Economic performance and the demand for foreign labor in the oil-exporting and labor-importing states of the Arab Gulf

Case of Oman

Central Bank of Oman and Sultan Qaboos University

3rd Annual Conference of the Regional Research Network of the Central Bank of MENA

14-15 Sep 2023

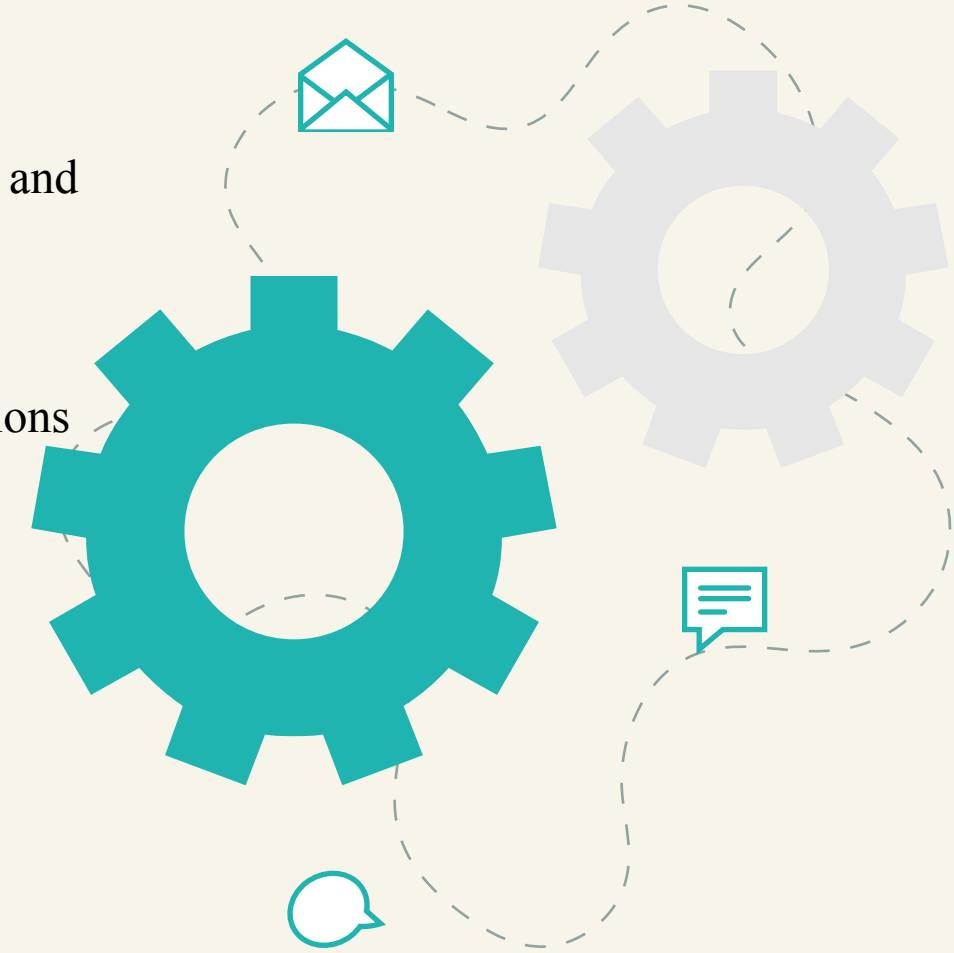
Motivations

A **Presence of foreign labor**: Economic, social, and political implications

B **The impact differs**: status of the economy, national employment, and local social conditions

C **Special importance to the GCC**:

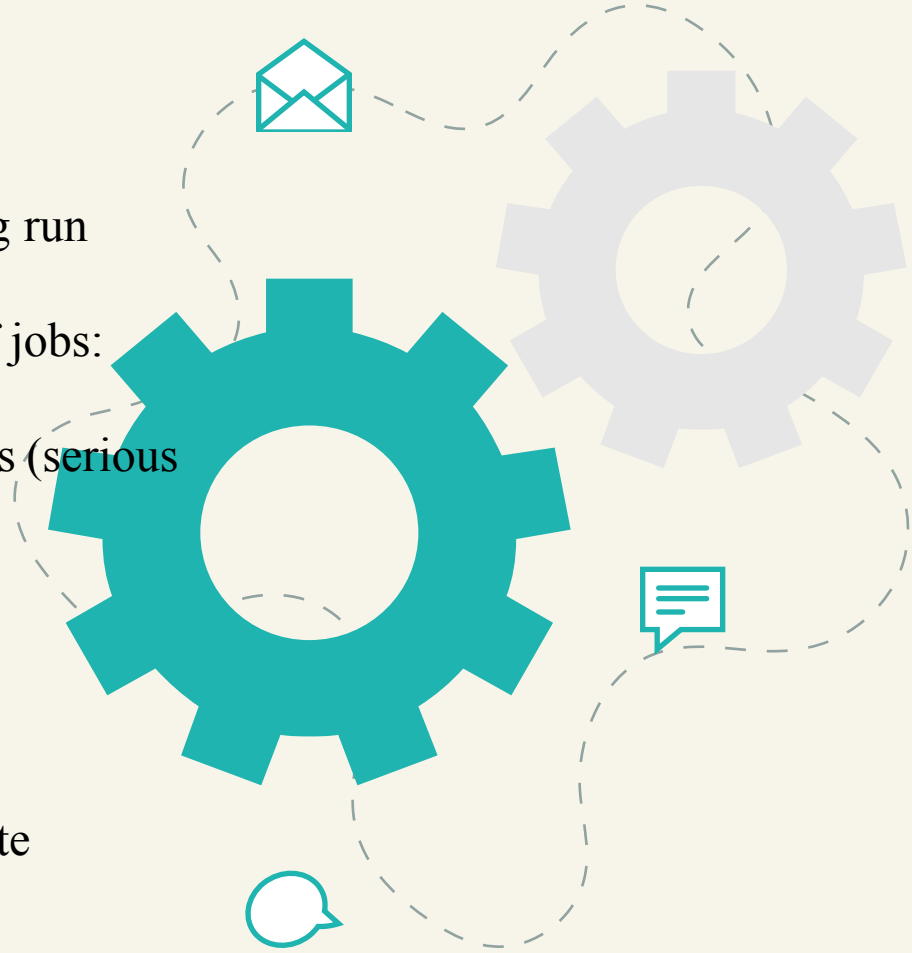
- Foreign labor accounts for a significant proportion of the workforce.
- Increasing demand for foreign labor: Preference for expatriates, the lack of necessary skills among locals, the lower salaries offered to locals compared to expatriates.
- Economic growth is labor dependent, key factor in economic development.



Motivations

D **Creates social and economic challenges:**

- Social cohesion and social inequality issues
- Loss of national identity and culture in the long run
- Job insecurity for locals
- Reluctance of locals to take up certain types of jobs: physically demanding or have low salaries
- Relatively high unemployment rate of nationals (serious concern)



E **Bahrain and Oman**: the strongest pressure to nationalize private sector labor markets

F **Economic reforms**: Diversification, improving productivity, fostering the emergence of the private sector, and ensuring that labor market policies support the employment of nationals.

G **The relationship** between economic performance and the demand for foreign labor in the Arab Gulf region is a complex issue.

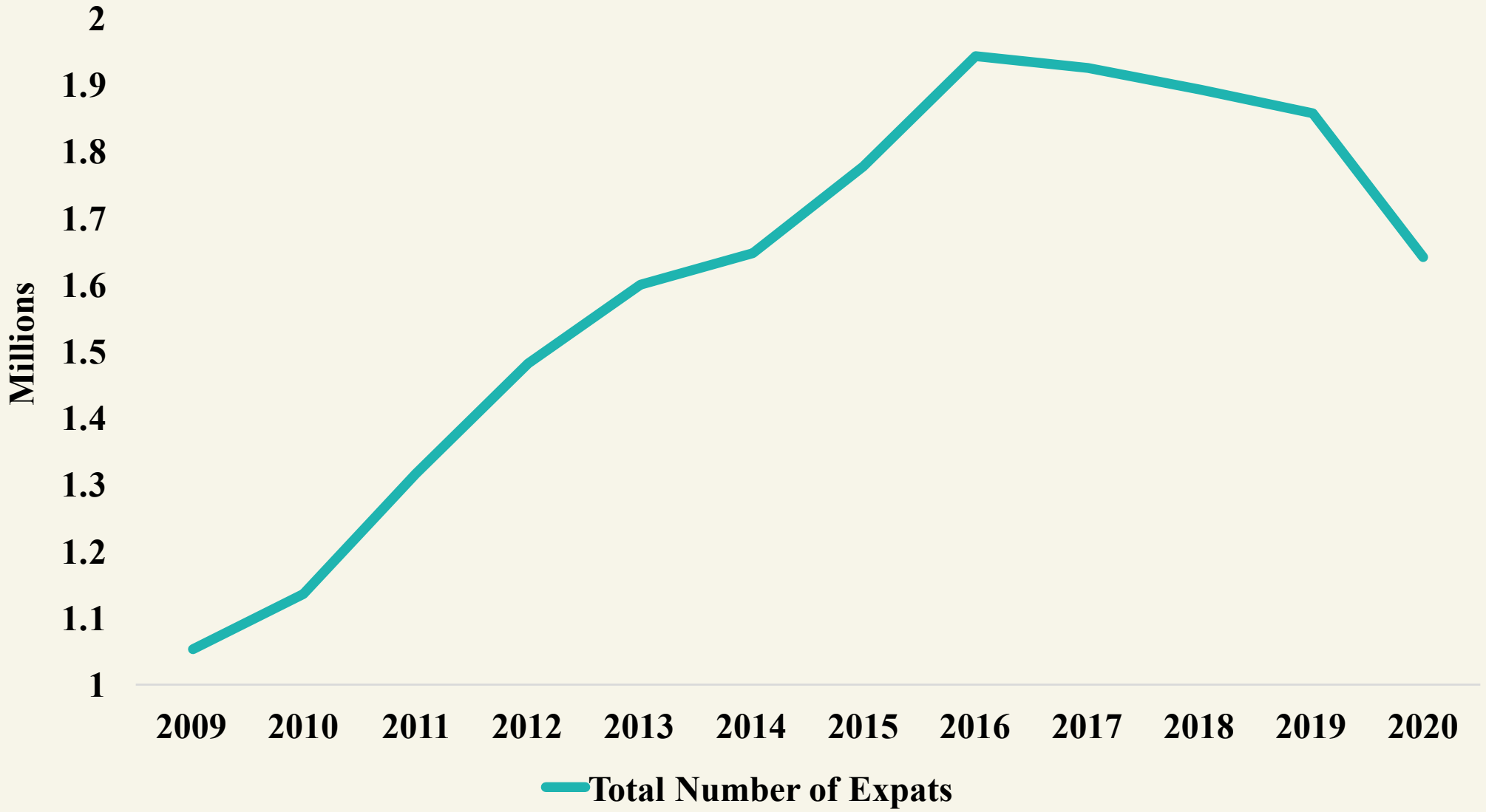
Percentage of expatriates in GCC countries

Year: 2022

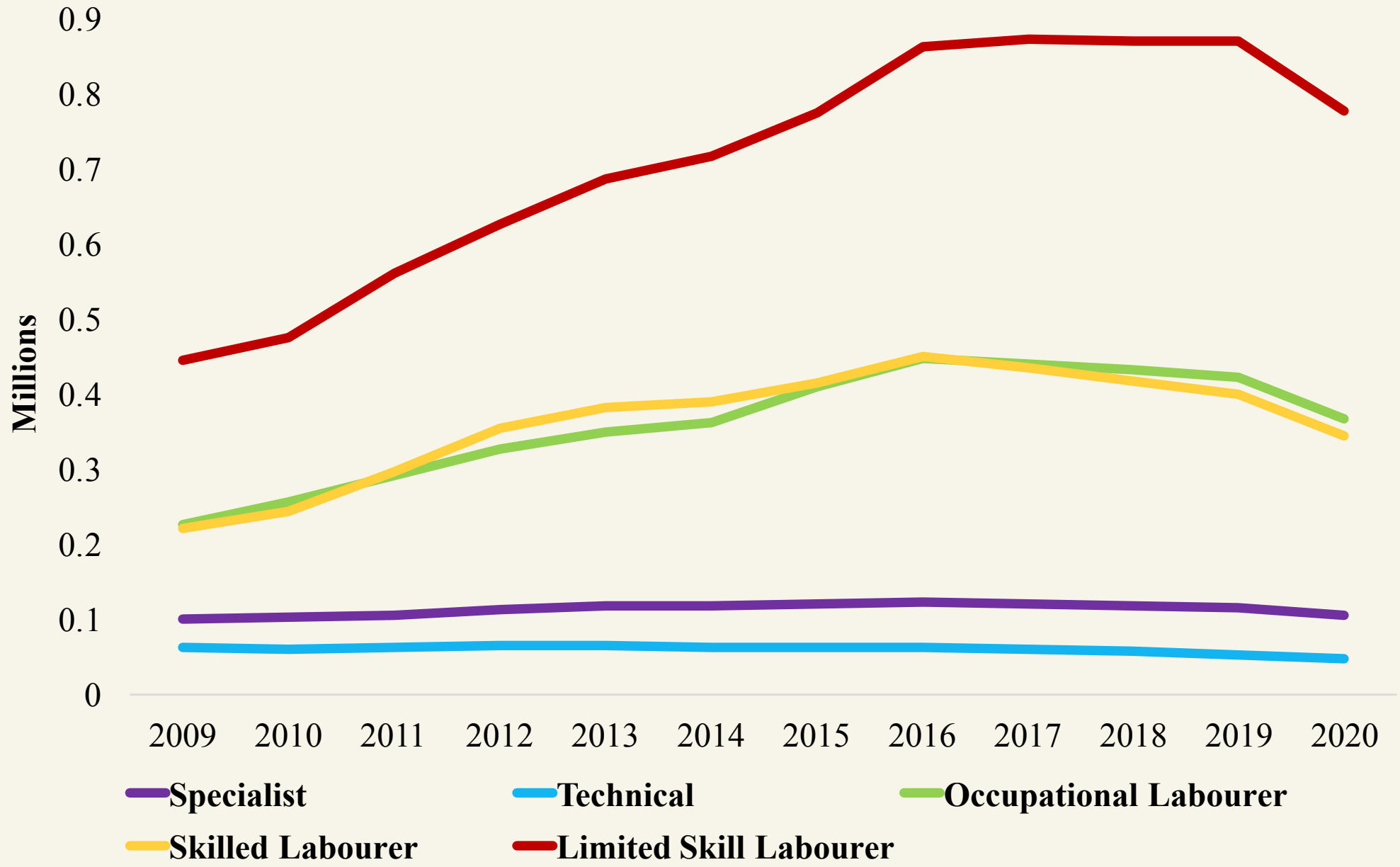
Country	Expats as a percentage of the total population
United Arab Emirates	88.50%
Qatar	85.70%
Kuwait	69.20%
Bahrain	52.00%
Oman	44.00%
Saudi Arabia	32.70%

Source: https://www.go-gulf.ae/expatriate-middle-east/

Total Number of Expats in Oman 2009-2020



Change in Number of Expats in Oman 2009-2020



Contributions

The relationship between economic growth and the total expatriate labor has yet to be directly examined in the literature. (Aggregated & Disaggregated levels)

Two recent policy debates in Oman, the GCC countries:

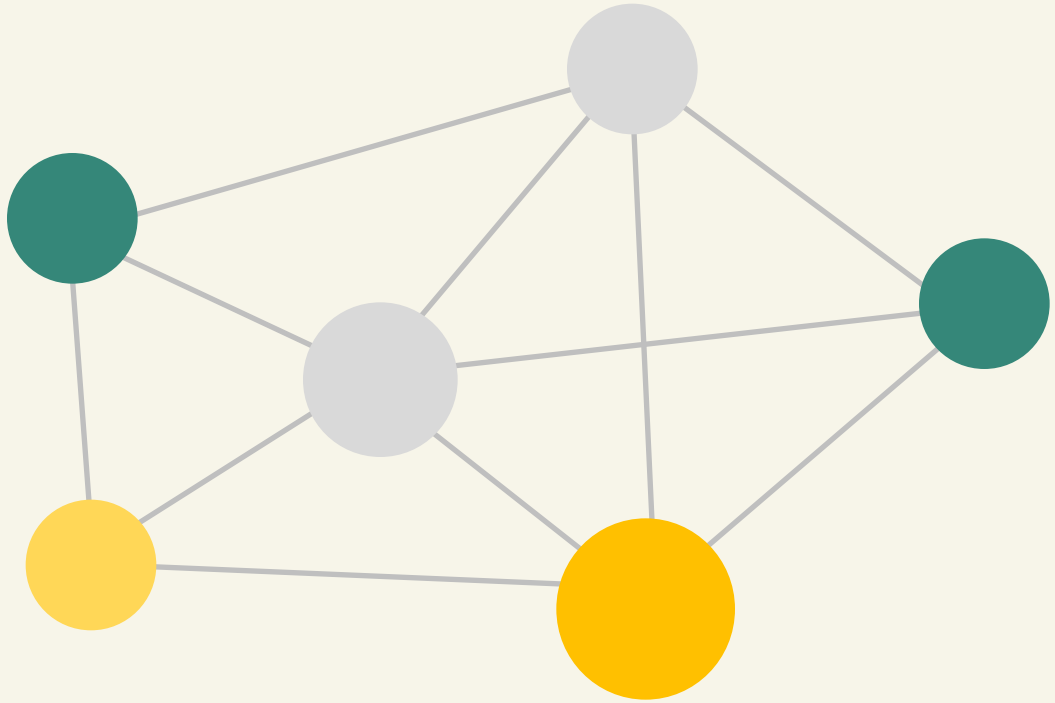
- Increased foreign labor force and expats' role in economic growth.
- High rate of unemployment of nationals.

This estimation will guide analyzing and forecasting the foreign labor dynamic, total output, and impact of policies.

Main Objectives

- Investigates the relationship between economic growth and demand for labor in Oman, considering separately skilled and unskilled labor as well as hydrocarbon GDP and nonhydrocarbon GDP.

- Examine the causality relationship among the variables.



LITERATURE REVIEW

- Large literature on the relationship between labor and different macroeconomic indicators; few studies on the relationships between growth rate and employment.

- Previous studies have not directly examined the association between the demand for expatriates and the overall economic performance in the GCC, nor consider disaggregation.

- The question of whether economic expansion derives the foreign workers or vice versa has been left unanswered.

Model Specification and Data

Auto-Regressive Distributed Lag (ARDL) Models

ARDL/Error-Correction (EC) Model applied to assess the short and long-run relationships

Annual data set (source: NCSI) ranges from 2003 – 2019

Discussing 18 models from the 36 estimated models

Model Specification and Data

- $LGDP_t = \beta_0 + \beta_1 LEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{1t}$ $(1a)$
- $LHGDP_t = \beta_0 + \beta_1 LEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{2t}$ $(2a)$
- $LNHGDP_t = \beta_0 + \beta_1 LEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{3t}$ $(3a)$

- $LGDP_t = \beta_0 + \beta_1 LSEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{1t}$ $(1b)$
- $LHGDP_t = \beta_0 + \beta_1 LSEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{2t}$ $(2b)$
- $LNHGDP_t = \beta_0 + \beta_1 LSEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{3t}$ $(3b)$

- $LGDP_t = \beta_0 + \beta_1 LUSEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{1t}$ $(1c)$
- $LHGDP_t = \beta_0 + \beta_1 LUSEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{2t}$ $(2c)$
- $LNHGDP_t = \beta_0 + \beta_1 LUSEXPAT_t + \beta_2 LGEXP_t + \beta_3 GREV_t + \varepsilon_{3t}$ $(3c)$

Model Specification and Data

- $\Delta LGDP_t = C_1 + \sum_{i_1=1}^{l_1} \tau_{1_i} \Delta LGDP_{t-i_1} + \sum_{i_2=1}^{l_2} \alpha_{1_i} \Delta LEXPAT_{t-i_1} + \sum_{i_3=1}^{l_3} \alpha_{2_i} \Delta LGEXP_{t-i_2} + \sum_{i_4=1}^{l_4} \alpha_{3_i} \Delta LGREV_{t-i_3} + \beta_1 LEXPAT_{t-j} + \beta_2 LGEXP_{t-j} + \beta_3 LGREV_{t-j} + \varepsilon_t$

- $\Delta LHGDP_t = C_2 + \sum_{i_1=1}^{l_1} \tau_{2_i} \Delta LHGDP_{t-i_1} + \sum_{i_2=1}^{l_2} \delta_{1_i} \Delta LEXPAT_{t-i_1} + \sum_{i_3=1}^{l_3} \delta_{2_i} \Delta LGEXP_{t-i_2} + \sum_{i_4=1}^{l_4} \alpha_{3_i} \Delta LGREV_{t-i_3} + \lambda_2 LNHGDP_{t-j} + \theta_1 LEXPAT_{t-j} + \theta_2 LGEXP_{t-j} + \beta_3 LGREV_{t-j} + \varepsilon_t$

- $\Delta LNHGDP_t = C_3 + \sum_{i_1=1}^{l_1} \tau_{3_i} \Delta LNHGDP_{t-i_1} + \sum_{i_2=1}^{l_2} \vartheta_{1_i} \Delta LEXPAT_{t-i_1} + \sum_{i_3=1}^{l_3} \vartheta_{2_i} \Delta LGEXP_{t-i_2} + \sum_{i_4=1}^{l_4} \alpha_{3_i} \Delta LGREV_{t-i_3} + \lambda_3 LNHGDP_{t-j} + \mu_1 LEXPAT_{t-j} + \mu_2 LGEXP_{t-j} + \beta_3 LGREV_{t-j} + \varepsilon_t$

Diagnostic Tests

- The results from conducting the Skewness, Kurtosis, and Jarque-Bera normality test reveal a normal distribution of the time series variables.
- The findings of ordinary bilateral correlation between variables indicate expected relationship between variables and are statistically significant.
- Stochastic properties of variables were tested using ADF unit root test. All variables except real GDP are I(0) and real GDP is I(1), with intercept and linear trend.

Empirical Results and Discussion

Dependent Variables		GDP	HGDP	NHGDP
Horizon	Independent Variables	Coef. & Significance		
SR	EXPAT	-0.041**	-0.068**	-0.038
	SEXPAT	-0.059**	-0.094	0.003
	USEXPAT	-0.143**	-0.063	-0.035
LR	EXPAT	0.122**	0.059	0.207**
	SEXPAT	0.164**	0.061	0.126
	USEXPAT	0.114**	0.052**	0.194**

Empirical Results and Discussion

Dependent Variables		EXPAT	SEXPAT	USEXPAT
Horizon	Independent Variables	Coef. & Significance		
SR	GDP	1.676	-0.047	1.943
	HGDP	-5.238	-2.979*	-5.491
	NHGDP	-4.109	0.449	-4.970
LR	GDP	1.510	-	1.680
	HGDP	-4.855*	-4.838	-4.978*
	NHGDP	2.766***	-	2.813***

Empirical Results and Discussion

- The number of *Expats,* at aggregated and disaggregated levels, is cointegrated with the total *GDP*, and in the short and long terms. (SR - and LR +)

- *Unskilled Expats* is cointegrated with *GDP* at aggregated and disaggregated levels, in the long term.

- Bidirectional cointegration between *NonHydrocarbon GDP* and *Unskilled Expats*, in the long term.

Empirical Results and Discussion

- A 10% increase in the number of expatriates correlates with a 1.21% increase in GDP and a 2.07% increase in NHGDP.
- A 10% increase in the number of skilled expatriate labor correlates with a 1.64% increase in GDP.
- A 10% increase in the volume of unskilled expatriate labor correlates with a 1.14% and a 1.94% rise in GDP and NHGDP.
- A 10% increase in NHGDP is correlated with a 27.7% growth in the total volume of expatriate labor, and specifically a 28.1% growth in the volume of unskilled expatriate labor.

Empirical Results and Discussion

Panel A: *GDP*

Variables	**Short-Run causality (F-stats)**			**Direction of causality**	**Long-run causality (ECT t-stats)**	**Joint Short & Long-run Causality (F-stats)**			**Direction of causality**
	ΔLGDP	*ΔLEXPAT*	*ΔLGEXP*			*ΔLGDP & ECT*	*ΔLEXPAT & ECT*	*ΔLGEXP & ECT*	
ΔLGDP	-	1.77	0.09	-	-0.4793193*	-	11.45*	16.12*	*EXPAT → GDP; GEXP → GDP;*
ΔLEXPAT	0.73	-	1.51	-	5.979153***	2.89	-	2.89	
ΔLGEXP	0.95	1.97	-	-	0.597295	0.99	2.98	-	

Panel B: *HGDP*

Variables	**Short-Run causality (F-stats)**			**Direction of causality**	**Long-run causality (ECT t-stats)**	**Joint Short & Long-run Causality (F-stats)**			**Direction of causality**
	ΔLHGDP	*ΔLEXPAT*	*ΔLGEXP*			*ΔLHGDP & ECT*	*ΔLEXPAT & ECT*	*ΔLGEXP & ECT*	
ΔLHGDP	-	0.18	0.10	-	-0.5094085**	-	8.19**	7.02**	*EXPAT → HGDP; GEXP → HGDP;*
ΔLEXPAT	0.68	-	0.00	-	0.4968187	0.85	-	0.05	
ΔLGEXP	1.36	4.10**	-	*EXPAT → GEXP;*	0.6040196	1.70	4.14	-	

Panel C: *NHGDP*

Variables	**Short-Run causality (F-stats)**			**Direction of causality**	**Long-run causality (ECT t-stats)**	**Joint Short & Long-run Causality (F-stats)**			**Direction of causality**
	ΔLNHGDP	*ΔLEXPAT*	*ΔLGEXP*			*ΔLNHGDP & ECT*	*ΔLEXPAT & ECT*	*ΔLGEXP & ECT*	
ΔLNHGDP	-	3.17***	5.56**	*EXPAT → NHGDP; GEXP → NHGDP; NHGDP → EXPAT; GEXP → EXPAT;*	0.1507593	-	3.56	5.60***	*GEXP → NHGDP; NHGDP → EXPAT; GEXP → EXPAT;*
ΔLEXPAT	8.30*	-	4.29**		5.571415*	34.26*	-	29.73*	-
ΔLGEXP	2.01	2.37	-	-	0.4583322	2.65	2.82	-	

Empirical Results and Discussion

Panel A:

Variables	Short-Run causality (F-stats)			Direction of causality	Long-run causality (ECT t-stats)	Joint Short & Long-run Causality (F-stats)			Direction of causality
	ΔLGDP	ΔLEXPAT_SKILL	ΔLGEXP			ΔLGDP & ECT	ΔLEXPAT_SKILL & ECT	ΔLGEXP & ECT	
ΔLGDP	-	0.01	0.60	-	-0.4391864*	-	15.08*	16.96*	EXPAT_SKILL → GDP; GEXP → GDP;
ΔLEXPAT_SKILL	0.34	-	0.05	-	-1.007049	0.35	-	0.25	
ΔLGEXP	0.04	0.63	-	-	-0.6985849	1.16	4.05	-	

Panel B:

Variables	Short-Run causality (F-stats)			Direction of causality	Long-run causality (ECT t-stats)	Joint Short & Long-run Causality (F-stats)			Direction of causality
	ΔLHGDP	ΔLEXPAT_SKILL	ΔLGEXP			ΔLHGDP & ECT	ΔLEXPAT_SKILL & ECT	ΔLGEXP & ECT	
ΔLHGDP	-	0.25	0.29	-	-0.4227386	-	3.79	3.02	EXPAT_SKILL → GEXP;
ΔLEXPAT_SKILL	1.97	-	0.27	-	-1.713525	2.93	-	1.000	
ΔLGEXP	1.42	4.21**	-	EXPAT_SKILL → GEXP;	0.0077559	1.42	4.72***	-	

Panel C:

Variables	Short-Run causality (F-stats)			Direction of causality	Long-run causality (ECT t-stats)	Joint Short & Long-run Causality (F-stats)			Direction of causality
	ΔLNHGDP	ΔLEXPAT_SKILL	ΔLGEXP			ΔLNHGDP & ECT	ΔLEXPAT_SKILL & ECT	ΔLGEXP & ECT	
ΔLNHGDP	-	9.58*	1.50	EXPAT_SKILL → NHGDP;	-0.1360916*	-	17.65*	18.72*	EXPAT_SKILL → NHGDP; GEXP → NHGDP; NHGDP → EXPAT_SKILL; GEXP → EXPAT_SKILL;
ΔLEXPAT_SKILL	0.46	-	2	-	-1.077505**	6.62**	-	4.72***	
ΔLGEXP	1.14	1.82	-	-	0.1028983	1.14	2.04	-	

Empirical Results and Discussion

Panel A:

Variables	Short-Run causality (F-stats)			Direction of causality	Long-run causality (ECT t-stats)	Joint Short & Long-run Causality (F-stats)			Direction of causality
	ΔLGDP	ΔLEXPAT_USKILL	ΔLGEXP			ΔLGDP & ECT	ΔLEXPAT_USKILL & ECT	ΔLGEXP & ECT	
ΔLGDP	-	1.63	0.02	-	-0.4560265*	-	10.26*	14.86*	EXPAT_USKILL → GDP; GEXP → GDP;
ΔLEXPAT_USKILL	0.86	-	1.77	-	6.747977***	3.66	-	3.65	
ΔLGEXP	1.07	2.33	-	-	0.7283849	1.22	3.18	-	

Panel B:

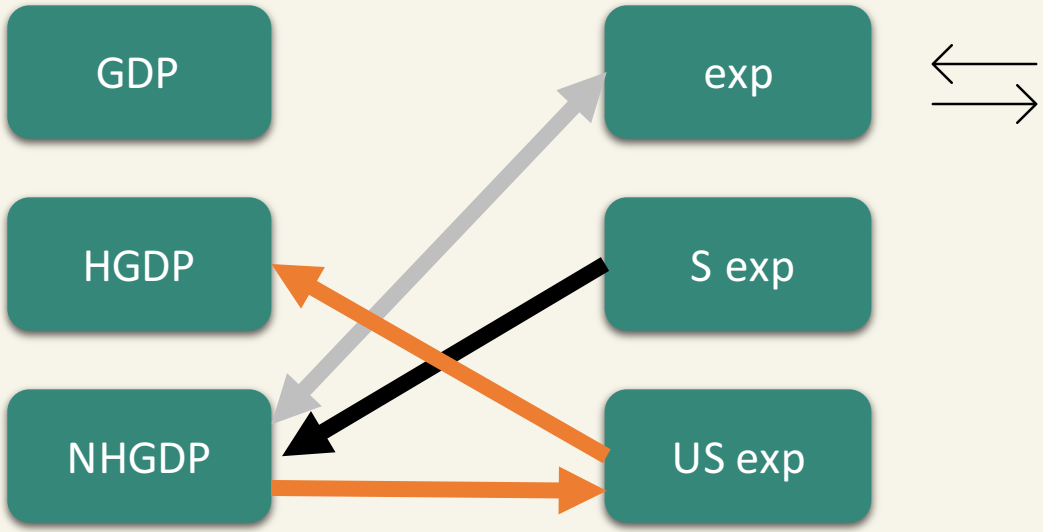
Variables	Short-Run causality (F-stats)			Direction of causality	Long-run causality (ECT t-stats)	Joint Short & Long-run Causality (F-stats)			Direction of causality
	ΔLHGDP	ΔLEXPAT_USKILL	ΔLGEXP			ΔLHGDP & ECT	ΔLEXPAT_USKILL & ECT	ΔLGEXP & ECT	
ΔLHGDP	-	0.20	0.06	-	-0.4953654**	-	7.89**	6.74**	EXPAT_USKILL → HGDP; GEXP → HGDP;
ΔLEXPAT_USKILL	0.58	-	0.00	-	0.4889008	0.74	-	0.05	
ΔLGEXP	1.39	4.09**	-	EXPAT_USKILL → GEXP;	0.6504918	1.8	4.18	-	

Panel C:

Variables	Short-Run causality (F-stats)			Direction of causality	Long-run causality (ECT t-stats)	Joint Short & Long-run Causality (F-stats)			Direction of causality
	ΔLNHGDP	ΔLEXPAT_USKILL	ΔLGEXP			ΔLNHGDP & ECT	ΔLEXPAT_USKILL & ECT	ΔLGEXP & ECT	
ΔLNHGDP	-	2.82***	5.24**	EXPAT_USKILL → NHGDP; GEXP → NHGDP;	0.1413754	-	3.20	5.29***	GEXP → NHGDP; NHGDP → EXPAT_USKILL; GEXP → EXPAT_USKILL;
ΔLEXPAT_USKILL	7.86*	-	4.14**	NHGDP → EXPAT_USKILL; GEXP → EXPAT_USKILL; EXPAT_USKILL → GEXP;	5.905024*	36.55*	-	32.06*	
ΔLGEXP	2.15	2.96***	-		0.5445849	3.2	3.31	-	

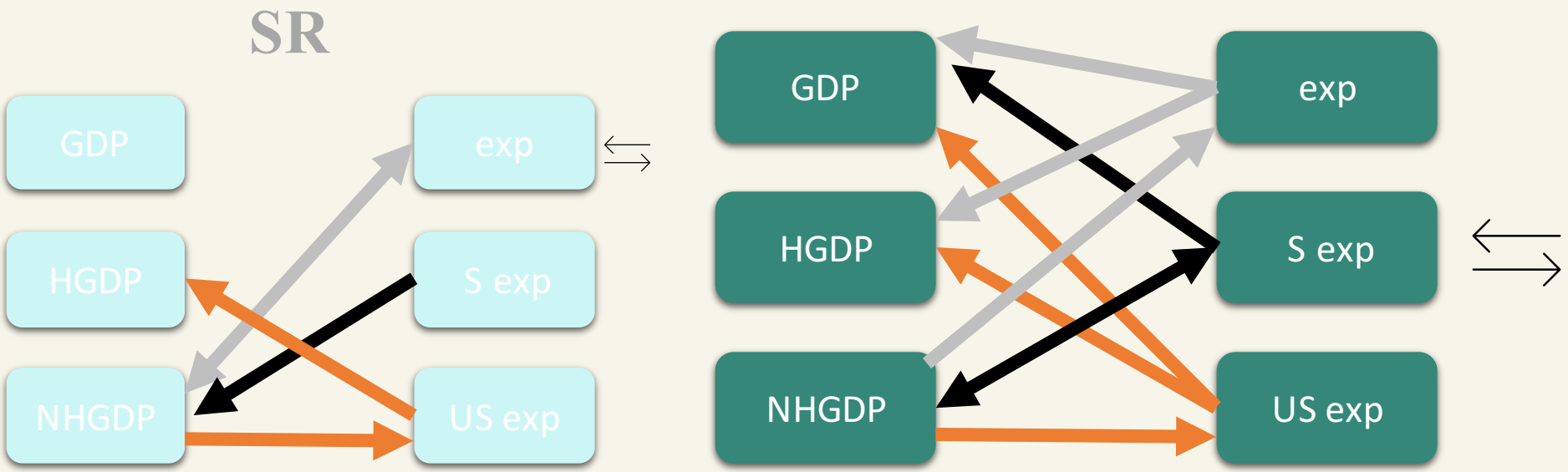
Causality

SR

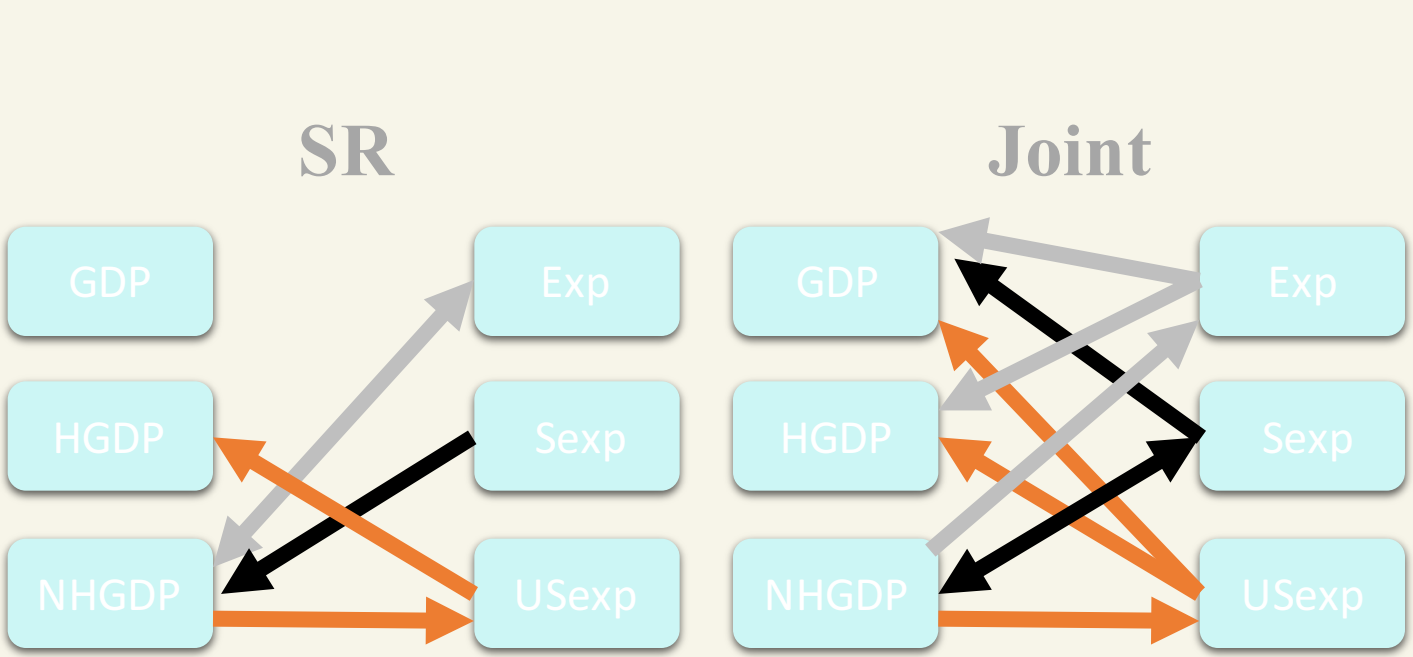


Causality

Joint



Causality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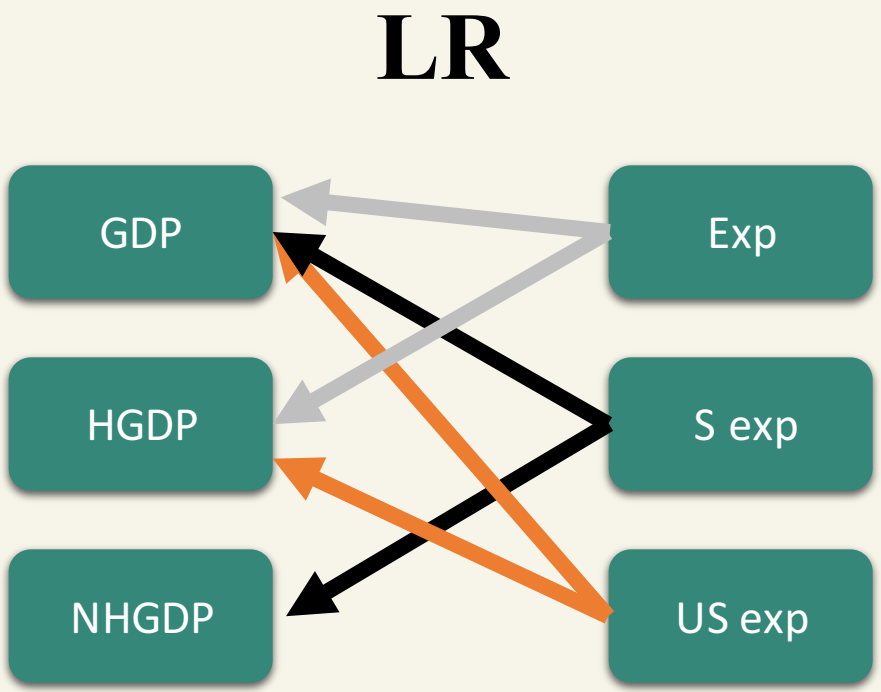
LR
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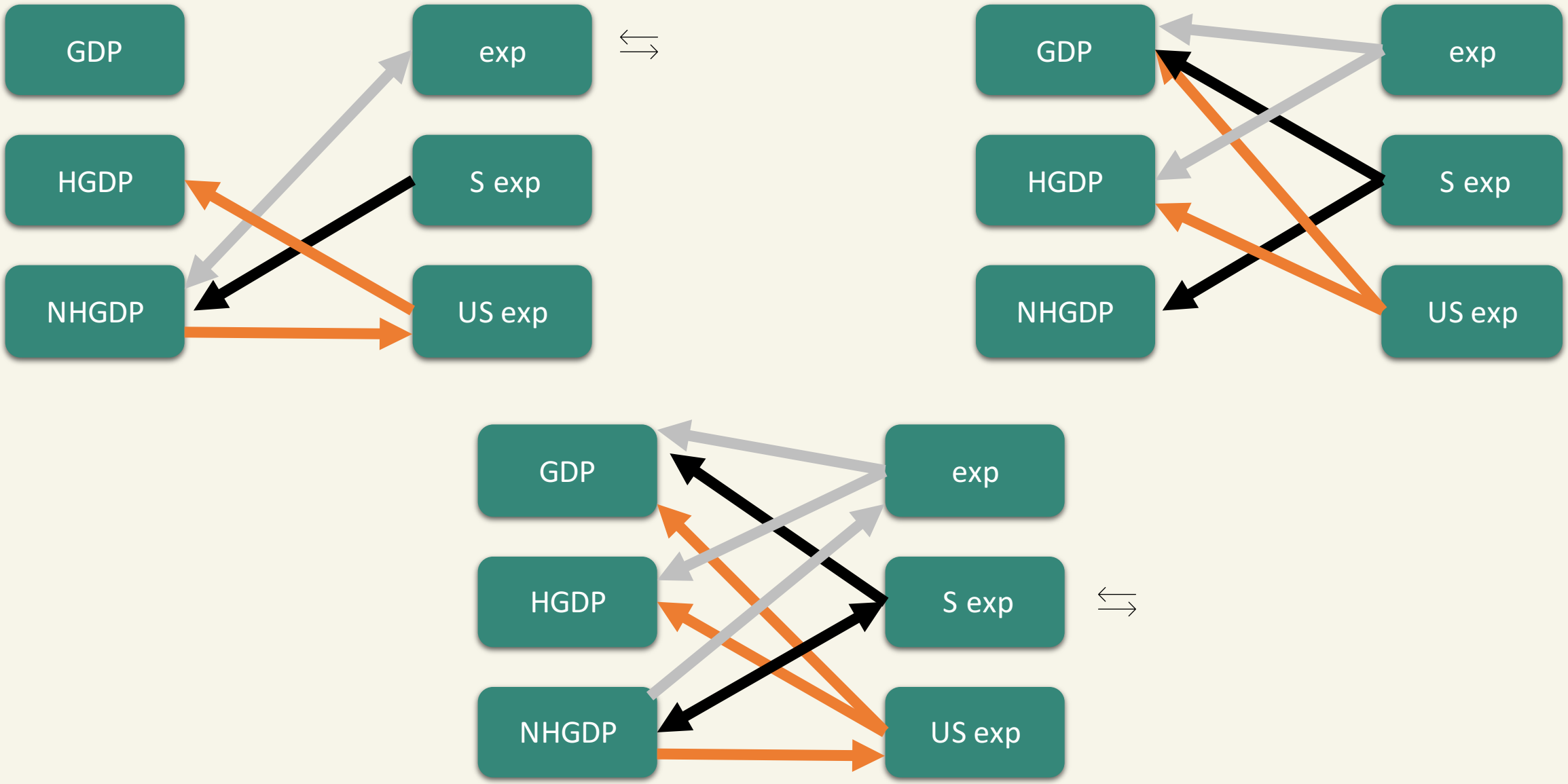
Causality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Empirical Results and Discussion

- Chicken-Egg relationship is found between *Expats* and *NonHydrocarbon GDP* in the short term; and
- between *Skilled Expats* and *NonHydrocarbon GDP*, in the joint term.

- The number of *Expats* has a granger causality with *GDP* at some aggregated and disaggregated levels, in the long term.

- *Skilled Expats* granger causes *NonHydrocarbon GDP*, in all terms.
- *Unskilled Expats* granger causes *Hydrocarbon GDP*, in all terms.

- *NonHydrocarbon GDP* has a granger causality with *Unskilled Expats* in the short and joint term, and with total *Expats* in the joint term.

- ✓ Foreign Labor in Oman plays a significant role in the economic growth, and not visa versa.
  - ✓ NonHydrocarbon sector growth could lead to a higher demand for foreign labor.
- ✓ Foreign Labor in Oman has more remarkable linkage with NonHydrocarbon sector than the Hydrocarbon sector. (Skilled & Unskilled Expats)
- ✓ Relationships are negative in the shot term due to adjustment to a new country and productivity reasons.
- ✓ Findings provide a guide to policymakers in Oman and the GCC countries on labor market correlations and dynamics so as to initiate effective labor market reforms and promote jobs for nationals.

Conclusion

Several policies to address the economic and social challenges:

1. **Developing a skilled local workforce:** investing in quality education and training programs, financial assistance, incentives to private sector. (targeted sectors)
2. **Increasing labor market participation of women**: underrepresented in the labor force; promoting gender equality.
3. **Encouraging private sector growth**: creating more jobs for locals, reducing! the dependence on foreign labor → by reducing barriers to entry, providing incentives, one-stop shop for business registration and licensing.
4. **Implementing labor market reforms**: reducing the sponsorship system and improving working conditions for workers → improving the welfare of workers.
5. **Promoting entrepreneurship**: create job opportunities for locals, access to financing, supporting business incubators and accelerators, promoting innovation and R&D.

Conclusion

Acknowledgment

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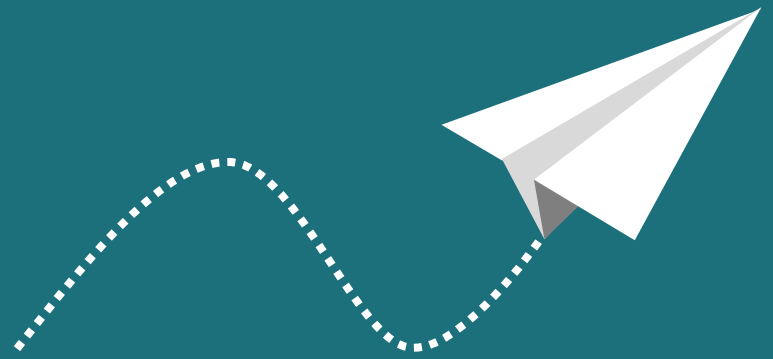
- This research work was supported by Abu Dhabi National Oil Company (ADNOC), Emirates NBD, Sharjah Electricity Water & Gas Authority (SEWA), Technology Innovation Institute (TII) and GSK as the sponsors of the 4th Forum for Women in Research (QUWA): Sustaining Women's Empowerment in Research & Innovation at University of Sharjah.

Thank You



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Analysis and Economic
Modelling Department

Central Bank of Oman,
Muscat, Oman

Summary of results for the 27 models

Model #	Dependent Variable	Independent Variables	Timeline	Effect
Model 1	GDP	Total Expatriate Labor, Government Expenditure	Short term	-ve
			Long term	+ve
Model 2	HGDP	Total Expatriate Labor, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 3	NHGDP	Total Expatriate Labor, Government Expenditure	Short term	insignificant
			Long term	+ve
Model 4	GDP	Skilled Expatriate Labor, Government Expenditure	Short term	-ve
			Long term	+ve
Model 5	HGDP	Skilled Expatriate Labor, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 6	NHGDP	Skilled Expatriate Labor, Government Expenditure	Short term	insignificant
			Long term	+ve
Model 7	GDP	Unskilled Expatriate Labor, Government Expenditure	Short term	-ve
			Long term	+ve
Model 8	HGDP	Unskilled Expatriate Labor, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 9	NHGDP	Unskilled Expatriate Labor, Government Expenditure	Short term	insignificant
			Long term	+ve

Model #	Dependent Variable	Independent Variables	Timeline	Effect
Model 10	Total Expatriate Labor	Total GDP, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 11	Total Expatriate Labor	Hydrocarbon GDP, Government Expenditure	Short term	insignificant
			Long term	+ve
Model 12	Total Expatriate Labor	Non-Hydrocarbon GDP, Government Expenditure	Short term	insignificant
			Long term	+ve
Model 13	Skilled Expatriate Labor	Total GDP, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 14	Skilled Expatriate Labor	Hydrocarbon GDP, Government Expenditure	Short term	insignificant
			Long term	+ve
Model 15	Skilled Expatriate Labor	Non-Hydrocarbon GDP, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 16	Unskilled Expatriate Labor	Total GDP, Government Expenditure	Short term	insignificant
			Long term	insignificant
Model 17	Unskilled Expatriate Labor	Hydrocarbon GDP, Government Expenditure	Short term	insignificant
			Long term	+ve
Model 18	Unskilled Expatriate Labor	Non-Hydrocarbon GDP, Government Expenditure	Short term	insignificant
			Long term	+ve

Model #	Dependent Variable	Independent Variables	Timeline	Effect
Model 19	Government Expenditure	Total GDP, Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 20	Government Expenditure	Hydrocarbon GDP, Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 21	Government Expenditure	Non-Hydrocarbon GDP, Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 22	Government Expenditure	Total GDP, Skilled Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 23	Government Expenditure	Hydrocarbon GDP, Skilled Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 24	Government Expenditure	Non-Hydrocarbon GDP, Skilled Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 25	Government Expenditure	Total GDP, Unskilled Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 26	Government Expenditure	Hydrocarbon GDP, Unskilled Expatriate Labor	Short term	insignificant
			Long term	insignificant
Model 27	Government Expenditure	Non-Hydrocarbon GDP, Unskilled Expatriate Labor	Short term	insignificant
			Long term	insignificant