



Learning by devaluating: A supply-side effect of competitive devaluation



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ABSTRACT

This study shows that the learning-by-doing (LBD) effect has substantial consequences for the international transmission of a monetary policy. LBD implies that a country can increase its productivity-increasing skill level by competitive devaluation, which happens at the expense of the neighbour if the Marshall–Lerner condition is satisfied. If measured by the cumulative change in output after 12 quarters, LBD increases the harmful effect of competitive devaluation on foreign output by 85–125%. If LBD is sufficiently strong and the cross-country substitutability is high (low), the effect of the monetary policy on foreign (domestic) welfare reverses to negative (positive).

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1. Introduction

During the recent global financial crisis, the U.S. Federal Reserve implemented an expansionary monetary policy by lowering the short-term nominal interest rate to the zero lower bound. Some economists have accused the Federal Reserve of competitive devaluation, which aims to depreciate the dollar and thereby boost U.S. exports and the economy at the expense of the rest of the world. For example, [Stiglitz \(2008\)](#) argues that U.S. interest rate reductions have contributed to a weaker dollar, thus helping export the problems of the U.S. economy to other countries. He also argues that, from a global perspective, this is simply a new version of a beggar-thy-neighbour policy. Later [Stiglitz \(2010\)](#) argues that “[c]ompetitive devaluation engineered through low interest rates has become the preferred form of beggar-thy-neighbour policies in the 21st century”.

The traditional Mundell–Fleming model supports the view that competitive devaluation is harmful to the rest of the world. However, the new open economy macroeconomics (NOEM) literature does not unambiguously support this view. In two-country NOEM models based on local currency pricing (LCP), the increase in demand caused by a lower interest rate is split between the countries, and output increases in both countries. This has a beggar-thy-neighbour welfare effect, because the home country can improve its terms of trade at the neighbour's expense. However, LCP implies that an exchange rate depreciation causes an improvement in the terms of trade. This is inconsistent with the empirical evidence of [Obstfeld and Rogoff \(2000\)](#), which shows the opposite. In addition, the LCP assumption violates the traditional view whereby an exchange rate depreciation causes a fall in the relative price of the country's exports, and consequently world demand shifts towards its products.

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In NOEM models based on producer currency pricing (PCP), an interest rate reduction depreciates the currency and boosts the country's output at the neighbour's expense (if the Marshall–Lerner condition is satisfied).¹ The reason is that the country experiences a fall in the relative price of its exports, and world demand shifts towards its products. A crucial parameter that governs the welfare effects of a monetary policy is the elasticity of substitution between domestic and foreign goods (cross-country substitutability, in short). If it is high, an interest rate reduction increases utility in both countries. This is because an improvement in the foreign terms of trade implies that foreign consumption increases despite a fall in output. If the cross-country substitutability is low, an interest rate reduction has a beggar-thyself effect. This is because the welfare benefits from the higher output are dominated by the welfare losses from a deterioration of the terms of trade. In summary, in the basic NOEM models, based on PCP, a monetary expansion does not have a beggar-thy-neighbour welfare implication, despite the fact that it increases domestic output at the neighbour's expense.

Open economy models typically treat productivity exogenously and independent of the exchange rate, and focus on the demand-side effects of exchange rate changes. It has been known, however, that exchange rate changes can also affect productivity and the supply side of the economy. *Boltho (1996)* discusses the possible supply-side effects of devaluations and emphasizes that some models have suggested that exchange rate depreciations could have beneficial effects that go beyond a short-term boost to exports. Higher output could stimulate investment and cause a positive supply response in the form of more rapid productivity growth, which would increase the competitive advantage. Moreover, *Bean (1988)* emphasizes supply-side effects that come from the presence of technical progress through learning by doing (LBD).² He argues that “[i]f the level of total factor productivity depends on past levels of output, then a fall in output today, due to, say, a loss in competitiveness, will lower productivity in the future and reduce supply” (*Bean, 1988, 59*).³

Not everybody shares the view that it might be beneficial to have undervalued currency. *Porter (1990)* argues that depreciations can be harmful, because an overvalued exchange rate can be better for productivity growth by forcing higher productivity growth in the traded-goods sector. However, *Matsuyama (1992)* uses a two-sector open economy growth model to show that a combination of LBD in the traded goods sector and a depreciation of the exchange rate can cause a temporary increase in productivity growth. The evidence of *McLeod and Mileva (2011)* supports this idea. They find a robust and causal relationship between a weak exchange rate and faster productivity growth. Moreover, they find that faster productivity growth is partly driven by the LBD effect.

The importance of LBD is highlighted by *Chang, Gomes, and Schorfheide (2002)*. They emphasize that the empirical labour economics literature has shown the following results: past work experience has a significant effect on current wage earnings, displaced workers suffer considerable wage losses, and the wage profile is strongly affected by job tenure. According to Chang et al., these findings suggest that the aggregate economy experiences systematic changes in labour productivity, as business cycles are associated with a strongly pro-cyclical hiring of new workers and counter-cyclical layoffs. Motivated by these observations, they assume an LBD mechanism in which worked hours increase the skill of the workers, which increases productivity in subsequent periods. The authors show that the LBD mechanism improves the ability of real business cycle models to match empirically observed output and employment fluctuations.⁴

Empirical evidence shows that exchange rate depreciations may have beneficial effects on the supply side of the economy, and the economy may experience systematic changes in productivity associated with the pro-cyclical hiring of new workers and counter-cyclical layoffs. This leads me to study the consequences of LBD for the international transmission of a monetary policy, which includes carrying out an analysis of the welfare consequences of LBD. A limitation of the above-mentioned studies that use LBD is that only the positive effects are analysed. In addition, I am not aware of any paper that analyses the implications of LBD in a two-country model that features imperfect competition and nominal rigidities. In this paper, I fill in this gap by studying the positive and normative consequences of LBD in the context of a two-country NOEM model. Based on the idea of *Chang et al. (2002)*, I assume that the productivity-increasing skill level of the firm accumulates over time, according to hours worked in the past. Therefore, competitive devaluation has supply-side consequences for both countries.

This paper shows that the introduction of an LBD mechanism into an open economy model has substantial, quantitative implications for the effectiveness of a monetary policy to stimulate domestic exports and output. LBD implies that a domestic country can raise its productivity-increasing skill level by competitive devaluation, which happens at the neighbour's expense if the Marshall–Lerner condition is satisfied. The expenditure-switching effect of an exchange rate depreciation increases domestic employment. This causes productivity-increasing skill level accumulation. In the short term, this lowers the relative price of domestic goods and appears to be a positive, temporary productivity shock that increases the supply of domestic goods. The opposite happens abroad. The LBD mechanism increases the cumulative change in domestic output over 12 quarters by 34–52% when compared to the case without LBD. However, this occurs at the neighbour's expense if the Marshall–Lerner condition is satisfied, as the mechanism strengthens the harmful effect of competitive devaluation on foreign output by 85–125%, depending on parameterization. If the Marshall–Lerner condition is not satisfied, domestic monetary expansion also increases foreign output, and the LBD mechanism strengthens the positive effect of a monetary policy on foreign output by 69%.

One of the main findings of this paper is that LBD has qualitative implications for the welfare effects of a monetary policy. As mentioned earlier, if LBD is absent and the cross-country substitutability is equal to the elasticity of substitution between two goods

¹ The Marshall–Lerner condition is that the sum of the price elasticities for imports and exports is greater than one in absolute value.

² The idea of learning by doing dates back at least to *Arrow (1962)* and *Kaldor (1957)*.

³ Many empirical studies support the view that it might be beneficial to have undervalued currency. *Dollar (1992)* finds that an overvalued exchange rate harms growth. *Razin and Collins (1999)* find that a mild undervaluation enhances economic growth, but a large undervaluation is harmful. *Hausmann, Pritchett, and Rodrik (2005)* find that growth accelerations often coincide with exchange rate depreciations.

⁴ *Johri and Lahiri (2008)* use the idea of *Chang et al. (2002)* to show that a combination of LBD in production and habit formation in leisure can enhance the ability of flexible price models to account for the observed high volatility and persistence of real exchange rates. The same question cannot be addressed in the context of the present model because the real exchange rate is always constant as preferences are identical across countries and the law of one price holds for all goods.

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