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Dutch Disease in Saudi Arabia?

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1 Introduction

1.1 The topic

Natural resource abundance can act as a blessing and a curse. A blessing because the discovery of natural resources or an increase in the world market price of a domestic resource, increases the income and thereby also the consumption possibilities in the economy. And a curse as it can cause Dutch Disease which can have severe economic effects in the short as well as in the long run and can act as an obstacle to development within the country. In the end it all depends on how the revenues are used. The importance of wise revenue management cannot be stressed enough. But to spend and manage large revenues wisely can be more complicated than it may first seem. There are endless ways to spend and manage them and there are no uniform solutions to cure Dutch Disease if the country against all odds gets infected by it.

The Dutch Disease theory originated after the Netherlands found large sources of natural gas in the North Sea in the 1960s. As a result of the large capital inflows, which followed from increasing export revenues, the demand for the Dutch florin increased which in turn resulted in an appreciation of the Dutch exchange rate. This further led to greater difficulty for Dutch manufacturing goods to compete on the international markets.

The Dutch Disease theory has remained relevant to this day and is still affecting countries all over the world. With today's increasing world market prices for raw materials we are likely to find other affected countries in the future as well. Dutch Disease theory is now also used to explain negative effects from capital inflow caused for example by aid, remittances, beneficial terms-of-trade shocks or sharp productivity increases in export production. Hopefully this study along with other previous and future studies will increase the knowledge about Dutch Disease and will hopefully contribute to lessen the harmful effects that Dutch Disease causes.

1.2 Statement of purpose and limitations

The aim of this study is to investigate whether Saudi Arabia has suffered from Dutch Disease or not and to examine how Saudi has managed symptoms related to Dutch Disease. In order to do this, the Dutch Disease theory will be used along with different policy suggestions for Dutch Disease management. This will be used as a theoretical framework and will be applied

on the case of Saudi Arabia to answer this question. The suggested policies for Dutch Disease management used in this thesis are only examples and are not intended to be seen as a complete record of policies for Dutch Disease management. Dutch Disease affects different countries in various ways hence policies to cure or calm Dutch Disease can take several forms. Further, the timeframe for this study is limited to the early 1960s until today. Some data was however not available for the early 1960s hence the earliest data available has been used.

One could argue that industrialized countries are expected to have a larger and more developed manufacturing sector than a developing country would have and that Dutch Disease would therefore affect industrialized countries harder than developing ones. On the other hand, there are several other symptoms of Dutch Disease that can cause problems for a country. More over, even though a developing country may have a less developed or smaller manufacturing sector, this does not mean that a decline in this sector would not be harmful for the country and its economy. Hence Dutch Disease theory may still be relevant which a number of studies have shown.

Saudi Arabia is an interesting country to study in terms of Dutch Disease as it is the largest oil producing country in the world and hence has at least one condition required by Dutch Disease theory: heavy natural resource dependence.

The thesis starts with chapter two which presents the Dutch Disease theory and its mechanisms. Chapter three presents policy suggestions for Dutch Disease management while chapter four evaluates whether Saudi Arabia has suffered from Dutch Disease or not by applying the theoretical framework on what has actually happened in Saudi Arabia. The final chapter summarises and concludes.

2 The Dutch Disease Theory

The theory of Dutch Disease by Corden & Neary¹ states that an inflow of capital, caused for example by an oil boom, causes the real exchange rate to appreciate. The reason for this appreciation is that domestic prices in the tradable and non-tradable sector will be affected asymmetrically with the prices of the non-tradable sector rising at a faster rate. This further implies that the competitiveness of the tradable goods deteriorates in international markets as the opportunity cost of producing tradable goods has increased.

The small open economy is assumed to consist of three sectors in Corden and Neary's model. Tradable goods are produced by the booming and the lagging sectors while the third sector produces non-tradable goods. The booming sector can for example be the oil, gas or mineral industry and the lagging sector the manufacturing industry. The non-tradable sector is usually defined as services. The three sectors use a common factor of production, labour, and a sector specific factor, capital.

The most important mechanism behind Dutch Disease is the real exchange rate hence we start this chapter by introducing its definition.

2.1 The real exchange rate

Changes in the real exchange rate imply changes to the cost structures of the economy. The definition that will be used here follows the definition used in Falck², Devarajan³ and Darin-Ericson & Nilsson⁴. This particular definition, referred to as the Trade Theory definition, shows in a very good way the allocation of resources in the economy between the tradable and non-tradable sector.⁵ However, since national data rarely specifies which goods are tradable and which are non-tradable this definition is difficult to implement in practice. On the other hand, when studying Dutch Disease theory it is very helpful as it clarifies the shifts of the resources between the three sectors hence making it justifiable to use in theory.

¹ Corden and Neary (1982) pp.825-848

² Falck (1997) p.34

³ Devarajan (1997) pp. 34-53, p.38

⁴ Darin-Ericsson and Nilsson (1999) p.8

⁵ Falck (1997) pp.65-66, referring to Edwards (1989) p.6

The real exchange rate is defined as the relative price of tradable goods (P_T) to non-tradable goods (P_N)

$$\mathbf{RER} = \mathbf{P_T / P_N}$$

An appreciation of the real exchange rate, as a consequence of capital inflow in the case of Dutch Disease, implies that the opportunity cost of producing tradable goods has increased. Consequently a real appreciation implies a fall in RER. Under the assumption that the country's main trading partner's relative prices are unchanged the home country will be less competitive on the international market in producing tradable goods. Likewise, under the same assumption, depreciation implies a rise in RER and consequently a gain in international competitiveness.⁶

The real exchange rate defined above is the main mechanism behind Dutch Disease. The appreciation of the exchange rate gives rise to two different effects in the economy which is called the spending effect and the resource movement effect by the Dutch Disease theory. Sections 2.2 and 2.3 below will further examine these effects while section 2.4 gives a graphic analysis of the spending and resource movement effects.

2.2 The spending effect

The spending effect explains the consequences from an increase in disposable income following a boom in the energy sector and from inflow of foreign exchange. Assuming positive income elasticity, the increase in disposable income leads to increased spending and demand for both tradable and non-tradable goods. The increased demand for non-tradables gives rise to an increase in prices since the country's resources limit the supply of these goods and the boom has not increased these specific resources. The price of non-tradable goods on the other hand is determined on the world market. Because of the small country assumption the increased domestic demand does not affect world demand hence the price of tradable goods does not rise or at least not as much as the price of non-tradable goods. The asymmetric price increase gives rise to an appreciation of the real exchange rate thus making tradables less competitive on the world market. The increased price of non-tradables also implies increasing wages in this sector. Consequently labour will to some extent be attracted from the tradable sector to the non-tradable sector. This shift in labour will continue until factor prices

⁶ Falck (1992) pp. 4-5 and Falck (1997) pp.34-35

equalizes between all sectors. The effect on the tradable sector is not only less labour but also less production and exports from this sector.⁷

2.3 The resource movement effect

The second effect is split into two sub-effects, the direct and indirect resource movement effect. The direct resource movement effect implies increasing marginal productivity of labour and hence increasing wages in the booming sector. As was the case in the spending effect, increased wages in one sector tends to attract labour from other sectors. In this case however, labour is attracted from the non-tradable and the lagging sector into the booming energy sector. The shift of labour will continue until wages are equalized in all sectors. The result of the direct resource movement effect is called direct de-industrialization.⁸

The indirect resource movement effect is similar to the spending effect and results from the reduced production in the non-tradable sector. With unchanged demand for non-tradables the reduced supply results in excess demand. With excess demand follows increased prices which in turn will increase the wage in this sector compared to other sectors. This will lead to further labour reallocation from the lagging sector to the non-tradable sector.

2.4 Graphic analysis of the spending and resource movement effects

The two effects are illustrated in figure 2.1 and 2.2 below. The y-axis represents both the lagging and the booming tradable sectors as an aggregate. The x-axis represents the non-tradable sector. The PP curve represents all possible combinations of tradable and non-tradable goods that can be produced with existing production factors. This curve also shows all possible consumption possibilities under the assumption of no capital inflows. The initial equilibrium in the economy is represented by point A. The NN line is the price line and TT is the income consumption curve. The P'P curve represents the increased possibility of producing tradables as a consequence of the resource boom. The asymmetric shift of the PP line is due to the fact, already mentioned above, that the resource boom only increases production possibilities of tradable goods and not non-tradables as the production of these is

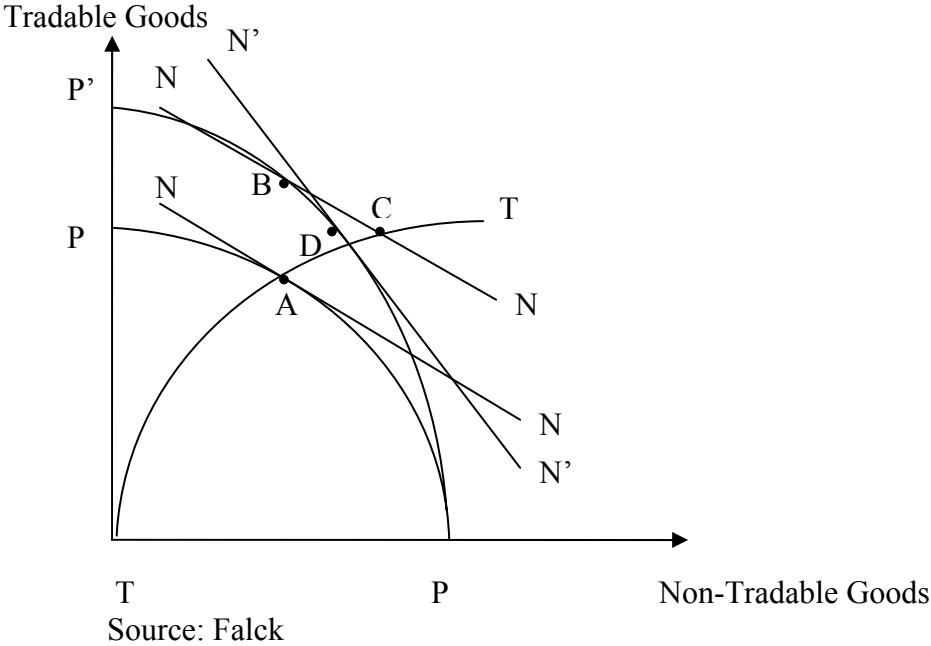
⁷ Falck (1997) p.35

⁸ Corden and Neary (1982) p.830

determined and limited by the resources of the country which has not been increased by the boom.

In order to isolate the spending effect we assume that the inflow of foreign exchange is spent in such a way that the demand for labour is held constant. By using this assumption we eliminate the resource movement effect. The resource boom shifts the PP curve upwards to P'P and the new production point B lies vertically above point A as the price of non-tradables is unchanged. Point C represents the now preferred bundle of goods at the given price. However, C laying outside the P'P curve represents an excessive demand for non-tradable goods. In order to clear the market, prices of non-tradables must rise to reduce demand. The new equilibrium point will be somewhere between B and the intersection of the TT line and the P'P curve, for example at point D. Consequently the outcome of the spending effect is an increase in the production of tradable and non-tradable goods.

Figure 2.1: The spending effect

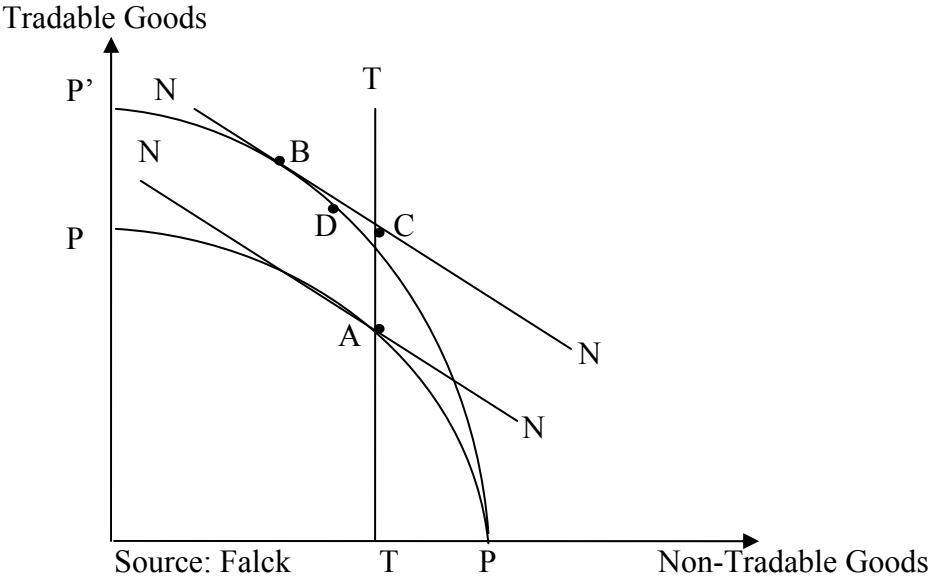


In order to isolate the resource movement effect (see figure 2.2) the spending effect is eliminated by the assumption of zero elasticity of non-tradable goods. The income consumption curve TT is in this case a vertical line through point A.

Point B represents the new production point after the boom with unchanged prices for non-tradable goods. As marginal productivity of labour and wages has increased in the booming sector labour is attracted from the lagging and the non-tradable sectors into the

booming energy sector. As the y-axis represents both tradable sectors the overall effect is an increase in tradables and a decrease in non-tradables. The intersection of the TT line with the NN line at point C is the demanded bundle of goods which represents excess demand for non-tradable goods at unchanged prices. In order to clear the market prices of non-tradables must rise and the final equilibrium, point D, will be somewhere between point B and the intersection of the P'P and TT lines. The resource movement effect results in an increase in the production of tradables and a decrease of the production of non-tradables. The direct resource movement effect is represented by the shift from point A to point B while the indirect effect is represented by the move from point B to point D.

Figure 2.2: The resource movement effect



When the spending and resource movement effects are combined it is clear that they both contribute to a real appreciation of the real exchange rate. This can be seen when looking at point D in figures 2.1 and 2.2 as they have a higher relative price of non-tradables compared to the initial equilibrium at point A. The effect on the lagging sector is also clear as both the spending and the resource movement effect decrease employment and production in this sector.⁹ The effect on the non-tradable sector is not as clear however. The spending effect and the indirect resource movement effect tend to raise production in this sector while the direct resource movement effect tends to lower it. The question of which of the spending and resource movement effect will dominate depends from case to case. However, a country

⁹ Corden and Neary (1982) p.831

dependent on oil where the oil industry is very capital intensive and hence uses little labour can be assumed to be dominated by the spending effect.¹⁰

¹⁰ Falck (1997) p.38

3 Policy suggestions for Dutch Disease management

Countries affected by Dutch Disease often show different symptoms as Dutch Disease can affect various parts of the economy. Since countries are affected differently there is no uniform solution or cure for Dutch Disease. Policy implementation towards Dutch Disease management can thus be a difficult task. The success of such a policy depends on the correctness of the analysis of the factors behind the specific Dutch Disease related problems. Some policies that might be seen as obvious Dutch Disease cures or calmatives can have long run negative economic effects hence the restoration of the Dutch Disease infected economy depends on government analysts and policymakers.

This chapter presents some suggested policies found in the literature. The policies can be categorized into four groups: policies towards the manufacturing sector; labour policies; agriculture policy and other policies such as devaluation; diversification; revenue funds and investment abroad.

3.1 Policies towards the manufacturing sector

Dutch Disease theory predicts the manufacturing sector to decline as a result of the real exchange rate appreciation caused by capital inflows from natural resource revenues. There may be various ways for a government to try to aid this sector but this section will study a) the effects of increasing demand for manufacturing products; b) the effects of subsidising manufacturing production and c) imposing or increasing import tariffs as a way to change the manufacturing cost disadvantage to a cost advantage.

A country's government might suggest that the declining manufacturing production, and hence also declining exports from this sector, is a result of inadequate demand. Further, it's possible that the suggested way of increasing demand for these products would be to issue new money or new bonds. The actual effect of this policy will however be declining foreign reserves as increased government demand is often matched with increasing imports. The reason behind this policy's inefficiency is that the true factor behind the declining manufacturing production and exports is not inadequate demand but rather increased production costs as a consequence of an appreciation of the real exchange rate.¹¹

¹¹ Enders and Herberg (1983) p. 486

If the government instead tries to tackle the excessive cost of production by subsidies the result will be an improvement of manufacturing profitability and increased production and employment. It will further imply increased nominal income and spending. However, due to the spending effect this will imply increased prices in the non-tradable sector. With increased prices comes increased wages hence the spending effect will in the long run tend to draw production resources out of the manufacturing sector and into the non-tradable sector. If the government tries to maintain the level of production by increasing subsidies to the manufacturing sector, inflation may be the lasting result.¹²

Imposing or increasing existing import tariffs is another way for the government to support the manufacturing sector. The tariffs will make foreign manufactures more expensive in the domestic market hence giving the domestic manufacturing sector a cost advantage. This will lead to increased domestic production in this sector and a rise in nominal income and spending. The consequences will be similar to those describe in section b) above.¹³

3.2 Labour policies

The labour market is also predicted to be affected by Dutch Disease as labour will be laid off in the manufacturing sector and hence will have to seek employment in the energy sector or the non-tradable sector. Suggested labour policies include a) a wage freeze in order to prevent labour to loose employment in the manufacturing sector; b) another variant of this policy would be to subsidise wages instead of imposing a wage freeze to prevent labour from loosing jobs in the manufacturing sector; c) another way of aiding employment would be to improve labour mobility between sectors. This can be done in several different ways and hence only a few are mentioned here; d) under special circumstances importing foreign labour might be needed. This would be the case of an overheated labour market with excess demand for labour which cannot be satisfied by the domestic labour force.

Domestic income and demand increases as a result of the boom in the energy sector. By imposing a wage freeze at the pre-boom level the profitability of the manufacturing sector can be prevented to decline and employment will stay constant at the pre-boom level.

¹² Ibid. p. 489-490

¹³ Ibid. p. 490

The increased demand for manufactures will be matched by higher imports. The wage freeze will dampen but not totally neutralize the price increase in the non-tradable sector. Profits will be abnormally large in the non-tradable sector and it will become politically difficult to maintain the wage freeze. Entrepreneurs will try to bid up wages in turn to attract labour into the non-tradable sector and labour unions will fight for an abolishment of the wage freeze in order to obtain some of the higher profits for their members. Because the wage freeze will prevent the initiatives for labour to move from the manufacturing sector into non-tradables, the result is in-optimal use of production factors.¹⁴

Instead of a wage freeze a wage subsidy could be used in order to keep employment constant in the manufacturing sector before and after the boom. The result would however be repressed inflation, i.e. excess demand for labour and non-tradable goods. Another effect of this policy would be a larger real appreciation of the real exchange rate than if this policy had not been implemented. Further, a wage subsidy could restrain the budget and hence hinder the government from implementing more suitable policies or government expenditures.¹⁵

Some of the consequences of Dutch Disease are due to insufficient mobility of different factors of production, for example labour, between sectors. In the long run, it is the migration of labour from the manufacturing sector into the non-tradable sector that will restore full employment after a decline in the manufacturing sector as a consequence of Dutch Disease. Policies towards labour mobility improvement can take several forms.¹⁶ Some possible policies are: developing infrastructure; creation of employment offices; job training programs and subsidizing the construction of homes.¹⁷ The creation of employment offices and job training programs could function in a way to make the match making process faster and more efficient which would shorten the time it takes to find a suitable employee for a vacant job and vice versa. Although Dutch Disease theory assumes labour to be a factor of production equal to all sectors the reality is more versatile. In reality labour mobility may be slowed down by the fact that labour might need necessary training before starting a job in another sector. Depending on the specific skills needed the education or training process might take a long time hence slowing down the mobility of labour.

¹⁴ Enders and Herberg (1983) p.487

¹⁵ Van Wijnbergen (1984) p. 245

¹⁶ Enders and Herberg (1983) p. 490-491

¹⁷ Darin-Ericson & Nilsson (1997) p.18

In the case of an overheated labour market with excessive demand for labour, importing foreign labour will be effective. This will also reduce the real exchange rate appreciation as imported labour will only spend part of their income on non-traded goods. Moreover, domestic price inflation pressure will decrease as a prevention of shortages of non-traded goods has occurred due to the imported labour.¹⁸

3.3 Agriculture policy

Dutch Disease affected countries often experience a decline in the agricultural sector, at least in the short run. This is also a result of increasing production costs due to the appreciated real exchange rate. With the government subsidising this sector a sustained level of production is possible as well as the security of price stability. These subsidies will not have the same effects as subsidies in the manufacturing sector though. However, subsidies may have an immense effect on the budget as they are “seldom reduced and hardly ever abolished”.¹⁹ Another problem is that they may be difficult to administer and sometimes the cost of administration can be unjustifiably high. By raising the income tax on urban labour the effects on the budget can be partly dampened. This will also imply an increased opportunity cost for rural-urban migration and thus making migration and working in the city less attractive. Increasing taxes may also prevent a very large appreciation of the real exchange rate as the non-trading sector is more common in urban areas.²⁰

3.4 Other policies

Other tempting solutions to Dutch Disease related problems can be a) a devaluation of the real exchange rate, as this would at least initially give the manufacturing sector a more favourable external position; b) diversification to make the economy less dependent on resource revenues and hence make the economy less vulnerable to price and/or demand shocks; c) revenue funds to stabilize natural resource revenues and d) investing the resource revenues abroad to prevent them from affecting and disturbing the economy.

¹⁸ Van Wijnbergen (1984) p. 244-245

¹⁹ Enders and Herberg (1983) p. 490

²⁰ Feltenstein (1992) p. 285-286

A tempting way to support the manufacturing industry could be a nominal devaluation of the real exchange rate. This would at least initially give the manufacturing sector a more favourable external position which would in turn imply decreasing manufacturing imports and increase production as well as exports. However, such a policy will have severe economic effects in the long run. The effects of the devaluation will be price changes which will increase profitability of the export sector as well as increase nominal income. Compared to the pre-devaluation situation profitability of the tradables sector will increase as the higher nominal income will be partly spent in both the tradable and non-tradable sector despite a decrease in domestic demand. However, in the long run the tradable sector will not be able to sustain the initial expansion in output and employment but has to decrease gradually to the pre-devaluation level. If the government interprets the increased and subsequent decrease in production as a result of an insufficient devaluation there is a risk that they decide to devalue the real exchange rate again. This could push the economy into a vicious circle of devaluations, inflation and unemployment.²¹

As Dutch Disease is a result of resource dependence, diversification may seem to be an obvious and straightforward solution. Various authors have argued the importance of diversification away from resource dependence in order to improve economic performance.²² As many oil exporting countries have promised diversification away from dependence on crude oil exports generally the results have been poor as public money have been used in inefficient and uncompetitive industries.²³ This is because governments have often invested in government owned enterprises. If these enterprises are monopolies they tend to be high cost and inefficient as they are not subject to competition. These enterprises also tend to attract subsidies and protection that will eventually hinder their development. The difficulty of diversification can further be explained by the overvalued exchange rates. They have caused a contraction of existing non-oil, gas or mineral tradable sectors and are also likely to inhibit the rise of a new tradable sector. The conclusion is that private sector investment is the only really effective way to diversification. However, it is important to note that the government can play an important role in this process by maximizing the resource revenue flow to the private sector rather than from the public sector. Some countries (Botswana, Indonesia, Chile and Malaysia) seem to have avoided Dutch Disease by imposing a policy of trade openness with

²¹ Enders and Herberg (1983) p. 488-489

²² See for example Auty (1994) referred to in Stevens (2003) p. 19

²³ Stevens (2003) p. 19 referring to: Eden (1979), Kurbusi (1984) and Rumaihi (1986)

the rest of the world along with a deliberate policy of exchange rate depreciation to ensure competitiveness of non-oil, gas and mineral exports.²⁴

According to Stevens²⁵ a revenue fund can fulfil three functions. First, it can be used to invest the revenues abroad and hence not letting the revenues affect and disturb the economy. Second, by setting a price assumption for budget purposes the fund can be used to stabilize revenues if the world market price exceeds this price. If the resource price is lower than the assumed price the funds assets will top up the budget. Third, as the oil, gas and/or mineral resources are limited and cannot be assumed to last forever the funds accumulated revenues can be used by future generations.

An appreciation of the real exchange rate can be avoided by investing the resource revenues abroad. This is a way for the government to choose when and how much capital to bring back into the country. This is also a way to prolong the benefits of the resource boom even after it has come to an end. On the other hand, if the resource boom lasts for a long time growing interests from the foreign assets can create a secondary boom.²⁶

²⁴ Stevens (2003) p.19

²⁵ Ibid. p.21-22

²⁶ Enders and Herberg (1983) p. 491

4 Dutch Disease and Saudi Arabia

As mentioned in section 1.2, the Dutch Disease theory presented in chapter two along with the policy suggestions for Dutch Disease management in chapter three will function as a theoretical framework in order to analyse whether Saudi Arabia has suffered from Dutch Disease or not. In order to do this, different aspects of the Saudi Arabian economy will be examined. The first thing to look for when searching for Dutch Disease is heavy oil dependence. Further, the areas where Dutch Disease symptoms are likely to occur and thus the areas we will examine are; the real exchange rate, inflation, the manufacturing sector, the agricultural sector, the labour force, industrialisation and infrastructure. The areas will be examined in terms of what is predicted by the Dutch Disease theory and what has actually happened in these sectors or areas in Saudi Arabia.

4.1 Oil dependence

Oil-induced Dutch Disease assumes an oil sector which largely contributes to the economy. In the case of Saudi Arabia as shall be seen below, this is undeniably true.

Before the establishment of the Kingdom of Saudi Arabia in 1932 the country consisted of several separate and heterogeneous regions that lived of specific resources and different activities. The unification of these regions into the Kingdom and the discovery of oil six years later was the beginning of widespread economic change. In the beginning, oil revenues were mainly kept by the ruling family and its tribal allies. Oil revenues increased slowly until the 1970s and the government usually operated under financial constraint.

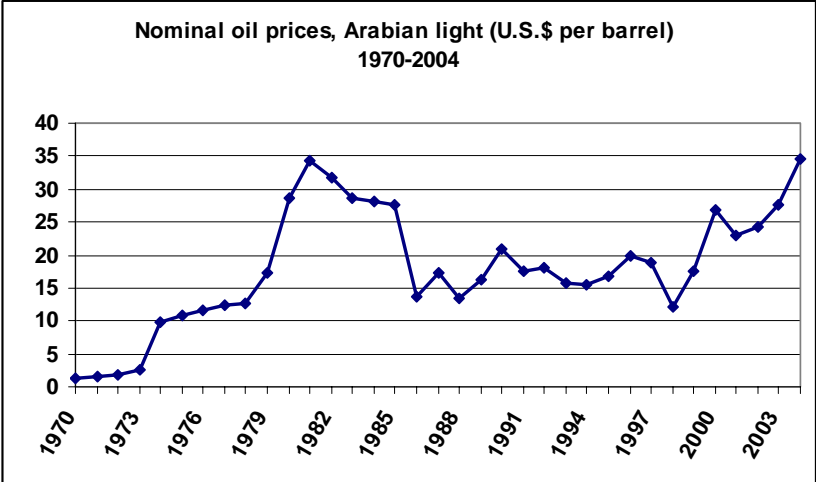
Saudi Arabia played an important role in the reconstruction of Europe after World War II as a reliable source of oil. Even after this Saudi Arabia's oil assets have been very important to the industrialized world as the steady flow of oil was regarded to be essential for international economic stability. Saudi Arabia's position in the world oil market increased after the Gulf War in 1991 as it was the only major oil-producing country that had considerable excess capacity of crude oil production and thereby a strong influence on oil supplies and prices.

In the early 1970s, as oil exports increased sharply, royalty payments and taxes on foreign oil companies increased considerably and as the Kingdom began setting and increasing oil prices, the economic situation changed dramatically. Saudi Arabia's revenues

per barrel of oil quadrupled from US\$0.22 in 1948 to US\$0.89 in 1970. By 1982 the average export price had reached well above US\$30 per barrel of oil (in nominal prices see figure 4.1 and in real prices see figure 4.2 below). The governments oil revenues jumped from US\$4.3 billion to US\$101.8billion between 1973 and 1980. Saudi officials finally obtained the means to make major structural changes in the economy.

Today, Saudi Arabia is by far the largest oil producer in the world and relies heavily on oil revenues.²⁷ The oil sector is the key domestic production sector as oil revenues constituted 84 % of total government revenues and 46 % of GDP in 2004.²⁸ Oil export revenues, of which a large portion is allocated to the budget, accounted for 88 % of total exports in 2004 (during the oil boom in the 1970s it accounted for over 99 %!).²⁹ Figure 4.3 illustrates Saudi Arabian crude oil production in 1962 to 2004 while figure 4.4 shows government revenues in 1969 to 2004.

Figure 4.1: Nominal oil prices 1970-2004



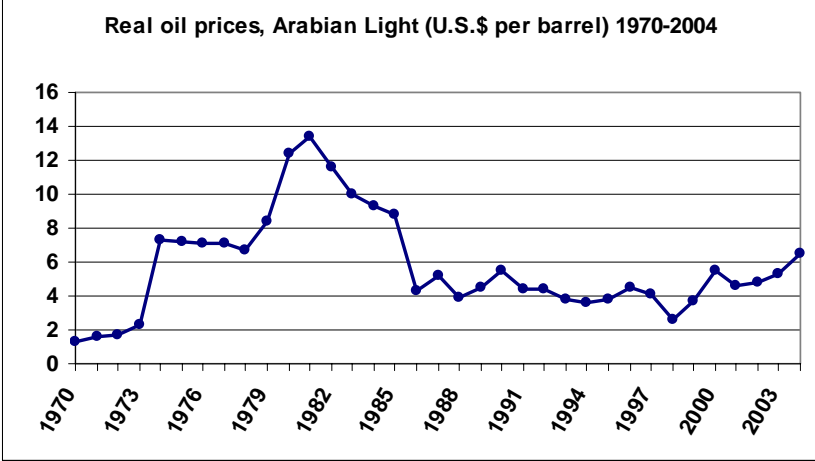
Source: IMF, International Financial Statistics Book (IFS) and OPEC

²⁷ Dibooglu and Alesia (2004) p.50

²⁸ Computed from IMF and SAMA data

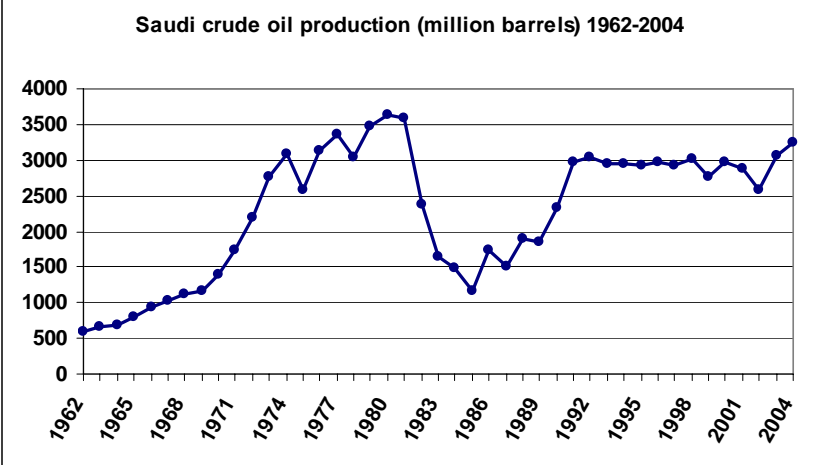
²⁹ SAMA/Ministry of Finance

Figure 4.2: Real oil prices 1970-2004



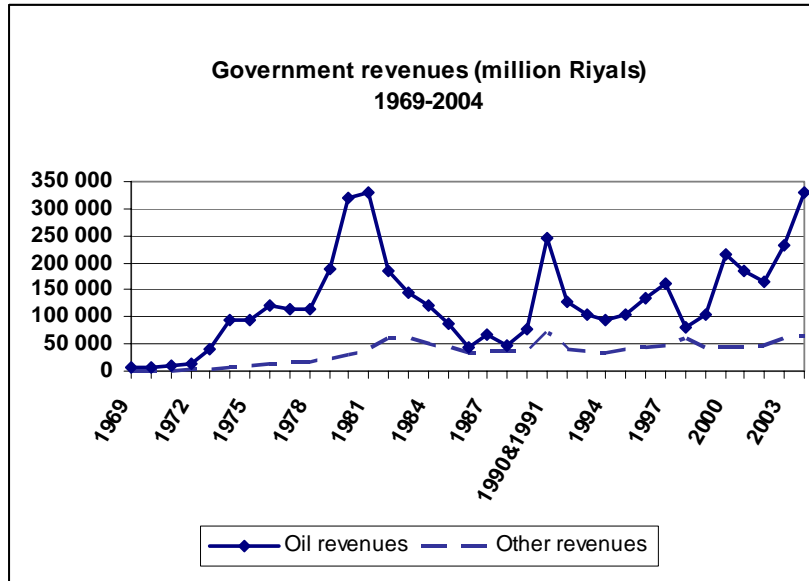
Source: IMF, International Financial Statistics Book (IFS) and OPEC

Figure 4.3: Saudi crude oil production 1962-2004



Source: Ministry of Petroleum & Mineral Resources

Figure 4.4: Government revenues 1969-2004



Note: Budget allocation for the fiscal year 1990 was merged with the budget for 1991.

Source: Ministry of Finance

4.2 The real exchange rate

The Dutch Disease theory predicts a real exchange rate appreciation as an effect of capital inflow from the resource boom. Looking closer at the Saudi Arabian real exchange rate will reveal if this was the case or not in the country.

Even when data for the price development of tradable and non-tradable goods are not available there exists other ways of studying real exchange rate developments. One such way is the real effective exchange rate. Bahmani-Oskooee³⁰ has constructed a quarterly real effective exchange rate for Saudi Arabia using the following equation:

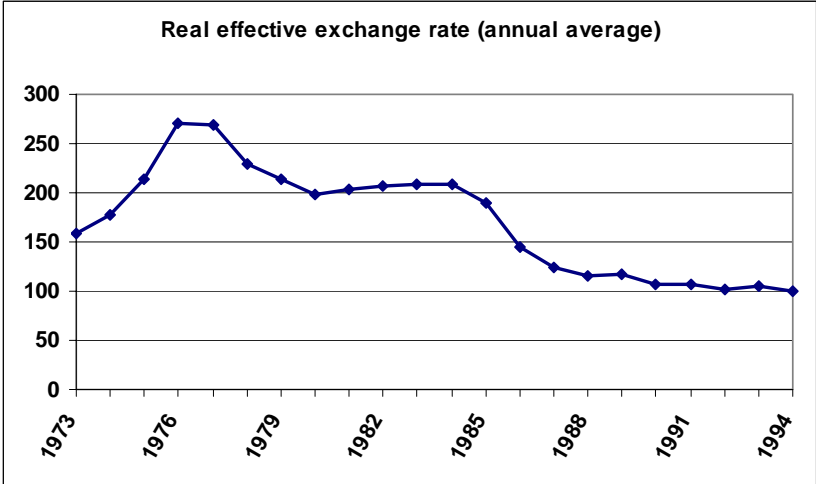
$$REFX_j = \sum_{i=1}^n \alpha_{ij} \left(\frac{(CPI_j R_{ij} / CPI_i)_t}{(CPI_j R_{ij} / CPI_i)_{90}} \times 100 \right)$$

Where $REFX_j$ is the index of the real effective exchange rate for country j ; CPI_j and CPI_i is the consumer price index for country j and trading partner i respectively; R_{ij} is the nominal bilateral exchange rate between country i and j defined as number of i 's currency per unit of j 's currency; n is the number of trading partners; α_{ij} is the share of country j 's import from trading partner i in the base period (1990) and $\sum \alpha_{ij} = 1$.

³⁰ Bahmani-Oskooee (2001) p. 104-106

Recalculating his data into an annual average real effective exchange rate results in figure 4.5 below. The figure illustrates clearly a real appreciation of the real effective exchange rate between 1973 and 1976 followed by a real depreciation between 1977 and 1980 and yet another depreciation followed after 1984.

Figure 4.5: Real effective exchange rate 1973-1994



Source: Annual average data computed from Bahmani-Oskooee (2001) p.105-106

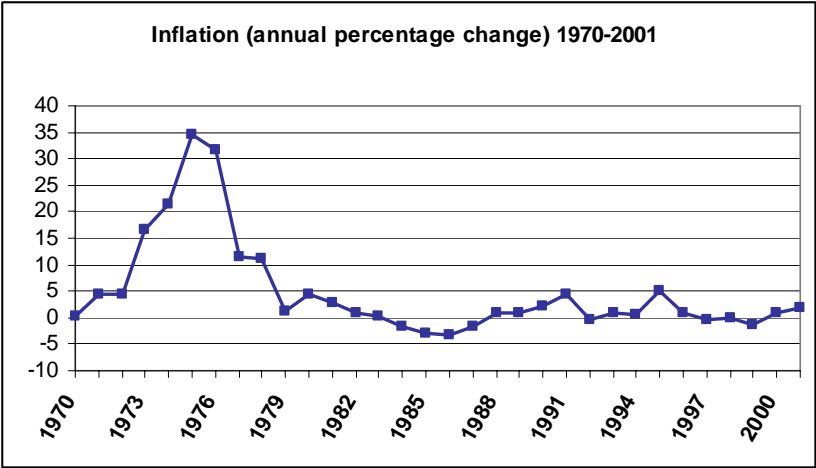
4.3 Inflation

High inflation is common in Dutch Disease affected countries. The causes of inflation can be several and does not only have to depend on capital inflow. However, large capital inflows increases the money supply and thereby causes inflation as more money will increase demand and consequently prices. In the case of Saudi Arabia structural factors had contributed considerably to the rising inflation. However, the main factor responsible for Saudi inflation in the 1970s was the increase in liquidity which resulted from the increase in oil revenues after the first oil shock. This liquidity was injected by the Saudi government into the economy to finance economic development.³¹

As can be seen in figure 4.6 below, the first half of the 1970s was characterised by high inflation, as high as 35 % in 1975. Inflation decreased again during the second half of the 1970s to a bit over 0%. After the 1970s, inflation fluctuated between 5 % and -5 %.

³¹ Akikina and Al-Hoshan (2003) p. 438-439

Figure 4.6: Inflation 1970-2001



Source: International Monetary Fund, World Economic Outlook Database, September 2000

4.4 The manufacturing sector

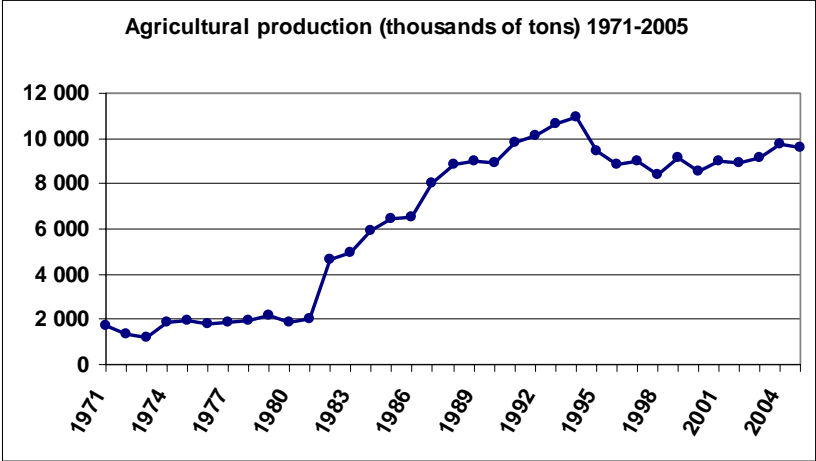
The manufacturing sector is predicted to decline by Dutch Disease theory as the real exchange rate appreciation has made domestic manufactures more expensive than foreign manufactures. In Saudi Arabia the manufacturing sector was small before the first oil boom in the 1970s. The increased oil revenues gave Saudi officials the means to improve and expand the domestic manufacturing sector financed by subsidies and by the government building manufacturing plants. Consequently the manufacturing sector increased instead of decreasing as predicted by the theory. The expansion of the manufacturing sector was part of the massive development effort (see section 4.7 below) and five-year plans funded by oil revenues and imposed by the Saudi government starting from 1970, in order to develop the country and the economy in various ways.

4.5 The agricultural sector

The Dutch Disease theory states a possibility of a decline in the agricultural sector as labour will move from this sector into either non-tradables or into the booming sector. Ministry of Planning estimated the total labour force in 1979 to 2.9 million and agriculture accounted for 15.8 % of the total work force. By 1989 the total labour force had risen to 5.8 million but agriculture’s share had declined to 9.9 %. Despite the decrease in agricultural employment agricultural production increased, especially between 1981 and 1994, see figure 4.7. This increase in output was a result of major subsidies to the agricultural sector. The original

objective in raising output was national security. Saudi Arabia became self sufficient in several major food grains but the cost to the budget and the ecology could not be justified. Rather than gaining peasant farmers the subsidies gained large conglomerates.³²

Figure 4.7: Agricultural production 1971-2005



Source: Ministry of Agriculture

4.6 Labour force

The spending and resource movement effects predict shifts in the labour force between the sectors. The former effect expects labour to some extent to be attracted from the tradable sectors to the non-tradable sector whereas the latter effect predicts labour to be attracted from the lagging and the non-tradable sectors into the booming energy sector. In case of an overheated labour market with excessive demand for labour there will be a need to import foreign labour.

Saudi Arabia suffered from an overheated labour market and was in demand for foreign labour. This changed the labour force even more than just domestic labour shifting between the sectors. The imported foreign labour functioned as a way to calm Dutch Disease symptoms related to the overheated labour market and repressed inflation. Without the imported labour the prices of the non-tradable sector would have risen further, due to shortages of non-tradable goods as a result of increased demand, and would hence lead to an even greater appreciation of the real exchange rate.

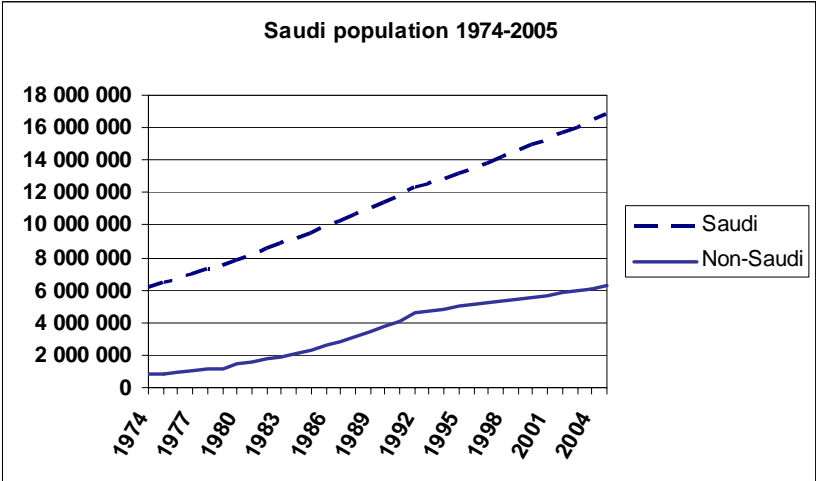
The domestic labour force grew at an annual rate of 5 % between 1975 and 1985. Despite an annual population growth of 3.5 %, which was among the highest in the

³² Fareed Mohamedi (1992)

world, there was still need for foreign labour. Many foreign workers were brought into the Kingdom by the private sector.³³ These foreign workers have an important role in the Saudi economy, especially in the oil and service sectors.³⁴ In 2005 there were over 6 million foreigners in Saudi Arabia as can be seen in figure 4.8 below.

According to figures provided by the Ministry of Planning the total labour force in 1979 consisted of 45 % working in producing sectors and 55 % working in service sectors. In 1989 the share of total work force working in producing sectors had declined to 36 % and consequently the share of service sectors had risen to 64 %. Moreover, the total work force was concentrated in four main sectors. In 1979 agriculture accounted for 15.8 %, construction 20.4 %, trade 10.6 % and community and social services, including government service 34.1 % of total work force. In 1989 agriculture had fallen to 9.9 %, construction fell to 16.4 % while trade had increased to 15.6 % and community and social services had increased as well to 42.4 %.³⁵

Figure 4.8: Saudi population 1974-2005



Source: Central Department of Statistics & Information, Ministry of Economy and Planning

4.7 Development efforts

In response to suggestions of International Monetary Fund advisers Saudi Arabia established a planning agency in 1958. The agency which later became the Ministry of Planning formed five-year plans for the economy. These five-year plans were implemented in order to develop the country and the economy. The plans were prepared in advance and their budget depended

³³ Fareed Mohamedi (1992)
³⁴ CIA Fact book
³⁵ Fareed Mohamedi (1992)

on the oil revenues. As the oil revenues grew so did the budget for these development plans. In the 1970s when oil prices as well as oil exports increased rapidly the massive expenditures caused several problems. The flood of imports that followed after 1972 was too large for the transportation system to handle. The ports were clogged as ships had to wait for months to unload their cargo. Storage and distribution from the ports were also inadequate. By 1976 the clogged ports, an acute housing shortage, skyrocketing construction costs and a growing manpower shortage caused prices to accelerate at what some observers estimated at about 50 % a year, although the official cost-of-living index did not reflect these rates. During the 1980s when oil prices and hence oil revenues began to recede the Saudi government decided to cut expenditures. These cuts were however not sufficient which resulted in budget deficits from 1983 to 2000.³⁶ See figure 4.4 above and figures 4.9 and 4.10 below. Apart from these negative effects, the development efforts also had positive effects with massive expenditures to facilitate for example industrialization and infrastructure.

4.7.1 Industrialization

As described in section 2.3, the indirect resource movement effect causes de-industrialisation as the manufacturing sector and the non-tradable sector loose production resources to the booming energy sector. However, in the case of Saudi Arabia the growing oil revenues have in fact facilitated the industrialization in the country. Industrialization was facilitated mainly by government investment in processing plants that used the country's hydrocarbon resources. This also implied that the government tried to diversify the economy At least a decade was spent by very large investments to build the plants. Gas-gathering systems and pipelines for gas and crude oil and two main industrial sites were also financed and built.³⁷

4.7.2 Infrastructure

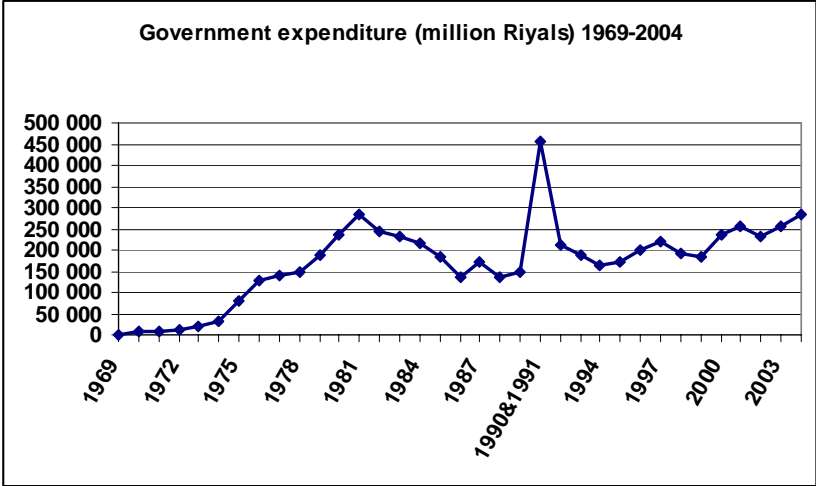
De-industrialisation can also result in inadequate infrastructure or that the existing infrastructure is not restored and rebuilt when necessary. In the case of Saudi Arabia however, the development effort helped to the restoration and building of water, sewerage, electricity,

³⁶ Fareed Mohamedi (1992)

³⁷ Ibid.

telecommunication systems, and desalination as well as building airports, ports and laying an immense network of roads. Hospitals and schools were also built. A massive increase in government spending on education of about 10 % of the budget per year was also implemented. By mid 1980s the massive expenditures totalled US\$500 billion.³⁸

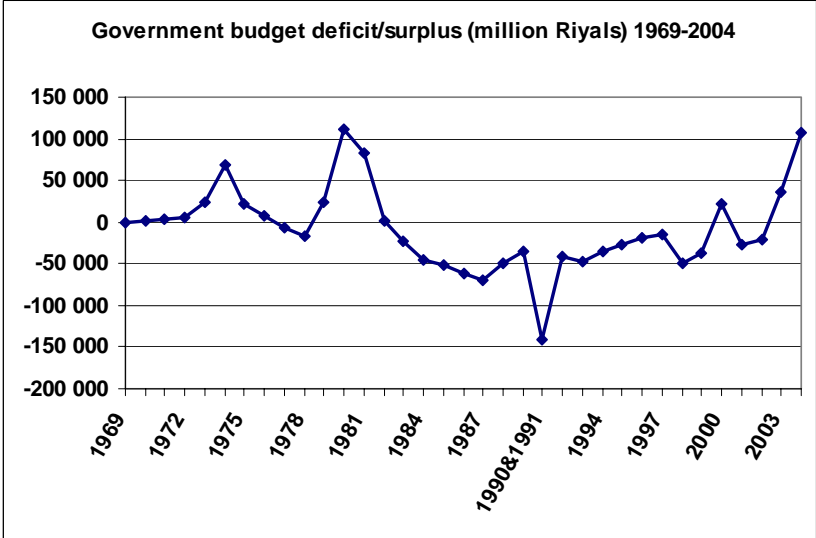
Figure 4.9: Government expenditures 1969-2004



Source: Ministry of Finance

Note: Budget allocation for the fiscal year 1990 was merged with the budget for 1991.

Figure 4.10: Government budget deficit/surplus 1969-2004



Source: Ministry of Finance

Note: Budget allocation for the fiscal year 1990 was merged with the budget for 1991.

³⁸ Fareed Mohamedi (1992)

5 Dutch Disease and Saudi Arabia - Conclusion

The aim of this study was to investigate whether Saudi Arabia has suffered from Dutch Disease or not as well as to see how Saudi has managed symptoms associated with Dutch Disease. Saudi seems to have the right prerequisites for Dutch Disease and as the world's largest oil producer it is clear that the oil sector contributes significantly to the Saudi Arabian economy. It was also shown that Saudi is and has been largely dependent on oil revenues as they constitute the major part of government revenues. The massive inflow of liquidity resulting from the increase in oil revenues resulted in high inflation, especially during the first part of the 1970s, as well as changes to the real effective exchange rate. Further, the oil booms also resulted in an overheated labour market with large needs of foreign labour and an expansion of the non-tradable sector. So far, all evidence seems to point in the direction of Dutch Disease.

Other areas have however not behaved according to the predictions of the Dutch Disease theory. The Dutch Disease theory predicts a decline in the manufacturing sector as well as the possibility of a decline in the agricultural sector through the spending and/or resource movement effects. The actual effects of the oil boom were in contrast an increase in the manufacturing sector as well as an increase in agricultural production. The conclusion must thereby be that although Saudi Arabia has suffered from Dutch Disease related symptoms the country did not suffer from Dutch Disease as the theory only partly explains the actual events in the economy.

The Dutch Disease theory assumes that Dutch Disease related problems might happen if no measures are taken after large capital inflows. In Saudi Arabia however, the government started implementing several policies and development efforts *before* the first oil boom. As we have seen, these policies and development efforts caused a number of negative economic effects such as bottlenecks in the production, housing shortages, increasing prices etc. But on the other hand, these policies and development efforts helped to develop and establish the hydrocarbon industry and hence worked towards diversification of the economy. It also prevented many Dutch Disease related problems from occurring. The development efforts before the oil booms combined with the fact that the manufacturing industry was so small prior to the oil booms also help to explain why this industry did not experience a contraction and that Dutch Disease did therefore not happen. Further, the tradable sector is subject to two counteracting effects; the appreciation of the real exchange rate deteriorates the

competitiveness of the manufacturing products on the international markets and hence decreases manufacturing production. On the other hand, government support (through the development effort) increased the production from this sector by subsidies which changed the cost structure which in turn increased and helped to foster development within this sector. Without government support of the manufacturing sector the effect of the real exchange rate appreciation would have dominated and hence the sector would have decreased as is predicted by the Dutch Disease theory.

Another aspect to how Saudi Arabia managed to avoid Dutch Disease is that the development efforts were funded by and followed the pace of oil revenues. If the government had decided to maintain expenditures at constant levels through loans when the oil price crashed the country would have suffered even more negative effects with even larger budget deficits than it already suffered from in 1983 to 2000, see figure 4.10 above. Luckily when the oil price crashed the government decided to somewhat cut expenditures.

The case of Saudi Arabia has clearly shown how natural resource abundance can be a blessing and a curse even though it did not suffer from Dutch Disease. Many oil producing countries around the world are highly dependent on their oil revenues. However, it is not likely that they all suffer or has suffered from Dutch Disease. Saudi Arabia is one example of a country that managed to avoid it. It would be interesting with future studies focusing on other oil producing countries which have also managed to avoid Dutch Disease. Are there any factors similar to those in Saudi Arabia which prevented Dutch Disease from occurring or has it depended on other factors different from those in Saudi Arabia? Such studies could probably also give some valuable advice to other countries likely to get affected by different forms of Dutch Disease. Studies of other Middle Eastern countries with conditions similar to those in Saudi Arabia, in terms of history and economy, could maybe give some answers to these and other questions.

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