Dutch Disease in the era of energy transition: How does international migration matter?

Dramane Coulibaly* Fatih Karanfil† Luc Désiré Omgba‡

Extended Abstract

From the initial Conference of Parties (COP 1) in Berlin in 1995, where CO2 emissions were at 22 billion tonnes, the trajectory has surged to a staggering 36.8 billion tonnes in 2022, preceding COP 28 that took place in Dubai in 2023 (IEA, 2023). This rapid increase emphasizes the pressing need for transformative actions in the realm of energy transition. The global commitment made in the Paris Agreement of 2015 to cap the emissions trajectory and limit the temperature rise below a 2 °C increase since the pre-industrial era is now facing skepticism more than ever before. Recent projections suggest that the critical 1.5 °C threshold might be breached during the 2020s (Hansen et al., 2023). Simultaneously, the global energy crisis that has unfolded since 2021, driven by factors such as the rapid economic rebound following the pandemic and Russia's invasion of Ukraine, has thrust the costs and prices of energy into the spotlight of the political agenda. This development has prompted concerns among countries about the expenses associated with the transition. Besides its far-reaching implications on the global economy, today's energy crisis presents a dual challenge that surpasses immediate economic concerns. It intensifies climate anxieties and jeopardizes the livelihoods and well-being of populations worldwide. Notably, The Economist (2023) contends that the energy crisis during the winter of 2022 could potentially have resulted in a more significant loss of human life in the European Union than the COVID-19 pandemic. This striking comparison underscores the urgent need for innovative approaches and more efficient energy systems to navigate an energy transition. This transition is not just about addressing climate change challenges but also about contributing to global energy security. As argued by Yergin (2022), the energy crisis has redirected focus toward energy security, especially for fossil-fuel-importing countries, potentially sidelining considerations related to energy transition. Hence, a comprehensive global energy transition should consider both fossil-fuel-importing and exporting countries. Recognizing the diverse challenges and opportunities each group faces in their pursuit of sustainable and resilient energy transitions is crucial. Fragmented approaches may escalate energy security risks and geopolitical tensions in the course of energy transitions (IEA, 2023).

While most discussions on energy transition have primarily centered on the impacts and efforts within fuel-importing countries, domestic transition roadmaps of fuel-exporting countries have remained relatively underexplored despite their significant impact on the

*Univ Lyon, Université Lumière Lyon 2, GATE UMR 5824, 35 rue Raulin, 69007 Lyon, France. Corresponding author, E-mail address: coulibaly@gate.cnrs.fr

†KAPSARC, P.O. Box 88550, 11672 Riyadh, Saudi Arabia

‡BETA-CNRS, University of Lorraine, 23 rue Baron Louis, 54000 Nancy, France.

global energy landscape. Paradoxically, in addition to being at the forefront of potential economic repercussions resulting from the global shift away from fossil fuels, the majority of fuel-exporting countries bear greater vulnerability to climate-related risks due to their geographical locations.

In fact, the vulnerability of fossil-fuel-exporting countries in the face of global energy transitions is compounded by historical economic dynamics. The roots of economic challenges in these countries can be traced back to a period of economic growth in what are now developed countries, marked by a rapid increase in demand for fossil fuels, notably oil. As the global fossil fuel demand escalated, the economies of fuel-exporting countries underwent a substantial shift towards the fossil resource industry. This transformative phase paved the way for the phenomenon commonly referred to as the *Dutch Disease*. Accompanying a boom in the resource sector, this phenomenon is characterized by a decline in the non-resource traded sector with an appreciation of the real exchange rate.

The Dutch Disease phenomenon is extensively studied in the literature, with numerous examples highlighting its impact on resource-dependent economies, such as the decline in non-resource sector, the appreciation of the real exchange rate, and implications for overall economic stability (for a recent review, Mien and Goujon, 2022). Migration has emerged as a potential mitigating factor against the negative effects of the Dutch disease. Corden (1984) originally proposed that migration could mitigate these effects, although its impact on the real exchange rate remains ambiguous. Wahba (1998) also developed a theoretical model showing that labor immigration may help reduce the symptoms of Dutch disease in major oil exporters like the Gulf States. In the same vein, van der Ploeg (2011) further suggests that an increase in labor supply could potentially attenuate the appreciation of the real exchange rate. Empirical evidence from Raveh (2013) supports the idea that migration can indeed mitigate the Dutch disease, as observed in the case of Canadian inter-provincial migration.

The above brief discussion sets the stage for exploring the role of migration in mitigating the Dutch Disease effect within the context of energy transition. Further, from an empirical point of view, at the crossroads of energy transition, economic dependence on fossil fuels, and international migration, the Gulf Cooperation Council (GCC) region stands out more prominently than any other region in the world. The GCC region, consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, has a substantial influence on the international energy scene as a key player in oil and gas markets, possessing a substantial share of the world's reserves. Yet, substantial economic reliance on fossil fuels poses hurdles during a period in which these economies have embarked on a transformational journey to move away from fossil fuels while striving to maintain sustained economic growth and stability (Karanfil and Pierru, 2021). At the same time, the GCC countries are characterized by a notable reliance on international migration, with a substantial percentage of their labor force being foreign workers. Consequently, the region represents now the largest source of migrant remittances worldwide. This distinctive demographic and labor market composition shapes the socio-economic fabric of the region, making international migration a crucial aspect of their economic policy.

It is also noteworthy that a global energy transition lacking stability in the income of oil- and gas-exporting countries would encounter significant obstacles (Karanfil and Omgba, 2023). While demand shocks have traditionally been the primary focus of transition scenarios, recent considerations shed light on the adverse impacts of negative supply shocks on the energy transition (Boer et al., 2023). In a global energy market where fossil

fuels (oil, natural gas, and coal) still account for 80% of the world's energy supply (IEA, 2023), over-investment in new capacity or premature retirement of existing infrastructure within the oil and gas industry could undermine efforts to achieving secure energy transitions. Such actions may lead to increased market volatility along the transition path (IEA, 2023; Bordoff and O'Sullivan, 2022). The potential volatility outlined in this scenario might intensify the impact of Dutch disease, thereby hindering the expansion of sectors other than oil and gas. Thus, maintaining macroeconomic stability is crucial for the energy transition path, positively influencing investments and productivity in the non-extractive sector.

Given this context, energy-exporting countries, such as those in the GCC, despite facing significant vulnerability both geographically and economically, are key in the global energy transitions. Therefore, there is a need to explore factors that could mitigate the Dutch disease, reducing dependence on oil and gas revenues while ensuring stability in the energy market for an effective transition. Specifically, this paper examines how these countries respond to energy price shocks, especially within the context of energy transitions, where the comprehensive impact is not yet fully understood (Bordoff and O'Sullivan, 2022). Additionally, the paper seeks to explore how and to what extent international migration influences the dynamics of Dutch disease, given the substantial presence of foreign nationals in the workforce of GCC economies.

In this paper, we then introduce a simple model of a small open energy-exporting economy to theoretically illustrate the interplay among energy price shocks, international migration, and their consequential effects on both tradable and non-tradable sectors. This model establishes that international immigration may help in mitigating the Dutch disease phenomenon induced by an improvement in the energy terms of trade. This mitigating impact of international immigration occurs even when accounting for migrant remittances. We test this theoretical prediction by estimating a structural vector autoregression (VAR) model on a panel of the 6 GCC countries with annual data over the period 1980-2019. Specifically, we examine the dynamic effects of energy terms of trade shocks and international migration shocks on key economic indicators, including outputs in tradable and non-tradable sectors, and the real exchange rate. Our identification strategy relies on the robust approach of sign restriction with penalty developed by Uhlig (2005). After highlighting the importance of the energy terms of trade shocks for the dynamics of migration flows to the GCC countries, we find empirical evidence aligning with our theoretical prediction of the mitigating role of immigration flow on the Dutch disease phenomenon. Indeed, our empirical results show that a temporary migration inflow of 1 migrant per 1,000 inhabitants leads to a significant increase in manufacturing production by 0.8 percent immediately and 0.5 percent after one year. The cumulative impact remains significant at the 10-year horizon.

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