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Resource Curse Contagion in the Case of Yemen

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Abstract:

This study analyses the economic developments in Yemen from the 1970s to today in the context of the resource curse hypothesis. After a brief survey of the resource curse literature, using empirical data, historical accounts, and political (economic) analyses, I confirm that post-reunification Yemen suffers from an intense oil curse. The curse is evidenced by low genuine savings rates, oil-dependency, a stagnating economy, and institutional failure. However, this study finds that the institutional failure which caused this is itself a product of the resource-curse-like developments following migrant worker remittances from Saudi Arabia in the 1970s and 1980s. Moreover, the current instability in Yemen has its origins in rent-seeking defections in the corrupt governing patronage network due to sudden anticipations of oil exhaustion. The analysis suggests that worker migration is able to transmit resource curse symptoms to other economies, which makes them also more vulnerable to future resource curse triggers, and that declining resource reserves increase political instability of countries with strong patronage networks.

Keywords:

Resource Curse, Yemen, Oil Curse, Patronage, Remittances, Development

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1. Introduction

The air strike interventions of the Saudi-Arabia-led coalition, following the al-Houthi takeover of 2014/2015, brought the almost forgotten Republic of Yemen back into the limelight. Yemen, a failed state and the weakest of all Middle Eastern economies, is a net exporter of crude oil and natural gas (henceforth abbreviated oil and gas respectively). Thus, that Yemen is suffering from energy poverty (El-Katiri and Fattouh, 2011) seems paradox. This reminds one of the economic puzzle known as resource curse: economies abundant in natural resources that exhibit bad economic performances.

Assessing this issue is of interest for resource and development economists and for analysts or policymakers of Yemen alike. In general, even though the underlying reasons for resource curses have been quite extensively studied in the past (see Van der Ploeg (2011a) for a comprehensive summary on the topic), many topics are still insufficiently examined. This includes its dynamics, the reciprocal relationship between resource curse and government, and the question why some resource-abundant economies suffer from the curse and others not. Concerning Yemen in particular, to the best of my knowledge, Al Iriani (2012) and Al Iriani and Al Eriani (2015) have been the only studies which address the resource curse in Yemen explicitly, giving evidence for its presence. Yet, the curse plays a central role in the county's history. Thus, for studying the country or designing policies for it, understanding the resource curse in Yemen and its far-reaching impacts is crucial. Until now, attempts to intervene in Yemeni politics have usually only been of modest success. For a long time, action was focussed on conditioning aid on the fulfilment of certain reforms, a policy with doubtful effects in the context of the current developments.

This study uses empirical data, political (economic) analyses, and historical accounts to examine to which extent Yemen is suffering from the curse and which factors have influenced these developments. As a result, I can confirm that today's Yemen suffers from an oil curse, supported by time series each covering more than 20 years. However, of much greater interest, I am able to show that the institutional failure that enabled the oil curse arose from the effects of workers' remittances which flew into the economy during the 1970s: a first curse, transmitted from Saudi Arabia. Implicitly, the current misery in Yemen can be traced back to the establishment and empowerment of a corrupt state apparatus, which resulted from this first resource curse. This suggests a conclusion so far not popularly considered in the literature: resource curses may be potentially contagious in the presence of labour mobility and can be transmitted to another economy, where they cause lasting damage to institutions. This in turn makes the affected economy prone to future resource curses. Al Rawashdeh and Maxwell (2013) have already made similar observations regarding the effect of workers' remittances in the case of Jordan. Hence, the case of Yemen supports the view that the classic understanding of resource curses might have been too narrow and should be geographically expanded and generalised to other kinds of external rents.

Today's Yemen is the product of a series of turbulent historic developments during the last 50 years. The 1960s had left Yemen torn into northern Yemen Arab Republic (YAR) and southern, communist People's Democratic Republic Yemen (PDRY). Both states had just emerged from armed conflict (a revolution against the former monarchy in the North and a liberation from British protection in the South, including interventions by Saudi Arabia and Egypt) and were mostly tribal areas with hardly any institutions or modern economic activity. This changed during the 1970s, when institutions grew quickly in the wake of a steeply rising labour demand from neighbouring Saudi Arabia, which attracted a significant part of the Yemeni work force and resulted in a large inflow of workers' remittances. Oil was discovered and exports initiated during the 1980s, which were also marked by tribal unrest and economic setbacks under long-term president Ali Abdullah Saleh, who took over YAR's government in 1978. A reunited Yemen was established in 1990 but subject to multiple adverse macroeconomic events in subsequent years. Since 2011, persistent violent conflict between different groups and systematic government failure have finally ended in the state's complete breakdown in the form of multiple takeovers and subsequent wars, lasting until the present.

Colton (2010) is the only study explicitly acknowledging the connection between changes in Yemen in the 1970s and the economic post-reunification struggles. Nevertheless, her study is not set in the context of the resource curse literature and only touches the role of the government in Yemen, although the latter is a key variable for the analysis of these events. In this regard, I find that Yemen's path to complete state failure in this decade can be explained by the destabilisation of the governing patronage network due to incentives to defect. The tendency to turn against the government increased following lower revenues and the sudden anticipation of an exhaustion of oil reserves after the country reached its peak oil production in 2002.

The paper is structured as follows: Chapter 2 briefly reviews the resource curse literature, giving a synopsis of (recent) studies to point out the symptoms which are used to diagnose the curse later on. Chapter 3 is the analysis itself, chronologically structured, and Chapter 4 presents a brief discussion of the results' implications and a policy recommendation note for the case of Yemen.

2. Background: The Symptoms of a Resource Curse

The following subsections explain the different symptoms of a resource curse. From the beginning, it is recognized that "the curse is real but not destiny" (Elbadawi and Gelb, 2010, p.iii), according to the consensus in the modern literature on the topic. The different economic effects (Dutch disease, price volatility) do indeed harm the economy but can be tackled – at least principally – by adequate policy. Hence, the major driver behind the curse is government failure.

2.1 The Dutch Disease

Dutch disease is a term inconsistently used to describe a substantial deindustrialisation due to a growing natural resource sector, often connected to an appreciation of the (real) exchange rate. Corden and Neary (1982) have shown how a boom in the resource exporting sector leads in the first stance to labour movements from other sectors into the boom sector, later drawing further labour force from the manufacturing sector into the services sector due to the increased income, finally increasing the price of services – ergo a real exchange rate appreciation. Over time, the role of learning-by-doing effects and the crowding out of positive externalities in the manufacturing sectors have been discovered (Krugman, 1987, Sachs and Warner, 1997). More recent

studies have suggested that – especially in the case of developing economies – time-inconsistent investment schemes or absorptive constraints cause the Dutch disease. Absorptive constraints describe the economy's disability to efficiently utilise its resources in terms of investment and consumption, i.e. the economy is bottlenecked by the absence of non-tradable factors such as infrastructure or human capital, an adverse appreciation of the real exchange rate, or the institutional background (Van der Ploeg and Venables, 2013).

As it may be expected, the "right" description of the Dutch disease depends on the exact situation, i.e. the economy affected and the resource involved. For instance, absorptive constraints in the form of labour may be valid in the case of Nigeria (a lack of human capital) but not for the oil-rich Gulf States, which have managed to attract skilled labour from abroad. To bypass this discussion, I adopt a perspective on the Dutch disease that is comprehensive but focussed on developing economies: Due to limited non-tradable development factors and/or a weak institutional background, export revenues are not reinvested or used efficiently. Moreover, the boom and its resulting capital inflows lead to a concentration and higher wages in the resource-associated sector and the growing services sector, provoking a real and/or nominal appreciation, harming the other industries' international competitiveness. Furthermore, missing economies of scale in the manufacturing industry lead to a relative decrease in its productivity. All these factors result in the economy's deindustrialisation.

An appreciation of the real exchange rate hampers growth through its effect on tradeables and their industry. This is especially true for developing economies (Rodrik, 2008). Concerning the effect of deindustrialisation itself, there are indeed studies which cast doubts on its negative impact on long-term growth (Sosa and Magud, 2010). However, this only applies to certain cases. With a complete resource dependency, the economy might enter a sectorial trap, which leaves it unprotected in case of substantial negative demand or supply shocks (e.g. exhaustion or technology switching), finally causing a post-boom collapse (Elbadawi and Gelb, 2010, Gelb and Grasmann, 2009). Underinvestment in education and research are further potential consequences of the concentration in natural resources (Gylfason, 2001). This leads to an undersupply (or a flight) of human capital, which prevent technological progress and, thus, long-term growth (Papyrakis and Gerlagh, 2006, Kufenko, 2015).

Optimal reinvestment patterns of resource rents can indeed differ for each economy. However, in the general case, the rents should be reinvested into renewable capital for sustainable economic growth and for preventing a post-boom collapse. Still, as part of the Dutch disease, many resource-dependent economies exhibit low savings and high consumption rates (Collier et al., 2010, Cherif and Hasanov, 2013). Majbouri (2015) estimates that, on average, Middle Eastern oil producers could have yielded 17% more income over a period of 40 years if resource rents had been invested sustainably. Sustainable reinvestment can be evaluated most effectively by a genuine savings indicator, i.e. an economy's aggregated savings adjusted for changes in assets such as resource depletion, education, and environmental factors (Hamilton, 1994, Hamilton, 2010). Hence, genuine savings are a major indicator for diagnosing a resource curse (Van der Ploeg, 2011a, Boos and Holm-Müller, 2013, 2012).

2.2 Price Volatility Effects

The volatility of the world market prices of natural resources harms an export-dependent economy because international price shocks are transmitted directly to the domestic economy. Hausmann and Rigobon (2003) have shown that for such an economy a price deviation of only 6% causes a GDP shock of 30%. In the absence of stabilising mechanisms, this affects an economy significantly and provokes unemployment and distributional frictions. A major transmission channel is the nominal exchange rate: International price volatility transfers into exchange rate volatility (Clements et al., 2008), implying volatile prices and, thus, volatile revenues for companies engaged in trade. In the light of bad financial systems in most developing countries, companies are likely to be liquidity constrained, which prevents expansion, innovation, and growth (Aghion et al., 2009). Financial development has a mitigating effect on trade volatility in minerals (Moradbeigi and Law, 2016), but the underlying relationship may be reciprocal, since resource abundance can have a negative effect on financial development (Xu et al., 2015). Further links for volatility damages are wrong decisions under uncertainty and the mitigation of human capital and foreign investment (Van der Ploeg and Poelhekke, 2009).

Apart from businesses, the fiscal state itself is a major transmitter for volatility damages. In resource-exporting economies, a significant part of the public budget originates from export revenues (Moore, 2007). The fiscal state then faces an optimisation problem under uncertainty when designing fiscal policies and could

implement policies during boom times that may prove infeasible in post-boom stages. Especially in case of a debt-financed policy, this may induce incremental costs, which create an additional burden for the economy, leading to decreased long-term growth. A design of fiscal budgeting equivalent to the permanent income approach may prove optimal but is only rarely implemented (Gelb and Grasmann, 2009). As Zakharova and Medas (2009) report, there are tools to manage the volatility effects, but the (fiscal) state, which is discussed in the next subsection, plays a pivotal role in this.

2.3 Institutional Failure

The necessary condition for a resource curse is bad governance. As discussed, all other symptoms are mitigatable by adequate policy, suggesting that an affected economy's governance is either unable to implement these policies or that it causes the symptoms actively. This is evident from numerous empirical studies, which have shown that resource curses are entirely mitigatable by sufficient institutional performance (Corrigan, 2014, Bleaney and Halland, 2014, Bjorvatn et al., 2012). Petermann et al. (2007) have found that resource abundance increases corruption in many cases, which forms a vicious cycle with the curse in the form of lowered growth (Mauro, 1995, Bai et al., 2013). Kolstad and Wiig (2012) show that trust is affected significantly by resource-affected variables such as corruption, institutions and civil wars.

A major link in this cycle is 'rent seeking', which causes economic damage and worsens the institutional quality. The term stands for the waste of economic resources by individuals concentrating on overall unproductive actions (e.g. investments) to gain windfalls of whatever kind (Murphy et al., 1993, Robinson et al., 2014). Given sufficiently weak institutions, different individuals or parties try to gain political or military control over the resources or to profit from their revenues. An important pattern is the inefficient provision of public goods due to bribery (Bulte and Damania, 2008). As mentioned above, resource revenues may be a reason or at least a factor for military conflict (Bannon and Collier, 2003). Such internal resource wars damage infrastructure and impose boundaries on economic activity and growth within the country. Moreover, the victor will most likely exploit the resource rents. Economic uncertainty for foreign investors and domestic savers are a further effect, which makes investment capital necessary for development scarce (Alesina et al., 1996).

Resource abundance may seduce politicians to waste economic resources to stay in power, so that they themselves can benefit longer from corruption windfalls. Rulers may engage in patronage, since resource rents make it easier to buy off dissidents or important stakeholders in general (Acemoglu et al., 2004, Kolstad and Søreide, 2009). This includes the system of authoritarian bargains, i.e. benefitting a group of important stakeholders with highly-paid public sector positions in exchange for their backing, with devastating effects on labour markets (Assaad, 2014). Where regimes have to be backed by a larger share of the population (such as democracies), the government may design obviously infeasible or time-inconstant policies to gain popular support, e.g. by imposing only low taxes (McGuirk, 2013) or by investing in white elephants (Robinson and Torvik, 2005). This may involve high fiscal spending or the neglect of substantial long-term investments in general (including education), generating exactly the symptoms described in the sections above (Dietz et al., 2007, Boos and Holm-Müller, 2013, Van der Ploeg, 2011a, van der Ploeg, 2011b). However, the precise pattern of economic performance is highly non-monotone and depends on the exact policy survival function (Caselli and Cunningham, 2009). Apart from that, the will to stay in power contradicts necessary institutional modernisation that might decrease the mismanagement of natural resources (Ross, 2012). Al-Ubaydli (2012) has even argued for a general trade-off between development and the possibility for corruption, leading corrupt leaders to deter resource-rich economies from growing.

Lastly, the economy is also directly damaged by the embezzlement of resources and public money. Without adequate monitoring-institutions or within a legal vacuum, the governing body is able to draw parts of the resource rent flows, often by the corrupt granting of extraction or export licences (Uberti, 2014).

3. The Resource Curse in Yemen

Each of the next subsections covers a different part of the events in Yemen. The first subsection reveals how workers' remittances in the 1970s and 1980s passed on resource curse symptoms to the country: The remittances led to Dutch disease patterns (high imports and the crowding out of manufacturing and agriculture) and created fertile soil for the development of corrupt institutions. In the second subsection, I use different economic indicators to demonstrate that post-reunification Yemen suffers from a resource curse. Lastly, I analyse how governance and resource extraction are linked in modern Yemen and what consequences this has for Yemeni politics.

3.1 Initial Contagion through Workers' Remittances

With the oil price shock following the Yom Kippur War of 1973, an increase in labour demand in Saudi Arabia attracted a significant Yemeni migrant workforce, which made up more than 20% of the overall Yemeni population in certain years and created capital inflows that have shaped the country until today. As I will explain, even though Yemen in the 1970s did not have any proven oil reserves, the remittances triggered effects in the Yemeni economy, which can be diagnosed as a resource curse. Hence, the remittance flows from neighbouring, labour-scarce Saudi Arabia transmitted resource curse symptoms to Yemen. In general, there is already a growing body of literature which finds that remittance flows can produce symptoms similar or even equal to those of resource abundance (see Abdih et al. (2012), Al Rawashdeh and Maxwell (2013), Barajas et al. (2009), Tyburski (2014). The same applies to some extent to foreign aid (Rajan and Subramanian, 2008) or to any other windfall.

After the 1960s, Yemen was divided into a republican north, the Yemen Arab Republic (YAR), and a socialist south, the People's Democratic Republic of Yemen (PDRY). It was still underdeveloped and characterised by a landownership-and-worker system often close to a feudal one, even in the south (Dresch, 2000). In general, regardless of the difference in the political system, both states developed quite similarly, at least in terms of the events relevant for this study. With the remittances, Yemen entered an era of cultural and structural change. The new wealth misled the Yemeni society, which developed time-inconsistent patterns of consumption and neglected investments in renewable capital.

Fig. 1 summarises the relevant developments by contrasting price and (capital) trajectories (imports, remittances, expenses for foreign workers) with the changing sector composition of the Yemeni GDP. As depicted, following the rising oil price, the remittances exceeded $US 1 billion from 1977 onwards, which made them the backbone of the Yemeni economy. The imports (consumption goods of all kinds, including a high share of food) increased continuously and outgrew the remittance inflows at the end of the 1970s, raising the current account deficit in 1980 to $US 778 million (El Mallakh, 2014). Moreover, the remittances escalated wages in the YAR, which in turn attracted foreign workers (Chaudhry, 1997). Fig. 1 (A) reveals that the path of remittance outflows followed the remittance inflows with a minor lag that results from wage and policy rigidities during the beginning of the boom.

El Mallakh (2014) explains that the country had an absorptive constraint in human capital: Educational standards in Yemen were weak, with less than 1% of the population having obtained school education of any degree and 65% being illiterate. As he reports, the state established higher wage rates for foreign workers, who were mostly employed in the public sector, for education or construction. As a result, in 1980 the share of foreign teachers reached 89% (even 96% in the stage of secondary education).

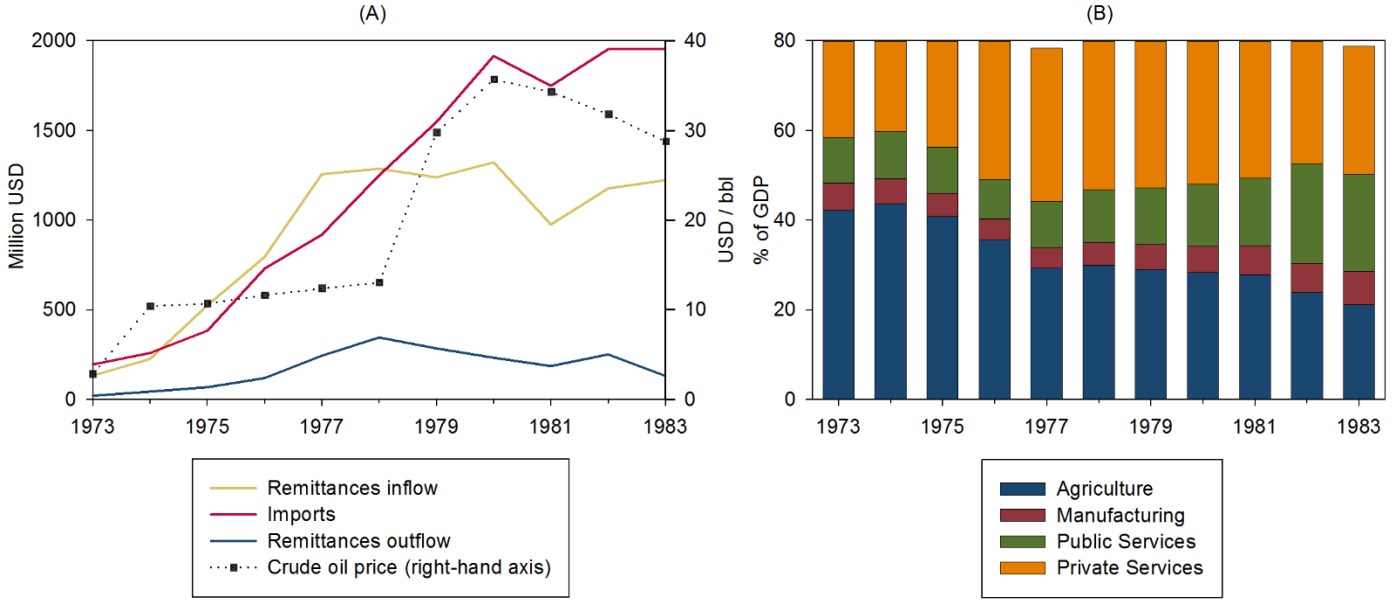

Fig. 1. Developments in the Yemen Arab Republic during the remittances boom phase 1973 - 1983. (A) Trajectories of remittances, imports and the oil price and (B) changes in the sectoral composition (main industry sectors). *Data*: El Mallakh (2014), World Bank (1979), British Petroleum (2013), and Looney (1990). *Note*: Remittances before 1976 are proxied by overall capital inflows.

The overall higher wage level hampered the development of a manufacturing sector. Fig. 1 (B) shows that the manufacturing industry almost stagnated in relation to the GDP. The state did not actively invest in that sector (Dresch, 2000), and so only the manufacturing of consumption goods, building material, food and beverages, and a small chemical industry became established (El Mallakh, 2014). The graph illustrates furthermore that the traditional key sector's share, agriculture, decreased continuously. By the end of the decade, although the land is arable for coffee, fruits, and cotton, about 40% of the domestically consumed food in both states was imported, giving "the killing blow to agriculture" ('Abd al-Salam, 1988). According to Dresch (2000), neglecting agriculture led to a decrease in its productivity. In addition to the higher wage level and the increased land prices due to incipient speculation, this made domestic production significantly more expensive than imports. He notes that profits were not reinvested in the industrial sector and the related monopolisation of wealth paved the way for corrupt structures.

Another factor which harmed the agricultural sector came in the form of qat, a drug-like plant, which lowers overall working productivity (Hassan et al., 2002) and consumes scarce land and water resources. Until the 1970s, qat was rare and was seen as a luxury good that was consumed only by the upper classes or on special occasions (Dresch, 2000). With the remittance flows, qat became affordable and, as part of the rising consumerism, a daily consumption good with a demand rising proportionally with income (El Mallakh, 2014). Until the late 1980s, qat revenues accounted for the majority of overall agriculture revenues. The cultivation of qat was only possible with the usage of water-intensive irrigation methods. Hence, it consumed water and arable land intensively, which are both scarce resources in Yemen. Furthermore, the spreading of qat contributed to the rising monopolisation of wealth, since the market was controlled by only a few families (World Bank, 1979). It should be noted that the rising cultivation of qat potentially downward-biases some data on agriculture, since qat farms were often not properly registered or calculated into the data.

Returning to Fig. 1 (B), the private services sector replaced agriculture as the leading sector in 1977. Remarkably, the largest growth in private services occurred in finance and real estate. However, the highest relative growth occurred not in private but in public services. According to Dresch (2000), remittance flows and the resulting import and consumption culture stimulated the establishment of a state apparatus with growing influence. He reports that in the early 1970s, the YAR erected and continuously empowered the "Central Planning Organisation" (responsible for infrastructure projects and supply planning); it later grew into a large, highly inefficient state apparatus of ministries and (semi-)governmental organisations. The state was virtually unable to tax the remittance flows (only about 20% are estimated to have passed official channels), forcing the government to cover the exploding expenditures (from nearly nothing in the 1960s to about 50%) nearly completely by international aid and debt, mostly coming from the World Bank, Kuwait, and Abu Dhabi.

Rising consumerism, low human capital formation, and the crowding out of agriculture and manufacturing by services and working migration are clear patterns of a Dutch disease. Capital inflows were not countered by policies designed to build up renewable capital, and the economy became dependent on remittances for financing the import of essential items. Moreover, the formation of a large powerful state system prone to corruption (especially through supply planning) and the monopolisation of wealth in certain families mark a worsening of the institutional background. A large inflow of foreign currency and rising domestic prices in the presence of fixed exchange rates until 1983 led to an appreciation of the real exchange rate with potentially harmful effects on growth and industry as well as a misallocation of resources among sectors. These facts are evidence of a resource curse in Yemen without the presence of a significant natural resource sector. Thus, workers' remittances were sufficient to pass on the hazardous effect of Saudi Arabian crude oil to Yemen – the resource curse proved contagious and was transmitted to Yemen in the presence of labour mobility.

Even though the (transmitted) curse is already evident from the Dutch disease patterns and the emerging institutional failure, additional facts confirm this result. Fig. 1 has already revealed that spending and the size of the services sector directly follow the negative turn in the price movement in the years 1980 – 1983, which suggests the transmission of price fluctuations into the Yemeni economy. I will subsequently argue that Yemen in the 1980s experienced a post-boom-collapse after the decline in oil prices, which completes the picture of a resource curse. During this time, both states suffered enormously under the decline in oil prices, which reduced by more than half the inflow of remittances (Dresch, 2000).

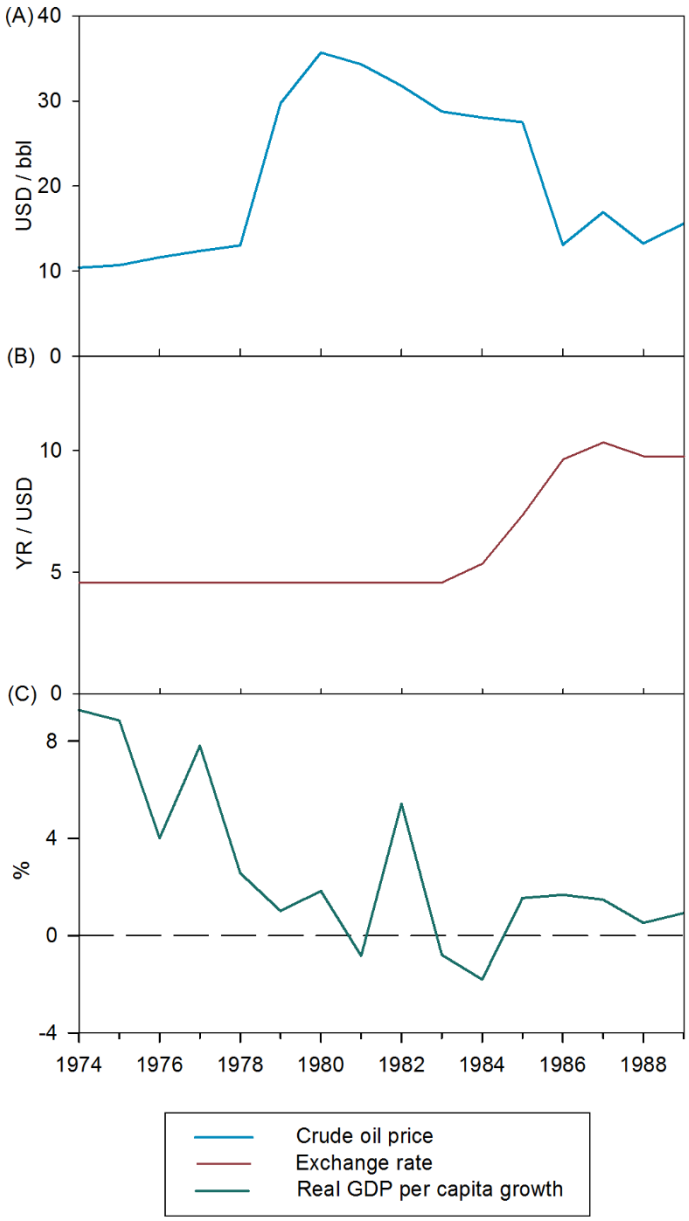

Fig. 2. Real GDP per capita growth, exchange rates and oil prices in the Yemen Arab Republic 1974 - 1989. *Data*: British Petroleum (2013), United Nations Statistical Commission (2015), and U.S. Energy Information Administration (2015).

Fig. 2 provides an overview of the events in the YAR, i.e. how growth reacted to changes in the crude oil price and the nominal exchange rate. As the graph demonstrates, until 1980, the economy exhibited positive diminishing growth rates. With the downturn in oil prices in 1981, the economy entered a recession. The positive outlier in 1982 might have been because of large foreign aid transfers in the wake of a severe earthquake or due to the first oil discovery in South Yemen (to be discussed in the next paragraph), but it does not affect the general pattern of recession, which continued in the following years. The continuously diminishing remittances harmed the economy in the face of an almost constant import volume, forcing the Yemeni government to introduce austerity measures in 1983 (e.g. import tariffs and quotas) and to declare 1984 the "year of agricultural development" (El Mallakh, 2014). Additionally, after about ten years, the central bank could no longer sustain an exchange rate of 4.5 YR/USD and had to accept a major currency depreciation, putting pressure on the import-driven society. However, depreciation, austerity measures, and agriculture promotion helped the economy escape the recession and return to low but positive growth rates.

Nevertheless, a number of central remarks are in place. As Dresch (2000) explains, the economy was highly dependent on international aid donors and lenders – they became Yemen's second economic pillar after the remittances, both being windfall incomes. The increasing lending behaviour reveals an interesting spending pattern: After oil was discovered in the early 1980s, the government directly anticipated future oil rents and

adjusted its current spending and, thus, increased borrowing. However, significant oil exports had not started before 1988. Dresch further notes that the promotion of agriculture facilitated the depletion of scarce fossil water. This indicates an additional degree of unsustainability in Yemen's pattern of consumption.

Lastly, and most importantly, Dresch notes that the emergent state apparatus exhibited patterns of grand corruption: The government used windfalls (including anticipated future oil revenues) to engage in patronage to government allies in order to extend its influence. This led to increasingly (violent) conflicts with different (paramilitary) tribes. His account explains the continuous presence of unrest, assassinations, and internal wars. This is evidence for a permanently fragile institutional system and fertile ground for corrupt governing structures.

Naturally, the unrest also had adverse direct economic consequences in the form of hampered growth (especially during the middle of the period analysed) and huge military spending, reaching 50% of the budget (reported to have been spent very inefficiently). Dresch reports how this in turn worsened institutional quality: The import quotas assigned by the government to specific businesses created new ways for corruptive behaviour and exclusively benefited certain family clans, usually those with military ties. After the incipient oil exports, the military and the bureaucratic complex, which were built up for 20 years, finally effectively merged to something illustratable as an "administrative feudal system where power depended on the ownership of the state itself" (p.164). He furthermore reports that there were disappearing non-billed oil revenues as well as an increase in patronage and petty corruption (bribes to security personnel were estimated by 15% of a project's expected profit). Lastly, he mentions that the rents of the 1980s did not reappear in the form of renewable capital, with only some infrastructure investments (of partially debatable sense) and a virtually non-existing industry.

3.2 The Oil Curse of Reunited Yemen

The reunited Yemen after 1990, which of necessity shifted its economic focus from remittances to oil, is marked by economic crisis, oil dependency, and unsustainability as the following subsection explains.

Three indicators are used to depict Yemen's general economic development (Fig. 3): Real GDP per capita growth, the human development index (HDI), and the adjusted net savings rate (ANSR), a genuine savings indicator (see Appendix A1). As discussed previously, genuine savings are the most adequate measure of evaluating the sustainability of economic development, with an unambiguous result in the case of Yemen. Further, its low GDP growth, and stagnating HDI support the picture of Yemen suffering from a significant resource curse.

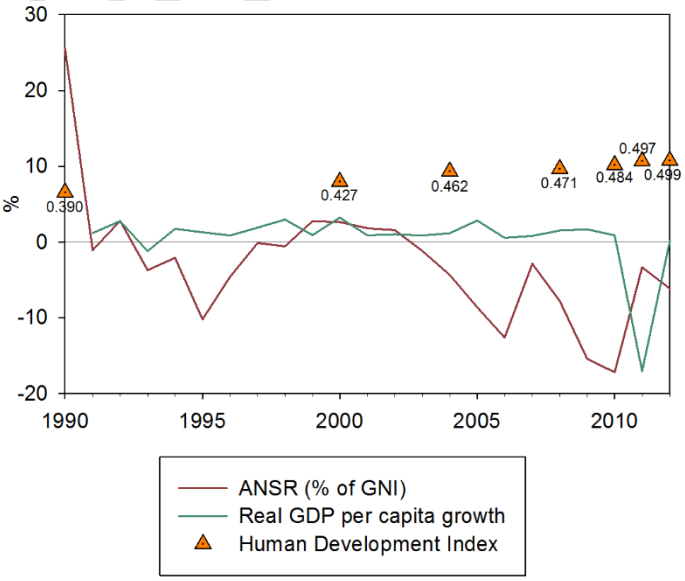

Fig. 3. Real GDP per capita growth, the adjusted national saving rate and the Human Development Index in reunited Yemen 1990 - 2012. *Data*: Alkeldar (2013), Central Bank of Yemen (2013), Human Development Report Office (2013), World Bank (2015), (2010), Republic of Yemen (2014), (2009, 2006), United Nations Statistical Commission (2015), own calculations.

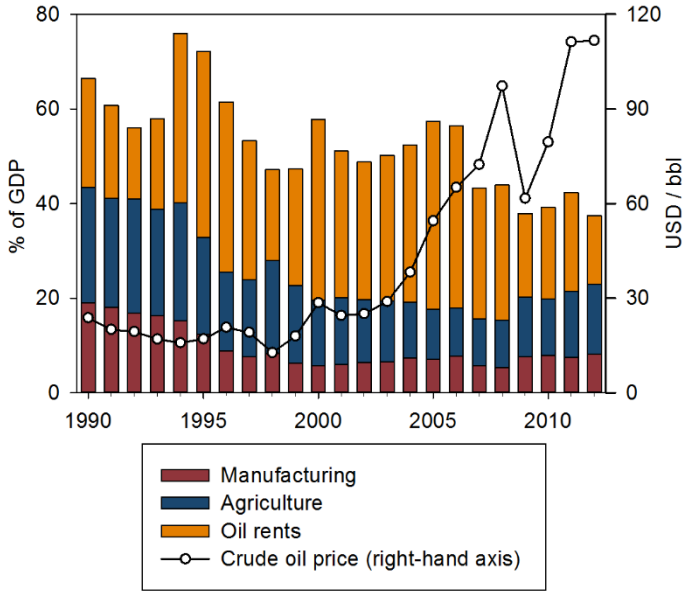

Fig. 4. Sectoral changes in reunited Yemen and the crude oil price 1990 - 2012. *Data*: British Petroleum (2013), World Bank (2015), Central Bank of Yemen (2013).

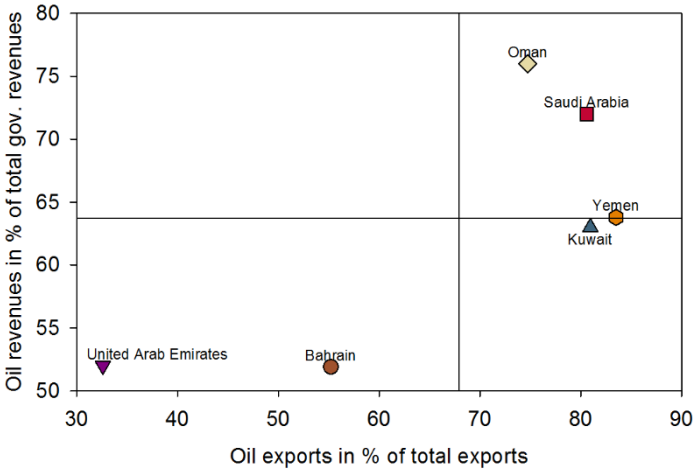

Fig. 5. Oil dependency in Yemen and selected Gulf Co-operation Council countries (average 1997 - 2000. *Data:* IMF (2012), World Bank (2015), Mottu and Ahmad (2002).

During the recent decades, ANSRs have been nearly exclusively below zero, with an apparently worsening trend over time. In 1990, Yemen was hit by a second post-boom collapse of remittances. The decision to side with Iraq, in Saddam Hussein's invasion of Kuwait against the Saudi-supported US-intervention, led to the expulsion of nearly 800,000 Yemeni migrant workers from Kuwait, destroying one of the main pillars of the Yemeni economy, and putting the new state under immense pressure (Dresch, 2000). The sudden collapse of the net transfers led to the ANSRs' immediate crash from 25.5% to -1.0% and hindered economic growth, and this after the reunited state was already struggling under the consequences of absorbing the run-down economy of ex-socialist South Yemen and decreasing aid flows. Colton (2010) reports that the volume of the drop in remittances, and the true nature of Yemen's macroeconomic misery, far exceeded official estimates, resulting in (unofficial) unemployment rates of 40%. From then on, Yemen has exhibited almost permanently negative ANSRs, accounting for the completed reorientation from remittance flows to oil rents, without reinvesting into renewable capital, including education. Expenditures for the latter have fluctuated between 4 and 7.5 % of GDP over time, and its outcomes are weak, with 35% of Yemeni adults being illiterate (UNICEF, 2015).

Genuine savings data suggest that Yemen has been living at the expense of exhaustible resources, without building up renewable capital accordingly. Moreover, real GDP per capita growth rate has generally been weak, and typically been only barely above zero (except during the 2011 uprisings, falling to -17%) (Fig. 3).

Also, the HDI has only risen moderately, leaving Yemen at rank 154 in 2013. Hence, Yemen's economy, and overall development, have nearly stagnated throughout the last 25 years.

The composition of sectors, illustrated in Fig. 4, further cements the resource curse diagnosis by revealing oil dependency and deindustrialisation. Oil rents have been the major driver of the Yemeni GDP. In 1993, they outgrew agriculture and have subsequently accounted for large values, peaking at 40% of GDP. These rents have fluctuated naturally with the oil price, and later declined, due to exhaustion of reserves. Evidently, Yemen's economy is dependent on oil, coupled with unsustainability and further deindustrialisation: both agriculture and manufacturing have diminished significantly over time. Whilst agriculture initially accounted for almost 25% of GDP, the sector has since contracted to less than 10%, even though Yemen is classified as one of the most food-insecure countries globally, and has the second-worst rate of child malnutrition worldwide (World Food Program, 2010). Manufacturing, already traditionally weak in Yemen, fell from 19% in 1990 to a low of 5% in 2008. The slight increase in both sectors from 2009 onwards can be attributed to a fall in oil rents, due to lower production. The share of manufactured goods in exports, which barely reach 4%, affirms the almost non-existence of industry, not to mention high-technology exports, which have never exceeded 0.5% (World Bank, 2015).

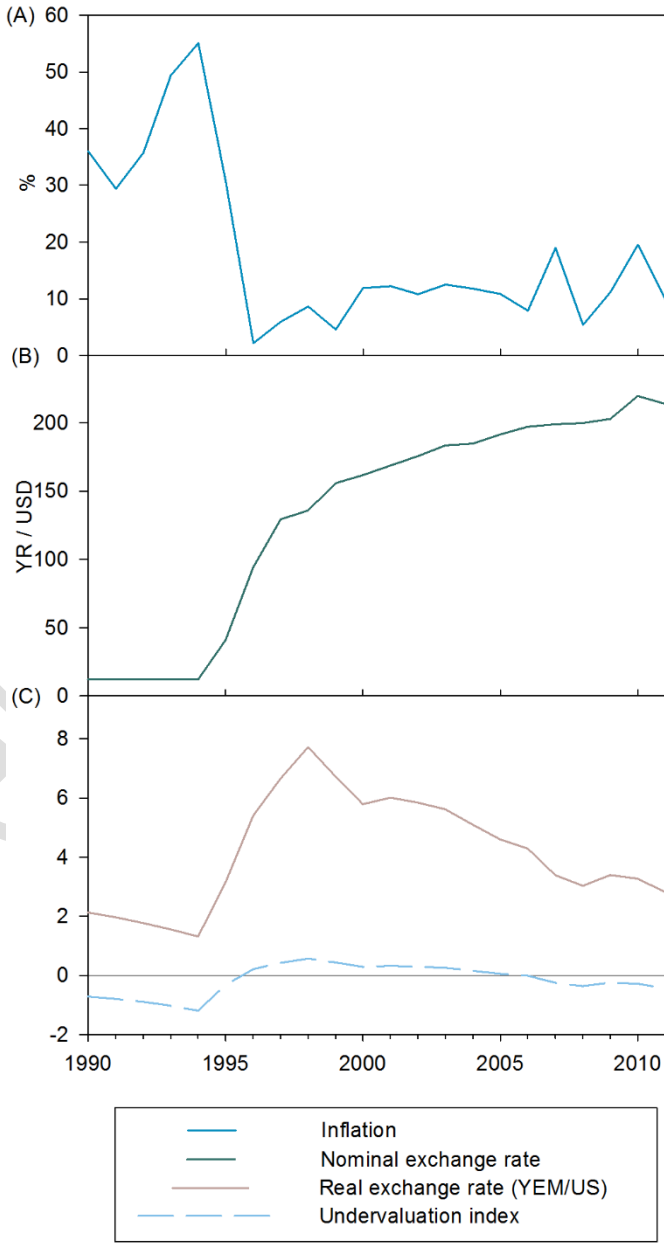

Fig. 6. Currency and price developments in reunited Yemen 1990 - 2012. *Data*: Central Bank of Yemen (2013), World Bank (2015), Republic of Yemen (2014), (2009, 2006), own calculations.

Fig. 5 compares oil dependency in Yemen in the late 90s with a sample of Gulf countries. With more than 80% of Yemen's exports being derived from oil – a share almost three times higher than in the UAE –, it has the highest share of oil in total exports of the countries included. Even though, compared to gulf producers, Yemen is a small producer of oil and definitely no major player in the market, the simple absence of any other exports had turned oil into Yemen's main tradeable good. Concerning the importance of oil revenues for the government, Yemen is not differing from the sample of resource-rich Gulf states. Only the governments of Oman and Saudi-Arabia depend more on oil to finance their budget.

Due to the numerous macroeconomic shocks of the 1990s, an interpretation of Yemen's financial data, with regards to its resource issues, is difficult. Fig. 6 illustrates various relevant currency-related indicators, such as inflation, exchange rates, and the undervaluation index (see Appendix A2). The central bank's attempt to maintain a constant exchange rate against the US dollar became unsustainable in 1994/1995, with inflation rates peaking at between 50% to 55%. Hyperinflation followed attempts to tackle the post-remittance crisis with unfeasible fiscal programs, financed by increased money supply. Moreover, it may be assumed that the associated significant real exchange rate overvaluation was part of the time-inconsistent policy to finance imports at the cost of growth. After abandoning this policy, the nominal exchange rate depreciated by more than 240% to 1000% within one and four years, respectively, taking pressure from the Riyal and reducing both inflation rates and real overvaluation. Until 2006, the real exchange rate maintained slightly undervalued before entering the overvaluation zone with the rise in oil prices. Yemen's persistently-high inflation rates affect quantitative analyses, by potentially biasing estimates of relationships such as the Balassa-Samuelson factor, which is a crucial parameter in the undervaluation index. Chami (2007) finds similar patterns in general, but reports a more drastic overvaluation over time.

Nevertheless, additional evidence for the presence of a resource curse from the real exchange rate is not necessary, since sufficient proof has already been given by the presence of unsustainability, oil dependency, deindustrialisation, and a stagnating economy. The subsequent section continues by analysing the institutional background as the last dimension of Yemen's resource curse.

3.3 State Failure in Reunited Yemen

An evaluation of Yemen's institutional quality gives an unambiguous picture in line with the resource curse theory, which is used to close the circle of this analysis. State failure marks the necessary condition of the curse and is the central link between the remittance curse and the oil curse, which proves the lasting effect of the institutional damage that Yemen had taken in the 1970s. Moreover, this part of the analysis is central for an understanding of the reciprocity between government and curse in Yemen. The country is marked by widespread corruption in administration and, of much bigger impact, the entire governing body. Following the developments of the 1970s, a deeply rooted and closely connected governance-military-commercial complex has been established, working through patronage and misappropriation of the public budget.

Table 1 contains three internationally recognised indexes for an evaluation of governance, which confirm the omnipresence of corruption, a lack of transparency, and maladministration in the public sector. It is worth mentioning, that the Global Competitiveness Index, which evaluates the comprehensive environment for economic development and businesses, ranks Yemen as the third worst country of the 144 included in the survey.

Index	Explanation	Year	Score	Rank	Source
Corruption Perceptions Index	Rises in a corruption-free public sector	2015	18/100	154/168	Transparency International (2016)
Open Budget Index	Rises in the availability of information	2012	11/100	87/98	Open Budget Initiative (2012)
Global Competitiveness Index	Rises in a more competitive environment for development	2014	3.0/7.0	142/144	Schwab (2014)

Table 1. Selected indicators of corruption and institutional quality

Petty corruption in Yemen, stimulated by underpaid and unskilled public employees, occurs mostly in the form of bribery (e.g. for the processing of applications) and 'ghost workers' (receiving budget for non-existing

employees), reaching a degree of widely accepted normality (USAID, 2006). A poll suggested that 68.2% of Yemeni companies regard bribery as necessary for their business (World Bank, 2015).

Yemen's complete state failure, however, is a consequence of grand corruption, which constitutes an integral part of the political system: A small, fragmented elite class receives patronage for their backing of the system in turn. USAID (2006) categorise these elites into (certain) northern tribes, the military, business elites, technocrats, and regional notables (e.g. elders, tribe leaders). They find that the tendering processes, a military-officers-led semi-public commercial network, and – most importantly – the national budget itself are the most prominent instruments for the embezzlement of public funds. The national budget virtually underlies no accounting (complete aggregation of entries) and officially contains patronages in the form of subsidies to certain tribes. Furthermore, oil revenue estimations in the budget calculation are done very *conservatively*, creating supplemental budgets of officially unforeseen revenues, whose later use is irreproducible (World Bank, 2008). This pattern is also traceable on the income-generating side. It is estimated that only 30% of tax revenues reach the public treasury (USAID, 2006). Hill et al. (2013) highlight the concentration of the commercial sector: Before the 2011 uprising, 80% of imports, manufacturing, processing, banking, and the telecommunication and transport sector had been controlled by only about ten families. They further explain that the Yemen Petroleum Company, which is controlled by the president itself and governs nearly all contracting for the import or export of oil, is an important instrument for corruption, especially through the allocation of monopoly privileges to allies of the former president.

Concerning the latter, it may be sufficient to quote a United Nations Security Council (2015) report which accuses Ali Abdullah Saleh, who governed Yemen (respectively YAR until the reunification) from 1978 to 2012, of having accumulated financial assets of up to $US 60 billion during his presidency. However, grand corruption in Yemen is deeply rooted and by no means limited to his person or time in office. Therefore, his ousting in the supposed revolution of 2011 is unlikely to have yielded any substantial changes. Rather, as Hill et al. (2013) argue, the uprising's outcome was determined by profit-and-power-seeking defections: The system of power (a triangle between him, General Ali Mohsen, and Sheikh Abdullah al-Ahmar – later replaced by his son –, and a small class of elites gathered around them) had become increasingly unstable after the oil-based system of patronage became unfeasible. This led some elements to defect the network and support the uprising. The authors confirm that the current government consists to a large degree of actors who have been part of Saleh's government or its wider network. This clearly underlines that 2011 cannot be identified as a turning point in the country's history but only as a change in the balance of power that leaves behind the same situation as before and discloses the *revolution* to be a mere act of rent-seeking.

A look at the evolution of key indicators over time (Fig. 7), supports this analysis and, thereby, the resource curse hypothesis for Yemen. As shown in Fig. 7 (A), the country reached its oil peak in the year 2002, and Lahn (2009) estimates Yemen to become a net importer of oil by 2019. I argue that this has a direct effect (revenues and fiscal balance) and an indirect effect (adjustment of political behaviour). Yemen's economy is largely dependent on hydrocarbon exports. Oil revenues make up the majority of state revenues with almost 70% in 2011 (Republic of Yemen, 2014), and the country has a non-oil fiscal balance moving around -40% (it has only increased after 2009 due to incipient gas exports). Furthermore, as Al Iriani (2012) finds in line with the resource curse literature, tax revenues have substantially decreased over time. Fig. 7 (B) demonstrates that with reaching its oil peak, Yemen began running fiscal deficits (except in 2006), which puts pressure on growth and development. This reveals that Yemen has entered a new post-boom collapse. In the face of the oil price developments after 2006, large energy subsidies further contribute to fiscal pressure. This has already led to multiple uprisings which followed governmental attempts to reduce the level of subsidies. The events, leading to the 2014/2015 takeover and the current war, were also initially triggered by a proposed reduction of energy subsidies to improve fiscal balance.

Fig. 7 (A) furthermore displays three of the World Governance Indicators (WGI): Political Stability / Absence of Terrorism, Government Effectiveness, and Control of Corruption (see Appendix A3). All exhibit generally low values and decrease over time (except for the period between 2004 and 2008). Political stability worsened in an oscillating motion throughout the years, starting immediately with the first significant decrease in oil exports 2003 / 2004. Effectiveness of governance first seemed to improve between the years 2004 and 2007 in response to the beginning decline of oil exports but then dropped notably below the values of 2000. Except for the outlier period 2004 to 2007, corruption has become an even more severe problem in Yemen over time with the Control of Corruption index reaching values close to 0% from 2008 onwards.

As noticed before, it is remarkable that the escalation of Yemen's government failure evolves simultaneously with the decline in oil exports. The intuition behind Yemen's peak oil as (at least a partial) trigger for these developments is inherent uncertainty over future rents for the country's stakeholders, i.e. its patronage network. Moreover, the diminishing oil exports lowered government revenues, which had been necessary to finance patronage (which is equivalent to the backing of the government). These two factors provoked defections from the system to gain control over the remaining rents. A seemingly negative correlation of increasing government failure and oil prices supports this perspective, because higher prices increase the remaining resources' value and, thus, lead to a greater incentive to engage in rent-seeking by turning against the government.

However, even though the equilibrium of power (in the patronage network) is inherently fragile, the complete disintegration as a response to declining oil exports – much ahead of a final exhaustion of oil reserves – is a sudden reaction. A potential interpretation for this is another idiosyncratic pattern of economic behaviour: Similar to the anticipation of future oil-rents in the 1980s (i.e. credit borrowing up to five years in advance of the first oil exports), the political behaviour reacts abruptly to the oil peak. This implies that the expectations over oil reserves and revenues were updated immediately such that the remaining revenues were suddenly considered as entirely transitory. In other words, the future absence of oil revenues (recall that Yemen is expected to become a net importer of oil by 2019) caused sudden pre-dated reactions, which is essentially what happened in the 1980s. Whereas the discovery of oil led to immediate credit borrowing in advance, reaching peak oil caused an immediate disintegration of the wider government network, because its fundament, patronage, *will* become unsustainable in a foreseeable future. Hence, Yemen's peak oil might have led to an ad-hoc adjustment of the expected permanent revenues to zero after realising oil's finity, which made the informal agreements infeasible and increased rent-seeking behaviour for the remaining transitory rent flows.

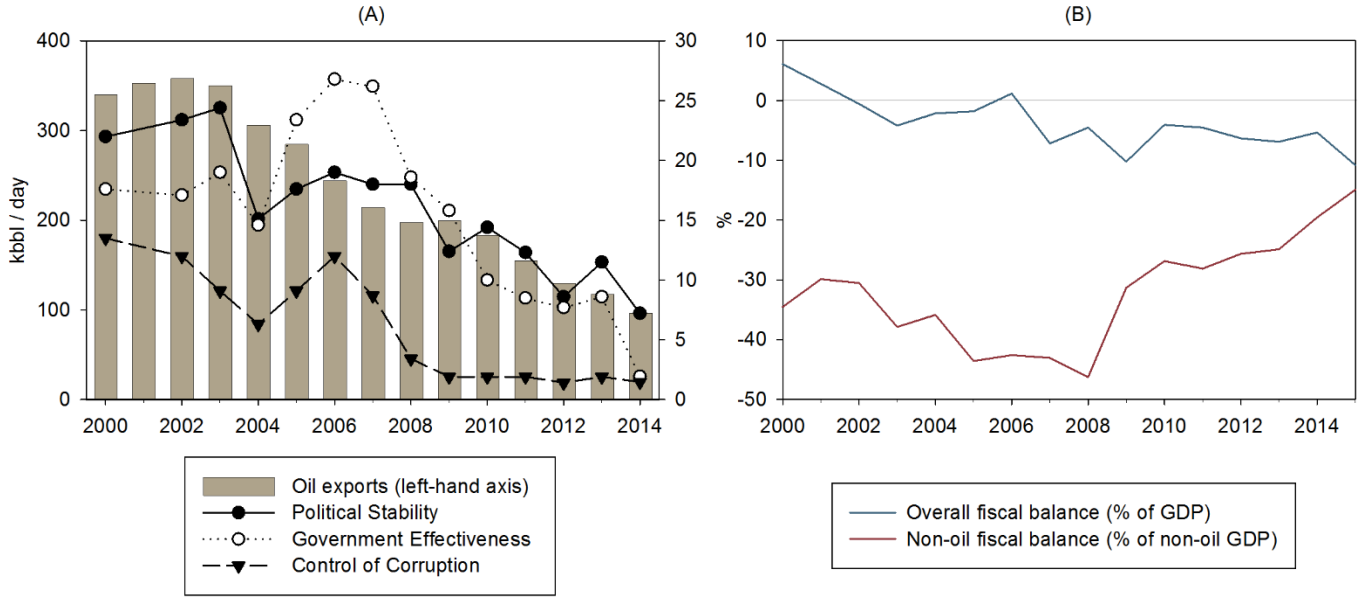

Fig. 7. Peak oil and governance in Yemen 2000 - 2015. (A) Oil exports and World Governance Indicators (WGI) and (B) fiscal balances. *Data*: IMF (2015) and World Bank (2015)

4. Conclusion and Discussion

In the 1980s, a writer already implicitly predicted this study's results with astonishing precision: The oil "was not corrupting the noble Bedouin, but the Bedouin was corrupting the oil"('Abd al-Salam, 1988). In summary, this study illustrated that Yemen has been suffering under two curses: its own oil curse, since the late 1980s, and a preceding remittances curse, passed on to Yemen by Saudi Arabia through workers' remittances from the 1970s onwards. Both curses can be confirmed clearly by rent dependency as well as neglected manufacturing and by post-boom-collapses. Most important, however, the current situation in Yemen was shown to be determined by a complete government failure, marking the crucial cornerstone of a resource curse. It was shown that the post-reunification government, and its oil curse, were an implicit product of the 1970's curse and its harmful effect on Yemen's institutions: Remittance flows and related goods import

streams created an environment in which a highly corrupt state apparatus was able to develop, triggering further misappropriation, mismanagement, and internal wars. Finally, it was shown that the patronage network actively governing Yemen since the mid-1980s, is still the main political actor, and that recent history in Yemen has been affected adversely by increasing fragility in the system of power, following the sudden adjustment of oil revenue expectations post Yemen's peak level of oil production.

These results add to our knowledge about resource curses. The study is gives an example of a resource curse that was not triggered by natural resources in the narrow sense. Thus, it places remittances in line with foreign aid and similar (principally) exogenous windfalls. This contributes to the tendency in the literature to generalise the idea of curses to other kinds of external rents. Most interestingly, the case of Yemen suggests that the classic understanding of a resource curses might also lack a geographical dimension: Under – at least partial – labour mobility across borders, workers' migration was able to contaminate Yemen with resource curse symptoms. It is of course disputable to suggest a counterfactual that Yemen would not have been suffering from the oil curse if it had not been infected by Saudi Arabia in the 1970s, but at least an intensification is evident from the results. The example of Yemen indicates that a potential resource curse contagion – through a weakening of the institutional background – makes the affected country more vulnerable towards future curses. Lastly, the findings suggested a pattern of sudden adjustments of political behaviour variables with changes regarding the expectations of remaining resource reserves. The case of Yemen suggests that this impact on resource curse dynamics can be tremendous, especially in causing chaos and unrest because patronage systems, which are prominent in many resource-curse-affected economies, may become infeasible when resource rents start to diminish. Moreover, the preference for the presence of elements in the network may increase significantly, such that defecting the network becomes more attractive than cooperation.

Of course, relying on a mostly descriptive analysis of empirical data is a major shortcoming of this study. Historical data on Yemen is only rarely available and, if present, in many cases not entirely reliable, as argued at multiple points of this study. The extensive use of test statistics and econometric tools, however, requires a data level that, for many questions asked here, cannot be obtained. Nevertheless, the descriptive analysis of the events in Yemen was unambiguous as a whole, such that conclusions about the country's development are indeed scientifically valid. Still, the use of a larger cross-country panel to support the suggestion of the existence of a general pattern of resource curse contagion is left open for future research. The same applies to a generalisation of findings regarding the impact of declining resource reserves on political stability.

Another important question is the direct political consequence of this research for Yemen: How can the curse be cured? Discouragingly, there is no easy answer for this situation, since Yemen's misery originates from bad governance, effectively preventing growth and development. The reduction of aid transfers (after failing to meet the agreed conditions) may be morally right, but it stays questionable whether this had not fuelled the current misery by further destabilising the fragile political system. As shown, the main actors on Yemen's political stage these days (i.e. both before and after the coup) are actually the same who had been present under the former president. Supporting any side in the conflict does not solve the problem of state failure; it just distorts the game of power in favour of a certain actor. It is worth mentioning, that every possible (temporary) equilibrium of power in contemporary Yemen is cursed with fragility, and every disturbance of this equilibrium (such as the 2011 uprisings or the current war) damages both the physical and human capital accumulated by then. Hence, the appropriate policy has to aim at fighting the grand corruption in Yemen, requiring the disbanding of the entire political patronage network, which has persisted for more than three decades. The government has to be called on to show transparency and to demonstrate the capability to achieve inner stability in order to facilitate investments and to pave the way for economic development. This includes immediate policies to support education and manufacturing since – given the scarcity of arable land and water - it may not be possible to achieve autarky in the food sector and to escape import dependency. It is crucial to establish an independent non-hydrocarbon sector to secure the economy's development after an exhaustion of its oil reserves.

The war-torn Republic of Yemen and its people have suffered for long under corruption and internal conflicts of elites. Within this theatre of war, too often innocent civilians have borne the consequences of wars over power and resources. Hence, one can only hope that after the end of the current war not only destruction remains but also the chance for a new start.

Appendix

A1. The Adjusted Net Savings Rate (ANSR)

For addressing the sustainability of rent management, a measure of genuine savings is the appropriate tool in most cases. For this study, I use the *adjusted net savings rate* as % of GNI, as proposed by Bolt et al. (2002): a genuine savings indicator that adjusts the national savings rate by the depletion of non-renewable resources and environmental damage to give a more comprehensive image of sustainability. The values were calculated according to the scheme given by World Bank (2012) as the sum of net national savings and education expenditures minus the depletion rates of natural resources as well as CO^2 and particulate matter damages. Net national savings are taken from World Bank (2015) until 2007 and calculated based on Republic of Yemen (2014) and Central Bank of Yemen (2013), including estimations of depletion rates with a method based on the calculation scheme. CO^2 and particulate matter damage data is taken from World Bank (2015) until 2009 and then extrapolated with five-year-means. Education spending data is calculated according to data from Alkeldar (2013), World Bank (2010), and Republic of Yemen (2014) (due to missing data, the value from 1992 is assumed for 1990 and 1991). Resource depletion data is taken from World Bank (2015).

Year	ANSR
1990	25.54
1991	-1.06
1992	2.78
1993	-3.72
1994	-2.09
1995	-10.23
1996	-4.57
1997	-0.12
1998	-0.56
1999	2.75
2000	2.63
2001	1.82

Year	ANSR
2002	1.58
2003	-1.18
2004	-4.36
2005	-8.62
2006	-12.65
2007	-2.88
2008	-7.80
2009	-15.47
2010	-17.22
2011	-3.32
2012	-6.14

Table 2 – Calculated Adjusted Net Savings Rates as % of GNI

A2. The Real Exchange Rate and the Undervaluation Index

For assessing the real exchange rate, the method described by Rodrik (2008) is applied. Accordingly, at first, the real exchange rate q is estimated as the ratio of nominal exchange rate E and purchasing power parity (PPP) conversion factor ρ. The undervaluation index ψ is obtained as the difference between the real exchange rate's log and a constant for the Balassa-Samuelson effect β (i.e. PPP-derivations due to a positive correlation between high national income and price level). According to Rodrik, if ψ is positive (negative), the real exchange rate tends to be undervalued (overvalued). Formally:

$$q_t = \frac{E_t}{\rho_t}, \quad \psi_t = \ln(q_t) - \beta$$

For the Balassa-Samuelson effect, I assume a value of 1.469 as estimated by Drine and Rault (2003), since the regression method prescribed by Rodrik leads to severe overestimations in the case of Yemen (coefficients between 2.5 and 8, depending on the observations and control variables included).

A3. Governance Indicators

For quantifying institutional quality, World Governance Indicators (WGI) are used. It should be remarked that the indicators themselves are an index of different governance indicators from various institutes and organisations, which partially include arbitrary value assignments. Hence, the exact values and short-time fluctuations should be interpreted very carefully. Therefore, it is preferable to use the indicators to determine general trends over a decade without analysing single values or index movements. Kaufmann et al. (2014) defines the indexes as:

Political Stability and Absence of Violence/Terrorism – capturing perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.

Government Effectiveness – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Control of Corruption – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

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