Norwegian wine imports: a gravity model approach

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To investigate:

-the main determinants of wine imports in Norway

-if tourism can have a role as potential driving factor (...exists a relationship between the Norwegian holiday experience and their wine consumptions)
Why Norway?
Nowadays, wine has become a part of the diet among large groups of the Norwegian population.

After 1970 Norwegian wine imports have strongly increased.
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Ås
The alcoholic trade is a State Monopoly.

Alcoholic beverages up 4.75 of alcohol volume can be sold only in special government outlets:

“Vinmonopolet”.

Established in 1922

To contrast the abuse of alcohol consumption

Educator
Wine trade in Norway

Norge
(259 Butikker)

- Akershus (22 butikker)
- Aust-Agder (6 butikker)
- Buskerud (13 butikker)
- Finnmark (9 butikker)
- Hedmark (12 butikker)
- Nordland (17 butikker)
- Nord-Trøndelag (9 butikker)
- Oppland (16 butikker)
- Oslo (26 butikker)
- Rogaland (15 butikker)
- Sogn og Fjordane (10 butikker)
- Sør-Trøndelag (17 butikker)
- Telemark (11 butikker)
- Troms (11 butikker)
- Vest-Agder (9 butikker)
- Vestfold (9 butikker)
- Østfold (10 butikker)
The Vinmonopolet divides wines in different lists:

- Basic
- Single lot
- Order
- Test
- Additional
In 2010 the Norwegian wine imports were equal to 387 million of dollars.

The Vinmonopolet absorbs around the 80%.

The other 20% is shared between HORECA and Duty Free.
Wine trade in Norway

Imports of wine in Norway

Source: Statistisk sentralbyrå
Norwegian wine market shares by country of origin

75% of the total market
Wine trade in Norway

Norwegian wine market shares by country of origin

- Australia: 5%
- Chile: 4%
- Argentina: 2%
- United States: 2%
- Others: 12%
Focus in the attention on the main exporters countries we have analysed the imports trend

Europeans  Non Europeans
Norwegian wine imports from the main European countries

Source: Statistisk sentralbyrå
Norwegian wine imports from the main non-European countries

Source: Statistisk sentralbyrå
We believe it’s interesting to parallel the previous data to the information regarding the Norwegian outbound tourism demand.
Average night per year spent by Norwegians on holiday

Source: our elaboration on EUROSTAT data
The European destinations collect the great part of total outbound Norwegian tourism flows, but the major destinations don’t correspond at the major exporter wine countries.
Norwegians on holiday

19% Germany
15% Sweden
14% Denmark
12% UK
7% USA
Norwegians on holiday

Outbound Norwegian tourism flows directed to European countries

Source: EUROSTAT
Norwegians on holiday

Outbound Norwegian tourism flows directed to non-European countries

Source: EUROSTAT
Giving the object of the analysis, the gravity model has been considered the natural context where conducting the empirical investigation.

The gravity model has many applications in different fields of empirical research, in particular in migration and international trade.
The gravity model employed considers unilateral wine imports from the major exporting countries as dependent variable.

\[ imp_{j,t} = \alpha_j + \beta_0 imp_{j,t-1} + \beta_1 tur_{j,t} + \beta_2 res_{j,t} + \beta_4 dist_j + \beta_5 price_{j,t} + \varepsilon_{j,t} \]
The lagged variable \( (imp_{j,t-1}) \) captures the tendency of Norwegian to import wine from the same country.

The covariate \( tur_{j,t} \) tests whether the Norwegians' choice with respect to an holiday destination can influence their wine consumption once back in Norway.

The variable \( res_{j,t} \) tells us if foreign residents prefer to consume wine coming from their own country.
Being the proposed econometric model a dynamic panel regression model with the lagged dependent variable among regressors, the system GMM estimator has been considered as the appropriate econometric tool to conduct the empirical analysis.

This estimation technique is particularly suitable to correct for the dynamic endogeneity.

Moreover, it accommodates situations with fixed effects and autocorrelation within individuals.
It is common in the Gravity Model that...

... the flows of the considered good between two different regions or countries depend positively on their sizes and negatively on the distance.
The period covered is 1995-2009

22 countries of origin

1 country of destination
### Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
<th>SE</th>
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<tbody>
<tr>
<td>$Imp_{j,t-1}$</td>
<td>0.61****</td>
<td>0.1301</td>
</tr>
<tr>
<td>$tur_{j,t}$</td>
<td>0.26*</td>
<td>0.1592</td>
</tr>
<tr>
<td>$res_{j,t}$</td>
<td>- 0.25*</td>
<td>0.1328</td>
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<tr>
<td>$dist_{i,j}$</td>
<td>0.45**</td>
<td>0.2262</td>
</tr>
<tr>
<td>$price_{i,t}$</td>
<td>- 4.59**</td>
<td>2.0975</td>
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<tr>
<td>$Const$</td>
<td>4.76</td>
<td>3.5609</td>
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<tr>
<th>Obs</th>
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<tbody>
<tr>
<td>$Nr. of instruments$</td>
<td>29</td>
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<table>
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<tr>
<th>Abond AR(1)</th>
<th>Pr &gt; z =</th>
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<td>0.010</td>
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<th>Abond AR(2)</th>
<th>Pr &gt; z =</th>
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<td>0.597</td>
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<tr>
<th>Hansen</th>
<th>Prob &gt; chi2 =</th>
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<tr>
<td></td>
<td>0.646</td>
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Note: The system GMM estimator has been applied using the *xtabond2* command in Stata (Roodman, 2006). The lag of the dependent variable is treated as endogenous. Standard errors are robust to heteroskedasticity. Stars denote p-values as follows: * p<0.10; ** p<0.05; *** p<0.01; **** p<0.001.
The lagged dependent variable is statically significant showing a positive elasticity of 0.61 that reveals the presence of important habit persistence in the behavior of Norwegian wine imports.

A positive elasticity of 0.26 is also estimated for $\text{tur}_{j,t}$ which means that Norwegian tourism flows directly to a country positively influence the wine imports from such a country.
Low statistical significance is found for the variable $res_{j,t}$, which shows a negative elasticity (-0.25).

We found a surprising positive elasticity for distance (0.45) and, as expected, a negative elasticity for relative price (-4.59).
Norwegian wine imports do not seem to be discouraged by the distance with respect to the exporting countries.

Norwegian wine consumers seem to be attracted by new wines.

This result can be due also to the role played by the Vinmonopolet, which doesn’t discriminate wines according to the region of origin.

Norwegian tourism flows play a positive role in the wine imports.
Final remarks

The high significant coefficient reported by relative prices reveals that Norwegian wine imports are strongly negatively affected by price differentials.

The statistical significance of the lagged dependent variable reveals the presence of important habit persistence in the behavior of Norwegian wine imports.
Final remarks

The negative sign (-0.25) found for the variable $res_{j,t}$, would mean that...

... the number of people choosing to live in Norway acts as pushing factor for the Norwegian imports.

Alternatively...

it means that the residents from the exporting country $j$ prefer to consume wines coming from others exporting countries.
Thank you for Your Attention