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When and how should infant industries be protected?

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Abstract

This paper develops and analyzes a welfare maximizing model of infant industry protection. The domestic infant industry is competitive and experiences dynamic learning effects that are external to firms. The competitive foreign industry is mature and produces a good that is an imperfect substitute for the domestic good. A government planner can protect the infant industry using domestic production subsidies, tariffs, or quotas in order to maximize domestic welfare over time. As protection is not always optimal (although the domestic industry experiences a learning externality), the paper shows how the decision to protect the industry should depend on the industry's learning potential, the shape of the learning curve, and the degree of substitutability between domestic and foreign goods.

Assuming some reasonable restrictions on the flexibility over time of the policy instruments, the paper subsequently compares the effectiveness of the different instruments. Given such restrictions, the paper shows that quotas induce higher welfare levels than tariffs. In some cases, the dominance of the quota is so pronounced that it compensates for any amount of government revenue loss related to the administration of the quota (including the case of a voluntary export restraint, where no revenue is collected). In similar cases, the quota may even be preferred to a domestic production subsidy.

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1. Introduction

The infant industry argument is one of the oldest arguments used to justify the protection of industries from international trade. First formulated by Alexander Hamilton and Friedrich List at the beginning of the 19th Century, the case for infant industry protection has been generally accepted by economists over the last two centuries—although some of the arguments supporting protection have come under successful attacks over the years. In his famous statement supporting the case for infant industry protection, John Stuart Mill alluded to one of the main prerequisites for such industries: the presence of dynamic learning effects that are external to firms.¹ Mill recognized that certain additional conditions must also be met in order to justify protection. He specifically mentioned that protection must be temporary and that the infant industry must then mature and become viable without protection. Subsequently, Charles Francis Bastable added another condition requiring that the cumulative net benefits provided by the protected industry exceed the cumulative costs of protection.² Together, these conditions are known as the Mill–Bastable Test. The economics literature has subsequently developed formal models with dynamic learning externalities demonstrating how protection can potentially raise welfare. This literature has also shown that the protection provided by production subsidies is preferable to that provided by tariffs or quotas, as the latter additionally distort consumption. Nevertheless, production subsidies may not be feasible due to government fiscal constraints and distortions associated with raising the needed revenue.

Now consider the problems encountered by a government planner who wishes to follow these relatively straightforward recommendations when deciding on a specific policy for an infant industry characterized by the previously mentioned learning effects. Although clear and intuitive, the Mill–Bastable Test is hard to apply in practice: both the benefits and costs of protection change over time as learning progresses. The cumulative benefits and costs not only reflect the changes driven by the learning process but also those caused by the adjustment over time of the level of protection (typically, the latter decreases as learning progresses). Recommendations for the policy instrument choice (subsidy, tariff, or quota) are equally clear but also greatly complicated by practical considerations. The recommendations are based on the assumption that the level of the policy instrument can be costlessly changed over time. In fact, these changes are costly and may not even be feasible over certain time intervals.³ How do these considerations affect the government planner's choice of policy instrument?

This paper seeks to answer this question and assist the government planner with the application of the Mill–Bastable Test. The paper shows how the cumulative costs of protection can be approximated by a fixed learning cost that can be readily compared to an appropriately normalized benefit flow. The paper describes how the fulfillment of the test depends on the industry's learning potential, the speed of learning, and the degree of

¹ See Mill (1848, pp. 918–919). The full statement is reprinted in Kemp (1960).

² See Bastable (1921, pp. 140–143). For further discussion of the Mill–Bastable Test, see Kemp (1960) and Corden (1997, ch. 8).

³ The cost or incapacity to adjust the policy instrument may be driven by actual costs and political procedures or alternatively by the capture of the political process (once the policy is implemented) by special interest groups.

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