Rue de la Banque

The long-term cost of protectionism for education

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The long-term costs of protectionism are difficult to evaluate as very few countries have switched back to this economic policy after a long period of free trade. One country that did make the move was France in 1892, when the Chamber of Deputies, encouraged by the president of the customs commission, Jules Méline, decided to sharply raise cereal import duties. This decision slowed the upwards trend in education levels as it made farming jobs more attractive than manufacturing jobs, thereby reducing the relative return on an education. These findings are consistent with the theory of unified growth which associates demand for education with technological improvement. They also suggest that educational progress is reversible.

Conventional economic theory holds that implementing protectionist policies leads to substantial losses. However, these losses are difficult to quantify empirically due to the lack of recent examples of a country that has switched from free trade back to protectionism. To overcome this problem, economists generally simulate the loss in economic growth that would result from a decline in foreign trade following a sharp rise in import tariffs. From this, they then deduce the short-term costs of protectionism. A recent estimate by Arkolakis et al. (2012) suggests that these costs are low ("A crude summary of our results is: 'So far, not much'").

This apparent lack of significant short-term costs nonetheless conflicts with studies of microeconomic data, which show that trade liberalisation has had a significant impact on employment in the United States (Autor *et al.*, 2013) and France (Carluccio et al., 2017; Malgouyres, 2017), as well as on the speed of innovation (Bloom et al., 2016).

The long-term cost of protectionism can be estimated more directly by looking at historical episodes of reversals in trade policy. One example of particular note was the reversion to protectionism in France following the first globalisation boom that took place from the 1830s to the early 1890s. At the time, a surge in grain imports from North America and Argentina had led to a steep drop in cereal prices, and European governments responded by adopting increasingly protectionist agricultural trade policies.

In Bignon and García-Peñalosa (2017), we study the effect of the sharp increase in import tariffs in France in 1892 (the Méline tariff) on levels of education. This protectionist shock occurred at a time when agriculture did not require much qualified labour. Therefore, by increasing the price of agricultural products relative to manufactured goods, higher cereal tariffs made it more attractive to work in farming than in manufacturing, and hence reduced the relative return on an education. At the level of the individual administrative districts or *départements* (hereafter referred to as departments), this negative shock lowered education levels and increased birth rates in proportion to the share of cereal production in local employment. An explanation for this can be found in the unified growth theory developed by Galor and Weil (2000), which holds that demand for education in a particular sector is positively correlated with the degree of technological progress. As farming at the time was not very technology-intensive, protectionism lowered the relative return that could be expected from an education and ultimately led to a decline in rates of school enrolment.

The Méline tariff of 1892

In continental Europe, protectionist measures were adopted in response to discontent among farmers, whose incomes had dropped sharply following a surge in cereal imports from the Americas (Golob, 1944). Indeed, from the 1870s onwards, import volumes from Argentina and North America had risen markedly, leading to a slump in cereal prices. The growth in imports was fuelled by the railway construction boom – financed by European financial markets – which made it possible to cultivate new expanses of land in these regions (Bignon et al., 2015), and by a fall in the cost of transatlantic freight with the advent of steamships.

In France, the resurgence of protectionism led to the introduction in 1892 of a new import tariff on cereals, equivalent to around 25% of the cost of the imported goods. As manufactured goods prices were declining steadily, the tariff led to a sharp increase in the relative incomes of farmers (Zolla, 1903). This policy of protecting agricultural incomes persisted until the start of the First World War: instigated by the minister Jules Méline, it enjoyed strong support in parliament from a coalition of farming interests, including republican and conservative representatives of constituencies specialising in cereal production (Dormois, 2012).

There has been very little analysis of the precise impact of the Méline tariff on the French economy. Based on a comparison of economic growth rates in the 1880s with those in the 1890s, historians tend to conclude that the tariff had a positive effect (Bairoch, 1972). However, even though growth rates did effectively increase in the 1890s, the causal relationship established solely on the basis of a time comparison is invalid, as it ignores the fact that the import tariff (fortuitously) coincided with the diffusion of innovations during the Second Industrial Revolution. To get around this identification problem, we look at how the impact of the Méline tariff on the incentive to get an education varied according to each department's specialisation in cereal production.

As Chart 1 shows, the share of the labour force employed in cereal production differed widely across the country, and was particularly high in the western and south-western departments. Using these geographical variations, we examine whether those departments with higher shares of cereal production also experienced larger falls in rates of enrolment in primary education and of literacy, and larger increases in birth rates following the introduction of the 1892 import tariff.

C1 **Share of cereals in local production in each district in 1892**

(in %)

27
21
18
15
9
0, no information available
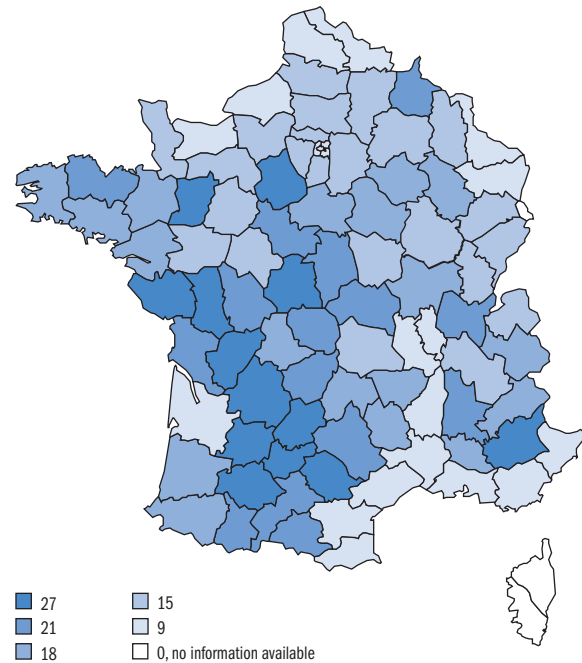
Source: Bignon and García-Peñalosa (2017).

Agriculture and education in the French economy in the XIXth century

Our identification strategy assumes that agriculture is not a very technology-intensive sector. This was especially true when the protectionist policies were introduced. At the end of the XIXth century, France was still primarily an agricultural economy: the share of the total labour force employed in agriculture stood at 50% in 1870, and at 40% in 1913; by comparison, in the United Kingdom, the shares were 22% and 10% respectively.

In France, the agricultural sector did not grow through the development of new technologies to boost yields or through expansion into new markets. This contrasts with the United States and Denmark, where economic growth was driven by foreign trade in agricultural goods, as well as by technological progress: in the United States, new refrigeration techniques made it possible to export larger quantities of meat, while in Denmark, growth was fuelled by incremental innovations designed to streamline the supply chain in order to meet English demand for butter.[1]

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[1] *This low appetite for technology is discussed by Barral (1968). See Henriksen and O'Rourke (2005) for an analysis of the Danish case.*

This reduced appetite for new technology in French farming resulted in lower demand for qualified labour and hence for education among rural populations. As a consequence, in 1906, 20% of France's agricultural labour force was illiterate, compared with 10% in manufacturing, and rates of illiteracy were higher among self-employed farmers than among farm labourers.

Despite this lag in the agricultural sector, France still saw a sharp rise in overall living standards over the period, driven primarily by the two industrial revolutions: first in the coal and steel industries in the mid-XIXth century, and later in electricity and chemicals during the Belle Époque. It was manufacturing, therefore, that drove demand for education in the XIXth century. Between 1830 and the end of the 1860s, education became increasingly widely available. The Guizot Law in 1833 made it compulsory to open a school – public or private – in towns with more than 500 inhabitants. The Falloux Law of 1850 then extended this obligation to all municipalities, while in 1867 the Duruy Law made it compulsory for girls to receive a primary education. As a result, by the time Ferry Laws were passed in 1881-1882,[2] rates of school enrolment had reached particularly high levels. The number of schools increased to a similar extent, rising from 10,000 in 1830 to 80,000 at the start of the 1880s. By 1892, therefore, the entire population had access to education.

Nonetheless, as the historian Antoine Prost (1993) notes, the years from 1886 to 1896 were a lost decade in terms of educational progress due to a decline in rates of enrolment (see Chart 2). In our view,
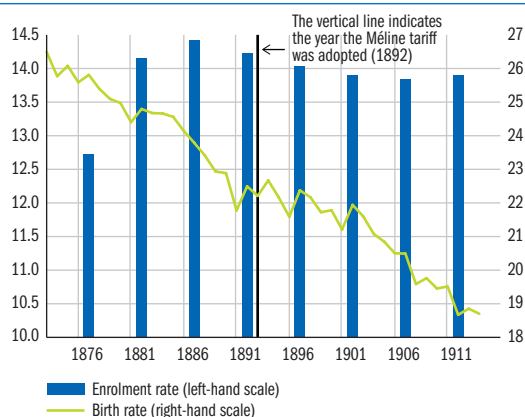
the introduction of cereal import tariffs was a major contributor to this trend, as it reduced the incentive to build up human capital by favouring a sector that had little need for qualified labour. A corollary of this fall in education investment was an increase in fertility, as predicted in the theory of unified growth.

Return on human capital, education and fertility

The introduction of protectionist cereal tariffs constituted a negative shock to returns on education. Rates of school enrolment depend on the benefits economic agents can expect to derive from an education: thus, if the expected return on an education is low, agents have a greater incentive to consume their income, for example by having more children (Becker and Tomes, 1976); conversely, if the return on an education is high, then investment in education should increase and the number of children per familys hould fall.

The effects of this intuition on economic growth were formalised by Galor and Weil in their unified growth theory or UGT (2000). UGT was developed to explain the transition from a Malthusian growth trap (where an increase in income leads to a rise in the population but not in levels of income per capita) to a growth model based on education and knowledge. UGT is based on two key assumptions: first, that the pace of technological progress depends on population size and on the level of education of the labour force; second, that educating children represents an increased time constraint, and that households take this into account when deciding how many offspring to have. These two factors are sufficient to explain the Industrial Revolution: demand for education was driven by technological progress, which encouraged parents to have smaller families and increase the educational attainment of their children.

We construct a unified growth model to explain the changes observed in education and fertility levels after the adoption of the Méline tariff in 1892. Using this model, we show that, as agriculture required very little qualified labour, the increase in agricultural incomes reduced the average incentive to gain an education, and that this effect was strongest in those departments most specialised in cereal production.

C2 Rates of enrolment in primary education and birth rates in France, 1876-1911

(in % and per 1,000 inhabitants, respectively)

The vertical line indicates the year the Méline tariff was adopted (1892)

■ Enrolment rate (left-hand scale)
── Birth rate (right-hand scale)

Source: Bignon and García-Peñalosa (2017).

Protectionism, education and fertility in the French departments after 1892

To measure the impact of protectionism on the incentive to get an education and modify fertility rates, we estimate regressions for a panel of 85 French departments for the period 1872-1913. We use data from the five-yearly population census to measure birth and fertility rates for women aged 15 to 49. We also use the official statistics on primary education (*Statistique de l'enseignement primaire*) to construct enrolment rates for children aged 6 to 13 and for those aged over 13, and rates of absenteeism in both summer and winter. To test the robustness of our results, we estimate three different equations.

First, we estimate a linear regression, which shows that the greater a department's specialisation in cereal production, the more its school enrolment rates declined following the introduction of the Méline tariff. These results are confirmed by our findings on absenteeism: after 1892, rates of absenteeism during the annual harvest increased more in those departments with a higher share of cereal production. The opposite is found to be true for birth and fertility rates, which both increase to a greater extent in those departments benefiting the most from the Méline tariff. The impact of protectionism on education and fertility therefore increases according to the degree of exposure to these policies. In our last specification, we show that the findings are similar when we allow for differences in impact over the short and long term. To ensure that our regressions correctly capture the impact of protectionism, we demonstrate that these results are still valid when the level of religious conservatism in the department, the impact of migration and the structure of agricultural landownership are taken into account.

The results suggest that protectionism has a strongly negative impact over the long term. By reducing rates of school enrolment, the Méline tariff lowered the potential growth of the French economy. If we transpose these findings to today's policy debate, the implication is that protectionism in sectors requiring little qualified labour will lead to a fall in education levels.

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