WHITTLING AWAY AT PRODUCTIVITY DISPERSION FURTHER NOTES:

Persistent Dispersion or Measurement Error?

By

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Abstract

This note considers several hypotheses regarding measurement error as a source of observed cross-sectional dispersion in plant-level productivity in the US textile industry. The hypotheses that reporting error and/or price rigidity in either materials and/or output account for a substantial portion of the observed dispersion in productivity are consistent with the data. Similarly, the hypothesis that transitory product niches or fashion effects lead to differential markups and consequently dispersion in observed productivity is consistent with the data. The hypothesis that transfer pricing problems lead to persistent differences in plant-level productivity, in contrast, does not appear to be consistent with the data. Finally, the hypothesis that some plants have permanent product niches that lead to dispersion in observed productivity does not appear to be consistent with data. In order to avoid imposing a strong functional form on the data, this note follows a non-parametric methodology developed in the early paper.

Keywords: plant-level productivity, textile industry, measurement error.

I. Introduction

This note adds further results to “Whittling Away at Productivity Dispersion (Dwyer, 1995).” In that paper, productivity was measured at the plant level via a value added based measure of total factor productivity in 22 different textile industries from 1972 until 1987.[1] I found a great deal of dispersion in plant-level productivity. Further empirical work suggests that plant-level productivity is made up of at least two components (Dwyer, 1996). One component is highly transitory and another component is highly persistent. These results beg the question: how much of the transitory and permanent components are the result of measurement error?[2] This note examines the ratio of material costs to total value of shipments (hereafter the mat:sales ratio) across productivity levels as a possible proxy for measurement error. There are at least six possible hypotheses for why the mat:sales ratio could differ across plants. I will consider each in turn.

In carpets at least, a manufacturer will receive price protection from his suppliers. The manufacturer typically contracts an option to purchase a material input at a given price

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[1] Total factor productivity is measured as the ratio of value added to an index of inputs. The index of inputs is the geometric average of capital and total employment, weighted according to their output elasticities. The output elasticities are taken from estimates of a Cobb-Douglas production function that is estimated with time and time region dummies. For further methodological details see Dwyer (1995).

[2] In this paper, the term measurement error is anything that leads to a deviation from the computed deflated revenue based measure of a physical quantity and the actual corresponding physical quantity. The term reporting error, in contrast, refers to forms being filled out incorrectly. Reporting error is one form of measurement error, but measurement error need not be reporting error.

for a certain period of time, perhaps six months. Therefore, if the price of an input were to rise sharply, a plant that has just signed such a contract will purchase its inputs at a price below the industry average. This will lead to value added being overstated. Therefore, the plant will be measured as being highly productive, but will have a low mat:sales ratio. Under this hypothesis, the mat:sales ratio will be inversely associated with the transitory component of observed productivity, but not the persistent component.

This explanation can be equally well applied to the output price of a product. Suppose a plant contracts at a certain price over a certain period of time, and business conditions change, making it either a good price or a bad price. If it is a good price, it will lead to high productivity with a low mat:sales ratio. If it is a bad price, it will lead to a low productivity with a high mat:sales ratio. Under this hypothesis, the mat:sales ratio will be inversely associated with the transitory component of observed productivity, but not the persistent component.

Another version of essentially the same story is that the plant finds itself selling a product for which there is a shortage, i.e., a market niche or a product that is in fashion. In this situation, the plant can charge a high price for its product that will not be captured by the four digit price index. Therefore, the real value added of the plant will be overestimated. Consequently, the plant’s productivity will be high and its mat:sales ratio will be low. Unless the plant can maintain the product niche, this phenomenon will be transitory. Under the hypothesis of a temporary product niche, the mat:sales ratio will be inversely associated with the transitory component of productivity but not the persistent component of productivity.

In the event that the plant can maintain the product niche, it can be thought of as a high value added plant, which is the fourth possibility: If a plant is able to consistently produce more value added with the same inputs, then it is a high value added plant, which could be thought of as a form of productivity. Under this hypothesis, the mat:sales ratio would be inversely associated with the persistent component of productivity.

Another type of measurement error stems from ambiguity in setting transfer prices. If a plant is selling its output to a parent company, its often not clear what the arm's length price -- the price at which the product would trade if the two parties were unrelated -- would be. A plant that sets the transfer price of its output too high will have overstated value added and productivity and have a low mat:sales ratio, *ceteris paribus.* Each plant develops its own system for assigning this price and it is likely that the system will stay in place for sometime. This type of measurement error should be rather persistent. Under this hypothesis, the mat:sales ratio would be inversely associated with the persistent component of productivity.

Finally reporting error can lead to a low mat:sales ratio for a plant measured as being highly productive. If forms are filled out incorrectly, the errors that benefit a plant's productivity are those that understate materials and overstate sales. Given that a plant has a high level of observed productivity, then it is likely that the reporting error is in its favor. Therefore, plants with high levels of productivity should have low mat:sales, at least due to reporting error. The mat:sales ratio should be associated with the transitory component of the error term, at least to the extent that the reporting error is transitory.

In this note, I first measure the extent to which the more productive plants have low mat:sales ratios. I then present and execute a methodology for determining how much of the dispersion in productivity levels can be attributed to measurement error, depending on whether or not the measurement error is in total value of shipments or in the cost of materials purchased. I then measure the extent to which this measurement error is associated with the persistent component of productivity. I find that measurement error, proxied by the mat:sales ratio, typically accounts for between 25 to 50 percent of the dispersion in productivity levels. Furthermore, this form of measurement error is associated with only the transitory component of productivity.

II. The Mat:Sales for High versus Low Productivity Plants

Plants are ranked into deciles according to their productivity in a given time period. The first column of Table 1 presents the time mean of the ratio of the productivity levels of the plants in the ninth to the plants in the second decile - - the TFPratio. Intuitively, the TFPratio is the ratio of the productivity level of the 85th percentile plant to the 15th percentile plant. Likewise, the first column of Table 2 presents the ratio of the mean productivity level of the eighth and ninth decile to the mean productivity level of the first and second decile. These are robust unit free measures of dispersion in plant-level productivity.[3] The fact that they range from two to four implies that the plants that are in the top end of the

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[3] Robust in the sense that they are not outlier dominated. All observations are used to rank the data. The magnitude of the outliers, however, does not effect the magnitude of the dispersion. This is a desirable property when working with the LRD, because the outliers are clearly the product of reporting error, e.g., reporting the number of employees rather than thousands of employees.

distribution produce more than twice the output of plants in the bottom end of the distribution, with the same inputs. Approximations of the standard errors are in parentheses (they are based on a first order Taylor expansion, for the details see Appendix III of Dwyer 1995.).

The second column of these tables presents time mean of the ratio of the mean mat:sales ratio for the plants in the upper end of the distribution to those in the lower end, when ranked according to productivity. The fact that these numbers are almost always less than one demonstrates that the plants that are measured as being highly productive generate more output with the same material inputs than the plants in the lower end of the distribution. This is predicted by all of the six hypotheses described in the introduction.

III. How Much of Dispersion in Plant-Level Productivity Can Be Attributed to Measurement Error.

Suppose all plants have the same mat:sales ratio and the same level of productivity. Further, suppose that the observed dispersion in the mat:sales ratio is solely the product of measurement error. Then, how much dispersion would you expect to observe in productivity? and how does this compare to what is observed? It turns out, that it critically depends on where the measurement error is. If the measurement error is in material inputs, then you would expect less dispersion in productivity than if the measurement error were in the total value of shipments measure. Therefore, we consider both possibilities as an upper and lower bound.

Errors in Materials

Suppose that there are two plants, A and B, both of which have the same valued added Cobb-Douglas production function, i.e., a Cobb-Douglas production function nested within a perfect complements production function, but materials is measured with error. That is,

$$Y = Min\left\{ X/(1-s), M/(s) \right\},$$

where M is materials and X is an index of capital and labor inputs. Clearly, cost minimization implies that M=sY and X = (1-s)Y. Value added is defined as:

$$Y = Min\left\{ X/(1-s), M/(s) \right\}.$$

TFP is defined as:

$$TFP = \frac{VA}{X} = 1 .$$

Now suppose that observed value added is based on observed materials which contains measurement error:

$$VA^o = Y - M^o = (1-s)Y + sY - M^o = VA + \left(M - M^0\right),$$

where the superscript, o, represents the observed value. Therefore, observed TFP is given by:

$$TFP^o = 1 + \frac{M - M^0}{X};$$

Let,

$$\text{d} = \frac{M - M^0}{X}.$$

Suppose that firms A and B employ the same materials to inputs ratio but differing in their *'s, that is measurement error as a percent of inputs. Then the ratio of their observed TFPs is given by:

$$\frac{TFP_A}{TFP_B} = \frac{1 + \text{d}_A}{1 + \text{d}_B} = \frac{1 - \left(M^o / Y\right)_A}{1 - \left(M^o / Y\right)_B},$$

by straight-forwrd algebraic manipulation. This equation says that if measurement error in materials was the only source of productivity dispersion, then you would expect the ratio of productivity levels of the plants in the ninth to first decile, to be equal to the ratio of one minus the typical mat:sales ratio for the plants in the respective deciles. I measure the *typical* ratio as being the mean of each group. The third column of Tables 1&2 computes the TFP ratio predicted by the mat:sales ratio, where I am comparing the ninth to second deciles. The sixth column of these tables presents the percentage of the TFP ratio that is accounted for by the mat:sales ratio, according to this methodology. It is the time mean of the predicted TFP ratio less one divided by the observed TFP ratio less one.

Errors in Total Value of Shipments

Let:

$$VA^o = Y^o - M = Y^0 - Y + VA,$$

where Y^0 is the observed level of output.

Note that:

$$TFP^o = \frac{Y^0 - Y}{X} + 1 = \left(\frac{s}{1-s}\right)\left(\frac{Y^o}{M} - 1\right).$$

Therefore, the ratio of the productivity of Plant A to Plant B is given by:

$$\frac{TFP^A}{TFP^B} = \frac{\left(\frac{1}{M/Y^A} - 1\right)}{\left(\frac{1}{M/Y^B} - 1\right)}.$$

This expression can be evaluated at the mean mat:sales ratio for the means of the respective deciles. This predicted TFP ratio is always bigger than the TFP ratio computed under the assumption that the measurement error was in the materials variable. In Tables 1 and 2, the fifth column presents the predicted TFP ratio according to this methodology and the seventh column presents the percentage of dispersion in productivity that is accounted for by the mat:sales ratio.

If the measurement error is assumed to be in materials, the percentage explained ranges from a low of -1.4 percent to a high of 36, with a median of 13.5 percent. Alternatively, if the measurement error is assumed to be in sales, the percentage explained range form a low of -2.2 percent to a high of 92 percent with a median of 34.5 percent. Therefore, it appears that dispersion in the mat:sales ratio across plants with different levels of productivity accounts for a substantial portion of the dispersion in productivity.

IV. Is the Association Between Mat:Sales and Productivity Persistent or Transitory?

The previous section demonstrates that there is an inverse relation between productivity and the mat:sales ratio. The question then becomes: is the association with the persistent component of productivity or the transitory component of productivity or both? This can be addressed by tracking the plants at the top and bottom ends of the distribution forward in time and compute the ratio their mat:sales ratio in the future.

By tracking plants that were highly productive into the future one filters out the transitory component and is left with a persistent component: The plants that were in the top end of the distribution have above average productivity today, because the persistent component of their productivity is above average, even though their transitory component has regressed to the mean on average (see Dwyer, 1995). The question then becomes, do the plants that were highly productive continue to use less materials per unit sales than the plants that had low levels of productivity. Tables 3 and 4 executes this methodology. They present the time mean of the expected mat:sales ratio:

$$EXMS = \frac{Average\ Mat{:}Sal\ Ratio_{t+x} of\ plants\, that\, were\, in\, the\, 9th\ decile\, in\, t}{Average\ Mat{:}Sal\ Ratio_{t+x} of\ plants\, that\, were\, in\, the\, 2th\ decile\, in\, t},$$

for Table 3, and

$$EXMS = \frac{Average\ Mat{:}Sal\ Ratio_{t+x} of\ plants\, that\, were\, in\, the\, 8th\, or\, 9th\ decile\, in\, t}{Average\ Mat{:}Sal\ Ratio_{t+x} of\ plants\, that\, were\, in\, the\, 2th\, or\, 3th\ decile\, in\, t},$$

for Table 4.

The results of these tables are remarkable. The EXMS regresses to one, or very close to one for most industries within two or three years; the E3MS ratio is statistically indiscernible from 1 in every industry in Table 3 and statistically indiscernible or greater than one in every industry in Table 4. This suggests that the measurement error proxied by differences in the mat:sales ratio is inversely associated with the transitory component of productivity but not the persistent component of productivity. Therefore, this is consistent with the hypotheses that rigid prices, temporary market niches, and/or transitory reporting error lead to dispersion in productivity. The hypothesis that internal transfer pricing issues lead to dispersion in productivity, however, appears to be inconsistent with these results. At least transfer pricing policies do not appear to lead to dispersion in the persistent component of productivity. Furthermore, it does not appear that measurement error in either materials or sales is the source of dispersion in the persistent component of productivity.

Table 1: The TFPratio and The Ratio of Mat:Sales for the 80-90 Percentile to the 10-20 Percentile when Ranked according to Productivity.

SIC	TFPrat		Mat:Sales ratio		pTFPr by mat	pTFPr by Sales	% explain by mat	% explain by Sales
2211	2.448	(.018)	0.79	(.023)	1.32	1.71	22.	49.
2221	2.328	(.011)	0.86	(.022)	1.17	1.37	13.	27.
2231	2.691	(.033)	.		.	.	.	
2241	2.483	(.023)	0.89	(.053)	1.15	1.40	9.7	25.
2251	3.380	(.055)	0.83	(.047)	1.27	1.59	14.	31.
2252	2.344	(.020)	0.80	(.028)	1.31	1.66	24.	51.
2253	3.054	(.030)	1.04	(.051)	1.00	1.01	-0.76	-1.4
2254	2.885	(.059)	.		.	.	.	.
2257	2.967	(.028)	0.98	(.043)	1.06	1.14	3.8	8.
2258	2.992	(.031)	1.03	(.080)	0.97	0.95	-2.1	-3.7
2261	3.023	(.045)	.		.	.	.	.
2262	2.704	(.035)	0.85	(.057)	1.15	1.37	9.9	24.
2269	3.365	(.084)	.		.	.	.	.
2273	3.796	(.038)	0.90	(.021)	1.26	1.44	9.2	15.
2282	2.724	(.021)	0.99	(.059)	1.04	1.08	2.2	4.4
2283	2.334	(.0094)	0.85	(.016)	1.27	1.49	20.	36.
2295	2.891	(.032)	0.76	(.045)	1.45	1.96	22.	48.
2296	4.693	(.26)	.	.	.	.	.	.
2297	2.798	(.038)	0.83	(.052)	.	.	.	.
2298	3.163	(.047)	0.89	(.058)	1.24	1.57	13.	31.
2299	3.029	(.029)			1.14	1.36	7.1	18.

Table 2: The Ratio of Mat:Sales for the 70-90 Percentile to the 10-30 Percentile when Ranked according to Productivity.

Sic	TFPrat	Mat:Sales ratio	pTFPr by mat	pTFPr by Sales	% explain by mat	% explain by Sales
2211	2.06 (.015)	0.82 (.019)	1.26	1.55	24.	52.
2221	1.97 (.011)	0.89 (.018)	1.13	1.26	13.	26.
2231	2.22 (.037)	0.86 (.076)	1.13	1.40	12.	35.
2241	2.09 (.024)	0.85 (.044)	1.16	1.42	15.	39.
2251	2.71 (.046)	0.88 (.043)	1.14	1.31	9.3	20.
2252	1.98 (.017)	0.84 (.026)	1.22	1.47	23.	48.
2253	2.43 (.024)	1.06 (.044)	0.98	0.97	-1.4	-2.2
2254	2.32 (.051)	0.72 (.043)	1.37	1.96	36.	92.
2257	2.37 (.023)	0.95 (.033)	1.09	1.18	6.8	12.
2258	2.44 (.030)	0.99 (.055)	1.02	1.06	1.8	4.3
2261	2.41 (.042)	0.80 (.047)	1.23	1.61	18.	48.
2262	2.20 (.034)	0.84 (.047)	1.18	1.44	14.	34.
2269	2.57 (.070)	0.80 (.050)	1.40	1.82	24.	50.
2273	2.95 (.033)	0.91 (.018)	1.19	1.32	10.	16.
2282	2.23 (.024)	1.02 (.052)	0.99	0.99	-.83	-.94
2283	1.98 (.010)	0.88 (.014)	1.20	1.36	20.	36.
2295	2.33 (.033)	0.83 (.026)	1.30	1.57	22.	42.
2296	3.25 (.296)	.	.	.	.	.
2297	2.24 (.037)	0.84 (.034)	1.22	1.47	19.	40.
2298	2.56 (.049)	0.86 (.033)	1.16	1.36	12.	28.
2299	2.45 (.027)	0.87 (.043)	1.16	1.39	11.	26.8

Table 3: The Expected Mat:Sales Ratio: Compares the Mat:Sales Ratio of plants in the 80-90 percentiles to those in the 10-20th percentiles.

SIC	Mat:Sales rat	E1MS	E2MS	E3MS	E4MS
2211	0.79 (.023)	0.92 (.029)	0.95 (.022)	1.01 (.028)	0.94 (.015)
2221	0.86 (.022)	0.94 (.039)	0.98 (.034)	1.00 (.035)	1.00 (.033) .
2231	.	.	.	.	.
2241	0.89 (.053)	.	.	.	.
2251	0.83 (.047)	.	.	.	.
2252	0.80 (.028)	0.92 (.032)	0.93 (.016)	.	.
2253	1.04 (.051)	1.13 (.12)	1.22 (.107)	.	.
2254	.	.	.	.	.
2257	0.98 (.043)	1.16 (.064)	1.07 (.051)	0.99 (.030)	.
2258	1.03 (.080)	.	.	.	.
2259	.	.	.	.	.
2261	0.85 (.057)	.	.	.	.
2262	.	.	.	.	.
2269	0.90 (.021)	.	.	.	.
2273	0.99 (.059)	0.96 (.032)	1.01 (.021)	1.02 (.012)	.
2282	0.85 (.016)	.	.	.	0.95 (.024)
2283	0.76 (.045)	0.92 (.026)	0.95 (.029)	0.98 (.026)	.
2295	.	.	.	.	.
2296	.	.	.	.	.
2297	0.83 (.052)	.	.	.	.
2298	0.89 (.058)	.	.	.	.
2299		.	.	.	

Table 3 (cont.); The Expected Mat:Sales ratio: Compares the Mat:Sales ratio of plants in the 80-90 percentiles to those in the 10-20th percentiles.

SIC	E5MS	E6MS	E7MS	E8MS
2211	.	.	.	.
2221	0.99 (.030)	0.99 (.025)	1.01 (.026)	1.04 (.029)
2231	.	.	.	.
2241	.	.	.	.
2251	.	.	.	.
2252	.	.	.	.
2253	.	.	.	.
2254	.	.	.	.
2257	.	.	.	.
2258	.	.	.	.
2259	.	.	.	.
2261	.	.	.	.
2262	.	.	.	.
2269	.	.	.	.
2273	.	1.12 (.014)	.	.
2282	.	.	.	.
2283	0.93 (.027)	0.95 (.022)	0.92 (.019)	0.96 (.021)
2295	.	.	.	.
2296	.	.	.	.
2297	.	.	.	.
2298	.	.	.	.
2299	.	.	.	.

Table 3 (Cont.) **The Expected Mat:Sales ratio: Compares the Mat:Sales ratio of plants in the 80-90 percentiles to those in the 10-20th percentiles.**

sic	e9ms	e10ms	e11ms	e12ms
2211	.	.	.	.
2221	1.09 (.030)	1.08 (.032)	1.07 (.028)	.
2231	.	.	.	.
2241	.	.	.	.
2251	.	.	.	.
2252	.	.	.	.
2253	.	.	.	.
2254	.	.	.	.
2257	.	.	.	.
2258	.	.	.	.
2259	.	.	.	.
2261	.	.	.	.
2262	.	.	.	.
2269	.	.	.	.
2273	.	.	.	.
2282	.	.	.	.
2283	0.96 (.021)	0.93 (.017)	0.98 (.016)	0.99 (.013)
2295	.	.	.	.
2296	.	.	.	.
2297	.	.	.	.
2298	.	.	.	.
2299	.	.	.	.

Table 4 (cont.): **The Expected Mat:Sales ratio: Compares the Mat:Sales ratio of plants in the 70-90 percentiles to those in the 10-30th percentiles.**

SIC	Mat:Sales	EMS1	EMS2	EMS3	EMS4
2211	0.82 (.019)	0.93 (.027)	0.93 (.027)	0.98 (.034)	0.95 (.028)
2221	0.89 (.018)	0.94 (.023)	0.98 (.023)	0.98 (.021)	0.98 (.022)
2231	0.86 (.076)	.	.	.	.
2241	0.85 (.044)	0.93 (.066)	0.95 (.063)	.	1.05 (.079)
2251	0.88 (.043)	0.92 (.052)	0.93 (.050)	.	.
2252	0.84 (.026)	0.91 (.034)	0.94 (.041)	0.98 (.045)	0.98 (.047)
2253	1.06 (.044)	1.19 (.063)	1.22 (.073)	1.25 (.082)	1.18 (.083)
2254	0.72 (.043)	.	.	.	.
2257	0.95 (.033)	1.03 (.042)	1.01 (.041)	0.98 (.037)	0.99 (.042)
2258	0.99 (.055)	1.09 (.077)	1.09 (.074)	1.07 (.078)	1.08 (.092)
2261	0.80 (.047)	.	.	.	.
2262	0.84 (.047)	0.90 (.067)	0.93 (.079)	0.96 (.085)	0.97 (.089)
2269	0.80 (.050)	0.76 (.071)	0.78 (.065)	.	.
2273	0.91 (.018)	0.97 (.025)	1.01 (.026)	1.00 (.027)	1.00 (.028)
2282	1.02 (.052)	1.14 (.059)	1.13 (.066)	1.17 (.065)	1.09 (.074)
2283	0.88 (.014)	0.95 (.016)	0.97 (.017)	0.98 (.018)	0.98 (.018)
2295	0.83 (.026)	0.97 (.045)	0.93 (.054)	.	.
2296	. .	.	.	.	.
2297	0.84 (.034)	.	.	.	.
2298	0.86 (.033)	.	.	.	.
2299	0.87 (.043)	0.92 (.058)	0.99 (.070)	0.95 (.088)	.

Table 4(cont.) **The Expected Mat:Sales ratio: Compares the Mat:Sales ratio of plants in the 70-90 percentiles to those in the 10-30th percentiles.**

SIC	EMS5	EMS6	EMS7	EMS8	EMS9
2211	0.94 (.029)	0.98 (.036)	0.92 (.033)	0.94 (.034)	0.94 (.047)
2221	0.99 (.024)	1.00 (.027)	1.00 (.029)	1.03 (.031)	1.06 (.034) .
2231	.	.	.	.	.
2241	.	.	.	.	.
2251	.	.	.	.	1.04 (.075) .
2252	1.01 (.041)	0.97 (.048)	0.89 (.055)	1.01 (.076)	.
2253	1.10 (.070)	1.00 (.081)	1.11 (.10)	1.16 (.107)	.
2254	.	.	.	.	.
2257	0.99 (.052)	1.03 (.054)	0.99 (.051)	1.05 (.064)	.
2258	.	.	.	.	.
2261	.	.	.	.	.
2262	.	.	.	.	0.99 (.040) .
2269	.	.	.	.	0.99 (.029) .
2273	1.01 (.029)	1.00 (.030)	0.98 (.033)	0.97 (.033)	.
2282	1.19 (.085)	.	.	.	.
2283	0.97 (.020)	0.98 (.021)	0.96 (.022)	0.98 (.024)	.
2295	.	.	.	.	.
2296	.	.	.	.	
2297	.	.	.	.	
2298	.	.	.	.	
2299	.	.	.	.	

Table 4 (cont.) **The Expected Mat:Sales ratio: Compares the Mat:Sales ratio of plants in the 70-90 percentiles to those in the 10-30th percentiles**

SIC	EMS10	EMS11	EMS12
2211	1.03 (.056)	0.97 (.050)	.
2221	1.03 (.035)	1.05 (.037)	1.04 (.043)
2231	.	.	.
2241	.	.	.
2251	.	.	.
2252	.	.	.
2253	.	.	.
2254	.	.	.
2257	.	.	.
2258	.	.	.
2261	.	.	.
2262	.	.	.
2269	.	.	.
2273	0.99 (.042)	1.01 (.059)	.
2282	.	.	.
2283	0.95 (.029)	0.99 (.032)	1.006 (.034)
2295	.	.	.
2296	.	.	.
2297	.	.	.
2298	.	.	.
2299	.	.	.

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