Preliminary version

The New Views on Demographic Transition:
A Reassessment of Malthus and Marx s views on Population

Elise S. Brezis
Department of Economics,
Bar-Ilan University,
Ramat-Gan, Israel
fax: 972-3-5353180;
e-mail: brezie@mail.biu.ac.il.

Warren Young
Department of Economics,
Bar-Ilan University,
Ramat-Gan, Israel
fax: 972-3-5353180;
e-mail: youngw@mail.biu.ac.il

.

Paper to be presented at the conference Old and New Growth Theories: An Assessment , Pisa.

Introduction

Demographic transition and Malthusian growth have started to become the focus of interest amongst scholars doing research on the theory of growth. Papers in economic growth that have explicitly related demographic transition and growth are Becker et al. (1990), Galor and Weil (1996, 2000) and Dahan and Tsiddon (1998)[1]. In all these models education, human capital, and altruism play a preponderant role in decisions about fertility. These models are based on Malthus s theory regarding fertility rate and growth.

Recently, an alternate approach has been developed to the factors that may explain demographic transition. Brezis (2001) shows that the interaction between different social classes can be an alternative means by which to understanding the demographic transition that took place in the 19th century. Her model fits descriptive writings of the period, and especially those of Karl Marx, for whom the main elements of economic and social behavior, at the time were: Capital, Social Classes and the Labor Market. These three elements may provide an explanation for the observed patterns of fertility rates and industrialization.

The purpose of this paper is to focus on the different elements presented in Marx and Malthus and show that their divergence of views lead today to two different ways of modeling demographic transition. This paper will mainly focus on the divergence of views of these two thinkers regarding the family and the labor market. It will also be linked to the notion of altruism inside the family, and show that over time there was a different perception regarding the place of children in the family. Indeed in the 19th century, Marx considered children a necessity for survival; they were an *investment/production* good. More precisely, the Marxian view suggests that the proletarianization of the workforce (a term coined by Tilly) brings on a fertility increase, since the working masses attempt to accumulate the one factor of production they do control - labor power.[2]

---

[1] See Morand (1999) as well.

[2] proletarianization is the shift from self-employment with control over means of production to working for others.

In contrast to this, Malthus perceived children as a consequence of *the laws of nature*, an approach on which models of fertility (starting with the works of Becker, 1960, 1988, 1990) have based altruism. These models assert that children are a *consumption* good. In this paper we will analyze the debate between these two lines of reasoning by means of a formal model which differentiates between the two views. In section 2 and 3 of the paper, we present Malthus s and Marx s views respectively in section 4, we present the alternate models that emanate from their respective views. In section 5, we present some historical facts, and in section 6 we provide some conclusions regarding the efficacy of the models as explanations of the historical data presented in the paper.

II. Malthus s Principles

Before describing the views of Malthus (1766-1834), one has to recall that he held what was in effect the first chair of Political Economy in England (at Haileybury) to which he was appointed due to his insights on questions of mortality, fertility and population increase. Furthermore, his work on the principle of population also led to the whole subject of demographic research. However, his point of view on wages and the Poor Law is more problematic, and some of his remarks on the poor led Marx to write: The people were confronted not with a man of science but with a bought advocate, a pleader on behalf of their enemies, a shameless sycophant of the ruling classes . (see Flew, 1970, p.52)

1. Malthus s View on the Principle of Population

Malthus s view of population is based on the assumption that human behavior is driven by nature, and men will have as many children as nature gives them the possibility to sustain. Indeed, Malthus demographic theory regarding the equilibrium between fertility and mortality rates, is based on his basic philosophy regarding human beings which he termed the general laws of nature . Malthus maintained that there is no reason whatever to suppose that anything besides the difficulty of procuring in adequate plenty the necessaries of life should either indispose this

greater number of persons to marry early or disable them from rearing in health large families . (Malthus, 1970, pp. 242-5.) His theory was succinctly presented by Flew (1970, p. 47):

> since population tends to press to the limit of available subsistence; since the power of production is beyond all comparison weaker than the power of reproduction; and since the equilibrium between population and resources can be maintained only by the constant operation of various checks, all of which are kind of either vice or misery, then population will always grow until there is enough misery or enough vice or more likely a sufficient mixture of both to achieve equilibrium.

In other words, since population, if not checked , will increase by more than food production, there will be a problem. When the population of a nation reaches the frontier of its food production possibilities, there are only two ways to maintain equilibrium: either positive checks or preventive checks or both.

The preventive checks are all actions which reduce the fertility rate (late marriage, birth control), while the positive checks are those that increase the mortality rate (war and epidemics). If a country reduces the preventive checks (i.e., more marriage), in consequence the positive checks will increase (higher mortality) and vice-versa.

These checks can be also divided into three different categories: the checks of *vice*, of *misery* and of *moral restraint*. The positive checks are always either of misery (war, epidemic), or of vice (birth control, since Malthus was opposed to it and saw birth control as a vice), and the preventive checks are either of vice or through moral restraint, i.e., postponing marriage.

One cannot disregard the fact that Malthus s views presents a side which is pure theory-based, but concomitantly another which is based upon his own moral values. For Malthus, the only way of keeping population in equilibrium with the means of subsistence, and which is perfectly consistent with virtue and happiness, is moral restraint :

> The population which has arisen naturally from the fertility of the soil, and the encouragements to agriculture, may be considered as genuine and desirable; but all that has been added by the encouragement to marriage has not only been an addition of so much pure misery in itself, but has completely interrupted the happiness which the rest might enjoy (Malthus, 1970, p. 30).

2. Malthus s Views on Wages

As a corollary to his views on moral restraint for the workers, i.e. the poor , Malthus presented a theory regarding wages, unemployment and fertility that can be summarized as follows: An increase in wages (or in transfers) would:

1. Reduce their supply of labor.

2. Increase the demand for bread and meat leading to a price increase, but not to an increase in quantity purchased or supplied. In his words (ibid, pp.94-98):

> Suppose that by a subscription of the rich the 18 pence a day which men earn now was made up 5 shillings, it might be imagined that they would than be able to live comfortably and have a piece of meat every day for their dinners. But this would be a false conclusion The transfer of 3 shillings and 6 pence a day would not increase the quantity of meat in the country . Moreover it would make every man able to indulge himself in many hours or days of leisure And in a short time not only the nation would be poorer but the lower classes themselves would be much more distressed than when they received only 18 pence a day . I feel no doubt whatever that the parish laws of England have contributed to raise the price of provision and to lower the real price of labour.

3. Increase the fertility rate. Since the laws of nature are that workers will have as many children as possible, higher wages will lead to an increase in population. Therefore Malthus claimed that: The poor laws of England tend to depress the general conditions of the poor Their first tendency is to increase population without increasing the food for its support. A poor man may marry with little or no prospect of being able to support a family (ibid, p. 97).

Malthus s overall theory led him to express some strong political opinions regarding the poor laws: The evil is perhaps gone too far to be remedied, but I feel little doubt in my own mind that if the poor laws had never existed.. the aggregate mass of happiness among the common people would have been much greater than it is at present (ibid., p.101).

III. Marx s Views

The debate between Malthus and Marx was not only a polite debate over theories, but Engels and Marx were apoplectic. Their violent reactions went so far as to call him a sham philanthropist which produced the Malthusian population theory —the crudest, most barbarous theory that ever existed, a system of despair which struck down all those beautiful phrases about

love of neighbour and world citizenship It is an infamous theory, a revolting blasphemy against nature and mankind (pp.199-219).

1. Population

In order to understand the difference in their conception of demographic development, one must focus on the difference between the Marxian and Malthusian conception of human nature. As shown above, the main assumption of Malthus s theory is that the decisions of men are driven by nature. This was not the case for Marx and Engels: Marx and Engels did not contend that human reproduction was simply a function of the sex drive and the high birth rate of the laboring class was due to their inability to control this passion .(p.111).

For Marx, man controls nature: man therefore is able to control nature consciously and make his own history. It is this ability which allows him to produce beyond subsistence and which guarantees that he will not have subjected to the dilemma that Malthus has described (p.109).

Since, in Marx view, the decisions about fertility are related to the modes of production and also to social class, there should be a difference in family decisions between the bourgeois and the proletariat. He stresses that it is the economic differences between classes that lead to a difference in family behavior.

Regarding the bourgeoisie, children are a means for continuing the family business: On what foundation is the present family, the bourgeois family based? On capital, on private gain. In its completely developed form this family exists only among the bourgeoisie. .. The bourgeois sees in his wife a mere instrument of production (Marx and Engels, 1948, p.26). In other words, the capitalistic orientation of bourgeoisie will determine the optimal number of children, that are the legal heirs of the business.

For the proletariat, a social class without property, the worker s relation to his wife and children has not longer anything to do with bourgeois family relations. Instead it is formed by the dependence of all on the family s wage labor (ibid, p.111). As expressed by Marx: Previously, the workman sold his own labor power, which he disposed of nominally as a free agent. Now he sells wife and child. He has become a slave dealer (Marx, 1967, p.395).

2. Wages and Subsistence Level.

Marx did not accept the Ricardian and Malthusian iron law of wages , but instead believed that the problem originated on the supply side. An increase in population was in the interest of the elite as it increases the reserve army of labor and thus decreased wages.

Malthus s view that there are too many people relative to food production is irrelevant for Marx. For him: the quantity of grain available is completely irrelevant to the worker if he has no employment it is therefore the means of employment and not of subsistence which put him into the category of surplus population (Marx, 1973, p. 607).

IV. Malthusian and Marxian models of the family

Despite the difference of viewpoint between Malthus and Marx, there is something common in the way they look at the family. For both of them the overall decisions about fertility (decisions on restraining their reproductive power) are due only to economic reasons.

1. The Malthusian view as presented in Becker s and similar models

The Malthusian view has been modeled by Becker and recently by Galor, Weil, and Moav. Based on Malthus s views on the laws of nature, one has the maximum possible number of children given by the constraint of nature itself, and by using the preventive checks, so that the positive checks will not be effective.

Indeed, Becker considers his line of reasoning to be a continuation of that of Malthus:

> Malthus famous discussion was built upon a strongly economic framework; mine can be viewed as a generalization and development of his For most parents, children are a source of satisfaction.. Children would be considered a consumption good. ..I will try to show that the theory of demand for consumer durables is a useful framework in analyzing the demand for children (Becker, 1960, pp.209-211)

Later on his models incorporated altruism instead of the notion of consumption good: Our model is based on the assumption that parents are altruistic toward their children.. Parents are

altruistic toward children in the sense that the utility of parents depends positively on the utility of their children .(Becker, 1988)

However the use of the term altruism here is somehow problematic, since if one has altruistic feelings, then why does it includes only one s own children, and not those of others?. The way to explain altruism for children is to take the pure point of view of Malthus (which is clearly underlined in Galor and Moav). It is not a pure altruism *per-se* ,i.e., giving for an *alter huic*, but giving for the natural continuation of ourselves. Nonetheless the utility function that is maximized is: [3]

$$U_0 = v(C_o, n_0) + a(n_0)n_0.U_1 \quad . \qquad (1)$$

where $a(n_0)$ represents the degree of altruism. It means that the utility of each person depends on their own consumption, the number of children and their own utility of the child. They complete the model by specifying the budget constraint and by introducing a cost for having and raising children.

Galor and Weil (2000) have a specification slightly different from that of Becker:

$$U_0 = v(C_o, n_0 z_1) = c_0^{1-\gamma}(n_0 w_1 h_1)^{\gamma} \quad . \qquad (2)$$

In their model, the individual does not care about the consumption of his heirs but about their income, z ,which is equal to the wage per efficiency unit of labor (w) multiplied by the level of human capital of each child (h).[4]

The outcome of these models is that when income increases, the fertility rate will also increase. This model (as the one of Becker et al., 1990) also incorporates human capital. These models can describe the dynamics of demographic transition that took place in the 19th century. In the first phase, due to an increase in income, the fertility rate increases. The reduction of fertility that takes place later on is due to the fact that when education is needed, agents prefer to have fewer children, who are educated, rather than more uneducated children.

---

[3] Since this model is well known, in this version we present the equations of these models succinctly

2. A Marxian model

The way to model Marx views on population is to distinguish the utility function of the workers from that of the business elite as done in Brezis (2001).

2.1 The Business Elite

2.1.1 The Utility function

Since Marx did not accept nature as the force channeling the decision to have children, why then, would the business elite care about the number of children they had? The reason was uncertainty.

The business elite was concerned about the family business and interested in the continuation of the familial enterprise, but as emphasized by Crouzet (1999): Many dynasties have disappeared, because of a lack of offspring . Mortality remained high during the 19th century, and the survival of the firm was a function of the number of children the business elite had; so that the higher the number of children they had, the higher the probability of the firm s survival.

Indeed, data shows that the fertility rate amongst the business elite was very high. Some prominent British industrialists such as for example, Sir John Guest, had 10 children, William Crawshay had 14, Henry Overton Wills had 18. In Alsace, France, the Koechlins had 14 children, and the average number of children for the families of the business elite in northern France in the textile industry was more than 10. As Crouzet (1999, p. 47) points out: large families were not only a guarantee against early deaths, they allowed the appointment of the most able sons. Familial firms based upon families without many children usually did not survive. For instance, the Andr and the Schneider dynasties disappeared because of a small number of children (three) who died with no offspring.[5]

The model will therefore incorporate uncertainty. Denoting p, as the probability of survival of the firm, we assume that:

$$p = p(n^b) \quad \text{where } p' > 0 \text{ and } p'' < 0 \qquad (3)$$

where n^b is the number of children per family in the business elite.

---

[4] To get their results, they also assume that consumption has to be above a subsistence level.

The utility function of the business elite is a function of consumption, C_t, and the increase in the value of the firm. The increase in the value of the firm is due to the saving of the entrepreneur, S_t. The value of the firm is not known with certainty since it depends on whether the dynasty has offspring. Therefore the business elite maximizes an expected utility. When it has children who can take over the firm, the utility of the savings is $U(S_t)$; when there are no children, savings are lost and we obtain $U(S_{to})=0$. Assuming an additive function with the same weight on each argument, we therefore get that expected utility is:

$$EU = U(C_t) + p(n_t^b)U(S_t) = \ln(C_t) + p(n_t^b)\ln(S_t) \quad . \tag{4}$$

For simplicity, we assume that the utility is a log function.

2.1.2 Timing and Budget Constraint

We assume that each generation lives one period. The income of the entrepreneur is the rents he gets on the inherited capital, r_tK_t. He divides his income between his own consumption, the consumption of his children and savings, S_t:

$$r_t K_t = C_t + S_t \quad . \tag{5}$$

where $\tilde{C}_t$ includes his own consumption and that of his children.[6] A share λ of this total consumption $\tilde{C}_t$ goes to his own consumption (and a share 1-λ goes to the children). We assume that the children s consumption increases as a function of the number of children, i.e., the $\lambda(n_t^b)$ function is negatively sloped, so that the higher the number of children, the lower his own consumption. We also assume that the function is convex. A simple form for this function is to choose an exponential form: $\lambda = e^{-n}$.

Substituting in equation (4), we get that the entrepreneur chooses his savings and the number of children so as to maximize:

$$\ln[(r_t K_t - S_t)\lambda(n_t^v)] + p(n_t^v)\ln(S_t) \quad . \tag{6}$$

---

5 See Crouzet (1999) and Lewis (1986).

6 The spouse s consumption is included in his own consumption.

Let us note that this utility function is similar to the one based on Malthus s view. While the assumptions on human behavior are different in Marxian and Malthusian models, economic behavior in both is similar for the business elite.

The first order conditions, are shown in equations (7) and (8) that determine the amount of savings, consumption and children chosen by the entrepreneur:

$$S_t = p(n_t^b)/(1+p(n_t^b))]r_tK_t = P(n_t^b)r_tK_t \quad P = p/(1+p) \quad P' \geq 0 \quad P < 0 . \tag{7}$$

$$-\lambda'(n_t^b)/\lambda(n_t^b) = p'(n_t^b)\ln(Pr_t K_t) \quad . \tag{8}$$

For the SOC to be negative, we have to assume that λ is such that $\lambda'^2 \geq \lambda''\lambda$. Under this condition, we obtain that the left hand side is upward sloping (and in the case that the λ function takes an exponential form, it is linear). The right hand side of equation (8) is downward sloping, so the solution of the number of children is shown in figure 1.[7] Equation (7) indicates that savings are a linear function of rents (r_tK_t), and equation (8) shows that the number of children is a positive function of the capital stock (K_t).

Thus, in a Marxian model, the economic behavior of the business elite is similar to that in a Malthusian one - when their income increases (i.e., rents), their fertility rate increases.

2.2 The Proletariat

For Marx, during industrialization, there is a proletarianization of the workforce. Since the wage of one person was not adequate for subsistence, having children brought about an increase in family income. The way to model this is to assume that the utility function of the proletariat is not inherently different from that of the business elite since they are not different human beings , but their economic situation is different. At their level of income, workers do not save at all. Moreover, wages were smaller that the subsistence level, i.e., $\bar{w} > w$ and therefore, despite the fact that the utility might be the same, they are constrained. For simplicity, the utility function of the worker is

[7] The RHS might be upward sloping for small n, and then downward sloping. If we assume that K is large enough or for p being more concave, the RHS has a negative slope.

slightly different than that of the business elite (but a unified utility function could be presented). In each period, workers choose to maximize a utility function:

$$U = U(C, n) \quad \text{and} \quad U_1 \geq 0, U_2 \leq 0 . \tag{9}$$

In contrast to Malthus, who assumes that nature leads human beings to want as many children as possible, Marx did not believe this, which means that children do not directly influence the utility function. However there is still the suffering of parents who see that their children have to work hard, that is to say that there is an indirect influence due to the fact that parents would prefer their children not work, but have no choice, so we assume that $U_2 < 0$.

The budget constraint of the family in each period is:

$$C + l(n^w) = w + wn^w \quad \text{and} \quad C \geq \bar{C} . \tag{9 }$$

$\bar{C}$ is the subsistence level of consumption for an adult, n^w is the number of children the worker has, and $l(n^w)$ is the consumption of children. We assume that $l(n^w)$ is upward sloping and concave ($l' > 0$ and $l' < 0$).

On the right hand side of equation (9) we have family income. This includes the worker s wage as well as children s wages. Wages of children were, in reality, lower than wages of adults (about half in the textile industry), but just to simplify the model, we take all wages as equal. On the left hand side, we have the outlays, i.e., the worker s consumption, as well as his children s consumption.

However, the wage rate is so low that at the optimum of the utility function, consumption is lower than the subsistence level. Therefore, as shown in figure 2, they are at a higher fertility rate than the optimum (at the right on the graph). Equation (9) is binding and the number of children is such that:

$$w + wn^w * - l(n^w *) = \bar{C} . \tag{10}$$

In order to obtain an equilibrium different from zero, it is necessary that l <w. In other words, at equilibrium, the net wages of children at the margin is greater than zero. In figure 2 we see that fertility is a decreasing function of wages (a move to the left), as shown in equation (11):

$$dn^{w*}/dw = (1+n)/(l'-w) < 0 \quad . \qquad (11)$$

We also assume that the second derivative of the l function is large enough to obtain that $(1+n)l''/(l'-w) \geq 2$. Under this assumption, we thus get that $d^2 n^{w*}/dw^2 \leq 0$.

3. Comparison between the two paradigms

The main difference in the conclusions of these two types of models is that while a Malthusian paradigm implies that an increase in income leads to an increase in the fertility rate, a Marxian paradigm will imply the opposite for the proletariat. Indeed, the interpretation of equation (11) is that when wages decreased, , families needed more children to survive and fertility rate went up. This is very different from the Malthusian result. So the model presenting Marx s view permits us to see that while Marxian and Malthusian models show similarity for the business elite, i.e., that an increase in income leads to an increase in the fertility rate, they give opposite results for the proletariat. Let us now check which model makes more sense from the historical point of view.

V. Historical Facts

The first point we check is whether we observe that when income has increased, there was an increase or decrease in fertility.

1. Real Wages and fertility rates

Works based on Malthusian models state that the increase in income that occurred in the first half of the nineteenth century -- which led, via an income effect, to an increase in fertility -- corroborates the assumptions of their model. However, while there is no doubt that total income increased in the first half of the 19th century, income of the most important social class —the

workers -- did not increase and even decreased, so that their model then predicts a decrease in fertility.

Indeed, there is an ongoing debate in the literature on the evolution of wages and more generally, the standard of living in the 19th century England. While the optimists (Clapham, Ashton, Hartwell, 1972) show that industrialization was equivalent to an increase in the standard of living of the workers, the pessimists (starting with Engels, Thompson, Toynbee, Hammond and more recently Hobsbawn) disagree with this view.[8] This economic debate was tainted with philosophical connotations and was related to the debate on the *bienfaits* of the capitalism. The data displayed in Table 1 shows that : If the Chartists in 1837 had called for a comparison of their time with 1787, and had obtained a fair account of the actual social life of the working-man at the two periods, it is almost certain that they would have recorded a positive decline in the standard of life of large classes of the population .[9] In conclusion, the data presented in Table 1 fits a Marxian model better than a Malthusian one.

Since the Marxian model is based on the fact that children s work was a necessity, it is therefore necessary to present the facts about children s work in the 19th century.

2. Children s work

Children s work in the 19th century was an important element in the cotton industry, the leading sector of industrialization. Children under 12 years old comprised 8% of the labor force in the cotton industry, with children aged 13-18, another 10% (see Evans, 1990, p. 250). In certain regions, they were a preponderant part of the workforce. Some of the textile machines were better suited to be operated by children. For example, the Roberts machine that was adopted after 1824, required nine children (and one adult), instead of the two adults required for the technology used previously (see Bairoch, 1998, p. 434).

Usually, children began working at the age of 8 or 9, and the incomes of all members of the family were pooled. After the age of 13, they were allowed to retain some of it to build a small amount of capital prior to marriage. As Engels pointed out: When they [the children] get on far

---

[8] See Hobsbawn, 1957 .

enough to earn more than their cost to their parents from week to week, they begin to pay the parents a fixed sum of board and lodging and keep the rest for themselves. This often happens from the fourteenth or fifteenth year. (Engels, 1962, p. 177).

Children s income was a necessity for the proletariat: At no stage in this family history, had they been able to manage only on the husband s wage (Meyering, 1990, p.141).[10] Indeed among counties in England in 1851, there was a positive correlation between fertility and percentages of children between 9-14 years old who were employed (see Birdsall,1983, p. 116).

In the 19th century, since few attended schools, and the housing standards were poor, the marginal cost of an additional child would be food, which was much lower than the marginal benefit. When considering benefits, the wages received by children were around half that of adults. For instance, in France, children were paid around 450fs a year, working from 5am to 7pm, (while adults were paid around 755fs). From that they kept around 20fs for themselves. In England, in a cotton mill survey in 1859, men were paid a weekly wage of 18s and boys were paid 7s (see Evans, 1990).

The costs of raising children were very low. However there was a rise in these costs in the late 19th century due to the enforcement of restrictions on child labor and schooling that were enacted at the beginning of the century. In 1802, the Peel Factory Act was enacted that limited the maximum hours of work for children to 12 hours a day. In 1833, the Factory Act prohibited child labor under the age of nine; children between the ages of 9-13 were permitted to work 8 hours per day (48h/week, 52 weeks/year), and between the ages of 14-18, 12 hours per day (69h/week). These laws were solely directed towards the textile mills. After 1878, all sectors were affected by the Factory Act.[11] In 1891, elementary schooling was made compulsory.[12]

---

[9] On the consumption side, the reduction in income has been shown by the reduction of consumption of meat, sugar and tea in the first half of the century (see Taylor, 1975).

[10] The need for child labor is also due to the fact that during proto-industrialization, women worked at home (i.e., the family-economy). In the 19th century, during industrialization, the dichotomy between the home and the factory emerged. Women stopped working when having children (only 28% of working women were married) so that child labor was needed even more.

[11] There were Factory Acts already in 1853 and 1867, but they led only to minor changes (1847).

[12] In France the situation was similar since laws equivalent to the Factory Acts were enacted in 1830 and 1841.

All of these laws were only actually enforced around 1880, and thus led to an increase in the costs of raising children at the turn of the century. Moreover, at about the same time it also became more expensive to raise children due to the Poor Law of 1868, that made it an offense for parents to neglect to supply their children with such basic necessities as food, lodging, and clothing. To sum up, then, the intergenerational income flows during the 19th century were from children to parents, as implied in the Marxian model.

VI. Conclusion

The two main frames of analysis in the 19th century regarding the subject of population were those of Marx, on the one hand, and Malthus, on the other hand. This paper has illustrated their divergences as well as their common features. The main divergence is the way they see the interaction between man and nature. While Malthus takes the state of nature as a given and as having the main influence on peoples decision-making, Marx sees the social framework as important in explaining the decisions taken by people. For Marx, the differences of behavior between classes, is something that cannot be ignored.

This paper has shown that both analytical frameworks can explain the increase in fertility that took place in the first half of the 19th century. However, the reduction in wages as shown in table 1, would best fit a Marxian one.

Moreover, for more liberally-oriented observers who have some difficulty in accepting Malthus s argument and who feel that the Malthusian moral stance -- the idea that poverty is the responsibility of the poor themselves, the necessary consequence of their own unbridled reproduction -- is not only based on a falsehood, but is odious and hypocritical, especially when it comes from a well-heeled clergy man who was firmly opposed to contraception (Cottrell and Darity, p. 187), this Marxian model could be adopted to explain the demographic transition.

And, of course, one does not have to be a Marxist of any vintage to accept the Marxian model of demographic transition presented in this paper.

Bibliography

Bairoch, P. 1998. *Victoires et Deboires*. Paris: Gallimard.

Bardet, J-P. and J. Dupaquier. 1998. *Histoire des Populations de l Europe-II- La revolution demographique 1750-1914*. Paris: Fayard.

Baumol, W.J. 1983. Marx and the Iron Law of Wages *American Economic Review* 73:303-8

Becker, G.S. 1960. An Economic Analysis of Fertility in European Countries, in *Demographic and Economic Change in Developed Countries*, NBER Princeton University Press, pp. 209-31.

Becker, G.S. and R. Barro. 1988. A Reformulation of the Economic Theory of Fertility, *The Quarterly Journal of economics,* February: 1-25.

Becker, G.S., Murphy K.M., and R. Tamura. 1990. Human Capital Fertility and Economic Growth *Journal of Political Economy*, 98,5: S12-S37.

Birdsall, N. 1983. Fertility and Economic Change in 18th and 19th century Europe: A comment, *Population and Development Review,* 9(1): 111-123.

Brezis, E.S. 2001. Social Classes, Population Growth and Economic Growth, *European Economic Review*, forthcoming

Cottrell, A. and W. Darity, Jr. 1988. Marx, Malthus, and wages *History of Political Economy* 20:2, 173-190

Crouzet, F. 1999. Business Dynasties in Britain and France, in Brezis E.S. and P. Temin (eds), *Elites, Minorities and Economic Growth*. New York: Elsevier, North-Holland, pp.41-54.

Dahan, M. and D. Tsiddon. 1998. Demographic Transition, Income Distribution, and Economic Growth, *Journal of Economic Growth* 3(1): 29-52.

Evans, C. 1990. Unemployment and the Making of the Feminine during the Lancashire Cotton Famine in Hudson P. and W.R. Lee eds. *Women s Work and the Family Economy in Historical Perspective*. Manchester: Manchester University Press.

Feinstein, C.1981. Capital Accumulation and the Industrial Revolution in R.C. Floud and D.N. McCloskey (eds.), *The Economic History of Britain since 1700,* Cambridge: Cambridge University Press.

Engels, F. 1964. Outlines of a Critique of Political Economy in Marx, *Economic and Philosophical Manuscripts of 1844*. New York: International Publishers

Flew, A. 1970. Introduction in Malthus,T.R., *An Essay on the Principle of Population.* London: Penguin Books.

Galor, O. and D.N. Weil 1996. The Gender Gap, Fertility, and Growth, *American Economic Review*, 86, 374-387.

Galor, O and D.N. Weil. 2000. Population, Technology and Growth: From the Malthusian regime to the Demographic Transition, *American Economic Review*, 90: 806-828.

Hartwell, R.M. 1972. *The Long Debate on Poverty*.

Hollander, S. 1984. Marx and Malthusianism *American Economic Review* 74:139-51

_____. 1986. Marx and Malthusianism: Reply *American Economic Review* 76:548-50

Hobsbawn EJ 1957 The British Standard of Living 1790-1850. Economic History Review 10: p.49

Lewis, J.S. 1986. *In the Family Way: Childbearing in the British Aristocracy, 1760-1860*, New Jersey: Rutgers University Press.

Maddison, A. 1995. *Monitoring the World Economy, 1820-1992*, Paris:OECD.

Malthus,T.R. 1970. *An Essay on the Principle of Population.* London: Penguin Books.

Malthus,T.R. 1974. *Principles of Political Economy.* New Jersey: Augustus Kelley

Marx, K. 1967. *Capital*, Vol. I. New York: International Publishers

_____. 1968. *Theories of Surplus Value*, Part II. Moscow: Progress Publishers

_____. 1973. Critique of the Gotha Programme in *The First International and after*, ed. David Fernbach. New York: International Publishers

Marx, K. and F. Engels. 1948. *The Communist Manifesto*. New York: International Publishers

Meyering, A. 1990. La Petite Ouvri re Surmen e: Family Structure, Family Income and Women s work in Nineteenth Century France in Hudson P. and W.R. Lee ed. *Women s Work and the Family Economy in Historical Perspective*. Manchester: Manchester University Press.

Mitchell, B.R. and P. Deane. 1971. *Abstract of the British Historical Statistics*, Cambridge: Cambridge University Press

Morand, O. 1999. Endogenous Fertility, Income distribution and Growth, *Journal of Economic Growth*, 4:331-349.

Sauvy, A. 1969. *General Theory of Population*. New York: Basic Books

Taylor, A.J. 1975. *The Standard of Living in Britain in the Industrial Revolution*. London

Tilly, L.A. and J. Scott. 1989. *Women, Work and Family*. London: Routledge.

Wiltgen, R. 1981. Marx and Engels on Malthus and Population: a Reconstruction and Reconsideration *Quarterly Review of Economics and Business* 21:4, 107-26

Table 1

Fertility Rate, Real Wages and the Capital -Labor ratio in England, during the 19th century

	Ig (Fertility rate)	Real Wages	Real wages in the cotton industry	K/L in the industrial sector
1800	.65	95	98	396
1810	.65	124	76	383
1820	.65	110	53	375
1830	.65	101	45	335
1840	.66	100	49	340
1850	.67	100	52	346
1860	.67	103	68	378
1870	.68	118	81	400
1880	.65	134	87	420
1890	.62	166	95	434

Sources: Bardet and Dupaquier, 1998; Mitchell and Deane, 1971; Feinstein 1981; Maddison, 1995.

Figure 1

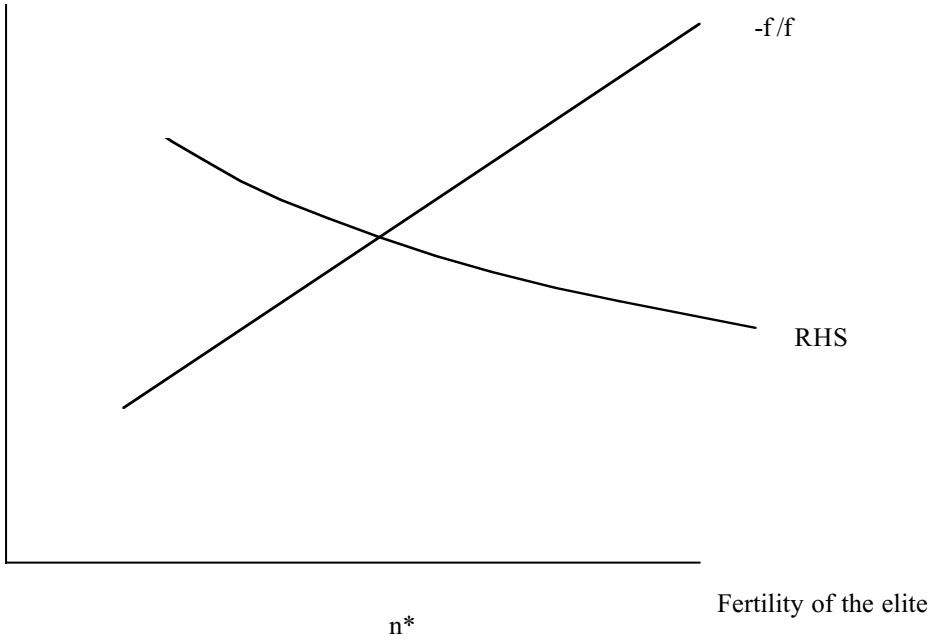

Figure 2