Two figures, one showing the market values of soccer players in Germany and the other showing the statistical procedure for determining player market value.

### Market Values of Soccer Players in Germany

#### Data Base

- Market Values: Gathered from [www.transfermarkt.de](http://www.transfermarkt.de) (Statistics for over 37,000 players)
- Skill Data: Gathered from [www.fifa-manager.com](http://www.fifa-manager.com) (Player ratings for soccer simulation)

- Market Values: Based on survey of professional/expert audience
- Skill Data: Based on survey of registered site-users and experts

For 296 soccer players in German Bundesliga, 48 attributes were gathered.

#### Robust PCA

Matrix of loadings for robust PCA with $k = 7$ factors.

#### Robust Regression Results

Relative contribution of factors to player’s market value (grouped by role).

### Attributes of Skills and Physique

<table>
<thead>
<tr>
<th>Skills</th>
<th>Physicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>Motion</td>
</tr>
<tr>
<td>Passing</td>
<td>Speed</td>
</tr>
<tr>
<td>Ball Control</td>
<td>Stamina</td>
</tr>
<tr>
<td>Defensive</td>
<td>Athletics</td>
</tr>
<tr>
<td>Heading</td>
<td>Jumping</td>
</tr>
<tr>
<td>Tackling</td>
<td>Robustness</td>
</tr>
<tr>
<td>Offensive</td>
<td>Gymnastics</td>
</tr>
<tr>
<td>Shot Accuracy</td>
<td>Balance</td>
</tr>
<tr>
<td>Shot Power</td>
<td>Agility</td>
</tr>
</tbody>
</table>

### Statistical Procedure

1. **Explanatory**
2. **Dependent**
3. **Skill Data Set**
   - Robust PCA
   - Logarithm
   - Extract factors with $PCA_{proj}$
   - Robust regression analysis
   - Extract factors with $PCA_{proj}$
   - Robust regression models with $ltsReg$ for
   - Defense players
   - Midfielders
   - Forward players
   - Identify outliers

### Outlier

- **Name**
- **Surname**
- **Club**
- **MV**
- **Fitted MV**
- **Gap (%)**

#### References


### Contact

- **Thomas Kirschstein**
  - thomas.kirschstein@wiwi.uni-halle.de

- **Steffen Liebscher**
  - steffen.liebscher@wiwi.uni-halle.de

- **Peter Bönisch**
  - peter.boenisch@wiwi.uni-halle.de

Martin-Luther-University
Gr. Steinstrasse 73
06099 Halle (Saale)
GERMANY