

Malthusian and Neo-Malthusian Theories/ Ran Abramitzky and Fabio Braggion

Malthus' Legacy

Few economists have had such controversial ideas, and generated a debate on such a scale as Thomas Malthus. In "*An Essay on the Principle of Population*", published in 1798, the English economist made public his theory on population dynamics and its relationship with the availability of resources. The essay was the result of his skepticism towards positivist theorists, praising the perfectibility of man and greeting the advances and diffusion of human knowledge as a source of welfare and freedom for future generations. Disagreeing with such perspectives, Malthus maintained that the development of mankind was severely limited by the pressure that population growth exerted on the availability of food.

The foundation of Malthus' theory relies on two assumptions that he views as fixed, namely that food and passion between sexes are both essential for human's existence. Malthus believed that the world's population tends to increase at a faster rate than its food supply. Whereas population grows at a geometric rate, the production capacity only grows arithmetically. Therefore, in the absence of consistent checks on population growth, Malthus made the gloomy prediction that in a short period of time, scarce resources will have to be shared among an increasing number of individuals. However, such checks that ease the pressure of population explosion do exist, and Malthus distinguishes between two categories, the preventive check and the positive one. The preventive check consists of voluntary limitations of population growth. Individuals, before getting married and building a family, make rational decisions based on the income they expect to earn and the quality of life they anticipate to maintain in the future for themselves and their families. The positive check to population is a direct consequence of the lack of a preventive check. When society

does not limit population growth voluntarily, diseases, famines and wars reduce population size and establish the necessary balance with resources. According to Malthus, the positive check acts more intensively in lower classes, where infant mortality rates are higher and unhealthy conditions are more common. The preventive and positive checks, by controlling population growth, eventually close the mismatch between the level of population and the availability of resources, but the latter at a cost of creating misery and wickedness that cannot be avoided and are beyond the control of men. Under this perspective, technological improvements that contribute to the increase in agricultural yields will only produce a temporary increase in living standards, but will be offset in the long run by a correspondent increase in population size that will cancel the temporary relief. Migrations could alleviate the effects of the positive check, but Malthus considers this possibility unfeasible, as general conditions were too harsh in possible receiving countries.

Malthus was strongly opposed to monetary transfers from rich to poor individuals. According to him, increasing the welfare of the poor by giving them more money would eventually worsen their living conditions, as they would mistakenly be led to think that they can support a bigger family, which would in turn depress the preventive check and generate higher population growth. At the end of this process, the same amount of resources has to be split between a larger population, triggering the work of the positive check to populations. Moreover, immediately after such a transfer, people can afford buying more food, bidding its price up and decreasing real wages, which hurt poor individuals whose main income comes from their labor. For these reasons, Malthus, together with other distinguished economists like David Ricardo, opposed the English poor laws, a piece of legislation that gave relief to poor and unemployed people, and played a central role in their reform in 1834. He held

that it is better for a family to foresee its lack of ability to support children before having them, than to deal with subsequent diseases and infant mortality. In other words, taking for granted that checks on populations are unavoidable, it is better to use the preventive check than the positive one.

Malthus realized that his model implied that real wages determined by the market would always be pinned down to the subsistence level. If real wages were above this level, population would begin to grow, inducing a decline in nominal wages as a result of firms having a larger supply of labor available. Moreover, the larger population would result in an increase in the demand for goods, which would force prices to go up and real wages to decrease to their subsistence level. This concept was known as the Iron Law of Wages, and, although first conceptually formalized by Ricardo in 1817, it was constantly present in Malthus's work.

Classical economists typically assumed that diminishing returns characterize agricultural production and mining activities, whereas constant returns are features of manufacturing. This hypothesis, taken together with Malthus' population principle, yields even more pessimistic scenarios for countries that base their productive structure on manufacturing. An immediate consequence is that population growth increases employment in the industrial sector more than it does in the agricultural sector and raises manufacture supply more than it does agricultural supply. Therefore, population pressure, which increases both the supply and the demand for goods, induces prices of agriculture to move up relative to those of manufacturing, impoverishing factory workers.

This perspective had important policy implications for Britain at the beginning of the 19th century, especially for the debate on the Corn Laws. The Corn Laws were variable tariffs and export subsidies intended to protect English agriculture. After the

Napoleonic wars, agricultural prices fell all over Europe and British landowners demanded more protection. These issues created an enormous debate in Britain between supporters of the Corn Laws and advocates of free trade policies. Malthus strongly opposed their possible repeal and defended landlords' positions for mainly two reasons. First, he held that the economic system was characterized by an intrinsic lack of demand that could endanger entrepreneurs and that landowners provided the solution for this problem. Their tastes were usually biased towards purchasing luxury goods, keeping aggregate demand at satisfactory levels. Therefore, impoverishing landowners by repealing the Corn Laws would result in a decline in living standards. Second, by specializing in manufacturing, a country would become poorer, because the pressure of population would cause a deterioration in its terms of trade (the ratio of manufacturing prices to agricultural prices), a result of the different production technologies in the two sectors presented above. Malthus' support for the Corn Laws should not be interpreted as an aversion to the industrial sector. On the contrary, he maintained that the consumption of luxury goods would alleviate the population pressure by increasing the opportunity cost of having an extra child.

Malthus' ideas have a large impact on the advance of economics, demography and evolutionary biology. The biologist Charles Darwin (1809-1882) was inspired to formulate his concepts of the evolution of species starting by the idea of the struggle for survival over scarce resources theorized by Malthus. In Darwin's perspective, only individuals whose traits were better suited to face the environment would survive and generate a lineage that would last longer.

Malthus' Influence on the History of Economic Thought

Besides the influence Malthus had on economic historians (to be described later), he also had impact on the thoughts of scholars such as David Ricardo (1772-1823), John

Stuart Mill (1806-1873), and other classical economists. The economists Ricardo and Mill, for instance, both accepted Malthus' theory of population, but believed that free trade could generate high profits for a long period and alleviate the pressure on scarce resources. In the later years of the 19th century, as the predictions of constant real wages and population explosion did not materialize, Malthus's influence waned.

Long Term Trends in Population and Output Growth

From the dawn of history until the time of Malthus, most societies in the world displayed his suggested relationship between population and standards of living. That is, temporary improvements in living standards were offset by population growth, whereas a transitory decline in living standards eventually resulted in a decrease in population size through the operation of the positive check. Population average annual growth rates were relatively low, but increased from 10,000BC to year 0, and further increased from year 0 to the 1750s. Nevertheless, population growth was not continuous and experienced oscillations, as did living standards. Birth rates increased considerably before the year 0 and remained high, until the industrial revolution. Malthus' model was a better description of agricultural societies that characterized antiquity and the Middle Ages than it was of the post industrial revolution era. By the 19th century, however, things had begun to change. The modern period saw a substantial decline in fertility rates in industrialized countries, and even though population growth rates increased dramatically to almost 0.6% in 1950 and more than 1.8% in 1990 due to an increase in life expectancy, many countries experienced a dramatic growth in agricultural and industrial production. Living standards improved permanently without a subsequent increase in population growth rates. Malthus' prediction, which sounded so logical and powerful at the time it was made, was refuted in large parts of the world.

Neo-Malthusians

E.A. Wrigley's work has supported Malthus' theory, focusing his research on British economic and population history. He has argued that Britain, before and immediately after the industrial revolution, displayed all the main features of a Malthusian economy, but by the end of the nineteenth century the relationship between population and income was broken.

He defines British economy before the industrial revolution as an "Organic Economic System", characterized by decreasing returns to scale, where population movements set standards of living to the subsistence level. The use of wood and other organic materials as source of energy in production process tightened decreasing returns and narrowed production possibilities.

Wrigley shows that in modern Britain, from 1566 to 1871, prices and population were closely related: when population increased, for instance from 1781 to 1806, the price index also rose. On the other hand, downturns in population correspond to decline in prices.

Moreover, he points out that fertility rather than mortality was the main determinant of population growth during the eighteenth century, and that nuptiality changes accounted almost entirely for the movements in fertility. In modern England, weddings were celebrated after a careful economic calculus operated by the potential bride and groom, and therefore constituted the main mechanism relating population size with economic conditions. This Malthusian link between population and economic growth disappeared in the last quarter of the XIX century, when a new socio-economic paradigm prevailed. The increased production did not lead to a rise in population, as Malthus would have predicted. Individuals began to adopt different forms of birth controls within families, thus reducing birth rates. By the 1930s large

families had become rare in England, and more than half of the couples had only one or two children.

The neo-Malthusian literature also involves comparative studies, checking for Malthusian effects. Of particular interest is the comparison between the English and the French experience. Until 1790, France was characterized by a high-pressure system, where adjustments to the Malthusian equilibrium were operated through the positive check and higher death rates, whereas Britain adjusted through nuptiality and preventive check. After the French Revolution, the progressive introduction of birth controls gradually moved France to a low-pressure system. The peculiar feature of this phenomenon is that while England created a mechanism of adjustment based on number of weddings and nuptiality, France bypassed this procedure and directly arrived to birth controls within families.

David Weir is also among the economists who empirically tested the existence of a Malthusian pressure. Using tax records of Rosny-Sous-Bois, a small village south of Paris, he is able to trace a demographic history of this locality for the year 1747. His findings suggest that Rosny was a classic Malthusian micro-system. In particular, under a Malthusian perspective, age at marriage is expected to fall with rise in income, and mortality rates are predicted to be negatively related with living standards. Indeed Weir finds that, female age at marriage was lower, the higher the income of the husband, and mortality rates of children and adults were negatively related to income.

Regarding the Malthusian comparison between demographic trends in France and England, Weir estimates the elasticity response of birth and death rates to a wheat price shock in France and Britain for the periods 1670-1869. If the neo-Malthusian prediction is correct, we expect a higher response of birth rates to wheat price shocks,

in Britain, and a higher reaction of mortality rates in France, as positive enters in action. Weir's results reject the Malthusian prediction in most of the cases. During the second half of the eighteenth century, there is no significant difference between the two countries' responses of birth rates to price shocks. Even for the period after 1790, in which neo-Malthusians asserted a higher adjustment in France through marital fertility, he does not find any important variation from the result obtained for the previous period. In the nineteenth century, the two countries displayed the same demographic behavior, despite the introduction of birth control practices in France. Regarding the positive check and mortality rates after 1740, France seems to be more sensitive to wheat price shock, but the results are less clear.

The existence of a consistent positive check is shown in only in one specific simulation run for the seventy years prior to 1740: in this case a doubling the wheat price in one year yields a much higher response for the French death rate when compared to the English one.

Malthus criticized

Malthus' argument regarding the relationship between population growth and production capacity has been subject to considerable criticism. Furthermore, economists began to look for alternative explanations, attempting to close the gap between Malthus' prediction and the new reality that has been revealed to them. Malthus claimed that with a fixed amount of land and a growing population, diminishing marginal productivity would result in individuals living constantly at a subsistence level. A frequently heard critique was that he ignored the possibility that technological improvements and capital accumulation are strong enough forces and may relax the population pressure and improve the condition of individuals, even in the presence of a growing population.

One kind of criticism emphasized potential positive consequences of population growth in the long run ignored by Malthus. Ester Boserup, for instance, suggested that Malthusians' arguments display a reverse causation. According to her, population growth is an autonomous factor, which affects agricultural productivity rather than being affected by it, as suggested by the Malthusian school. Boserup claimed that Malthus' assumption of diminishing returns to labor needs not hold in the long run, as higher population may lead to a more efficient division of labor as well as to improved agricultural practices (signaled by the frequency of cropping). She concluded that soil fertility should not be viewed as fixed and given by nature, but instead can be improved by substituting the agricultural technology to a better one, which is likely to be a result of an increase in population. Primitive communities with higher population growth rates are more likely to experience economic development, provided that the necessary investment in agriculture is undertaken. Julian L. Simon is another critic of the Malthusian reasoning, emphasizing the long run benefits of population growth. Simon claims that whereas population growth has a negative effect on living standards in the short run due to diminishing returns and the temporary burden it poses on society, it has positive effects on living standards in the long run due to knowledge advances and economies of scale. Employing a simulation model, Simon finds that in the long run (after 30 to 100 years) and when compared to constant-size population, moderate population growth improves standards of living both in more developed and in less developed countries. Simon held that, in the long run, a growing population tends to advance knowledge, which, in turn, increases productivity and output at a higher rate than that of population growth. Nevertheless, he claimed that a country's optimal policy regarding population growth depends on the weight given to future periods relative to the present. The more weight a country

gives to future generations and the more willing a country is for the short run decline in standards of livings, the better it is for that country to pursue a policy of moderate population growth.

The second kind of criticism stressed the importance of fertility decisions made by parents that were overlooked by Malthus. This view was developed after three interesting regularities were observed. First, it was found that in the modern era, the population of poor countries grew faster than that of rich ones. Low-income countries experienced annual population growth rates of more than 2% between 1965 and 1990, whereas high-income countries grew at a rate of less than 1% in the same period. Second, fertility rates are negatively correlated with income per capita, and third, life expectancy at birth is much higher for countries with higher income per capita. Motivated by these observations, economists raised the possibility that the number of children and the investment made in each child are economic decisions taken consciously by parents. Gary S. Becker and Gregg H. Lewis were the first to formalize the idea that parents may be altruistic towards their children and when making fertility decisions, they will take into account both the number of children and the quality of each of them that is reflected in his consumption, education, health etc. They show that when altruism is present, the Malthusian prediction doesn't hold and higher living standards are consistent with lower fertility rates, as observed in the data. Becker, Kevin M. Murphy and Robert F. Tamura pointed out that Malthus' analysis is not suited to the modern era, as it ignores the importance of education and the higher cost of raising children in industrialized countries, a result of the higher value of time in such countries. These two factors induce parents in rich countries to invest in their children's quality rather than in their quantity, which can account for lower fertility rates than the ones suggested by Malthus.

Oded Galor and Omer Moav advance a new view of the Malthusian Era. The long period of output stagnation and population pressure stimulated a Darwinian pressure, which brought about qualitative changes in the composition of human species that eventually allowed some economies to experience sustained growth in income per-capita. Galor, together with David N. Weil, further analyze the relationship between population growth, technological change and living standards, and find that population growth gradually improved technology, which in turn increased investment in human capital, inducing households to substitute quality for quantity children. At the end of this process, fertility rates are permanently lower and standards of living improve. This view implies that the Malthusian era was a necessary stage in order to reach sustained economic growth.

In spite of all of the above critiques, Malthus' theory still applies to many poor countries that are still struggling to get out of the Malthusian cycle. Even among richer countries, a Neo-Malthusian relationship between population growth and the environment has been argued for, based on the idea of the overuse of scarce natural resources. But this problem, too, is more severe in poor countries, which usually depend more on their natural resources.

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