



Approaches to deal with a Dutch Disease - A Systematic Review

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Abstract:

The Dutch disease model was broadly applied in the past on different countries and causing sources creating revenues (Benjamin et al., 1987; Corden, 2012; Égert, 2012; Fardmanesh, 1991; Larsen, 2006; Niftiyev and Czech, 2020; van der Ploeg and Venables, 2013; Zhang et al., 2021). In reference to the question of how countries and governments can successfully deal with resource deposits, Werner (2012) shows that national resource funds are an opportunity to overcome the possible strongly negative economic development. This presented chapter conducts a systematic literature review with empirical studies that deal with countries facing occurring or possible occurring Dutch disease because of resource deposits like minerals or oil. It shows that, industrial diversification, a favourable business environment, attracted domestic and foreign investment in the industrial and agricultural sectors as well as good institutional quality are recommended to prevent a Dutch Disease.

JEL Classification: H7; N5; O13; Q38

Keyword: Dutch Disease, resources deposits, governmental approaches.

1 Introduction

After the revelation that resource discoveries can lead to deindustrialization of a country, as in the Netherlands, this phenomenon was studied repeatedly. Corden and Neary (1982) formulated this development as Dutch Disease (DD) model in 1982.

The DD examines the economic impact of resource discoveries and their export on the exchange rate, on production of industrial goods and on service sector. In the case of the Netherlands, it was natural gas discoveries that led to specialization in the booming resource sector. The foreign currency coming into the country caused exchange rate to appreciation, making goods in the manufacturing sector more expensive and thus less competitive. This led to lower production, an exodus of workers and, as a result, deindustrialization. (Corden, 1984).

In recent years, there have been repeated resource discoveries or new technological developments that have opened new reserves of raw materials. Therefore, the question arose whether a DD occurs or has to occur in these countries. There was a broad discussion about this in the literature and the model according to Corden and Neary (1982) was developed several times and other triggers were discussed. Various causes of DD have been investigated in the literature. These include natural resources such as oil and minerals, remittance and agricultural goods (Makhlouf, 2013). Agricultural goods in particular have been studied in the literature as a booming sector or as an affected sector (Raju and Melo, 2003).^{68,69} However, despite the scientific discussion with this phenomenon, there is currently no systematized presentation of political options for action when a country explores large new raw material deposits.

In this study, a systematic literature review is conducted. This is done based on four databases. The aim is to contribute to the identification of the possibilities that exist for a country to prevent or remedy DD in the long term in the event of a discovery of raw materials.

A literature search did not find a study specifically on DD of countries with natural resource deposits based on empirical studies that identified the policy action recommendations in the DD literature to address DD⁷⁰. This gap poses the problem that there is no overview of possible actions. For this reason, this study aims to help fill the gap described above.

⁶⁸ For the development of DD over the last 40 years, see Mien and Goujon (2021); Boire and Nell (2021).

⁶⁹ In recent years, DD has begun to be studied for individual regions e.g. USA Ouedraogo (2016) Canada Papyrakis and Raveh (2014), China Shao et al. (2020).

⁷⁰ There are also contributions in the literature that question the existence of the DD, such as Nülle and Davis (2018).

For this purpose, studies that empirically examine countries with natural resource deposits and discuss a DD are used as a basis. This shows which effects and consequences the extraction of raw materials can have and how it can be counteracted to achieve a positive economic development in the long term.

This study examines empirical studies that discuss DD in countries. Countries which also have large resource deposits but do not have DD discussed, suffer from DD, or have resource curses (RC) discussed are not included in the present study. To this end, the following research question will be investigated: How to fight Dutch Disease?

This study is divided into the following points. In the next section, the state of the current literature is described followed by the methodology, before the results and finally the summary follow.

2 Literature Review

In this section, the model of DD is shown over in development as well as an overview of possible courses of action.

In the past, the discovery of large quantities of resources in countries such as the Netherlands through the exploitation of natural gas in the North Sea led to large revenues and subsequently to deindustrialization. This development was described by Corden and Neary (1982) as the Dutch Disease (DD). Besides the countries with negative examples, there are others that have been able to use the export of resources for a positive development⁷¹. The term "Dutch Disease" and the development were examined and discussed under the terms DD, Resource Curse (RC)⁷² and "Paradox of plenty". The term "Resource Curse" is also discussed in the literature and takes a broader approach than DD. DD is often used as a "channel" of RC and refers more to the economic impact of commodity exports. The term "paradox of plenty" is often used synonymously for DD (Benjamin et al., 1987; Corden, 1984; Corden and Neary, 1982; Fardmanesh, 1991; Neary and van Wijnbergen, 1986). It should be noted that DD and RC are also used synonymously in the literature in many cases and the boundaries are not clearly drawn. In delineating the terms, Larsen (2006), in outlining the effects of DD and RC, shows that in DD, the industrial sector is negatively affected and in RC, growth declines. These developments can occur individually and together

⁷¹ Examples of negative development: Netherlands Corden and Neary (1982) or Indonesia Basu and Datta (2007)

Example of positive development: Norway Ramírez-Cendrero and Wirth (2016), Botswana Barczikay et al. (2020)

⁷² Based on Auty (1993) and for a meta-study about RC Havranek et al. (2016) and for differentiate RC and DD in the past years Mien and Goujon (2021)

(Larsen, 2006). Based on Corden and Neary's (1982) model, the DD model is understood and examined in this study as the developments in the economic sector of society and its implications. Two effects are defined as the result of commodity export: the Resource Movement Effect (RME) and the Spending Effect (SE). These are described in a small open economy with the industrial producing or tradable sector, the service or non-tradable sector and the booming commodity sector.

The SE describes the development when the revenues of the booming sector are spent by the individuals or the state. Due to the sudden high increase in demand of the tradable sector, the increased demand is covered by imports. The non-tradable sector, on the other hand, which also has increased demand, cannot be increased as quickly. This results in an increase in prices for the services offered. (Hjort, 2006) This process is called indirect deindustrialization. (Corden and Neary, 1982)

The sale of raw materials abroad brings large amounts of foreign currency into the country. When these are exchanged for the national currency, the exchange rate appreciates. As a result, other tradable goods from the industrial and agricultural sectors become more expensive for foreign countries compared to substitutes from abroad, and consequently demand decreases. As a result, labor moves from the industrial sector to the service sector. This development is called RME and represents direct deindustrialization. (Alssadek and Benhin, 2021; Corden and Neary, 1982)

Other authors divide the effects into the windfall effect, SE, RME and combined effect. The windfall effect refers specifically to the inflow of foreign currency into the local currency. Like the combined effect, which refers to the further development of currency strength and the sectors, this can be subsumed under the consequences of commodity exports and the RME and SE. (Marañón and Kumral, 2021)

In addition, the literature describes the learning-by-doing effect. This describes the development when people leave the industrial sector for the booming or service sector so that the knowledge specific to the tradable sector is lost. The result is lower productivity, lower growth and thus negative development in the long term. (Gylfason et al., 1999; Krugman, 1987; Sachs and Warner, 1995; van Wijnbergen, 1984)

In addition to the various effects of DD, the literature has examined the different actions of countries and recommended policy actions.

There has been a broad discussion in the literature about the influence of fiscal policy and the beneficial impact on the economy of a state where there is a booming resource sector. Corden (1984) favours taxation of the booming sector for subsidies to the tradable sector overprotective measures for the tradable sector. Bruno and Sachs; Feltenstein; van Wijnbergen (1982; 1992; 1984) argue against government saving revenues from the booming resource sector and for government recouping from society

through subsidies to invest in the declining sectors. Mien and Goujon (2021) address, based on the described results, for developing countries that it needs a successful tax system in the country. Thus, the money should be used in industries that would not have continued without the commodity boom. In addition, the risk must be included, if the subsidies to the sectors are linked to the revenues, that these fluctuate strongly in accordance with the commodity price. According to Mien and Goujon (2021), the assumption of the first two points is difficult to make in countries with corruption. (Mien and Goujon, 2021, p. 27) In the trade-off between investing and saving commodity revenues, Mien (2021) concludes that the "gradual scaling-up" approach according to Richmond, C., Yackovlev, I. and Yang, S.-C. S. (2015) comparable to the Berg et al. (2013) "sustainable investment" approach is a good option by continuously increasing public revenues. (Berg et al., 2013, p. 122) Funds that are managed independently from the government are mentioned as a possibility for the government to save the revenues. This is only recommended over the option of management by the central bank if future revenues are high. (AfDB/BMGF, 2015) Investment options recommended are physical and human capital specifically public investment for all economic sectors or in exports to support tradable goods. (Mien and Goujon, 2021, p. 30)

In monetary policy, there are different approaches to the effects of flexible exchange rates with flexible money inflows or fixed exchange rates. Edwards and Aoki; J. Peter Neary (1983; 1982) address the different variants of fixed nominal exchange rate and supply and demand of money and the dependent appreciation of the currency as well as possible inflation. Lama and Medina Guzman (2012) examine the advantages and disadvantages of exchange rate devaluation and conclude that even if the fixed exchange rate has positive effects, there may be strong misalignments. As a result, they recommend allowing the exchange rate to appreciate. The various contributions in the literature show the theoretical, empirical and modeled results, but there is still no consensus on an advantageous procedure in the case of DD.

In the literature, the quality of institutions and the need to improve them is also given as a policy recommendation. Ologunde et al. (2020), based on their study of sustainable development in African countries from 1992-2017 and the heavy dependence on oil revenues, recommend that immediate investments in human capital, agriculture and diversification are important to prevent negative impacts. Since these have not yet taken place, they conclude that institutions are not acting.

In this section, the DD model with the effects and the different policy recommendations in this section were described. The following section discusses the methodology of the systematic literature review before describing its results.

3 Methodology

Methodologically, a Systematic Literature Review was chosen to examine the results of different studies in relation to the research question. This was designed and conducted based on Fisch and Block (2018) and following the PRISMA scheme (Page et al., 2021). Four databases were searched (Business Source Ultimate, EconLit, wiso as well as ISI web of knowledge) using Boolean search with the operators “AND” and “OR” in German and English as well as the following terms and their synonyms: Dutch Disease, paradox of plenty, resource curse, empirical, natural resources, economic development, country-based studies and policy recommendations. The search was conducted in the databases Business Source Ultimate, EconLit between 18 to 31.10.2021, in the database "wiso" between 01 to 13.11.2021 and between 10 to 11.01.2022 research "web of science". The supplementary hand search was conducted from 10.-21. October and 14.-30. November 2021. In this search, 136 studies were identified in the databases and 31 studies were identified through the hand search. In a first selection process, the studies were categorized into "included", "excluded" and "uncertain" based on the title, abstract and keywords following Vesco et al. (2020). If a publication did not have an abstract or keywords, the text was included. Studies in the third category were re-examined based on the text. These were included or excluded based on the defined search criteria, so that duplicate studies, studies that did not do the economic investigation or empirical studies that did a qualitative investigation (n=1) were also excluded. Only journal articles were used to ensure the quality of the studies was verified. In this process, 154 studies including duplicate studies were excluded. For the data, e.g. panel data, time series data and different models were included for evaluation to achieve a broader data base. The basis for the analysis was 18 studies.

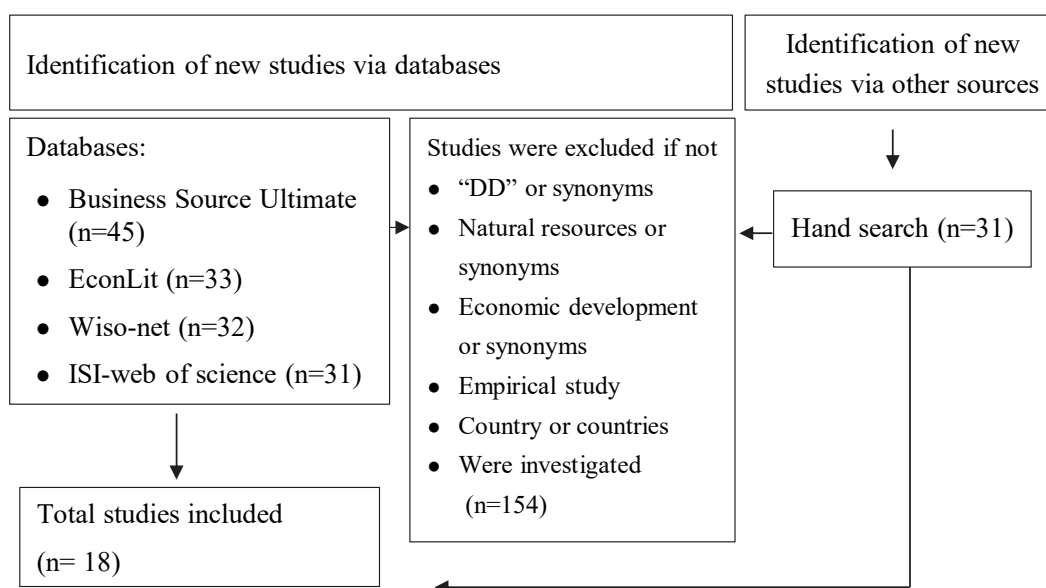


Figure 1: Flow diagram (following Page et al., 2021)

4 Results

The following section shows the results of the systematic literature review. Table 1 shows the studies reviewed with the effects examined in each and policy topics and recommendations therein. The studies are ordered by the number of countries examined, the commodities, the basis for examining DD, and, for the case studies, alphabetically by continent. The table shows that the studies mostly focused on either the RME and SE or monetary and fiscal policy. At the same time, the quality of institutions was included and examined in individual studies.

The studies show a mixed picture on the arrival of the RME and SE. Larsen (2006) observed only a small labor movement. Boire and Nell (2021) also show that the commodity sector and local suppliers want to work together, especially in the future, to contribute to mutual success. In addition, the manufacturing and service sector in Chile shows positive effects from the booming sector, so that despite high expenditures indicating DD, positive development can be achieved through cooperation between the sectors and fiscal management (Marañon and Kumral, 2021).

In the studies that examined several countries, Karamelikli et al. (2017) found a negative impact on the tradable sector due to the commodity boom and increased spending, more was imported into the countries (SE). In addition to Karamelikli et al. (2017), Allegret and Benkhodja; Alssadek and Benhin (2014; 2021) also find confirmation of DD due to SE. Allegret and Benkhodja (2014) observe only a slight change in the tradable sector with wages. In contrast, Alssadek and Benhin (2021) find the migration of labor from the manufacturing and agriculture sectors to the booming sector. Contradicting the theory, however, they also find a migration of labor from the service sector to the booming sector, as the latter also declines during the boom. Alssadek and Benhin; Taiebnia, Ali and Shakeri, Gity (2021; 2012) find in the oil-producing countries studied, compared to the non-high oil-producing countries, the price of oil and thus the booming sector causes the other sectors to shrink. However, they see only limited confirmation of the DD hypothesis, since the booming sector does have a strong negative impact on the manufacturing and agriculture sector. Contrary to the hypothesis, however, the boom also has a slightly negative impact on the service sector (Taiebnia, Ali and Shakeri, Gity, 2012). The study by Gerelmaa and Kotani (2016), which conducted the most comprehensive study of commodity-rich and non-commodity-rich countries with 182 countries, and thus, like Hiroyuki Taguchi and Ni Lar (2016), again included some countries that had already been studied, show high commodity dependence of countries from 1970 to 1990 led to low growth. In comparison, the period from 1990 to 2010 is also examined. The result is that when countries such as Indonesia build a strong tradable sector, these countries were able to overcome DD. In addition, the authors found confirmation that DD can

be a problem for countries in the short term but can be overcome in the long term with good management (Gerelmaa and Kotani, 2016).

12 of the selected studies examine monetary and fiscal policy. Basu and Datta (2007) examined the influence of the exchange rate. In the case of monetary policy, Allegret and Benkhodja (2014) conclude that it is best to formulate a separate inflation and exchange rate rule for each country for successful management, as they find countries for both rules where they are more advantageous. (Allegret and Benkhodja, 2014) Rosa (2007) suggests based on his research, that the increased exchange rate and the resulting burden on companies helps the tradable sector to adjust and become more competitive. He divides the companies into three categories according to their productivity and assumes that they export to the industrialized countries, the Commonwealth of Independent States CIS countries and non-exporting companies from Russia. (Rosa, 2007) Boire and Nell (2021) find for Mali, on the one hand, an appreciation of the exchange rate and a decrease in the manufacturing sector due to the export and sale of raw materials. On the other hand, they find the effect of the real exchange rate is a possibility in that the commodity sector can support the tradable sector in the long run, but do not justify this further (Boire and Nell, 2021, p. 1). Alssadek and Benhin (2021) find confirmation for the DD model in that the boom leads to an appreciation of the exchange rate and decline in the tradable sector of the manufacturing and agricultural sectors (Alssadek and Benhin, 2021, p. 10). Saibu and Oladeji (2008) examine expected and unexpected policy shocks, focusing on monetary and fiscal policy. They found no positive impact of expected shocks on economic outcomes. Raju and Melo (2003) also examine monetary and fiscal policy for the occurrence of DD.

In examining fiscal policy, a particular focus is on human capital. Shittu et al. examine human capital for its impact on growth and find an inconsistent but rather negative result. In examining human capital on foreign direct investment (FDI), they find that human capital can mitigate the negative impact on economic development. (Shittu et al., 2021, p. 1) Marañón and Kumral (2021) conclude that the manufacturing and service sector could benefit from the booming sector through fiscal management such as investment, funds and cooperation. Coury, Tarek and Dave, Chetan (2010) found when government institutions invested in the diversification of the tradable sector, it had a strong negative significant effect from 1980 to 2005. In addition, they found a "negative, long-run impact of inflation on growth" (Coury, Tarek and Dave, Chetan, 2010, p. 25).

Butkiewicz and Yanikkaya (2010) and Saibu and Oladeji (2008) also examine the influence of institutions. The latter found that Nigeria's economic openness caused a decrease in the effectiveness of policies, which in turn caused a decrease in trust in politics. (Saibu and Oladeji, 2008) Shittu et al. (2021) examine institutional quality,

find when it is measured aggregately a negative impact and when the metrics are measured individually mixed results on growth. When examined together with FDI, they find that institutions can positively influence the long-term negative impact of FDI on growth. In addition, institutional quality together with commodity endowment has a positive impact on economic development. (Shittu et al., 2021) Hiroyuki Taguchi and Ni Lar (2016) also examine the quality of institutions from 1996 to 2015 and find improvement in oil-selling countries such as Iraq, Qatar and Saudia Arabia. They also find this in countries with less dependence on the commodities such as Lao PDR, Myanmar and Vietnam. (Hiroyuki Taguchi and Ni Lar, 2016, p. 37)

Author	Country, Continent	Resources	RME and SE	Monetary and fiscal policy	Institutional quality
Case Studies					
Saibu and Oladeji (2008)	Nigeria, Africa	Oil		X	X
Hasanov et al. (2019)	Azerbaijan, Asia	Oil		X	
Basu and Datta (2007)	Indonesia, Asia	Oil		X	
Rosa (2007)	Russia, Asia	Oil	X	X	
Larsen (2006)	Norway, Europe	Oil	X		
Boire and Nell (2021)	Mali, Africa	Gold	X	X	
Marañon and Kumral (2021)	Chile, Latin America	Copper	X	X	
Raju and Melo (2003)	Colombia, Latin America	Coffee		X	
Several Countries					
Coury, Tarek and Dave, Chetan (2010)	Gulf region (GCC), Asia	Oil		X	
Karamelikli et al. (2017)	OPEC, Africa, Asia, Latin America	Oil	X		
Allegret and Benkhodja (2014)	Selected oil exporting countries, Africa, Asia, Latin America, North America	Oil	X	X	

Taiebnia, Ali and Shakeri, Gity (2012)	Selected oil producing and non-oil producing countries, Asia, Latin America	Oil	X		
Alssadek and Benhin (2021)	Oil rich countries, Europe and North America, MENA, Asia and Pacific, Latin America and Sub-Sahara Africa	Oil	X	X	
Taguchi and Khinsamone (2018)	ASEAN, Asia	Oil, gas and mining			
Shittu et al. (2021)	Partly MENA-region, Africa, Asia	Natural resources		X	X
Hiroyuki Taguchi and Ni Lar (2016)	“Asian Economies”, Asia	Oil, natural gas and coal	X		X
Butkiewicz and Yan-ikkaya (2010)	100+ developed and developing countries	Minerals		X	X
Gerelmaa and Kotani (2016)	182 developed and developing countries worldwide	Natural resources	X		

Table 1: Investigated studies and DD effects

In the studies, policy recommendations were given, which are summarized and systematized in the following. These, together with the positive developments from the studies, result in the recommendations to take action against an impending DD or to prevent a DD. The policy recommendations of the selected studies are presented in the following section.

Since economics and the various options for government action to mitigate or prevent DD from arising directly interact with monetary and fiscal policy, this section examines them together based on the issues they address.

In the policy implications of Karamelikli et al. (2017), the manufacturing sector is specifically motivated with tradable goods. Taguchi and Lar (2016) are also in favour of diversifying the tradable sector by improving the business environment. The policy implications examined by the studies fall into two categories. They concern the business trading environment and the quality of institutions. First, the business environment is understood as the factor influencing labor as a central prerequisite for the growth of the manufacturing sector (Hasanov et al., 2019). Larsen (2006) describes the successful implementation in Norway, where the manufacturing sector was made the wage-leading sector by the government together with the employers. The goal was to prevent the booming sector from becoming the wage-earning sector, thereby triggering further mechanisms of DD. (Larsen, 2006) This point is later also repeatedly summarized under the term human capital.

The literature often recommends the development of human capital and infrastructure, as well as the establishment of a fund (Werner, 2012). Alssadek and Benhin (2021) are particularly in favour of domestic investment in the tradable sector (manufacturing and agriculture). At the same time, if the tradable sector is regressing, they recommend attracting FDI "by lowering the cost of doing business, developing their institutional quality by reducing corruption and rent-seeking activities and making the rule of law more effective, as well as enhancing labor productivity by increasing investment in education and health." (Alssadek and Benhin, 2021, p. 10) Basu and Datta (2007) conclude that tax subsidies policies are beneficial in using remittance to support tradable sector development. Saibu and Oladeji (2008) also describe that it is essential to adjust the openness of the economy, to the degree of development, otherwise there may be negative effects on the economy. Boire and Nell (2021) add that it is important to consider the stage of the economy and whether the pace of mechanization should be slower or faster.

The country's infrastructure is often linked to the topic of funds in the literature, through which the further development of infrastructure can be financed through investments. These funds are centrally designed to ensure that revenues are regulated so that SE does not occur. (Raju and Melo, 2003) These are described by Basu and Datta; Boire and Nell; Larsen; Marañon and Kumral; Werner (2007; 2021; 2006; 2021; 2012) describe the extent to which these have been implemented and that they have also been positive for development. The funds are to be used to develop roads, health care, schools, energy supply, public transport, water and labor skills to support the tradable sector. (Alssadek and Benhin, 2021; Basu and Datta, 2007; Boire and Nell, 2021; Karamelikli et al., 2017) Basu and Datta (2007) describe, in addition, "labor-intensive technologies" (p. 24) have been used in rural development in Indonesia to create jobs there. Larsen (2006) emphasizes that in the development of the public sector, this should be done to improve the working conditions of women. The aforementioned measures are also identified for the development of human capital and its retention in the country by Shittu et al. (2021) as an essential factor to ensure workers stay in the countries and do not migrate.

Larsen (2006) and Hasanov et al. (2019) show in Norway and Azerbaijan, an important component of the funds were also revenue saving and strict fiscal discipline. The goal was to pay off debt and build up savings in the event of a commodity price shock. Karamelikli et al. (2017) proposed for OPEC to share oil and non-oil revenues in the state budget to achieve less dependence.

In addition to strengthened human capital and a diversified economy, Alssadek and Benhin; Basu and Datta; Butkiewicz and Yanikkaya; Hiroyuki Taguchi and Ni Lar; Karamelikli et al. (2021; 2007; 2010; 2016; 2017) mention the institutional quality that can be improved. Rosa (2007) specifically addresses the reduction of judicial

corruption for a stronger orientation toward developed countries and sees this supported by resource abundance at the same time. Shittu et al. (2021) support this and recommend for more rule of law "via property rights and contract enforcement as well as enhancing the culture of accountability" (Shittu et al., 2021, p. 18). Taguchi and Khinsamone (2018) aim for less dependence through increased quality of institutions. At the same time, according to Boire and Nell (2021), the government should support backward linkages between the booming and manufacturing sectors for positive economic development.

Allegret and Benkhodja (2014) examine the effectiveness of influencing inflation or the exchange rate to prevent or mitigate DD. Raju concludes that a flexible exchange rate is beneficial, in contrast to Alssadek and Benhin (2021), who are in favour of minimizing exchange rate appreciation. Rosa (2007) concludes that to support companies, fewer regulations should be imposed on them to facilitate their orientation to developed countries.

Author	Economic recommendation	Monetary and fiscal policy	Institutional recommendation
Case Studies			
Saibu and Oladeji (2008)		X	X
Hasanov et al. (2019)	X	X	X
Basu and Datta (2007)		X	
Rosa (2007)			X
Larsen (2006)	X	X	X
Boire and Nell (2021)	X	X	X
Marañon and Kumral (2021)		X	
Raju and Melo (2003)		X	
Several Countries			
Coury, Tarek and Dave, Chetan (2010)	X		
Karamelikli et al. (2017)	X	X	X
Allegret and Benkhodja (2014)		X	
Taiebnia, Ali and Shakeri, Gity (2012)			

Alssadek and Benhin (2021)	X	X	X
Taguchi and Khinsamone (2018)		X	X
Shittu et al. (2021)		X	X
Hiroyuki Taguchi and Ni Lar (2016)			X
Butkiewicz and Yanikkaya (2010)			X
Gerelmaa and Kotani (2016)			

Table 2: Policy implications

5 Conclusion

Since the formulation of the DD model in 1982 by Corden and Neary (1982), there have been discussions in the literature about the various effects and implications to newly developed natural resource deposits. In this chapter, the results are presented and limitations and future research needs are identified.

The goal of this systematic literature review is to identify ways in which DD can be addressed. The results show that for this purpose, diversification of industrial enterprises, support of the state for a favourable business environment through infrastructure and trained human capital as well as attracted domestic and foreign investment in the industrial and agricultural sectors are recommended. The investments for this can be made from the funds, some of which are also used to regulate the revenues. The regulation of the income, which is not to be exchanged directly from the foreign currency into the domestic currency, is with it then, the exchange rates does not rise and the RME and SE is released. At the same time, it is important for countries to achieve a sustainable approach as described by Richmond, C., Yackovlev, I. and Yang, S.-C. S. (2015) between investing and saving as well as repaying debt as described by Larsen (2006). This is complemented by the institutional quality, which is often mentioned together with the previous points, to fight against DD and corruption.

The literature to date addresses the developments in theory and the various effects. However, there is still no overview of the policy implications given based on the experiences from other countries. The results of the present study confirm the Corden and Neary (1982) model of DD and shows the options for action when raw material depletion occurs. The results can be used by countries that make new resource discoveries or are able to develop new sources of raw materials due to technological innovations to help mitigate the occurrence of DD.

The limitations of this systematic literature review are the number of studies examined. For future studies it is essential to investigate the different effects and their influence on the effectiveness of the individual policy measures, how they affect developed and developing countries and to what extent the commodity or associations such as OPEC affect the effects and the political options for action of DD.

This paper examines the options for action when a country is dependent on natural resources. When a country develops new raw materials, it is essential to prevent the RME and SE so that deindustrialization does not follow. To do this, the literature recommends diversifying the tradable sector, regulating revenues through resource discoveries and using a sustainable development strategy to pay off debt with funds, saving money, paying attention to how the exchange rate is moving and that this does not negatively impact the economy. At the same time, investments can be made in infrastructure and human capital, as well as institutional quality can be improved.

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