

**THE SEPHARDIM DIASPORA:
A MODEL OF FORCED MIGRATION AND CONFISCATION**

João Ricardo Faria*

May 1998

Abstract

This paper studies the expulsion of Jews from Spain in 1492. This forced migration process is addressed with a model that blends demographic, religious and macroeconomic features. The optimal migration path is derived. It is shown that a large portion of the Sephardim community fled the country and, given the confiscation process they suffered, their final income was smaller than the income just before the expulsion. The model provides several predictions: (i) the rate of growth of the country falls with the migration; (ii) an increase in the inflation rate decreases the final income of the Jews; (iii) the government has an incentive to generate inflation since this minimises the negative impact of the diaspora on the rate of growth; and (iv) the decision to reduce the activities of the Spanish Inquisition diminished the migration.

JEL Classification Numbers: D99, J19, J61, J79

Keywords: Migration, Confiscation, Discrimination

Acknowledgments: I would like to thank, without implication, Joaquim Andrade, Andy Dickerson, Flávio Menezes, Peter Sanfey, Seref Saygili, and especially, Francisco G. Carneiro, for useful comments.

Address for Correspondence: Department of Economics, Keynes College, University of Kent, Canterbury, CT2 7NP, United Kingdom. Tel: +44 1227 823026; fax: +44 1227 827850; email: jrof1@ukc.ac.uk.

* Department of Economics, University of Kent, UK and Department of Economics, University of Brasília, Brazil

THE SEPHARDIM DIASPORA: A MODEL OF FORCED MIGRATION AND CONFISCATION

1. Introduction

The Edict of expulsion of Jews¹ from the Crowns of Castile and Aragon was signed on 31 March 1492, and promulgated between April 29 and May 1 (Baer, 1971, p.434) giving four months for all Jews to leave Spain (Hillgarth, 1978, p.447). Simultaneously with the Edict of expulsion, the Spanish government enacted laws to benefit the converts, such as exempting them from the control of the Inquisition for some time. The Jews were forbidden to take away gold, silver and precious stones. Their possessions could be converted into letters of exchange. Synagogues, cemeteries and other public estates were confiscated by the royal treasury. These measures, together with the short amount of time they were given to leave the country, implied serious economic losses to the Sephardim community (Kilsby, 1996, p.21). It was practically impossible to receive fair prices for their houses and goods, to protect their letters of exchange from depreciation or to collect debts owed to them. The Edict of expulsion created the following dilemma to the Jews: (i) keep their faith, leave Spain and lose part of their wealth; or (ii) change their faith, stay in Spain and keep their wealth (Bravo, 1992, p.31; Suárez, 1992, pp.318-22).

The objective of the paper is to analyze the migration process of the Spanish Jewry (the Sephardim Diaspora). The problem is interesting since the force behind the decision to migrate is institutional. It can be considered as a forced migration process with confiscation.

¹ The Jews from the Iberian Peninsula are also called Sephardim. This word comes from Sepharad, which appears in the shortest of all the books of the Old Testament, Obadiah 1:20. It was used to designate a region around Sardis, where Jewish exiles were deported after being captured in Jerusalem by Nebuchadnezzar. This name was later applied to Spain.

Moreover, the Edict of expulsion imposes a blend of demographic, religious and economic considerations that makes the study of the migration process using models in the Harris-Todaro tradition problematic². The model describes the optimal decisions by the Jews to migrate, evaluating the costs associated with the confiscation *vis-à-vis* the decision to convert themselves to Catholicism and retaining their wealth. The model is able to show the demographic and macroeconomic impacts of the Sephardim diaspora. The most important economic consequence is the negative impact on the growth rate of the Spanish economy. Given the high human capital content of the Jewish population, its expulsion represents a social cost for Spain. The skills of Jews were lost at a crucial moment in Spanish History - its unification and the discovery of the New World.

The paper is organized as follows. Section 2 presents the historical background and the basic model of the Sephardim diaspora. Section 3 examines the effect of inflation in the confiscation process, the role of the Inquisition in migration and addresses the final impact of the diaspora on Spanish growth. Section 4 concludes.

2. Historical Background and the Abravanel Model

The estimate of the number of Jews that left Spain is controversial. The total Jewish population in Spain in 1492 is estimated to be 200,000 (Edwards, 1991, p.34). Baer (1971, p.438) has suggested that some 120,000 emigrated to Portugal³ and that another 50,000

² There are exceptions in the migration studies, Ades and Glaeser (1995) and Faria and Mollick (1996), for example, that explore the role of government intervention in the migration process.

³ Portugal is another interesting case to be analysed. In 1496 the Jews were expelled from the country. However, given the economic importance of Jews, the King, Dom Manuel, forced them into mass conversion in 1497 (Serebrenick, 1962, pp.16-25; Lipiner, 1987, p.36). One curious effect of such an act was that the name “Portuguese” was thereafter regarded as synonymous with that of “Jew” in foreign countries (see Yerushalmi, 1981, p.10). Even Erasmus dismissed the Portuguese as “a race of Jews” (Boxer, 1973, p.274).

moved to North Africa, Italy and Turkey⁴. Vazquez de Prada (1978, p.103) accepts that migrants amounted to between 100,000 and 160,000, and Cameron (1993, p.140) admits a figure somewhere between 120,000 and 150,000. Vicens Vives (1969, p.244) is emphatic on 150,000. However, despite the different numbers, there is no doubt that a major migration took place in the *four months* of the official expulsion period (Edwards, 1991, p.34).

Hillgarth (1978) has pointed out that it is difficult to see the expulsion of the Jews “as primarily due to a thirst for money on the part of Monarchs” (p.461)⁵. The driving forces of the expulsion were of racial and religious nature (Baer, 1971, p.435). The racial motive is related to the Spanish *reconquista* of former territories from the Muslims since the Sephardim community was also seen as comprising foreigners. The religious problem was more serious. Since the pogroms of 1391, many Jews were converted to Catholicism (Edwards, 1991, pp.28-9). They were called *conversos*, and were also known as *Marranos* (pork-eaters). During the fifteenth century they were frequently accused of heresies associated with judaizing practices such as lighting candles on Fridays, circumcising newborn sons, and using Biblical names. Popularly, *conversos* seemed indistinguishable from Jews (Kamen, 1983, p.38). Thus, the consensus among historians would appear to be that the necessity of purifying the *conversos*

⁴ Turkey is a special case, since Sultan Bayazid II has incentivised their migration to Turkey. Bayazid II is purported to have said: “The Catholic monarch Ferdinand was wrongly considered as wise, since he impoverished Spain by the expulsion of the Jews, and enriched Turkey” (Immanuel Aboab).

⁵ Despite this, in general we agree with Hicks’ (1969): “If there is one thing about kings (...) if there is one general thing about them which seem to learn from the history books, it is that more often than not they were hard up. (...) Through their lack of money they have been put to the most desperate straits; savage confiscations of the wealth of Jews” (p.81). However, as Barzel (1992) has correctly argued, confiscation cannot be a frequent practice, since the Kings would be unable to find willing lenders. Moreover, for Barzel (1992, p.12) “the Jewish property was protected from confiscation by the ruler only as long as Jewish lenders were able to produce a higher tax income to the ruler than the ruler could have had by confiscating their property and managing funds himself”.

and their Catholic faith was the main explanation for the Jewish expulsion (Baer, 1971; Hillgarth, 1978; Edwards, 1991).

Following the expulsion act, the Sephardim community started the preparations for their departure. Their leaders negotiated with the Spanish Crown the conditions for their departure and with other governments, the conditions for the migrants to be accepted (Kaplan, 1992). Amongst these leaders the most distinguished was Don Isaac Abravanel (also: Abrabanel, Abarbanel), one of the most important lenders to the Catholic monarchs (Baer, p.437).

Don Abravanel is considered here as the social planner of the Sephardim community, along the lines of the command optimum framework (Blanchard and Fischer, 1989). Don Abravanel is supposed to maximize the social welfare of the Sephardim community under the restrictions imposed by the demographic and religious conditions generated by the expulsion. The framework used here is inspired by the literature on the relationship between Vampires and Human beings, which was pioneered by Hartl and Mehlmann (1982, 1983)⁶. Their contribution in dealing with optimal control problems with demographic constraints is useful in our context as will become clear below.

The demographic features of our model are the following (see Yerushalmi, 1981, p.6). After the expulsion, the Catholic population (C) is increased by the number of converted Jews, *Marranos* (\dot{M}), who wish to stay in Spain and change their religion:

$$\dot{C} = nC + \dot{M} \quad (1)$$

where n is the net rate of growth of the original Christian population, and the dot over a variable defines its time derivative.

⁶ Snower (1982) has explored the macroeconomic implications of their model. See also Hartl *et al.* (1992).

In this basic model, the religious decisions are taken as constant⁷, thus the *Marranos* are assumed to be converted from the Jewish population (J) at a constant rate ρ :

$$\dot{M} = \rho J \quad (2)$$

The Jews who want to preserve their religion have to migrate. So the variable J stands for the Jewish population and also for the number of migrants. In order to migrate, they suffer a confiscation process (ϕ), through the low prices paid for their goods and houses, the depreciation of their letters of exchange and by the debts that were not collected by them⁸. At the same time there is a part of the Jewish population that intends to stay in Spain, acting as Catholics but remaining Jews in their private lives. These are the *cripto-jews*, which form a fixed proportion δ of the Sephardim population J . So the migration process can be described by:

$$\dot{J} = (J - \dot{M})\phi - \delta J \quad (3)$$

Despite the costs to continue to be Jewish, given by the confiscation process and forced migration, one can argue that such costs can increase the net group utility. As shown by Iannaccone (1992), stigma and self-sacrifice can be considered as perfectly rational behaviour. However, these religious costs are assumed to be imposed by the religious group on itself and not imposed from the outside, as in the case of the Sephardim expulsion. For those who placed a higher value on Jewish religious practice, the expulsion enhanced their cohesion

⁷ The human capital approach to religion (Iannaccone, 1995) prescribes that overall rates of conversion to and from a particular group should be lower the more nearly unique the group, as the Jews, for instance. For a critique of this approach, see Montgomery (1996).

⁸ Note that it was assumed in equation (2) that the decision to convert to Catholicism is independent of the confiscation process.

around their religion⁹. The Sephardims' passive and peaceful behavior during the expulsion is an example of the fact that religious belief can improve the ability to withstand major social stresses (see Stark *et al.*, 1996).

The demographic conditions can be combined in a single differential equation, as in Hartl and Mehlmann (1982, 1983), by assuming $x = C / J$. Thus, by introducing equation (2) into equations (1) and (3), we have:

$$\dot{x} = (n - (1 - \rho)\phi + \delta)x + \rho \quad (4)$$

Considering the fact that the confiscation differed among regions in Spain (Baer, 1971, p.435; Hillgarth, 1978, p.448), we assume that this was caused by different proportions of Catholics and Jews in each region (the variable x). Moreover, we assume that in regions with the highest x , the confiscation of the Sephardim wealth was smaller than in areas with lower x , given that the popular anger against Jews was decreasing with x . Another factor that affects the confiscation is the Jewish income (y). We assume that the richest Jews were less likely to leave the country since they would have lost a great part of their wealth given that the Crown had offered many facilities for their conversion¹⁰. So there is no reason to assume that confiscation was increasing with the Jewish income. Therefore we suppose the following confiscation function:

$$\phi = \phi(x, y), \quad \phi_x < 0, \quad \phi_y < 0, \quad \phi_{xx} > 0, \quad \phi_{yy} > 0, \quad \phi_{xy} = 0 \quad (5)$$

⁹ Obviously this affirmation has to be considered with caution. If religious persecution enhances the religious ties, it does not imply A PRIORI that it must be suggested as a way to guarantee religious fidelity!! The point is that given the established persecution, religion plays a fundamental role in minimising their effects A POSTERIORI.

¹⁰ This holds true for Don Abraham Seneor, the last Jewish court-appointed rabbi of Castile, and his son-in-law, R. Meir Melamed, which were baptized as Fernando Nuñez Coronel and Fernando Pérez Coronel with a great ceremony on June 15, 1492, (Baer, 1971, p.436).

Assume that Don Isaac Abravanel shares the same opinion as Shylock, the Jew from Shakespeare's *The Merchant of Venice* (1994), about coexistence with Christians. In Act 1, scene 3, Shylock says about Christians: "I will buy with you, sell with you, talk with you, walk with you, and so following, but I will not eat with you, drink with you, nor pray with you"¹¹ (p.249)¹². Then, as the leader of the Sephardim, Abravanel prefers to leave Spain, in order to keep his religion. Moreover, he has to maximize the social welfare (the function U) of the Jews by looking after their income (y)¹³:

$$\text{Max}_y \int_0^{\infty} U(y)e^{-rt} dt \quad (6)$$

where r denotes the Jews' rate of time preference, subject to the demographic effects of the expulsion, given by equation (4).

The Abravanel problem is one in which the religious decisions are taken as a restriction since the Jews have to make their religious decision first and the economic decision then follows, driven by Don Abravanel. This problem can therefore be regarded as a two stage maximisation process. In the first stage, the Jews make their optimal religious choices. In the second stage, they decide how to tackle economically their choice¹⁴.

Substituting equation (5) into equation (4) and maximizing (6) subject to equation (4), given the initial value of x , $x(0)$, the current value Hamiltonian follows:

¹¹ Such behaviour is termed by Weber (1983, p.131) as the "universal dualism of internal and external morality of the Jews".

¹² It is curious to note that Don Isaac Abravanel died in Venice in 1508.

¹³ In a model of migration between home country and diaspora, Hercowitz and Pines (1997) assume a linear utility function in expected income.

¹⁴ The sequential nature of the Abravanel problem is justified by the role of the Sephardim leadership during the negotiations on the expulsion issues. Abravanel can only make economic decisions taking the religious decisions as previously determined by individual Jews. However, a full microeconomic model would have to explain the conversion decision that was assumed to be exogenously given in equation (2).

$$H = U(y) + \lambda \{ [n - (1 - \rho)\phi(x, y) + \delta]x + \rho \}$$

where λ is the costate variable. The first order conditions are:

$$H_y = 0 \Rightarrow U_y - \lambda(1 - \rho)\phi_y x = 0 \quad (7)$$

$$\dot{\lambda} - r\lambda = -H_x \Rightarrow \dot{\lambda} = \lambda[r - n + (1 - \rho)\phi(x, y) - \delta + x(1 - \rho)\phi_x] \quad (8)$$

$$\lim_{t \rightarrow \infty} x\lambda e^{-rt} = 0 \quad (9)$$

In order to analytically solve the model we assume the following format for the confiscation function:

$$\phi(x, y) = \frac{1}{x} + \frac{1}{y} \quad (10)$$

Substituting (10) into (4) yields:

$$\dot{x} = \left[n - (1 - \rho) \left(\frac{1}{x} + \frac{1}{y} \right) + \delta \right] x + \rho \quad (4')$$

We also assume a constant intertemporal elasticity of substitution (CIES) utility function:

$$U(y) = \frac{(y^{1-\gamma} - 1)}{1 - \gamma},$$

where $-\gamma$ is the elasticity of marginal utility. Higher values of γ indicate that Jews have a strong preference for smoothing their income over time, shifting their income from the future to the present.

Differentiating (7) with respect to time and using (8), (4') and the CIES function, we obtain the differential equation for the control variable y :

$$\dot{y} = \frac{y}{2-\gamma} \left[r - \frac{(1-2\rho)}{x} \right] \quad (11)$$

The dynamic system formed by equations (4') and (11) gives us the demographic, religious and economic characteristics of the Sephardim diaspora which are synthesized in Figure 1.

<<Figure 1 about here>>

Figure 1 shows that the optimal path to be followed by the Sephardim community is to leave the country up to x^* (see Appendix for the derivation of the saddle-point path). Given the initial condition $x(0) = C(0)/J(0)$, x increases to x^* . Notice that $C(0) < C^*$ and $J(0) > J^*$, therefore, $x(0) < x^*$. In order to follow the optimal migration path, Don Isaac Abravanel controls the Sephardim income. The Jewish income jumps initially from its initial level, $y(0)$, to \bar{y} and after joining the optimal path, decreases monotonically to y^* . Solutions outside the stable saddle path do not satisfy the optimal conditions above.

We must stress that the equilibrium (x^*, y^*) vanishes if $\rho \geq 0.5$ and $r \geq n + \delta$ ¹⁵. This demonstrates just how fragile is the demographic-religious-macroeconomic equilibrium obtained. If the Sephardim rate of discount (r) or their rate of conversion to Catholicism (ρ) are high enough, they can generate an explosive solution to the problem, in which case the income and population of the Sephardim community disappears. Therefore, the model predicts that the majority of the Sephardim population fled Spain soon after the expulsion (in accordance with historians such as Vicens Vives, 1969 and Edwards, 1991), and their final income, given the confiscation process, was below their initial income.

¹⁵ Note that the condition $\gamma < 2$ is generally expected. However, Barro and Sala-i-Martin (1995, p.83) assume in numerical simulations for modern growth processes that $\gamma = 3$ (in their notation $\theta = \gamma$).

3. Inflation, Inquisition and Spanish Growth

As the main part of the Sephardim wealth was converted into letters of exchange, the study of the effect of their depreciation is valuable. Depreciation is captured by the role of inflation. Inflation decreases the real interest rate paid by the letters of exchange. Thus, an augmentation in the rate of inflation increases the confiscation. In the model, inflation (π) can be introduced as an exogenous variable in the confiscation function:

$$\phi(x, y, \pi) = \frac{1}{x} + \frac{1}{y} + \alpha\pi(1 - \pi) \quad (10')$$

Solving the model with equation (10') in the place of equation (10) provides the same x^* and a modified y^* , which is given by:

$$y^* = \frac{(1 - \rho)}{-(1 - \rho)\alpha\pi(1 - \pi) + n + \delta - r}$$

The comparative-static analysis shows that an increase in the inflation rate decreases the optimal income of Jews ($dy^*/d\pi = \alpha(1 - 2\pi)y^{*2} < 0 \Leftrightarrow \pi > 0.5$), and does not affect the migration process, since the optimal population rate x^* does not change.

The impact of the Inquisition in our model can be addressed by assuming that the number of crypto-jews varies negatively with the number of Inquisition prosecutions (I) such that:

$$\delta = \delta(I), \quad \delta' < 0,$$

and that the rate of conversions of *Marranos* to Catholicism varies positively with I :

$$\rho = \rho(I), \quad \rho' > 0.$$

Thus an increase in Inquisition activities affects both x and y . It decreases x^* , ($dx^*/dI = -2\rho'/r < 0$), meaning that a greater number of Jews migrate. This result can be called the Torquemada effect¹⁶, since Jews fear to stay in Spain even assuming the Catholic faith. This explains the decision by the Catholic Kings, Ferdinand and Isabella, to exempt the *conversos* from the control of the Inquisition for a time. The final effect on y is indeterminate; Inquisitorial persecutions can increase or decrease the Jewish income depending on the marginal effect of the Inquisition on the rate of conversions of *Marranos* and crypto-jews.

The impact on the rate of growth of Spain is straightforward to examine. Note that, just before the expulsion, the total income of Spain was the summation of the income of Catholics (y_C) and Jews:

$$Y(0) = y_C + y(0)$$

At the end of the forced migration process, the total income of the country was the summation of the new income of Catholics and the income of the *Marranos*:

$$Y^* = y_C + \Delta y_C(\phi^*) + y(0) - y^*$$

where the second term on the right hand side represents the increase in the income of Catholics after the total confiscation.

Hence the Spanish rate of growth with the expulsion was:

$$\frac{\Delta Y}{Y(0)} = \frac{\Delta y_C(\phi^*) - y^*}{Y(0)}$$

¹⁶ Fray Thom s Torquemada (1420-1498) was the true organizer of the Spanish inquisition (Roth, 1996). At solicitation of the Spanish Majesties, the Pope Sixtus IV bestowed on Torquemada the office of grand inquisitor (see Blotzer, 1913).

This term is expected to be negative since the portion of the Jewish income that fled the country was greater than the marginal benefit of confiscation on the income of Catholics. The reasoning behind this result is that the Jewish population occupied strategic positions in administration, finance, trade and other jobs that required high human capital investment such as medicine and learning (Vicens Vives, 1969, p.177; Bravo, 1992, p.29; Suárez, 1992, pp.30-33; Kilsby, 1996, p.21; Davies, 1997, p.394). Therefore, there is a negative impact of migration on growth.

Notice, however, that an increase in the inflation rate is functional to the Spanish crown, since y^* diminishes and ϕ^* increases with inflation. Thus, a rise in the inflation rate can actually decrease the negative impact of the diaspora on the rate of growth of Spain. In short, inflation is positively related to growth in this model.

4. Conclusions

The model developed in this paper has demonstrated how the migration process of the Jews expelled from Spain in 1492 took place. We have blended religious, demographic and macroeconomic conditions to show that the majority of the Sephardim population fled the country, and their wealth was confiscated. The model provides four predictions: (i) the growth rate of Spain ought to fall after the migration; (ii) an increase in the inflation rate decreases the final income of the Jewish people; (iii) the government has an incentive to generate inflation since the negative impact of the diaspora in the growth rate is minimized; and (iv) reductions in Inquisition persecutions diminished the migration. The type of forced migration investigated here raises some important issues about the optimal behaviour of the

government¹⁷. In particular, our results suggest that governments should react to migration decisions to avoid the associated negative economic effects.

It should be noted that the model is general enough to be applied to other similar situations. The expulsion of Muslims (Moriscos) from Spain from 1609 to 1614 is one of them. It can also be modified to understand the forced conversion of the Jewish population in Portugal in 1497. Another set of problems for which the model can be used is concerned with the investigation of recent cases of forced migration (i.e., those driven by political forces, such as the recent episodes in Rwanda, and the expulsion of the Asian population from Uganda in 1972). An example is the Mariel boatlift. From May to September 1980, some 125,000 Cubans arrived in Miami. Card (1990), for example, has studied the impact of such migration process on the labour market in the arrival country. In contrast, the model in this paper has analysed the impact on the country that originated the migration process.

¹⁷ Veitch (1986) has explored the confiscations as a “self-enforcing” relationship between the king and his victims.

BIBLIOGRAPHY

- Ades, A.F. and E.L. Glaeser (1995) Trade circuses: explaining urban giants. *Quarterly Journal of Economics* 110, 195-227.
- Baer, Y. (1971) *A History of The Jews in Christian Spain*. The Jewish Publication Society of America, Philadelphia.
- Barro, R.J. and X. Sala-i-Martin (1995) *Economic Growth*. McGraw-Hill, New York.
- Barzel, Y. (1992) Confiscation by the ruler: the rise and fall of Jewish lending in the middle ages. *Journal of Law & Economics* 35, 1-13.
- Blanchard, O.J. and S. Fischer (1989) *Lectures on Macroeconomics*. MIT Press, Cambridge.
- Blotzer, J. (1913) Inquisition. In *The Catholic Encyclopedia*, The Encyclopedia Press, New York.
- Bravo, M.A.B. (1992) Estudio preliminar. In M.A.B.Bravo (ed.) *Diáspora Sefardí*, Editorial MAPRE, Madrid.
- Boxer, C.R. (1973) *The Portuguese Seaborne 1415-1825*. Pelican Books, New York.
- Card, D. (1990) The impact of the Mariel boatlift on the Miami labor market. *Industrial and Labor Relations Review* 43, 245-257.
- Cameron, R. (1993) *A Concise Economic History of the World*. Oxford University Press, Oxford.
- Davies, N. (1997) *Europe: A History*. Pimlico, London.
- Edwards, J. (1991) *The Jews in Christian Europe 1400-1700*. Routledge, London.
- Faria, J.R. and A.V. Mollick (1996) Urbanization, economic growth and welfare. *Economics Letters* 52, 109-115.
- Hartl, R. and A. Mehlmann (1982) The transylvanian problem of renewable resources, *Operations Research* 16, 379-390.
- Hartl, R. and A. Mehlmann (1983) Convex-concave utility function: optimal blood-consumption for vampires. *Applied Mathematical Modelling* 7, 83-88.
- Hartl, R., A. Mehlmann, and A. Novak (1992) Cycles of fear: periodic bloodsucking rates for vampires. *Journal of Optimization Theory and Applications* 75, 559-568.
- Hercowitz, Z. and D. Pines (1997) Migration between home country and diaspora: an economic analysis. *Journal of Public Economics* 65, 45-59.
- Hicks, J.R. (1969) *A Theory of Economic History*. Clarendon Press, Oxford.
- Hillgarth, J.N. (1978) *The Spanish Kingdoms: 1250-1516*. Clarendon Press, Oxford.

- Iannaccone, L.R. (1992) Sacrifice and stigma: reducing free-riding in cults, communes, and other collectives. *Journal of Political Economy* 100, 271-291.
- Iannaccone, L.R. (1995) Household production, human capital, and the economics of religion. In M. Tommasi and K. Ierulli (eds.) *The New Economics of Human Behavior*, Cambridge University Press, Cambridge.
- Kamen, H. (1983) *Spain 1469-1714*. Longman, London.
- Kaplan, Y. (1992) Los Sefardíes en Europa. In M.A.B. Bravo (ed.) *Diáspora Sefardí*, Editorial MAPFRE, Madrid.
- Kilsby, J. (1996) *Spain: Rise and Decline, 1474-1643*. Hodder & Stoughton, London.
- Lipiner, E. (1987) *Gaspar da Gama*. Nova Fronteira, Rio de Janeiro.
- Montgomery, J.D. (1996) Contemplations on the economic approach to religious behavior. *American Economic Review* 86, May, 443-447.
- Roth, C. (1996) *The Spanish Inquisition*. W.W. Norton & Company, London.
- Serebrenick, S. (1962) *Breve História dos Judeus no Brasil*. Edição Biblos, Rio de Janeiro.
- Shakespeare, W. (1994) The Merchant of Venice. In *Complete Works of William Shakespeare*, Harper Collins Publishers, Glasgow.
- Snower, D.J. (1982) Macroeconomic policy and the optimal destruction of Vampires. *Journal of Political Economy* 90, 647-655.
- Stark, R.; L.R. Iannaccone and R. Finke (1996) Religion, science and rationality. *American Economic Review* 86, May, 433-437.
- Suárez, L. (1992) *La Expulsion de los Judíos de España*. Editorial MAPFRE, Madrid.
- Vazquez de Prada, V. (1978) *Historia Economica y Social de España, Vol. III, Los Siglos XVI y XVII*. Conferderacion Española de Cajas de Ahorros, Madrid.
- Veitch, J.M. (1986) Repudiations and confiscations by the medieval state. *Journal of Economic History* 46, 31-36.
- Vicens Vives, J. (1969) *An Economic History of Spain*. Princeton University Press, Princeton.
- Weber, M. (1983) Religion and other factors in the development of modern capitalism. In S. Andreski (ed.) *Max Weber on Capitalism, Bureaucracy and Religion*, George Allen & Unwin, London.
- Yerushalmi, Y.H. (1981) *From Spain Court to Italian Ghetto*. University of Washington Press, Seattle.

APPENDIX

The steady state solutions of system (4') and (11), when $\dot{x} = \dot{y} = 0$, are:

$$x^* = \frac{1-2\rho}{r}$$

and

$$y^* = \frac{1-\rho}{n+\delta-r}$$

In order that $x^* > 0$, we must have $\rho < 0.5$, and for $y^* > 0$, we must have $n + \delta > r$.

The equilibrium point (x^*, y^*) is a saddle point since, from the following Jacobian matrix A :

$$A = \begin{bmatrix} \frac{\partial \dot{x}}{\partial x} & \frac{\partial \dot{x}}{\partial y} \\ \frac{\partial \dot{y}}{\partial x} & \frac{\partial \dot{y}}{\partial y} \end{bmatrix}_{(x^*, y^*)} = \begin{bmatrix} r & \frac{(1-2\rho)(n+\delta-r)^2}{r(1-\rho)} \\ \frac{(1-\rho)r^2}{(2-\gamma)(n+\delta-r)(1-2\rho)} & 0 \end{bmatrix}$$

we can see that:

$$\det(A) = -\left(\frac{(n+\delta-r)r}{2-\gamma}\right) < 0$$

$$\text{tr}(A) = r > 0$$

FIGURE 1

