BUSINESS CYCLE SYNCHRONIZATION IN THE ARAB REGION: RECYCLING PETRODOLLARS IN THROUGH TRADE AND REMITTANCES

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Motivation

• Higher economic growth in oil-exporters is associated with higher growth in oil importers, though correlation is not that strong.

*Real output correlations between oil-rich and oil-importing Arab countries*
Motivation

• Understanding business cycles and their drivers helps us
  • Identify the impact of economic ties between countries
  • Assess how (the channels) shocks can get transmitted from one country to another
  • Alternatively, how economic conditions in one country can affect positively or negatively affect another country
  • Better understand growth developments
Objective and contribution

• This paper estimates the determinants of BCS in the case of Arab countries

• Which channel matters: trade, finance or remittances?

• Among the few papers that
  – Studies BCS in the Arab world with a focus on channels of transmission (Cashin et al., 2014).
  – Recognizes that remittances can act as a channel of transmission of business cycle shocks (Barajas et al., 2012).
  – Uses bilateral data on trade and remittances (Ilahi and Shendy, 2008).
  – Applies a system of simultaneous equation (suggested by Imbs, 2004) in order to test the simultaneous effects of bilateral trade, remittances and cross-country differences in production structures.
Outline

1. Stylized facts
2. Theory
3. Data and methodology
4. Empirical results
5. Conclusion
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1. Stylized facts
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I. Stylized facts: External flows

- Oil-importing economies are primarily dependent on exports and then remittances but much less FDI

- These flows tend to increase during oil booms and recede during busts

*External flows to non-oil economies and growth in RR economies*
I. Stylized facts: trade

• Exports in non-oil economies are correlated with GDP in resource-rich economies.

The graph illustrates the correlation of external flows to non-oil economies and growth in RR economies. The equation is given by:

\[ y = 1.4315x - 6.4123 \]

and the goodness of fit is given by:

\[ R^2 = 0.9534 \]
As a result of the lack of shared common technical regulations and conformity measures between Arab countries, intra-trade among the Leagues of Arab States (LAS) is quite low.
I. Stylized facts: remittances

- Correlation of incoming remittances to non-oil economies with GDP of resource-rich economies is high

![Graph showing the relationship between Remittances and GDP](image)
1. Stylized facts: remittances

- Remittances inflows in Jordan and Egypt are as high as 10 percent of GDP while they are lower in other countries and they are much higher than FDI (except in Lebanon).
I. Stylized facts: bilateral remittances

**Opposite patterns:**

- Remittances in Egypt and Jordan from the GCC account for at least half of the total remittances received in those countries.
- Migrants from Tunisia and Morocco are more exposed to Europe.

*Incoming remittances by sending country*
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II. Theory

• Drivers of Business cycle correlation

1. Trade: (+) because consumption can increase trade. 
   (-) if trade triggers inter-industry specialization, 
   trading economies will become prone to industry-specific shocks

2. Finance  (+) if cross-border stock market exposure between 
   countries is high, then a decline in one country’s stock market 
   could induce a simultaneous decline in the demand for domestic 
   consumption and investment goods in another. 
   (+) financial contagion
   (-) if liquidity constraints, imperfect information or 
   regulatory limits to capital flows lead to capital flows’ reversals 
   and investment herding behaviour,
   (+) if financial integration stimulate production 
   specialization and if countries use of financial markets to 
   diversify consumption risks
II. Theory

• Drivers of Business cycle correlation

3. Specialization may have direct effects on output co-movements independent of trade and finance (Imbs, 2004)

4. Remittances:
   • Theory of BSC did not incorporate remittances as a driver
   • Shy empirical work (Barajas et al., 2012) and Abdih (2012)
   • We borrow from the literature on determinants of remittances
     (+) remittances can be pro-cyclical with the host country’s income
     (-) or limited if remittances are not used to finance consumption and/to enhance investment in physical capital and human capital formation
     (-) if host country is experiencing a downturn, so that migrants are forced to return to their home countries with their savings.
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Data and Indices

• We use annual data between 2010-2014.
• Bilateral output correlations in business cycles $p$ are computed on the basis of the cyclical component of annual real GDP (from WDI) using the Hodrick-Prescott filter.

• Bilateral trade (from the Trade Map (International Trade Center, Geneva) is computed using the sum of bilateral exports and imports.

• Similarity Index:

$$S_{ij} = \frac{1}{T} \sum_t \sum_n |s_{ni} - s_{nj}|$$

• where $S_{n,i}$ denotes the GDP share of industry $n$ in country $I$; $T=$number of the trading partners.

• $S$ reaches its maximal value for two countries with no sector in common.

• Sectoral shares are from the WDI.

• Bilateral remittances data are from the WB global migration database.
Methodology

• The paper follows Imbs (2004) to investigate the determinants of BCS

• Which was the first to do so in a context of a system of simultaneous equations (SSE).

• The SSE relate bilateral output correlations to measures of trade and finance as follows:

\[
\begin{align*}
\rho_{ij} &= \alpha_0 + \alpha_1 T_{ij} + \alpha_2 S_{ij} + \alpha_3 R_{ij} + \alpha_4 I_{1ij} + \epsilon_{1ij} \quad (1) \\
T_{ij} &= \beta_0 + \beta_1 S_{ij} + \beta_2 I_{2ij} + \epsilon_{2ij} \quad (2) \\
S_{ij} &= \gamma_0 + \gamma_1 T_{ij} + \gamma_2 R_{ij} + \gamma_3 I_{3ij} + \epsilon_{3ij} \quad (3) \\
R_{ij} &= \delta_0 + \delta_1 I_{4ij} \quad (4)
\end{align*}
\]
Methodology

• The estimation strategy combines the features of simultaneous equations procedures, and allow for the possible endogeneity of some dependent variables, since for instances specialization can be endogenous to trade and vice versa.

• The use of instruments helps isolate the different components of the endogenous variables

• Our system of equations has been estimated using different techniques namely 2 Stages Least Squares (2SLS), Ordinary Least Squares (OLS), Seemingly Unrelated Regressions (SURE) and sure with OLS degrees-of-freedom adjustment (MVREG).

• Results remain relatively robust across estimation methods.
Identification

- **Business cycle equation**: includes trade, remittances and similarity.
- **The trade equation**: a gravity-type equation is used where $I_2$ includes bilateral distance, whether the two countries share common borders, common language, and whether they have been colonized by the same colonizer. Gravity variables come from the CEPIII dataset.
- **The similarity equation**, the vector $I_3$ includes the product of their GDP/capita and the GDP gap between the two countries (obtained from WDI).
- **In the remittances equation**, the last vector $I_4$ includes the share of oil rents in both the sending and the receiving country.
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### Findings (1)

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<td>Ln(GDP imp)</td>
<td>0.732***</td>
<td>(0.116)</td>
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<tr>
<td>Ln(GDP exp)</td>
<td>0.959***</td>
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<td>Similarity</td>
<td>0.369**</td>
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<td>Ln(Dist)</td>
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<td>Contig</td>
<td>0.167</td>
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<td>(0.375)</td>
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<td>Colony</td>
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<td>(0.833)</td>
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<td>Com col.</td>
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<td>Time to trade</td>
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## Findings (2)

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<td>Ln(Trade)</td>
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<td>(0.0223)</td>
<td>(0.00825)</td>
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<td>Rem/GDP</td>
<td>-13.71*</td>
<td>7.548**</td>
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<td>(7.968)</td>
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<td>Diff. Time to st. bus.</td>
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<td>Oil rents/GDP imp</td>
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<td>-6.60e-05***</td>
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<td>(0.298)</td>
<td>(4.523)</td>
<td>(0.132)</td>
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<td>Constant</td>
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<td>205</td>
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<td>R-squared</td>
<td>0.049</td>
<td>0.522</td>
<td>0.063</td>
<td>0.106</td>
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Findings (3)

• *Business cycle equation:*

  1. Business cycles are mainly affected by patterns of specialization (similarity index), suggesting that two economies with similar structure are more correlated.

  2. Remittances have a negative and significant impact on the correlation of the business cycle between different economies (counter-intuitive result).

  3. Trade has no direct effect on business cycle correlations. Yet, this result could be attributed to the trivial share of intra-Arab trade and the divergence of their productive structures.
Findings (4)

**Trade equation:**

4. The gravity variables all have the expected signs but the similarity index is not significant.

**Similarity equation:**

5. The effect of the product of the GDP/capita of the two partners on similarity is significant: Similarities in economic structure result in correlated business cycles.
6. Remittances also affect similarity positively.
7. Bilateral trade is negatively correlated with similarity.

**Remittances equation:**

8. The higher the share of oil rents to GDP in the sending country, the higher the share of remittances to GDP. This finding is intuitive given that the most important remitting countries are highly dependent on oil.
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Preliminary Conclusions

• The aim of the paper was to empirically determine the drivers of BSC among Arab countries
• So far, empirical results point that:

1. Countries with similar productive structures have more synchronized business cycles.

2. Remittances lead to less synchronized business cycles though they are positively associated with oil rents in sending economies.

3. while trade has no significant effect.
Further research

Very much work in progress:

1. Include finance in the SSE (still looking for bilateral FDI data).

2. Include high-frequency data for GDP (quarterly) to calculate output correlations.

3. Include higher-level (two-digit) value-added data) from UNIDO.

4. Use rent per capita instead of oil rents which better captures level of development and also excess liquidity.

5. Attempt to lengthen the sample period in order to know more about the different types of business cycles (downturns and upswings but data limitations so far).

6. Enlarging the sample could shed light on the extent to which Arab countries differ from global trends.
Thanks for your attention!