Escape From Traditions Toward The Fertility Transition

First Draft

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Abstract:

We propose an economic and cultural explanation for the decline of human fertility during the demographic transition. We show that some transformations in the economic and/or cultural structure of a society can imply a fertility transition, that is to say a transition from a traditional high births rate regime to a modern low births rate regime. Furthermore the cultural structure of the population is not exogenous. It is the result of an endogenous cultural evolution mechanism. That mechanism could explain the fact that, at least for France and Great Britain, the fertility rates begun to fall before the mortality rates; it can still explain the actual persistence of high fertility rates in some Sub-Saharan African countries. Furthermore we will demonstrate that cultural heterogeneity is persistent in the long run.

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1 Introduction

We propose an economic and cultural explanation for the decline of human fertility during the demographic transition. We show that some transformations in the economic and/or cultural structure of a society can imply a fertility transition, that is to say a transition from a traditional high births rate regime to a modern low births rate regime.

Explaining the fertility transition is not a novel topic Economists and demographers provided some relevant theories in this field. From an economic viewpoint, we distinguish two main explanations. Firstly, the beckerian costs advantages analysis shows that a change in the relative cost and/or efficiency of education (quality) and child rearing (quantity) can provoke a trade-off between quantity and quality of children desired by parents. Secondly a risk analysis of fertility behaviors demonstrates that the children mortality variations can explain the fertility variations by a risk effect: according to Sah [1991] and Kalemli-Ozcan [2002], the more likely children are to die, the more children parents decide to give birth in order to ensure themselves a minimum success in their reproductive activity.

Demographers discovered some other ways of explanation. One of the most important from our point of view is the influence of culture and traditions on fertility choices. People belong to some cultural groups that embody specific norms and traditions directly affecting their economic behaviors. That impact has been highlighted by demographic and econometric studies.

Demographic studies in Sub-Saharan Africa establish that identical family planning programs and public health policies have very heterogenous results given the populations studied. Mekonnen and Mekonnen [2002] show that rural Ethiopian women use significantly less maternal health services than urban women because they are more readily influenced by

traditional practices that are contrary to modern health care. Furthermore they find that religion has emerged as an important predictor of antenatal care utilization in rural Ethiopia what is consistent with the works of Addai [1998] and Mekonnen [1998].

Economists recently explored that phenomenon with econometric studies that directly analyze the impact of traditions and religion (which are considered as good proxies for culture) on economic performance and sometimes especially on fertility behaviors[2]. From a microeconomic viewpoint, Hacker [1999] shows that the degree of catholic conservatism (measured by a dummy variable indicating wether individual belong yo special religious groups such as Congregationalists, Universalists, Lutherans...) is a good proxy for religion sentiment of the nineteenth century American native white woman. They find that this proxy have a significant effect on the women's fertility: more conservatism implies a higher total fertility rate.

Antecol [2000] and Guiliano [2004] attempt to show that European immigrants to the United States tend to adopt the same familial and economic behavior as their parents. Fernandez and Fogli [2005] show that culture is important to two economic outcomes that are relevant for our model: female work and fertility. They observe the economic behavior of immigrants to the United States during the second half of the twentieth century. They consider the expected female labor force participation and their total fertility rate, for the year 1950 in the immigrant's country of origin, as a good proxy for culture because it reflects their country cultural attitude toward women's labor and fertility. They find that the cultural proxy is an economically and statistically significant variable to explain women labor force participation and their total fertility rate. This effect remains robust after controlling for the bias of unobservable human capital differences and network quality heterogeneity.

[2]Note that in a macroeconomic perspective Max Weber paved the way with his "The Protestant Ethic and the Spirit of Capitalism". Barro and Mc Cleary [2002] find that economic growth responds positively to the extent of some religious beliefs but negatively to church attendance in an international panel of countries.

On the basis of that evidence, we propose a model where people are culturally heterogeneous in the sense that they can belong to a traditional culture (not especially a religion) characterized by a high birth rate norm or to a modern culture (not especially the occidental one) characterized by a low birth rate norm. We construct utility functions that make a deviation from the fertility cultural norm of the group costly.

Furthermore the cultural structure of the population is not exogenous. It is the result of an endogenous cultural evolution mechanism. To obtain such a mechanism, we need to use the theory of endogenous preference formation, which offers a lot of formalization possibilities. We choose to follow the line of Bisin and Verdier [2001] where preferences are constructed through some socialization mechanisms that we will specify in what follows.

Parents exhibit a paternalistic altruism (imperfect empathy), that is to say they value their children future behavior through the filter of their own preferences, then they prefer that their children adopt the same cultural trait as their own. Two types of socialization mechanisms coexist. Firstly, the vertical socialization allows parents to invest some resources in order to socialize their children to their own trait. Secondly, if parents do not succeed with vertical socialization, a process of oblique socialization appears and this process differs from Bisin Verdier's in the sense that it is composed of two stages. In the first stage the child has a positive exogenous probability to adopt the opposite trait to her parents' one. This probability represents the "degree of influence" exerted by the parent's adverse culture and it can be driven for example by schools, media, national religion, which promote the opposite culture. Finally, if at the end of the first stage, the child is still not socialized, she will be randomly matched with an agent in the society and adopt her trait.

In this framework we will demonstrate that cultural heterogeneity is persistent in the long run and a variation in the relative degree of influence between the two cultures is

likely to induce a fertility transition in the economy. Such a mechanism is observed in rural traditional high births rate societies (often Muslim) where cable TV is introduced. This introduction frequently provokes a significant decline in the local total fertility rate. Hornick and Mcanany [2002] explain that phenomenon by the sudden and intensive exposure to the occidental culture that promotes woman emancipation and low birth rate norms. Grupta and Kahn [1996] study the high rate of adolescent childbearing in India and they find that this rate significantly decreases with the degree of exposure to the media. They argue that media improve adolescents exposure to family planning in the districts concerned (Uttar Pradesh). Our model is capable of capturing this kind of mechanism if we reasonably consider that the change of the exposure degree to the media describes a change in the degree of influence of the modern culture.

The rest of the paper is organized as follows: in the first section we describe the structure of the economy and the microeconomic behavior of the heterogenous agents in the population. In the second section we analyze the cultural and demographic dynamics of the economy, which allows us to obtain a fertility transition when there is a rise in the relative influence of the modern culture. Finally we will discuss the realism of our results and conclude.

2 Description of the economy and microeconomic behaviors

2.1 The Economy Model

We consider an overlapping generation economy where there are L_t agents who live for two periods. In the first period they are children, they only receive education from their parent and do not consume. In the second period they are adult, they decide the optimal level

of their consumption C_t, the number of their children N_t and their education e_t (which is understood as the socialization effort we will defined in the next section). Family are monoparental in order to simplify our results. Childbearing will be costly, every child implies a cost ϕ. The education cost is noted $\gamma(q)$.

Agents are culturally heterogenous in the sense that they could belong to different cultural groups. We suppose that there exist two cultures in the economy. The first culture is called *traditional* and it is characterized by a high fertility norm $\overline{N}$. The second culture is called *modern* and it is characterized by a low fertility norm $\underline{N}$. In order to reflect the impact of culture on microeconomic behaviors, a deviation from the group fertility norm will be costly. We note q_t the proportion of modern agents at the period t, then $(1-q_t)$ represents the proportion of traditional agents at that date. Now we can interpret the fact that $\gamma'(q_t) < 0$, it captures an externality: more the parent's culture is in majority less education is costly. That can be analyzed as a network effect or a peer effect. As q_t is exogenous for each agent, this hypothesis will have no impact on our microeconomic results, it will have an impact just on the population dynamic.

In the line of Bisin Verdier [2001], parents are altruistic but with an imperfect empathy. They have a paternalistic altruism for their children, that is to say they value their children future behavior through the filter of their own preferences. In a formal way, we suppose that a modern parent who has a modern child receives a payoff noted V^{mm} and if she has a traditional child, she receives V^{mt}. A traditional parent who has a traditional child receives V^{tt} and if she has a modern child, she receives V^{tm}. Paternalistic altruism implies that $V^{mm} > V^{mt}$ and that $V^{tt} > V^{tm}$.

The cultural trait a child will adopt is not exogenously determined, it is the result of a socialization process where parent's education choices are crucial. In a first stage, parent try

to directly socialize her child (vertical socialization) to her own culture through education. That education spending influences positively the child probability to adopt her parent's trait.

For the modern parent, that probability is noted $\tau\left(e_t^m\right)$ such that $\tau'\left(e_t^m\right) > 0$, $\tau''\left(e_t^m\right) < 0$ and $\lim_{e_t^m \to \infty} \tau\left(e_t^m\right) = 1$. If vertical socialization does not succeed, a stage of oblique socialization appears. In the first part of this stage, the child has an exogenous probability $\eta \in [0,1]$ to adopt the traditional culture, η represents the traditional degree of influence on the modern socialization mechanism. If after this stage the child is still not socialized, she will be randomly matched with an agent in the society, then she will adopt the modern trait with probability q_t and the traditional trait with probability $1-q_t$. Now we can write the transition probabilities emerging from the modern socialization mechanism,P^{mm} and P^{mt} respectively designing the probability for a child who have a modern parent to adopt the modern culture and the probability for a child who have a modern parent to adopt the traditional culture such that:

$$\begin{aligned} P^{mm} &= (1-\eta)\, q_t + \tau\left(e_t^m\right) \cdot \left[1 - (1-\eta)\, q_t\right] \\ P^{mt} &= \left[1 - \tau\left(e_t^m\right)\right] \cdot \left[1 - (1-\eta)\, q_t\right] \end{aligned}$$

Symmetrically, a traditional parent invests e_t^t in education, the success probability of vertical socialization is noted $\widetilde{\tau}\left(e_t^t\right)$ such that $\widetilde{\tau}'\left(e_t^t\right) > 0$ and $\widetilde{\tau}''\left(e_t^t\right) < 0$ and $\lim_{e_t^t \to \infty} \widetilde{\tau}\left(e_t^t\right) = 1$. During the first stage of oblique socialization, the child has a probability $\pi \in [0,1]$ to become modern, π representing the modern degree of influence on the traditional socialization mechanism. If the child is still not socialized, the random matching implies a probability q_t to become modern and $(1-q_t)$ to become traditional. If we note P^{tt} and P^{tm} respectively the probabilities for a child who have a traditional parent to adopt the traditional culture and the probability for a child who have a traditional parent to adopt the modern culture,

it follows that:

$$\begin{aligned} P^{tt} &= (1-\pi)(1-q_t) + \widetilde{\tau}\left(e_t^t\right) \cdot [\pi + (1-\pi) q_t] \\ P^{tm} &= \left[1 - \widetilde{\tau}\left(e_t^t\right)\right] \cdot [\pi + (1-\pi) q_t] \end{aligned}$$

Then, with these transition probabilities, we can write the dynamic of traits in the population, that is to say the cultural dynamic. We note $\dot{q}_t$ the growth rate of the modern proportion into the population, note that our model uses discrete time notations, then $\dot{q}_t$ is just equal to $\dfrac{q_{t+1} - q_t}{q_t}$. It is straightforward to obtain:

$$\dot{q}_t = \frac{q_t N_t^m \left(1 - q_t - P^{mt}\right) - (1-q_t) N_t^t \left(q_t - P^{tm}\right)}{q_t N_t^m + (1-q_t) N_t^t} \tag{1}$$

Note that N_t^m and N_t^t represent respectively the fertility behavior of modern and traditional parents. Then the parents microeconomic choices are crucial to our cultural and demographic transition that is described by $\dot{L}_t$ such that:

$$\dot{L}_t = q_t N_t^m + (1-q_t) N_t^t - 1 \tag{2}$$

2.2 Microeconomic Choices

On the basis of our previous hypothesis, we can write the maximization program of a modern parent born at period $(t-1)$:

$$\begin{cases} \underset{C_t, N_t^m, e_t^m}{Max}\ W_t^m\left(C_t^m, N_t^m, e_t^m\right) = u^m\left(C_t^m\right) - \frac{1}{2}\alpha^m\left(N_t^m - \overline{N}\right)^2 + P^{mm}V^{mm} + P^{mt}V^{mt} \\ \qquad (st) \qquad w_t = C_t + \phi N_t^m + \gamma\left(q_t\right) e_t^m \\ \qquad\qquad P^{mm} = (1-\eta) q_t + \tau\left(e_t^m\right) \cdot [1 - (1-\eta) q_t] \\ \qquad\qquad P^{mt} = [1 - \tau\left(e_t^m\right)] \cdot [1 - (1-\eta) q_t] \end{cases}$$

α^m represents the intensity of the pressure exerted by the norm $\overline{N}$ into the modern group. We suppose that preferences are additively separable and that the budget constraint is linear in order to obtain simple results without an important loss of generality[3]. We specify the technology existing in the vertical socialization mechanism as $\tau\left(e_t^m\right) = \left(e_t^m\right)^\beta$ and the utility of consumption $u^m\left(C_t^m\right) = A^m C_t^m$, then we have the following results[4]:

$$N_t^m = \overline{N} - \frac{\phi A^m}{\alpha^m} \tag{3}$$

$$e_t^m = \left(\frac{\beta\left[1-(1-\eta)\,q_t\right]\Delta V^m}{\gamma\left(q\right)A^m}\right)^{\frac{1}{1-\beta}} \tag{4}$$

where $\Delta V^m = V^{mm} - V^{mt} > 0$. It represents the degree of intolerance of the modern parent, the hypothesis of paternalistic altruism implying that:
$V^{mm} = E_t\left[u^m\left(C_{t+1}^m\right) - \frac{1}{2}\alpha^m\left(N_{t+1}^m - \overline{N}\right)^2\right]$ and $V^{mt} = E_t\left[u^m\left(C_{t+1}^t\right) - \frac{1}{2}\alpha^m\left(N_{t+1}^t - \overline{N}\right)^2\right]$.

A simple comparative statics analysis shows that our results have some good properties. The optimal fertility choice of a modern parent increases with the norm: the highest the normal number and the deviation sanction are, the more numerous the modern births are. The preference for consumption and the childbearing cost have a negative impact on the optimal parent's fertility. The optimal education level is logically decreasing with the consumption preference and education costs and a increasing with the degree of the modern parent's intolerance: the more intolerant the parent is, the more she educates her children to enhance her chances not to have traditional children.

The impact of q_t on e_t^m is not clear because two contrary effects are in balanced. The positive effect comes from the fact that vertical and oblique socialization mechanisms are

[3]Non separability in utility and non linearity in budget constraint would have imply a non concavity of the problem. For the treatment of this kind of maximisation programs, see Baudin [2005].

[4]The linear formulation of the consumption utility suppresses all income effect, which is a strong simplification. However, with a more realistic specification, the income effects would not have dominate the substitution effects by hypothesis in order to keep good comparative static properties.

substitute. The higher the proportion of modern is, the more the children of modern parents will have chances to be matched with a modern agent when vertical socialization has failed; then the less parents educate (socialize) their children. The negative effect comes from the peer effect or network effect, there exists an externality that decreases the cost of education when the proportion of modern increases. That non monotonic influence of q_t on education choices could provoke the existence of multiple steady states in the cultural and demographic dynamics.

In a symmetric way, we can write the maximization program of a traditional agent:

$$\begin{cases} \underset{C_t, N_t^m, e_t^m}{Max} W_t^t\left(C_t^t, N_t^t, e_t^t\right) = u^t\left(C_t^t\right) - \frac{1}{2}\alpha^t\left(N_t^t - \underline{N}\right)^2 + P^{tt}V^{tt} + P^{tm}V^{tm} \\ \qquad (st) \qquad w_t = C_t^t + \phi N_t^t + \widetilde{\gamma}\left(q_t\right)e_t^t \\ \qquad\qquad\quad P^{tt} = \left(1-\pi\right)\left(1-q_t\right) + \widetilde{\tau}\left(e_t^t\right)\cdot\left[\pi + \left(1-\pi\right)q_t\right] \\ \qquad\qquad\quad P^{tm} = \left[1 - \widetilde{\tau}\left(e_t^t\right)\right]\cdot\left[\pi + \left(1-\pi\right)q_t\right] \end{cases}$$

Where $\widetilde{\gamma}\left(q_t\right)$ represents the cost of traditional socialization effort, which exhibits a network externality too. Then we have: $\widetilde{\gamma}'\left(q_t\right) > 0$. α^t represents the intensity of the pressure exerted by the norm $\underline{N}$ into the traditional group, we suppose that $\widetilde{\tau}\left(e_t^t\right) = \left(e_t^t\right)^\sigma$ and $u^t\left(C_t^t\right) = A^t C_t^t$. Then we obtain the following results:

$$N_t^t = \underline{N} - \frac{\phi A^t}{\alpha^t} \tag{5}$$

$$e_t^t = \left(\frac{\sigma\left[\pi + \left(1-\pi\right)q_t\right]\Delta V^t}{\widetilde{\gamma}\left(q_t\right)A^t}\right)^{\frac{1}{1-\sigma}} \tag{6}$$

All the comparative statics results we obtained for the modern parent's behavior are symmetrically valid for the traditional parent's behavior. Note that $N_t^t - N_t^m > 0$ when no special assumption is made about A^t, A^m, α^t and α^m, that is to say if we do not consider that the modern parents have a consumption preference largely higher than the traditional

parents; and that traditional culture exerts a significantly lowest pressure on its members. Those hypothesis seem to be reasonable. On the basis of those results, we are able to calculate the cultural and demographic dynamics of the economy.

2.3 Cultural and Demographic Dynamics

2.4 Analytical Results

The distribution dynamic of traits into the population is given by equations (1), (5), (6), (3), and (4). After simplifications, it can be written as follows:

$$\begin{aligned} \dot{q} &= \frac{q_t\left(N_t^m - N_t^t\right) - q_t^2\left(N_t^m - N_t^t\right) - \Psi\left(q_t\right) + \Xi\left(q_t\right)}{q_t N_t^m + \left(1 - q_t\right) N_t^t} \\ with \quad \Psi &= q_t N_t^m \left[1 - \left(1 - \eta\right) q_t\right] \left[1 - \left(\frac{\beta\left[1 - \left(1 - \eta\right) q_t\right] \Delta V^m}{\gamma\left(q_t\right) A^m}\right)^{\frac{\beta}{1-\beta}}\right] \\ and \quad \Xi &= \left(1 - q_t\right) N_t^t \left[\left(\pi + \left(1 - \pi\right) q_t\right)\right] \left[1 - \left(\frac{\sigma\left[\pi + \left(1 - \pi\right) q_t\right] \Delta V^t}{\widetilde{\gamma}\left(q_t\right) A^t}\right)^{\frac{\sigma}{1-\sigma}}\right] \end{aligned} \tag{7}$$

This dynamic is highly non linear and no analytic solution can be found but some interesting properties. $\left.\frac{d\dot{q}}{dq}\right|_{q=0} > 0$

Proposition 1 *Cultural heterogeneity will be persistent in the long run.*

Proof. We have to verify that $\dot{q}$ is continuous on $q \in [0,1]$. A set of necessary and sufficient conditions is that

$$\lim_{q_t \to 1} \gamma\left(q\right) > 0 \ , \ \lim_{q_t \to 0} \widetilde{\gamma}\left(q_t\right) > 0 \text{ and } \frac{N_t^m}{N_t^t} \neq -\frac{1 - q_t}{q_t}$$

This three conditions are satisfied by hypothesis.

Now we can see that $\dot{q}\Big|_{q=0} > 0$ and that $\dot{q}\Big|_{q=1} < 0$, then there exists at least one stable interior steady state and there exist an impair number of interior steady states. ■

The population dynamic will crucially depend on the cultural dynamic, which can not be analytically solved, then we propose a numerical exercise.

2.5 Numerical Results

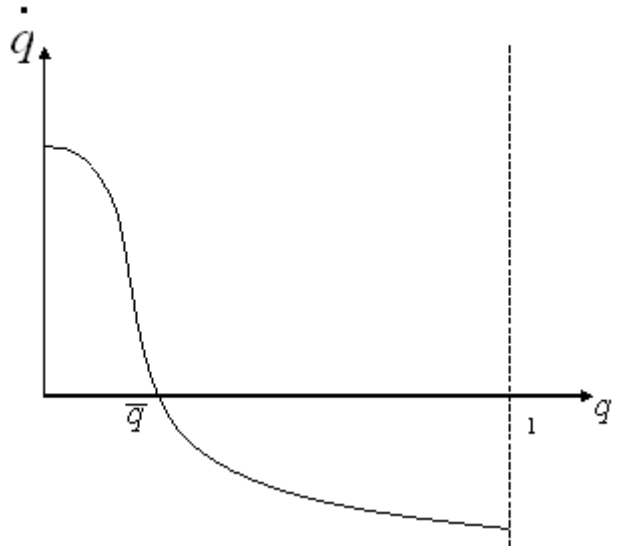
As mentioned in the previous sub section, the number of steady states crucially depends on the values attributed to our parameters. We finally find that, for some realistic values of those parameters[5], a unique stable steady state exists such that cultural heterogeneity never disappear from the economy.

We choose the very relevant parameters of the model and reformulate equation (**??**) as follows:

$$\dot{q} = 0 \iff q = \overline{q} \equiv \Gamma\left(\beta, \sigma, \eta, \pi, \Delta V^m, \Delta V^t\right)$$

Numerical calculations shows that unambiguously, $\frac{d\overline{q}}{d\eta} = \Gamma'_{\eta} < 0$ and $\frac{d\overline{q}}{d\pi} = \Gamma'_{\pi} > 0$; $\frac{d\overline{q}}{d\Delta V^t} = \Gamma'_{\Delta V^t} < 0$ and $\frac{d\overline{q}}{d\Delta V^m} = \Gamma'_{\Delta V^m} > 0$; $\frac{d\overline{q}}{d\sigma} = \Gamma'_{\sigma} < 0$ and $\frac{d\overline{q}}{d\beta} = \Gamma'_{\beta} > 0$. Those comparative statics results are encouraging because they have the properties we wish.

[5] See appendix for the details of the calibration.



We can see that, *ceteris paribus*, a variation in the relative degree of influence of modern culture implies an increase in $\overline{q}$: more the modern culture is influent and more, in the long run, the proportion of modern agents will be high. In the same way, the highest the relative efficiency of the modern vertical socialization mechanism $\left(\frac{\beta}{\sigma}\right)$ is, the highest $\overline{q}$. All these results are in the line of our empirical findings in the introduction, we can now establish some stylized results.

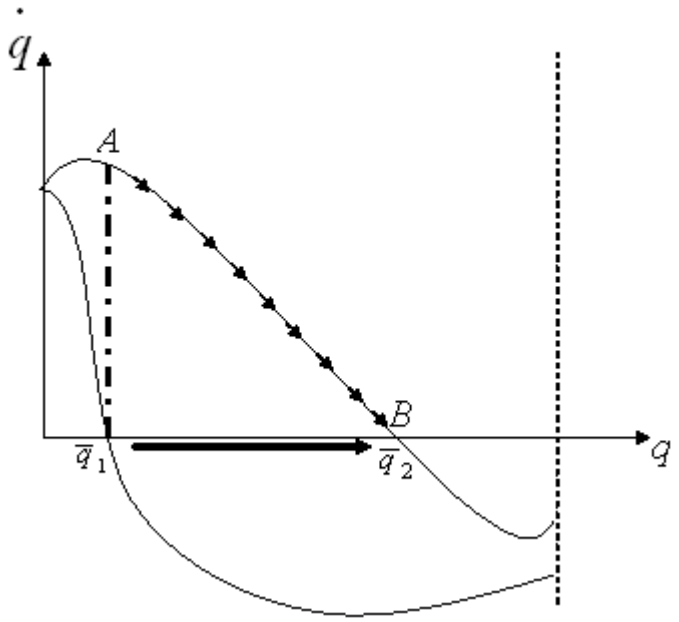
3 Scenario for a fertility transition decline

We define the fertility transition as a transition from a high births rate steady state to a low births rate steady state. Our model can generate such a phenomenon through a significant change in the relative rate of culture's cross-influence. We use a calibration relatively different from the previous one in the sense that we give an initial advantage to the traditional culture: $\underline{N}$ is still superior to $\overline{N}$, and the rate of penetration of the traditional culture into the modern socialization process is very large whereas the modern degree of influence is very small. We choose the following calibration, all other parameters have not change: $\eta = 0.1$ and $\pi = 0.9$

Such a calibration gives two advantages to the traditional culture, a higher fertility rate and a more efficient mechanism of culture diffusion. We unambiguously find that $\overline{q}$ is very low; the modern culture does not disappear because its degree of influence remains positive such that, by the law of large numbers, there will always exist some traditional children that will become modern.

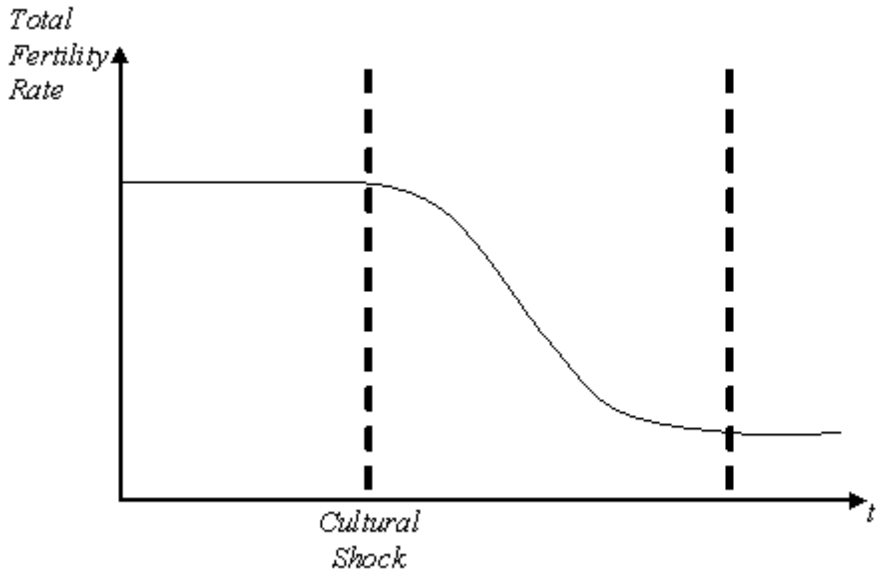
Now we suppose that a cultural shock arises in the economy, the relative degree of the two cultures influences become: $\eta = 0.9$ and $\pi = 0.1$. In the line of our analytical results, we know that such a change would have an ambiguous effect. In fact, *ceteris paribus*, more traditional children become modern because of the highest influence that the modern culture exerts on them, and less less modern children become traditional because of the lowest influence that the traditional culture exerts on them. However parents will react to this change. The lowest the traditional culture is influent, the lowest the modern parents vertically socialize their children because the risk of traditional culture adoption has decreased. In the same way, facing the rise of modern culture influence, traditional parents improve their vertical socialization effort. The net impact can only be calculated by numerical methods. Unambiguously we find a large increase in $\overline{q}$. That result appears as logical in the sense that, to obtain the reverse result, the elasticities of socialization efforts to the influence degree of the external culture, have to be largely higher than one, what is contrary to our hypothesis in the numerical exercise.

We obtain the following graphical results:



Before the cultural shock, the economy is characterized by a high fertility rate steady state where the traditional population is largely in majority. After the shock, the steady state moves from $\overline{q}_1$ to $\overline{q}_2$. Economy is now located at point A where $\dot{q}$ is positive, it follows the new cultural trajectory to attain the new steady state at point B. The transition from point A to point B is called "cultural transition" in the sense that the majority culture has changed.

Following equation (2), since $\frac{d\dot{L}}{dq} < 0$, a fertility transition appears. The modern are becoming in majority and then their low fertility rate norm implies a significant decrease in the average fertility rate of the total population. Then the fertility growth rate tends to decreases such that:



Note that the previous total fertility rate was $\overline{q}_1\left(\overline{N}-\frac{\phi A^m}{\alpha^m}\right)+(1-\overline{q}_1)\left(\underline{N}-\frac{\phi A^t}{\alpha^t}\right)$, the new one is equal to $\overline{q}_2\left(\overline{N}-\frac{\phi A^m}{\alpha^m}\right)+(1-\overline{q}_2)\left(\underline{N}-\frac{\phi A^t}{\alpha^t}\right)$ which is lower.

4 Discussion and Conclusion

We propose to explain the fertility transition by a mechanism of cultural evolution, a variation in the relative degree of influence exerted by a low births rate culture can provoke such a phenomenon. We obtain that result with a very stylized model in the line of Bisin and Verdier. It has the advantage to propose an endogenous evolution of the preferences through a culture adoption choice affected by a particular socialization mechanism.

That mechanism could explain the fact that, at least for France and Great Britain (data from Doepke [2004]), the fertility rates begin to fall before the mortality rate. Such situations do not exist today because developed countries export the basic needs of vaccination and hygiene in the developing countries that did not experience a cultural transition in term of fertility behaviors. This is confirmed by studies on the Sub-Saharan fertility rates. Countries like Cameroon, Uganda and Senegal do not really complete their demographic transition

because of the persistence of cultural barriers. The problem of AIDS in the developing countries is another side of the blocked demographic transition problem. Moral norms and traditions seem to condemn people who are infected and the mortality rates are dramatically increasing.

Explaining the fertility transition by a culture transition is clearly a complementary way to the existing theories. We are convinced that economic and cultural variables are closely linked: no fertility and demographic transition can occur if one of those two variables do not evolve. That is why we only consider this paper as a first step, and in future work we will try to construct a more realistic model that can explain the joint evolution of demographic, cultural and economic variables through the path of development.

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