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Does financial system development, capital formation and economic growth induces trade diversification?

Sohail Amjed
Business Administration, University of Technology and Applied Sciences, Salalah Campus, Salalah, Oman, and
Iqtidar Ali Shah
Business Administration, Yorkville University, New Westminister Campus, New Westminister, Canada

Abstract

Purpose – The purpose of this study is to investigate long-run and short-run relationships between trade diversification, financial system development, capital formation and economic growth.

Design/methodology/approach – ARDL estimation approach is applied to analyze long-run and short-run relationships between the financial system development, capital formation, economic growth and trade diversification in case of the Sultanate of Oman over the period 39 years starting from 1979 till 2017.

Findings – The results show that financial system development and economic growth has a positive impact on trade diversification in the short-run and long-run. However, capital formation has a negative impact on trade diversification in the short run and long run. The negative relationship between trade diversification and capital formation implies that over the period of study, the investment in capital goods was made to enhance the production capacity of the oil sector to maximize revenue.

Research limitations/implications – This research is limited to analyze long-run and short-run relationship between the financial system development, capital formation and economic growth and trade diversification in case of Sultanate of Oman.

Practical implications – To achieve the diversification goal, the policymakers need to formulate policies to strengthen the financial system and invest in infrastructure development to promote the non-oil sector. The research findings of this study will provide insights to the policymakers to formulate an effective diversification policy.

Originality/value – This research contributes to the existing literature by providing empirical evidence of the short-run and long-run analysis of the selected variables in the context of an oil-dependent country.

Keywords Trade diversification, Capital formation, Economic growth, Financial system development, Oil dependence

Paper type Research paper

1. Introduction

Endogenous growth theory has gradually dominated the classical theory of specialization and comparative advantage. Endogenous growth theory emphasizes diversification by human capital development and the development of new technologies for sustainable economic growth. The proponents of endogenous growth theory argue that dependence on

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concentrated resources results in slower economic growth (Sachs and Warner, 1995). Countries with concentrated commodity exports such as oil, gas and minerals face many types of income instabilities from both inbound and outbound factors. Therefore, such countries are more vulnerable to economic instability and slower economic growth (Fuinhas *et al.*, 2015).

Sufficient evidence exists that natural resources are not always proved motor for economic development, other factors such as quality of institutions play an important role (Mehlum *et al.*, 2006; Mobarak and Karshenasan, 2012). Diversification is considered one of the most effective solutions to many challenges faced by commodity-dependent countries. Therefore, they struggle to wean themselves off the revenues generated through the trade of concentrated commodities (Hassan *et al.*, 2018). Through structural changes in policy and institutional networks, this endowed money can be used for infrastructure development, human capital development, and financial sector development which is pre-requisites for economic diversification. If a multipronged economic policy is formulated, economic free-wheel can be spun with money from endowed resources to start the diversified and sustainable economic growth.

The existing literature offers little insights to the policymakers of Oman to help them to formulate a comprehensive trade diversification policy based on macroeconomic factors. There is a lack of comprehensive studies about the Sultanate of Oman which has investigated the dynamic relationship between trade diversification and relevant macro-economic factors using time series techniques. Therefore, we have chosen, Oman as a case study to fill this gap in the literature. We investigated the dynamic relationship between trade diversification and carefully selected macro-economic variables. Extant literature shows that several socioeconomic factors may potentially affect trade diversification. Based on relevant literature, we selected the most important macro-economic factors which may potentially affect trade diversification such as economic growth, financial system development and fixed capital formation. Oman is an important and active member of the GCC. It is the second-largest GCC country after Saudi Arabia. Like other oil-producing countries, Oman is struggling to diversify its economy to increase the contribution of non-oil revenues to its national exchequer (Hamid and Amin, 2017).

This empirical study will provide insights to the policymakers to formulate an effective diversification policy for the Sultanate of Oman. This research contributes to the existing literature by providing empirical evidence of the short-run and long-run analysis of the selected variables in the context of an oil-dependent country. The research findings of this study will provide insights to the policymakers to formulate an effective diversification policy.

Rest of the paper is organized as follows: Section 2 is a brief review of theoretical and empirical studies related to our topic, Section 3 underpins methodological techniques and justifications for their appropriateness, Section 4 explains the empirical results and contain the discussions thereon, Section 5 concludes the research with important policy implications.

2. Literature review

The benefits of trade diversification are generally well recognized in the literature. Depending on one resource hinders sustainable and balanced economic growth in many ways (Herzer and Nowak-Lehnmann, 2006). Therefore, oil-exporting countries need to diversify their exports to stabilize the fiscal revenues for sustainable economic growth (Alsharif *et al.*, 2017). The main concern is that why some resource-rich countries have succeeded to achieve trade diversification while others have not been able to achieve. For example, some oil-exporting countries such as Algeria, Congo, Ecuador, Gabon, Nigeria, Venezuela and the GCC countries have limited success in diversification despite their continuous efforts. While countries such as Malaysia, Indonesia and Mexico have been able to diversify their economy away from oil and

Chile from copper (Callen *et al.*, 2014). Thus, the main argument is to find the economic factors that diversifying the economy from a dominant resource. Few studies identified the determinants of trade diversification such as political, geographic, economic, demographic and institutional (Acemoglu *et al.*, 2005; Dunning, 2005; Mehlum *et al.*, 2006; Malik and Temple, 2009; Cuberes and Jerzmanowski, 2009; Ahmadov, 2012). According to Esanov (2012), economic diversification has two types: economic (product) diversification and export diversification. In economic diversification, the economy intended to produce more diversified goods and services for local consumption with the aim to reduce imports. In export diversification, the economy intended to increase the share of goods in the existing exports by introducing new products and/or enter into new geographical markets. To promote both types of diversifications, Esanov (2012) proposed two different strategies, i.e. import substitution industrialization strategy and export-led industrialization strategy. In import substitution industrialization strategy, domestic industries are promoted and protected from foreign competition and encourage replacing foreign products in order to reduce imports. In export-led industrialization strategy, export sectors are supported and domestic markets are opened for foreign competition. Both export-promotion and import-substitution strategies are important for the economic growth and self-reliance of the economy.

The researchers who support export oriented policy include Onayemi and Ishola (2009), Basher (2012), Egwakhide (2012), Kruegor (1978), Bhawati (1978), and Papageorgious *et al.* (1991). Agosin *et al.* (2012) have explored the role of several factors in economic diversification in case of developing countries including trade openness, financial development, real exchange rate volatility and factor endowment (human capital accumulation). They found that only human capital accumulation (higher schooling) helps to diversify exports. Agosin *et al.* (2012) and Al-Kawaz (2008) investigated a set of potential drivers which can be divided into three main categories: economic reforms, structural factors and macroeconomic variables. Longmore *et al.* (2014) used a large panel dataset covering 183 countries over the period 1980–2010 and found that openness to FDI and access to finance are fundamental determinants of diversification. Kazandjian *et al.* (2016) identified that gender equality as an additional determinant of diversification. Sukumaran Nair (2016) explored that mining share, higher share of taxes and appreciation in exchange rates assist in the limited diversification process of Botswana. Longmore *et al.* (2014) found out that openness are the most fundamental drivers of diversification in Trinidad and Tobago. Esanov (2012) found out that the quality of institutions and infrastructure are the critical determinants of diversification, while trade and investment freedom are important determinant for export diversification. Ahmadov (2012) examined political and institutional factors enabling or hindering export diversification in the resource-rich developing world between 1962 and 2010. In case of Oman, the key drivers for trade diversification have not been identified or investigated. Therefore, we selected the most important macro-economic factors which may potentially affect trade diversification such as economic growth, financial system development and fixed capital formation.

2.1 Fixed capital formation and export diversification

Fixed capital formation formerly called gross domestic investment is total outlay on fixed assets and changes in inventories in a single fiscal year. It includes investment in fixed assets by the public sector and the private sector. The revenues from the production and trade of concentrated commodity limit the flexibility of the state to spend on the other sectors to promote them (Sweidan and Alwaked, 2016). Oil dependent states tends to direct their infrastructure development to enhance production to maintain revenues in the period of decreasing oil prices. Therefore, a major part of government spending in oil-dependent countries is spent to enhance the production and trade of hydrocarbon goods (Auty and Gelb, 2001). This tendency leads to undermining the proportionate development of the non-oil

sector. A negative relationship between trade diversification and fixed capital formation in the case of oil-dependent countries can be anticipated.

2.2 Financial system development and export diversification

This is common wisdom now that a vibrant financial system is essential for sustainable economic growth (Adeola and Evans, 2017). The extant literature suggests that a vibrant financial system is essential for the economic growth of an economy (Levine and Zervos, 1998). However, the nature of the relationship between financial system development and economic growth is not necessarily the same in the case of oil-dependent countries. For instance, Badeeb and Lean (2017) reported that this relationship is negatively affected by oil dependence in the case of Yemen (an oil-dependent Gulf country, neighboring Oman, and Saudi Arabia). A sound financial system provides easy access to credit and enables the private sector to reach its full potential and development of new startups (Hermes and Lensink, 2000; Beck and Demirguc-Kunt, 2006). In GCC countries, the corporations engaged in oil production and trade are controlled by the state. The oil business is mainly handled by the state through these giant companies such as ARAMCO in Saudi Arabia and PDO in Oman. Such resourceful corporations seldom need credit from the private sector. Therefore, the private sector is normally the non-oil sector in the case of GCC countries. Financial system development directly benefits the private sector which is entirely non-oil sector. Therefore, the development of the financial system directly supports and promotes the non-oil sector in the GCC region and more specifically in the Sultanate of Oman. A positive relationship can be expected between financial system development and trade diversification. The research findings of Nili and Rastad (2007) revealed that oil-exporting countries have lower financial development and economic growth compared to the rest of the world.

2.3 Economic growth and export diversification

Export diversification has important effects on productivity and economic growth. Hesse (2008) provided some robust empirical evidence of a positive effect of export diversification on per capita income growth. It can reduce exposure to external shocks, reducing macroeconomic volatility and increasing economic growth (Agosin *et al.*, 2012). Al-Marhubi (2000) investigated that export diversification promotes economic growth. Esu and Udonwa (2015) argued that export trade is the engine of economic growth and it enhances employment generation through the development of export oriented industries, increase foreign exchange earnings and improves balance of payment position of any economy. Melitz (2003) indicate that an increase in export variety can increase productivity.

There is a variety of definitions and measurement schemes for trade diversification. The most commonly used measure of diversification such as Herfindahl, Gini, and Theil indices, actually measures the concentration of sectorial proportion in the overall trade mix. However, the choice of any particular measure of trade diversification depends on the objective of the study (Al-Marhubi, 2000; DeBenedictis *et al.*, 2009; Parteka and Tamberi, 2013). In this study we are interested in investigating how Sultanate of Oman can wean off from the oil sector for revenue generation. We used proportion of non-oil sector in the total export mix of the Sultanate similar to previous studies such as Albassam (2015) in case of Saudi Arabia, Khayati (2019) in case of Bahrain and Shayah (2015) in case of UAE.

3. Methodology

The relationship between trade diversification, human capital development, financial sector development and economic development is modeled as the following log-linear equation. In the log-linear equation, endogenous and exogenous variables are translated into their natural

logs. The log level specification has several advantages over the level equation. Log-linear specification mitigates the size and scale difference in the measurement of discrete variables. It also enables the interpretation of estimated parameter coefficients in terms of elasticities. Therefore, we have preferred a log-linear model specification over level specification.

$$\ln \mathrm{TRD}_{t,} = \alpha + \beta \ln \mathrm{GCF}_t + \beta \ln \mathrm{FSD}_t + \beta \ln \mathrm{ECG}_t + \varepsilon_t \quad (1)$$

where TRD is abbreviated for trade diversification which is measured as the percentage of non-oil export in the total exports of Oman (Albassam, 2015). GCF for gross capital formation, measured as total spending on fixed assets and changes in the inventories as a percentage of GDP. Gross capital formation formerly known as gross domestic investment is a statistical measure of aggregate investment in fixed assets and changes in inventories by commercial and public enterprises. It includes both, infrastructure development and production capacity enhancement. Diversified and developed industry and supporting infrastructure is essential for diversified export (Ramcharan, 2006; WDI, 2019). Therefore, an economic relationship between trade diversification and gross capital formation can be expected. FSD for financial sector development measured as domestic credit to the private sector as a percentage of GDP. ECG is for economic growth, measured as per-capita income in terms of constant US dollar as a percentage of GDP. α and β represent the parameter estimates and ε is for error term which we assume normally distributed. The endogenous and exogenous variables are various macroeconomic variables officially reported by the Sultanate of Oman. The time-series data of considered variables starting from 1979 to 2017 is collected from the World Bank database (WDI, 2019). The data of 2018 and 2019 was not available for some series; therefore 2018 and 2019 data could not be included.

The most common methods of measuring trade diversification include Herfendal index, Gini Index and Theil's entropy index. These indices estimate the level of trade diversification by measuring the concentration level of export shares of various commodities. The order of preference for various indices is highly subjective which depends upon the objective of measurement. Dynamics of the economy in addition to the objectives of the study can be relevant decision criteria to choose a suitable measure of diversification. We have selected the Sultanate of Oman, which is an oil-producing country and its economy heavily depends on oil exports. The country is striving to increase the proportion of non-oil exports in its export mix. Therefore, we have taken the proportion of non-oil exports in total exports as a proxy for export diversification. The purpose of this study is to investigate the share of the non-oil sector in the total exports of the country. Therefore, export diversification is measured as a contribution of non-oil sector exports in the total exports of the country.

Ideally, the correlation between regressors and disturbance term should be zero. However, this knife-edge assumption of no endogeneity is not always fulfilled especially in case of instrumental variable and polled regression models. Moreover, the endogeneity problem cannot be directly tested (Ketokivi and McIntosh, 2017). The selection of appropriate statistical methods effectively contributes to minimizing the endogeneity problem. Extant literature shows that ARDL framework effectively contributes to overcoming serial correlation and endogeneity problem because it is free of residual correlation (Narayan, 2004; Jalil *et al.*, 2013; Nkoro and Uko, 2016; Baloch and Suad, 2018; Nazir *et al.*, 2018). It implies that the validity of ARDL results is not compromised even some degree of endogeneity exists among the variables (Marques *et al.*, 2016). Higher order transformation of variables in addition to lagged values of variable contributes to overcoming the endogeneity problem. Time series data rarely fulfill the conditions of normal regression. Normally time series data has trends, structural breaks, and unit-roots. Higher order transformation of data induce stationarity and produce better results compared to level regression. Therefore, we applied time series methodology to test the relationship amongst the model variables.

We specify the following ARDL equation for the considered variables, to investigate their inter-relationship.

$$\Delta \ln \mathrm{TRD}_t = \alpha_0 + \alpha_{\mathrm{TRD}}\mathrm{TRD}_{t-1} + \alpha_{\mathrm{CPF}}\mathrm{CPF}_{t-1} + \alpha_{\mathrm{FSD}}\mathrm{FSD}_{t-1} + \alpha_{\mathrm{ECG}}\mathrm{ECF}_{t-1} + \sum_{j=1}^{p} \alpha \Delta \ln \mathrm{CPF}_{t-j} + \sum_{k=1}^{q} \alpha \Delta \ln \mathrm{FSD}_{t-k} + \sum_{l=1}^{r} \alpha \Delta \ln \mathrm{ECG}_{t-l} + \varepsilon_t$$

Error Correction Model can be derived by simple linear transformation in the ARDL model. The ECM provide short-run results without compromising long-run information.

$$\Delta \ln \mathrm{TRD}_t = \psi_0 + \sum_{j=1}^{p} \psi \Delta \ln \mathrm{CPF}_{t-j} + \sum_{k=1}^{q} \psi \Delta \ln \mathrm{FSD}_{t-k} + \sum_{l=1}^{r} \psi \Delta \ln \mathrm{ECG}_{t-l} + \sum_{m=1}^{s} \psi \Delta \ln \mathrm{TRD}_{t-m} + \psi \mathrm{ECT}_{t-1} + \varepsilon_t$$

The first step in time series analysis is to test the presence of unit root to specify the level of integration. As a rule of thumb, if all series are stationary at level I(0) simple regression at level can be run to estimate the parameter coefficients provided other conditions are met. If the variables are integrated at first difference I(1) error correction model can be applied provided the long-run relationship exists. If there are mix level of integration, then ARDL approach produces better results. Therefore, as a first step we tested unit root by alternate approaches to have sufficient evidence about the level of integration. After having information about the time series properties of our data we proceed to the estimation of appropriate lag length through standard lag selection criteria. We used different criteria to check the appropriate lag length. At the third step we proceed for cointegration testing. We used ARDL bound testing approach to test the presence of long run relationships amongst the model variables. ARDL bound testing approach yield better results compared to other cointegration tests when the sample size is relatively small. After having information regarding the presence of cointegration we proceed to estimate the error correction model.

4. Results and discussion

Table 1 depicts the descriptive statistics of the modeled series, at level. The results indicate that over the period of study, the average fixed capital formation remained 22.58% of GDP, credit to the private sector as an indicator of Financial System Development remained 33.32% of the GDP and per capita income remained 16,192.18 constant US dollars over the period of study. The contribution of the non-oil sector in the total export remained 16.54% average over the period of 39 years with steady growth from 5% in the year 1979 to 37% in the year 2016 and then a sharp decline of 10% in the year 2017. The results of Jarque–Bera test indicate that series CPF and TRD are normally distributed and on the other hand ECG and FSD do not follow a normal distribution. ARDL technique effectively overcomes the normal distribution assumption therefore we expect that our results will not be affected.

As a standard procedure in time series analysis, at the outset, we proceed to test the unit root of individual series. We applied two alternate unit root tests to confirm the results, namely Augmented Dicky-Fuller (ADF) test and Phillips-Perron (PP) test. Both tests are widely used in time series analysis and considered appropriate to confirm the presence of unit root in the series. We checked unit root by first allowing intercept and then by allowing both trend and intercepts in the models. The results of both tests at level and first differenced including intercept and then both intercept and trend are reported in Table 2. The results

Table 1.
Descriptive statistics

	CPF	ECG	FSD	TRD
Mean	22.5819	16192.1800	33.3168	16.5350
Median	22.4397	16689.8300	30.7300	16.4505
Maximum	36.4889	19454.2200	75.9590	37.9964
Minimum	12.3266	9878.4920	13.3520	3.8379
Std. Dev.	6.4527	2512.4440	15.4301	8.7094
Skewness	0.1814	−1.0090	1.1093	0.6436
Kurtosis	2.0527	3.4471	4.0816	2.8059
Jarque–Bera	1.6721	6.9429	9.8991	2.7535
Probability	0.4334	0.0311	0.0071	0.2524

Table 2.
Unit root tests

		Augmented Dickey-Fuller				Phillips-Perron			
		At level I(0)		1st difference I(1)		At level I(0)		1st difference I(1)	
TRD	*I*	−2.1207	0.2380	−6.2164	0.0000	−1.8683	0.3431	−7.0633	0.0000
	IandT	−2.5971	0.2837	−6.1669	0.0001	−2.4872	0.3323	−8.1395	0.0000
FSD	*I*	−0.1153	0.9405	−5.2690	0.0001	−0.2711	0.9199	−5.2628	0.0001
	IandT	−2.9227	0.1674	−5.1390	0.0009	−2.4268	0.3607	−5.1285	0.0009
CPF	*I*	−2.0259	0.2750	−6.2351	0.0000	−2.1027	0.2448	−6.6603	0.0000
	IandT	−2.3137	0.4168	−6.2075	0.0000	−2.3081	0.4197	−7.1173	0.0000
ECG	*I*	−3.7548	0.0070	−3.7932	0.0064	−3.5894	0.0107	−3.8320	0.0058
	IandT	−1.4506	0.8289	−5.0338	0.0012	−1.4262	0.8368	−5.0024	0.0013

show that all the series are non-stationary at level, i.e. I(0) except economic growth if the intercept is allowed in the model. If the trend is also included the series economic growth merits non-stationary at level. All four series are stationary when first differenced, i.e. I(1) as indicated by the corresponding *t*-statistics and *p*-Values. ADF and PP tests confirm that all the series are I(1) stationery.

After having information about the time-series properties of the data we proceed to select the appropriate lag length. Table 3 shows the results of standard tests for the selection of appropriate lag structure. The test statistics of Hannan-Quinn information criterion (HQ), Schwarz information criterion (SC), Akaike information criterion (AIC), Final prediction error (FPE), and Sequential Modified LR Test Statistic (LR) indicates that one period is the appropriate lag length for the given data. The information about the appropriate lag length is useful in the development and estimation of the regression model for time series data.

To confirm the presence of long-run relationships among the model variables ARDL bound test approach is used. The decision criterion for the presence of cointegration is a comparison of computed *F*-statistics with the critical bound value. If the computed value is higher than the upper bound critical value, it indicates the presence of long-run relationship if

Table 3.
Lag length selection criteria

Lag	Log L	LR	FPE	AIC	SC	HQ
0	13.5067	NA	0.0000	−0.4726	−0.2526	−0.3958
1	194.0528	300.9103*	7.70e-11*	−9.1140*	−7.7944*	−8.6535*
2	213.7797	27.3984	0.0000	−8.8211	−6.4018	−7.9767
3	233.2210	21.6014	0.0000	−8.5123	−4.9933	−7.2841

Note(s): *indicates lag order selected by the criterion

it falls below the lower bound then the decision against the cointegration relationship. If the computed value of *F*-statistics lies between the upper and lower bound value the relationship is indecisive. In such a case, the presence of a long-run relationship is confirmed by the significant negative error correction term. The results indicate two cointegration vectors at 1% confidence level in trade diversification and financial system development models. However, the Capital formation model indicates the presence of cointegration at 10% confidence level. In both TRD model and FSD model *F*-statistics is greater than the critical upper bound value at 1% confidence level. In case of CPF model *F*-statistics is greater than upper bound critical value at 10% confidence level. Based on ARDL bound testing approach, it is concluded that there are at least two cointegration vector (see Table 4).

After having information about the presence of cointegration, we proceed to estimate ARDL model to analyze the short-run and long-run relationship among the model variables. The short-run and long-run coefficients are presented in Table 5. Since we specified the relationship among considered series as a log-linear equation, the derived coefficients are interpreted as elasticities. The long-run results indicate that financial system development has a positive impact on trade diversification as coefficient value is positive and corresponding *t*-statistics is significant. Less than 1% *p*-value indicates that the

Variables	TRD	FSD	ECG	CPF
F-statistics	5.5945*	6.8839*	1.90986	4.0196***
Critical Value	10%	5%	1%	
Lower Bound	2.618	3.164	4.428	
Upper Bound	3.532	4.194	5.816	
Diagnostic tests				
R^2	0.69822	0.92578	0.93420	0.64502
Adj. R^2	0.61199	0.90458	0.91540	0.54359
F-statistic	8.09768	43.65728	49.69117	6.35957

Table 4.
ARDL bound test for cointegration

Variable	Coefficient	*t*-statistic	*p*-value
Long-run results at level			
C	−8.8782	−1.5790	0.1328
FSD	1.0470*	3.5561	0.0024
ECG	1.1317***	1.7363	0.1000
CPF	−1.0241*	−6.4282	0.0000
Short-run results			
C	−8.7591	−1.5557	0.1382
D(TRD(−1))	0.3598**	2.2400	0.0387
D(FSD)	2.3742*	7.1179	0.0000
D(FSD(−1))	0.0894	0.1837	0.8564
D(ECG)	0.7910	0.7273	0.4770
D(ECG(−1))	0.2003	0.1867	0.8541
D(CPF)	−0.4999*	−2.8818	0.0099
ECT(−1)*	−0.9866*	−6.0316	0.0000
R-squared		0.8323	
Adjusted *R*-squared		0.7365	
Durbin–Watson stat		1.6878	
F-statistic		14.0907	
Prob(*F*-statistic)		0.0000	

Note(s): *, ** and *** denotes the significance at 1%, 5 and 10% level, respectively

Table 5.
Long Run and short-run Analysis

relationship is significant at a 99% confidence level. The coefficient value 1.047 means that one unit increase in FSD will cause 1.047% units increase in proportion of non-oil sector exports in the export mix of the Sultanate of Oman. The non-oil export is unit elastic to the financial system development which is a good indicator for the policymakers. The positive relationship as expected is consistent with most of the previous studies. Bojanic (2012) found evidence of a positive relationship between financial system development and trade openness in the case of Bolivia. Adeola and Evans (2017) also reported positive impact of financial system development on trade diversification in case of Nigeria. Many other significant studies indicated a positive relationship between financial system development and various measures of trade (see for example, Kim *et al.*, 2012; Huang and Chang, 2014; Saidi and Mbarek, 2017). However, Agosin *et al.* (2012) reported that financial system development does not help in diversification. Similarly, Kurronen (2015) reported that in the case of resource-dependent countries financial development to cater the needs of resource sectors, particularly, hinders the diversification. The last two studies which posit negative or no relationship are methodologically different than our study. In long-run the impact of economic growth on trade diversification is also positive but significant at the 10% level. The coefficient of ECG is positive and greater than one which implies that trade diversification is more elastic to the economic growth of the country one unit increase in the per capita income results in 1.13 units increase in the proportion of non-oil exports in the total export mix of the Sultanate. The positive relationship between economic growth and export diversification is widely reported in the literature (see for example Al-Marhubi, 2000; Herzer and Nowak-Lehnmann, 2006; Cadot *et al.*, 2013; Aditya and Acharyya, 2013). However, the nature and direction of causality between trade diversification and economic growth vary across countries (Gözgör and Can, 2017; Rani and Kumar, 2019). The magnitude of the positive relationship between economic growth and trade diversification is significant insight for the policymakers of Oman. The long-run relation between capital formation and trade diversification is negative and statistically significant as indicated by coefficient values and corresponding t-statistics and p-value. This result is contrary to the research findings of Yu (1998), Adhikary (2015), Adeola and Evans (2017). The possible reason of this dichotomy in the result is the fundamental differences in political, social and economic structures (Cadot *et al.*, 2013). The negative relationship in capital formation and trade diversification was expected in case of the Sultanate of Oman. The dependence on concentrated commodity trade is a vicious circle (Karl, 1997). The resource-dependent countries have to invest in the production and trading facilities of commodities, producing crucial funds to run the economy. Such investment hinders the establishment of diverse industries (Gelb, 1988; Sachs and Warner, 2001; Beblawi and Luciani, 2015). The trade diversification series is derived as a reciprocal of contribution of oil trade in the trade mix of the Sultanate. The negative significant value of the coefficient of CPF means that capital formation in the sultanate positively contributes to the proportion of oil exports in the export mix of the Sultanate. One percent increase in the CPF will result in more than 1% decrease in the proportion of non-oil exports in the export mix. This research finding has great policy implication for Oman. Government spending on infrastructure development and private investments in fixed industrial assets need to be rationed for the development of a diversified industry in order to reduce the oil dependency.

The second half of Table 5 depicts the short-run results. The results show that the one-period lag value of trade diversification has a significant positive impact on the trade diversification. The positive coefficient value of 0.36 signifies that a one unit change in a period lagged TRD cause 0.36 unit changes in the export diversification and this relationship is significant at 5% level. This autoregressive response indicates the momentum effect in the short-run in the case of Oman. The autoregressive response has been already reported in the literature (Belloumi, 2014); therefore, the results are consistent with existing studies and

confirm the momentum effect in short run. The short-run coefficient of FSD is positive and significant at 1% level. In short-run trade diversification is more elastic to the financial system development, one unit change in FSD results in 2.37 unit change in the TRD. The short-run positive impact of financial system development on trade diversification is consistent with existing studies (see for example, Kim *et al.*, 2010; Huang and Chang, 2014). This research finding suggests that short-run reforms in the financial system to increase credit to the private sector may greatly contribute to the export diversification. This also indicates that Oman's private sector has the potential to contribute in the exports if adequate financing opportunities are created.

In short-run capital formation shows a negative impact on trade diversification, as indicated by the statistically significant negative coefficient value of the CPF. The negative relationship is consistent in short-run as well as long-run. The negative impact of capital formation on trade diversification was anticipated. Oman is an oil-exporting country and heavily depends on oil exports. To stabilize the revenue in rapidly changing oil prices in the international oil market Oman has to enhance its production facilities (Hakro and Omezzine, 2016). Therefore, investment in fixed assets around the oil industry hinders the development of the non-oil sector (Hasanov *et al.*, 2017; Al-Abri *et al.*, 2019). The short-run coefficients of economic growth are statistically insignificant, which implies that in short-run economic growth does not affect the trade diversification. It is a logical result because the short-run impact of economic growth on trade diversification is expected to be negligible. Diversification is a long process and it is only possible if effective long-term economic policies are formulated (Argüello, 2017; Caselli *et al.*, 2020). The negative value of the error correction term reflects the speed of adjustment from the short-run to the long-run is significant at 1% level. In addition to ARDL bound testing, significant and negative error correction term also confirms the presence of long-run relationship among the model series. We found that the ECM_{t-1} is negative and significant at 1% level. The significant negative value (−0.9866*) implies that any disequilibrium in the long-run function due to short-run variation is adjusted 98.66% annually.

R-squared and adjusted *R*-squared values indicate a good fit of the model. Significant *F*-statistic shows the overall significance of the model. Durbin–Watson stat closer to two means that the model is free from the autocorrelation problem. For checking the stability of the model, we draw *cumulative sum of recursive residuals (CUSUM) and cumulative sum of square of recursive residual (CUSUMsq)* plots. CUSUM and CUSUMsq plots are presented as Figures 1 and 2 respectively. The plots show that both plots remain within the

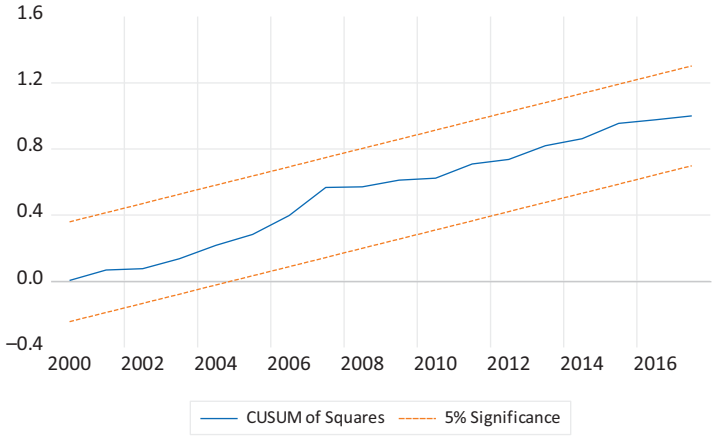

Figure 1.
Plot of the cumulative sum of recursive residuals (CUSUMs)

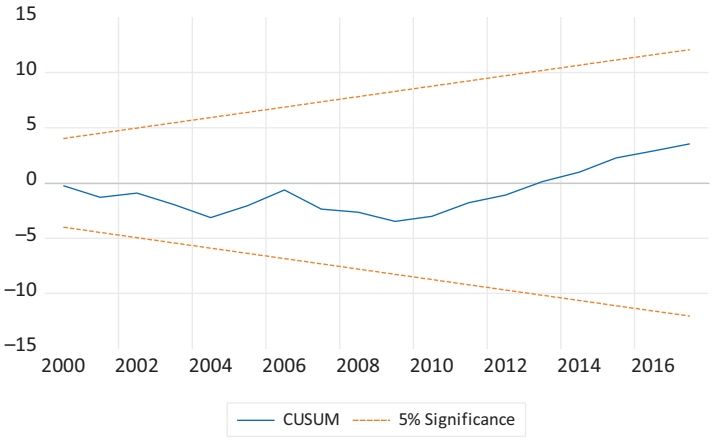

Figure 2.
Plot of cumulative sum of square of recursive residual (CUSUMsq)

upper and lower critical bounds at 5% significance level which indicates that the model is structurally stable over time and there is no sign of structural breaks in the data.

5. Conclusion and policy implications

This study aims to investigate the relationship between trade diversification, financial system development, capital formation and economic growth. The empirical results show that the series trade diversification, financial system development, and capital formation are non-stationary at level but stationary when first differenced. However, economic growth is stationary at level when allowed only intercept. Lag selection criteria indicate that one period lag is an appropriate lag length for the specified model. For checking the long-run relationship among the modeled series ARDL bound testing approach was applied. The results confirm the presence of long-run relationship between the modeled series. After having information about the time-series properties of the data, ARDL model was estimated for long-run and short-run analyses.

The ARDL results show that in long-run and short-run financial system development positively contributes to enhancing the proportion of non-oil exports in the export mix of the Sultanate. A vibrant financial sector greatly contributes to enhancing industrialization and productivity. Therefore, policymakers should focus on the development and modernization of the financial system which enables easy access of credit to the private sector. The availability of funds would attract investors to set up new industries and enhance the capacity of the existing non-oil industry. The policymakers should also focus on rationing funds to diversify the industrial base in the country to achieve the goal of reduction in reliance on oil exports. The significant positive short-run coefficient of financial system development greater than one implies that the availability of credit to the private sector has higher elasticity. Financial system development has an immediate positive impact on the non-oil industry as indicated by the significant positive short-run parameter coefficient. It also means that the country's production capacity is underutilized due to lack of funds availability. Prudent fiscal policies may greatly contribute to achieving the full potential of industry for export diversification in the short run.

Economic growth has also a positive relationship with export diversification in long-run. In the short run, the relationship is positive but insignificant. This result signifies that in long-run economic growth rate can spur the trade diversification if economic policies continue to promote industrial diversity of the Sultanate. In Oman other sectors heavily depends on

government spending on development projects such as construction, chemical, mining, and extraction industries. This reliance on government spending should be discouraged and efforts should be made to promote a self-sufficient non-oil sector by enabling easy access to credit, reforms in financial markets, prudent fiscal policies, infrastructure development to promote non-oil sectors and investment in human capital development. Economic policies to promote the non-oil sector may create immunity against the oil price volatility.

We found that the relationship between capital formation and the proportion of non-oil exports is negative in the Sultanate. This research finding has great policy implications for the oil dependent countries like Sultanate of Oman. The investment in fixed assets cause decrease in the proportion of non-oil exports in the export mix of Oman. In other words increase in the fixed gross investment leads to increase in the proportion of oil exports in the export mix. This result implies that over the period of study the infrastructure development mainly promoted oil exports. It needs to be reversed to achieve the goal of diversification. Policymakers should formulate development policies to direct development projects to promote and facilitate the non-oil sector. Long-term policy to facilitate investment in the non-oil sector may greatly contribute to enhancing the non-oil exports of the country.

Stable economic growth, vibrant financial system, and rationing of funds for infrastructure development for the non-oil sector are crucial for export diversification for the Sultanate of Oman. The policy makers need to make policies for structural changes in the development patterns of the country and the establishment of a vibrant financial system.

Further research can be carried out to investigate the causal relationship between economic growth and export diversification. Other variables such as human capital development flow of FDI, entrepreneurship regional, and economic integration may also be included in the analysis in future research. This research is limited to the Sultanate of Oman, other GCC countries may also be included in the investigation to generalize the results to all oil-producing countries.

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Corresponding author
Iqtidar Ali Shah can be contacted at: ishah@yorkvilleu.ca