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How many hominins walked on the slope of the Foresta ignimbrite deposit (Roccamonfina volcano, central Italy)?

Maria Rita Palombo^{1,*}, Adolfo Panarello²

¹ CNR - IGAG, Istituto di Geologia Ambientale e Geoingegneria, Area della Ricerca di Roma 1, Roma, Italy ² Laboratorio di Ricerche Storiche e Archeologiche dell'Anticihità, Dipartimento di Scienze Umane, Sociali e della Salute, Università di Cassino e del Lazio Meridionale, Cassino (FR), Italy *Corresponding author: mariarita.palombo46@gmail.com

ABSTRACT - The footprints left by the Palaeolithic hominins at the ca. 350 ka old Foresta "Devil's Trails" ichnosite (Tora-Piccilli, central Italy) are rather variable, even in a single trackway. The peculiar characteristics of the deposit and the acclivity of the soft, slipping slope the hominins were walking on, which forced trackmakers to change pace and walking direction, likely account for this variability. As a result, determining whether the footprints were left by distinct trackmakers, as it would be logical to hypothesize based on the main settings of the trackways, or by a single individual who descended the slope more than once in a short time span, is difficult. To try to answer the question, we have analysed the Foresta/"Devil's Trails" footprint sample by means of various statistical methods with the double aim of quantitatively defining the minimum number of hominin trackmakers who walked on the ignimbrite deposit's slope and scrutinizing to what extent the acclivity of the substrate and the position of each footprint on the slope may affect their dimensions and proportions. The obtained results suggest that four trackmakers (A, B, C, and E) walked on the ignimbrite slope of the deposit. Individuals A, B, and C most likely had similar foot sizes, whereas individual E had larger one. Conversely, more solid data are needed to support the hypothesis that a fifth individual, smaller in size, left the footprints of short sequence D. Furthermore, the results underline how much the coarse, soft, and slippery substrate, along with the slope acclivity, influenced the direction of walking and its changing, the velocity, the length of the stride, the pace stability, and the way in which the foot rests on the substrate slope and, in turn, the shape and size of the footprints. The synergetic action of these factors influenced the footprint proportions, which differ in dimensions even within the same trackway.

Keywords: Homo; footprints; pyroclastic substrate; Middle Pleistocene; MIS 10; statistical analyses.

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1. INTRODUCTION

The human trackways of the Foresta/"Devil's Trails" (F/ DT) ichnosite, first reported in 2003 (Mietto et al., 2003) and here analysed, were impressed by hominins walking on a pyroclastic ignimbrite unit (LS7) (Santello, 2010) of the Roccamonfina volcano (Brown Leucitic Tuff, BLT), which deposited during Plinian eruptions of the second period of the stratovolcano activity (385-230 ka) (Fig. 1).

Several ages have been proposed for the emplacement of the BLT formation, mainly ranging from 385 and 325 ka (e.g., Luhr and Giannetti, 1987; Radicati di Brozolo et al., 1988; Ballini et al., 1990 and references therein; Cole et al., 1992, 1993; De Rita and Giordano, 1996; Rouchon et al., 2008; Santello, 2010; Di Vito, 2022 and references therein). The radiometric dating of LS7 [345 ± 6 ka (Scaillet et al., 2008) and 349 ± 3 ka (Santello, 2010)], and LS8 eruptive events, which occurred at most after 3.24 ka the deposition of LS7 (cf. Santello, 2010, p. 67), indicate that humans and other animals left their footprints during a glacial phase (MIS 10, 374-337 ka), shortly before the Termination IV 8 (Cheng et al., 2009).

The surface on which hominins and other mammals left their tracks likely originated from rapid erosional processes that affected the still-soft pyroclastic flow after it had partially filled a pre-existing valley. The exposed surface of about 2,000 m² consists of a narrow sub-planar area at the top and a strongly downward-inclined surface



Fig. 1 - The Foresta/"Devil's Trails" ichnosite: a) location; b) geographic map; c) stratigraphic sketch (modified from Santello, 2010); d) south-western view of the trampled slope.

(average slope \sim 30°, max 80°) (Panarello et al., 2022a, 2022b). The presence of hominin trackways on this slope, as well as the texture and granulometry of the coarse substrate containing about 3-4% of lithic fragments (Santello, 2010), make the F/DT a unique ichnological site. Indeed, most of the hominin footprints known to date open air were impressed on the surface of cineritic deposits, alluvial muddy sediments, or have been found in an aeolian context and rarely on inclined surfaces (e.g., Cape South Coast, South Africa; Helm et al., 2018a, 2018b, 2019a, 2019b).

At the F/DT ichnosite, two different sets of footprints are present. Some are located on the sub-planar surface at the top of the ignimbrite unit LS7 (Figs. 1, 2), while others, which are the only ones analysed in this work, are located on the slope of the ignimbrite deposit (Fig. 3). The arrangement of the numerous bi-directionally oriented footprints impressed on the apical sub-planar surface suggests that hominins walked forth and back time by

time in this way. It represents the oldest known prehistoric pathway, more than 50 m long (Panarello, 2016; Panarello and Mietto, 2022 a,b; Panarello et al., 2017 a,b, 2020, 2022a and references therein). From this pathway, two long trackways (Trackway A, which is zeta-shaped, and Trackway B) branch out. Both trackways descend southeastward along the slope at a minimum distance of about 10.5 m from each other, showing a regular right-to-left succession. A third footprint sequence (Trackway C), also east oriented and divided into two segments by a natural and recent anthropogenic break of the slope, runs along the basal part of the inclined outcrop (Mietto et al., 2003; Avanzini et al., 2008, 2020; Panarello et al., 2017 a,b, 2022a and references therein). A quarry cut in the tuffaceous deposit abruptly interrupted a short sequence, Trackway E, consisting of four west-oriented footprints. Two other couples of footprints were also detected: D01 and D02 (testifying the presence of a trackway then destroyed by a rather recent anthropogenic cut), and F01 and F02,



Fig. 2 - Western view of the prehistoric pathway at the top of the Foresta/"Devil's Trails" ignimbrite deposit slope.

which are close to the long slide of a trackmaker foot (B09 footprint) that characterizes Trackway B (Panarello et al., 2020, 2022 a,b,c,d and references therein). Trackway B is characterised by the presence of a long fossil slip, B09, which has been named following the numbering order of the other footprints, being a step in the regular walking succession created by a long slide of the left foot. Since its length (about 90 cm) largely exceeds that of a footprint, it has been excluded from statistical analyses (Panarello et al., 2022 a,b,c,d).

When humans walked on the ignimbrite flow deposit, the temperature of the substrate had significantly decreased, but it was still soft because the wide circulation of water had soaked the surface in fluids. A neolithization process occurred as the temperature further decreased and was likely completed when the following LS8 pyroclastic unit covered the trampled surface without deforming the tracks and, in turn, permitting their preservation (Santello, 2010).

The soft and slippery substrate and the steepness of the slope affect the direction of walking and its changing, as well as the gait velocity, which influenced stride length, the way in which the foot rests against the substrate slope, and, in turn, the size and morphology of the footprint. As a result, footprints can differ within the same trackway in terms of shape, depth, length, and direction of the steps. Furthermore, it is difficult to establish whether the trackways are penecontemporary or have been left at a short time distance by several individuals, or perhaps by the same individual who descended the slope more than once.

Accordingly, the aim of this research is twofold: i) to quantitatively define the minimum number of hominin trackmakers who walked on the ignimbrite slope deposit; ii) to investigate to what extent the substrate acclivity and the position of each footprint on the slope might have affected the footprint dimensions and proportions.

2. MATERIAL

For the scientific purposes of the present research, we used the last official dimensional and morphometric data published in 2022 (Panarello et al., 2022 a,b,d).

We analysed the footprint morphometry of the three principal trackways (A, B, and C), of the few footprints of the short trackway E, and of the two very short successions of two-step directions of walking D and F. Footprints of the pathway at the top of the slope were excluded from the analysis due to the impossibility of recognizing single trackways as well as taking precise measurements. We analysed the footprints (50), for which it was possible to take both the maximum length and width (Tab. 1) (sample A, including the 23 footprints of Trackway A, the 17 of Trackway B, and the 6 of Trackway C, as well as the footprints D01, E02, E03, and F02), and the sample of the best-preserved traces (21), showing the clearest anatomical features (sample B, including the 9 selected footprints of Trackway A, the 9 ones of Trackway B, and the single selected footprints C05, E03, and F02). For comparison purposes, we also analysed footprints from some Cape South Coast (South African) ichnosites.

3. METHODS

We scrutinized the intra- and inter-trackway variation ranges by means of different statistical analyses [box plots, univariate analysis, bivariate analysis (reduced major axis, RMA), and multivariate analyses (similarity and principal component analysis)] based on the official dimensional and morphometric set of data collected and elaborated by the scientific team working at Foresta ichnosite (cf. Panarello et al., 2023) and published in 2022 (Panarello et al., 2022 a,b,d).

3.1. FOOTPRINT MEASUREMENTS

The F/DT human footprints have been measured and photographed repeatedly at a short distance during several surveys by more than one researcher. The mean value has been retained as the most probable valid measurement. Measurements have been taken using landmarks, which can be easily and quite reliably positioned on the preserved parts of each footprint of F/ DT (acropodion, pternion, and most distal points of the lateral and medial metatarsal tubercles), whatever their overall state of preservation (Fig. 4).

We conventionally measured the footprint area (Fa) by



Fig. 3 - General diagram of the Foresta/"Devil's Trails" ichnosite showing the patterns of trackways A, B, C, and E (modified after Panarello et al., 2023).

vectorializing the surface through a geometric polyline never created with less than 40 points, to approximate the actual surface with a percentage that does not affect the last decimal place with respect to the chosen accuracy.

We measured the depth of the footprints in the deepest point of the heel area and in the deeper forefoot area in the following way (Fig. 5):

1) A line parallel to the geographical horizon (HL) has been drawn from the first point of impact of the heel on the slope.

2) The heel depth was measured on the vertical of a

plumb line drawn from HL to the deepest point in the heel area.

3) The vertical of a plumb line led from HL to the deepest point of the forefoot area was used to measure the depth to the ball of the foot.

Photogrammetric 3D models, based on detailed footprint images, have been elaborated following Mallison and Wings (2014) by using the software Agisoft Photoscan Pro (version 0.9.0) and then scaled with metal comparators.

Following Falkingham et al. (2018) and Belvedere et

Tab. 1 - Measurements of the hominin footprints impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit.

			Footprint me	asurements		
Footprint	Footprint Length (FI) (mm)	Footprint width (Fw) (mm)	Fw/FI x 100 (Fin)	Footprint area (Fa) (sqmm)	Heel Depth (Hd) (cm)	Ball Depth (Bd) (cm)
A0l-L	25.7	11.1	43.2	240	1.5	3.5
A02-R	25.7	11.2	43.6	229	6.8	6.3
A03-L	24	11.2	46.7	197	2	2.6
A04-R	25.1	11.2	44.6	222	4.4	5.6
A05-L	23.1	10.5	45.4	185	12.6	15.1
A06-R	24.1	10.2	42.3	179	6.8	10.9
A07-L	23	10.3	44.8	173	4	4.4
A08-R	24.5	11.4	46.5	218	26.6	25.5
A09-R	23	10.7	46.5	179	2	7.1
Al0-L	20.9	9	43.1	135	10.7	17.7
A11-R	23.3	10.3	44.2	177	27	29.7
A12-L	22.5	10.4	46.2	184	24.4	25.5
A13-R	23.4	11	47	182	15.7	16.5
A14-L	22.3	11.4	51.1	190	7.3	8.5
A16-L	23.5	11.7	49.8	200	9.4	10.2
A17-R	24.8	11.2	45.2	211	16	16.1
A18-L	24.5	11.5	46.9	217	4.8	7.2
A19R	24.8	-	-	-	4.4	-
A20L	24.5	-	-	-	4.5	-
A21-R	24.5	11.6	46.8	227	18.2	18.6
A22-L	24.7	10.7	43.7	199	11.5	13.5
A23-R	24.5	10.8	44.1	204	9.8	10.9
A24-L	24.5	11.8	47.8	244	15	17.2
A25-R	24.5	11.7	47.7	212	17.4	17.4
A26-L	24.5	10.9	44.5	212	15.2	19.3
B00-L	22	10.3	46.8	197	3.8	4.1
B0l-R	22	11	50	194	3.7	5.7
B02-L	23	10.5	45.6	206	8.7	11.4
B03-R	23	10	43.5	179	4.4	8.5
B04-L	21	10	47.6	152	4.5	2.8
B05-R	23.2	10.5	45.2	199	12.1	11.6
B06-L	22.5	10	44.4	173	4.1	5.4
B07-R	23	10.5	45.6	196	4.9	7.8
B0B-L	22	11	50	201	3.5	6.7
B08a-R	22.5	11	48.9	181	19.6	23.2
B09-L	90.1	9.5	-	-	-	-
Bl0-R	21	10.5	50	167	30.2	33
B11-L	23	10	43.5	205	34.5	36
B12-R	23.2	10	43.1	173	15.9	16.4
B13-L	23.1	10.5	45.4	197	18.8	20.6

Tab. 1 - ... Continued

			Footprint me	easurements		
Footprint	Footprint Length (FI) (mm)	Footprint width (Fw) (mm)	Fw/FI x 100 (Fin)	Footprint area (Fa) (sqmm)	Heel Depth (Hd) (cm)	Ball Depth (Bd) (cm)
B14-R	-	11	-	-	11.8	13
B15-R	23.1	10.6	45.9	162	20.5	22.7
B16-L	23	10.4	45.2	179	23	23.2
B17-R	-	10	-	-	29.9	-
B18-L	23.1	10.4	45	195	24.3	27
B22-L	-	-	-	-	4.8	-
C05-R	22.6	10.4	46	185	-	-
C07-L	22.6	10.4	46	169	-	-
C08-R	22.1	10.5	47.5	172	7.3	9.3
C09-L	21.4	12	56.1	194	0.1	4.5
Cl0-R	24.6	10	40.6	194	0.2	2
C11-L	-	10	-	-	3	7.7
C12-R	24.2	9.5	39.2	176	4.1	8
C13-L	-	10	-	-	11.5	17.5
001-R	19.3	11.5	59.6	138	3	9.7
002-L	-	12	-	-	2.2	9
E02-L	27	11	40.7	246	-	-
E03-R	27	10.5	38.9	183	12.3	12.8
F02-R	25.9	10.5	40.5	189.5	-	-

al. (2013), depth maps and plans with millimetric level curves have been elaborated using Kitware Paraview software (see Panarello, 2020, 2022; Panarello et al., 2020, 2022 a,b,c,d for data and additional information).

3.2. STATISTICAL ANALYSIS

We analysed the intra-footprint, intra-track, and intertrack relationships among the dimensions of the footprints impressed on the volcanic slope by the Foresta hominins, applying univariate, bivariate, and multivariate statistical analyses to both samples, including all the measured footprints (sample A) and the samples characterised by the most accurate and precise measurements (sample B). We have analysed the dimensional variation ranges considering the four-dimensional variables (i.e., footprints maximum length (Fl), width (Fw), area (Fa), and the ratio of width against maximum length x 100 [(Fw/Fl)x100 in the text, Fin in figures 15-20], as well as the depth of heel (Hd) and ball (Bd)] of all footprints (Sample A) in all trackways and tracks, and in each A, B, and C trackways, and of the best-preserved footprints (Sample B) in all trackways and tracks, and in each A, and B trackways.

Furthermore, we applied the principal component multivariate analysis (PCA) to the human footprints

from some Cape South Coast (South African) ichnosites [Brenton-on-Sea, Garden Route National Park, Site 1, Goukamma Tracksite 1, Goukamma Nature Reserve (Tracksite 2) (Helm et al., 2018 a,b, 2019 a,b, 2020 a,b), in which footprints are impressed on inclined aeolian coastal substrates. The explanatory data analysis diagrams (box plots) were used for the visual representation of the dimensional variation in the two sites (Brenton 1 and Goukamma Tracksite 2), counting the richest footprint samples.

Analyses were conducted with the PAST (PAleontological STatistics) 3.16 software (Hammer et al., 2001).

3.2.1. Box Plots

Explanatory data analysis diagrams known as box plots and whisker plots are used to visually represent the distribution of numerical data and its skewness by displaying data quartiles (or percentiles) and medians for the visual representation of variation in the analysed sets of data, as well as to have an effective and easy-to-read statistical summary. A box plot is particularly suitable for comparing distributions because the average value and the overall variation range are immediately clear.



Fig. 4 - Dimensional conventions adopted for the Foresta/"Devil's Trails" human footprints measurements (modified after Panarello et al., 2023).



Fig. 5 - A graphic sketch of conventions adopted for measuring footprint depths.

3.2.2. Univariate analysis

We applied four normality tests (Shapiro-Wilk, Anderson-Darling, Lilliefors, and Jarque-Bera tests) to the measurements of the footprints of Trackways A, B (sample A, B), and C (sample A) to verify if the sample was taken from a footprint group with a normal distribution (null hypothesis). Among the applied tests, the Shapiro-Wilk and Anderson-Darling are the most exact, and the Lilliefors and Jarque-Bera are given for reference. A normal distribution is rejected if the given p (normal) is <0.05.

3.2.3. Bivariate analysis

We estimated the relationships between footprint length (dependent variable) and the other footprint parameters (width, area, and length vs. width ratio) (independent variables) by linear bivariate analysis, regressing logtransformed footprint length (dependent/response variable, y-axis) against log-transformed footprint parameters (footprint width, footprint area, and footprint length against footprint width ratio; independent/ predictor/explanatory variables, x-axis) of each footprint. We adopted a model II linear bivariate regression (reduced major axis, RMA), which is a common method for handling the problem of natural variability in both x and y, because it tries to reduce the x and y errors by minimizing the sums of squares of the perpendicular distance between each point and the regression line (e.g., Labarbera, 1989; Sokal and Rolf, 1995; Smith, 2009). It is preferable to the least squares method when a considerable variation between the variables is detected, since it is just a ratio of two standard deviations, making no distinction between independent and dependent variables. The RMA method is widely regarded as superior to the MA analysis because it is more likely to produce a significant fit to simulated data samples (e.g., Warton et al., 2006).

The footprint length scales with 'positive allometry' with respect to the focal dependent variable if the allometric exponent AE (slope) is >1, with 'negative allometry' if AE<1, while AE=1 indicates an isometric growth (Huxley and Teissier, 1936). Isometry implies geometric similarity such that no changes in shape with respect to the size occur (Schmidt-Nielsen, 1984).

Estimates of standard errors for slope and intercept imply both a normal distribution of residuals and independence between the variables and the variance of residuals. The RMA fitting, standard error estimation (which assumes a normal distribution of residuals and independence between variables and variance of residuals), slope comparison, and 95%-bootstrapped confidence limits (CII-CIu = lower and upper limits of the confidence interval) are given for all footprints impressed on the slope following Warton et al. (2006). The r² is Pearson's r correlation coefficient squared. The Monte Carlo permutation test (p) on correlation (r²) uses 9,999 replicates.

Residuals (the distances from each data point to the regression line in the x and y directions) were inspected by means of the Durbin-Watson test for analysing positive autocorrelation and negative autocorrelation of residuals, and the Breusch-Pagan test for verifying the normal distribution and independence between an independent variable and residual variance (homoskedasticity), though log-transformed generally avoids heteroskedasticity.

3.4. MULTIVARIATE ANALYSIS

We evaluated the similarity and differences among footprints by means of clustering (classic cluster analysis) and ordination (principal component analysis-PCA) methods.

3.4.1. Similarity

The hierarchical clustering routine has been successfully used in studies on hominins (e.g., Raichlen et al., 2008) and tetrapod footprints (e.g., Romano and Citton, 2017; Antonelli et al., 2023). We used this method to investigate if the footprint cluster is simply dependent on the putative trackmakers or if any inconsistencies in the footprint clustering might depend on their position on the slope affecting their shape and dimensions.

Cluster analysis is a multivariate technique aimed at grouping cases based on the similarity of their attributes, minimizing the distance within each group, and maximizing the distance between groups. It is commonly used to group a series of samples based on multiple variables (in this case, footprint dimensions) that have been defined for each case (e.g., individual footprints).

We have analysed the clustering of footprints as a whole and on a single trackway by using the unweighted pair-group average method (UPGMA). In UPGMA, the level at which a member (case, i.e., a footprint) joins an existing cluster is based on the average similarity of all the existing members, calculated from the original matrix of coefficients. Each member of a cluster, therefore, has an equal weight at all levels of clustering. Clusters are joined based on the average distance between all the members in the two groups.

3.4.2. Principal Component Analysis

We used PCA as a descriptive and exploratory multivariate technique, being a useful tool for summarising all the information that describes the similarities/differences of a set of cases in a small number of dimensions, regardless of the statistical proprieties of the data (Hammer and Harper, 2006).

According to this method, the positions of cases (footprints) plotted against the two axes (each corresponding to a dimension in space) depict the gradient of greatest variation along the "first" axis and the second largest gradient of variation along the "second" axis. The PCA finds, indeed, new hypothetical variables (linear combinations of the original variables) that account for as much as possible of the variance in multivariate data (e.g., Jolliffe and Cadima, 2016 and references therein). The eigenvalues and eigenvectors of the variance-covariance matrix, or the correlation matrix, are determined with the SVD algorithm, highlighting the factors (variables) that contribute more to join/separate cases (sites) from each other.

This method has frequently been applied also to analysing human footprints (e.g., Hatala, 2014; Citton et al., 2017; Romano and Citton, 2017; Duveau et al., 2018, 2019; Romano et al., 2019; Bennett et al., 2020; Wiseman et al., 2020; Antonelli et al., 2023).

We carried out the Principal Component Analysis (PCA) (a method that maximizes the variance of the projected data) to evaluate the extent of the difference among groups of footprints that belong to each trackway and validate whether the hypothesis that groups of footprints were left by different individuals may be considered or rejected, and whether the position of a footprint on the slope may affect or not affect the extent of its variance.

4. RESULTS

The footprints dimension in the three main trackways' (A, B, and C) are moderately variable within the same track but similar between one track and another, as evidenced by the statistical analyses, while the dimensions of a few footprints in the sequences E and D differ from all the others. Despite the modest dimensional differences and the very small number of footprints E, F, and D, the set of results and the spatial distribution of the footprints suggest that different trackmakers likely walked on the ignimbrite slope deposit, though some probably had a similar foot size, as detailed in the following paragraphs.

4.1. STATISTICAL ANALYSIS

The footprints of trackways A, B, and C are rather similar in length, ranging from 20.9 mm (A09) to 25.7 mm (A01 and A02), with a small difference even within a single trackway. The width variation range is proportionally larger, ranging from 9 mm (A10) to 12 mm (C09) (Tab. 1). As a result, it is not immediate to decide if the three trackways were left by three distinct individuals, as the trackway positions would suggest, or whether they were left by a single individual who walked down the slope several times in a short period of time. We used different statistical methods to answer the question, and to verify to what extent the variations in the dimensions and proportions were influenced by the depth, and in turn by the gait and the position of the foot on the slope.

For a comparative purpose, we conducted PCA on the human footprints from the selected Cape South Coast ichnosites mentioned above and use box plots for the visual representation of size ranges at the richest footprint samples from Brenton 1 and Goukamma Tracksite 2.

4.1.1. Footprint depth

The obtained results show, on the one hand, the significant dissimilarity of footprint depth from one point to another of the slope (Tabs. 1, 2) and, on the other hand, the good correlation of the depth variation shown by heel and ball (Fig. 6). The heel and ball depth vary from a few centimetres, or even millimetres (e.g., A01, A03, A09, C09, and C10 footprints) to about 35 cm (B11) and from 2 cm (C10) to 36 cm (B11), respectively. However, there is a clear prevalence of shallow footprints, as supported by the depth mean (average heel depth = 11.58 cm; average ball depth =13.52 cm), as well as by the values moderately positive of the skewness, indicating that the curve, likely mesokurtic, is right short-tailed. The value of both variation coefficients confirms (heel coefficient = 75.82; ball coefficient = 63.73) is, indeed, much higher not only than 20 (the maximum value for an acceptable standard deviation to the mean), but also than 30, the maximum value to be considered acceptable for a normal data distribution (see e.g., Sheret, 1984; Hammer and Harper, 2005; Mahmoudvand and Hassani, 2009; Shechtman, 2013; Aronhimae et al., 2014; Pélabon et al., 2020 and references therein for a discussion) (Tab. 2).

Tab. 2 - Summary of the univariate analysis statistics' data obtained for the heel and ball of all (samples A) and the best-preserved (Sample B) measured footprints impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit.

	UN	VIVARIATE STATI	STICS	
	Sample A (al	ll footprints)	Sample B (selec	cted footprints)
	Heel Depth	Ball Depth	Heel Depth	Ball Depth
N	46	46	19	19
Min	0.1	2	4.4	7.2
Max	34.5	36	34.5	36
Sum	532.6	621.7	305.2	332.3
Mean	11.57826	13.51522	16.06316	17.48947
Std. error	1.294354	1.269938	1.776853	1,684985
Variance	77.06618	74.18621	59.9869	53.94433
Stand. dev	8.778735	8.613142	7.745121	7.34468
Median	9.6	11.15	15.9	17.2
25 prcntil	4.1	6.6	11.5	11.6
75 prcntil	17.6	18.775	20.5	22.7
Skewness	0.7677272	0.7815928	0.4790999	0.7358159
Kurtosis	-0.2463639	-0.1048331	0.4772112	0.7470654
Geom. mean	7.55287	10.79536	14.03923	16.04349
Coeff. Var.	75.82084	63.72921	48.21668	41.99486



Fig. 6 - Scatter diagram of heel and ball depths of all the measured footprints impressed on the ignimbrite slope surface at the Foresta/"Devil's Trails" ichnosite.

The correlation between heel and ball depth is quite high in the Trackway A footprints (r²=0.9382), though among the deepest and longest footprints, the heel is deeper than the ball in the A11 one that was impressed during a foot slip and a forward imbalance of body weight. The opposite occurs in the A08 footprint, located at the uppermost part of the slope. Among the mediumlength footprints, the heel is deeper than the ball in the A10 footprint, consistently with its position on the slope, which caused the trackmaker's foot to slip forward toward a first lateral and then medial direction. The two less deep and smaller footprints (A01 and A03) are located both in the sub-planar part of the trackway as well as they are the A0, A06, and A05, which are longer and from shallow to medium deep (Fig. 6) (Panarello et al., 2022a). The correlation between footprint length (Fl) and depth, therefore, seems to be only partly conditioned by the footprint position on the trackway.

The heel and ball depths of Trackway B footprints have the maximum correlation value (r^2 =0.9781), which is highest in the deepest footprints (B11, B10, and B18) and decreases in the shallowest ones (B00, B01, B03, B07, and B08). Among the latter footprints, there are not only the footprints of the first part of the trackway (B00 and B01, and B03 and B04, which are characterised by a heel deeper than the ball and vice versa, respectively) but also the B07 and B08 footprints. The latter is a footprint marking the beginning of the trackmaker sliding (B09), documented by footprints B10-B11, which are, respectively, the longest and deepest, but with a well-correlated depth of heel and ball (Fig. 6) (Panarello, 2020; Panarello et al., 2022 a,b).

On average, the fluctuation in the depth of the A, B, and C trackways is roughly consistent with the position of the footprints along the trackway and with the trackmaker's gait at that point. Consequently, the depth variability is high (coefficient of variation > 30) even analysing the best-preserved footprints, which show thin anatomical features (Sample B) (Fig. 6). The curve is still right short-tailed but weakly leptokurtic, with a clear prevalence of medium-high depth values, as also indicated by the average values of the heel (16.03 cm) and ball depth (17.49 cm) (Tab. 2). The correlation between heel and ball depth of the footprints of Trackway B (r²=0.9776) is similar to that obtained for all the Trackway B footprints (Sample A), whereas that of the footprints of Trackway A is a little higher (Fig. 6).

All things considered, the analysis of footprint depth suggests some correlation between heel and ball depth and an occasional correlation between footprint depth and Fl. However, the correlation is always extremely low when the heel and ball depths of each footprint are compared with their length (Fl) and width (Fw) (Figs. 7, 8). Moreover, Fl and Fw have an extremely low correlation (Fig. 9), and their value varies even within the same trackway, regardless of the footprint depth, which can vary significantly even in the case of footprints with very similar Fl and/or Fw.

4.1.2. Footprint dimensions

We analysed the footprint dimension pattern of the four trackways (A, B, C, and E) and of the D and F short series by means of different statistical methods with the double aim of identifying the principal variation factors affecting the observed variations and of objectively confirming the trackmaker minimum number.

4.1.2.1. Box plots

In the box plot obtained considering the 50 footprints for which both the footprints' maximum length (Fl) and width (Fw) and derived values [footprint ara (Fa) and ratio of width against maximum length (Fw/Fl)] were available (Sample A), the length and width of most of the footprints fall within the box of the 25-75% quartiles (Fig. 10a). The main exceptions are the following: the Fl in footprints E02 and E03 (oriented in a direction almost opposite to that of other trackways A, B, and C), and the Fw of footprint A09. In the E02 and E03 footprints, the Fl value is close to the upper inner fence, which corresponds to the data point with a maximum value of less than 1.5 times the box height; the Fw of footprint A09 (a poorly definite footprint located after a Trackway A hiatus), an outliner with a value inferior to 1.5 times the box height; and the Fw and even more Fl of footprint D01, both with values inferior to 1.5 times the box height (lower inner fence).

The footprint distribution is less uniform in the box plot of Fw/Fl, where the footprints C09 and D01 fall well above the upper inner fence, having respectively a value of more than 1.5 and 3 times the height of the box. The variation range reduces, as expected, in Sample B (Fig. 10b), particularly as regards the footprint width, whereas the Fl of most footprints equally divides into two groups, one with a value close to the maximum value of the third quartile, the other to the minimum value of the second quartile. The F02 footprint matches the upper inner fence, whereas the E03 footprint is 1, 5, and 3 times the height of the box. Conversely, the Fw/Fl value of F02 matches that of the lower inner fence, and that of E03 is lower than 1.5 times the box height. In the Fa box plot, the only outliner is E02, with a value slightly higher than the upper inner fence, whereas the values of A24 and B15 match those of the upper and lower inner fences, respectively.

In terms of the box plots obtained for the footprints of each trackway, those obtained for all Trackway A footprints show a very narrow variation range for Fl and especially Fw, whereas A10 falls clearly below the lower inner fence. The range increases in the Fw/Fl box, where the value of the outliner A51 is higher than that of the upper inner fence, and even more in the Fa box plot, where, however, no outliners are present (Fig. 11a). The Fa values are quite variable, also considering only the best-preserved footprints (Fig. 11b), whereas the variation ranges of Fl and Fw are minimal, suggesting that Fl and Fw are not strictly correlated in most trackway A footprints. The box plots obtained for all (Fig. 12a) and the best-preserved footprints (Fig. 12b) of Trackway B provides similar results. The Fa box plot shows the



Fig. 7 - Scatter diagram of the heel (above) and ball (below) depth against the footprint lengthin all the measured footprints impressed on the ignimbrite slope surface at the Foresta/"Devil's Trails" ichnosite.



Fig. 8 - Scatter diagram of the heel (above) and ball depth against the footprint width (below) in all the measured footprints impressed on the ignimbrite slope surface at the Foresta/"Devil's Trails" ichnosite.



Fig. 9 - Scatter diagram of the length and width of all the measured footprints impressed on the surface of the ignimbrite deposit slope at the Foresta/"Devil's Trails" ichnosite.

largest variation range among the box plots obtained for the dimensions of the few measurable footprints of Trackway C, but the footprint values fall within the 25-75% quartiles, except for C09, whose value matches that of the lower inner fence (Fig. 13). The C09 footprint is confirmed to be proportionally larger than the others, with a value that matches that of the upper inner fence in both the Fw and Fw/Fl box plots (Fig. 10).

4.1.2.2. Univariate analysis

The summary of statistical data highlights the quite restricted range of variation in each of the three trackways A, B, and C. The variation further reduces in the case of sample B, with the average values of the measured dimensions (Fl, Fw, Fa, and Fw/Fl) of trackways A, B, and C being rather similar. The average footprint length, for instance, ranges from 23.95 mm (Trackway A) to 22.57 mm (Trackway B) in sample A and from 24.59 mm (Trackway A) to 23.08 mm (Trackway B), whereas the two measured footprints of sequence E have a length (27 mm) greater than the maximum value of all other footprints (Tabs. 1, 3).

The obtained variation coefficient confirms the moderate variability of footprint dimensions. It is, indeed, always lower than 20, and reaches the maximum

values of 12.35 and 13.06 in the case of all footprints' (sample A) Fa of Trackway A and Fw/Fl of Trackway C, respectively (Tab. 3). The values of kurtosis indicate some prevalence of normocurtic or slightly platicurtic distribution of data for most footprint dimensions, with the exception of the leptocurtic distribution shown by Fw/Fl in all footprint samples A and B and by Fw and Fa and Fw and Fw/Fl in the footprint samples of Trackway A and Trackway C, respectively. Most sample skewness values are less than 1 or greater than -1, indicating only moderate if not negligible asymmetry of the Gaussian curves. In particular, the distribution of Fl, Fw, and Fa values of the entire measurable footprints of samples A and B is quasi-symmetric, whereas Fw/Fw values show a moderately positive (1.247) and negative (-1.194) asymmetric distribution in the samples A and B, respectively. Examining the footprints of each trackway, values that are high if compared to the average footprint dimensions (positive asymmetry) are shown by Fl and Fa of Trackway A (sample B), but FL values are moderately tailed to the left, whereas all the footprints of the trackway are analysed (sample A), as it occurs for sample A of the Trackway B footprints. Finally, the Fw value distribution of the totality of Trackway C footprints is right-tailed.

The p values <0.05 resulting in some normality tests



Fig. 10a - Box plot illustrating the variation range of all the measured footprints (Sample A) impressed on the surface of the slope of the ignimbrite deposit at the Foresta/"Devil's Trails" ichnosite.Fl = footprint length; Fw = footprint width; Fa = area. Blue = left footprint; Violet = right footprints; Dot = Trackway A; Fill square = Trackway B; Fill diamond = Trackway C; Fill triangle = Trackway D; Fill inverted triangle = Trackway E; Circle = F footprints.

(Tab. 4) imply some departures from the data normal distribution, especially as regards to FL of selected footprints (sample B) of Trackway A and to both Fl and Fa of all (sample A) and selected footprints (sample B) of Trackway B. Conversely, the dimensions of Trackway C footprints show a normal distribution.

All things considered, the results of univariate statistical analysis hint at a more random distribution of the footprint dimension in Trackway B than in the other trackways, despite the fact their dimensional ranges are comparable to or inferior to those of Trackways A and C.



Fig. 10b - Box plot illustrating the variation range of the bestpreserved footprints (Sample B) impressed on the surface of the slope of the ignimbrite depositat the Foresta/"Devil's Trails" ichnosite. Abbreviations and symbols as in figure 10a.

4.1.2.3. Bivariate analysis

The reduced major axis (RMA) bivariate linear regression was used to investigate how much the footprint length (FI) (dependent variable) might depend on the other independent variables [footprint width (Fw), area (Fa), and the ratio of Fl against Fw x 100]. The two sets of analysed data, respectively, include all the footprints for which it was possible to measure the four variables considered for the analysis (Sample A) and some selected footprints that allowed sound measurements (Sample B). The sample size ranges from a maximum of 50 (all the measured footprints) to a minimum of 6 cases (all the measured footprints from Trackway C) (Tab. 5, Tab. SI1).

The confidence interval (CI) for slopes is large in the first set of data (Tab. 5). The difference between upper (CIu) and lower (CII) values ranged from 3.1933 (footprint Fa of Trackway C) to 0.1469 (footprint Fa of Trackway A) (average value of the CIu-CIi interval =



Fig. 11a - Box plot illustrating the variation range in all the measured footprints (Sample A) impressed in the Trackway A on surface of the slope of the ignimbrite deposit at the Foresta/"Devil's Trails" ichnosite. Abbreviations and symbols as in figure 10a.

1.4004). The interval values of Fl of all footprints (2.9649) and Trackway A (2.9208) are also particularly high. In the second set of data (Tab. 5), the confidence intervals (CI) for slopes reduce, ranging from 2.3402 (all footprint Fw/Fl) to 0.1515 (Fa of trackway B footprints), with an average value of 0.7731.

The p-value, which tests the null hypothesis of no correlation and no association between the changes in the independent variable and the shifts in the dependent variable, is <0.05 for most of the independent variables in sample A, with the exception of Fw of all (p=0.2979) and Trackway B (p=0.7017) footprints, and Fa of Trackway B (0.0781) and Trackway C (p=0.871). Conversely, in sample B the p value is >0.05, with an exception given



Fig. 11b - Box plot illustrating the variation range in the bestpreserved footprints (Sample B) impressed in the Trackway A on the surface of the slope of the ignimbrite deposit at the Foresta/"Devil's Trails" ichnosite. Abbreviations and symbols as in figure 10a.

for the Fl of all footprints (0.0233). Moreover, r^2 , which explains the extent to which the variance of a variable is related to that of a second variable, is generally low or extremely low in both samples, with exceptions given for Fa (0.7837) and Fw/Fl (0.7837) of all footprints of Trackway A, and Fw (0.7319) and Fw/Fl (0.8995) of all footprints of Trackway C (Tab. 5).

The Breusch-Pagan test provides some support for the robustness of our bivariate analysis. The test results rejected non-stationary variance of residuals nearly for all independent variables in the RMA of both samples. The only exception is Fw/Fl of all footprints (Sample A) for which the test gives a p-value <0.05 (Tab. SI2).



Fig. 12a - Box plot illustrating the variation range of all the measured footprints (Sample A) impressed in the trackway B on the surface of the slope of the ignimbrite deposit at the Foresta/"Devil's Trails" ichnosite. Abbreviations and symbols as in figure 10a.

Therefore, the hypothesis of heteroskedasticity (i.e., a non-stationary variance of residuals) could be rejected and homoskedasticity assumed in both samples for all other independent variables. For these variables, the variance of the residuals is equal over the range of measured values, suggesting a normal distribution of residuals.

The Durbin-Waston test for autocorrelation in residuals indicates that for most of the independent variables, there is a moderately positive correlation with the dependent variable (Fl) in the statistical regression analysis of Sample A data, where the test statistic varies from 1.0831 (Fw/Fl of all footprints) to 1.4815 (Fw of all footprints). Fa footprints of Trackway A (2.1468), Fw footprints of



Fig. 12b - Box plot illustrating the variation range of the bestpreserved footprints (Sample B) impressed in the trackway B on the surface of the slope of the ignimbrite deposit at the Foresta/"Devil's Trails" ichnosite. Abbreviations and symbols as in figure 10a.

Trackway B (2.1119), and Fa footprints of Trackway C (2.3579) show, however, a negative autocorrelation. In general, the p-value was >0.05, except for the Fw and FW/ Fl of all footprints, and Trackway A Fl.

The statistic test for Sample B indicates a negative correlation for the independent variables of Trackways A and B footprints, whereas the correlation is positive when the variables of all the selected footprints are analysed. Moreover, the p-value is > 0.05 for the latter variable, but > 0.05 in the case of Fw/Fl for all selected footprints.

Overall, the bivariate analysis results indicate a random variation in footprint length and width, which could be due to the synergistic action of the various factors that influenced the trackmakers, who walked with a variable



Fig. 13 - Box plot illustrating the variation range of all the measured footprints (Sample A) impressed in the Trackway C on the surface of the slope of the ignimbrite deposit at the Foresta/"Devil's Trails" palaeoichnosite. Abbreviations and symbols as in figure 10a.

velocity, changing direction time by time as they moved down the slope.

4.1.2.4. Similarity analysis

Results obtained by the clustering analysis on the one hand highlight the difficulty of defining groups of footprints sharing similar size and proportions and, in turn, of separating the footprints of each trackway from the others. On the other hand, the results confirm some slight differences in the footprint proportion belonging to the same trackway. These differences likely mainly depend on the ways in which trackmakers place the foot on the different points of the slope and on the load exerted on the uneven ground, and its variable granulometry. Footprints E02 and E03, the only measurable of the short E sequences, however, generally form a cluster clearly separated from the others. The single F02 footprint sometimes clusters together or close to E02 and E03, whereas the single D01 footprints rarely fall in large clusters.

Unravelling the different trackways is easier when only the footprint of Sample B, whose preservation status permitted measurements more compelling than those of footprints showing less clear anatomical details, is analysed. When only the basic dimensions Fl and Fw are considered and the data derived from them (Fa e Fw/Fl) are excluded, the separation into two clusters, trackways A and B, is rather well-defined. In this case, the value of the cophenetic correlation coefficient (CCC) is significantly higher than the lower value of the CCC in other dendrograms, whereas the distance among groups is reduced.

In the analysis of the whole measured footprints (Sample A) obtained by using all the variables (Fl, Fw, Fa, and Fw/Fl) (Fig. 14a), the footprints setting is mainly unrelated to their belonging to one or another trackway. The value of CCC is quite lower (0.788) as well as the similarity among the main clusters, whereas it is significantly higher among the minor groups. The groups that are the furthest apart are those of E03 and E02 footprints in cluster B, which are separated in an outgroup-like fashion.

In the dendrogram resulting from the analysis of the Sample B footprints (Fig. 14b), most of footprints of the A and B trackways gather in separate groups, though the CCC value is still low (0.7636). A1.1 only includes Trackway A footprints, whereas A1.2 primarily includes the Trackway B footprints. Some Trackway B footprints fall in the A2 cluster together with A24 and F02, setting separately from the others. The isolated position of E03 is confirmed.

The results obtained for the Sample A footprints by removing Fw and Fl from the analysis (Fig. 15a), are roughly similar to the previous one, but CCC is moderately higher (0.793), and in the main cluster A, a few Trackway A footprints fall in the group A2 that is clearly separated from the large group A1, which encompasses all the other footprints. Once again, E02 and E03 form a distinct cluster, B, to which also F02 joins. The main difference between the dendrograms resulting from the analysis of Sample B footprints using all four variables (Fig. 15b) and using only three variables (Fl, Fw, and Fa) (Fig. 14b) is the setting of A244 and F02 that gather together in sister group relation, A2.2 of the group, A.21, which includes some Trackway B footprints as well as C05, the only of Trackway C selected for the analysis.

The footprints in the dendrogram obtained for the Sample A footprints using the variables Fl, Fw, and Fw/Fl (Fig. 16a) are mostly randomly distributed in the various groups of the largest cluster A, whereas E03 and E02 are grouped together in cluster B. Contrary to the previous dendrograms, F02 falls in group A.1.1 of cluster A. The results obtained seem to suggest a limited correlation between Fl and Fw variations in some less preserved

Tab. 3 - Summary of the univariate analysis statistics' data obtained for the samples A (all the measured footprints) and B (best-preserved footprints) impressed of the Foresta/"Devil's Trails" slope of the ignimbrite deposit and in each main trackway (trackways A, B, and C).

	Sample A (all the measured	l footprints)			Sample B (best-preserved	footprints)	
All Footprints	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio	All Footprints	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
N	50	50	50	50	Ν	21	21	21	21
Min	19.3	9	135	38.9	Min	22.6	10	162	38.9
Max	27	12	246	59.6	Max	27	11.8	244	47.8
Sum	1171.3	535.3	9618.5	2292.5	Sum	504.5	225.9	4186.5	941
Mean	23.426	10.706	192.37	45.85	Mean	24.02381	10.75714	199.3571	44.80952
Std. error	0.2157627	0.08677487	3.360661	0.5201432	Std. error	0.2465867	0.1227796	4.211823	0.4736839
Variance	2.327678	0.3764939	5.647021	1.352745	Variance	1.276905	0.3165714	3.725286	4.711905
Stand. dev	1.525673	0.613591	23.76346	3.677968	Stand. dev	1.130002	0.5626468	19.301	2.170692
Median	23.1	10.5	194	45.5	Median	24.5	10.5	199	45.2
25 prcntil	22.5	10375	178.5	43.675	25 prcntil	23.05	10.4	184	43.6
75 prcntil	24.5	11.2	205.25	47.125	75 prcntil	24.6	11.3	212	46.25
Skewness	0.0719521	-0.08107937	0.08404799	1.246	Skewness	0.9267267	0.5611684	0.2476553	-1194277
Kurtosis	0.5649397	0.171182	0.462491	3.846	Kurtosis	0.7872371	-0.7797774	0.2594083	1898636
Geom. mean	23.37716	10.68864	190.9094	45.7124	Geom. mean	2399909	1074335	1984709	4475748
Coeff. var	6.512	5.731	12.353	8.021	Coeff. var	4.703676	5.230448	9.681619	4.844265
Trackway A	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio	Trackway A	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
Ν	23	23	23	23	Ν	9	9	9	9
Min	20.9	9	135	42.3	Min	24.5	10.7	199	43.7
Max	25.7	11.8	244	51.1	Max	24.8	11.8	244	47.8
Sum	550.9	251.8	4616	1051.7	Sum	221.3	101.6	1944	413.2
Mean	23.95217	10.94783	20.06957	45.72609	Mean	24.58889	11.28889	216	45.91111
Std. error	0.2388932	0.1342332	5240627	0.4507884	Std. error	0.04547418	0.1358558	4409586	0.5210685
Variance	1312609	0.4144269	6316759	4673834	Variance	0.01861111	0.1661111	175	2443611
Stand. dev	1145691	0.64376	2513316	2161905	Stand. dev	0.1364225	0.4075673	1322876	1563205
Median	24.5	11.1	200	45.4	Median	24.5	11.4	212	46.5
25 prcntil	23.1	10.5	182	44.1	25 prcntil	24.5	10.85	207.5	44.3
75 prcntil	24.7	11.4	218	46.9	75 prcntil	24.75	11.65	222.5	47.3
Skewness	-0.7968577	-1207619	-0.4667217	0.6987684	Skewness	1.011219	-0.3244872	1.138383	-0.23488
Kurtosis	0.8235094	2365487	0.6873681	0.4566072	Kurtosis	-1.I33091	-1.091812	1.854589	-1.720532
Geom. mean	23.92527	10.9288	199.098	45.67806	Geom. mean	24.58855	11.28231		45.88735
Coeff. var	4.783246	5.880254	12.52302	4.727947	Coeff. var	0.5548138	3.61034	6.124424	3.404852
Trackway B	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio	Trackway B	Footprint Length	Footprint width	Foot print area	Lengh against Width ratio
Ν	17	17	17	17	Ν	9	9	9	9
Min	21	10	152	43.1	Min	23	10	162	43.1
Max	23.2	11	206	50	Max	23.2	10.6	205	45.9
Sum	383.7	177.2	3156	785.7	Sum	207.7	92.9	1685	402.4
Mean	22.57059	10.42353	185.6471	46.21765	Mean	23.07778	10.32222	1872222	44.71111
Std. error	0.1765196	0.08511645	3.926663	0.5598211	Std. error	0.02777778	0.08296214	4803869	0.3489844
Variance	0.5297059	0.1231618	262.1176	5.327794	Variance	0.006944444	0.06194444	2076944	10.96111
Stand. dev	0.727809	0.3509441	16.19005	2.308201	Stand. dev	0.08333333	0.2488864	1441161	1.046953

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Tab. 3 -... Continued

	Sample A (all the measure	ed footprints)			Sample B (best-preserved	footprints)	
All Footprints	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio	All Footprints	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
Trackway B	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio	Trackway B	Footprint Length	Footprint width	Foot print area	Lengh against Width ratio
Median	23	10.5	194	45.6	Median	23.1	10.4	195	45.2
25 prcntil	22	10	173	44.7	25 prcntil	23	10	176	43.5
75 prcntil	23.1	10.55	198	48.25	75 prcntil	23.15	10.5	198	45.5
Skewness	-1.280016	0.3288698	-0.5911545	0.5936057	Skewness	0.5005714	-0.6373	-0.5745038	-0.6676454
Kurtosis	0.6295855	-0.69387	-0.7047984	-0.8045287	Kurtosis	-1.68395	-1.68395	-0.8915777	-1.4482
Geom. mean	22.55926	10.418	184.9581	46.16425	Geom. mean	23.07764	10.31953	1867159	44.70012
Coeff. var	3.22459	3.366845	8.720875	4.994199	Coeff. var	0.3610977	2.411171	7697595	2.341595
Trackway C	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio					

footprints. The hypothesis is at least partially supported by the clustering of Sample B footprints (Fig. 16b). In the dendrogram, indeed, the footprints of Trackway A gather together, falling into the two separate groups A2 and A.1.1.1. The latter is the sister group of A.1.1.2, which included most of the Trackway-B footprints as well as C05. The other footprints of Trackway B are moderately similar to the previous ones and form the small A.1.2 group inside A1.1, whereas E03 and F02 are set separately in cluster B. Moreover, the CCC value (0.9063) is rather high.

In a last attempt to explore if, and to what extent, the footprint cluster may depend on the trackmaker's autopodiun anatomy or be randomly distributed because their position on the slope diversely affected their shape and dimensions, we performed the analysis using only the two basic footprint dimensions Fl and Fa as variables. In the dendrogram obtained for the Sample A footprints (Fig. 17a), the similarity among groups is high, and the footprint distribution is reasonably coherent with their belonging to Trackway A and B, though some departures are present, such as the presence of two groups, including respectively B04 plus B01, and A10, A02, and A01, in the sub-cluster A2. The large A1 sub-cluster is divided into two groups: A.1.1, mainly including Trackway A footprints together with C10 and C12, and the larger group A.1.2, including the majority of Trackway B footprints as well as a few footprints of Trackway A and the other footprints of Trackway C, except for C09, which falls in the group B2 of the cluster B together with E03 and E02, as well as F02 and D01, forming the group B1. When the cases analysed are limited to the Sample B footprints (Fig. 17b), the split of the footprints of Trackway A and B into two sub-clusters, A1 and A2, respectively, is clear, the similarity among groups increases, and CCC reaches its maximum value (0.9063). The footprint C09 falls in the cluster of Trackway B footprints, but in a separate ramus within the group A1.1, whereas E03 and F02 fall together, forming cluster B, sharply distinct from the main cluster A that includes all other footprints.

Trackway B	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
Median	23	10.5	194	45.6
25 prcntil	22	10	173	44.7
75 prcntil	23.1	10.55	198	48.25
Skewness	-1.280016	0.3288698	-0.5911545	0.5936057
Kurtosis	0.6295855	-0.69387	-0.7047984	-0.8045287
Geom. mean	22.55926	10.418	184.9581	46.16425
Coeff. var	3.22459	3.366845	8.720875	4.994199
Trackway C	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
N	6	6	6	6
Min	21.4	9.5	169	39.2
Max	24.6	12	194	56.1
Sum	137.5	62.8	1090	275.4
Mean	22.91667	10.46667	181.6667	45.9
Std. error	0.5049202	0.342215	4.477102	2.446767
Variance	1.529667	0.7026667	120.2667	35.92
Stand. dev	1.236797	0.8382521	10.96662	5.99333
Median	22.6	10.4	180.5	46
25 prentil	21.925	9.875	171.25	40.25
75 prentil	24.3	10.875	194	49.65
Skewness	0.4418692	1.324025	0.1527514	0.8579499
Kurtosis	-1.314453	2.892181	-2.286171	1.147444
Geom. mean	22.88911	10.43983	181.3916	45.58592
Coeff. var	5.396932	8.008779	6.036669	13.05736
Е	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
N	2	2	2	2
Min	27	10.5	183	38.9
Max	27	11	246	40.7
Sum	54	21.5	429	79.6
Mean	27	10.75	214.5	39.8
Std. error	0	0.25	31.5	0.9
Variance	0	0.125	1984.5	1.62
Stand. dev	0	0.3535534	44.54773	1.272792
Median	27	10.75	214.5	39.8
25 prcntil	27	10.5	183	38.9
75 prcntil	27	11	246	40.7
Skewness	0	0	0	0
Kurtosis	0	-2.75	-2.75	-2.75
Geom. mean	27	10.74709	212.1745	39.78982
Coeff. var	0	3.288869	20.76817	3.19797

Tab. 4 - Normality Test data resulting from the analysis of the samples A (all the measured footprints) and B (best-preserved footprints) impressed on all the Foresta/"Devil's Trails" slope of the ignimbrite deposit and in each main trackway (trackways A, B, and C).

5	Sample A (all	the measured	l footprints)			Sample B (be	est-preserved	footprints)	
Trackway A	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio	Trackway A	Footprint Length	Footprint width	Footprint area	Lengh against Width ratio
N	23	23	23	23	N	9	9	9	9
Shapiro-Wilk W	0.9373	0.912	0.9654	0.9542	Shapiro-Wilk W	0.6602	0.9215	0.916	0.9061
p(normal)	0.1569	0.04492	0.5814	0.3561	p(normal)	0.0004856	0.4052	0.3604	0.2895
Anderson- Darling A	0.5764	0.4837	0.2536	0.3564	Anderson- Darling A	1.486	0.3158	0.3961	0.3738
p(normal)	0.1185	0.2069	0.7016	0.4265	p(normal)	0.0003085	0.4706	0.2915	0.3336
p(Monte Carlo)	0.1341	0.2092	0.7284	0.4345	p(Monte Carlo)	0.0001	0.5018	0.3199	0.3568
Lilliefors L	0.2055	0.1306	0.09388	0.1039	Lilliefors L	0.4093	0.1633	0.2177	0.2024
p(normal)	0.013	0.3816	0.8635	0.7426	p(normal)	0.0001	0.6931	0.2482	0.3525
p(Monte Carlo)	0.012	0.3778	0.8657	0.7416	p(Monte Carlo)	0.0001	0.6977	0.262	0.3502
Jarque-Bera JB	2.279	7.424	0.8122	1.644	Jarque-Bera JB	1.56	0.8712	1.375	0.9038
p(normal)	0.32	0.02443	0.6663	0.4396	p(normal)	0.4584	0.6469	0.5028	0.6364
p(Monte Carlo)	0.1114	0.0189	0.5399	0.2035	p(Monte Carlo)	0.0921	0.3174	0.1156	0.2857
Trackway B	Footprint Length	Footprint width	Foot print area	Lengh against Width ratio	Trackway B	Footprint Length	Footprint width	Foot print area	Lengh against Width ratio
N	17	17	17	17	N	9	9	9	9
Shapiro-Wilk W	0.7798	0.866	0.9194	0.8942	Shapiro-Wilk W	0.8084	0.7856	0.912	0.8467
p(normal)	0.001085	0.01897	0.1441	0.05434	p(normal)	0.02543	0.01395	0.3303	0.06849
Anderson- Darling A	1.517	0.8401	0.583	0.6915	Anderson- Darling A	0.7416	0.9115	0.4391	0.6925
p(normal)	0.000422	0.02383	0.1107	0.0579	p(normal)	0.03345	0.01146	0.2235	0.0456
p(Monte Carlo)	0.0003	0.0229	0.1093	0.0556	p(Monte Carlo)	0.0342	0.0117	0.2324	0.0462
Lilliefors L	0.3106	0.1804	0.2265	0.2018	Lilliefors L	0.2691	0.2893	0.2608	0.2754
p(normal)	0.0001	0.1439	0.02059	0.0616	p(normal)	0.05697	0.02892	0.07414	0.04643
p(Monte Carlo)	0.0001	0.1447	0.0212	0.0654	p(Monte Carlo)	0.0584	0.031	0.0718	0.0482
Jarque-Bera JB	3.851	0.7524	1.328	1.425	Jarque-Bera JB	0.8602	1.241	0.7647	1.149
p(normal)	0.1458	0.6865	0.5149	0.4903	p(normal)	0.6504	0.5378	0.6822	0.563
p(Monte Carlo)	0.0408	0.5365	0.2382	0.2026	p(Monte Carlo)	0.3218	0.1494	0.4116	0.1582
Trackway C	Footprint Length	Footprint width	Foot print area	Lengh against Width ratio					
N	6	6	6	6	All results	s considere	d, the simil	arity analy	sis points out
Shapiro-Wilk W	0.9161	0.8695	0.8831	0.9127	on the one l	hand a sign	ificant sim	ilarity in th	ne dimension
p(normal)	0.4777	0.2241	0.2836	0.4544	pattern of t and, on the	the footprist other hand	nts of the l, the pecul	trackways iarity of th	A, B, and C e measurable
Anderson-	0.3289	0.4873	0.3421	0.3379	footprints of	of the shore	rt Trackwa	v E, as w	ell as of the

Darling A

p(normal)

p(Monte Carlo)

Lilliefors L

p(normal)

p(Monte Carlo)

Jarque-Bera JB

p(normal)

p(Monte Carlo)

0.3813

0.4201

0.2677

0.1964

0.2035

0.5317

0.7665

0.5626

0.1326

0.1402

0.3175

0.05647

0.059

0.9395

0.6252

0.139

0.3505

0.3925

0.203

0.6121

0.6093

0.6856

0.7098

0.3429

0.36

0.3937

0.2281

0.4234

0.4361

0.4463

0.8

0.6711

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footprints of the short Trackway E, as well as of the footprints F01 and F02, though to a much lesser degree.

4.1.2.5 Principal Component Analysis

We ran the PCA first on the total footprint dataset (Sample A) and then on the dataset of the most compelling footprint measurements (Sample B). For each dataset, the PCA was computed first using all the variables (Fl, Fw, Fa, Fin) (Figs. 18, 21), then excluding Fin (Figs. 19, 22), and afterward using the Fl, Fw, and Fin variables (Figs. 20, 23).

The PCA results obtained from the total dataset (Sample A) by using the three different groups of variables (Figs. Tab. 5 - Summary of intraspecific bivariate allometry of the samples A (all the measured footprints) and B (best-preserved footprints) impressed on all the Foresta/"Devil's Trails" slope of the ignimbrite deposit and in each main trackway (trackways A, B, and C). AE = allometric exponent; Cll = lower value in the 95% bootstrapped confidence interval (N=1999); Clu = upper value in the 95% bootstrapped confidence interval (N=1999); r^2 = determination coefficient; p = predictive value (testing the null hypothesis of no correlation and no association between the independent changes and dependent variables shifts).

SAMPLE A	Independent Variable	Slope (AE)	Std. Error	95% Cil	95% Ciu	Intercept (AC)	Std. error	95% Cil	95% Ciu	r2	d	Allometry
	Footprint width	1.1528	0.16454	0.82285	3.7878	0.41185	0.39032	-5.8424	1.201	0.022097	0.2979	Р
All footprints	Footprint area	0.5049	0.043471	0.43069	0.57754	0.49624	0.22814	0.10762	0.88456	0.64418	0.0001	Z
•	Footprint Length against Footprint Width ratio	-0.81611	0.0827	-0.93723	-0.61631	6.2715	0.3169	5.5039	6.7422	0.50711	0.0001	Z
	Footprint width	0.79878	0.13131	0.46864	0.95594	1.2647	0.31412	0.88857	2.0525	0.43253	0.0017	Z
Trackway A	Footprint area	0.36937	0.03841	0.2622	0.43975	1.2195	0.20306	0.84373	1.794	0.78373	0.0001	Z
	Footprint Length against Footprint Width ratio	-1.0263	0.22809	-3.6635	-0.78603	7.0963	0.87237	0.84373	1.794	0.78373	0.0001	Z
	Footprint width	-0.98022	0.25178	-3.482	-0.56122	5.4133	0.59015	4.4386	11.275	0.010348	0.7017	z
Trackway B	Footprint area	0.3662	0.085221	0.24868	1.084	1.2045	0.44495	-2.5524	1.8163	0.18763	0.0781	Z
(17147)	Footprint Length against Footprint Width ratio	-0.66568	0.11613	-0.95881	-0.34158	5.6672	0.44507	4.432	6.7823	0.5435	0.001	Z
1) 010	Footprint width	-0.68983	0.17859	-1.0233	0.81454	4.7487	0.41907	1.2421	5.5551	0.7319	0.0126	Z
Trackway C	Footprint area	0.88969	0.4437	-0.0057296	3.1876	-1.4963	2.3077	-1.3493	3.2083	0.0051294	0.871	N (I)
	Footprint Length against Footprint Width ratio	-0.42099	0.066743	-0.58058	-0.15959	4.7387	0.25503	3.7471	5.3623	0.89946	0.0054	N
SAMPLE B	Independent Variable	Slope (AE)	Std. Error	95% Cil	95% Ciu	Intercept (AC)	Std. error	95% Cil	95% Ciu	r2	Ь	Allometry
	Footprint width	0.89389	0.17957	0.37559	1.209	0.45847	0.18522	-0.13813	0.98482	0.23323	0.0233	N (I)
All footprints	Footprint area	0.47767	0.10242	0.23347	1.5749	0.65082	0.54196	-5.1896	1.9337	0.12658	0.1077	Z
	Footprint Length against Footprint Width ratio	-0.92637	0.19258	-3.0914	-0.7512	6,,6994	0.73214	6.0425	14.971	0.17885	0.0535	Z
	Footprint width	0.15254	0.053289	0.059607	0.53379	2.8326	0.12915	1.9074	3.0562	0.14573	0.3099	Z
Trackway A	Footprint area	0.092524	0.029991	-0.018946	0.34601	2.7051	0.16117	1.348	3.2996	0.26452	0.1618	Z
	Footprint Length against Footprint Width ratio	0.162	0.059183	0.068054	0.58691	2.5824	0.22646	0.95372	2.9452	0.065719	0.4905	Z
	Footprint width	0.14873	0.055602	0.02532	0.5006	2.7917	0.12979	1.9683	3.0832	0.021636	0.7248	Z
Trackway B	Footprint area	-0.045899	0.017192	-0.17122	-0.019714	3.3789	0.08992	3.2404	4.0387	0.017941	0.7298	Z
	Footprint Length against Footprint Width ratio	-0.15313	0.057873	-0.53912	-0.080895	3.7207	0.21992	3.4461	5.1882	0.00013839	0.9767	Z

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Fig. 14a - Q-mode dendrogram showing how all footprints (Sample A) impressed on the F Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, Fw, Fa, and Fw/Fl variables. Fl = Footprint length; Fw = Footprint width; Fa = Footprint Area; Fw/Fl = (Footprint length against footprinf width) x 100.

18, 19, and 20; Tables SI3, and SI4 in Supplementary Information), highlight an overlapping of scores of the trackways A, B, and C, with those of trackway A and B showing the main similarity in score dispersion, though the dispersion area of the Trackway B footprints indicates they are on average slightly smaller than those of Trackway A. Moreover, scores of some footprints (e.g., A01, A10, A14, A24, B04, B10, C09, C10, and C12) fall quite far from the other of the same sample. The single D01 footprint score and those of the short E and F sequences generally fall outside the variation ranges of trackway footprints. The eigenvalue and the variance percentage captured by the first component (PC1) are definitely greater than those of the second component (PC2), and in turn, the variance of axis 1 is greater than it is on axis 2 in the PCA obtained by using the first two groups of variables, whereas those of PC2 are greater than those of PCI considering the Fl, Fw, and Fin variables (Table SI4). The eigenvalue and percentage of variance captured by the other components are always negligible.

More in detail, in the PCA biplot obtained for Sample A using all variables (Fl, Fw, Fa, and Fin) (Fig. 18), the

variance accumulated by PC1 (which accounts for as much as possible of the variability in the data) and PC2, reaches 95.512% and 2.3986%, respectively. As a result, the sum of the variances of the two components nearly equals the total variance, and PC1 is sufficient to describe the essence of the data. In PC1, Fa is the variable that contributes the most to PC1, as evidenced by its large and positive loading (Tab. SI4). Fin is the variable that has the major effect on PC2, followed by Fl. Fin and Fl correlate with PC2 positively and negatively, respectively. Therefore, the variable loading could suggest that the proportion of footprints has some influence in determining the position of scores in the PCA biplot. The orientation and length of the vectors, corresponding to the loading of each variable, show that an increase in the Fa variable influences where scores plot in the space, with smaller footprints distributed on the left of axis 2. Fin, with a vector is significantly away from the axis origin, and, subordinately, Fw variables influence their position in the quadrants above axis 1, where the scores of the proportionally narrower footprints plot, whereas Fl influences the position where the longer and wider



Fig. 14b - Q-mode dendrogram showing how the best-preserved footprints (Sample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, Fw, Fa, and Fw/Fl variables. Abbreviations as in figure 14a.

footprint scores plot in the quadrants below axis 1. Fin and Fw vectors strongly correlate with each other and negatively correlate with Fl, whereas Fa slightly positively and negatively correlates with Fin and Fw, and Fl, respectively. The scores' position in the PCA biplot (Fig. 18) suggests that the D01 footprint is the shortest, but the proportionally largest despite its small area, and E03 footprint is the longest and narrowest. In the Trackway A footprint sample, the position of the A10 score, which plots far from the others, likely depends on the anomalous proportions of the footprint (oval, with the sole medio-laterally inclined towards the slope bottom) that are opposite to that of the A24, which is deep and well-defined. The scores of Trackway B footprints plot closer to axis 2 than Trackway A scores, mainly falling in the quadrants on the left of the axis, as it happens for the scores of Trackway C footprints, except for the shortest and widest C09 score and C10 and C12 that are the lengthiest and narrowest of the sample.

In the PCA biplot resulting from the analysis of the variables Fl, Fw, and Fa (Fig. 19), PC1 largely describes the essence of the data, almost corresponding to the total variance (99.75%), whereas the variance accumulated by PC2 and PC3 is insignificant. The variable loadings in PC1 are all positive, but Fa is the variable that contributes the most to this component, as evidenced by its large loading (Tab. SI4). Its loading is, on the other hand, extremely low and negative in PC2, where the variable with the greatest effect on the total variance is Fl, followed by the relatively low loading of Fw. Therefore, the variable loading could suggest that the footprint length, partially affecting their area value, has a rather significant effect in determining the position of scores in this PCA biplot. This hypothesis is supported by the length and orientation of the notable length of the Fl vector, which negatively correlates with Fw, which rests in



Distance 37.5 А 45.0 52.5 100 60.0 cophenetic correlation coefficient = 0.793

Fig. 15a - Q-mode dendrogram showing how all footprints (Sample A) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, Fw, and Fa, variables. Abbreviations as in figure 14a.

the opposite position on axis 2 and is definitely shorter, as it is Fa that slightly negatively correlates with Fl and Fw, respectively (Fig. 19). The position of the scores roughly confirms most of the evidence provided by the previous PCA results. In addition, the position of the F02 score accounts for the quite significant length of this footprint. In the PCA obtained for Sample A, using the variables Fl, Fw, and Fin (Fig. 20), the variance accumulated by the first principal component (which still largely describes the essence of the data), and the second components reaches 96.364% and 3,4487%, respectively. In PC1, the variable loadings are all positive, and Fin is the variable that most contributes to this component, followed by Fl. In PC2, the same variables have a negative and positive loading, respectively, with Fl being the most influential (Table SI6). The vectors corresponding to the loading of the three variables are positively correlated. Fl is the longest, followed by Fw, which is the most correlated with PC2, and Fin, which is slightly shorter and has a lower correlation degree. The scores of the trackway A, B, and C footprints changed their positions (Fig. 20). The majority of scores of Trackway A plot in the quadrants above axis 1, which gathers the scores of footprints with the major dimensions and are roughly equally scattered on the left end the right of axis 2. The scores of Trackway B footprints

7.5

15.0

22.5

30.0

A2

plot in the two quadrants below axis 1 and are closer to each other on the left of axis 2 than on its right. The scores of Trackway C footprints also plot in the quadrants below axis 1, except for the C09 score that plots far from the others in the quadrant above axis 1, on the right of axis 2, where the scores with the highest Fw/Fl index plot. The position of the D01, E02 and E03, and F02 scores support the indications given by the previous PCA, confirming the small dimension of the D01 footprint as well as the major length of the quite narrow E03 footprint.

The PCA biplots obtained, reducing the case to the most compelling footprint measurements (Sample B) (Figs. 21, 22, and 23; Tables SI3, and SI4 in Supplementary Information) give more convincing results. The footprints of trackways A and B are always clearly separated and fall in distinct quadrants, suggesting that two different individuals ran across the F/DT slope of the ignimbrite deposit, as indicated by the footprints of trackways A and B. The presence of a third trackmaker, who impressed the Trackway C footprints, cannot be confidently confirmed because only in one footprint, C05, the preservation status allowed for perfect measurements. This footprint, however, falls in all box plots in a separate position, not far from the position of the scores of the Trackway B footprints.

In the PCA run by using all variables (Fig. 21), PC1 and



Fig. 15b - Q-mode dendrogram showing how the best-preserved footprints (Sample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, Fw, and Fa, variables. Abbreviations as in figure 14a.

PC2 account for 98.78% and 1.0643% of the variance, respectively, whereas PC3 and PC4 have too low a loading to exert any significant influence. Fa is the variable that most influences PC1, where all variables have a positive loading. The most influential variable for PC2 is Fin, which shows a positive loading, followed by Fl, which shows a negative loading (Tab. SI4). Indeed, the vectors corresponding to the two variables, which are very long for Fin, are uncorrelated with each other. The Fa vector correlates positively with Fl and negatively with Fin and the very short Fw vector. The scores of the Trackway A and B footprints plot clearly separately on the right and left of axis 2, suggesting some difference in the proportions between the footprints of the two trackways, with the footprints of Trackway B being on average slightly narrower, shorter, and smaller than those of Trackway A.

The position of the F02 footprint and especially the E03 one indicates they are the longest in the sample B.

In the PCA boxplot obtained by using the Fl, Fw, and Fa variables (Fig. 22), the first component accounts for almost all the total variance (99.667%) and nearly fully describes the essence of the data. The loading of the variables is positive in PC1, whereas in PC2, Fa has a slightly negative loading. Fa and Fl are the most influential variables for PC1 and PC2, respectively (Tab. SI4). The corresponding vectors are negatively correlated, whereas the Fw vector correlates positively with Fl and slightly negatively with Fa. Most of the footprint scores of the two trackways A and B plot in opposite quadrants, except for A24 and B11, as well as A22 and B05 that plot on axis 2 above and below axis 1, respectively. As a result, the two groups are clearly separated. The score position of



Fig. 16a - Q-mode dendrogram showing how all footprints (Sample A) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, Fw, and Fw/Fl variables. Abbreviations as in figure 14a.

Trackway B footprints again indicates that they result on average shorter and narrower than those of the Trackway A, whereas E03 and F02 footprints once again clearly appear to be the lengthiest in the sample B.

In the PCA obtained after excluding from the analysis the variable that most influenced PC1, Fa, in the PCA discussed above and using the variables Fl, Fw, and Fin (Fig. 23), PC1 and PC2 accumulate 79.814% and 20.181% of the variance, respectively. Fin is the variable that most influences PC1, followed by Fl, whose negative loading is lower than the positive one of Fin (Tab. SI4). The loading of the variables is positive in PC2, which is more influenced by Fl than by Fw and Fin. The corresponding vectors are positively correlated, with Fl being the longest. The footprint scores of the two trackways A and B plot in opposite quadrants above and below axis 1, respectively, where the scores of the relatively larger and smaller footprints fall.

All things considered, the PCA results, on the one hand, indicate that the first component always accounts for nearly the total of the variance (from 96.36% to 99.75%,) with a single exception (79.8% in the PCA obtained for the Sample B, using Fl, Fw, and Fw/Flx100 variables), substantially describes the relationships among the footprint dimensions, whose values are generally positively correlated with such a variable. On the other

hand, it underlines the wide variability of the footprint measurements included in Sample A that hampers a clear separation among the footprints belonging to the main trackways. This is not surprising because most of the footprints are not perfectly preserved, and, in turn, the measurements cannot be regarded as totally compelling. Indeed, the separation between the footprints of trackways BA and B becomes clearer, as do the differences in proportions of the footprints E03 and F02 with respect to those of all the other footprints. Unfortunately, in the Trackway C only one footprint, C05, is best preserved. As a result, the statistical analysis cannot confirm or reject the hypothesis about whether the footprints of this trackway were impressed or not by a further trackmaker.

5. DISCUSSION

The correct identification of the minimum number of human trackmakers who left their footprints frequenting or visiting a site, as well as inferring their main characteristics (e.g., physical parameters, age, and sex), is frequently a difficult task. Identification is generally possible by comparing the dimensional and directional differences of well-preserved footprints, aligned in wellreadable distinct trackways impressed on the sub-planar



Fig. 16b - Q-mode dendrogram showing how the best-preserved footprints (Sample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, Fw, and Fw/Fl variables. Abbreviations as in figure 14a.

surfaces of substrates with uniform, thin granulometry, or footprints impressed by individuals of different age and stature, as occurs, for example, in the famous Latest Glacial Willandra Lakes region (southeastern Australia) (Webb et al., 2006 a,b, 2007), and the slightly more recent Engare Sero ichnosites (East African Rift, Tanzania) (Hewitt et al., 2010; Zimmer et al., 2012, 2018; Liutkus-Pierce et al., 2016; Hatala et al., 2020 and references therein). The distinction between one trackmaker and another is made even easier if the footprints show foot anomalies or post-traumatic details that are repeated along a specific trackway, as can be seen in some recent Homo sapiens trackways (see, for example, Kennedy et al., 2003; Panarello, 2016 and references therein). In the most fortunate cases, the very receptive substrate permits the identification of different footprint morphotypes due to the presence of very sharp anatomical details, for instance at the latest Pleistocene site of Grotta della Basura

(Liguria, Italy) (Citton et al., 2017; Avanzini et al., 2020 and references therein; Romano et al., 2019), and at the Holocene Acahualinca site (Manague Lake, Nicaragua), where the peculiar morphology of the footprints suggested the formalization of a new ichnotaxon, "*Hominipes modernus*" (Schmicke et al., 2009, 2010; Lockley et al., 2009; Romano et al., 2019).

The identification of the trackmaker number becomes more difficult when the footprints are not well-preserved or impressed on coarse substrates, or when the footprints are partially or completely over-imposed and altered by the almost simultaneous passage of various trackmakers in the same trackway direction, as occurred, for example, for the footprints left by G2 and G3 hominins at the Pliocene Laetoli G site (Olduvai Gorge, East Africa) (Masao et al., 2016 and references therein). In such cases, as at the F/DT ichnosite, some hypotheses could be advanced statistically by analysing data based on anatomical landmarks. The



Fig. 17a - Q-mode dendrogram showing how all footprints (Sample A) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, and Fw variables. Abbreviations as in figure 14a.

Early Pleistocene ichnosites of Ileret and Koobi Fora Formation (Kenya) (Behrensmeyer and Laporte, 1981; Bennett et al., 2009; Bobe and Carvalho, 2018; Dingwall et al., 2013; Hatala et al, 2016, 2017; Roach et al., 2016, 2018), Happisburgh (Norfolk, UK) (Ashton et al., 2014; Ashton, 2021; Wiseman et al., 2020), and Gombore II (Melka Kunture, Ethiopia) (Altamura, 2019; Altamura et al., 2017, 2018, 2020) are a few examples.

Identification is also problematic when the footprints are few, isolated, chaotically arranged, or altered by bioturbation, even if they were impressed during the same time slice by one or more trackmakers. In these cases, only unusual morphometric features and inferences based on archaeological rather than palaeontological or biomechanical data may allow some inferences [e.g., among the oldest, some footprints from Koobi Fora "ichnosite" (Behrensmeyer and Laporte, 1980; Bennett et al., 2009; Hatala et al., 2017; Roach et al., 2016, 2018 and references therein; Bobe and Carvalho, 2018 and references therein), and those from the early Late Pleistocene Langebaan Lagoon site (Roberts and Berger, 1997; Roberts, 2008)].

Furthermore, at some ichnosites, a single trackmaker

may have visited the same site several times and left different footprints or may be walking with a different gait. As a result, footprints left by the same individual could differ in preservation, morpho-structural characteristics, dimensions, and proportions in the same trackway, making it problematic to determine the trackmaker minimum number even if the trackways are clearly identifiable. This is most likely the case with the F/DT footprints, where the trackmaker's gait is further influenced by the coarse, uneven ground surface, and slope acclivity may vary from one point to another, forcing the trackmaker to change pace and direction.

Indeed, the nature of the substrate represents the most influential factor affecting the morphology of animal and human footprints and the quality and quantity of the preserved anatomical details of the trackmakers' feet. Bennett and Morse (2014), for instance, demonstrated that substrate properties (grain-size, sorting, grain shape, porosity, packing, consolidation, and water content) significantly influence the presence, structure, and topology of fossil footprints (Marty et al., 2009; Bennett and Morse, 2014 and references therein). Furthermore, granulometry, water content, and other substrate



Fig. 17b - Q-mode dendrogram showing how the best-preserved footprints (ample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit cluster using the dimensional Fl, and Fw variables. Abbreviations as in figure 14a.

characteristics can change along a single trackway, as can the acclivity of the substrate, the consolidation degree, and the footprint preservation status.

At the F/DT ichnosite, all such conditions occur simultaneously. Moreover, the length of F/DT footprints suggests that most of them were left by some individuals (if not by a single trackmaker) of roughly the same size and age.

Accordingly, the hypothesis that at the F/DT ichnosite the same trackmaker may have left different footprints walking through substrate zones with different characteristics and, in turn, that a single trackmaker might descend the slope more than once could be rejected based on the statistical analysis conducted in the present contribution. Moreover, the results obtained coupled with the deduction resulting from the analysis of the characteristics and the distribution of the footprints on the slope suggest that most likely at least four different individuals walked on the slope (the trackmakers of A, B, C, and E trackways), though some inconsistencies have been observed that find some explanation considering the position of the footprints along the trackway and on the slope. The shape of the footprints, indeed, was almost certainly conditioned not only by the characteristics and the slope of the substrate but also by the conscious or unconscious movements of the trackmakers, as well as by the repeated translations, sliding, and oriented sinking caused by the need to maintain balance and, hypothetically, by the trackmakers' attempts to descend the irregular slope with the minimum possible effort. For instance, when the walking direction veers toward the bottom of the slope, the footprint may be proportionally longer. In the footprint diagonally oriented to the slope, the footprint of the foot downslope is deformed on its lateral margin, whereas the deformation affects the medial margin in the footprint of the other foot. When



Fig. 18 - Biplot diagram produced by the principal components analysis (PCA) using all variables (Fl, Fw, Fa, and Fw/Fl) and all footprints (Sample A) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit. The component loadings (below) show the degree to which the different original variables enter into components 1 and 2. Abbreviation as in figure 14a.

the footprint orientation is consciously varied in search of greater stability, footprints left by the same foot can appear smaller or more evanescent than most of the others.

In the Trackway A, for example, the anomalous proportions of the A10 left footprint, which stand out in the PCA analysis diagrams (Figs. 18, 19, and 20), results from the significant gravity slide of the entire foot outwards while this foot is consciously straightened by the trackmaker, who turns it clockwise and orients it towards the walking progression line. As a result, the foot placement angle is -30° negative. This forces the trackmaker to insert the second foot right away, shortening the stance time of the forefoot and, as a result, fine-tuning the footprint. Indeed, the general shape is

altered by a strong sliding towards the lateral side and then by the sudden rotation of the foot to the antero-medial direction caused by the higher slope-break and the lower stage of consolidation of the substrate. The distal region of the A10L footprint appears truncated in comparison to the A11R footprint due to the rapid support of the right heel of the foot, which shortens it even further. The footprint A01 (left), located in a fairly sub-planar part of the slope at a very short distance from the prehistoric pathway, has an uncertain outline and an almost flat midfoot area, but clearly visible posterior and anterior margins. Some anatomical details are evident, but the heel area (which is shallower than the ball one) and the distal limit of the forefoot are well-defined, permitting a compelling measure of the length. A01, moderately larger



Fig. 19 - Biplot diagram produced by the principal components analysis (PCA) using all variables (Fl, Fw, and Fa) and all the footprints (Sample A) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit. The component loadings (below) show the degree to which the different original variables enter into the components 1 and 2. Abbreviation as in figure 14a.

than the Trackway A better preserved set of footprints was most likely left on slick ground, causing a small sliding motion in an anteromedial direction, which widened the forefoot (Panarello et al., 2022 a,b,d, table 1). Two support phases and a loading movement phase can be detected in A24 (left), which is well-impressed and sub-elliptical in shape. The first causes a moderate sinking, whereas in the second, the heel sinks much more in the soft substrate. The foot shifted towards the inside due to the body weight shifting perpendicularly to the direction of advancement, as the preserved structural marks document. The latter show the successive stages from the impact area of the foot on the plastic substrate to the final standing area, with forward slides and rotations of the foot. Although the footprint dimensions were measured at the moment of the maximum balance of the trackmaker (i.e., just before the push-off of the foot), the proportion of the A24

differs from the majority of the Trackway A footprints (Panarello et al., 2022 a,b,d, table 1).

In Trackway B, B04 and B10 footprints show the most significant differences from the others (see, for example, Figs. 18, 19, and 20). This may depend on the fact that footprint B04 is positioned in a south-easterly direction at the innermost position with respect to the edge of the slope, perhaps because this was the safest area in which to find stability while walking on the unevenly consolidated ground. This resulted in a slight torsion of the foot towards the south and a slight translation of the entire foot towards the steepest slope. The footprint B10, slightly shorter than the others, being truncated at its distal part, represents the first point where the trackmaker regained his body balance after a long slide of the whole leg. The footprint was likely impressed when the body was leaning forward to support the full weight of the body before



Fig. 20 - Biplot diagram produced by the principal components analysis (PCA) using all variables (Fl, Fw, Fa, and Fw/Fl) and the bestpreserved footprints (Sample B) impressed on the Foresta/"Devil's Trails" right slope of the ignimbrite deposit. The component loadings (below) show the degree to which the different original variables enter into the components 1 and 2. Abbreviation as in figure 14a.

performing the step-crossing hop, which ends with the footprint B11 (Mietto et al., 2003; Avanzini et al., 2008; Panarello, 2020; Panarello et al., 2022 a,b,d).

As regards the other footprints, the E03 right footprint, despite being the longest (27 cm), appears narrow because it represents the first antero-medial downhill subsidence of a track up to sub-planar in a non-homogeneously plastic area, which forces the foot to an unnatural lateral displacement that produces a measurable concavity at the bottom of the cavity outer wall. The footprint F02 also appears disproportionally longer because it is located along a ledge narrower than the maximum width of the foot. As a result, the trackmaker was forced to put the big toe on the upstream wall to avoid falling (Panarello et al., 2020). These examples show how much the peculiarity of the F/DT floor and the difficulty of descending a slipping slope may have affected the shape of the footprints.

On the one hand, the obtained results provide quite solid clues for confirming the different identities of Trackways A and B, as well as the not entirely preserved sequence E; on the other hand, the hypothesis of a fourth trackmaker, who impressed the Trackway C footprints, is clearly less solid. Actually, the trackway is poorly defined and has some peculiarities that raise some uncertainties. Therefore, it is quite difficult to understand the causal factors behind the anomalous proportion of poorly preserved footprints, as with most of the Trackway C footprints (Panarello et al., 2020; Panarello et al., 2022 a,b). For instance, the C09 footprint can be recognised



Fig. 21 - Biplot diagram produced by the principal components analysis (PCA) using all variables (Fl, Fw, Fa, and Fw/Fl) and all footprints (Sample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit. The component loadings (below) show the degree to which the different original variables enter into components 1 and 2. Abbreviation as in figure 14a.

only for its surface, flattened with respect to the uneven one of the surrounding substrate areas, and for being in line with the other, better-preserved footprints because no anatomical details are detectable (Panarello et al., 2022 a,b,d). The C12 footprint is stretched in an anteromedial direction, so the length (24.2 cm) is disproportioned with respect to the width (9.5 cm), as confirmed by the dimensions and proportions of the only well-preserved C05 footprint (22.6x10.4 cm) (Tab. 1, Fig. 18).

The arrangement of the Trackway C footprints on the ignimbrite slope deposit could account for these dimensional inconsistencies. Indeed, more accurate studies demonstrate that Trackway C, initially described as two successions of 10 footprints separated by an extended gap (Mietto et al., 2003; Avanzini et al., 2008), consists of two segments (1C and 2C), belonging to the same trackway but differently oriented and inclined due to the geomorphological constraints of the slope. As a result, the footprints of the more inclined segment 1C show signs of sliding towards an antero-medial direction, whereas the footprints of segment 2C, which runs southeast in a quite sub-planar direction, are more regular and less deep. However, despite the dimensional variation of the poorly preserved Trackway C footprints, to date, no unquestionable evidence has been found indicating that the 1C and 2C segments are part of two different trackways. As a result, the hypothesis that Trackway C may be imprinted by a single trackmaker, not the same as Trackways A, B, and E, appears to be the most appropriate.

Unfortunately, the peculiarity of the F/DT ichnosite



Fig. 22 - Biplot diagram produced by the principal components analysis (PCA) using all variables (Fl, Fw, and Fa) and the best-preserved footprints (Sample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit. The component loadings (below) show the degree to which the different original variables enter into the components 1 and 2. Abbreviation as in figure 14a.

prevents the comparison of their pattern with human footprints from other ichnosites. Some of the South African coastal ichnosites, which include a large and best-preserved record of Late Pleistocene hominin tracks mainly dated to MIS 5e, are the only known thus far where the footprints were impressed on the slope substrate of aeolian dune systems (Roberts and Berger, 1997; Roberts, 2008; Helm et al., 2018 a,b, 2019 a,b, 2020 a,b, 2021). However, a compelling comparison aimed at determining how much the characteristics of the substrate, particularly its acclivity, could have affected human gaits, and footprint morphometry is problematic due to a variety of factors. For instance, some imprinted aeolian dune blocks are not in the primary position. This reduces the possibility of determining both the slope acclivity in the track where humans were walking and the actual position of the footprint on it. Furthermore, some footprints were likely impressed by individuals of different ages; some are preserved as concave epirelief, others as convex hyporelief, and some are visible only in section. As a result, morphometric data may be inhomogeneous (Tab. SI5).

For instance, among the tracksites recording the largest human footprint samples, at Brenton 1 (Brentonon-Sea), the footprint length values show a mesocurtic distribution even if the footprints range from rather short (12 cm) to large (23 cm), suggesting the presence of both young and adult individuals. Conversely, the width variation range is much larger, perhaps suggesting some influence of the substratum acclivity (Figs. 21 and 6, Tab.



Fig. 23 - Biplot diagram produced by the principal components analysis (PCA) using all variables (Fl, Fw, and Fw/Fl) and all the footprints (Sample B) impressed on the Foresta/"Devil's Trails" slope of the ignimbrite deposit. The component loadings (below) show the degree to which the different original variables enter into the components 1 and 2. Abbreviation as in figure 14a.

6). The length of footprints at the Goukamma 2 tracksite (Goukamma Nature Reserve), which are less numerous, have a moderate range of variation, and the small-sized footprints prevail. The width variation range is larger than at Brenton 1, so Goukamma 2's scores are less dispersed in the PCA graph (Figs. 24 and 25, Tab. 6). However, it is challenging to hypothesise whether some differences in the substrate characteristics might have determined the different patterns characterised by the footprints of these two sites.

As a result, any inference about the causal factors affecting the proportions of these South African footprints cannot be regarded as compelling for a sound comparison of their pattern with that of the F/DT sample.

7. CONCLUSION

At the F/DT ichnosite, the two long trackways, A and B, of human footprints that run along the the ignimbric flow on the very steep slope surface of the deposit are so well-delineated and visible that they have been noticed by the local population since the 19th century, with the folkloric name "Ciampate del Diavolo." The team led by P. Mietto (Mietto et al., 2002; Panarello et al., 2023) conducted field and laboratory research for approximately twenty years (2001-2018), resulting in the discovery of several other humans' footprints arranged in short trackways (the two detached sectors of Trackway C and the four footprints of Trackway E), or in very short sequences, as well as the poorly preserved footprints of the pathway,

Tab. 6 - Summary of the univariate analysis statistics' data obtained for the footprint samples from the Cape South Coast (South African) ichnosites of Brenton 1 (Brenton-on-Sea) and Goukamma site 2 (Goukamma Nature Reserve). Data from Helm et al. (2018 a,b, 2019 a,b, 2020 a,b).

			UNIVARIATE	STATISTICS			
	Brenton 1 (Br	enton-on-Sea)			Goukamma site 2 (Gouk	amma Nature Reserve)	
	Footprint Length (mm)	Footprint width (mm)	Lengh against Width ratio		Footprint Length (mm)	Footprint width (mm)	Lengh against Width ratio
N	27	27	27	N	13	13	13
Min	12	1.5	9.38	Min	12	5.5	44.44
Max	23	10	58.33	Max	20	10	62.5
Sum	478.5	189	1073.04	Sum	195	100	668.95
Mean	17.72222	7	39.74222	Mean	15	7.692308	51.45769
Std. error	0.5197888	0.4401502	2.284571	Std. error	0.6201737	0.342214	1.63917
Variance	7.294872		14.09201	Variance	5	1.522436	3.492944
Stand. dev	2.700902	2.287087	11.87098	Stand. dev	2.236068	1.23387	5.910113
Median	17.5	7	41.67	Median	15	8	50
25 prcntil	16	9	37.5	25 prcntil	13	7	46.41
75 prcntil	20	6	47.06	75 prentil	16	8	55.495
Skewness	-1.723306	-0.7447823	-1.378286	Skewness	0.8984928	0.1044676	0.8208693
Kurtosis	0.09753222	0.3067398	1.531307	Kurtosis	0.7054545	0.3012234	-0.390666
Geom. mean	17.51482	6.48349	37.01799	Geom. mean	14.85439	7.59932	51.15796
Coeff. var	15.2402	32.67268	29.86994	Coeff. var	14.90712	16.04031	11.48538
			NORMALIT	LY TESTS			
	Brenton 1 (Br	enton-on-Sea)			Goukamma site 2 (Gouk	amma Nature Reserve)	
	Footprint Length	Footprint width	Lengh against Width ratio		Footprint Length	Footprint width	Lengh against Width ratio
N	27	27	27	N	13	13	13
Shapiro-Wilk W	0.9722	0.919	0.8394	Shapiro-Wilk W	0.9273	0.9189	0.8996
p(normal)	0.6616	0.03732	0.000715	p(normal)	0.3143	0.2424	0.1321
Anderson-Darling A	0.2732	0.7543	1737	Anderson-Darling A	0.3971	0.6224	0.5138
p(normal)	0.6391	0.04352	0.0001406	p(normal)	0.3161	0.0818	0.1565
p(Monte Carlo)	0.671	0.044	0.0002	p(Monte Carlo)	0.3308	0.0797	0.1633
Lilliefors L	0.1137	0.1667	0.2182	Lilliefors L	0.1735	0.2477	0.2128
p(normal)	0.4843	0.05054	0.0001	p(normal)	0.3444	0.02813	0.105
p(Monte Carlo)	0.4818	0.0518	0.0015	p(Monte Carlo)	0.3452	0.0299	0.1077
Jarque-Bera JB	0.1392	2224	8846	Jarque-Bera JB	1357	0.04733	1386
p(normal)	0.9328	0.3289	0.012	p(normal)	0.5073	0.9766	0.5
p(Monte Carlo)	0.9343	0.1251	0.0176	p(Monte Carlo)	0.1771	0.9836	0.1779

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Fig. 24 - Box plot illustrating the variation range of footprints impressed on the aeolian deposits surface at Brenton 1 and Goukamma 2 (Goukamma Nature Reserve) ichnosites (Cape South Coast, South Africa). Footprint length (Fl and width (Fw) (data from Helm et al., 2018 a,b, 2019 a,b, 2019 a,b, 2020 a,b).

running at the top of the slope. In this contribution, we have attempted to objectively ascertain the minimum number of individuals who descended the slope using the soundest available data (state of preservation of the footprints, morphometric features, quantity and quality of anatomical details, position on the slope with respect to the other footprints of the same track, and precision of the recorded measurements) for the latter, for which the precise number of trackmakers is difficult to hypothesize.

The obtained results and the direct inspections of the footprint arrangement at the ichnosite allow us to state that most likely at least four trackmakers (A, B, C, and E) walked on the ignimbrite slope deposit. In more detail, assuming that foot size and stature are actually positively related, the footprints of trackways A, and B, were likely left by two individuals of similar stature, whereas the individual who made the Trackway E footprints was likely taller. Furthermore, it is highly probable that an individual of comparable stature to that of trackmakers A and B left the Trackway C footprints, as suggested by field observations. On the other hand, more solid evidence is needed to support the hypothesis that a fifth, smaller individual left the footprints of short sequence D, which is based solely on a single imperfectly preserved footprint.

Furthermore, the results underline how much substrate conditions (coarse granulometry, plasticity, and slipperiness) along with slope acclivity influenced the trackmaker gait (velocity, and stride length), the walking direction and its changing, the pace stability, and the way in which the foot rests against the substrate slope. The combined action of these factors conditioned the footprint shape and size proportions, resulting in variation of the footprint proportions along the same path.

All things considered, the set of data confirms the



Fig. 25 - Biplot diagram produced by the principal components analysis (PCA) computed for the human footprint samples from some Cape South Coast (South African) ichnosites [Brenton-on-sea (Br), Garden Route National Park-Site 1 (GRNP), Goukamma Tracksite 1 (Gouk1), Goukamma Nature Reserve, Tracksite 2 (Gouk2). The component loadings (below) show the degree to which the different original variables enter into components 1, 2, and 3. Abbreviation as in figure 11a.

peculiar characteristics of the footprints of the site and the difficulty of being able to compare their pattern with those of other sites with human footprints from Pleistocene ichnosites.

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SAMPLE A (all footprints) - Reduced Major Axis (RMA) regression - Statistics

	All Foot	prints			Trackw	ay A			Trackw	ay B			Track	way C	
RMA Regre	ession: Footprint wid	th (Fw)-Footprint	length (FI)	RMA Regr	ession: Footprint wid	th (Fw)-Footprint	length (FI)	RMA Reg	ession: Footprint wid	th (Fw)-Footprint	length (Fl)	RMA Regres	sion: Footprint w	idth (Fw)-Footprin	nt length (Fl)
Slope AF	1 1528	Std. error a	0.16454	Slone AF	0 79878	Std. error a	0.13121	Slope AF	-0 98022	Std. error a	0.25178	Slope AF	-0.68983	Std. error a	0.17850
+-	7 006	p (slone).	7 198F-9	Siope AL	6 0823	p (slone).	0.13131	+-	3 8033	p (slone).	0.0014411	+·	3 8676	n (slone)	0.17033
Intercent AC	0 41185	Std. error b	0 30033	Intercent AC	1 2647	Std. error b	0 31412	Intercept AC	5 4122	Std. error b	0.59015	Intercept AC	4 7497	Std. error b	0 41907
intercept Ac	0.41105	Stu. error b.	0.55052	intercept Ac	1.2047	510. 61101 0.	0.51412	Intercept Ac	5.4155	510. 61101 0.	0.55015	Intercept Ac	4.7407	560. 61101 0.	0.41507
E% hootstranno	d confidence interval	c (N=1000)-		0E% bootstrapp	od confidence interval	c (N=1000)-		95% bootstrann	d confidence interval	c (N-1000)		05% hootstrange	d confidonco into	prole (N=1000):	
	(0.82285 3.7878)	3 (14-1555).		Slone AF	(0.46864_0.95594)	3 (14-1555).		Slone AF	(-3 /82 -0 56122)		Slope AF	1 0233 0 81454)	14013 (14-1555).	
ntercent AC	(-5 8424 1 201)			Intercent AC	(0.88857 2.0525)			Intercent AC		(4 4386 11 275)		Intercent AC	(1 2421 5 5551)		
nterceptivie	(5.0424. 1.201)			interceptivie	(0.0005712.0525)			interceptivie		(4.4500.11.275)		interceptine	(1.2.121. 5.55551)		
Correlation:				Correlation:				Correlation:				Correlation:			
	0 14965			correlation.	0 65767			correlation.	0 10172			correlation.	0.95551		
	0.14803			1.	0.03707			·. ·?·	-0.101/3			r. r.	-0.833331		
2.	0.022097			12:	0.43255			12.	0.010548			12.	2 72045		
	1.0414			L.	4.0008			Li (-0.39604			L.	-3.73045		
D (uncorr.):	0.30289			p (uncorr.):	0.00064855			p (uncorr.):	0.09765			p (uncorr.).	0.029807		
Permutation p:	0.2979			Permutation p:	0.0017			Permutation p:	0./01/			Permutation p:	0.0126		
		(-)-								(=) =	.1 (=1)			(=) =	
RMA Regr	ession: Footprint are	ea (Fa)-Footprint	ength (FI)	RMA Reg	ression: Foot print are	ea (Fa)-Footprint	length (FI)	RMA Reg	ression: Footprint are	ea (Fa)-Footprint I	ength (FI)	RMA Regre	ssion: Footprint a	irea (Fa)-Footprint	t length (FI)
Slope AE	0.5049	Std. error a:	0.043471	Slope AE	0.36937	Std. error a:	0.03841	Slope AE	0.3662	Std. error a:	0.085221	Slope AE	0.88969	Std. error a:	0.4437
t:	11.615	p (slope):	1.5093E-15		t:	96165	p (slope):	t:	4.297	p (slope):	0.00063558	t:	2.0051	p (slope):	0.11544
ntercept AC	0.49624	Std. error b:	0.22814	Intercept AC	1.2195	Std. error b:	0.20306	Intercept AC	1.2045	Std. error b:	0.44495	Intercept AC	-1.4963	Std. error b:	2.3077
95% bootstrappe	d confidence interval	s (N=1999):		95% bootstrappe	ed confidence interval	s (N=1999):		95% bootstrappe	ed confidence interval	s (N=1999):		95% bootstrappe	d confidence inte	rvals (N=1999):	
Slope AE	(0.43069. 0.57754)			Slope AE	(0.26221. 0.43975)			Slope AE	(0.24868. 1.084)			Slope AE	057296. 3.1876)		
ntercept AC	(0.10762. 0.88456)			Intercept AC	(0.84373.1.794)			Intercept AC	(-2.5524. 1.8163)			Intercept AC	-1.3493. 3.2083)		
Correlation:				Correlation:				Correlation:				Correlation:			
r:	0.80261			r:	0.88529			r:	0.43316			r:	0.07162		
r2:	0.64418			r2:	0.78373			r2:	0.18763			r2:	0.0051294		
ti	9.322			t:	8.5134			t:	1.8613			t:	0.14361		
o (uncorr.):	2.3954E-12			p (uncorr.):	0.00044012			p (uncorr.):	0.082412			p (uncorr.):	0.89275		
Permutation p:	0.0001			Permutation p:	0.0001			Permutation p:	0.0781			Permutation p:	0.871		
RMA Reg	ression: Fw/Fl x 100	(Fin)-Footprint le	ength (FI)	RMA Re	gression: Fw/Fl x 100	(Fin)-Footprint le	ngth (Fl)	RMA Re	gression: Fw/Fl x 100	(Fin)-Footprint le	ngth (Fl)	RMA Regr	ession: Fw/Fl x 10	00 (Fin)-Footprint	length (Fl)
Slope AE	-0.81611	Std. error a:	0.0827	Slope AE	-1.0263	Std. error a:	0.22809	Slope AE	-0.66568	Std. error a:	0.11613	Slope AE	-0.42099	Std. error a:	0.066743
t:	9.8683	p (slope):	3.9018E-13	t:	4.4994	p (slope):	0.00021908	t:	5.7323	p (slope):	0.03965	t:	6.3076	p (slope):	0.0032302
ntercept AC	6.2715	Std. error b:	0.3169	Intercept AC	7.0963	Std. error b:	0.87237	Intercept AC	5.6672	Std. error b:	0.44507	Intercept AC	4.7387	Std. error b:	0.25503
95% bootstrappe	d confidence interval	s (N=1999):		95% bootstrappe	ed confidence interval	s (N=1999):		95% bootstrappe	ed confidence interval	s (N=1999):		95% bootstrappe	d confidence inte	rvals (N=1999):	
Slope AE	(-0.937230.61631)			Slope AE	(-3.66350.78603)			Slope AE	(-0.958810.34158)			Slope AE	580580.15959)		
ntercept AC	(5.5039, 6.7422)			Intercept AC	(6.1987, 17.171)			Intercept AC	(4.432, 6.7823)			Intercept AC	(3.7471, 5.3623)		
	(0.0000.0				(0.20011211212)				((
Correlation:				Correlation:				Correlation:				Correlation:			
r:	-0 71211			r	-0 10992			r	-0 73723			r:	-0 9484		
-2-	0.50711			r	0.10002			r2·	0.5435			r7·	0.99946		
12. h	-70274			+-	-0.49457			+-	-4 226			+-	-59821		
n (uncorr):	6 6758F-0			n (uncorr):	0.62629			n (uncorr):	0.000733/3			n (uncorr):	0.0039253		
Permutation n:	0.07502-5			Permutation n	0.6274			Permutation n	0.00073343			Permutation n:	0.0035255		
rennatation p.	0.0001			r crinatation p.	0.0274			rematation p.	0.001			r childration p.	0.0001		
		5	SAMPLE B (se	lected footp	rints) - Reduced	Major Axis (F	RMA) regress	ion - Statistic	S						
	All Foot	prints	SAMPLE B (se	lected footp	r <mark>ints) - Reduced</mark> Trackw	<mark>Major Axis (</mark> F av A	RMA) regress	ion - Statistic	:s Trackw	av B					
PMA Pegra	All Foot	prints	SAMPLE B (se	RMA Regr	rints) - Reduced Trackw	Major Axis (F ay A th (Ew) Ecotorist	(MA) regress	ion - Statistic	S Trackw	ay B	length (El)				
RMA Regre	All Foot	prints th (Fw)-Footprint	Iength (FI)	RMA Regr	rints) - Reduced Trackw ression: Footprint wid	Major Axis (F ay A th (Fw)-Footprint Std. error a:	(MA) regress	ion - Statistic RMA Regr	S Trackw ession: Footprint wid	ay B th (Fw)-Footprint	length (Fl)				
RMA Regre Slope AE	All Foot ssion: Footprint wid 0.89389 40.770	prints th (Fw)-Footprint Std. error a:	CAMPLE B (se length (Fl) 0.17957	RMA Regr Slope AE	rints) - Reduced Trackw ression: Footprint wid 0.15254	Major Axis (F ay A th (Fw)-Footprint Std. error a:	(MA) regress length (FI) 0.053289	ion - Statistic RMA Regr Slope AE	S Trackw ession: Footprint wid 0.14873	ay B th (Fw)-Footprint Std. error a:	length (Fl) 0.055602				
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TABLE SI2	 The residua Pagan tests for 	ls' table repor normal distri	ts the distance ibution and in	es from each data point to the r dependence between independ	egression line ent variable a	. in the x and y	y directions (fr riance (homos	irst and third o skedasticity) a	columns). The re reported in	results of the Durbin-Watson the second and fourth columns	and Breusch-
SAM	PLE A (all th	e measured	l footprints) - RMA Regression - Resi	iduals	SAM	PLE B (best	-preserved	footprints)	- RMA Regression - Resid	luals
	All foo	tprints		TESTS			All foo	tprints		TESTS	
RMA Regree	ssion: Footpri	nt width (Fw) Regress	-F length (Fl) Residual	Std Error of estimates	0.087174	RMA Regres	sion: Footpri	nt width (Fw) Regress	-F length (Fl) Residual	Std Frror of estimates	0.045879
24.069	32.465	31.865	0.060012			24.336	31.987	3231,0000	-0.032374		
24.159	32.465	31.968	0.049673	Durbin-Watson statistic	14815	24.159	32.108	32152,0000	-0.0043824	Durbin-Watson statistic	1.1698
24.159	32.229	31.968	0.02605			2.451	32.108	32466,0000	-0.03575		
23.514	31.398	31.224	0.017412	Breusch- Pagan statistic	2366	23.702	31.987	31744,0000	0.024271	Breusch- Pagan statistic	0.0014155
23.321	31.355	31.003	0.035242	p (nonoskedastic)	0.12002	24.681	32.068	32619,0000	-0.055071	p (nomoskedastic)	0.50555
24.336	31.987	32.172	-0.018548			24.596	31.987	32543,0000	-0.055594		
23.702	31.355	31.442	-0.0086774			23.888	31.987	3191,0000	0.0077171		
23.321	31.485	31.003	0.048202			23.514	31.442	31575,0000	-0.013383		
23.418	31.135	31.114	0.0021257			23.514	31.355	31575,0000	-0.022041		
23.375	31.046	32.172	-0.11263			23.020	31.333	31139,0000	0.021372		
24.596	3.157	32.472	-0.090164			23.514	31.398	31575,0000	-0.017703		
24.159	32.108	31.968	0.014026			23.609	31.398	3166,0000 3149.0000	-0.026176 -0.013487		
2.451	32.108	32.373	-0.026426			23.418	31.398	3149,0000	-0.009149		
23.702	31.987	31.442	0.054502			23.418	31.179	3149,0000	-0.031032		
24.681	32.068	3.257	-0.050172			23.514	32.542	31575,0000	0.096707		
24.596	31.987	32.472	-0.048492			RMA Regre	ssion: Foot p	rint area (Fa)-	F length (FI)		
23.888	31.987	31.655	0.033154			Fa 53.845	FI (FI) 31 987	Regress.	Residual	Std. Error of estimates	0.051211
23.979	3.091	3.176	-0.085005			53.519	32.108	32.073	0.0035864	Durbin-Watson statistic	1.4232
23.514	31.355	31.224	0.013073			53.799	31.987	32.207	-0.021978	p (no pos. autocoorelation)	0.87766
23.026	31.355	30.662	0.069317 -0.021655			5.425	32.108	32.422	-0.031328 0.019385	Breusch- Pagan statistic	0.7465
23.514	31.442	31.224	0.021731			53.181	31.987	31.911	0.0075317	p (homoskedastic)	0.38759
23.026	31.135	30.662	0.047338			54.972	32.068	32.767	-0.069865		
23.514	3.091	31.224	-0.085005			53.566	31.987	32.095	-0.010843		
23.979	31.135	3.176	-0.062532			51.874	31.355	31.287	0.006801		
23.514	30.445	31.224	-0.077898			52.933	31.442	31.793	-0.035136		
23.026	31.442	30.662	0.077975			5.323	31.355	31.935	-0.057983		
23.514	31.398	31.224	0.017412			51.533	31.442	31.124	0.031745		
23.609	31.398	31.333	0.0064851			52.832 50.876	31.398	31.745	-0.03463		
23.418	31.398	31.114	0.028443			51.874	31.355	31.287	0.006801		
23.514	30.956	31.224	-0.026843			5.273	31.398	31.696	-0.029756		
24.849	30.634	32.764	-0.21296			52.204	31.179	31.444 31.392	0.15659		
22.513	31.864	3.007	0.1793			52.444	32.542	31.559	0.098321		
23.418	31.179	31.114	0.0065603			RMA Re	egression: FI/	Fw-Fl (Fl)-F le	ngth (Fl)	Chal Franzish antimatan	0.049460
23.418	29.601	32.273	-0.26718			38.395	31.987	31.426	0.056039	Std. Error of estimates	0.048409
24.423	29.601	32.273	-0.26718			38.111	32.108	31.689	0.041942	Durbin-Watson statistic	0.63906
23.979	32.958	3.176	0.11979			3.848	31.987	31.347	0.063973	p (no pos. autocoorelation)	0.0000798
RMA Regre	ession: Foot pr	int area (Fa)-	F length (FI)			37.773	31.987	32.002	-0.0014928	Breusch- Pagan statistic	4.1132
Fa	FI (FI)	Regress.	Residual	Std. Error of estimates	0.041975	37.865	31.987	31.917	0.0069479	p (homoskedastic)	0.04255
54.806	32.465	32.634	-0.016946	Durbin-Watson statistic	1 6/32	3.867	32.068	31.171	0.089712		
52.832	31.781	31.638	0.014303	p (no pos. autocoorelation)	0.13376	37.955	31.987	31.834	0.015313		
54.027	32.229	32.241	-0.001206		0 44 46 4	37.728	31.355	32.044	-0.068921		
52.204	31.398	31.132	0.066839	p (homoskedastic)	0.41464	38.111	31.442	31.689	-0.02475		
51.533	31.355	30.982	0.037336			37.728	31.355	32.044	-0.068921		
53.845	31.987	32.149	-0.01622			37.635	31.442	3.213	-0.068821		
49.053	30.397	29.729	0.020122			38.265	31.398	31.547	-0.014833		
51.761	31.485	31.097	0.038754			38.111	31.355	31.689	-0.033408		
52.149	31.135	31.293	-0.015767			38.067	31.398	3.173	-0.033177		
5.247	31.046	31.455	-0.040897			3.661	32.958	3.308	-0.012116		
52.983	3.157	31.714	-0.014382			37.013	32.542	32.706	-0.01637		
53.519	32.108	31.984	-0.012429				Tra	ck A		TESTS	
5.425	32.108	32.353	-0.024476			RMA Regres	sion: Footpri	nt width (Fw)	-F length (Fl)		
52.933	31.987	31.689	0.029822			Fw (Fw)	FI (FI)	Regress.	Residual	Std. Error of estimates	0.00584
54.972	32.068	32.718	-0.064979			24.336	32.108	32.039	0.0096795	Durbin-Watson statistic	2.6246
53.566	31.987	32.008	-0.0021292			24.423	31.987	32.052	-0.0065232	p (no pos. autocoorelation)	0.89606
53.566	31.987	32.008	-0.0021292			2.451	32.108	32.065	0.0043266	Breusch- Pagan statistic	0 66702
52.679	3.091	3.156	-0.064961			23.795	31.987	31.956	0.0030565	p (homoskedastic)	0.41409
53.279	31.355	31.863	-0.050812			24.681	32.068	32.091	-0.0023214		
51.874	31.355	31.154	0.020122			24.596	31.987	32.078	-0.0091533		
52.933	31.442	31.689	-0.024699			RMA Regre	ssion: Foot p	rint area (Fa)-	F length (FI)		
51.533	31.135	30.982	0.015357			Fa	FI (FI)	Regress.	Residual	Std. Error of estimates	0.0051443
52.781	31.355	31.612	-0.025688			53.845	31.987	32.033	-0.0046101	Durbin-Watson statistic	2 5738
51.985	31.135	3.121	-0.0074672			53.799	31.987	32.029	-0.0041847	p (no pos. autocoorelation)	0.9091
5.118	30.445	30.803	-0.035814			5.425	32.108	3.207	0.0038173	Drawah Draw of 11	0.00000
5.323	31.355 31.442	31.838	-u.048355 0.045994			52.933 53.181	31.987 31.987	31.948 31.971	0.0038272	preuscn-Pagan statistic p (homoskedastic)	0.30789
52.832	31.398	31.638	-0.023919			54.972	32.068	32.137	-0.006905	, , , , , , , , , , , , , , , , , , , ,	
50.876	31.398	3.065	0.074844			53.566	31.987	32.007	-0.0020279		
51.8/4	31.398	31.586	-0.018766			53.566 RMA Re	egression: FI/	3∠.007 Fw-Fl (Fl)-F le	ngth (FI)		
51.475	30.956	30.952	0.00034644			FI/Fw	FI (FI)	Regress.	Residual	Std. Error of estimates	0.006654
52.679	30.634	3.156	-0.092612			38.395	31.987	32.044	-0.0057565	Durbin-Watson statistic	2 6060
51.705	31.864	31.068	0.046743			3848	32.108	32.058	-0.007144	p (no pos. autocoorelation)	0.91081
52.204	31.179	3.132	-0.014069			38.459	32.108	32.055	0.0053723	Description of the second s	
51.299 49 273	31.179	30.863	0.031603			37.773	31.987	31.944	0.0043043	Breusch- Pagan statistic	0.5923
49.273	29.601	2.984	-0.023926			3.867	32.068	32.089	-0.0020932	r (nonioskeudstie)	3.4+133

55.053	32.958	32.759	0.019933			38.649	31.987	32.086	-0.009884		
RMA Re	gression: FI/	Fw-Fl (Fl)-F le	ngth (Fl)			37.955	31.587	31.573	0.0013034		
Fl/Fw	FI (FI)	Regress.	Residual	Std. Error of estimates	0.050692		Tra	ck B		TESTS	T
37.658	32.465	31.981	0.048348	Durkin Watson statistic	1 0921	RMA Regress	sion: Footpri	nt width (Fw)	-F length (Fl)	Chal France of antimates	0 44424
37.751	32.465	31.906	0.05587	p (no pos. autocoorelation)	0.00033995	23.026	31.355	кеgress. 31.342	0.0013078	Std. Error of estimates	0.44434
37.977	32.229	31.721	0.050754	, (p		23.514	31.442	31.414	0.0027095	Durbin-Watson statistic	2.0351
38.155	31.398	31.576	-0.017773	Breusch- Pagan statistic	0.63867	23.514	31.355	31.414	-0.0059486	p (no pos. autocoorelation)	0.62746
37.448	31.822	32.153	-0.033113	p (homoskedastic)	0.42419	23.026	31.355	31.342	0.0013078	Brousch- Pagan statistic	0.97445
38.395	31.987	31.381	0.060606			23.514	31.398	31.342	-0.0016102	p (homoskedastic)	0.37443
38.395	31.355	31.381	-0.0025733			23.609	31.398	31.429	-0.0030199		
37.635	30.397	3.2	-0.16028			23.418	31.355	3.14	-0.0045253]	
3/.88/	31.485	31./95	-0.031013			23.418	31.398	3.14	-0.00018694		1
38.501	31.527	31.293	0.023397			Fa	FI (FI)	Regress.	Residual	Std. Error of estimates	0.44775
39.338	31.046	30.611	0.043504			51.874	31.355	31.408	-0.0053072		
3.908	3.157	30.821	0.074887			52.933	31.442	31.359	0.0082124	Durbin-Watson statistic	2.3667
38.111	32.108	31.612	0.049635			52.781	31.355	31.366	-0.0011428	p (no pos. autocooreiation)	0.86381
38.459	32.108	31.328	0.078024			51.533	31.442	31.424	0.001786	Breusch- Pagan statistic	0.11722
37.773	31.987	31.888	0.0099218			52.832	31.398	31.364	0.0034291	p (homoskedastic)	0.73207
37.865	31.987	31.813	0.01/358			50.876	31.398	31.454	-0.005549		
38.649	31.987	31.173	0.081399			5.273	31.398	31.369	0.0029608		
37.955	31.987	31.739	0.024727			RMA Re	gression: Fl/I	Fw-Fl (Fl)-F le	ngth (Fl)		
38.459	3.091	31.328	-0.041777			FI/Fw	FI (FI)	Regress.	Residual	Std. Error of estimates	0.0047829
3.912	31 355	30.788	-0.0122			37.728	31.355	3.143	-0.0075376	Durbin-Watson statistic	2 1533
37.728	31.355	31.925	-0.057001			38.199	31.355	31.358	-0.0003181	p (no pos. autocoorelation)	0.68719
38.628	30.445	3.119	-0.074464			37.728	31.355	3.143	-0.0075376		
38.111	31.442	31.612	-0.017056			37.635	31.442	31.444	-0.00029408	Breusch- Pagan statistic	1.1207
37.932	31.355	31./58	-0.002267			38.265	31.398	31.365	0.0050244	p (nomoskeudsuč)	0.29876
3.912	3.091	30.788	0.0122			38.111	31.355	31.372	-0.0016672		
38.898	31.135	3.097	0.016518			38.067	31.398	31.378	0.0019921		
3.912	30.445	30.788 31 07E	-0.03432								
37.635	31.442	3.2	-0.055882								
38.155	31.398	31.576	-0.017773								
38.265	31.398	31.487	-0.0088339								
38.111	31.355	31.612	-0.025714								
38.607	30.956	31.207	-0.025125								
40.271	30.634	29.849	0.078493								
37.038	32.027	32.488	-0.046054								
38.286	31.804	31.469	-0.028941								
38.286	31.179	31.469	-0.028941								
40.877	29.601	29.355	0.024598								
40.877	29.601	29.355	0.024598								
37.062	32.330	32.468	0.049044								
37.062	32.558	32.468 32.508	0.049044 0.0034298								
37.062	32.542	32.468 32.508	0.049044 0.0034298								
37.062 37.013	32.538 32.542 Tra	32.468 32.508 ck A	0.049044 0.0034298	TESTS]					
37.062 37.013 RMA Regres Fw (Fw)	32.542 32.542 Tra sion: Footpri Fl (Fl)	32.468 32.508 ck A nt width (Fw) Regress.	0.049044 0.0034298 -F length (Fl) Residual	TESTS Std. Error of estimates	0.039507						
37.052 37.013 RMA Regres Fw (Fw) 24.069	32.538 32.542 Tra sion: Footpri Fl (Fl) 32.465	32.468 32.508 ck A nt width (Fw) Regress. 31.874	0.049044 0.0034298 -F length (Fl) Residual 0.05914	TESTS Std. Error of estimates	0.039507						
37.062 37.013 RMA Regres Fw (Fw) 24.069 24.159	32.538 32.542 Tra sion: Footpri Fl (Fl) 32.465 32.465 32.465	32.468 32.508 ck A nt width (Fw) Regress. 31.874 31.945	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.051976	TESTS Std. Error of estimates Durbin-Watson statistic o (on por autocogrelation)	0.039507						
37.062 37.013 RMA Regress Fw (Fw) 24.069 24.159 24.159 24.159	32.538 32.542 Tra sion: Footpri Fl (Fl) 32.465 32.465 32.465 31.781 32.229	32.468 32.508 ck A nt width (Fw Regress. 31.874 31.945 31.945 31.945	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.051976 -0.016461 0.028353	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation)	0.039507						
37.062 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 24.159	32.542 32.542 Tra sion: Footpri Fl (Fl) 32.465 32.465 32.465 31.781 32.229 31.398	32.468 32.508 nt width (Fw) Regress. 31.874 31.945 31.945 31.945 3.143	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.051976 -0.016461 0.028353 -0.0031306	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic	0.039507 1219 0.0305637 0.95606						
37.062 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 23.514 23.224	32.542 32.542 Tra sion: Footpri Fl (Fl) 32.465 32.465 31.781 32.229 31.398 31.822	32.468 32.508 nt width (Fw) Regress. 31.874 31.945 31.945 31.945 3.143 31.198	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.051976 -0.016461 0.028353 -0.0031306 0.062403	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 23.514 23.224 23.221 24.326	32.542 32.542 Tra sion: Footpri Fl (Fl) 32.465 31.781 32.229 31.398 31.822 31.355 31.987	32.468 32.508 ck A nt width (Fw) Regress. 31.874 31.945 31.945 31.945 31.198 31.198 31.276 32.087	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.05976 -0.016461 0.028353 -0.0031306 0.062403 0.0078926 -0.00998	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch-Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 23.514 23.224 23.321 24.336 23.702	32.542 32.542 Tra sion: Footpri Fl (Fl) 32.465 31.781 32.229 31.398 31.822 31.355	32.468 32.508 ck A nt width (Fw) Regress. 31.874 31.945 31.945 31.945 31.198 31.198 31.276 32.087 3.158	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.051976 -0.016461 0.028353 -0.0031306 0.062403 0.0078926 -0.00998 -0.002541	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 RMA Regress Fw (Fw) 24.059 24.159 24.	32.542 32.542 Tra sion: Footpri Fl (Fl) 32.465 32.465 31.781 32.229 31.398 31.822 31.398 31.822 31.355 31.987 31.355 30.397	32.468 32.508 ck A nt width (Fw) Regress. 31.874 31.945 31.945 31.945 31.945 31.143 31.198 31.276 32.087 3.158 30.198	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.051976 -0.016461 0.028353 -0.0031306 0.062403 0.0078926 -0.00988 -0.002541 0.019918	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 23.514 23.221 23.321 23.321 23.321 23.322 21.972 23.321 23.340	32.536 32.542 Tra sion: Footpri Fl (Fl) 32.465 32.465 32.465 32.465 31.781 32.229 31.338 31.822 31.355 30.397 31.355 30.397 31.485 31.355	32,468 32,508 ck A nt width (Fw 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,276 32,087 31,276 30,198 31,276 31,27	0.049044 0.0034298 -F length (Fl) Residual 0.051914 0.051916 0.001306 0.002540 0.0031306 0.002541 0.00252 0.002952 0.002952 0.002952	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 24.069 24.159 24.159 24.159 24.159 23.514 23.321 24.336 23.702 21.972 23.321 23.321 23.341 23.341 23.341 23.341 23.341 23.341 23.341 23.341 23.341	32.526 Tra sion: Footpri Fl (Fl) 32.465 32.465 32.465 32.465 31.781 31.827 31.398 31.822 31.355 31.987 31.355 30.397 31.485 31.135 31.135	32,468 32,508 ck A nt width (Fw, Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,276 32,087 31,583 31,276 31,353 31,801	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.028353 -0.0031306 0.062403 0.0078326 -0.002982 -0.022541 0.002852 -0.021804 -0.027386	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 23.514 23.224 23.321 24.336 23.702 21.972 23.321 23.418 23.979 24.336	32.522 Tra sion: Footpri FI (fl) 32.465 32.465 32.465 31.781 32.229 31.398 31.825 31.987 31.855 30.397 31.485 31.135 31.355 31.327 31.485 31.135 31.527 31.046	32,468 32,508 ck A tt width (Fw, Kegress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,198 31,276 31,353 31,276 31,353 31,801 32,087	0.049044 0.0034298 F length (Fl) Residual 0.05914 0.025914 0.028353 -0.0031306 0.0028254 0.0078926 -0.02998 0.0202541 0.0201804 -0.027386 -0.027876 -0.0278776 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.0278776 -0	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 23.514 23.321 23.321 23.321 23.321 23.322 21.972 23.321 23.326 23.702 21.972 23.321 23.348 23.379 24.336 24.596 24.59 24.356 24.596 24.59	32.542 Tra sion: Footpri FI (FI) 32.465 31.781 32.245 31.781 32.245 31.781 31.852 31.385 31.355 30.397 31.485 31.135 31.57	32,468 32,508 32,508 32,508 32,508 31,94531,945 31,945 31,945 31,945 31,94531,945 31,945 31,94531,945 31,945 31,94531	0.049044 0.0034298 	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch-Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 24.159 23.514 23.321 23.321 23.321 23.370 21.972 23.321 23.370 24.336 24.396 24.399 24.336	32.532 32.542 Fa (Fi) 32.465 32.465 32.465 32.465 32.465 31.781 32.229 31.382 31.385 31.385 31.385 31.355 30.397 31.485 31.13	32,468 32,508 32,508 ck A Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,198 31,198 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276 31,1353 31,1276	0.049044 0.0034298 -F length (Fl) Residual 0.05914 0.05914 0.016461 0.028353 -0.0016461 0.028453 -0.002541 0.019918 0.020852 -0.021804 -0.02284 0.022841 0.020852 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.027386 -0.021804 -0.0	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 8RMA Regres Fw (Fw) 24.069 24.159 24.159 23.514 23.221 23.321 23.321 23.321 23.321 23.322 21.972 23.321 23.321 23.418 23.979 24.433 24.4596 24.459	32.542 Tra sion: Footpri F[(f)] 32.465 32.465 31.781 32.265 31.398 31.398 31.822 31.398 31.987 31.355 31.395 31.355 31.3577 31.3577 31.3577 31.35777 31.357777 31.357777777777777	32,468 32,508 ck A nt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,2087 31,945 32,2087 32,2156 32,225	0.049044 0.0034298 -F length (Fl) Residual 0.051976 -0.016461 0.0031306 -0.028353 -0.0031306 -0.0078926 -0.0078926 -0.0078926 -0.021804 -0.027340 -0.0172401 0.016329 -0.016329	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 FMA Regres Fw (Fw) 24.059 24.159 24.159 24.159 24.159 23.514 23.321 24.336 23.702 21.972 23.321 24.336 24.595 24.459 24.459 24.459 24.459 24.459 24.35	31.536 32.542 Tra sion: Footpri Fl (Pl) 32.465 32.465 31.481 32.229 31.398 31.325 31.398 31.355 31.987 31.355 31.987 31.355 31.987 31.355 31.987 31.355 31.987 3	32,468 32,508 ck A nt width [Fw] Regress. 31,874 31,94531,945 31,945 31,945 31,945 31,945 31,94531,945 31	0.049044 0.0034298 -F length (FI) Residual 0.051976 -0.016461 0.028353 -0.0031306 0.0078926 -0.0031306 0.0078926 -0.027848 -0.027848 -0.027848 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.0278400 -0.02784000 -0.02784000 -0.02784000 -0.02784000 -0.0278400000000000000000000000000000000000	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 37.013 24.059 24.159 24.159 24.159 24.159 23.514 23.321 24.336 23.702 21.972 23.321 24.336 24.336 24.59 24.423 24.433 24.459 24.325 24.325 24.325 24.325 24.325 24.325 24.325 24.325 24.325 24.325 24.325 23.702 23.702 24.325 24.423 24.423 24.425	32.542 Tra sion: Footpri F[(F]) 32.465 32.465 32.465 31.781 32.245 31.322 31.322 31.322 31.325 31.325 31.325 31.325 31.355 31.355 31.355 31.355 31.355 31.357 31.485 31.355 31.357 31.485 31.357 31.485 31.357 31.485 31.357 31.485 31.357 31.485 31.357 31.485 31.357 31.485 31.357 31	32,468 32,508 ck A nt width [Fw] Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,087 32,294 32,2156 32,2156 32,2255 32,2156 32,2255 32,1555 32,2255 32,2555 32,2555 32,2555 32,2555 32,2555 32,2555 32,2555 32,2555 32,2555 32,25555 32,25555 32,255555 32,25555555555	0.049044 0.0034298 -F length (Fl) Residual 0.051976 -0.016461 0.028353 -0.0031306 0.0078926 -0.0031306 0.0078926 -0.027846 -0.027846 -0.027846 -0.027846 -0.027846 -0.027846 -0.027846 -0.016956 -0.011702 -0.016956 -0.011702 -0.040638	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507						
37.062 37.013 37.013 37.013 37.013 24.069 24.159 24.159 24.159 24.159 24.159 23.514 23.321 23.321 23.321 23.321 23.3702 24.336 24.596 24.423 24.423 24.423 24.423 24.423 24.423 24.596	32.542 Tra sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 32.465 31.781 32.425 31.325 31.325 31.325 31.325 31.327 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.347 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.345 31.357 31.347 31.357 31.347 31.357 31.347 31.357 31.347 31.347 31.357 31.347 3	32,468 32,508 ck A nt width (Fw) 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,2087 31,2087 31,2087 31,2087 32,2087 32,2094 31,945 32,205 31,555 32,262 32,255 32,262 32,255 32,262 32,255 32,262 32,262 32,255 32,262 32,262 32,262 32,262 32,262 32,262 32,265 32,26	0.049044 0.0034298 	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 37.013 37.013 24.059 24.059 24.159 24.159 24.159 23.514 23.321 23.321 23.320 21.972 23.321 23.3702 24.336 24.359 24.423 2.4591 24.423 2.4591 24.3795 24.4591 24.596 24.4591 24.596 24.596 24.599 24.423 2.4591 23.795 24.6591 24.599 24.591 24.5	32.542 sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 31.781 32.465 31.87 31.387 31.387 31.387 31.387 31.387 31.387 31.387 31.387 31.387 31.987 32.108 31.987 32.068 31.987	32,468 32,508 ck A nt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,2087 31,58 30,198 31,276 32,2087 31,2087 32,215 3	0.049044 0.0034298 -F length (FI) Residual 0.05114 0.051976 0.028353 0.028353 0.0083266 0.00938 0.002852 0.00938 0.0078426 0.0078401 0.01702 0	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818						
37.062 37.013 37.013 37.013 24.069 24.059 24.159 24.159 23.514 23.221 23.321 23.321 23.321 23.321 23.321 23.321 23.322 24.356 24.596 24.459 24	32.542 Tra sion: Footpri F[(f)] 32.465 32.465 31.781 32.265 31.398 31.398 31.822 31.398 31.987 31.987 31.987 31.987 31.046 31.987 31.046 31.987 32.108 31.987 32.108 31.987 32.068 31.987 32.068 31.987 32.988 31.987 32.068 31.987 32.068 31.987 32.988 31.987 31	32,468 32,508 ck A nt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,2067 31,945 32,2067 31,945 32,2156 32,225 31,945 32,2156 32,225 31,945 32,226 31,945 32,226 31,945 32,226 31,945 32,226 31,945 32,226 32,226 32,226 32,226 31,226 32,226 31,226 32,226 32,226 31,226 32,226 32,226 32,226 31,226 32,266 32,266 32,266 32,266 32,266 32,266 32,266 32,266 32,266 32,26	0.049044 0.0034298 -F length (Fl) Residual 0.051976 -0.016461 0.0031306 0.0031306 0.0078926 -0.007982 -0.007982 -0.0021804 -0.02786 -0.02786 -0.02786 -0.02786 -0.01702 0.016956 -0.01702 0.040638 0.033308 -0.032398 -0.032498 -0	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507						
37.062 37.013 37.013 37.013 37.013 37.013 24.059 24.159 24.159 24.159 24.159 24.159 23.514 23.321 24.336 23.702 23.370 24.596 24.159 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.459 24.596 23.896 23.896 23.896 23.898 RMA Regree Fa 54.337	32.542 Tra sion: Footpri Fl (f) 32.465 32.465 31.781 32.465 31.398 31.398 31.822 31.355 31.987 31.355 31.987 31.485 31.135 31.987 31.485 31.135 31.987 32.108 31.987 32.108 31.987 32.108 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 32.008 31.987 31.987 32.008 31.987 31.987 32.008 31.987 31.987 32.008 31.987 32.988 32.988 32.988 33.987 32.988 33.987 34.987 35.987 35.987 35.987 35.987 35.987 35.987 35.987 35.987 35	32,468 32,508 ck A nt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,198 31,276 32,294 31,278 31,287 32,294 31,55 32,262 32,226 31,58 31,655 32,262 32,229 31,728 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,728 31,59 32,294 31,745 32,295 32,595 32,	0.049044 0.0034298 -F length (FI) Residual 0.051916 0.051916 0.051916 0.051916 0.0031306 0.062403 0.0031306 0.002826 0.0021804 0.0029826 0.002986 0.002986 0.002986 0.000000000000000000000000000000	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates	0.039507 1219 0.0305637 0.95606 0.32818 0.32818						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.321 23.321 24.336 23.702 23.702 23.321 24.336 24.596 24.423 24.423 24.423 24.459 24.423 24.459 24.423 24.459 24.459 24.459 24.459 24.859 24.659 25.652 2	32.542 Tra sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 32.465 31.781 32.425 31.827 31.325 31.327 31.325 31.327 31.485 31.327 31.485 31.327 31.485 31.327 31.485 31.327 31.485 31.327 31.485 31.327 3	32,468 32,508 ck A nt width (Fw) Regress. 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,198 31,276 31,288 30,198 31,276 31,358 31,276 32,294 31,945 32,255 32,362 31,728 31	0.049044 0.0034298 	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Std. Error of estimates Durbin-Watson statistic	0.039507 1219 0.030567 0.95606 0.32818 0.32818						
37.062 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 24.069 24.159 24.423 23.702 23.702 23.702 23.702 23.702 23.705 24.423 24.596 23.888 RMA Regree Fa 54.337 52.832 54.027 52.832 54.027 52.832 54.027 52.832 54.027 52.832 54.027 52.832 54.027 52.832 54.027 54	32.542 Tra sion: Footpri F(F) 32.465 32.465 32.465 32.465 32.465 31.781 32.425 31.827 31.827 31.827 31.827 31.827 31.827 31.827 31.987 32.465 31.781 32.245 31.781 32.245 31.781 32.245 31.781 32.245 31.781 32.245 32.781 32.245 32.781 32.245 32.781 32.245 32.781 32.245 32.781 32.245 32.781 32.781 32.245 32.781 32.245 32.781 32.781 32.245 32.781 32.245 32.781 32.781 32.781 32.2455 32.781 32.2455 32.781 32.781 32.2455 32.781 32.2455 32.781 32.2455 32.781 32.2455	32.468 32.508 ck A nt width (Fw) Regress. 31.874 31.945 31.945 31.945 31.945 31.945 31.945 31.945 31.945 31.945 31.945 31.945 31.945 31.276 31.583 31.276 32.297 32.297 32.297 32.255 32.362 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 3.2155 32.265 31.709 32.2155 32.255 3	0.049044 0.0034298 -F length (FI) Residual 0.05197 -0.016461 0.028353 -0.0031306 0.028353 -0.0031306 0.0262403 0.0078825 -0.002982 -0.022541 0.002982 -0.022541 0.020852 -0.021804 -0.027386 -0.017040 -0.027386 -0.01702 0.016329 -0.021804 -0.027386 -0.01702 0.016329 -0.021846 F length (FI) Residual 0.007472 0.007472	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818						
37.062 37.013 37.012	32.542 sion: Footpri F[(F)] 32.465 32.465 32.465 32.465 31.781 32.465 31.872 31.387 31.387 31.387 31.387 31.387 31.387 31.357 30.397 31.485 31.387	32,468 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,265 32,265 32,2156 32,225 31,158 32,265 32,265 32,265 31,709 32,216 31,709 32,216 32,216 3	0.049044 0.0034298 -F length (FI) Residual 0.05914 0.051976 -0.016461 0.028353 -0.028353 -0.028362 -0.0027866 -0.0027866 -0.0027866 -0.0027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027866 -0.027876 -0.027866 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027876 -0.027877 -0.027876 -0.027875 -0.027855 -0.007855 -0.	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Persons. autocoorelation) Persons. autocoorelation) Persons. autocoorelation)	0.039507 1219 0.0305637 0.95606 0.32818 0.02158 0.02158 21468 0.65847						
37.062 37.013	32.542 Tra sion: Footpri FI (FI) 32.465 32.465 31.781 32.265 31.398 31.398 31.822 31.395 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 31.987 32.068 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 32.906 31.987 31.987 32.906 31.987 31.987 32.906 31.987 31.987 31.987 31.987 32.906 31.987 3	32,468 32,508 ck A nt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,1276 32,2087 31,353 31,874 31,945 32,2156 32,224 31,945 32,2156 32,326 32,224 31,945 32,2156 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 31,745 32,255 32,326 32,224 32,224 31,745 32,255 32,326 32,224 32,224 32,224 32,224 32,224 32,224 32,225 32,224 32,225 32,224 32,224 32,225 32,225 32,224 32,224 32,225 32,225 32,225 32,224 32,244 32,244 32,244 32,244 32,244 32,244 32,244 32,244 32,2	0.049044 0.0034298 -F length (FI) Residual 0.05314 0.05314 0.05314 0.0031306 -0.016461 0.028353 -0.0031306 -0.0078926 -0.0079826 -0.0079826 -0.0079826 -0.020852 -0.021804 -0.02786 -0.02786 -0.01702 -0.01702 -0.0176956 -0.01702 -0.012541 0.032088 -0.023397 -0.03208 -0.023397 -0.03208 -0.023397 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.032541 -0.03208 -0.023397 -0.03279 -0.032541 -0.03208 -0.023397 -0.03279 -0.0379 -	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.02158 21468 0.65847 0.0083322 0.92727						
37.062 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.014 32.320 24.159 24.159 24.336 24.396 24.397 24.336 24.396 24.397 24.336 24.596 24.459 25.204	32.542 Tra sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 32.465 31.987 31.383 31.322 31.355 31.387 31.385 31.397 31.355 31.357 31.485 31.357 31.987 3	32,468 32,508 ck A it width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,198 31,276 32,2087 31,258 31,258 31,258 31,258 31,258 31,258 31,279 31,275 31,277 31,275 31,279 31,275 31,279 31,275 31,279 31,275 31,279 31,275 31,279 31	0.049044 0.0034298 -F length (FI) Residual 0.051976 -0.016461 0.051976 -0.0016461 0.028353 -0.0031306 0.062403 0.0078926 -0.0021804 -0.0029386 -0.027386 -0.012702 -0.017020 -0.017020 -0.017020 -0.012656 -0.012702 -0.027386 F length (FI) Residual 0.0392846 F length (FI) Residual 0.019988 0.0192846 F length (FI) Residual 0.019288 0.019273 -0.007420 -0.0074515 -0.0076315 -0.00776 -0.00776 -0.00776 -0.00776 -0.00776 -0.007775 -0.007775 -0.007775 -0.007775 -0.007775 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.00755 -0.0	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.02158 0.022727 0.02158 0.022727 0.022777 0.022777 0.02777 0.02777 0.02777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.027777 0.0277777 0.027777777777						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.320 23.321 23.321 24.336 23.702 23.321 24.336 24.596 24.423 24.423 24.423 24.459 24.423 24.459 24.423 24.459 24.423 24.459 24.423 23.702 23.705 24.68 RMA Regres Fa 54.337 52.204 51.874 51	32.542 Tra sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 32.465 31.781 32.425 31.827 31.325 31.987 31.325 31.987 31.485 31.987 31.485 31.987 31.485 31.987 31.355 31.987 3	32,468 32,508 ck A nt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,276 31,288 30,198 31,276 31,388 30,198 31,276 31,388 31,276 31,388 31,276 32,294 31,945 32,255 32,265 32,265 31,728 31	0.049044 0.0034298 -F length (FI) Residual 0.051976 0.051976 0.051976 0.051976 0.0031306 0.062403 0.007826 0.0031306 0.007826 0.0029386 -0.027386 -0.027386 -0.012804 -0.027386 -0.012804 -0.027386 -0.0126956 -0.016956 -0.011702 -0.0116956 -0.0116956 -0.011702 -0.0116956 -0.011702 -0.0116956 -0.011702 -0.0116956 -0.011702 -0.0116956 -0.011702 -0.0116956 -0.011702 -0.011702 -0.011702 -0.011702 -0.011702 -0.011702 -0.011702 -0.011702 -0.011702 -0.00056 -0.001702 -0.00056 -0.0005	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (homoskedastic) Breusch- Pagan statistic ρ (homoskedastic) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.3281						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.321 23.321 23.321 24.336 24.336 24.396 24.423 24.423 24.423 24.423 24.423 24.423 24.429 24.596 23.888 RMA Regree Fa 54.337 52.204 51.874 49.053 51.874 35.849 51.874 35.849 51.874 35.849 3	32.542 Tra sion: Footpri F(f) 32.465 32.465 32.465 32.465 31.781 32.465 31.87 31.827 31.325 31.827 31.325 30.397 31.485 31.355 30.397 31.485 31.135 31.1357 31.1357 31.1357 31.137 31.987 31.987 31.987 31.322 31.327 31.325 31.327 31	32,468 32,508 ck A nt width (Fw, Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,2087 32,2087 31,2087 32,2087 32,2087 32,2087 32,2087 32,2087 32,2087 32,2087 31,508 32,2087 31,508 32,2087 31,508 32,2087 31,728 31,508 31,728 31,508 31,728 31,508 31,728 31,508 31,729 31,728 31,729 31,728 31,729 31,	0.049044 0.0034298 0.0034298 0.00514 0.05197 0.05197 0.028353 0.028353 0.0028353 0.002852 0.002982 0.002982 0.002982 0.002982 0.002982 0.002982 0.002982 0.002982 0.002982 0.002982 0.002999 0.002852 0.002186 0.001702 0.004638 0.0029397 0.0029397 0.0029397 0.00293846 Flength (FI) Residual 0.0078452 0.0078452 0.0078452 0.0078455 0.007855	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.02158 21468 0.65847 0.0083332 0.92727						
37.062 37.013	32.542 sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 31.781 32.465 31.822 31.387 31.387 31.387 31.387 31.387 31.355 30.397 31.485 31.387 31.357 32.108 31.987 32.108 31.987 32.108 31.987 32.108 31.987 32.108 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.987 32.987 31.987 32.987 31.987 32.987 31.987 31.987 32.987 31.987	32,468 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,1276 32,2087 31,1355 32,2156 32,2156 32,2156 32,2156 32,2156 32,2156 32,2156 32,2157 31,1477 31,2294 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,709 32,2155 31,229 32,2155 31,709 32,2155 31,21555 31,21555 31,21555 31,215555 31,2155555	0.049044 0.0034298 -F length (FI) Residual 0.05114 0.051976 -0.016461 0.028353 -0.0031306 0.028403 0.0078926 -0.002786 -0.0078926 -0.002786 -0.027840 -0.027386 -0.027387 -0.032088 -0.027387 -0.032088 -0.027387 -0.032088 -0.027387 -0.03208 -0.027387 -0.03208 -0.027387 -0.03208 -0.02788 -0.02785 -0.00785 -0.00786 -0.00786 -0.00785 -0.00785 -0.0084373 -0.007885 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785 -0.00785	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.032818 0.02158 0.02158 21468 0.65847 0.0083332 0.92727						
37.062 37.013	32.542 Tra sion: Footpri FI (FI) 32.465 31.781 32.465 31.282 31.387 31.398 31.398 31.3987 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.357 32.108 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 31.987 32.068 31.987 31.987 32.068 31.987 31.987 32.068 31.987	32,468 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,087 31,353 31,874 31,355 32,294 31,945 32,2156 32,2156 32,2156 32,2156 32,2156 32,2155 32,2156 32,2155 32,2155 32,2155 32,2155 32,2155 32,2155 32,2155 32,2155 32,2155 32,2155 31,2179 32,2175 31,217	0.049044 0.0034298 -F length (FI) Residual 0.05314 0.05314 0.05314 0.05314 0.0031306 -0.01264 0.0031306 0.0078926 -0.0031306 0.0078926 -0.002982 -0.021804 -0.027386 -0.027380 -0.027380 -0.027380 -0.027380 -0.01702 0.01702 0.016529 -0.012702 -0.012702 -0.012702 -0.023275 -0.02352 -0.003275 -0.003275 -0.00355 -0.00555 -0.00555 -0.00555 -0.00555 -0.00555 -0.00555 -0.005555 -0.005555 -0.005555 -0.005555 -0	TESTS Std. Error of estimates Durbin-Watson statistic p. (no pos. autocoorelation) Breusch- Pagan statistic p. (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.32818 0.02158 21468 0.65847 0.0083322 0.92727						
37.002 37.013 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 24.159 24.159 23.514 23.321 23.322 23.321 23.322 23.321 23.325 24.681 24.596 23.882 54.337 52.204 51.874 5	32.542 Tra sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 32.465 31.827 31.385 31.322 31.325 31.325 31.327 31.355 31.357 31.485 31.357 31.987 31.987 31.355 31.357 31.987 3	32,468 32,508 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,1276 32,087 31,353 31,874 31,276 31,353 31,874 31,275 32,264 31,275 32,265 31,709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 32,215 31,1709 31	0.049044 0.0034298 0.0034298 0.0034298 0.0051276 0.0051276 0.0051276 0.0031306 0.002303 0.007826 0.002382 0.0023826 0.0023827 0.0038315 0.0038315 0.0023827 0.0023827 0.0023827 0.0023825 0.0023827 0.0023827 0.0023825 0.0023827 0.0023825 0.0023827 0.0023825 0.0023827 0.0023825 0.0023827 0.0023827 0.0023827 0.0023825 0.0023827 0.0023825 0.0023825 0.0023825 0.0023825 0.0023826 0.0024828	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (homoskedastic) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.32818 0.02158 0.02158 0.02158 0.022158 0.022158 0.022158						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.321 23.321 24.336 23.702 23.702 23.721 23.418 23.702 24.595 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 24.595 24.656 23.888 RMA Regree Fa 54.337 52.204 51.674 5	32.542 Tra sion: Footpri FI (F) 32.465 32.465 32.465 32.465 32.465 31.781 32.465 31.827 31.325 31.327 31.325 31.327 31.485 31.327 31.987 31.327 31.987 31.327 31.987 31.327 31.327 31.327 31.987 31.327 32.327 32.327 32.327 32.327 32.327 32.327 32.327 32.327 32	32,468 32,508 ck A th width (Fw, Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,2087 32,2087 31,2087 32,2087 31,2087 32,2087 32,2087 31,2087 32,307 32,3	0.049044 0.0034298 -F length (F) Residual 0.051976 0.051976 0.051976 0.0016461 0.02833 0.007826 0.002383 0.007826 0.002386 0.0027886 0.002986 0.012986 0.012986 0.012986 0.012986 0.012986 0.012986 0.02386 0.010457 0.02386 0.0238275 0.0084373 0.0096427 0.0023827 0.0038275 0.00238275 0.00238275 0.003826 0.0023827 0.0038275	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.02158 21468 0.65847 0.0083332 0.92727						
37.062 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.012	31.936 32.542 Tra sion: Footpri F(f) 32.465 32.465 32.465 31.781 32.465 31.87 31.827 31.827 31.827 31.827 31.827 31.355 30.397 31.485 31.355 30.397 31.485 31.527 31.94	32,468 32,508 ck A th width (Fw, Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,087 31,945 31,945 32,265 32,224 31,945 32,255 32,265 31,728 31,728 31,728 31,728 31,728 31,728 31,728 31,728 31,728 31,728 32,265 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 32,215 31,729 31	0.049044 0.0034298 0.0034298 F length (FI) Residual 0.051976 0.051976 0.051976 0.028353 0.0033306 0.028353 0.0033306 0.002852 0.0033306 0.002852 0.	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.02158 0.02158 0.02158 0.05847 0.0683332 0.92727						
37.062 37.013	32,542 sion: Footpri FI (FI) 32,465 32,465 32,465 32,465 31,781 32,465 31,877 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 32,108 31,987 32,108 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 32,208 31,987 31,987 32,208 31,987 31,987 32,208 31,987	32,468 32,508 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,2087 31,945 32,2087 32,2087 31,945 32,2156 32,2156 32,225 31,945 32,2156 32,2255 31,179 32,2087 31,795 31,2155 31,225 31,2255 31,229 32,2155 31,225 31,275 31,275 31,275 31,3155 31,3155 31,3157 31,31	0.049044 0.0034298 0.0034298 F length (FI) Residual 0.051976 0.051976 0.051976 0.051976 0.0031306 0.062403 0.0078926 0.0078926 0.0078926 0.0078926 0.0078926 0.01702 0.021846 0.01702 0.021846 0.017029 0.012541 0.012652 0.0021845 0.0023937 0.003208 0.0023937 0.003208 0.0023937 0.003208 0.0023937 0.003208 0.0023937 0.003208 0.002542 0.0023937 0.003208 0.002552 0.0084373 0.0078652 0.0084372 0.002852 0.0084373 0.007895 0.002555 0.0014578 0.0072956 0.0014578 0.0072956	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.02158 21468 0.65847 0.0083322 0.92727						
37.062 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.013 37.012	32.542 Tra sion: Footpri FI (FI) 32.465 31.781 32.465 31.781 32.465 31.781 32.465 31.87 31.385 31.387 31.385 31.387 31.355 31.987 32.108 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.068 31.987 32.07 32.08 31.987 32.08 31.987 32.08 31.987 32.08 31.987 32.08 31.987 32.08 31.987 32.08 31.987 32.08 31.987 31.987 32.08 31.987 32.08 31.987 31.987 32.08 31.987 32.088 31.987 32.088 33.987 32.088 33.987 32.088 33.987 33.987 33.987 33.987 34.987 34.987 35.987 35.987 35.987 35.987 35.987 35.987 35.987 35.987 35.987	32,468 32,508 32,508 32,508 32,508 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 32,087 31,353 31,874 31,945 32,206 32,2156 32,225 31,945 32,2156 32,2156 32,225 31,945 32,2156 32,225 31,945 32,2156 31,2157 31,2	0.049044 0.0034298 0.0034298 F length (FI) Residual 0.05314 0.05314 0.05314 0.05314 0.0031306 0.062403 0.0078926 -0.002982 -0.021804 0.0078926 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 0.020852 -0.021804 -0.021804 -0.022855 -0.021807 -0.021804 -0.011702 -0.011802 -0.021804 -0.022556 -0.021804 -0.011802 -0.011802 -0.011802 -0.012452 -0.02184 -0.012452 -0.022541 -0.022555 -0.	TESTS Std. Error of estimates Durbin-Watson statistic p. (no pos. autocoorelation) Breusch- Pagan statistic p. (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.02158 21468 0.65847 0.0083322 0.92727						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.321 23.524 23.321 24.336 24.336 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.595 24.681 24.596 23.882 SMA Regres Fa 54.337 52.204 51.874 5	32,542 Tra sion: Footpri FI (FI) 32,465 32,465 32,465 32,465 32,465 31,781 32,465 31,827 31,325 31,325 31,325 31,325 31,325 31,327 31,485 31,327 31,485 31,327 31,485 31,327 31,485 31,327 31,485 31,327 31,487 31,327 31,487 31,327 31,487 31,327 31,487 31,327 31,487 31,327 3	32,468 32,508 ck A mt width (Fw) Regress. 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,276 31,288 30,198 31,276 31,318 31,276 31,318 31,276 31,318 31,276 32,294 31,325 32,294 31,945 32,295 32,295 32,295 31,319 32,295 32,295 31,319 32,295 32,295 32,295 32,295 31,295 32,295 31,295 32,295 32,295 32,295 32,295 32,295 32,295 32,295 31,295 32,295 32,295 32,295 31,295 32,295 31,295 32,295 31,295 32,295 31	0.049044 0.0034298 -F length (FI) Residual 0.051916 0.051916 0.051916 0.051916 0.051916 0.051916 0.0031306 0.062403 0.007826 0.0023827 0.00064527 0.0028325 0.0028327 0.0028325 0.0028327 0.0028327 0.0028327 0.0028327 0.0028327 0.0028275 0.0028327 0.0028327 0.0028275	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32777						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.159 24.321 23.321 23.321 23.321 24.336 24.336 24.596 24.423 24.433 24.596 24.459 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.595 24.651 24.595 24.651 25.204 51.574 52.204 51.574 52.204 53.519 53.799 5.225 52.933 53.519 53.799 5.245 52.933 53.519 53.799 5.245 52.933 53.519 53.799 5.249 53.566 54.377 52.933 53.566 54.377 54.972 54.972 54.972 54.972 53.566 54.972 54.972 54.972 54.972 53.566 54.972 55.566 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 54.972 55.933 55.933 55.949 55.94	32.542 sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 31.781 32.465 31.827 31.325 31.827 31.325 31.327 31.325 31.327 31.327 31.327 31.327 31.345 31.327 31.345 31.987 32.108 31.987 32.987 31.987 32.987 31.987 32.987 31.987 32.987 31.987 32.987 31.987 31.987 32.987 31.987	32,468 32,508 32,508 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,276 32,207 32	0.049044 0.0034298 0.0034298 0.00514 0.051976 0.051976 0.051976 0.028353 0.028353 0.0028353 0.0028353 0.002852 0.002984 0.022541 0.002982 0.0022541 0.002982 0.0022541 0.002982 0.0022541 0.002982 0.002982 0.002997 0.012573 0.0014529 0.0029846 Flength (Fl) Residual 0.007842 0.007845 0.007845 0.007949 0.002545 0.0012573 0.00786472 0.0025846 0.007949 0.0025846 0.007949 0.0025846 0.007949 0.0025846 0.00786472 0.0025846 0.007949 0.0025846 0.00786472 0.0025846 0.00786472 0.0025846 0.00786472 0.0025846 0.00786472 0.0025847 0.0025846 0.007949 0.0025847 0.0025	TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32777						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.069 24.159 24.159 24.159 24.159 24.159 24.321 23.514 23.321 24.336 24.396 24.396 24.423 24.396 24.423 24.396 24.459 24.423 24.3702 23.795 24.681 24.596 24.423 24.795 24.696 24.595 24.691 24.595 24.691 24.595 24.691 24.595 24.691 24.595 24.691 24.595 24.691 24.595 24.691 25.204 51.874 51.874 51.874 51.874 51.875	32,542 Tra sion: Footpri F(f) 32,465 32,465 32,465 31,781 32,465 31,87 31,387 31,385 31,385 31,385 31,385 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,387 31,987 32,465 31,987 32,465 31,987 32,987 31,987 32,465 31,987 31,385 31,397 31,387 31,397 31,398 31,397 31,398 31,398 31,398 31,397 31,398 31,39	32,468 32,508 32,508 32,508 32,508 32,508 32,508 31,874 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,198 31,126 32,087 31,188 31,126 32,087 31,188 31,126 32,204 31,128 32,208 31,128 32,208 31,128 32,208 32,208 31,128 32,208 33,1314 31,314 31,314 32,208 32,208 33,1314 31,314 32,208 32,208 33,1314 32,208 32,208 33,1314 32,208 32,208 33,1314 32,208 32,208 32,208 33,1314 32,208 32,208 32,208 32,208 33,1314 32,208 32	0.049044 0.0034298 0.0034298 F length (FI) Residual 0.05114 0.051976 0.016461 0.062833 0.0031306 0.028353 0.0031306 0.002852 0.00	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no moskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.02158 21468 0.65847 0.0083332 0.92727						
37.062 37.013 37.013 RMA Regres Fw (Fw) 24.069 24.159 23.514 23.321 23.321 24.336 23.702 21.972 23.321 24.336 24.329 24.336 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.423 24.596 24.596 24.597 24.598 35.1874 49.053 51.874 49.535 51.874 49.053 51.874 49.053 51.874 49.535 51.874 49.535 51.874 49.535 51.874 49.535 51.874 49.535 51.874 49.535 51.874 49.535 51.874 49.535 51.874 49.535 51.874	32.542 sion: Footpri FI (FI) 32.465 32.465 32.465 32.465 32.465 31.987 31.822 31.385 31.387 31.355 30.397 31.485 31.387 31.355 30.397 31.485 31.357 31.357 32.108 31.987 32.108 31.987 32.108 31.987 32.108 31.987 32.068 31.987 32.2068 31.987 32.465 31.987 32.2068 31.987 32.465 31.987 32.2058 31.987 32.465 31.987 32.2058 31.987 32.465 31.987 32.2058 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 32.465 31.987 31.987 31.987 32.088 31.987 31.987 32.088 31.987 31.987 32.088 31.987 32.988 31.987 32.988 31.987 32.988 31.987 32.988 31.987 32.988 31.987 32.988 31.987 32.988 31.987 31.987 32.988 31.987 3	32,468 32,508 32,508 32,508 32,508 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,945 31,1276 32,2087 31,1355 32,2087 31,1355 32,2156 32,2255 31,127 31,945 32,2156 32,2255 31,128 32,2265 31,129 32,2265 31,129 32,2265 31,129 32,2265 31,129 32,2265 31,129 32,2255 32,2255 31,129 32,2255	0.049044 0.0034298 -F length (Fl) Residual 0.051976 -0.016461 0.051976 -0.016461 0.003230 0.0078236 -0.007892 -0.027840 -0.007892 -0.027840 -0.027852 -0.027840 -0.027852 -0.027840 -0.027852 -0.027840 -0.027852 -0.027852 -0.027840 -0.027852 -0.027	TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.039507 1219 0.0305637 0.95606 0.32818 0.32818 0.02158 21468 0.65847 0.008332 0.92727						

					
38.437	31.781	31.516	0.026477	Durbin-Watson statistic	11505
37.977	32.229	31.988	0.0240/1	p (no pos. autocoorelation)	0.0119306
38.155	31.398	31.806	-0.040718		10100
37.446	31.822	32.531	-0.070923	n (homoskodastic)	0 20620
38.022	31.333	31.942	-0.05671		0.30639
38.395	31.967	3.150	0.042692		
27 625	20 207	22 220	0.10416		
37.033	30.357	32.333	-0.19410		
37.887	31.403	31.626	-0.035385		
3.833	31.133	3 1/15	0.049109		
39 338	31.046	30 592	0.0077303		
3.908	3.157	30.856	0.071383		
38.111	32,108	31.851	0.025762		
3.848	31.987	31.472	0.051482		
38.459	32.108	31.494	0.061462		
37.773	31.987	32,197	-0.021045		
37.865	31.987	32.104	-0.011694		
3.867	32.068	31.277	0.07912		
38.649	31.987	31.298	0.06884		
37.955	31.987	32.011	-0.0024269		
	Tra	ck B		TESTS	
RMA Regres	sion: Footpri	nt width (Fw)	-F length (FI)		
Fw (Fw)	FI (FI)	Regress.	Residual	Std. Error of estimates	0.042743
23.321	3.091	31.273	-0.036269		
23.979	3.091	30.629	0.028182	Durbin-Watson statistic	21119
23.514	31.355	31.085	0.027034	p (no pos. autocoorelation)	0.62992
23.020	30 112	31.303	-0.020/92	Breusch- Pagan statistic	0 7/062
23.020	30.445	31 025	0.035603	p (homoskedastic)	0.74503
23.014	31 135	31 562	-0.04277	, ,	0.00000
23.514	31.355	31.085	0.027034		
23.979	3.091	30.629	0.028187		
23.979	31.135	30.629	0.050655		
23.514	30.445	31.085	-0.063938		
23.026	31.355	31.563	-0.020792		
23.026	31.442	31.563	-0.012133		
23.514	31.398	31.085	0.031372		
23.609	31.398	30.992	0.040663		
23.418	31.355	31.178	0.017653		
23.418	31.398	31.178	0.021992		
RMA Regre	ssion: Foot pr	int area (Fa)-	F length (Fl)		
Fa	FI (FI)	Regress.	Residual	Std. Error of estimates	0.33954
52.832	3.091	31.392	-0.048201	Durkin Watson statistic	14000
52.879	21 255	21.550	-0.042581	purbin-watson statistic	0 10246
53.279	31.333	31.330	-0.020108	p (no pos. autocoorelation)	0.19240
50 239	30.445	30.442	0.031335	Brousch, Pagan statistic	10521
52 933	30.443	31 / 20	0.00024258	n (homoskedastic)	0.0502
51 533	31.442	30.917	0.0012058	p (nonioskeuastic)	0.0302
52 781	31 355	31 374	-0.0018857		
52.701	51.555	51.574	0.0010000		
53.033	3.091	31.466	-0.055562		
53.033 51.985	3.091	31.466	0.0052914		
53.033 51.985 5.118	3.091 31.135 30.445	31.466 31.082 30.787	-0.055562 0.0052914 -0.034221		
53.033 51.985 5.118 5.323	3.091 31.135 30.445 31.355	31.466 31.082 30.787 31.538	-0.055562 0.0052914 -0.034221 -0.018326		
53.033 51.985 5.118 5.323 51.533	3.091 31.135 30.445 31.355 31.442	31.466 31.082 30.787 31.538 30.917	-0.055562 0.0052914 -0.034221 -0.018326 0.052483		
53.033 51.985 5.118 5.323 51.533 52.832	3.091 31.135 30.445 31.355 31.442 31.398	31.466 31.082 30.787 31.538 30.917 31.392	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913		
53.033 51.985 5.118 5.323 51.533 52.832 50.876	3.091 31.135 30.445 31.355 31.442 31.398 31.398	31.466 31.082 30.787 31.538 30.917 31.392 30.676	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.07222		
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.272	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.355 21 209	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.00058913 0.07222 0.031339		
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.07222 0.031339 0.0043259		
53.033 51.985 5.118 5.323 51.533 52.832 50.876 5.273 RMA Re FI/Ew	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.355 31.398 gression: Fl/I	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 Fw-Fl (Fl)-F le Regress	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.007222 0.031339 0.0043259 ngth (FI) Residual	Std From of estimates	0 23118
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 gression: Fl/I Fl (Fl) 3.091	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 5w-Fl (Fl)-F le Regress. 3.107	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.0058913 0.007222 0.031339 0.0043259 ngth (FI) Residual -0.015998	Std. Error of estimates	0.23118
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459 3.912	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.355 31.398 gression: FI/I FI (FI) 3.091 3.091	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 5w-Fl (Fl)-F le Regress. 3.107 3.063	-0.055562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.007222 0.031339 0.0043259 ngth (FI) Residual -0.015998 0.02803	Std. Error of estimates Durbin-Watson statistic	0.23118
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459 3.912 38.199	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.355 31.398 gression: Fl/I Fl (Fl) 3.091 3.091 31.355	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 Fw-FI (FI)-F Ie Regress. 3.107 3.063 31.243	-0.035562 0.0052914 -0.034221 -0.018326 0.052483 0.0058913 -0.07222 0.031339 0.0043259 ngth (Fl) Residual -0.015998 0.02803 0.01162	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation)	0.23118 17918 0.37193
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459 3.912 38.199 37.728	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.355 31.398 gression: FI/I FI (FI) 3.091 3.091 31.355 31.355	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 Fw-FI (FI)-F le Regress. 3.107 3.063 31.243 31.557	-0.035562 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.07222 0.031339 0.0043259 ngth (Fl) Residual -0.015998 0.02803 0.01162 -0.02803	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation)	0.23118 17918 0.37193
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459 3.912 38.199 37.728 38.628	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 gression: FI/I FI (FI) 3.091 31.355 31.355 30.445	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 5w-Fl (Fl)-F le Regress. 3.107 3.063 31.243 31.557 30.958	-0.035362 0.0052914 -0.034221 -0.018326 0.052483 0.00058913 0.007222 0.031339 0.0043259 ngth (FI) Residual -0.015998 0.02803 0.021235	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic	0.23118 17918 0.37193 25561
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459 3.912 38.199 37.728 38.628 38.611	3.091 31.135 30.445 31.355 31.442 31.398 31.355 31.398 31.355 31.398 gression: FI/I FI (FI) 3.091 3.094	31.466 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.355 5w-Fl (Fl)-F le Regress. 3.107 3.063 31.243 31.557 30.958 31.302	-0.053562 -0.034221 -0.018326 0.052948 0.00058913 0.00058913 0.00252483 0.00038913 0.003259 0.0043259 Residual -0.015998 0.02803 0.011162 -0.051235 0.013955	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.323 51.533 51.533 50.876 51.874 5.273 RMA RE FI/Fw 38.459 3.912 38.199 37.728 38.628 38.6111 37.7932	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398 31.398 gression: FI/I FI (FI) 3.091 31.355 31.385 31.355 31.452 31.452 31.455 31.355 31.455 31.35	31.466 31.082 30.787 31.538 30.917 31.332 30.676 31.042 31.355 w-F1(F1).F1 exercise Regress. 3.107 3.633 31.243 31.557 30.958 31.302 31.421	-0.053562 -0.052514 -0.034221 -0.018326 0.052483 0.0025814 0.0025813 0.0025813 0.0043259 ngth (Fl) Residual -0.015998 0.02803 -0.01235 -0.02857 -0.0287	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (nomoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 51.835 52.832 50.876 51.874 5.273 RMA Re FI/F 38.459 3.912 38.199 37.728 38.628 38.111 37.392 38.199	3.091 31.135 31.435 31.355 31.442 31.398 31.398 31.355 31.398 gression: FI/(FI) 3.091 3.091 31.355 31.355 31.355 31.452 30.445 31.442 31.135	31.46b 31.082 30.787 31.538 30.917 31.392 30.076 31.042 31.355 w-Fi (F)-F le Regress. 3.107 3.063 31.243 31.243 31.302 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.30	-0.053562 0.0052914 -0.034221 -0.018326 0.052493 0.0058913 0.07222 0.031339 0.0043259 Residual -0.01598 0.02803 0.021162 -0.012935 0.01162 0.013355 0.013355 0.013355 0.01555 0.01555 0.01555 0.01555 0.01555 0.01555 0.01555 0.01555 0.0155 0.01555 0.0155	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 51.533 51.533 52.832 50.876 51.874 5.273 RMA Re F//Fw 38.459 3.912 38.199 37.728 38.628 38.111 37.932 38.199 3.912 38.199 3.912	3.091 31.135 30.445 31.355 31.442 31.388 31.388 31.388 31.388 31.388 gression: Fl/l Fl(Fl) 3.091 3.091 31.355 30.445 31.355 30.445 31.355 31.3	31.46b 31.082 30.787 31.538 30.917 31.392 30.676 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.043 31.043 31.577 30.958 31.302 31.421 31.243 31.421 31.243 31	-0.055562 -0.0052914 -0.0052914 -0.0052914 -0.018326 -0.052483 0.00058913 -0.07222 0.031339 0.0043259 -0.015998 -0.015998 -0.020223 -0.0151235 -0.025275 -0.011162 -0.02803 -0.0280	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 52.832 50.876 51.874 5.273 RMA Re FI/Fw 38.459 3.912 38.459 3.912 38.628 38.111 37.732 38.199 3.912 38.3912 38.199 3.912	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398 31.398 FI (FI) 3.091 3.091 3.091 3.091 3.091 3.035 30.445 31.355 31.425 31.355 31.425 31.455	31.46b 31.082 30.787 31.338 30.917 31.332 30.676 31.042 31.355 5w -Fl (Fl)-F le Regress. 3 .107 3.063 31.243 31.557 30.958 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243 31.302 31.243	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0028913 0.0028913 0.0032891 0.0032891 0.0032891 0.003289 0.003289 0.003289 0.001162 -0.02223 -0.051235 0.012857 0.01185 -0.02857 0.01165 0.02857 0.012857 0.01285 -0.02857 0.01285 -0.02857 0.01285 -0.02857 0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -0.02857 -0.01285 -	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocorrelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 51.515 51.533 52.832 50.876 51.874 51.874 51.874 51.874 51.874 51.874 51.874 51.874 51.874 38.459 3.912 38.199 37.728 38.628 38.111 37.938 38.998 3.912 38.992 3.912	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.355 31.398 gression: Fl/(Fl) 3.091 3.091 3.091 3.091 3.091 3.1355 31.355 31.355 31.342 31.355 31.345 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.345 31.355 31.345 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.345 31.355 31.345 31.345 31.355 31.345 31.345 31.355 31.345 31.345 31.355 31.345 31.355 31.345 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.345 31.355 31.3	31.46b 31.082 30.787 31.538 30.917 31.332 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.557 30.958 31.302 31.421 31.243 30.0778 30.0778 30.0778 30.0778 30.0778 30.0778 30.0778 30.0778 30.0778 30.0778 30.0778 30.0777 30.0787 30.0778 30.0777 30.0787 30.0777 30.0787 30.0777 30.0787 30.0777 30.0787 30.0777 30.0787 30.0777 30.0787 30.07777 30.07777 30.07777777777	-0.053562 0.0052914 -0.034221 -0.018326 0.0058913 0.0058913 0.007222 0.031339 0.0043259 Residual -0.015998 0.02803 0.01162 -0.020223 -0.051235 -0.02857 -0.028	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 50.876 51.874 52.73 RMA Re FI/Fw 38.199 37.728 38.199 37.728 38.199 3.912 38.199 3.912 38.199 3.912 38.199 3.912 3	3.091 31.135 30.445 31.345 31.442 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.455 31.442 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.091 31.135 3.0913	31.46b 31.082 30.787 31.538 30.917 31.332 30.676 31.042 31.042 31.042 31.042 31.042 31.042 31.057 31.057 31.243 31.243 31.243 31.243 31.243 3.063 31.243 3.063 3.063 3.063 3.057 3.1557 3.1557	-0.055562 0.0052914 -0.018326 0.0058913 0.0028913 0.0028913 0.003222 0.031339 0.003229 Residual -0.015998 0.02803 0.011162 0.02803 0.011162 0.02803 0.01164 -0.01849 -0.01849 -0.01849 -0.01849 -0.00223 -0.02184 -0.01849 -0.01849 -0.00223 -0.01849 -0.00223 -0.01849 -0.00223 -0.01849 -0.00223 -0.01849 -0.00223 -0.01849 -0.00223 -0.00280 -	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 52.832 50.876 51.874 52.73 RMA Re F//Fw 38.459 3.912 38.192 38.192 38.111 37.932 38.111 37.932 38.112 38.199 3.912 38.112 38.112 38.112 37.728 38.111 37.728 38.112 37.112 38.112 38.112 38.112 38.112 38.112 38.112 38.112 38.112 38.112 37.112 38.112 37.728 38.112 37.728 38.112 37.728 38.112 37.728 38.112 37.728 37.729 37.728 37.729 37.728 37.729 37.7	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.355 31.355 31.355 31.442 31.355 3.091 31.355 3.091 31.355 31.442 31.384 31.3442 31.3442	31.46b 31.082 30.787 31.538 30.917 31.338 30.676 31.042 31.355 5w-Fl (Fl)-F le Regress . 31.07 3.0633 31.243 31.355 31.302 31.421 31.302 31.302 31.302 31.557 31.619 31.273	-0.053562 -0.052514 -0.034221 -0.018326 0.0526813 0.00526913 0.00252483 0.00258913 0.002483 0.00243259 0.0043259 0.02803 0.01162 -0.015998 0.02803 0.012857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.012554 0.02857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.01162 0.02857 0.012857 0.012857 0.012857 0.012857 0.012857 0.012857 0.012857 0.02857 0.012857 0.02857 0.012857 0.02857 0	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 51.515 51.533 52.832 50.876 51.874 52.73 RMA Ref F (/Fw 38.599 3.912 38.199 37.728 38.628 38.111 37.932 38.898 3.912 38.898 3.912 38.898 3.912 38.898 3.912 38.898 3.912 38.898 3.912 38.898 3.912 3.912 38.898 3.912 3.9	3.091 31.135 30.445 31.345 31.345 31.342 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.395 31.395 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.355 31.442 31.398 31.398	31.46b 31.082 30.787 31.538 30.917 31.332 31.642 31.042 31	-0.053562 0.0052914 -0.018326 0.0052914 0.018326 0.0052813 0.00252483 0.003339 0.0043259 Residual -0.015998 0.02803 0.011162 -0.02523 -0.051235 0.013955 -0.02823 -0.028594 -0.028548 -0.028594 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028548 -0.028	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 50.876 51.874 52.73 RMA Re FI/Fw 38.199 37.728 38.199 37.728 38.199 37.728 38.199 3.912 38.199 3.912 38.199 3.912 38.199 3.912 38.199 3.912 38.285 38.265 38.215	3.091 31.135 30.445 31.345 31.442 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.355 31.452 31.455 31.442 31.1355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.345 31	31.466 31.082 30.787 31.538 30.917 31.332 30.676 31.042 31.355 wFl(Fl)-Fl energy 3.107 3.663 31.243 31.243 31.243 31.243 31.243 3.063 31.421 31.243 3.063 3.063 3.1557 31.527 3.123 3.123	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.0028913 0.0028913 0.003229 Residual -0.015998 0.02803 0.011162 -0.051285 -0.02803 0.011162 -0.02803 0.011162 -0.02803 0.011649 -0.018	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.223 50.876 51.874 52.733 RMA Re F//Fw 38.459 39.122 38.199 37.728 38.111 37.932 38.111 37.932 38.111 37.932 38.111 37.932 38.111 37.932 38.111 37.932 38.111 37.728 38.3912 37.635 38.265 38.265 38.261	3.091 31.135 30.445 31.342 31.355 31.342 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.355 31.355 31.355 31.442 31.355 31.442 31.355 31.345 31.	31.46b 31.082 30.0787 31.538 30.977 31.538 30.0767 31.042 31.355 Fw-Fl (F)-F le Regress. 3.107 3.633 31.243 31.355 31.302 31.421 31.305 30.778 3.063 31.557 31.619 31.273 3.12 31.320 31.331	-0.053562 0.0052914 -0.018326 0.0052914 0.0052914 0.0052914 0.0052914 0.002483 0.002483 0.002483 0.0043259 0.0043259 0.002483 0.00287 0.01162 0.02857 0.012857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.002857 0.0058	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 51.985 51.518 52.832 50.876 51.874 52.73 RMA Ref F (/Fw 38.459 33.912 38.628 38.111 37.728 38.898 3.912 38.898 3.912 37.728 38.898 3.912 37.728 38.898 3.912 37.728 38.8067 38.151 38.151 38.151 38.151 38.151 38.151 38.151 38.155 38.155 38.151 38.155 38	3.091 31.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.395 31.395 31.395 31.355 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.442 31.398 31.395 31.	31.466 31.082 30.787 31.538 30.917 31.332 30.676 31.042 31.355 w-F1(F1)-F1 Regress. 31.063 31.557 30.958 31.302 31.423 31.577 30.958 31.302 31.421 31.243 30.678 30.678 31.577 31.619 31.273 31.127 31.302 31.302	-0.053562 0.0052914 -0.018326 0.0052914 0.0052914 0.00529483 0.00529483 0.00529483 0.00252483 0.00252483 0.0025283 0.0025295 0.01255 0.01255 0.012857 0.01162 0.02857 0.012857 0.002857 0.0	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.133 52.832 50.876 51.874 5.273 RMA R45 3.912 3.912 3.912 3.912 3.912 3.8199 3.912 3.8199 3.912 3.8298 3.8111 3.8155 3.8155 3.8115 3.8126 3.8111 3.8067	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.398 gresion: F//(F) 3.091 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.342 31.388 31.388 31.388 31.388 31.398 31.355 31.398 31.398 31.355 31.398 31.	31.46b 31.082 30.787 31.538 30.917 31.332 30.676 31.042 31.042 31.042 31.355 w.Fl(Fl)-Fl energy 3.107 3.063 31.557 30.958 31.302 31.423 31.527 31.423 3.063 3.077 3.1619 31.273 3.12 31.302 3.12 3.12 3.12 3.12 3.12 3.12 3.12 3.1	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.00268913 0.0024221 0.031339 0.0043259 Residual -0.015998 0.02803 0.01162 0.02803 0.01162 0.02803 0.013555 0.013955 0.012574 0.01849 -0.02929 0.0052969 0.0066833 -0.012574 0.01257	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 5.118 5.233 50.876 51.874 52.832 50.876 51.874 8.459 3.912 38.199 37.728 38.199 37.728 38.199 37.728 38.199 3.912 38.199 3.912 38.199 3.912 38.265 38.215 38.265 38.211 38.067	3.091 3.135 30.445 31.355 30.445 31.325 31.442 31.398 31.398 31.398 31.395 31.398 31.395 31.325 31.422 31.135 30.445 31.455 30.445 31.355 30.445 31.355 30.445 31.398 31.398 31.398 Tra Sion: Foolysis	31.46b 31.082 30.0767 31.538 30.917 31.332 30.676 31.042 31.042 31.042 31.355 w-FI (F)-Fie Regress. 3.107 3.063 31.243 3.1243 3.163 31.243 3.063 31.243 3.063 31.243 3.063 31.243 3.063 31.273 3.1273 3.1273 3.1273 3.1322 3.13	-0.053562 0.0052914 -0.018326 0.0058913 0.0028913 0.0028913 0.003222 0.031339 0.003229 0.003229 0.003229 0.003229 0.003293 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.011162 0.02803 0.01162 0.02803 0.01162 0.02803 0.01162 0.0052986 0.005298	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.23118 0.37193 0.37193 25561 0.10987
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 52.73 RMA Regres RMA Regres RMA Regres FW(Fw) 23.544	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.442 31.398 31.355 30.445 31.355 30.445 31.435 31.435 31.435 31.442 31.355 30.445 31.442 31.355 31.442 31.355 31.442 31.398 31.3	31.46b 31.082 30.787 31.538 30.917 31.538 30.917 31.538 30.917 31.322 31.355 5w -F1(F1)-F1 Regress. 31.063 31.557 30.958 31.302 31.421 31.323 31.527 31.	-0.053562 0.0052914 -0.018326 0.052483 0.0058913 0.0025483 0.0025483 0.0025483 0.0025483 0.0025483 0.0025483 0.00257 0.001298 0.02823 0.012958 -0.02527 0.011162 -0.02527 0.011162 -0.02257 -0.02257 -0.0257 -0.02257 -0.02257 -0.02257 -0.0257 -0	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS Std. Error of estimates	0.23118 17918 0.37193 25561 0.10987
53.033 51.985 51.985 51.512 50.876 50.876 51.874 52.73 RMA Ref 1 3.8129 3.912 38.199 3.912 38.199 3.912 38.282 38.111 38.028 38.111 38.067 38.155 38.155 38.155 38.111 38.067	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.398 31.355 31.398 gresion: FI/(T) 3.091 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.422 31.398 31.355 31.432 31.398 31.	31.46b 31.082 30.787 31.538 30.917 31.538 30.917 31.392 31.042 31.042 31.042 31.042 31.042 31.052 31.042 31.053 31.557 30.958 31.302 31.421 31.243 30.073 30.958 31.302 31.421 31.243 30.073 30.073 31.273 31.21 31.302 31.321 31.223 31.227 31.321 31.321 31.321 31.321 31.321 31.227 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.227 31.321 31.227 31.321 31.227 31.321 31.227 31.321 31.227 31.321 31.227 31.277 31.277 31.277 31.277 31.277 31.277 31.277 31.	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 0.0022483 0.00328913 0.003229 0.0031339 0.0043259 mgsth (Fl) Residual -0.015928 -0.0151235 -0.012923 -0.0251235 -0.012923 -0.02523 -0.02523 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02805 -0.028	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic	0.23118 17918 0.37193 25561 0.10987 0.10987
53.033 51.985 5.118 5.233 50.876 51.874 5.273 70.874 71/50 70 70 70 70 70 70 70 70 70 70 70 70 70	3.091 3.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.422 31.135 30.445 31.422 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.398 31.395 31.398 31.395 31.398 31.395 31.398 31.395 31.3	31.46b 31.082 30.0767 31.538 30.917 31.538 30.917 31.352 31.042 31.042 31.355 wFI(FI)-FI (FI)-FI (FI) (FI) (FI) (FI) (FI) (FI) (-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.0028913 0.003229 0.0031339 0.003229 0.003229 0.003139 0.003229 0.003299 0.004293 0.011162 0.02803 0.01162 0.02803 0.01162 0.02803 0.01162 0.02803 0.012574 0.01849 0.02803 0.012574 0.01849 0.02803 0.012574 0.01849 0.02803 0.012574 0.01849 0.02808 0.012574 0.01849 0.02808 0.01859 0.006833 	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.0026314 0.026314 15626 0.57673
53.033 51.985 5.118 5.323 51.535 51.535 51.537 71.74 7	3.091 3.135 30.445 31.355 31.442 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.442 31.355 31.442 31.388 31.388 31.398 31.3	31.46b 31.082 30.787 31.538 30.917 31.538 30.917 31.332 31.355 5FI (FI) - FI (FI) - FI Regress. 31.063 31.557 30.958 31.302 31.3	-0.053562 0.0052914 -0.018326 0.0052914 0.0052914 0.0052913 0.00252483 0.00258913 0.00258913 0.0024220 0.0031399 0.0043259 0.002023 0.015958 -0.015988 0.02807 0.011162 -0.012927 0.011162 -0.020223 -0.021235 -0.02857 0.011162 -0.02857 0.011162 -0.02857 0.011162 -0.02857 0.011162 -0.028568 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.028568 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.028588 -0.028808	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.0087 0.006314 15626 0.57673
53.033 51.985 51.985 51.512 50.876 51.874 52.73 RMA Ref FI/Fw 38.459 3.912 38.199 3.912 38.199 3.912 38.282 38.191 3.912 38.283 38.111 38.928 3.912 38.155 38.155 38.111 38.067 RMA Regres Fw (Fw) 23.514 24.354 23.026 22.513 23.214	3.091 3.135 30.445 31.355 30.445 31.325 31.432 31.398 31.355 31.338 31.355 31.355 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.422 31.335 31.355 31.442 31.398 31.355 31.442 31.429 31.4	31.466 31.082 30.0787 31.538 30.917 31.332 31.044 31.044 3	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 0.00252483 0.003291 0.003329 0.003329 -0.015998 0.02803 -0.015998 0.02803 -0.015245 0.02807 -0.015245 -0.02827 -0.015245 -0.02827 -0.015245 -0.02826 -0.02826 -0.02827 -0.01284 -0.02846 -0.02	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.10987 0.026314 15626 0.57673 0.1074
53.033 51.985 5.118 5.233 50.876 51.874 5.273 70.874 70.972 38.199 3.512 38.199 3.728 38.199 3.728 38.199 3.728 38.199 3.728 38.199 3.912 38.199 3.912 38.199 3.912 38.199 3.912 38.199 3.912 38.193 3.912 38.193 3.912 38.193 3.912 38.193 3.912 3.91	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.398 31.398 gression: F// 3.091 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.398 31.395 31.442 31.398 31.395 31.432 31.395 31.432 31.395 31.432 31.395 31.432 31.395 31.398 31.395 31.398 31.39	31.46b 31.082 30.0787 31.538 30.917 31.338 30.9767 31.342 31.355 wFI(FI)-FI eff Regress. 31.07 30.563 31.243 31.557 30.958 31.302 31.421 31.243 3.063 31.527 31.243 3.063 31.527 31.243 31.557 31.243 31.557 31.243 31.257 31.223 31.233 31.333 31.333 31.333 31.333	-0.053562 0.0052914 -0.018326 0.0058913 0.0028913 0.003222 0.031339 0.003222 0.031339 0.003229 0.0043259 Residual -0.015988 0.02803 0.011162 0.02803 0.011162 0.02803 0.011895 0.02803 0.011895 0.02803 0.001899 0.02803 0.001899 0.02803 0.001899 0.02803 0.001895 0.02803 0.001895 0.02803 0.001895 0.02803 0.0052969 0.006833 Feingth (Fil) Residual -0.013548 -0.03119 0.02808 0.02803 0.003864 -0.03119 0.02808 0.02808 0.003864 -0.03819 -0.03119 0.02808 0.0038808 0.003846 -0.03149 -	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.23118 17918 0.37193 25561 0.10987 0.10987 0.0026314 15626 0.57673 0.1074 0.74312
53.033 51.985 5.118 5.323 51.535 51.535 51.537 71.74 7	3.091 3.1135 30.445 31.355 31.442 31.398 31.398 31.398 gression: FI(FI) 3.091 31.355 30.445 31.435 31.435 31.435 31.435 31.435 31.435 31.435 31.435 31.442 31.355 31.345 31.355 31.345 31.355 31.342 31.398	31.46b 31.082 30.787 31.538 30.917 31.538 30.917 31.538 30.917 31.538 30.676 31.042 31.355 w -FI(FI)-FI e Regress. 31.063 31.557 30.958 31.302 31.421 31.302 31.421 31.302 31.312 31.303 31.303 31.303 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.302 31.303 31.302 31.303 31.302	-0.053562 0.0052914 -0.018326 0.0052914 0.0052914 0.0052914 0.00252483 0.00258913 0.002483 0.002483 0.002423 0.001528 0.002023 -0.015988 0.02803 0.011162 -0.020223 -0.021235 -0.02857 0.011162 -0.02857 0.011162 -0.02857 0.011162 -0.02857 0.011162 -0.02858 -0.02857 0.011162 -0.02868 -0.028688 -0.0319866 -0.0319866 -0.0319866 -0.0319866 -0.0319866 -0.031398 -0.0319866 -0.031398 -0.031199 -0.028808 -0.031398 -0.031388 -0.031888 -	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic p ones. autocoorelation) Std. Error of estimates Durbin-Watson statistic p (noneskedastic)	0.23118 17918 0.37193 25561 0.10987 0.10987 0.0026314 15626 0.57673 0.1074 0.74312
53.033 51.985 5.118 51.985 51.513 52.832 50.876 51.874 52.73 RMA Ref FI/Fw 3.8199 3.912 38.199 3.7728 38.628 38.111 37.728 38.628 38.111 38.067 RMA Regres Fw (Fw) 23.514 23.515	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.343 gression: FI/(FI) 3.091 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.355 31.355 31.355 31.422 31.398 31.355 31.442 31.398 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.35 31.355 31	31.466 31.082 30.787 31.538 30.917 31.538 30.917 31.355 w.F.I(FI).FI eff Regress. 31.063 31.243 31.557 30.958 31.302 31.421 31.243 30.958 31.302 31.421 31.243 30.958 31.577 30.958 31.577 31.243 31.577 31.243 31.577 31.273 31.273 31.273 31.273 31.227 31.322 31.321 31.321 31.321 31.321 31.321 31.321 31.323 31.577 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3333 31.3	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 -0.018326 0.003293 -0.015998 -0.015998 -0.015998 -0.015998 -0.015998 -0.015998 -0.011162 -0.020223 -0.021235 -0.021235 -0.021235 -0.028594 -0.028599	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic Std. Error of estimates Std. Error of estimates	0.23118 17918 0.37193 25561 0.10987 0.026314 0.026314 15626 0.57673 0.1074 0.74312 0.066702
5.033 5.1985 5.118 5.233 5.233 5.233 5.233 5.273 7.07 7.	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.398 31.398 31.395 31.355 31.355 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.442 31.338 31.388 31.388 31.388 31.388 Tra 51.19 30.956 30.634 30.956 30.634 31.179 31.179 31.179 31.179 31.179 31.179 31.179 31.179 31.179 31.179 31.179 33.171 33.171 33.171 33.171 33.171 33.171 33.171 33.171 33.171 33.171 3	31.46b 31.082 30.0787 31.538 30.917 31.332 31.352 w-Fl(Fl)-Fl end Regress. 31.07 30.573 31.243 31.557 30.958 31.302 31.243 31.557 30.958 31.302 31.321 31.243 31.557 30.958 31.321 31.243 31.557 31.517 31.243 31.527 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.322 31.321 31.321 31.323 31.333 3	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.002524 0.0032913 0.003222 0.031339 0.0043259 Residual -0.015998 0.02803 0.011162 -0.020223 -0.025273 0.011825 0.02803 0.02803 0.01162 0.02803 0.02803 0.01162 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02803 0.02804 0.02803 0.02803 0.02804 0.02803 0.02804 0.02803 0.02804 0.02803 0.02804 0.02803 0.0052969 0.0066833 Flength (Fl) Residual 0.02808 0.028088 0.028088 0.028808	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates	0.23118 17918 0.37193 25561 0.10987 0.026314 15626 0.57673 0.1074 0.74312 0.066702
53.033 51.985 5.118 5.323 51.533 52.832 50.876 51.874 5.273 RMA Ref 8.09 3.912 38.199 3.912 38.199 3.728 38.628 38.111 37.932 38.808 3.912 37.728 38.628 38.111 38.067 RMA Regres Fw (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 RMA Regres Fu (Fw) 23.514 23.418 RMA Regres Fu (Fw) 23.514 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.418 RMA Regres Fu (Fw) 23.514 23.418 RMA Regres Fu (Fw) 23.514 23.418 23.514 23.514 23.514 23.515 23	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.442 31.398 31.355 31.442 31.398 31.355 30.445 31.355 30.445 31.435 31.435 31.442 31.355 30.445 31.435 31.442 31.355 31.442 31.355 31.442 31.398 31.3	31.46b 31.082 30.0787 31.538 30.917 31.538 30.917 31.538 30.917 31.538 30.917 31.352 31.355 30.958 31.124 31.557 30.958 31.243 31.557 30.958 31.243 31.557 30.958 31.243 31.302 31.421 31.302 31.303 31.302 31.30	-0.053562 0.0052914 -0.018326 0.052483 0.0058913 0.0025483 0.0025483 0.0025483 0.0025483 0.0025483 0.0025483 0.002423 0.0012988 0.02803 0.011162 -0.015988 0.02803 0.011162 -0.020223 0.011162 0.02805 0.02855 -0.02857 0.011162 0.02855 -0.02857 0.011162 -0.028568 -0.02857 0.011162 -0.028688 0.0028688 -0.015348 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic p (nomoskedastic) Std. Error of estimates Durbin-Watson statistic p (nomoskedastic) Std. Error of estimates Durbin-Watson statistic p (nomoskedastic) Std. Error of estimates	0.23118 17918 0.37193 25561 0.10987 0.10987 0.0026314 15626 0.57673 0.074 0.74312 0.066702 23579 0.00740
53.033 51.985 51.985 51.518 52.33 52.832 50.876 51.874 52.73 RMA Ref FI/Fw 38.459 3.512 38.199 3.7728 38.628 38.111 37.728 38.628 38.111 38.929 3.912 38.828 38.111 38.067 RMA Regres Fw (Fw) 23.514	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.398 gresion: FI/(FI) 3.091 31.355 31.355 31.355 31.355 31.355 31.355 31.422 31.335 31.355 31.432 31.335 31.355 31.442 31.335 31.355 31.442 31.335 31.345 32.027 31.864 31.379 31.379 33.317 33.355 33.345 33	31.466 31.082 30.0787 31.538 30.917 31.538 30.917 31.392 31.044 31.044 3	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 -0.018326 0.003293 -0.015998 -0.015998 -0.015998 -0.015998 -0.015998 -0.015998 -0.0151235 -0.0151235 -0.02823 -0.02823 -0.02823 -0.02823 -0.02823 -0.02823 -0.02823 -0.02823 -0.02824 -0.0284 -0.0275 -0.02	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no moskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.006314 0.026314 15626 0.57673 0.1074 0.74312 0.066702 23579 0.8162
53.033 51.985 5.118 5.233 50.876 51.874 5.273 7.283 7.273 7.28 7.273 7.28 7.28 7.28 7.28 7.28 7.28 7.28 7.28	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.398 gression: F/(F) 3.091 31.355 31.355 31.355 31.452 31.355 31.452 31.355 30.445 31.355 31.442 31.335 30.445 31.355 31.442 31.335 30.445 31.355 31.442 31.388 31.385 31.345 31.385 31.345 31.385 31.345 31.385 31.	31.46b 31.082 30.787 31.538 30.917 31.538 30.917 31.352 w-Fl(Fl)-Fl e Regress. 31.067 31.243 31.557 30.958 31.302 31.243 31.557 30.958 31.302 31.243 31.557 30.958 31.302 31.243 31.557 30.958 31.321 31.243 31.557 31.243 31.557 31.243 31.557 31.273 31.267 31.322 31.267 31.322 31.321 31.322 31.327 31.333 31.	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.0025291 0.003229 0.003229 0.003229 0.003229 0.003229 0.003229 0.003239 0.01162 -0.015928 0.02803 0.01162 0.02803 0.01162 0.02803 0.01162 0.02803 0.01162 0.02803 0.01162 0.02803 0.01162 0.02803 0.0052969 0.0066833 -0.012574 0.012574 0.012574 0.012804 0.02803 0.0052969 0.0066833 -0.012548 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.015348 -0.012255 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02803 -0.02804 -0.015348 -0.02804 -0.02803 -0.02804 -0.02804 -0.02804 -0.02804 -0.02804 -0.02804 -0.02804 -0.02804 -0.02805 -0.	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic	0.23118 17918 0.37193 25561 0.10987 0.0026314 15626 0.57673 0.1074 0.74312 0.066702 23579 0.8162 0.97412
53.033 51.985 5.118 51.985 51.513 52.832 50.876 51.874 52.73 RMA Ref F (/Fw 38.459 38.199 37.728 38.628 38.111 37.932 38.199 37.728 38.628 38.111 37.932 38.808 3.912 37.728 38.205 38.205 38.205 37.728 38.205 38.205 38.205 38.205 38.205 38.205 37.728 38.205 37.728 38.205 38.205 37.728 38.205 37.728 38.205 37.728 37.728 37.728 38.205 38.205 37.728 38.205 37.728 37.728 38.205 38.205 37.728 37.728 37.728 38.205 38.205 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.728 37.729 37.728 37.728 37.729 37.728 37.729 37.728 37.729 37.728 37.728 37.729 37.728 37.728 37.729 37	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.348 31.398 31.355 31.347 FI(f) 3.091 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.355 31.342 31.388 31.398 31.355 31.388 31.398 31.355 31.388 31.398 31.398 31.355 31.38 31.385	31.46b 31.082 30.0787 31.538 30.917 31.538 30.917 31.538 30.917 31.538 30.917 31.538 31.627 31.62	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 0.0052913 0.00252483 0.0025483 0.0025483 0.0025483 0.0025483 0.002527 0.01162 -0.01598 -0.01598 -0.02527 0.011162 -0.022023 -0.02557 -0.02857 -0.0278 -0.0278 -0.0278 -0.0278 -0.0278 -0.0278 -0.0278 -0.0278	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (nomoskedastic) Std. Error of estimates Durbin-Watson statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (nomoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.23118 17918 0.37193 25561 0.10987 0.10987 0.0026314 15626 0.57673 0.074 0.74312 0.066702 23579 0.8162 0.8162 0.37812 0.27812
53.033 51.985 51.985 51.512 50.876 51.874 52.73 70.845 70.	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.342 31.398 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.342 31.338 31.355 31.344 31.398 31.355 31.344 31.398 31.355 31.344 31.398 31.355 31.344 31.398 31.355 31.345 31.3	31.466 31.082 30.0787 31.538 30.917 31.538 30.917 31.392 31.044 31.044 3	-0.053562 -0.0052914 -0.018326 -0.018326 0.0052914 -0.018326 0.00252483 0.00252483 0.00328913 0.003329 -0.015998 -0.015998 -0.015998 -0.015998 -0.0151235 -0.0151235 -0.025273 -0.025273 -0.017714 -0.01598 -0.02523 -0.025273 -0.017714 -0.015968 -0.025295 -0.025275 -0.015348 F length (FI) Residual -0.015348 F length (FI) Residual -0.015348 F length (FI) Residual -0.015348 F length (FI) -0.02527 -0.025275 -0.025375 -0.025375 -0.025375 -0.025375 -0.025375 -0.025375 -0.025375 -0.025385 -0.035385 -0.0355	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.006314 15626 0.57673 0.1074 0.74312 0.066702 23579 0.8162 0.87812 0.34872
53.033 51.985 5.118 5.123 51.533 52.832 50.876 51.874 52.73 70.845 71.728 71.729 71.728 71.72	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.398 gression: FI/(F) 3.091 31.355 31.355 31.452 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.442 31.398 31.398 31.355 31.442 31.179 31.17 31.17 31.17 31.17 31.17 31.17 31.17 31.17 31.17 31.17 31.17 31.17 31.17 3	31.465 31.682 30.787 31.538 30.917 31.538 30.917 31.332 30.676 31.042 31.355 w -Fl (F)-F le Regress. 31.077 30.633 31.557 31.322 31.321 31.327 31.337 3	-0.0353562 0.0052914 -0.0183266 0.0052914 0.0052914 0.0052914 0.0025291 0.002529 0.0043259 0.0043259 0.02803 0.01162 -0.015988 0.02803 0.01162 -0.020223 -0.01235 -0.02857 0.011162 0.02805 0.02805 -0.02857 0.01162 0.02805 0.02805 -0.01298 -0.015348 -0.015348 Flength (Fl) Residual -0.015348 -0.01548	Std. Error of estimates Durbin-Watson statistic p (no pos. autocorrelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic)	0.23118 17918 0.37193 25551 0.10987 0.10987 0.006314 15626 0.57673 0.074 0.74312 0.066702 23579 0.8162 0.34872 0.34872 0.045757
53.033 51.985 5.118 51.985 51.513 52.832 50.876 51.874 52.73 RMA Regres FI/Fw 38.459 38.151 38.459 38.152 38.152 38.152 38.152 38.152 38.265 38.111 38.067 RMA Regres Fw (Fw) 23.514 24.5144 24.5144 24.5144 24.5144 24.5144 24.5144 24.5144 24.5144 2	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.342 31.398 31.355 31.335 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.355 31.342 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.398 31.395 31.3	31.466 31.082 30.0767 31.538 30.917 31.538 30.917 31.538 30.917 31.538 30.917 31.322 31.355 w.Fl (Fl)-Fl energy 31.633 31.557 30.958 31.557 30.958 31.302 31.421 31.243 30.958 31.302 31.421 31.243 30.633 30.778 3.063 31.577 31.619 31.273 31.273 31.273 31.273 31.273 31.267 31.333 int area (Fa)-Fl 30.346 31.507 31.333 int area (Fa)-Fl 30.346 31.507 31.333 int area (Fa)-Fl 30.346 31.507 31.333 int area (Fa)-Fl 30.346 31.507 31.333 int area (Fa)-Fl 30.346 31.507 31.333 int area (Fa)-Fl 30.346 31.507 31.333 int area (Fa)-Fl 31.333 int area (Fa)-Fl 30.346 31.507 3	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 0.0052943 0.0052943 0.0052943 0.0052943 0.002325 0.002325 0.002325 0.002325 0.01295 0.01295 0.02827 0.011162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02827 0.01162 0.02857 0.012857 0.02857 0.012857 0.02857 0.012857 0.02857 0.02857 0.012857 0.02857	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (homoskedastic) Std. Error of estimates	0.23118 17918 0.37193 25561 0.10987 0.10987 0.10987 0.10987 0.10987 0.10987 0.10987 0.10987 0.10987 0.0057673 0.0057673 0.034872 0.34872 0.34872 0.34872 0.035766
53.033 51.985 5.118 5.133 51.985 50.876 50.876 51.874 52.73 70.874 70.7777 70.874 70.7777 70.77777 70.77777777777777777	3.091 3.135 30.445 31.355 30.445 31.342 31.382 31.384 31.385 31.386 31.388 31.398 31.355 31.345 31.355 31.355 31.355 31.355 31.355 31.355 31.355 30.445 31.355 30.445 31.355 30.445 31.355 31.422 31.388 31.398 31.398 31.398 31.398 31.398 31.398 32.027 31.64 32.027 31.864 32.027 31.864 32.027 31.864 31.179 31.179 31.179 31.179 31.1	31.466 31.082 30.0787 31.538 30.917 31.332 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.042 31.057 31.042 31.057 31.042 31.044 3	-0.053562 0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 0.00252483 0.0035913 0.003259 -0.015998 -0.015998 -0.015998 -0.015998 -0.015998 -0.0151235 -0.012233 -0.051235 -0.02823 -0.02823 -0.01714 -0.01594 -0.01274 -0.01284	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.006314 15626 0.57673 0.1074 0.066702 23579 0.8162 0.87812 0.34872 0.34872 0.015726 16280
53.033 51.985 5.118 5.123 51.533 52.832 50.876 51.874 52.73 70.844 71.728 71.729 71.728 71.729 71.728 71.729 71.729 71.728 71.729 71.72	3.091 3.135 3.091 3.135 3.0445 3.1355 3.0445 3.1398 3.1398 3.1398 3.1395 3.1398 gression: FI/(F) 3.091 3.1355 3.0445 3.1355 3.0445 3.1355 3.0445 3.1355 3.0445 3.1355 3.0445 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.1355 3.1442 3.1398 3.138 3.1398 3.138 3.1398 3.138 3.1398 3.138 3.1398 3.138 3.1398 3.138 3.139 3.139 3	31.465 31.082 30.787 31.538 30.917 31.538 30.917 31.332 30.676 31.042 31.355 w-Fl (Fl)-Fle Regress. 31.627 31.421 31.421 31.421 31.421 31.557 31.527 31.627 31.321 31.32	-0.035362 -0.035294 -0.03294 -0.018326 0.0052914 -0.018286 0.0052913 -0.015298 0.0043259 -0.01598 0.02803 0.011162 -0.01598 0.02803 -0.01598 -0.020223 -0.01598 -0.020223 -0.01285 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.02857 -0.028808 0.0052969 -0.015348 F length (FI) Residual -0.015348 F length (FI) Residual -0.015348 F length (FI) Residual -0.015348 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01	Std. Error of estimates Durbin-Watson statistic p (no pos. autocorrelation) Breusch- Pagan statistic p (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation)	0.23118 17918 0.37193 25551 0.10987 0.0066714 0.066702 0.87812 0.048722 0.015726 0.0157726 0.015776 0.015777 0.015776 0.015776 0.015776
53.033 51.985 5.118 51.985 51.513 52.832 50.876 51.874 52.73 RMA Regres F(/Fw 38.459 38.159 37.728 38.628 38.111 37.732 38.898 3.912 37.728 37.728 38.628 38.111 37.732 38.808 3.912 37.728 38.265 38.155 38.155 38.155 38.255 38.155 38.255 38.155 38.257 38.257	3.091 3.135 3.044 3.135 3.044 3.139 3.134 3.139 3.139 3.139 3.139 3.139 3.139 3.139 3.139 3.135 3.041 3.135 3.044 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135 3.139 3.135	31.465 31.082 30.787 31.538 30.917 31.538 30.917 31.538 30.917 31.538 30.917 31.322 31.355 w.Fl(Fl)-Fl eres 31.063 31.557 30.958 31.302 31.421 31.243 30.958 31.302 31.421 31.243 30.958 31.302 31.421 31.243 30.078 3.063 30.078 3.063 31.557 31.321 31.233 31.273 31.23 31.273 31.23 31.267 31.333 interes 31.325 interes 31.325 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes 31.327 interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes interes	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 0.0052943 0.0052943 0.0052943 0.0052943 0.0023259 0.0024223 0.001452 0.002802 0.002802 0.01162 0.02020 0.012955 0.02802 0.002802 0.02928 0.02928	Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic p (no pos. autocoorelation)	0.23118 17918 0.37193 25561 0.10987 0.1074 0.026314 0.006702 0.38782 0.38782 0.035726 0.57154 0.
53.033 51.985 5.118 5.1323 51.532 50.876 51.874 52.73 RMA Regres FI/Fw 38.459 3.512 38.199 3.7728 38.628 38.111 37.728 38.628 38.111 37.728 38.155 38.155 38.155 38.111 38.067 Pw (Fw) 23.514 24.5145 24.5145 24.5145 24.5145 24.51455 24.5145555555555555555555555555	3.091 3.135 30.445 31.355 30.445 31.355 31.442 31.398 31.355 31.342 31.398 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.355 31.342 31.398 31.355 31.344 31.398 31.355 31.344 31.398 31.355 31.344 31.398 31.355 31.344 31.398 31.355 31.345 31.345 31.345 31.345 32.027 31.864 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 31.179 30.956 30.634 32.027 31.864 32.027 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 33.864 33.179 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.864 34.77 34.86	31.466 31.082 30.0787 31.538 30.917 31.538 30.917 31.392 30.676 31.042 31.042 31.355 w.Fl(Fl)-Fl Regress. 31.07 31.243 31.557 30.958 31.327 31.243 30.958 31.327 31.243 30.958 31.424 31.243 30.0778 31.243 31.257 31.227 31.322 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.321 31.331 31.333 31.355 31.325 31.321 31.333 31.355 31.325 31.321 31.333 31.331 31.333 31.332 31.333 31.332 31.333 31.334 31.333 31.334 31.333 31.334 31.335 31.333 31.335 31.335 31.335 31.335 31.335 31.333 31.337 31.333 31.337 31.333 31.333 31.334 31.333 31.334 31.333 31.334 31.333 31.334 31.335 31.333 31.335 31.333 31.334 31.333 31.334 31.333 31.334 31.335 31.335 31.333 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.335 31.337 31.3	-0.053562 -0.0052914 -0.018326 0.0052914 -0.018326 0.0052914 -0.018326 0.003291 Residual -0.015998 -0.015998 -0.015998 -0.015998 -0.015998 -0.0151235 -0.0151235 -0.012232 -0.021233 -0.0151235 -0.028237 -0.012714 -0.01284 -0.01298 -0.028237 -0.021238 -0.022337 -0.012248 -0.022337 -0.012348 -0.022337 -0.021238 -0.022337 -0.021248 -0.022337	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic p (no pos. autocoorelation) Breusch- Pagan statistic	0.23118 17918 0.37193 25561 0.10987 0.026314 0.026314 15626 0.57673 0.1074 0.74312 0.066702 23579 0.8162 0.87812 0.34872 0.34872 0.34872 0.015726 16289 0.57154 0.23976
53.033 51.985 51.985 51.118 53.23 50.876 51.874 52.73 RMA Regres 74.75 75.2679 75.	3.091 3.135 3.044 3.135 3.044 3.1398 3.1398 3.1398 3.1398 3.1398 3.1398 3.1398 3.1398 3.139 3.135 3.045 3.091 3.135 3.044 3.020 3.02	31.446 31.082 30.787 31.538 30.917 31.538 30.917 31.538 30.917 31.537 30.676 31.042 31.355 30.677 31.057 31.057 31.243 31.557 30.958 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.421 31.302 31.312 31.327 31.27 31.27 31.27 31.302 31.312 31.302 31.312 31.327 31.327 31.327 31.327 31.327 31.327 31.327 31.327 31.337 31.337 31.337 31.338 31.338 31.338 31.339 3	-0.035362 -0.035294 -0.032214 -0.034221 -0.018326 0.0052914 0.0052914 0.002529 0.003299 -0.015988 0.0043259 -0.015988 0.02803 0.011162 -0.015988 0.02803 0.011162 -0.020223 -0.012357 -0.02807 -0.013986 0.02808 -0.02808 -0.012857 -0.02808 -0.012868 -0.012868 -0.012868 -0.012868 -0.012868 -0.012868 -0.012868 -0.012868 -0.012868 -0.012874 -0.01284 -0.015348 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548 -0.01548	Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) TESTS Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (no pos. autocoorelation) Breusch- Pagan statistic ρ (homoskedastic) Std. Error of estimates Durbin-Watson statistic ρ (homoskedastic)	0.23118 17918 0.37193 25561 0.10987 0.006702 0.8162 0.015726 0.015726 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.015726 0.023759 0.023759 0.015726 0.023759 0.023759 0.023759 0.023759 0.015726 0.023759 0.023759 0.023759 0.023759 0.023759 0.023759 0.023759 0.023759 0.023759 0.023758 0.023759 0.023758 0.025758 0.025758 0.025758 0.025758 0.025758 0.025758 0.025758 0.025758 0.025758 0.02

TABLE SI3 - PCA analysis: Scores of the Foresta "Devil Trails" footprints included in the samples A (all the measured footprints) and B (best-preserved footprints), obtained by using different sets of their measurements. The PCA scores were computed using vector products with the original data.

Sample A - PCA Scores						Sample B - PCA Scores																			
Variables: Footprint length, windth, area, windth/length ratio x 100 Variables: Footprin			es: Footprint l	ength, wind	h, area	Variables: Footprint length, windth, windth/lengthratio x 100			ndth,	Variables: Footprint length, windth, area, windth/length ratio x 100				Variables: Footprint length, windth, area			Variables: Footprint length, windth, windth/lengthratio x 100								
Cases	PC 1	PC 2	PC 3	PC 4	Cases	PC 1	PC 2	PC 3	Cases	PC 1	PC 2	PC 3	Cases	PC 1	PC 2	PC 3	PC4	Cases	PC 1	PC 2	PC 3	Cases	PC 1	PC 2	PC 3
A01L	47.743	-12.379	-0.23417	-0.080925	A01L	47.685	0.16647	-0.28107	A01L	-31.528	15.516	-0.030937	A08R	18.725	0.5224	0.40787	0.0071051	A08R	18.659	0.12983	0.19511	A08R	15.905	0.9838	0.0080705
A02R	36.75	-12.564	0.33261	-0.036947	A02R	36.699	0.60855	0.067861	A02R	-27.631	16.859	-0.019958	A17R	11.666	-0.47642	0.42348	0.0072532	A17R	11.663	0.56131	0.10681	A17R	0.24203	0.94469	0.0072624
A03L	46.305	0.9192	0.66449	0.069183	A03L	4.658	0.27882	0.48526	A03L	0.68509	0.90798	0.04716	A18L	17.752	0.93216	0.64454	0.0087328	A18L	17.661	0.16393	0.31518	A18L	19.878	10.942	0.0069881
A04R	29.704	-0.41706	0.25444	0.0071297	A04R	29.679	0.31241	0.11733	A04R	-16.359	1.39	0.022232	A21R	27.733	0.27416	0.42605	0.00054391	A21R	27.665	0.24924	0.17152	A21R	1.831	13.865	0.002933
AUSL	-/3.626	-0.6614	-0.1447	0.035053	AUSL	-/3./94	0.026362	-0.0943	AUSL	-0.35181	-0.4/5/2	0.033594	A22L	-0.41191	-11.909	-0.021457	0.014311	AZZL	-0.34886	0.4/415	-0.10514	AZZL	-11.901	0.21066	0.015647
AU6K	-13.219	-41.465	0.35942	0.0082141	AUBK	-13.332	13.148	-0.069006	AU6R	-36.222	-0.43826	-0.023791	A23R	46.028	-10.477	-0.068018	0.011647	AZ3K	46.511	0.3/3/1	-0.10974	AZ3R	-0.7929	0.32111	0.014565
AUTE	-19.555	-10.941	0.084441	0.054908	AU/L	-19.373	0.40736	-0.03575	A07L	-0.9115	12 952	0.012118	AZ4L	44./58	10 9/0	12 505	-0.01/2/5	A24L	12 669	-0.20791	0.028001	A24L	20.421	12.524	-0.0057805
AUAR	12 200	14.275	0.2030	0.053949	AUOR	12 274	-0.14018	0.29499	AUGR	0.3001	13.653	0.006722	A25R	12.615	10.049	0.25610	0.014135	A25K	12.008	0.2994	0.017667	A25K	0 20566	0.42155	0.0046234
A09K	-13.388	-44 352	-10 271	0.033431	A09K	-13.374	0.1423	-0.8326	A09K	-2.032	-35 671	0.030373	BO3R	-20.427	0 12500	-0.68765	0.0008338	ROSP	-20 386	-0.64847	-0.17007	RO3R	-0.39300	-14 545	0.015468
A102	-15 308	-21 915	0.085531	0.030646	A11R	-15 364	0.59452	-0.071878	Δ11R	-15 705	-0 66074	0.01/035	BOSR	-0 35615	0.12555	-0.62957	-0.0039827	B05R	-0.3793	-0.83998	-0.15132	BOSR	0 54405	-0 77541	0.0013400
A121	-84 138	0 20051	-0 54677	0.010178	A121	-8 407	-0 50255	-0 27983	A121	0 57654	-0.86056	0.02549	BOZR	-33 309	12 877	-0 50641	-0.014624	BOZR	-33 819	-0.97129	-0.065543	BOZR	0.97735	-0.88532	-0.012563
A13R	-10.385	0.75748	0.72169	0.085543	A13R	-10.355	0.35444	0.52047	A13R	11.284	0.36622	0.047735	B0711	55,184	-1.029	-1.915	-0.0034083	B111	56.023	-12.315	-0.74899	B111	-11.048	-14.545	0.015468
A14L	-25.645	53.184	0.25444	0.04348	A14L	-24.082	-11.344	0.52954	A14L	53.897	0.51189	0.037947	B12R	-26.433	-0.053727	-0.38597	0.032272	B12R	-26.379	-0.31534	-0.10755	B12R	-15.381	-13.446	0.028565
A16L	75.175	41.981	0.8154	0.10606	A16L	76.393	-0.42988	0.81658	A16L	38.273	13.932	0.084792	B13L	-23.425	10.202	-0.54439	-0.0089454	B13L	-23.803	-0.89442	-0.098043	B13L	0.7607	-0.83036	-0.0060145
A17R	18.69	-0.18443	0.54544	0.029904	A17R	18.678	0.47832	0.31296	A17R	-0.97689	12.647	0.023669	B15R	-37.238	30.306	13.336	-0.0052095	B15R	-37.362	-0.097913	0.72846	B15R	12.539	-0.70298	-0.029716
A18L	24.62	17.872	0.43332	0.071481	A18L	24.662	-0.12274	0.41605	A18L	0.75578	15.196	0.077701	B16L	-20.32	16.776	0.1066	-0.003374	B16L	-20.376	-0.60176	0.18839	B16L	0.58011	-0.99576	-0.011481
A21R	34.622	20.109	0.30897	0.04714	A21R	34.666	-0.2652	0.34148	A21R	0.58184	18.018	0.067584	B18L	-43.635	0.74371	-0.63944	-0.0084269	B18L	-43.817	-0.86125	-0.15578	B18L	0.36346	-0.94081	-0.0049321
A22L	67.326	-2.074	0.32209	-0.16052	A22L	66.711	0.7782	0.040001	A22L	-23.617	0.44545	-0.010129	C05R	-14.295	23.035	-0.21353	-0.033241	C05R	-14.387	-11.335	0.11061	C05R	14.467	-12.156	-0.037676
A23R	11.714	-14.873	0.22124	0.0016485	A23R	11.667	0.55046	0.024343	A23R	-1.972	0.57972	0.00084954	E03R	-16.609	-58.863	0.94973	-0.038384	E03R	-16.296	32.918	-0.26434	E03R	-64.416	15.329	-0.04466
A24L	51.563	36.652	-0.24081	0.029852	A24L	51.645	-11.119	0.13231	A24L	15.809	20.286	0.090021	F02R	-10.052	-42.622	0.3229	0.01993	F02R	-98.213	20.539	-0.27045	F02R	-4.634	0.82682	0.019018
A25R	19.607	23.932	0.85754	0.11448	A25R	19.671	0.049739	0.72654	A25R	15.351	17.881	0.099658													
A26L	19.691	-0.78723	-0.0047863	-0.0046207	A26L	19.659	0.19712	-0.059676	A26L	-15.823	0.71398	0.011828													
BOOL	45.234	13.757	-1.477	-0.049617	BOOL	45.541	-15.194	-0.76604	BOOL	12.852	-12.036	0.016907													
B01R	14.426	44.315	-0.52877	-0.013866	B01R	15.678	-15.227	-0.009742	B01R	43.946	-0.17313	0.015127													
B02L	13.593	0.34903	-1.077	-0.022588	B02L	13.592	-0.95099	-0.59117	B02L	-0.13214	-0.51748	0.034074													
B03R	-13.308	-27.565	-0.50643	-0.0065231	B03R	-13.384	0.27146	-0.4673	B03R	-21.759	-12.115	-0.0011623													
B04L	-40.479	0.64329	-0.48265	0.0036728	B04L	-40.444	-0.56218	-0.21886	B04L	23.129	-20.241	-0.011238													
B05R	66.256	-0.34814	-0.67289	0.00013462	B05R	66.092	-0.46154	-0.39498	B05R	-0.57148	-0.43396	0.033115													
BOGL	-19.348	-19.989	-0.55319	0.017916	BOGL	-19.4	0.031653	-0.42228	BOGL	-1.173	-14.429	0.020891													
B07R	36.093	-0.029168	-0.6597	0.0038575	B07R	36.035	-0.53234	-0.3633	B07R	-0.13214	-0.51/48	0.034074													
BUSL	84.315	46.963	-0.82086	-0.032378	BUSL	85.599	-18.158	-0.16925	BUSL	43.946	-0.1/313	0.015127													
BUOOK B10R	-11.461	27.022	-0 50109	-0.037054	BUOOK B10P	-11.395	-0.48749	-0.060202	BUOOK B10P	32.008	-12 621	-0.03/075													
B111	12 651	-17 732	-15 013	-0.075282	B111	12 586	-0.81701	-10 592	B111	-21 750	-12.021	-0.0011673													
B12R	-19.277	-34,158	-0.14406	0.013555	B12R	-19.369	0.71905	-0.2939	B12R	-26.153	-1.128	-0.0021206													
B13L	46.183	-0.20756	-0.64543	0.0033183	B13L	46.069	-0.47601	-0.36775	B13L	-0.35181	-0.47572	0.033594													
B15R	-30.34	-10.371	0.93994	0.091667	B15R	-30.352	0.97082	0.52808	B15R	0.13327	-0.3188	0.024915													
B16L	-13.353	-10.697	-0.058132	0.033928	B16L	-13.379	0.19777	-0.074196	B16L	-0.52182	-0.65175	0.023095													
B18L	2.632	-0.68076	-0.66977	-0.00628	B18L	26.077	-0.37386	-0.42045	B18L	-0.74149	-0.60999	0.022616													
C05R	-74.048	0.022119	-0.53249	0.0096386	C05R	-74.036	-0.44621	-0.28428	C05R	0.35687	-0.8188	0.025011													
C07L	-23.379	-0.58299	0.13514	0.051952	C07L	-23.385	0.22362	0.080314	C07L	0.35687	-0.8188	0.025011													
C08R	-20.45	11.057	-0.14512	0.02928	C08R	-20.41	-0.41139	0.018528	C08R	19.403	-0.87068	0.018728													
C09L	12.473	10.574	0.36733	-0.049513	C09L	15.553	-22.961	0.86299	C09L	10.468	11.229	-0.049131													
C10R	18.277	-53.588	-0.18494	-0.069801	C10R	1.671	12.147	-0.51566	C10R	-54.045	-0.47533	-0.067802													
C12R	-16.127	-73.557	-0.23107	-0.06686	C12R	-16.334	16.676	-0.67025	C12R	-6.665	-1.359	-0.081463													
D01R	-54.871	12.265	12.118	-0.26835	D01R	-54.484	-19.218	12.625	D01R	14.373	-0.13089	-0.34951													
E03R	-89.875	-79.135	23.455	-0.12583	E03R	-92.003	39.399	0.66655	E03R	-76.789	14.475	-0.24064													
E02L	53.866	-37.363	0.22133	-0.1798	E02L	53.735	12.103	-0.27765	E02L	-59.213	20.735	-0.14643													
F02R	-25.957	-5.869	13.554	-0.051586	F02R	-27.576	25.875	0.31669	F02R	-58.349	0.8522	-0.11743													

	Sampl	e A: PCA Lo	oadings		Sample B: PCA Loadings								
Variable	Va	ariables: Fl, F	[:] w, Fa, and Fi	in	Variable	riable Variables: Fl, Fw, Fa, and Fin							
	PC 1	PC 2	PC 3	PC 4		PC 1	PC 2	PC 3	PC 4				
FI	0.10676	0.12917	0.9598	0.22516	FI	0.019596	-0.43242	0.81632	-0.38243				
Fw	0.0032548	-0.0068518	-0.22785	0.97367	Fw	0.023039	0.037477	0.43959	0.89712				
Fa	0.97567	-0.2045	-0.075739	-0.022425	Fin	0.056567	0.89985	0.37169	-0.22117				
Fin	0.19145	0.97028	-0.14534	-0.027825	Fa	0.99794	-0.043381	-0.047247	-0.00066495				
Variable	Variak	oles: Fl, Fw, a	nd Fa		Variable	Varia							
	PC 1	PC 2	PC 3			PC 1	PC 2 PC 3						
FI	0.10841	0.97801	0.17819		FI	-0.2488	0.88728	-0.38837					
Fw	0.0033266	-0.1796	0.98373		Fw	0.13339	0.42854	0.89362					
Fa	0.9941	-0.10606	-0.022724		Fa	0.95933	0.17053	-0.22497					
Variable	Variab	les: Fl, Fw, a	nd Fin		Variable	Variak							
	PC 1	PC 2	PC 3			PC 1	PC 2	PC 3					
FI	0.42494	0.90445	0.037466		FI	0.019839	0.99098	-0.13256					
Fw	0.0098215	-0.045993	0.99889		Fw	0.023041	0.13209	0.99097					
Fin	0.90517	-0.4241	-0.028427		Fin	0.99954	-0.022714	-0.020212					

Table SI5 – Selected measurements of the human footprints from Cape
South Coast (South Africa) ichnosites used for the analysis.
Data from Helm et al. (2018a,b, 2019a,b, 2020a,b)

	Measurement				
Ichnosite	Footprint	Footprint length	Footprint width	Ew/El x 100	
		(FI)	(Fw)	FW/FIX 100	
	01L	17	7	41.17	
	03L	16	7.5	46.87	
	06R	16.5	6.5	39.39	
	06A	16,5	6,5	39.39	
	07R	19.5	7,5	38.46	
(e	08L	23	10	43.47	
Še	09L	20	7	35.00	
ģ	10R	15	7	46.66	
Ġ	11	16	6	37.50	
ent	15L?	17.5	8.5	48.57	
<u> </u>	16	1/	8	47.05	
st.	17L: 10	10	9	30.00	
Ö	10	10.5		59 22	
ţ	2012	22	10	<u> </u>	
Sou	211?	22	10	50.00	
be	22	17	7	41,17	
[Cal	23	15	6	40.00	
11(24	20	10	5.00	
tou	25L?	21.5	9.5	44.18	
ren	28	18.5	5.5	13.51	
ā	28A	18	4	22.22	
	29	21	3	14.28	
	30	16	1.5	9,37	
	31L	19	7	36.84	
	L03	12	5	41.66	
	L05R	16	7	43.75	
ala	C	24	11	45.83	
ute ion ark	(D)	15	8	53.33	
P Nat	F	9.5	5.5	57.89	
	G	24	10	41.66	
nma ite 1	Gouk1-R	21	11	52.38	
oukar acksi	Gouk1-IIR	21	8.5	40.47	
ЭG Т	Gouk1-IIIL	21	11.5	54.76	
	A1	14	7	50.00	
(e)	A3	15	7	46.66	
Ĩ.	A7	20	10	50.00	
lese	A8	15	9	60.00	
e F	A9	16	7	43.75	
atu	A11	20	9.5	47.50	
Ž	A12	16	10	62.50	
e 7	A13	16	8	50.00	
ksit	A14	18	8	44.44	
rac	B1	13	6	46.15	
la T	B2	12	5.5	45.83	
Ĕ	B5	16	8	50.00	
ıkaı	B6	13	7	53.84	
Gou	C1	13	8	61.53	
-	C2	14	8	57.141	
	174	15	8	53.33	