The Economics of the South Stream Pipeline in the Context of Russo-Ukrainian Gas Bargaining

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I. The context

II. The South Stream System

III. South Stream Cost

IV. South Stream Value

V. South Stream and Ukraine’s transit profits

VI. Conclusions
The context

• EU-Russia gas trade is important for

  – Russia:
    • Gas exports generate 4.5% of Russian GDP or half of Gazprom's revenue
    • Tax receipts from gas exports amount to 30% of Russia's defence budget

  – and for Europe:
    • 25% of European consumption is covered by Russian gas
The context (2)

The EU-Russia gas trade is highly dependent on Ukraine.
The context (3)

- Several transit disruptions through Ukraine since the fall of the USSR raised concerns about its reliability...

...and what is worse, Europe has been a collateral victim of these bilateral gas disputes.
The context (4)

Gazprom’s solution: Export route diversification strategy since early 1990s
Research question

• Given that Nord Stream is under construction

Will South Stream be built?
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The South Stream system

- Off-shore pipeline under the Black Sea (A-B):
  Total Capacity: 63 bcm;
  Length: ~900 km

- Northern route:
  1. Bulgaria-Serbia (B-F): ~960 km
  2. Serbia-Hungary (F-G): ~530 km
  3. Hungary-Slovenia (G-H): ~610 km
  4. Hungary-Austria (G-J): ~350 km
  5. Slovenia-Austria (H-I): ~220 km

- Southern route:
  1. Bulgaria-Greece (B-C): ~416 km
  2. Greece (C-D): ~690 km
  3. Greece-Italy (D-E): ~200 km

- Cost estimates:
  - Gazprom (2010): €15.5 Bn
The South Stream System in Russia

- South Stream would begin at Pochinki

- From Pochinki to Beregovaya (South Stream offshore):
  1. Existing lines ~ 32 bcm;
  2. A new pipeline from Pochinki to Beregovaya ~ 32 bcm

- Possible gas sources:
  1. Fields in operation: Nadym-Pur-Taz (NPT) region
  2. Yamal Peninsula (Gryazovets-Pochinki bi-directional pipeline ~ 36 bcm)
  3. Central Asia

- Total anticipated pipeline expansion in Russia ~2200 km

Source: adapted from eegas.com
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South Stream Construction Cost

- Cost of onshore pipelines:
  - Based on engineering model (WB, 2010)

- Cost of offshore pipelines:
  - Based on econometric estimation

- Project-related uncertainties:
  - Monte-Carlo simulation with key assumptions
Transporting gas to Germany and Italy

- On average, it is cheaper to use the Ukrainian route to export gas to Germany and Italy
- Transporting gas from Azerbaijan is cheaper through South Stream
Transporting gas to Southern Europe

US$/tcm

South Stream
Ukrainian route
Fields in operation (NPT)

Yamal Peninsula
Turkmenistan

Azerbaijan

BG - Bulgaria
TK - Turkey
GR - Greece
RS - Serbia
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Deriving South Stream value

- **South Stream value** = changes in Gazprom’s profit when South Stream is built versus when it is not built.

- A computational, strategic gas market model (Chyong & Hobbs, 2011) is used to calculate the South Stream value under:
  1. Different demand scenarios, and
  2. Different values of transit fees through Ukraine

- Major assumptions:
  1. Nord Stream is built by 2013 (55 bcm)
  2. Ukraine’s transit fee is fixed exogenously

### Demand Scenarios: 2011-2030

<table>
<thead>
<tr>
<th>Region</th>
<th>Low Demand case</th>
<th>Base case</th>
<th>High Demand case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western and Southern Europe</td>
<td>-0.2%</td>
<td>+0.7%</td>
<td>+1.9%</td>
</tr>
<tr>
<td>Central and Eastern Europe</td>
<td>-0.2%</td>
<td>+0.8%</td>
<td>+1.9%</td>
</tr>
<tr>
<td>Balkan Countries</td>
<td>-0.2%</td>
<td>+0.8%</td>
<td>+1.9%</td>
</tr>
</tbody>
</table>

Source: Base and Low Demand cases - IEA (2009)  
High Demand case - IEA (2000-2007)

<table>
<thead>
<tr>
<th>Short-run transit cost</th>
<th>Current transit fee</th>
<th>High transit fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50</td>
<td>2.07</td>
<td>5.11</td>
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</table>

**Transit fees through Ukraine ($/tcm/100km)**
South Stream Value

US$ Bn (NPV)

Low Demand Case  Base Case  High Demand Case

Average  90% Conf. interval

- Short-run transit cost
- Current transit fee
- High transit fee
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Ukraine’s transit profits
Ukraine’s net benefit of not raising the transit fee over 30 years

An impatient Ukraine would raise its transit fee, triggering the construction of South Stream

Source: (Vitrenko, 2008; Kovalko&Vitrenko, 2009)
Conclusions

• The value of South Stream investment is only positive when:
  – Gas demand in Europe is expected to be very high (+1.9% p.a.), or
  – When Ukraine raises its transit fee considerably

• Naftogaz’s corporate governance issues make its discount rate very high, which explains its willingness to bargain with Russia

• If Ukraine bargains to raise its transit fee sufficiently high, then South Stream would be built leading to the undesirable longer-term outcome of being completely bypassed by Gazprom

• To avoid this outcome, Ukraine would need to find ways to reduce the very high discount rate of Naftogaz, perhaps via restructuring and privatization
THANK YOU!