Balanced growth\textsuperscript{1}

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Abstract

Balanced growth has at least two different meanings in economics. In macroeconomics, balanced growth occurs when output and the capital stock grow at the same rate. This growth path can rationalize the long-run stability of real interest rates, but its existence requires strong assumptions. In development economics, balanced growth refers to the simultaneous, coordinated expansion of several sectors. The usual arguments for this development strategy rely on scale economies, so that the productivity and profitability of individual firms may depend on market size. The entry reviews the balanced growth debate, and the extent to which it has influenced development policies.

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Balanced growth

In macroeconomics, balanced growth refers to classes of equilibrium growth paths, while in development economics the term refers to a particular development strategy. These two uses of the term are clearly distinct, and each will be discussed in turn.

The concept of a balanced growth path is a central element of macroeconomics. It refers to an equilibrium in which major aggregates, usually but not exclusively output and the capital stock, grow at the same rate over time, and the real interest rate is constant. Most textbook growth models are constructed in a way that delivers this outcome. This is partly motivated by theoretical convenience, but also by historical observation. The conventional wisdom is that real interest rates and the capital-output ratio are surprisingly stable over long spans of time, at least in developed countries.

Balanced growth is not an inevitable property of growth models. It was not until the publication of classic papers by Solow (1956) and Swan (1956) that economists saw how a balanced growth path might arise from relatively appealing assumptions. The key insight is that a stable equilibrium path requires the possibility of substitution between capital and labour. The Solow-Swan model has subsequently underpinned much empirical work on economic growth, and has also influenced short-run macroeconomics.

The existence of a balanced growth path requires strong assumptions. The usual derivation assumes that aggregate output can be written as a function of the total inputs of capital and labour, with diminishing returns to each input and constant returns to scale overall. In addition to the conditions needed for aggregation, either the production function should be Cobb-Douglas, or technical progress should be restricted to the labour-augmenting type. In other words, when technology advances, it should be “as if” the economy had more labour than before, and not “as if” it had more capital.

Because these assumptions are strong, any use of balanced growth to rationalize the data tends to create new puzzles. For example, why should technical progress be exclusively labour-augmenting, as stability of real interest rates would require? Acemoglu (2003) has examined this question using an incentives-based model of technical change, but in general, balanced growth seems a less than inevitable outcome of a real-world growth process. The picture is even more complicated when there are multiple sectors, whether differentiated as capital and consumer goods, or as different types of final goods. As might be expected, where multiple sectors are present, the conditions needed for balanced growth become even stricter. Greenwood et al. (1997) and Kongsamut et al. (2001) are two useful references on multi-sector growth models.
None of this is to deny that balanced growth is a useful concept. The idea plays an important role in teaching and research in macroeconomics because of its simplicity and explanatory power. As with all organizing frameworks, however, it is a good idea to be aware of its limitations, and the possibilities that lie outside it.

In macroeconomics, balanced growth is usually associated with constant returns to scale. For most development economists, the term is more strongly associated with increasing returns, and a debate that began with Rosenstein-Rodan (1943). He argued that the post-war industrialization of Eastern and South-Eastern Europe would require coordinated investments across several industries. The idea is that expansion of different sectors is complementary, because an increase in the output of one sector increases the size of the market for others. A sector that expands on its own may make a loss, but if many sectors expand at once, they can each make a profit. This tends to imply the need for coordinated expansion, or a “Big Push”, and potentially justifies a role for state intervention or development planning. Another influential contribution by Nurkse (1953) made similar points, giving more emphasis to the links between market size and the incentives to accumulate capital.

In Rosenstein-Rodan’s paper the argument is set out informally, and with many digressions. But the central point will have a familiar ring to students of modern game theory and the literature on coordination failures. Essentially, Rosenstein-Rodan was setting out assumptions that might give rise to multiple equilibria in levels of development. Papers by Fleming (1955) and Scitovsky (1954) further clarified some of the necessary assumptions. Fleming emphasized the importance of Rosenstein-Rodan’s assumption that the industrializing sectors can draw on labour from other sectors without forcing up wages. Scitovsky noted that the proponents of balanced growth appeared to see externalities everywhere, but under perfect competition, external effects that are mediated through markets (“pecuniary external economies”) do not preclude Pareto efficiency. This result hints at the importance of scale economies to the balanced growth hypothesis, since then market size can influence unit costs, and Scitovsky’s logic no longer applies.

The key ideas of the balanced growth hypothesis were formalized in a much-admired paper by Murphy, Shleifer and Vishny (1989). In their multi-sector model, firms in each sector use constant returns to scale technologies, but one firm in each sector also has access to an increasing returns to scale technology. This technology will only be profitable to operate given a sufficiently large market. The structure of the model, with a competitive fringe of small-scale producers, ensures that wages are independent of labour demand in the industrializing sectors. The model yields multiple equilibria that can be Pareto-ranked.

The assumptions needed for multiplicity are more complicated than earlier authors believed, however. For example, increasing returns and an elastic supply of labour are not sufficient in themselves to generate multiple equilibria. Consider an equilibrium in which no sectors have industrialized (meaning that none are using the increasing returns to scale technique). If a single firm then adopts the modern technique and makes a loss, this will reduce rather than increase the size of the
market for other sectors, so the necessary complementarity is absent. For multiple equilibria to arise, the industrializing firm must somehow raise the size of the market for other sectors, even though it makes a loss when acting alone. In one of the models considered by Murphy, Shleifer and Vishny (1989), this is achieved by an extra assumption, namely that industrializing firms must pay higher wages than other firms.

Although the balanced growth hypothesis has been widely discussed, it has a number of limitations. The ideas are difficult to test empirically. From a purely theoretical point of view, the argument does not generalize straightforwardly to open economies. If firms can sell their output abroad, the role of domestic market size appears much less important. The balanced growth hypothesis then requires a more complex story, perhaps one in which firms are especially reliant on domestic markets in the early stages of their development.

The ideas have also been criticized on other grounds. The most prominent sceptic was Hirschman (1958), who argued that simultaneous, coordinated investment asked too much of developing countries. He regarded growth as a necessarily unbalanced dynamic process, in which successive disequilibria create the conditions for development in other sectors. Unbalanced growth could occur either through forward and backward linkages to downstream and upstream industries, or by drawing out latent capacities needed for growth, such as the application of entrepreneurial skills.

Importantly, this process is seen as too complex and unpredictable to lend itself readily to a government-inspired “Big Push”, partly because governments may lack the relevant information, and partly because simultaneous investment would place too many demands on limited organizational resources. Hirschman summarized his objections by saying:

‘if a country were ready to apply the doctrine of balanced growth, then it would not be underdeveloped in the first place’ (1958, p. 53-54).

But his preferred vision has echoes of the balanced growth doctrine in its appeal to complementarities and increasing returns; Krugman (1995) discusses this point in more detail. Arguably it is not so much the assumptions that differ, but the view of equilibrium selection. One interpretation of Hirschman’s critique is that the multiplicity of equilibria is illusory, because the earlier authors had missed out relevant state variables.

In practice, the balanced growth ideas have had less influence on development strategies than a more general commitment to state-led industrialization and import substitution. A perceived need for balanced growth may have motivated some attempts at indicative planning, but state interventions have usually tried to focus on particular sectors, rather than attempting the more ambitious task of simultaneous expansion across many industries. The reasons for this are likely to be complex, including uncertainty over which sectors should be encouraged to expand, and the
lack of obvious ways to coordinate this without direct state control. In the academic literature, the difficulty of testing the main ideas has been another factor in limiting their influence.

For reasons like these, the balanced growth hypothesis is currently at the margins of development thinking and policy advice. The ideas are still interesting, however, and their neglect is partly due to the accidents of intellectual history. Formalizing Rosenstein-Rodan’s original insights proved a difficult task. The reasons for this are discussed in Krugman (1995), as part of an illuminating account of the balanced growth debate and the role of formal models. He shows the continuing relevance of the main ideas to economic geography and regional science, and his book can be highly recommended to anyone interested in balanced growth, or the methods of modern economics more generally. Another useful reference is the special issue of the *Journal of Development Economics* on increasing returns and economic development (April 1996).

**References**


