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Dutch disease

The expression 'Dutch disease' was coined by *The Economist* in 1977 in describing the deindustrialization of the Dutch economy following the country's exploitation of the Groningen natural gas field, and the resulting appreciation of the Dutch currency's real exchange rate after the increase of its export receipts from a particular booming sector (such as the commodities sector).

Corden and Neary (1982) and Corden (1984) were at the origin of the Dutch disease core model. In their neoclassical model, they assume three sectors of activity: (i) a manufacturing sector exposed to international competition (the tradable sector), (ii) a sector sheltered from international competition (the non-tradable sector); and (iii) a booming sector (open to international trade, which can be associated with the energy sector while not limited to it). In general, the non-tradable sector includes the services sector, which is considered sheltered from international competition – although in practice some services are also easily outsourced abroad. An economic boom generates an increase in external revenues that have two significant effects on the domestic economy, leading to an increase in imports of tradable products at the expense of domestic production.

The first effect is the 'resources movement' effect. An increase in the booming sector's revenues gives rise to a higher remuneration for labour and capital in the economy as a whole. The non-tradable sector can follow the movement and increase the remuneration for labour and capital, since it is sheltered from international competition. The tradable sector

is unable to increase its prices, owing to the fact that the producers of this sector are price-takers and depend on international prices. Consequently, if these businesses try to retain their workers and investors by increasing their remuneration as the two other sectors, their margins will decrease dangerously until they close down.

The second effect is the spending effect, which follows from the increase in demand by those who receive the booming sector's revenues. All other things remaining equal, the increase in demand for both the tradable and non-tradable sectors leads to higher prices in the non-tradable sector. The tradable sector, however, is unable to face the rise in demand owing to competitive external constraints. It cannot raise its prices either. Hence the additional demand will be satisfied by imports. A change in the real exchange rate is reflected in the price movements of non-tradable goods relative to tradable goods, the latter being determined by international markets. An increase in the relative prices of non-tradable goods means an appreciation of the real exchange rate.

Recently, the Dutch disease was reinterpreted by development economists. Palma (2005) used the concept to discuss economic growth and development issues in Latin America. Bresser-Pereira (2008) authored a new model of the Dutch disease, according to which the Dutch disease is equal to the difference between the 'current equilibrium', which balances intertemporally the current account of a country, and the 'industrial equilibrium', that is, the exchange rate used by companies that produce tradable (non-commodity) goods or services in order to remain competitive.

The severity of the disease varies according to the international price of the commodity. The real exchange rate of an economy hit by the Dutch disease is drifting away from the one that would allow manufacturing industries to be competitive. The stronger the price boom, or the higher the Ricardian rent drawn from the exploitation of primary resources, the more the exchange rate moves away from a level where the manufacturing industry is profitable. The Ricardian rents originate from the high productivity of domestic producers of raw materials. A common (but politically difficult) way to neutralize the Dutch disease is to establish a sovereign wealth fund that keeps abroad the proceeds of exports. Another method proposed by Bresser-Pereira (2008) is to introduce

a tax on exports of raw materials – that is, those goods that give rise to the disease – in order to facilitate industrial development.

It is noteworthy that the Dutch disease is related to the restructuring of productive activities and not to fossil resources' exhaustible nature. Hence, the Dutch disease model has been used to study the impact of international remittances, tourism or official development assistance, potentially resulting in real exchange rate appreciations. Although the model was initially developed to understand the difficulties of countries already industrialized, it remains useful to understand lagging development and the tendency to overvalue the real exchange rate in countries exporting mainly raw materials.

ADRIEN FAUDOT

See also

Current accounts; Development; Exchange rates; Exchange rates – fixed vs flexible; Exchange rates – managed

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Ecological macroeconomics

Ecological macroeconomics is a relatively new strand of literature aiming to integrate the insights from ecological economics with those of different streams of heterodox macroeconomics. Ecological macroeconomics is an approach to macroeconomics that seeks to explicitly account for the economic system as a sub-system of the planet's biophysical systems. The field describes and analyses how

systems of finance, production and distribution both depend upon, and direct the transformation of materials and energy (Althouse, 2022). Beginning in the 2000s, ecological macroeconomics took form alongside the increasing awareness of the ecological crisis at the political level, and gained momentum after the 2008 financial crisis. Examples of this growing interest include a book, *Post Keynesian and Ecological Economics* (Holt et al., 2009), the dedication of a full section of the journal *Ecological Economics* to ecological macroeconomics (Rezai and Stagl, 2016), and reviews of topics and models covered in the field (Fontana and Sawyer, 2016; Røpke, 2016; Hardt and O'Neill, 2017).

Ecological macroeconomics has offered developments in two directions: on the one hand, by integrating ecological concerns within streams of macroeconomics that had historically overlooked such concerns (Lavoie, 2014); on the other hand, by enabling ecological economists to better understand money and finance, historically a weakness in the field (Fontana and Sawyer, 2016). An example of this fruitful collaboration lies in the Stock-Flow Consistent approach, developed originally within the post-Keynesian school of thought, which has proven to be a useful tool to highlight the interactions between ecological and macroeconomic dynamics (Dafermos et al., 2017; Bovari et al., 2018; Monasterolo and Raberto, 2018).

Ecological macroeconomists have formulated proposals to regulate the financial system while facilitating long-term investments towards a low-carbon economy (Røpke, 2017; Jackson, 2017). They have suggested that several 'green' monetary policies and 'green' prudential regulations could be used to accelerate investments in the transition (Campiglio et al., 2018). For instance, establishing differential capital requirements could reward banks that are more exposed to 'green' assets and/or penalize banks with higher exposure to fossil fuels (Rozenberg et al., 2013; Campiglio, 2016). Central banks could also implement 'forward guidance' policies through which they would influence market expectations towards 'green' investments (Campiglio, 2016), or offer favourable refinancing conditions to commercial banks that have invested in low-carbon projects (Aglietta et al., 2015).

Several ecological macroeconomists also argue that public investments are critical to overcome the inability of the private sector

