transition of all Jews from farming to crafts and trade.

6.1 Other Implications

The results regarding conversion and migration of Jews are not directly built into the model. The empirical analysis of these implications provides a test to our explanation for the observed transition of Jews to urban occupations.

**Conversion.** Both the size and the geographical concentration of the Jewish population underwent significant changes throughout the first millennium (see Section 2). At the beginning of the first century C.E., there were about 4.5 million Jews spread all over the Roman Empire and the Persian Empire, with three large and wealthy centers: Palestine, Egypt, and Babylon. By the time most Jews became engaged in urban, skilled occupations (around the seventh–ninth centuries), there was a large and wealthy Jewish community in Babylon and the Near East, a small community in Israel, and even a smaller community in Egypt, and in other places for which we do not have much information (see Table 2). Overall, in the early Muslim empire (seventh century) the size of world Jewry was 1-1.5 million.

The reduction in the total size can be the outcome only of deaths and conversions. During the revolts from 70 to 135 C.E., many Jews were killed. From the sources discussed in Section 2, these massacres account for at most half of the reduction in the total size. The rest of the reduction was the outcome of conversions. A distinction has to be made between forced and voluntary conversions because our human capital argument is relevant only for the latter.

Both Christianity in the Roman Empire and Zoroastrianism in the Persian Empire had established the principle of nonconversion of Jews by force. However, both encouraged conversions, sometimes through economic incentives. For example, in Persia tax exemptions were granted for lip service to the Zoroastrian gods (Baron 1952, 180). After the crushing of the Bar Kokhba Revolt in 135, the emperor Hadrian made the teaching and practice of Judaism a capital crime (Goldin 1960, 154; Nock 1969; and Goodman 1994). The edicts of Hadrian were repealed by the next emperor, Antoninus Pius, although acceptance of proselytes was still forbidden. To reduce even further the number of conversions to Judaism, the attitude of Jewish leaders also played a role. Unlike in previous times when Judaism sustained proselytism, after the destruction of the Second Temple the rabbis tried to discourage conversions, and leaders in Eretz-Israel showed contradictory attitudes toward proselytism (Neusner 1980; 1994).

Where does the evidence of voluntary conversions come from?

First, at the very beginning of the first century, there were many groups within Judaism such as Jews, Samaritans, Kutim, and many others. These groups became clearly distinguished one

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53 The same ban was reintroduced two centuries later when Constantius forbade Jews from making proselytes and conversion to Judaism was punished with death.
from the other at the end of the second century when Judaism under rabbinic influence made the reading of the Torah the main requirement for being a good Jew. The Samaritans, for example, were Jews who did not accept the Mishnah and the Talmud. They slowly separated from Jews when Judaism emphasized learning, and spread from Samaria to other regions in Palestine (Har and Oppenheimer 1990, 204). After the Bar Kokhba’s Revolt, there were also villages of Jewish farmers who became Kutim in Palestine.

Second, early Christians were Jews. The departure of Christianity from Judaism was slow. In fact, Christian Jews, Jewish Christians, and Jews themselves were all viewed as Jews in the Roman Empire even after the Bar Kokhba’s Revolt. The divergent trajectory of Christianity and Judaism started around the end of the second century, when Christianity stopped circumcision and declared that reading the Bible was not the main requirement for being a good Christian (Neusner 1987; 1990c). 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; 1952, 163) states that most early Jewish converts to Christianity were uneducated, poor free Jews. Gil (1992) maintains that Jewish and Samaritan farmers in Palestine converted to Christianity during the Byzantine period; their offspring later converted to Islam before the Crusaders’ conquest.

Third, indirect evidence that Jews voluntarily 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). We also know that there is a translation of the Bible, which was done in about 400 C.E. by Jews converted to Christianity in Palestine (Har and Oppenheimer 1990, 182).

In addition to voluntary conversions, which are relevant for our human capital argument, there were also episodes of forced conversions, which contributed to the decrease of the total Jewish population in the late Roman and Byzantine empires.55

All this evidence supports results 5 and 6. Conversion was a slow but significant process that mainly occurred when Jews were farmers, but almost stopped when they became merchants. In the Muslim period and after the transition from agriculture to crafts and trade, the size of the Jewish population did not change significantly, which means that massive conversions did not occur.56

Result 7 states that if taxes on Jewish and non-Jewish merchants are the same, then Jewish merchants do not convert. During the Islamic period all Jews paid the poll-tax of 2 dinars, but probably it was not a big burden, especially for merchants (Gil 1992, 140). Furthermore, as Avner Greif (1993) has shown for the Maghribi merchants in the Mediterranean in the high Middle Ages, there were significant benefits from being a Jewish merchant because as members of an ethnic group specialized in commercial enterprises, Jewish merchants could impose community sanctions, which reduced transactions costs and generated network externalities. This

54Note that this is exactly the time when the Mishnah was compiled, and learning and reading the Torah became the core of the Jewish religion.

55In 583, King Chilperic in France ordered the baptism of a large number of Jews in Paris; in 591, the bishops of Narbo and Arelate were reproved by Pope Gregory for forcibly baptizing the Jewish inhabitants of their cities; and in Spain, King Sisebut (612-620) ordered all Jews in his domain to receive baptism (Juster 1912).

56One of the predictions of Rapoport and Weiss (2002)’s model is consistent with this historical fact. Their argument is that religious antagonism was much greater between Christians and Jews than among Moslems and Jews. Therefore, since the size of the Jewish community is a function of the degree of hostility, the decrease in the Jewish population is predicted to be greater in the lands of Christianity, which is what happened historically.
further reduced the benefits from converting to another religion.

As for conversions of non-Jews to Judaism (result 8), we know that there were large conversions of pagans to Judaism before the revolts in the first century C.E. (see Section 2). The conversion by the king of Abiadene and its kingdom reported by Flavius Josephus himself is just one of the instances of conversion by choice to Judaism at this time. In contrast, we are not aware of cases of conversions by choice of non-Jews to Judaism after the third century. People converted to Judaism only by coercion, such as in the case of slaves owned by Jews. In fact, the rules issued by the late Roman and then Byzantine emperors prohibiting Jews from converting slaves are evidence of the forced conversion of slaves to Judaism.57

Migration. The model makes the obvious prediction that Jews, both farmers and merchants, migrate when economic conditions worsen.

Some Jewish migrations were the outcome of the persecutions ensuing from the revolts in the first century C.E. (Baron 1952, 210; Har and Oppenheimer 1990, 133-35). However, migrations were also prompted by economic reasons. At the beginning of the third century, taxes became higher in the Roman Empire, whereas wages were higher and prices were lower in Babylon than in Palestine (Jacobs 1990). Jewish farmers left Palestine and Egypt and migrated mainly to Babylon, which became the center of Jewish religious and economic life.58 Jewish leaders provided a lot of religious reasons against this migratory movements but they partly failed to convince the Jews not to leave Palestine (Har and Oppenheimer 1990, 133-135). This evidence is consistent with results 9 and 10 in the model. Notice that in contrast to Kuznets’ argument, the Jews who left Palestine were mainly farmers who remained farmers when they moved to Babylon (Neusner 1990b, 437). We do not have direct evidence supporting or rejecting result 11.

Result 12, which relates urbanization and migrations, is supported by the evidence on occupational choice in section 2. Around the eighth century, Jews became almost entirely a urban population.59 Since the late ninth century, as they became merchants, there were substantial voluntarily migrations of Jewish merchants in Muslim Spain and towns in Europe. During the tenth century, they spread to Champagne and South Germany. The documents from the Cairo Geniza and the Responsa supply a lot of evidence of the migrations of the Jews motivated by increasing trade opportunities which enabled them to reach standard of living comparable to the upper classes in Spain and Germany (Agus 1965; and Ben Sasson 1976, 393-402). The Jews could also be found in many places in Mesopotamia and Egypt. At that time (eighth-tenth centuries), they generated a network of trade which was all linked to Babylon and Baghdad (Greif 1989).

The Jews who were engaged in long-distance trade were literate and had high human capital (Agus 1965; Goitein 1967). In fact, from the Cairo Geniza documents and the Responsa we know that they were doing their business by writing letters, they were involved in complicated transactions, moneylending, partnerships and interest-rate calculations which required sophisticated

57 For example, in the early fourth century, the emperor Constantine prohibited Jews from owning non-Jewish converted slaves (Juster 1914, II, 72f). Constantius II made the circumcision of a slave a capital offense, and forbade Jews from buying slaves of any other religion (Jones 1964).

58 In 238 C.E. the citizens of the village in Terachia in Palestine wrote to the Roman governor Gordianus: “We will run away from the houses and a substantial harm will be caused to the Treasury” (Har 1990, 134).

59 In 787, Jewish authorities established that debts could be paid not only on land, but also on movable property (Ben Sasson 1976, 393).
understanding of trade rules with both Jews and non-Jews, and trade over many commodities in many languages in different countries. Some of the traders were also the religious leaders of the Jewish communities. Thus, selection certainly occurred with the most educated Jews moving into the high-skill international trade activities.

However, it is not that Jews were a local minority and they suddenly moved to new occupations. They moved voluntarily to new locations because they had the skills which enabled them to engage in those occupations with high returns to their human capital. Yet, they became a minority in all the places where they settled since their comparative advantage was limited to few skilled occupations (result 13). Nevertheless, the evidence in Tables 1 and 2 and the description by Bejamin of Tudela indicate that even by the end of the twelfth century, 70 percent of the Jews remained in Mesopotamia and there they engaged in many urban occupations. Migration was an endogenous choice, and not exogenous as Kuznets maintained. As farmers, Jews migrated only when local economic conditions severely deteriorated for Jews. As merchants, they migrated as the demand for their occupations increased. Both these facts support the predictions of our theory. The minority status of the Jews since the third century was the result of their choice to migrate.

7 Concluding Remarks

The novel contribution of this paper is to provide a simple economic rationale for the transition of Jews from farming to urban, skilled occupations from the eighth to the tenth century. Our argument is consistent with the main historical facts about the Jews in the first millennium. The transformation of Judaism into a religion which required each Jewish man to be able to read the prayers and learn the Torah, and later the Mishnah and the Talmud, made the Jewish people during the first millennium a literate ethnic group in a world where the rest of the population was illiterate. This transformation occurred at a time when Jews were farmers, and therefore, cannot be attributed to a human capital investment made in order to engage in a particular occupation or to enable potential migration. Education was an exogenous hedge in the formation of Jewish religion that we take as given. Based on this fact, we argue that the occupational transition was the outcome of the religious transformation. This nexus between Jewish education and observed occupational structure has been neglected by historians.

An important support to our theory comes from the fact that the size of the Jewish population reduced substantially at the time when they were farmers and they had to invest in children’s education. The timing of these changes—first the transformation of Judaism and the educational reform, later the occupational transition, and lastly the migrations to the growing western economies—brings further support to our human capital/occupational choice theory. In particular, this sequence of events contradicts the widely accepted historical view that Jews did not engage in agriculture and specialized in trade and finance due to restrictions and prohibitions or because of their minority status.

We acknowledge that we focus on changes that occurred over a very long period of time and many centuries ago for which it is difficult to find reliable economic evidence. In particular, we cannot build time series on literacy rates, occupational distribution, migrations, and conversions among Jews and non-Jews during the first millennium so that alternative theories can be formally evaluated.60 Given the questions we address, looking at cross-section or time-series data on

60 We have very strong evidence on the implementation of the educational reform among Jews for the Muslim
the nineteenth or twentieth century would not be useful. However, there is enough evidence to support the hypothesis that the occupational transition of the Jews was a result of the transformation of the religion many centuries beforehand. The fact that even today Jews are highly visible in high-skill occupations all over the world may be to some extent the outcome of this transformation that occurred almost two millennia earlier.

During the Middle Ages a large proportion of the Jews specialized in moneylending. The conventional view is that this was the result of restrictions imposed on Jews from engaging in occupations except moneylending, and prohibitions on non-Jews from engaging in moneylending (Roth 1938). Our paper raises the possibility that alternative hypotheses related to acquired skills and human capital may provide a different explanation for the ethnic distribution of moneylending in the Middle Ages.

period thanks to the monumental work of Goitein (1964; 1971). It should be noted that the Geniza documents are almost the unique source of evidence on Jewish and non-Jewish life during the Muslim era. This is already the period when the Jews were merchants. In contrast, right now we lack direct evidence on literacy and education among Jews in Babylon during the Talmudic period and in the seventh century. Gathering evidence and data on literacy and education among Jews in Babylon during the Talmudic period and in the seventh century is one of our first priorities in the next stage of this research project.
# Appendix

Table 4: Jewish and Total Population in Palestine (in million)

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Population</th>
<th>Jews</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 C.E.</td>
<td>3</td>
<td>2.25</td>
</tr>
<tr>
<td>100</td>
<td>2.25</td>
<td>1.5</td>
</tr>
<tr>
<td>150</td>
<td>1.75</td>
<td>1.0</td>
</tr>
<tr>
<td>235</td>
<td>—</td>
<td>Large migration to Babylon</td>
</tr>
<tr>
<td>300</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td>395</td>
<td>0.8</td>
<td>0.25</td>
</tr>
<tr>
<td>5th–6th centuries</td>
<td>1.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.2</td>
</tr>
</tbody>
</table>


<sup>a</sup> Mostly were Christians.
References


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