

Demystifying Dutch Disease

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Abstract

This paper examines the theory of Dutch disease and its implications for practical policy questions. Dutch disease is a term that is well-known to economists and development practitioners. But it is also a concept that is often conflated with “resource curse” and misinterpreted as a “disease” that necessarily causes adverse impacts on the economy. The paper points out that many of the seemingly well-established arguments in this field are not necessarily grounded in theory or empirical evidence. Great care is needed in diagnosing Dutch disease and formulating policy prescriptions based on the theoretical framework, given the restrictive assumptions that may not be fully applicable and the

limited relevance to today’s inextricably intertwined trade flows. Countries facing large inflows of foreign currency should focus on safeguarding the domestic economy from the volatility of international commodity and capital markets, and building robust institutions to reduce adjustment costs and boost broader competitiveness. A policy package needs to be comprehensive, covering macroeconomic and structural policy measures, and should be calibrated to target country specific concerns. Policies may need to be adjusted continuously in view of the evolving dynamics of the global and domestic economic environment.

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Demystifying Dutch Disease

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1. Introduction

This paper takes a fresh look at Dutch disease. Dutch disease is a term that is well-known to economists and development practitioners. But it is also a concept that is often conflated with “resource curse” and misinterpreted as a “disease” that necessarily causes adverse impacts on the economy.² A review of World Bank reports confirms that there are some persistent myths about Dutch disease. While these reports do not engage in some of the most damaging myths found in other economic literature, the rigor they exhibit is inconsistent.

The objective of this paper is to provide a concise overview of Dutch disease, synthesizing empirical literature and latest policy debates, and clarifying some of the typical misunderstandings about Dutch disease. The target audience of this paper is development practitioners, who are working to support countries facing surges in foreign currency inflows of any kinds, as well as government officials and anyone interested in learning about the operational implication of Dutch disease.

This paper is organized as follows. Section 2 presents a brief review of the standard Dutch disease theory with no international factor mobility and factor accumulation. Section 3 translates the theory into practical implications, and examines the myths of Dutch disease that often surface in the development literature and policy discussions. Section 4 presents a general policy package for countries that are subject to large influxes of foreign currency, and argues that such a package should be comprehensive and designed to target country-specific concerns. Finally, Section 5 concludes the paper.

2. Theory: What Is Dutch Disease?

In the original sense of the term, Dutch disease refers to a situation in which an extra wealth from an export boom—such as a discovery of major resource deposits—leads to *a contraction of other tradable activities* by giving rise to a real appreciation of the home currency.

Although Dutch disease is generally associated with mineral resources, the analytical framework of Dutch disease is equally applicable to a wealth increase that results from large inflows of foreign currency—foreign aid, remittances and capital inflows—as well as a non-extractive export boom, such as one associated with the displacement of older industry by technologically more advanced activities.

The “Core Model”

The Dutch disease theory was established by two Australian economists, Corden and Neary. Their seminal paper, published in 1982, provides the first systematic analysis of the Dutch disease mechanism—that is, how an export boom causes a structural shift in an economy.

Their simplest static framework, known as the “Core Model”, considers a small open economy that produces two types of goods—one booming and the other non-booming tradables—and non-tradable goods. The booming and non-booming goods are traded at exogenously given world prices, whereas the price of non-tradable goods is determined endogenously by domestic supply and demand conditions.

² In some cases, the resulting anxieties and political pressure to “cure” Dutch disease have led to a protectionism argument. For example, there is a heated debate in Canada about the potential impact of oil sand production on manufacturing employment.

Output of each sector, all for final consumption only, is produced by capital and labor, which are both internationally *immobile*. Capital is a factor specific to each sector, and labor is perfectly mobile between the three sectors. Booming-tradables are wholly exported and not for domestic consumption. Goods produced by the non-booming tradable sector are perfect substitutes for imports. There are no commodity or factor market distortions in the economy, and the wage rate adjusts flexibly to ensure full employment to be maintained at all times. Monetary considerations are disregarded in this model, and only relative prices (measured by the price of non-booming goods) matter. As discussed later, the well-known outcome of an export boom hinges critically on these assumptions.³

In this framework, an export boom causes a contraction of the non-booming tradable sector through two effects: the resource movement and spending effects. The resource movement effect takes place as the marginal products of factors increase in the booming sector, attracting labor out of the non-booming tradable and non-tradable sectors. With a reduced availability of labor, output of the other two sectors falls. This is the outcome of the resource movement effect.

The major impact of the boom comes typically from the spending effect, in which higher real income resulting from the export bonanza leads to increased spending, raising demand for non-booming tradables and non-tradables. Since the price of non-booming tradables is given exogenously, it does not rise despite increased demand, and any excess demand for non-booming tradables is met by increased imports. As for non-tradables, part of excess demand is satisfied by increased supply. However, since the capacity of satisfying the demand cannot be expanded quickly, the relative price of non-tradables rises to eliminate excess demand, resulting in a real appreciation of the domestic currency.⁴ Labor is drawn into the non-tradable sector as it expands production, putting an upward pressure on the wage rate measured in terms of the price of tradable goods, and squeezing profitability of the non-booming tradable sector. However, the wage falls when measured in terms of non-tradables because of the higher relative price of non-tradables. Whether the real wage—measured in terms of a consumption basket of two tradable and one non-tradable goods—rises or falls is uncertain. The direction and magnitude of the change in the real wage depend on the net impact of the resource movement and spending effects, as well as the composition of the consumption basket.

The two effects combined bring about a real appreciation and a contraction of employment and output in the non-booming tradable sector, *when labor is assumed to be in fixed supply and the only mobile factor between sectors*. This outcome, which characterizes Dutch disease, is sometimes called “de-industrialization”, but the term should be regarded as no more than shorthand for the decline of the non-booming tradable sector, which can include agriculture, tourism, financial services, or any other exportable goods and services.

No Dutch disease with perfect international mobility of capital and labor

There are extensive theoretical refinements to the Core Model, altering the assumptions and extending the scope of the analysis further, allowing for instance, for monetary considerations, presence of market

³ In addition, a set of standard neoclassical assumptions also applies.

⁴ In countries under the floating exchange rate regime, much of real appreciation occurs through nominal appreciation rather than domestic price increases.

rigidities, international factor mobility, dynamic economic adjustment, and knowledge spillovers, just to name a few.⁵

What is less known is that an export boom leads to an entirely different outcome, when the original assumptions are altered. For example, if capital and labor are assumed to be perfectly mobile internationally—representative of a long-term condition—the real exchange rate is not affected by an export boom, and there is no Dutch disease. Under perfect international factor mobility, supply of non-tradables expands to accommodate excess demand by getting more capital and workers from abroad without bidding them away from the other sectors.⁶ With infinitely elastic supply of non-tradables, there is no change in the price of non-tradables, and the real exchange rate does not move. The non-booming tradable sector also expands to benefit from higher domestic demand, increasing production, taking advantage of internationally mobile factors of production. Output of all three sectors expands under the assumption of perfect international capital labor mobility.

3. Dutch Disease in Practice: Myths and Evidence

There are widespread concerns about alleged adverse impacts of Dutch disease. This section translates the theory outlined earlier into practical implications, and examines typical misunderstandings about Dutch disease. It points out that many of the seemingly well-established arguments are not necessarily grounded in theory or evidence, and calls for great care when applying the theoretical framework to draw policy suggestions.

Myth 1. Dutch disease leads to a relative fall of non-booming tradables to non-tradables.

The Dutch disease theory suggests an *absolute* decline in the output of the non-booming tradable sector, relative to the level that would have prevailed in the absence of a boom (counterfactual). A decline in the ratio of non-booming tradable output-to-GDP or non-booming tradable exports-to-total exports does not automatically suggest Dutch disease. Logically, if there is a booming sector in the economy, then the share of other sectors has to fall, even when their output levels are maintained in absolute terms.

Myth 2. Dutch disease always results in an expansion of the non-tradable sector.

Production of non-tradables may *increase* or *decrease* in absolute terms. Profitability, and thus output, of the non-tradable sector depends on the net impact of the resource movement and spending effects on the wage rate. If the resource movement effect dominates the spending effect, labor moves towards the booming sector, raising the wage relative to the non-tradable sector and squeezing its profit. Output of both non-booming tradable and non-tradable sectors declines as a result, and the booming sector output expands. In a special case, where the booming exportable sector is an enclave (i.e., it does not participate in domestic factor markets), there is only the spending effect.⁷ The wage rate falls in terms of the price of non-tradables, raising profitability and output of that sector.

⁵ Important contributions include Corden (1984), van Wijnbergen (1984), Bruno and Sachs (1982), Buiters and Purvis (1983), Krugman (1987) and Matsuyama (1992).

⁶ Being a small open economy, the country takes an internationally determined wage and rental rate as given under perfect international mobility of factors.

⁷ Similarly, there is no resource movement effect when inflows of foreign exchange take the form of aid, remittance and foreign capital inflows (see Myths 12 and 13).

Myth 3. The Netherlands suffered Dutch disease driven by exploration of natural gas.

Rising unemployment and industrial stagnation that troubled the Netherlands during late 1970s to mid-1980s were not caused by real appreciation as predicted by the standard Dutch disease framework, but rather it was caused by the expansion of social welfare benefits that drove up wages and squeezed firms' profitability.⁸ With the rise in benefits, the social security contributions by both employers and employees grew steadily, leading to economy-wide increases in total labor costs. Pressures on the wages intensified further by the Dutch centralized wage bargaining system, in which the labor productivity indicator of the most productive sector (natural gas) played a central role. Available evidence suggests very little systematic and long-term net adverse consequences of natural gas development on the manufacturing sector.⁹

Myth 4. Dutch disease is caused by wasteful government spending.

Dutch disease could happen without expansionary fiscal policy or wasteful government spending. All that matters is the extent to which the economy *as a whole* spends the extra income on non-tradable goods and services. However, the manner in which the government conducts fiscal policy—in terms of the scale and instruments used as well as the allocation and quality of expenditures—is a crucial element in determining the magnitude and direction of the spending effect, and the economy's supply response to the excess demand. This is particularly the case when a large part of export earnings accrues to the government, most notably natural resource rents.

Myth 5. Dutch disease causes adverse impacts on long-run growth.

The logic behind Dutch disease suggests nothing inherently growth-inhibiting or indicative of welfare loss.¹⁰ Contrary to widespread belief, Dutch disease, by itself, is not a disease. It is simply a description of the causes and structural effects of boom-induced income growth, i.e., resource reallocation away from a less profitable non-booming tradable sector to sectors that have comparative advantage. The non-booming tradable sector declines as it is no longer price competitive. However, overall economic growth need not suffer from the shrinking non-booming tradable sector. This is an efficient adaptation of the economy to the new environment and increased wealth, and is not a source of concern on its own, especially when the export boom is expected to be permanent. Views about Dutch disease as intrinsically negative appear to be influenced by the natural resource curse thesis (see Myth 8).

Empirical studies find no definitive evidence that export specialization, including specialization in resource exports (proxy for Dutch disease), reduces long-run growth rates.¹¹ Yet the term Dutch disease

⁸ The Dutch economic trouble following the natural gas discoveries appears overstated. According to the BIS data, the Dutch guilder experienced a real effective *depreciation* (not appreciation) during late 1970s to mid-1980s. Also, data obtained from the Statistics Netherlands suggest that neither manufacturing output nor exports contracted in real, absolute terms for the same period, although its share in GDP or total exports declined because of the natural gas boom.

⁹ See Kremers (1986) for a good analysis of the impact of natural gas discoveries on the Dutch economy.

¹⁰ A number of prominent researchers emphasize this point. See, for example, Edwards and Aoki (1983), Neary and van Winjnbergen (1986), Krugman (1987), Bean (1988), Davis (1995), Sachs and Warner (1995), Hausmann and Rigobon (2003), Canuto (2007) and many others.

¹¹ Statistical results are sensitive to the changing of the sample period and sample of countries, as well as the way to deal with endogeneity associated with the measure of resource abundance, resource dependency and economic

continues to be used loosely whenever one sees harmful consequences of discoveries or sudden upward revaluation of exported natural resources in developed and developing countries.¹² Official reports published by the World Bank Group are no exception to this tendency, which raises the possibility that its advice could be misleading or discourage countries from pursuing the necessary policy actions (Box 1).

Box 1. Review of World Bank Documents

To investigate some of the common pitfalls associated with “Dutch disease,” we reviewed 28 country-specific, official World Bank reports that use the term, are publically available, and were published from 2000 onwards.^a The review confirms that there are some persistent misunderstandings about Dutch disease. In these documents, precision varies widely. While some reports carefully consider the Dutch disease concept and assess whether the country is exhibiting signs of the phenomenon, many other documents just mention Dutch disease as a risk and propose policy actions with little analysis.

Definition. Of the 28 reports, only four provide a precise definition that adheres to the original interpretation. While 11 country documents do not define the term at all, the remainder misinterprets Dutch disease as “harmful consequences of large foreign currency inflows,” “unproductive government spending,” or “increased volatility.” The inconsistent interpretation of the concept raises great concern, since definitions anchor the subsequent policy discussion and begin to delineate the problem.

Policy advice. Among the 28 World Bank publications considered, 20 offer policy advice. Only four reports suggest what might be considered as a “best practice” policy package, addressing volatility concerns and structural issues to enhance overall competitiveness. Of the remaining reports, the biggest group of reports offers a partial solution, focusing narrowly on fiscal measures, such as prudent fiscal management, counter-cyclical fiscal policies, or rule-based strategy to prevent real appreciation or avoid Dutch disease.^b Others recommend stand-alone policy actions, such as the accumulation of international reserves to avoid nominal appreciation of the local currency, or sterilization of balance of payments surpluses to mitigate upward pressures on the real exchange rate.

While the Bank reports do not engage in some of the most damaging myths found in other literature, the rigor they exhibit is inconsistent. Few of the reports give harmful suggestions, but the lack of precision—a hasty definition or none at all or an over-reaching policy prescription—could lead to misinterpretation.

^a The documents range from Country Economic Memoranda and Public Expenditure Reviews to smaller-scale policy papers and economic updates that give specific policy advice to governments.

^b Two of the 28 reports define “avoiding or curing Dutch disease” as a main policy objective of a country operation.

Myth 6. Dutch disease hampers productivity growth by limiting learning-by-doing opportunities.

The proposition that positive externalities accrue only to the manufacturing sector is illogical in today’s world, in which the share of manufacturing in most economies has been on the fall. Few now attributes to manufactured exports any special role in generating productivity growth.

Those who worry about Dutch disease are concerned that resource reallocation away from the export sector, in particular manufacturing, could permanently jeopardize a country’s long-term growth potential.

performance. While Sachs and Warner (1995) find specialization in resource exports to have a strong negative impact on growth, more recent studies dispute the Sachs and Warner findings on measurement and econometric grounds, and find results that suggest a “resource blessing”. See, for instance, Lederman and Maloney (2007), Brunnschweiler and Bulte (2008), van der Ploeg and Poelhekke (2009), and Haber and Menaldo (2011). See Lederman and Maloney (2007) for more discussion on the endogeneity issue, as well as Myth 8 for further discussion on resource curse.

¹² Canuto (2007).

This argument rests on the strong belief that a country cannot become rich without getting into manufacturing, because of its “special” spillover or other production-enhancing qualities that are critical for economy-wide productivity growth in the long run.¹³ This logic is as follows: since other sectors do not have these special characteristics, even a temporary set-back of manufacturing would permanently lower the entire economy’s future growth by choking off an important source of knowledge accumulation. Given the rapid technological changes that affect the sector, the manufacturing sector, once lost, may not bounce back when the boom is over.¹⁴

However, empirical evidence for the existence of knowledge-spillovers from manufactured exports is, at best, mixed.¹⁵ There is growing evidence that, with the evolution of new technology, such as ICT, the service sector is rapidly replacing the traditional export sector as a new engine of growth and job creation.¹⁶ Exports in ICT-intensive modern services are growing in both poor and rich countries, and are more technologically sophisticated than traditional exports. Likewise, the mining sector is no less linked to advances in knowledge and technological capabilities. Mineral extraction is indeed one of the most knowledge- and technology-intensive industries of the global economy, and a prime source of innovation.¹⁷ Furthermore, transfers of ideas and technology from abroad are not limited to exports. Evidence suggests that the level of imports, rather than exports, exerts more important effect on productivity and economic growth, through the intensification of domestic competition and access to intermediate inputs.¹⁸ There is no reason why positive externalities should be the exclusive preserve of manufactured exports.

Myth 7. Dutch disease undermines growth through real overvaluation of home currency.

An export boom-induced real appreciation should more properly be seen as an equilibrium phenomenon that reflects changes in underlying fundamentals.¹⁹ Great care is needed before labeling this an exchange rate “overvaluation”.

Concerns over Dutch disease are associated with the view that a real appreciation of the domestic currency hurts economic growth by undermining external competitiveness, but empirical evidence is far from established.²⁰ Advocates of “competitive” exchange rates, most prominently Rodrik (2008), claim

¹³ For example, see Rodrik (2008).

¹⁴ As regards concerns about resource depletion, Wright and Czelusta (2004) contend that natural resource reserves are rarely depleted as rapidly as expected. New mining technologies are invented (e.g., shale gas), as are processes that make more economical use of lesser grades.

¹⁵ See Lederman and Maloney (2012) for further discussions.

¹⁶ See Ghani, et al. (2012).

¹⁷ The US achieved rapid industrial development in the early 1990s not simply because it was endowed by plentiful natural resources, but because other industries benefited from the spillover effects of new technologies and education, in which the minerals sector had invested heavily (Wright and Czelusta, 2004).

¹⁸ See OECD (2010). Lawrence and Winstein (1999) find evidence that imports, rather than exports, have driven productivity growth in Japan and other East Asian countries.

¹⁹ This view is closely linked to the Washington Consensus, which argues any real exchange rate misalignment, that is, the real exchange is above or below the fundamental based long-run equilibrium, harms welfare and growth.

²⁰ The relationship between real appreciation and growth is mixed. Trevino (2011) finds real exchange rate overvaluation is associated with higher rather lower growth in some cases, whereas Magud and Sosa (2010) find no evidence that real appreciation hurts growth. Empirical evidence for the growth effect of undervaluation is even more inconclusive (e.g., Montiel and Servén, 2008).

that exchange rate undervaluation should be part of a comprehensive growth strategy. However, exchange rate manipulation to gain unfair competitive advantage—the practice that led to the currency war in the 1930s—goes against the spirit of international cooperation, is prohibited by international agreement, and is likely to be unsustainable in the long run. In addition, there is a strong possibility that prolonged undervaluation of the exchange rate leads to a build-up of inflationary pressures, thereby jeopardizing growth in the medium term. Furthermore, maintaining an undervalued exchange rate makes imports of essential capital and intermediate goods and services more expensive, affecting not only the tradable but also non-tradable sector, such as housing and transport.

Countries experience real appreciation of the currency as their productivity, output and income increase relative to the rest of the world (Balassa-Samuelson effect). While the tradable sector may lose price competitiveness, it would be wrong to conclude that export boom-driven appreciations are necessarily making the overall economy uncompetitive. A country's external competitiveness—simply put, its ability to sell its products on international markets—goes beyond notions of real exchange rate competitiveness. Measures of export competitiveness also include unit labor cost, the level of complexity or technology content of exported products, and the ability of firms to charge higher prices for similar products due to higher quality perception.²¹ Furthermore, behind-the-border measures, trade facilitation, as well as many other factors that constitute “institutions” are growing their importance in determining a country's international competitiveness.

Those who are worried about the negative impact of real appreciation also ignore an important aspect of today's increasingly interconnected global marketplace. With the rise in global value chains, production processes are increasingly fragmented across different countries, and imported goods and services are an essential input for exports, either for final sale or as intermediate inputs into further stages of production.²² A boom-induced real appreciation—an increase in the relative prices of *final* products—makes goods and services more expensive to sell abroad, but reduces the cost of imported *intermediate* inputs.²³ With a sufficiently large volume of foreign inputs, the benefits of cheaper access to imported inputs can potentially offset the negative effect of real appreciation. The non-booming tradable sector may be able to stay competitive and expand production to reap the benefit of the spending effect.

Myth 8. Dutch disease is synonymous with resource curse.

Dutch disease and resource curse are two separate issues, although frequently thought to be synonymous. Dutch disease describes a pure economic phenomenon, in which the economy adjusts to the new equilibrium following large-scale inflows of foreign exchange (of any kinds). Resource curse is a thesis that interprets natural resource abundance to cause intrinsically negative impact on growth and

²¹ World Bank (2014).

²² Trade in intermediate goods and services now accounts for more than two-thirds of total international trade flows (IMF, 2013a).

²³ It is increasingly recognized the real exchange rate fails to appropriately measure export competitiveness in today's world. Standard CPI-based real effective exchange rates are based on the assumption that goods traded are *final* consumption goods only, and it does not account for the fact that real appreciation could boost competitiveness through cheaper imported inputs. Various efforts are under way to find alternative measurements of competitiveness. See, for example, IMF (2013a) and Dupeyras and MacCallum (2013), for further discussion.

development. The thesis was advocated by Auty (1993), and later popularized by the seminal work by Sachs and Warner (1995).²⁴

There is a broad consensus that the issues around resources and development are only partly economic in nature, and are heavily influenced by the interactions between resource rents and the political and social institutions. Multi-country studies find that plentiful resources have adverse impact on development through large fluctuations of commodity prices and erosion of governance and institutions, for example, by engendering corruption, voracious rent-grabbing behavior, pro-cyclical macroeconomic policy, resource misappropriation, deterioration of the legal system, as well as armed conflicts and civil wars.²⁵ The degree to which institutions are endogenous to natural resource rents remains unresolved. While many countries fell into the resource curse trap, there are also countries that have been able to translate resource wealth into sustained economic performance, without compromising the institutional quality.²⁶

Myth 9. Dutch disease leads to a welfare loss.

Dutch disease, in itself, is welfare improving. Why so, when employment and output of the non-booming tradable sector shrink? It is because the economy as a whole benefits from the expansionary effect of the boom and the consequent structural change. The increased wealth accrued to the booming sector spills over to the rest of the economy through higher domestic demand, increasing wages, stimulating production, and, in turn, expanding consumption and investment further through another round of the wealth effect. The boom-induced real appreciation also allows consumers to enjoy imported goods and services that were not affordable without Dutch disease. The standard of living, which depends on the purchasing power over imports as well as domestically produced goods, goes up.

While Dutch disease brings about welfare improvements in the medium term, there are short-term consequences. In the real world, an economy cannot adjust instantaneously to the new environment because of rigidities in goods and factor markets. When capital and labor shift from one sector to another, firms are forced to shut down and workers have to find new jobs, creating temporary unemployment.²⁷ If inflation inertia is strong due to imperfect or asymmetric information, domestic prices would adjust only

²⁴ The resource curse thesis is built on the observation that countries rich in natural resources, in particular mineral resources, tended to have slower economic growth and worse development outcomes than countries with fewer resources in the latter half of the 20th century. Auty and Warhurst (1993) blame Dutch disease for the weak economic performance of mineral economies, and propose imposing regulations to control the level of exports so as to avoid the Dutch disease risk. However, their economic arguments lack rigor, and the authors (both geographers) apparently misunderstands Dutch disease as something that inevitably damages “the rate and efficiency of economic growth”.

²⁵ It needs to be underscored that commodities account for only part of the large cyclical fluctuations experienced by resource rich developing countries. Other factors, such as pro-cyclical macroeconomic policy and capital inflows, can exacerbate the commodity boom-bust cycles, instead of moderating them. For empirical studies that examine the natural resource thesis, see van der Ploeg and Poelhekke (2009), Rajan and Subramanian (2011), Ades and Tella (1999), Bhattacharyya and Hodler (2010), Gylfason (2004), Collier and Hoeffler (2009), and Mauro (1995).

²⁶ See Mehlum, et al. (2006a) and (2006b), and Boschini et al. (2007). Gelb (2014) argues that resource industries can have a modernizing effect both directly and through the income they provide, citing the example of Venezuela’s early onset of democracy.

²⁷ Unemployment can become particularly acute in countries with centralized wage bargaining, where the national resource sector sets the tone in nationwide wage negotiations and dictate wage settlements that other sectors can ill afford.

sluggishly to the new equilibrium.²⁸ The real exchange rate could temporarily overshoot its long-run value, amplifying the adverse consequences for the competitiveness of the non-booming tradable sector in the short run.²⁹ This transition, no matter how brief, is painful, both economically and politically. The pain of transition is aggravated if the boom ends up short-lived, which means that the costly initial adjustment must be reversed.

Myth 10. Resource rich developing countries should all be concerned about Dutch disease.

While the stylized models provide intuitively plausible characterization of an economy's response to an export boom, it is important to emphasize that what the model predicts as the outcome of an export boom hinges critically on the several assumptions that obfuscate the reality. Although these assumptions do not invalidate the core Dutch disease model, they do point to the fact that the models' conclusions may not be applicable in certain circumstances.

Empirical applicability of Dutch disease is generally quite limited for developing countries. Box 2 below highlights some of the most notable features of developing countries that are *not* in line with the assumptions of the analytical model, and cautions against making a hasty diagnosis of, or prognosis for, Dutch disease, without giving adequate attention to country specific circumstances.

Box 2. Dutch Disease: Assumptions and Realities in Developing Countries

Full employment assumption. One of the central issues of the Dutch disease concept is the assumption that a country is operating on its production possibility frontier, that is, full employment of all factors of production. This is an unlikely condition for many developing countries, where inefficient use of existing production factors is endemic. In countries with underemployed labor, the booming tradable sector can increase production by absorbing surplus workers without bidding labor away from the other sectors. Similarly, the non-tradable sector may be able to tap on the pool of idle labor without raising wages, and expand output to eliminate excess demand.^a Real appreciation of the home currency is likely to be limited, and Dutch disease may not be realized. In countries where unemployment is related to skills mismatch in the local labor market, firms may choose to scale up production by sourcing foreign skilled labor. In the absence of factor constraints, there would be little impact on the real exchange rate and the structure of the economy.

Fully flexible and competitive market assumption. Markets in developing countries may respond sluggishly to an export boom, or may move into a direction not predicted by the theory, influenced by market distortions, limited absorptive capacity, and other impediments that are often discussed in the context of resource curse. When market imperfections exist, the Dutch disease theory may be of little use in predicting the effect of an export boom on the economic structure.

In the presence of market distortions—e.g., administrative price controls, subsidies on key inputs or import restrictions—prices are unlikely to adjust rapidly to reflect domestic market conditions. Labor may not be easily reallocated between sectors, hampered by rigid labor regulations, skills mismatch, and other social or structural reasons. Supply response to increased demand may be quite sluggish in the absence of an enabling institutional and regulatory environment, as well as well-functioning financial intermediation. Goods and services that are otherwise tradable may not be exported or imported internationally, inhibited by trade barriers, exchange controls, as well as poor trade logistics and facilitation. Under such circumstances, how an economy responds to an export boom is unpredictable.

Perfect substitutability assumption. Goods and services produced in developing countries are typically imperfect substitutes for those traded on world markets. The prices of local products are thus influenced more by the

²⁸ See Dornbusch (1976) for the exchange rate overshooting model.

²⁹ See Buiter and Purvis (1983) who analyze the short-term dynamics of the real exchange rate, stemming from sluggish adjustment of domestic prices.

conditions of domestic markets rather than world markets. While part of the increased demand would still go to imported foreign products, producers of imperfect import substitutes, just like their non-tradable counterparts, would also benefit from the spending effect of the boom. Firms producing perfect import substitutes may lose from the real appreciation, but others producing imperfect substitutes could expand. The net impact on the overall tradable sector is ambiguous.

No intermediate input assumption. When *intermediate* inputs are introduced in the analytical framework, the impact of an export boom on the economy's structure becomes much more complex than indicated by a traditional trade model based on comparative advantages of *final* goods.

Developing countries depend heavily on foreign intermediate goods and services for production. While real appreciation of the currency makes it more difficult to sell goods and services internationally, exporters who rely heavily on imported contents benefit from cheaper foreign intermediate inputs. If the windfall is entirely spent on imports, it would have no impact on the domestic demand for non-tradables and the real exchange rate. Dutch disease would not arise.

In addition, studies reveal that a growing number of developing countries, including natural resource-rich and the poor, are participating in global value chains, suggesting that a boom-induced real appreciation would influence the structure of the economy in a more complex manner than predicted by the simple model.^b How real appreciation of the currency affects supply-chain trade cannot be analyzed in the Dutch disease framework, and is not well-understood at this stage.^c

^a Underemployment may take the form of low-productivity subsistence agriculture, underemployed jobseekers (part-time workers), or underemployed civil servants within the bureaucracy.

^b According to UNCTAD (2013), the share of developing countries in global value added trade is over 40 percent today. In 2009, for instance, 40 percent of gross exports from Malaysia and Vietnam consisted of foreign components. Among other sectors, manufacturing was the heaviest user of imported materials and equipment, with foreign value added embodied more than 60 percent of gross exports.

^c For further discussions, see IMF (2013a).

Myth 11. Dutch disease can be diagnosed.

Diagnosing Dutch disease is extremely challenging even when there is real appreciation. A shift from manufacturing to services has been a worldwide trend. To ascertain that a country suffers from Dutch disease requires one to prove the relationship between resource inflows, the real exchange rate, and a decline in the non-booming tradable sector, in the presence of a myriad of factors that affect economic performance. Coincidental strengths of foreign exchange inflows (exports, aid, remittance, capital flows) and the home currency should not be treated as *prima facie* evidence of Dutch disease, as this ignores the fact that the real exchange rate is influenced by a diverse set of factors.

A number of researchers have sought to find evidence of Dutch disease, but empirical results are mixed regardless of the methodology employed in the analysis.³⁰ Broadly, empirical literature of Dutch disease can be classified into three groups: (i) studies based on cross-country or panel data estimations; (ii) specific country studies based on time-series regression analysis; and (iii) country case studies that rely on stylized facts. The poor predictive power of the analytical framework appears to be attributed to several factors as discussed below.

³⁰ Examples of the first group include Arezki and Ismail (2010), Rajan and Subramanian (2011), and Lartey, et al. (2012). For the second type of studies, see Richards (1994), Oomes and Kalcheva (2007) and Algieri (2011). For the last type, see Dobrynskaya and Turkisch (2010).

Definition of Dutch disease. From the start, the literature lacks a common ground as to what it means by Dutch disease. While some researchers define absolute expansions of service activities as Dutch disease, others interpret increases in the share of resource exports in total gross exports, reductions in manufacturing value added in percent of GDP, or relative declines in manufacturing to service value added as a Dutch disease symptom. Few studies examine absolute declines in the tradable sector.³¹ Moreover, most of the literature focuses on the short-term impact of higher foreign exchange inflows, and does not assess the effects in the long term, ignoring completely the beneficial effects of inflows.

Tradable vs. non-tradable. In the real world, there is no clear dividing line between the tradable and non-tradable sectors, and distinguishing them is difficult. Studies often use manufacturing as a proxy for non-booming tradables. However, not all manufacturing firms produce exportable goods. A country's manufacturing sector may include some non-tradable as well as tradable good sectors. Thus, a decline of the sector as a whole because of real appreciation is by no means inevitable. The net effect of real currency appreciation can vary within the tradable sector.

Gross vs. net inflows. Analyses of Dutch disease seldom pay attention to simultaneous outflows of foreign currency, which dilute upward pressures on the real exchange rate. For example, if income accruing to the booming sector is largely repatriated, then the spending effect of the boom and thus the impact on the real exchange rate are likely to be limited. Similarly, Dutch disease is unlikely to occur if a large part of the foreign funds goes to imports, or purchases of foreign assets of various kinds (e.g., through a sovereign wealth fund), which involve outflows of funds.

Country-specific factors. Many studies fail to pay adequate attention to country-specific factors that have a significant impact on the real exchange rate or export performance, including, but not limited, to the economy's flexibility, macroeconomic policy stance, distortions, absorptive capacity, and types of spending financed by foreign exchange inflows. Obviously, the outcome of an export boom can differ significantly between a country that spends a large part of income windfalls on domestically produced goods and services and one that chooses to save the bulk of foreign resource inflows for future consumption.

Myth 12. Dutch disease can affect recipients of large foreign transfers.

There are fears that a surge in the inflows of foreign transfers, such as foreign aid and workers' remittances, can precipitate a sharp real appreciation through the spending effect, which could result in a contraction of the tradable sector by undermining competitiveness. When foreign transfers come in the form of remittance inflows, the Dutch disease effect could be exacerbated, since remittance inflows tend to raise the reservation wage, putting further upward pressures on the local wages. While the non-tradable sector can pass these processes onto prices, the import-competing tradable sector cannot follow suit to stay competitive.

³¹ Measuring precisely the decline in the non-booming tradable sector requires calculating the counterfactual size of the tradable sector, that is, how large the non-booming tradable sector would have been without foreign currency inflows. One way to measure the counterfactual is to use the Chenery and Syrquin's (1975) approach to estimate a norm for the size of the tradable sector (Brahmbhatt, et al., 2010).

There is little decisive evidence that Dutch disease is widespread among the recipient countries of sizable foreign aid or remittances.³² Yet caution is needed. The movement of the real exchange rate needs to be monitored closely, since foreign transfer-driven real appreciation and the resulting fall in the tradable sector, if happened, could have long-term consequences. Real appreciation driven by an export boom is the corollary of higher levels of income and consumption that a country enjoys as productivity increases and its citizens become richer. However, foreign transfers could prompt an immediate appreciation of the exchange rate without concurrent increases in a recipient country's productivity and output, when a sizable proportion of transfers are spent on domestically produced goods and services. Unless the transfers are used wisely to boost productivity, well-intended foreign gifts could give rise to an "overvaluation" of the home currency, potentially jeopardizing exports and growth in the long run. Damage to the recipient's economy could be greater if the inflows of transfer exhibit volatility.

Myth 13. Large foreign capital inflows can cause a Dutch disease effect.

Large inflows of foreign capital—FDI, portfolio investment and other investments (typically bank lending)—can trigger a sharp real appreciation of the currency and may encourage resource reallocation away from the tradable sector. Given the growing volume of international capital flows, their potential impact on the real exchange rate and tradable sector can be significant. A Dutch disease effect would intensify when resource rich countries receive an influx of foreign capital, which is a growing trend in recent years.

There are only few empirical studies that examine whether surges in capital inflows damage the export performance of the recipient countries. Dutch disease may or may not materialize in countries receiving sizable capital inflows.

Studies in this field have focused mostly on the short-run impact of volatile financial inflows on the real exchange rate, current account, and financial sector vulnerability of the recipient countries.³³ This reflects the bitter experience best exemplified by the Asian crisis in the late 1990s, when waves of capital inflows fueled excessive credit growth, expanded current account deficits, appreciated currencies and a loss of competitiveness. Empirical literature is unanimous that surges in foreign capital inflows lead to real currency appreciation, and that countries with poorly developed financial sector and weak institutions are particularly vulnerable to strong cyclicity of capital inflows.³⁴ A sudden stop or reversal of capital inflows prompts a reversal of the economy's adjustment process, leading to a real depreciation of the currency and forcing Dutch disease to be reversed (resources to move back from the non-tradable to the tradable sector). Vulnerabilities to sudden capital outflows are more pronounced in countries where

³² While some studies find a strong positive correlation between foreign transfers and the real exchange rate, others find evidence that increased aid or remittances had no systematic effect on the real exchange rate, or led to real depreciation, not real appreciation. See for example Lopez, et al. (2007), Fielding and Gibson (2012), Amuedo-Dorantes and Pozo (2004), Kang, et al. (2012), Lartey, et al. (2012), Martins (2013), and IMF (2005). Good literature review can be found in Magud and Sosa (2010), and Naceur, et al. (2012). Rajan and Subramanian (2011) find a negative relationship between aid inflows and export performance, whereas Selaya and Thiele (2010) show evidence that aid has positive and equally significant effect on the tradable and non-tradable sectors.

³³ See, for example, Bakardzhieva, et al. (2010), Lartey (2011), Combes, et al, (2012) and Jongwanich and Kohpaiboon (2013).

³⁴ See, for example, Dell'Ariceia, et al. (2008) and Kose, et al. (2006). Also see Chapter 6 of Gill, et al (2014) for Eurasia's experience of volatile capital inflows.

earlier resource reallocation led to large current account deficits, but could also be a threat to surplus countries with large external liabilities and overstretched domestic credit markets.

Myth 14. Dollarized economies are not subject to Dutch disease.

Dutch disease could strike even in countries that do not have a national currency (full dollarization).³⁵ Just as in other countries, an export boom or a sharp increase in capital inflows may induce changes in the relative price and resource reallocation, squeezing profitability and output of the non-booming tradable sector.

Whether partially (or unofficially) dollarized economies experience Dutch disease is an open question. There is no study that systematically investigates the presence of Dutch disease in these economies.³⁶ Under partial dollarization, individuals use US dollars or other hard currency to make transactions (payment dollarization) and protect their purchasing power of financial assets (financial dollarization).³⁷ In these economies, typically the bulk of large-scale transactions, both tradable and non-tradable, takes place in US dollars or other hard currency, and the national currency is used only for small, local transactions. If local prices and wages are also set in US dollars, then the movement in the real exchange rate does not affect overall production cost, and real appreciation does not erode export competitiveness of the tradable sector.

Myth 15. Dutch disease should be avoided through policy intervention.

Dutch disease adjustments driven by an export boom are an appropriate response to a country's increased wealth and do not automatically justify government intervention. Real appreciation associated with an export boom is not a cause of great concern as long as it reflects the country's strengthened fundamentals. Under such circumstances, countries should not be too worried about export specialization. This is by no means to discourage, or deny the benefits of, export diversification. Diversification is a slow process, and resource rents can be used effectively as levers for broader development, including diversification of the production or export base (see Section 4).

Corden (2012) argues that the best policy response to Dutch disease would be to “do nothing”, and allow the currency to appreciate and lift the real consumption wage (as a result of lower import prices). An intervention to prevent or reverse real appreciation is a welfare-reducing policy and can impose costs in the form of forgone opportunities to increase real expenditure, including possible underinvestment at home. Piecemeal protectionism to safeguard industries affected by Dutch disease would increase the adverse effect on other industries that are also affected by the stronger currency, and would do more damage to the economy than do nothing. A similar view is also expressed by Rogoff (2005), who warns against government intervention to stop Dutch disease, which is far more likely to create serious

³⁵ Resource rich countries that have adopted full dollarization include Ecuador and Timor-Leste. Another fully-dollarized economy, El Salvador, receives a large inflow of remittances.

³⁶ Existing Dutch disease studies for partially dollarized countries disregard completely the relevance of the real exchange rate, and make hasty policy recommendations to “cure” Dutch disease, thereby preserving export competitiveness.

³⁷ Among highly dollarized economies, Cambodia, Mongolia, Lao and Vietnam are resource exporters and net recipients of large foreign currency inflows (aid, FDI and other flows).

distortions.³⁸ The best approach is to let the price mechanisms generate appropriate market responses to increased wealth, while fostering an enabling environment in which private sector activity can flourish.

4. Policy Recommendation: Focus on Volatility Management and Boosting Competitiveness

Countries experiencing an export boom or receiving large-scale foreign resource inflows should focus on facilitating the economy's adjustment to the new long-run equilibrium and reaping the benefits of foreign financial inflows. Measures to stop real appreciation or prevent the decline in particular industries are not without cost, and past attempts have proven to be futile, especially in countries with weak institutions.³⁹

Efforts should be directed at creating an enabling environment, one which is characterized by stability, flexibility and competitiveness. While World Bank reports tend to focus narrowly on fiscal policy, a comprehensive approach is necessary to address an economy's broader competitiveness and productivity growth, while safeguarding the economy from volatility of international commodity and capital markets. Such an approach would go a long way towards promoting product and export diversification in the long run.

Managing volatility

Commodity prices, foreign aid and international capital flows are highly volatile and unpredictable, and countries that are exposed to large-scale resource flows need to build strong institutional frameworks to limit the transmission of volatility to the domestic economy, and thereby to ensure a stable macroeconomic environment in which the private sector can flourish. Volatile foreign currency inflows can lead to a temporary deviation of the real exchange rate from the long-run equilibrium level, which, by sending a misleading signal to the markets, could give rise to transitory Dutch disease that would soon be reversed.⁴⁰ It could also encourage large borrowing by those who overestimate the permanence of the boom or foreign exchange inflows, increasing vulnerability to a balance of payments or financial crisis. Policies to smooth out fluctuations of the real exchange rate are justified.

A stabilization package needs to be tailored to country specific conditions, in particular the types and destinations of foreign currency inflows. While countries tend to put much emphasis on fiscal policy, it is at most important to take a comprehensive approach, including consistent monetary policy and measures to strengthen the domestic financial sector, through which an increasing volume of financial inflows is channeled into the domestic economy.

³⁸ Rogoff further says, "... for most countries, it is not a macroeconomic issue until the exchange rate gets conspicuously out of line by historical standards, especially if this is caused by dramatic change in monetary or fiscal policy, or in capital inflows. Otherwise, countries concerned with maintaining competitive exchange rates will generally be wise to pursue stable and transparent macroeconomic policies, and to ensure that those policies enhance competition and flexibility at the microeconomic level."

³⁹ Measures to sustain the level of production in the tradable sector are essentially equivalent (when all prices are flexible) to levying a tax on the non-tradable sector.

⁴⁰ In practice, it is very difficult to judge whether increased capital inflows are temporary or permanent. Williamson (2005) suggests a rule of prudence in which positive shocks should be treated as temporary and negative shocks as permanent.

Counter-cyclical fiscal policy is the first line of defense against commodity price volatility. Ensuring macroeconomic stability in resource-rich countries depends primarily on how well public finances policy is delinked from fluctuations of resource revenue. Failure to do so can aggravate the boom-bust cycles. A mechanism should be designed to rein in the expansion of government spending by filtering large inflows of resource revenue that could be excessive or volatile. Unspent resource revenue can be saved in a fund (a stabilization fund) dedicated to liquidity management or investment in offshore assets, which can be drawn down to implement a fiscal stimulus during periods of low commodity prices or in the event of sudden reversals of foreign inflows. The operational rules anchoring fiscal policy should be simple but transparent for effective implementation and for greater accountability. While counter-cyclical fiscal policy tends to focus on the expenditure side, tax instruments can also be deployed, for example, to control rapid increases in private consumption or real estate booms. Consideration could also be given to retire external debt, especially expensive debt, early to induce an outflow of foreign funds.

To combat large capital inflows and their sudden stops, a combination of monetary policy and macro-prudential regulations is most effective, along with fiscal tightening, to mitigate inflationary pressures, absorb domestic liquidity, and limit excessive risk taking by the financial sector.⁴¹ Unlike resource revenues, capital inflows are not channeled through the national budget, and thus fiscal policy can dilute demand pressures only indirectly. Monetary policy alone is likely to be ineffective, as monetary tightening to slow credit growth would further encourage capital inflows. Recent experience suggests that the use of prudential instruments—such as the liquidity ratio, leverage ratio, loan-to-value ratio, reserve requirements on bank deposits, limits on exposure concentration, etc.—has been effective in safeguarding the financial sector, when the instruments are selected to target specific types of flows and used to complement macroeconomic policy measures.

Moving towards a more flexible exchange rate regime is also found to be effective in moderating the impact of volatile capital inflows.⁴² Experience suggests that a sterilized intervention is ineffective and incurs quasi-fiscal cost, which can be substantial. Imposing some form of capital controls, as part of a comprehensive policy package, could be considered to target speculative inflows that lead to the greatest vulnerabilities, but this may not be sufficient to stabilize financial flows if there are strong incentives for investors to circumvent them. Caution is warranted as capital controls are more distortionary than traditional fiscal and monetary policy responses, and tend to lose effectiveness over time.⁴³

It is important to monitor the economic conditions for signs of overheating, and continuously adjust the policy stance. For instance, the level of government spending prescribed by the fiscal rule may need to be tightened further to contain inflationary pressures and moderate exchange rate volatility. Additional prudential measures may need to be introduced if property markets exhibit signs of real estate speculation.

Removing obstacles to business activity and boosting overall competitiveness

The economy's transition to a new equilibrium involves inevitable transition costs, such as short-term unemployment, bankruptcies, administrative costs of establishing and closing business. Physical capital (e.g., land, factories) is often sunk and cannot be redeployed without cost, and acquiring new capital may

⁴¹ See Pradhan, et al. (2011), IMF (2013b) for further discussions on policy responses to capital flows.

⁴² IMF (2013b).

⁴³ See Kojo (1999) and Ostry, et al. (2011).

require investment (e.g., human capital), which takes time. The transition process is likely to be longer and more painful in countries where markets do not adjust flexibly, due to numerous barriers.

The pain of adjustment can be reduced through a set of policy actions aimed at removing such barriers and harnessing an enabling business environment.⁴⁴ Steps to remove supply-side bottlenecks—labor market rigidities, poor access to finance, complex administrative procedures for business start-ups, cumbersome business licensing requirements, just to name a few—can improve the economy’s flexibility and help facilitate supply response to increased demand, thereby speeding up the adjustment process. Robust institutions, such as strong rule of law, more consistent enforcement of regulations, and policies to promote free and fair competition, are also critical to promote innovation and boost productivity, thereby increasing the country’s overall competitiveness important for an eventual export diversification.

Reorienting public outlays to areas that facilitate the economy’s supply response, such as human capital and infrastructure, also goes a long way to enhancing the economy’s overall competitiveness, but great care is needed not to overwhelm the absorptive capacity. Boosting of priority expenditures needs to be in conformity with the stabilization objectives and the public sector’s administrative capacity to minimize waste and leakages.⁴⁵

5. Conclusions

This paper has examined the theory of Dutch disease and its implications for practical policy questions, which typically arise in discussing the effect of large influxes of foreign resources. It has pointed out that many of the seemingly well-established arguments in this field are not necessarily grounded in theory or empirical evidence. It asserts that great care is needed in diagnosing of Dutch disease, and formulating policy prescriptions based on the analytical framework, given the restrictive assumptions that may not be fully applicable and the limited relevance to today’s inextricably intertwined trade flows.

Countries facing large inflows of foreign currency should focus on safeguarding the domestic economy from the volatility of international commodity and capital markets, and building robust institutions to reduce adjustment costs and boost broader competitiveness, instead of trying to stop or prevent declines of particular industries, which could impose large cost and may be ineffectual. A policy package needs to be comprehensive, covering macroeconomic and structural policy measures, and should be calibrated to target country specific concerns. Policies may need to be adjusted continuously in view of the evolving dynamics of the global and domestic economic environment.

⁴⁴ For further discussions, see Chapter 6 in Gill, et al. (2014).

⁴⁵ Bevan (2005) argues that the composition of government spending should not be based simply on straightforward prioritization, but also on administrative capacity, which is most unlikely to be uniformly so everywhere. There is little point in routing a large increase in funds into a high priority sector if it is already unable to deploy its existing resources to good effect.

References

- Ades, A. and R. Tella (1999). "Rents, Competition and Corruption." *American Economic Review*, 89(4): 982-93.
- Ahrend, R., D. de Rosa, and W. Tompson (2007). "Russian Manufacturing and the Threat of 'Dutch Disease': A Comparison of Competitiveness Developments in Russian and Ukrainian Industry." *OECD Economics Department Working Papers*, No. 540.
- Algieri, B. (2011). "The Dutch Disease: Evidences from Russia." *Economic Change Restruct*, 44: 243-77.
- Amuedo-Dorantes, C. and S. Pozo (2004). "Workers' Remittances and the Real Exchange Rate: A Paradox of Gifts." *World Development*, 32: 1407-17.
- Arezki, R. and K. Ismail (2010). "Boom-Bust Cycle, Asymmetrical Fiscal Response and the Dutch Disease." *IMF Working Paper*, WP/10/94.
- Auty, R. (1993). *Sustaining Development in Mineral Economies: The Resource Curse Thesis*. London: Routledge.
- Auty, R. and A. Warhurst (1993). "Sustainable Development in Mineral Exporting Economies." *Resources Policy*, 19(1): 14-29.
- Bakardzhieva, D., S. Naceur, and B. Kamar (2010). "The Impact of Capital and Foreign Exchange Flows on the Competitiveness of Developing Countries." *IMF Working Paper*, WP/10/154.
- Bean, C. (1988). "The Impact of North Sea Oil." in *The Performance of the British Economy*, eds. Dornbusch and Layard, Clarendon Press, Oxford.
- Bevan, D. (2005). "An Analytical Overview of Aid Absorption: Recognizing and Avoiding Macroeconomic Hazards." Paper prepared for IMF Seminar, "Foreign Aid and Macroeconomic Management." Mapto, March 14-15, 2005.
- Bhattacharyya, S. and R. Hodler (2010). "Natural Resources, Democracy and Corruption." *European Economic Review*, 54(4): 608-21.
- Boschini, A., J. Pettersson, and R. Jesper (2007). "Resource Curse or Not: A Question of Appropriability." *Scandinavian Journal of Economics*, 109(3): 593 – 617.
- Brahmbhatt, M., O. Canuto, and E. Vostroknutova (2010). "Dealing with Dutch Disease." *Economic Premise*, No. 16, World Bank.
- Bruno, M. and J. Sachs (1982). "Energy and Resource Allocation: A Dynamic Model of the 'Dutch Disease.'" *Review of Economic Studies*, 49(5): 845-859.
- Brunnschweiler, C. and E. Bulte (2008). "The Natural Resource Curse Revised and Revisited: A Tale of Paradoxes and Red Herrings." *Journal of Environment Economics and Management*, 55(3): 248-64.
- Buiter, W. and D. Purvis (1983). "Oil, Disinflation, and Export Competitiveness." in *Economic Interdependence and Flexible Exchange Rates*, eds. Bhandari, J. and B. Putnam, Cambridge, Mass., Chapter 25.
- Canuto, O. (2007). "The Misery of the 'Dutch disease and Deindustrialization' Argument." *Economic Monitor*, July 22, 2007.
- Chenery, H. and M. Syrquin (1975). *Patterns of Development: 1950-1970*, Oxford University Press.

- Collier, P. and A. Hoeffler (2009). "Resource Rents, Governance and Conflict." *Journal of Conflict Resolution*, 49(4): 625-33.
- Combes, J., T. Kinda, and P. Plane (2012). "Capital Flows, Exchange Rate Flexibility and the Real Exchange Rate." *Journal of Macroeconomics*, 34(4): 1034-43.
- Corden, W. (1984). "Booming Sector and Dutch Disease Economics: Survey and Consolidation." *Oxford Economic Papers*, 36(3): 359-80.
- Corden, W. (2012). "Dutch Disease in Australia: Policy Options for a Three-Speed Economy." *Australian Economic Review*, 45(3): 290-304.
- Corden, W. and J. P. Neary (1982). "Booming Sector and De-Industrialisation in a Small Open Economy." *Economic Journal*, 92(368): 825-848.
- Davis, J., R. Ossowski, and A. Fedelino (2003). *Fiscal Policy Formulation and Implementation in Oil-producing Countries*, International Monetary Fund.
- Dell'Araccia, G., J. Di Giovanni, A. Faria, A. Kose, P. Mauro, and J. Ostry (2008). "Reaping the Benefits of Financial Globalization." *IMF Occasional Paper*, No. 264.
- Dobrynskaya, V. and E. Turkisch (2010). "Economic Diversification and Dutch Disease in Russia." *Post-communist Economies*, 22(3): 283-302.
- Dornbusch, R. (1976). "Expectations and Exchange Rate Dynamics." *Journal of Political Economy*, 84: 1161-76.
- Dupeyras, A. and N. MacCallum (2013). "Indicators for Measuring Competitiveness in Tourism: A Guidance Document." *OECD Tourism Papers*, 2013/02, OECD Publishing.
- Edwards, S. and M. Aoki (1983). "Oil Export Boom and Dutch-Disease: A Dynamic Analysis." *Resources and Energy*, 5(3): 219-42.
- Gelb, A. (2014). "Should Canada Worry About A Resource Curse?" *SPP Research Papers*, The School of Public Policy, University of Calgary, 7(2), January 2014.
- Ghani, E., A. Goswami, and H. Kharas (2012). "Service with a Smile." *Economic Premise*, November 2012, No. 96, World Bank.
- Gill, I., I. Izvorski, W. van Eeghen, and D. De Rosa (2014). *Diversified Development: Making the Most of Natural Resources in Eurasia*, World Bank.
- Gylfason, T. (2004). "Natural Resources and Economic Growth: From Dependence to Diversification." *CEPR Discussion Paper*, No. 4804.
- Haber, S. and V. Menaldo (2007). "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse." *American Political Science Review*, 105(1):1-26.
- Hausmann, R. and R. Rigobon (2003). "An Alternative Interpretation of the "Resource Curse": Theory and Policy Implications, in *Fiscal Policy Formulation and Implementation in Oil-producing Countries*, J. Davis, R. Ossowski, and A. Fedelino, eds., International Monetary Fund.
- International Monetary Fund (2005). *The Macroeconomics of Managing Increased Aid Inflows: Experiences of Low-Income Countries and Policy Implications*. August 8, 2005.
- International Monetary Fund (2006). "Ecuador: Selected Issues." *IMF Country Report*, No. 6/103, March 2006.

- International Monetary Fund (2013a). *Trade Interconnectedness: The World with Global Value Chains*. International Monetary Fund, August 26, 2013.
- International Monetary Fund (2013b). “The Yin and the Yang of Capital Flow Management: Balancing Capital Inflows with Capital Outflows.” in *World Economic Outlook*, October 2013, Chapter 4.
- International Monetary Fund (2014). “Sustaining Long-Run Growth and Macro Stability in Low-Income Countries: The Role of Structural Transformation and Diversification – Background Notes.” *IMF Policy Paper*, March 2014.
- Jongwanich, J. and A. Kohpaiboon (2013). “Capital Flows and Real Exchange Rates in Emerging Asian Countries.” *Journal of Asian Economics*, 24: 138-46.
- Kang, J., A. Prati, and A. Rebucci (2012). “Aid, Exports, and Growth: A Time-Series Perspective on the Dutch Disease Hypothesis.” *Review of Economics and Institutions*, 3(2):1-26.
- Kaulich, F. (2012). “Diversification vs. Specialization as Alternative Strategies for Economic Development: Can We Settle a Debate by Looking at the Empirical Evidence?” *UNDP Working Paper*, 3/2012.
- Kojo, N. (1999). “Malaysia Capital Controls and Exit Strategy.” Paper prepared for presentation at a workshop organized by ISIS Malaysia, “Currency Controls.” Kuala Lumpur, Malaysia, 21-22 January 1999.
- Kremers, J. (1986). “The Dutch Disease in The Netherlands.” in *Natural Resources and the Macroeconomy*, eds. Neary, P. and S. van Wijnbergen, MIT Press, Cambridge, MA.
- Krugman, P. (1987). “The Narrow Moving Band, the Dutch Disease and the Competitive Consequences of Mrs. Thatcher: Notes on Trade in the Presence of Dynamic Scale Economies.” *Journal of Development Economics*, 27(17): 41-55.
- Lartey, E. (2011). “Financial Openness and the Dutch Disease.” *Review of Economics*, 15(3): 556-68.
- Lartey, E., F. Mandelman, and P. Acosta (2012). “Remittances, Exchange Rate Regimes and the Dutch Disease: A Panel Data Analysis.” *Review of International Economics*, 20(2): 377-95.
- Lawrence, R. and D. Weinstein (1999). “Trade and Growth: Import-Led or Export-Led. Evidence from Japan and Korea.” *NBER Working Paper*, No. 7264, July 1999.
- Lederman, D. and W. Maloney (2007). *Natural Resources: Neither Curse nor Destiny*, World Bank and Stanford University Press.
- Magud, N. and S. Sosa (2010). “When and Why Worry About Real Exchange Rate Appreciation?: The Missing Link between Dutch Disease and Growth.” *IMF Working Paper*, WP/10/271.
- Marsh, I. and S. Tokarick (1994). “Competitiveness Indicators: A Theoretical and Empirical Assessment.” *IMF Working Paper*, WP/94/29.
- Martins, P. (2013). “Do Large Capital Inflows Hinder Competitiveness? The Dutch Disease in Ethiopia.” *Applied Economics*, 45: 1075-88.
- Matsuyama, K. (1992). “Agricultural Productivity, Comparative Advantage and Economic Growth.” *Journal of Economic Theory*, 58(2): 317-34.
- Mauro, P. (1995). “Corruption and Growth.” *Quarterly Journal of Economics*, 110(3): 681-712.
- Mehlum, H., K. Moene, and R. Torvik (2006a). “Cursed by Resources or Institutions.” *World Economy*, 29(8): 1117-31.

- Mehlum, H., K. Moene, and R. Torvik (2006b). "Institutions and the Resource Curse." *Economic Journal*, 116(508): 1-20.
- Montiel, P. and L. Severn (2008). "Real Exchange Rates, Saving and Growth: Is There a Link?" *World Bank Policy Research Working Paper*, No. 4636.
- Naceur, S., D. Bakardzhieva, and B. Kamar (2012). "Disaggregated Capital Flows and Developing Countries' Competitiveness." *World Development*, 40(2): 223-37.
- Neary, P. and S. van Wijnbergen (1986). *Natural Resources and the Macroeconomy*, MIT Press, Cambridge, Massachusetts.
- Oomes, N. and K. Kalcheva (2007). "Diagnosing Dutch Disease: Does Russia Have the Symptoms?" *IMF Working Paper*, WP/07/102.
- Organisation of Economic Co-operation and Development (2010). *How Imports Improve Productivity and Competitiveness*, May 2010.
- Ostry, J., A. Ghosh, K. Habermeier, L. Laeven, M. Chamon, M. Qureshi, and A. Kokenyne (2011). "Managing Capital Inflows: What Tools to Use?" *IMF Staff Discussion Note*, SDN/11/06, April 5, 2011.
- Pradhan, M., R. Balakrishnan, R. Baqir, G. Heenan, S. Nowak, C. Oner, and S. Panth (2011). "Policy Responses to Capital Flows in Emerging Markets." *IMF Staff Discussion Note*, SDN/11/10, April 21, 2011.
- Rajan, R. and A. Subramanian (2011). "Aid, Dutch Disease and Manufacturing Growth." *Journal of Development Economics*, 94(1): 106-18.
- Rakotoarisoa, M., R. Sharma, and D. Hallam (2011). *Agricultural Import Surges in Developing Countries: Analytical Framework and Insights from Case Studies*, Food and Agriculture Organization of the United Nations.
- Richards, D. (1994). "Booming-Sector Economic Activity in Paraguay 1973-86: A Case of Dutch Disease?" *Journal of Development Studies*, 31(2): 310-33.
- Rodrik, D. (2008). "The Real Exchange Rate and Economic Growth." *Brookings Papers on Economic Activity*, 39(2): 365-412.
- Rogoff, K. (2005). "Rethinking Exchange Rate Competitiveness." in *Global Competitiveness Report 2005-2006*, ed. Schwab, World Economic Forum, Geneva, Switzerland.
- Saborowski, C. (2009). "Capital Inflows and the Real Exchange Rate: Can Financial Development Cure the Dutch Disease?" *IMF Working Paper*, WP/09/20.
- Sachs, J. and A. Warner (1995). "Natural Resource Abundance and Economic Growth." *NBER Working Paper*, No. 5398, December 1995.
- Selaya, P. and T. Rainer (2010). "Aid and Sectoral Growth: Evidence from Panel Data." *Journal of Development Studies*, 46(10): 1749-66.
- Trevino, J. (2011). "Oil-Price Boom and Real Exchange Rate Appreciation: Is There Dutch Disease in the CEMAC?" *IMF Working Paper*, WP/11/268.
- United Nations Commission on Trade and Development (2013), *Global Value Chains and Development: Investment and Value Added Trade in the Global Economy*, advance unedited version.
- van der Ploeg, F. (2011). "Natural Resources: Curse or Blessing." *Journal of Economic Literature*, 49(2): 366-420.

van der Ploeg, F. and S. Poelhekke (2009). "Volatility and the Natural Resource Curse." *Oxford Economic Papers*, 61(4): 727-60.

van Wijnbergen, S. (1984). "The 'Dutch Disease': A Disease After All?" *Economic Journal*, 94(373): 41-55.

World Bank (2014). *Trading up to High Income*, Turkey Country Economic Memorandum, Report No. 82307-TR.

Wright, G. and J. Czelusta (2004). "The Myths of the Resource Curse." *Challenge*, 47(2): 6-38.