



## A middle income trap in a small open economy: Modeling the Argentinean case



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### ABSTRACT

This paper presents a model of the conditions that may lead a small open economy towards a middle income trap. This situation has shown to be pervasive in Latin America. As Argentina is a salient instance of this phenomenon, we develop a stylized model of its economy at the first decades of the XXth century. It consists of a general equilibrium model of an open emerging economy, which is a price-taking primary goods exporter. A growth process is triggered by an increase of commodity prices, due to an upward jump of the world demand of these goods. The economy goes through several phases of growth, starting from a subsistence stage. Once decreasing returns set in, the economy reaches a steady state. Only a sustained high demand of its export products allows the economy to thrive. Otherwise, the economy gets entrapped in a middle income level.

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### 1. Introduction

Following the 2007/2008 world crisis, which mainly affected the developed economies, it seemed that developing countries were the only ones able to help the world to avoid a downfall towards a long-run recession. While China was the most conspicuous economy pushing the global economy, other countries contributed as well. The countries in the BRICS group, in particular, seemed to be steered towards the status of advanced economies (Sharma, 2014). By 2015 these expectations have largely faded, mostly due to the fall in the world prices of commodities, the main production of developing nations (Qureshi et al., 2015). So, paralleling the discussion on the “secular stagnation” of advanced economies, the awareness on the existence of a *middle income trap* for developing nations spurred a literature to which this paper intends to be a contribution (Griffith, 2011; Eichengreen et al., 2012; Agénor and Canuto, 2015).

Our take is based on the realization that this is by no means a new phenomenon. Latin America has been prone to generate false hopes of rapid development followed by stops and setbacks (Paus, 2012; King and Ramlogan-Dobson, 2015). Argentina, for instance, is an early example of this.<sup>1</sup> This economy does in fact show all the features that may serve for an explanation of the existence of middle income traps. Instead of presenting a case study, we proceed by developing a model capturing those aspects. The main idea is that the particular features of the growth

process of a late-coming small open economy like Argentina's may help to explain how a middle income trap is reached. More precisely, we intend to show how the absence of increasing returns in the production of industrial goods and services leads to the stagnation of small agricultural goods producer economies. Unlike the usual approach in growth theory, we develop a general equilibrium model of a stylized version of the Argentinean economy, undergoing different stages of growth. We assume that foreign trade is balanced, and the economy is responsive to the changes in the external economic environment. In this economy, the initial stage consists of an agricultural sector, which uses land as its main production factor. At this stage there exists only a domestic market for these products. The proceeds are barely enough to satisfy current consumption, so that the bequest to the next generation consists only of land.

In a second stage the economy is able to export its agricultural goods. Since this economy is assumed to be small, the local producers are price takers in the world market. The rise of an external demand increases the prices of the local production, and then the income level.<sup>2</sup> This induces a change in the consumption pattern from agricultural to industrial goods and services. Since industrial products are tradable, they can be imported. Domestic production of industrial goods and services requires the use of physical and human capital, and thus the higher yields of agricultural production are devoted to the accumulation of both types of capital. Physical capital is assumed tradable, so that its price is taken from the world market. On the other hand, human capital is generated from an income tax applied to finance a public education system. The complementarity of physical and human capital requires critical levels of both to start the production process. Thus, in a further stage, once

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<sup>1</sup> A famous – but perhaps apocryphal – remark of the Nobel Prize winner Simon Kuznets is: “There are four kinds of countries in the world: developed countries, undeveloped countries, Japan and Argentina.” *The Economist* (2014).

<sup>2</sup> The importance of the existence of a successful “client” nation, like the UK was for Argentina is crucial for the ensuing growth process (Osborn and Vehbi, 2015).

enough capital has been accumulated, the economy is able to produce industrial goods and services, and to reach a middle income steady state level. If there is no upgrade in the technology, in the presence of decreasing returns, the economy will not grow further than that steady state level.

That is, the country gets trapped at a middle income level which, furthermore, is highly dependent on the international prices of agricultural products. Only a permanent increase of those prices can ensure an upgrade towards a higher income level. This result could illustrate the fact that many countries reached a middle income level before the Great Depression.<sup>3</sup> A policy recommendation that arises from this analysis is to act on the features of the economy that lead to a middle steady-state result, that is, on the existence of decreasing returns in the production function. Structural reforms leading to continuous increases in productivity can achieve this goal and allow the escape from the middle income trap. This is consistent with recent analyses based on empirical evidence (Agénor and Canuto, 2015; Qureshi et al., 2015).

The next section presents a review of the relevant literature, on which we base our main modeling choices. Section 3 presents the basic setting of the model. First the supply and demand functions of each sector are derived, and then we obtain the conditions for a general equilibrium. Up from the basic model, Section 4 characterizes the different phases of the growth process: from the economy of subsistence to the transitional stage, and finally to the modern phase, in which we obtain the steady state of the economy. Finally, Section 5 concludes.

**2. Literature review**

In the last decades growth theory tried to explain the sustained growth of per capita income. Most of the literature emphasized the role of technical progress. While originally it was assumed to be exogenous, later approaches focused on endogenous growth processes. Within this branch of the literature, two approaches can be distinguished. On the one hand, the AK model is based on the crucial assumption of perfect competition, postulating the existence of externalities and scale effects as responsible of the sustained growth of the economy (see Romer 1986 and Lucas 1988, 1990). On the other hand, the Research and Development (R & D) models assume imperfect competition; they explain growth in the long-run as a consequence of investment devoted to the creation of new processes and products, as well as from their spillovers (see Romer 1990, Grossman and Helpman 1991 and Aghion and Howitt 1992, among others).

Recent theoretical developments analyzed how growth processes go through different stages. In this sense, Galor and Moav (2002, 2006) exhibit how a growth process may give way to higher stages of development. In particular, they explain phenomena like the demographic transition and the demise of the class structure in advanced economies. The main feature of their models is that, at some point in the evolution of an economy, external shocks may induce a new phase in the dynamics, leading towards a new equilibrium. More precisely, Galor and Moav (2002) show how growth facilitates the rapid reproduction of individuals that carry less children and invest more in education. This leads to the avoidance of a Malthusian growth trap and the enhancement of the environment for technological progress. In this vein, Galor and Moav (2006) show how the creation of a public education system in an economy with a class structure (capitalists and workers) leads to the creation of human capital, which generates the conditions for further growth in an economy where the class distinctions fade away.

All these theoretical developments are intended to explain the stylized facts of growth in advanced economies. Moreover, Galiani et al. (2008) present an extension of this approach, in order to model the development of land rich economies as triggered by the emergence of

large-scale education systems. The idea is that the elite of landowners accepts collectively to be taxed in order to finance the education of credit-constrained workers. The rationale of this behavior is that a wide education system induces the accumulation of human capital able to sustain the human-capital-intensive services demanded by high-income groups.

Similarly, small open economies, specialized in the production of agricultural goods, tend to follow growth paths that differ from those of developed economies due to their exposure to foreign markets. In particular, they can reach a higher stage of development as long as external conditions are favorable enough. In this sense, some successful cases faced favorable foreign conditions that lead to a long period of high growth, associated with physical and human capital accumulation and later with the development of domestic production of services and an incipient industry. Argentina illustrates well this process, particularly from 1870 until the midst of the XXth century. Furthermore, this case is interesting also because it exhibits the stagnation associated to a reversion of terms of trade, without having generated endogenous mechanisms to ensure an autonomous continuation of the growth process. But, as a recent study of the case of Latin America presented by Rodrigues (2010) in the framework of a dynamic Heckscher–Ohlin model has shown, even though Latin America deepened its capital between the 1950s and the 1980s, the adoption of import substitution policies created a low productivity trap and put the region on a long-run stagnation path. As Taylor (2014) asserts, the import substitution industrialization of Latin American countries increased the gap in industrial development with respect to the developed countries. In fact, investment in capital goods has barely increased even during the recent surge in commodity prices which triggered a process of fast growth in the region. For example, for the Argentinian case Santarcangelo et al. (2011) show that this growth did not lead to a structural change. All these arguments seem to indicate that the technology in the industrial and services sectors in Latin America lacks the increasing returns proper of advanced economies, and their growth has been mostly due to the improvement of the international prices of agricultural goods.

**3. The basic setting**

*3.1. The demand side*

The economy has a constant number of adult agents,  $n$ . Each agent  $i$  born in  $t-1$  lives for two periods. At  $t$  he is an adult, has just one child, and decides the level of consumption and bequest at this period. The log-linear utility function is:

$$U_i(c_t^i, b_t^i) = (1-\beta) [\alpha_1 \log(c_t^A) + \alpha_2 \log(c_t^I + c_t^S) + \alpha_3 \log(c_t^S + c_t^I)] + \beta \log(b_t^i + \bar{b}^i)$$

where  $c_t^l$  for  $l = A, I, S$  is the consumption of either agricultural products, industrial goods or services. The constants  $c^l$ , for  $l = I, S$ , and  $\bar{b}^i$  are assumed positive, with  $c^I < c^S$ .<sup>4</sup> For simplicity, we assume that the effect of the consumption of each type of good on the utility is the same, i.e. the parameters are such that  $\alpha_1 = \alpha_2 = \alpha_3$ , while  $\alpha_1 + \alpha_2 + \alpha_3 = 1$ . In turn, industrial goods are available in the world markets while services are non-tradeable. The parameter that indicates the savings (and bequeathing) propensity is  $\beta \in [0, 1]$ . Thus, an individual's satisfaction depends on how much he consumes as well as how much he bequests to his (only) child. While the satisfaction of consuming any of the three kinds of goods has the same weight, there is a difference between consuming and bequeathing.

<sup>3</sup> In fact several of these countries remained stagnated until the surge in commodity prices of the 2000s and were affected by the recent downturn of these prices.

<sup>4</sup> Actually, the arguments  $X$  are assumed to be such that  $\log(X) > 0$ . This is ensured if  $X > 1$ . To simplify we assume that the variables we use are  $\bar{X} = X + 1$ .

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