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## Do local or global risk factors explain the size, value and momentum trading pay-offs on the Warsaw Stock Exchange?

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relationship between Polish, European and global currency-adjusted small minus big (SMB) and high minus low (HML). It is further shown that after adjustment for fluctuations between USD and PLN, the magnitude and correlation structure between local and global risk factors change significantly.

Q Keywords: size and value effects momentum trading global risk factors international asset pricing

Warsaw Stock Exchange

Q JEL Classification: G12 G11

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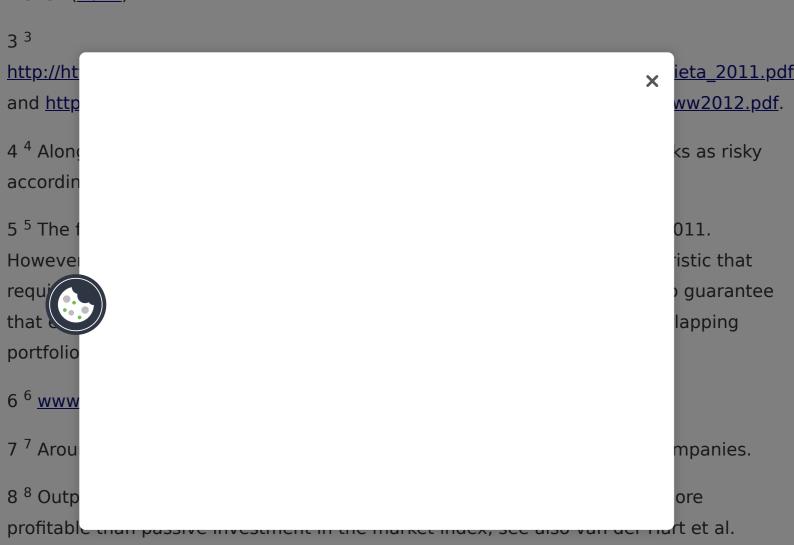
## **Funding**

This study was financially supported by the Graduate College 'Risk Analysis in Baltic States a in Frankfurt X (Oder). Notes 1 <sup>1</sup> See vidence. inter shifted from Giver if to why tock returns k-based and exist. Th behavio cet microstr ieral overviev ation of size tion of value and valu

effect, see Lakonishok et al. (1994). For the rational expectation-based interpretation of

value effect, see Zhang (2005), Petkova and Zhang (2005) and Petkova (2006). The theoretical defence of momentum as a risk-related effect can be found in, e.g., Chordia and Shivakumar (2002). Also Kang et al. (2011) examine the momentum relation to macroeconomic variables. Data related arguments come from, e.g., Kothari et al. (1995).

2 <sup>2</sup> The list of stocks available for short selling on the WSE can be viewed at <a href="http://http:\\www.gpw.pl/papiery\_wartosciowe\_dopuszczone\_do\_krotkiej\_sprzedazy">http://http:\\www.gpw.pl/papiery\_wartosciowe\_dopuszczone\_do\_krotkiej\_sprzedazy</a>. However, even if short selling is restricted, for the purpose of portfolio management the short portfolio can be used to underweight assets relative to the market index (De Groot et al., 2012). Size effect is shown to emerge from a tiny portion of microstocks, see Chan and Chen (1991), Fama and French (2007) and De Moor and Sercu (2013), among others. Regarding momentum trading, Hong et al. (2000), Grinblatt and Moskowitz (2004) and Lesmond et al. (2004) claim that profits yield from the short positions in small, illiquid stocks' related to higher transaction costs. The latter paper shows that transaction costs of small stocks are much higher than previously stated and that momentum 'paper profits' are spurious. However, Israel and Moskowitz (2013) argue that this evidence is sample specific. Furthermore, the value strategy was shown to be particularly strong among small stocks, see, e.g., Petkova and Zhang (2005), Fama and French (2012).



(2005). Lesmond et al. (2004) consider additionally the middle, nontraded portfolio, but the authors follow a different grouping technique.

9 <sup>9</sup> The public pension system reform in 1999 introduced the option to join the privately managed open-end pension funds that started to invest on the WSE.

10 <sup>10</sup> I use the value-weighted market returns for consistency with the CAPM assumption that the return to stocks measures the return to the aggregate wealth portfolio, Jagannathan Wang (1996). Further, available European and global market risk factors are value-weighted. See Hou et al. (2011) for the use of equal-weighted market return and Griffin (2002) for both.

11 <sup>11</sup> For the rationale behind small minus big (SMB) and high minus low (HML) factors, see, e.g., Fama and French (1993) and the website of Kenneth French <a href="http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\_library.html">http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\_library.html</a>. To facilitate the comparison with, e.g., van der Hart et al. (2005), I follow earlier studies and proxy global factors with American counterparts.

12 12 http://http://www.nbp.pl/homen.aspx?c=/ascx/archen.ascx.

 $13^{13}$  Jegadeesh and Titman (1993) document an average monthly momentum profit of roughly 1% for the US market during their study period. However, their results hold for

different × 14 <sup>14</sup> Re y, the results for the 1 presented in the ar 15 15 Th actors is 0.69 (0. eriod 1990-2005/ market risk pren 16 16 Th SD/PLN exchang ed sample D of 0.06. period U 17 <sup>17</sup> Fai vide spectrur nes even if controlling for 90% of relevant aggregated market capitalization, rama and french

(2008) note that microstocks make 3% of the market capitalization in the NYSE/Amex/Nasdaq environment but 60% of the total stocks in number.

