Verdoorn’s Law and the Analysis of Steady-State Growth: from an Unsatisfactory Marriage to a New Perspective†

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Introduction

This chapter tells a story which has an apparently unfortunate ending. The story concerns a basic, although rather neglected, aspect of Verdoorn’s Law – namely its compatibility with steady-state growth. The story appears to be unfortunate, since the attempts to marry Verdoorn’s Law to the analysis of steady-state growth produce inconsistencies and weaknesses. This fact seems to prevent Verdoorn’s Law from playing a satisfactory role in any long-run analysis. However, as this chapter will briefly show, Verdoorn’s Law can still have a useful role in long-run analysis if its role in economic development is explained and made endogenous.

Verdoorn’s Law has been conceived as applying to the long run, and not being concerned with short-run relationships because of cyclical variations in the utilisation of resources. Both in the original 1949 article and in Kaldor’s reappraisal, the law appears to be a robust statistical relationship. On the theoretical side, steady-state analysis appears to be the most appropriate method for its study. In fact, such analysis has been used by Verdoorn himself to provide foundations for the law. Subsequently, other different theories of economic growth appear to provide foundations for the law. However, as will be argued below, the marriage of Verdoorn’s Law with steady-state analysis does not prove to be a satisfactory arrangement, and, moreover, empirical studies have furnished less favourable evidence for the law since the 1960s.

Verdoorn’s Law establishes a stable long-run relationship between labour productivity growth and output growth in manufacturing with an elasticity between 0 and 1. The interest in the law stems from this being a true,

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rather than a spurious, correlation. It has been tested many times by using different methods, and for many advanced countries and regions over different periods of time. On balance, favourable results have been obtained, but for the most recent decades the law exhibits weaker evidence.

The economic intuition behind the law is still interesting after many decades. It states that larger volumes of output allow a greater division of labour, with the analogous effects in increasing productivity as that occurring from greater mechanisation (Verdoorn 1949, p. 16). This phenomenon has been labelled ‘learning by doing’ by Arrow (1962), who directly refers to Verdoorn (1949) and to the learning function in Verdoorn (1956, p. 433). In referring to Arrow, Kaldor (1966) remarks that learning is a dynamic and irreversible process, and therefore dismisses the traditional production function with increasing returns to scale as the basis of Verdoorn’s Law. Recently, the learning function and the Arrovian externalities have been emphasised by Lucas (1988, 1993) both to provide the foundation for his own endogenous growth model, and to justify the ‘miracle’ in the growth performance of the NICs.

Verdoorn’s Law can be explained by two opposing theoretical approaches: namely, the supply-side (or traditional) theory, and the demand-side (or Keynesian) theory. However, either the restriction to steady-state growth makes the explanation very poor, or the theory cannot sustain steady-state growth, if this is generally defined as a growth in the variables which can be indefinitely prolonged over time without any constraint. Otherwise, if this configuration can be sustained only for a definite period, because a constraint or some feedback emerges, then it must be regarded as a paradoxical analysis of the ‘temporary long run’.

Verdoorn’s Law remains a useful piece of analysis, however, if the steady-state method is abandoned and a new framework is found for it. This search would be arduous, but an attempt might be made by starting from the original concept underlying the law: the learning function. Since supply- and demand-side theories have used this concept, it is also tempting to combine both kinds of theories within a single framework, and this is possible if the evolution over time of the learning function is considered. In this new perspective of non-linear dynamics, Verdoorn’s Law emerges as an endogenously changing relationship.

This chapter is organised as follows: the next section briefly reviews empirical findings on the law. Then we discuss the original supply-side model in Verdoorn (1949) and the second attempt (Verdoorn, 1956) where the learning function is introduced. It is shown that the recent theories of endogenous growth, which appear to substantiate the law using the same concept, are in effect unsatisfactory analyses of steady-state growth. There follows an analysis that shows that demand-side models based on Verdoorn’s Law by Kaldor, Thirlwall and their coauthors also exhibit unsatisfactory aspects for steady-state analysis. Next, we argues that the marriage between Verdoorn’s