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# The Importance of Import Substitution in Marathon Economic Impact Analysis

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## Abstract

Marathon running has experienced considerable growth in recent years, fueled both by an increase in participation rates and by a corresponding increase in the number marathons staged each year. Because marathons have a presumed economic benefit, there also has been growth in the number of marathon-related economic impact studies. However, these studies calculate incorrectly, or omit altogether, an important source of impact: the impact generated when local runners use their home-city marathon as a substitute for participating in an alternative marathon out-of-town. Given that this pattern of behavior is common among marathon runners and the fact that local runners constitute a significant percentage of race participants in most marathons, errors in the treatment of locally based impact is an important problem that must be addressed. This study focuses on the proper way to account for locally sourced impact in marathon analysis, and presents a study of the 2006 Cincinnati Flying Pig Marathon to illustrate this methodology.

**Keywords:** economic impact analysis, import substitution, marathons

On the first weekend in May, 2006, Cincinnati hosted its eighth Flying Pig Marathon event. Nearly 5,000 runners registered for the signature race, the marathon, and about the same number of runners registered for the half-marathon. Overall, nearly 15,000 individuals registered for the various races that comprise the Flying Pig Marathon event. Staging marathon events is an increasingly common phenomenon in U.S. cities. According to *MarathonGuide.com*, the number of marathon finishers in the U.S. increased nearly 30% between 2000 and 2005 with about 400,000 marathon finishers in 2005 alone ("USA Marathoning: 2005 Overview," 2006). The report also suggests that this increase is due, at least in part, to

an increase in the number of marathons being staged. In 2005, for example, there were 28 new marathon races staged in the US. Moreover between 2000 and 2005, there was an average of 15 new marathons staged each year with at least 1,000 finishers. The proliferation of marathons and increases in marathon participation responds to the growing numbers of people who enjoy running for fitness reasons and the propensity of marathon organizers to use such events to showcase downtown areas to both suburban and out-of-town race participants and their guests. Such events also may generate significant economic impact to area economies and the large numbers of marathon economic impact studies



attests to the broad interest in estimating the amount of such impact.

Determining the economic impact of a marathon would seem to be a relatively simple process: estimate the amount of incremental direct spending in the area attributable to the marathon event, and then account for any multiplier effects generated by this spending. However a review of recent marathon economic impact analysis suggests that most, if not all, such studies have errors of varying significance in their impact estimates. These errors arise for many reasons, often because of the use of either faulty data or unrealistic multipliers. More importantly, these studies err with regard to their handling of an important source of impact, one which arises because of local participation in the marathon event. This impact occurs whenever local race participants redirect their spending from outside the area into the local economy because of their participation in the event, and is a phenomenon that occurs with a wide variety of events (Cobb, Weinberg, Trebbi, & Tschunza, 1989; Cobb & Weinberg, 1993; Blackwell, Cobb, & Weinberg, 2002). We call this phenomenon "import substitution" because it is analogous to the situation in international trade in which a country's residents substitute purchases of domestically produced goods for imports. Unfortunately, inclusion of this effect has occurred only sporadically in the economic impact analysis literature. Moreover, while it is even rarer to find incorporation of this effect in the impact analysis of sporting events, generally, there is absolutely no evidence that it has ever been included in marathon impact studies. Therefore, the focus of this paper is to present evidence that import substitution is a significant component of economic impact in marathon events and, in the process, corrects a widespread misunderstanding regarding how to measure and incorporate local spending in the calculation of economic impact of sport events.

### **Marathon Impact Review**

Marathon impact studies have been conducted for a number of years in cities all over the United States. When one examines the reports and press releases that provide impact estimates for nationally known races such as Boston ("Marathon 2000 by the numbers," 2004), New

York ("Marathon will add at least \$88 million," 2000), and Chicago (Hewings, 2003), as well as for races staged in cities like Cleveland (Campbell, 2004), Phoenix (Northern Arizona University, 2004), Washington (Madigan, 2002), Honolulu ("2004 Honolulu Marathon generates over \$90 million," 2005), San Diego ("\$78 million dollar rocker," 1999), Tampa ("Marathon's economic impact tripled," 2001), Portland (Smith, 2006), and Austin, Texas ("The 2005 Freescale Marathon," 2005), it is clear that they collectively describe an approach to conducting economic analysis that suggests the use of widely varying methodologies. For example, the per runner impact estimates vary dramatically across these studies, from less than \$1,000 in Washington, D.C. (Madigan, 2002), to as much as \$4,200 in Boston ("Marathon 2000 by the numbers," 2004). While larger metropolitan area events, where the races are often viewed as "national" in character and therefore might be expected to draw relatively large numbers of out-of-town participants, should generate greater impact per runner because of higher percentages of out-of-town participants and bigger secondary or multiplier effects, some of the largest per runner impacts occurred in mid-sized cities like San Diego ("The \$78 million rocker," 1999) and Honolulu ("2004 Honolulu Marathon generates over \$90 million," 2004). A closer examination of the methods used to construct these estimates reveals evidence that race analysts used a wide range of both assumptions and methodologies to estimate marathon economic impact. For example, estimates of the economic impact of the Napa Valley Marathon were constructed using only direct spending data and therefore failed to include any secondary (or multiplier) effects (Winitz, 2004). Another study, an analysis of the Florida Gulf Coast Marathon, relied on proxy data (e.g., "typical" visitor spending data from their local Chamber of Commerce) as the basis for their direct spending estimates ("Marathon's economic impact tripled," 2001). Even more significantly, many of the small city studies reviewed completely ignore any potential contribution from local race participants.

Generally speaking, larger city studies are on firmer methodological ground, basing their analysis upon actual survey data of their marathon participants and using conventional impact models to incorporate the secondary, or



multiplier, effects. However every one of the large city studies failed to correctly account for any impact generated by local participants. This failure to treat locally based economic impact correctly is understandable. Impact generated from local sources is a phenomenon that thoughtful impact analysts typically ignore because locally generated spending is always presumed to be spending that is merely shifted from another part of the area economy. In fact, Crompton, Lee, and Shuster (2001) suggest four principles "central to the integrity of economic impact analysis" in which the first requires the *exclusion* of local residents from contributing to economic impact on precisely these grounds, an argument that Crompton repeats in a number of other papers (Crompton, 1995, 1999; Crompton & Lee, 2000; Crompton, Lee, & Shuster, 2001). While Crompton and his co-authors are to be applauded for the care they exhibit in creating guidelines for honest impact estimation, it is likely that the exclusion of local residents from impact contribution leads to a significant underestimate of total economic impact. As noted earlier, locally generated impact can occur whenever local participation causes spending to be redirected from outside the local area into the local economy. Such will be the case whenever local participants use their participation to substitute for some out-of-town activity. When this occurs, the assumption that all local event spending is spending that is merely shifted from elsewhere within the local economy is incorrect. The plausibility that import substitution spending occurs would seem quite strong in a variety of circumstances. For example, it might be especially likely to occur whenever the event is significant enough that local residents actually stay home to attend the event rather than take an out-of-town vacation. Yet Lee and Taylor (2005), citing the guidelines in Crompton's work, omit all locally based impact for a major sporting event, the 2002 FIFA World Cup.

When impact studies do consider including locally sourced impact, there is considerable confusion regarding how it should be done. Hudson (2001), for example, argues that "local expenditures (for season tickets) should be only included if season tickets are purchased instead of an out-of-town vacation" (p. 27), but then goes on to state that "a safer assumption is to assume that no local spending represents an increase in economic activi-

ty" (p. 28). Press releases describing the economic impact of marathon races recently run in New York, Chicago, Phoenix, and Cleveland (among others) include locally sourced impact based on actual local spending, but arbitrarily limit the local contribution to an amount varying from 30-100% of total spending amounts. Patrick Rishe, a sports economics impact consultant and president of Sportsimpacts.com, indicated that in treating locally sourced spending, he counts "anywhere between 0-20% of their expenditures towards economic impact calculation with a slant towards the higher end of that range the larger the profile of the event" (P. Rishe, personal communication, April 4, 2003). However, if locally sourced impact does arise because of import substitution, the use of actual local spending data to estimate such impact is obviously problematic. With marathon events in particular, we believe that import substitution will invariably occur because of the nature of the event and the circumstances surrounding a participant's decision to run a marathon. Actual local race participant spending may either be greater or less than import substitution spending depending on such factors as the percentage of local runners that would have engaged in import substitution activity, and the differences in the amount of spending a local runner typically makes running a local race versus an out-of-town race. Therefore while the omission of this source of impact altogether will lead to a significant underestimate of overall economic impact whenever such activity is undertaken by sizable percentages of local event participants, we believe it is simply not correct to assume that including actual local spending amounts as a way of accounting for locally sourced impact provides a better estimate of an event's overall impact than omitting local impact contribution altogether.

The use of actual local spending instead of import substitution estimates, in addition to incorrectly accounting for total spending amounts, creates another form of error because of the differences in *where* such spending will occur in the local economy. For example the goods and services which local participants actually purchase as a result of their event participation will almost certainly differ from those they would have purchased somewhere else instead. Because redirected locally based spending is based upon the kinds of goods and services that runners



would have purchased as marathon participants outside the local area, such spending is more closely approximated by the pattern of spending done by *non-local* race participants in the local economy, rather than by the goods and services purchased locally by local race participants. This is an important point because the secondary, or multiplier, effects vary considerably across different sectors within the local economy. Of course it is not possible to know precisely where local marathon participants *would have spent* their income in the local economy had they redirected such spending from outside the area because of their participation in the local marathon, but a multiplier consistent with generalized household spending would appear to be far better than multipliers based upon the goods and services they actually purchased locally as event participants. To conclude, the error created in using an arbitrarily chosen percentage of actual local race participant spending in order to estimate the locally based contribution to marathon economic impact occurs for several different reasons. The best way to avoid making such errors is to survey local participants to determine both the percentage that engages in import substitution behavior and the amounts they would have typically spent had they participated in an out-of-town event if the local event had not occurred.

In addition to errors in the treatment of locally sourced impact, we also found that those marathon studies that included secondary (or multiplier) effects used wildly varying multiplier values to construct their estimates. Generally speaking, the size of these multipliers depends upon both the sector in which the spending takes place and the size of the metropolitan area involved. Multiplier values, according to the input-output models developed by the U.S. Department of Commerce (1997), generally tend to lie between 1.2 and 2.5 with larger values occurring in service sector spending and in larger metropolitan areas. Another model often used in impact studies, the IMPLAN model developed by the Minnesota IMPLAN Group, also has multipliers in this general range (Lindall & Olson, 2004). Yet at least one marathon press release, for the 2004 Motorola Austin Marathon (“The 2005 Freescale Marathon,” 2005), implicitly suggests a multiplier less than one. Others, such as the 2004 Rite Aid Cleveland Marathon study (Campbell, 2004), appear to

use multipliers well above those used in much larger cities and above the high end of the realistic multiplier range of 2.5. While certain sectors of area economies may have multipliers outside the range cited above, it is unrealistic to expect that the “average” metropolitan area multiplier also falls there.

To summarize, the evidence on marathon studies suggests that in most instances, economic impact estimation fails to follow standard models of impact methodology. Yet even in those studies that do so, the local component of impact contribution is accounted for improperly or not at all. Given the potential importance of the local component relative to that generated by non-local race participants, it is of critical importance to accurately estimate the contribution from local sources. Ignoring it altogether can lead to a considerable underestimate of marathon impact. Because marathons create costs to cities both in resources and traffic disruption, accurate economic impact estimation is essential to the equation in determining the value of staging such an event.

### **Marathon Economic Impact Methodology**

Marathon economic analysis therefore has three fundamental parts. The first element is the determination of the amount of non-local incremental direct spending in the local economy that can be attributed to the staging of the marathon event, spending that would otherwise not have taken place had the marathon event not occurred. This component largely consists of spending by visiting marathon participants because they came to the area and spent money as part of their participation in the marathon races. A second and less obvious component of this element of analysis exists to the extent that there is also spending by visitors to the area who came to support local marathon participants. Finally, there also may be non-local sponsorship spending associated with the staging and promotion of the marathon. Because visitor marathon participant spending is likely to account for most of this first impact element, a relatively detailed survey of race participants regarding both total amounts spent and the kinds of goods and services purchased must be administered to obtain this information. This survey may be conducted using either telephone or online tech-



nologies. Research based on an analysis of survey method bias and the consistency of response values to questions about specific category spending amounts suggests that both methods are equally reliable (Olberding & Cobb, 2007). To estimate spending by visitors who came to support local marathon participants, local race participants should be surveyed to determine the percentage who entertained such visitors and the amount in total that their visitors typically spent while in the area. Surveying race participants instead of the visitors themselves will yield a better response rate and given the relatively small contribution made to total visitor spending, it is not necessary to collect this kind of detailed information from non-local race participant spending.

The second element critical to estimating economic impact is the hypothetical spending we label import substitution, the amount of incremental area "direct spending" from local sources that is attributable to the marathon event. As noted earlier, it is incorrect to use actual spending data from local sources because such spending amounts have no predictable relationship to those hypothetical amounts that are redirected into the local economy because of the marathon event. Therefore one should not survey local marathon participants regarding any spending done as part of their participation. Instead, the survey of local runners should collect information in two critical areas: (1) the likelihood that local runners would have participated in an out-of-town race had the local marathon not taken place, and (2) the amount of money local participants would likely have spent out of the local area in participating in such an alternative venue. Research conducted as part of this study suggests that high percentages of both marathon and half-marathon local participants engage in such behavior. To the extent that this pattern is typical for most city marathon events, even cities with relatively low percentages of non-local runner participation may still generate considerable economic impact. If such information is not easily or reliably obtained by surveying local race participants, a reasonable proxy estimate could be obtained from spending amounts typically done by the non-local race participants to the extent the events are comparable. However, comparability problems are likely to exist given the wide variety of race venues. Therefore,

we believe that even though "spending" levels obtained from local race participants is hypothetical, it is preferable to using actual spending information collected from non-local race participants.

The third element necessary for economic impact analysis is a model of the local economy that allows the calculation of secondary, or multiplier, effects. These effects occur to the extent that direct spending flows, by generating additional area income, create additional spending flows. The size of these effects depends upon both the size and industrial mix of the metropolitan area and the sector in which the direct spending takes place. While it is obviously important to use a model with realistic multipliers, most models are relatively consistent with each other. However, those studies that estimate impact based upon models with unrealistically high multiplier values will obviously generate over-estimates of impact and a lack of credibility. Economic theory, as well as the preponderance of the models themselves, suggests that realistic multiplier values should fall in a range running roughly between 1.2 and 2.5 depending on the spending sector and the metropolitan area involved. The output from these models will typically measure the impact to area economy in terms of gross sales, employment, and earnings.

### **Cincinnati Flying Pig Marathon**

The Cincinnati Flying Pig Marathon is actually a collection of races including a marathon, half-marathon, 10-kilometer, 5-kilometer, wheelchair, and relay races. Events related to the 2006 marathon started on Friday and culminated at noon on Sunday with an awards ceremony. The 2006 Flying Pig, the eighth year of this event, had a record 14,911 registrants for all events. Nearly 10,000 of these registrants were evenly split between the marathon and half-marathon races. Economic impact estimates presented here are based solely on these two events because the smaller races had both high local participation rates and little expectation of significant import substitution activity. The population and survey sample characteristics are shown in Table 1.

In the marathon race, there were 4,178 finishers representing roughly 86% of registrants for that race. Nearly



**Table 1: Population and sample characteristics of full- and half-marathon participants**

Participant residence	Half-marathon	Percent	Full-marathon	Percent	Total
Population characteristics (N=8,561)					
Out-of-town	2,021	46.1%	2,478	59.3%	4,499
Local	2,362	53.9%	1,700	40.7%	4,062
Total	4383	100%	4178	100%	8,561
Sample characteristics (n=1,373)					
Out-of-town	349	57.3%	489	64.0%	838
Local	260	42.7%	275	36.0%	535
Total	609	100%	764	100%	1,373

60% of those who finished the marathon were from outside the Cincinnati metropolitan area, defined by the federal government as the 13-county area in southwest Ohio, southeastern Indiana, and northern Kentucky. Local finishers in the marathon race indicated that about 45% of them would have run in another race outside the Cincinnati area had the Flying Pig not taken place. Another 28% were unsure as to whether or not they would have done so. Counting only those local race participants who were sure that they would have run in an alternative race, there were a total of 3,248 marathon participants (non-local and local combined) who could be expected to contribute economic impact on the Cincinnati area economy. In addition, about 23% of local marathon finishers indicated that they had out-of-town guests associated with their participation in the marathon creating an additional source of marathon-related economic impact.

A total of 4,383 race participants, about 88% of total registrants, finished the half-marathon race. Of these finishers, 2,021 (or 46%) finishers were from outside the Cincinnati metropolitan area and therefore contributed to economic impact. In addition approximately one-third of the 2,363 local half-marathon finishers indicated that they would have run in an out-of-town race had the Flying Pig not taken place while another 17% were unsure. Counting only those local participants who indicated that they were sure they would have run in another race, a total of 2,822 half-marathon finishers were expect-

ed to have contributed to the economic impact of the Flying Pig event. Finally, a small number of local half-marathon participants, about 15%, stated that they entertained out-of-town visitors during the event, creating another source of potential economic impact. There was also one other relatively small source of impact to include in our analysis, spending in the local area by non-local event sponsors totaling about \$17,500. Random samples of both local and non-local race finishers were interviewed shortly after the races using online surveys specific to each group. Non-local race participants were asked detailed questions concerning what they had spent in a number of specific areas. The surveys used for local and non-local race participants are shown in the Appendix. Spending totals for non-local participants are presented in Table 2.

As this table indicates, both marathon and half-marathon finishers devoted about half of their total spending on accommodations and in restaurants. Both groups also spent relatively large amounts at the National City Health and Fitness Expo, on registration for the races, and for gasoline purchases in the area. Total spending for both groups across all categories is slightly higher than \$2.5 million. Each non-local marathon finisher spent roughly \$580 while in the Cincinnati metropolitan area, while their half-marathon counterparts spent slightly less at \$535 each.

As noted earlier, significant percentages of both marathon and half-marathon local finishers indicated



**Table 2: Non-local direct spending estimates**

Category	Marathon	Half-Marathon	Total spending
Gasoline	\$155,048	\$117,622	\$272,670
Parking	38,731	23,484	62,215
Public transport	15,264	3,314	18,578
Car rental	23,739	15,514	39,280
Lodging/hotels	456,795.	367,398	824,193
Restaurants	314,533	191,368	505,901
Bars	32,982	14,228	47,210
Entertainment	17,123	12,732	29,855
Expo	125,511	143,491	269,002
Department stores	51,493	61,277	112,770
Grocery stores	31,594	20,634	52,228
Other retail	8,202	5,760	13,962
Registration	166,026	107,113	273,139
<b>Total spending</b>	<b>\$1,437,041</b>	<b>\$1,083,962</b>	<b>\$2,521,003</b>

that they would have participated in an out-of-town race had the Flying Pig not taken place. The survey asked runners to estimate the total amount that they typically would spend on such a race. On average, each local marathon participant indicated that they would have spent about \$615 in an out-of-town race, slightly higher than the amount non-local marathon participants stated that they had spent while in the Cincinnati area. Local half-marathon participants, on the other hand, estimated that they would each have spent a bit less than their non-local counterparts did in the Cincinnati area, approximately \$418 apiece. Counting only those local marathon and half-marathon finishers who indicated that they were sure they would have participated in an out-of-town race, we estimate that they would have collectively spent over \$800,000 outside the Cincinnati area had the Flying Pig event not taken place. It is interesting to note that had *actual* local participant spending been used to estimate this impact, each local race participant would have had to spend roughly \$135 at the race. Had only a fraction of local participants been used as is generally the practice in marathon studies that include local impact, these runners would obviously have had to spend even more.

Given the amount of money local race participants indicated they would have spent elsewhere had the Flying Pig Marathon not taken place, the omission of this source of impact implies that the marathon's overall economic impact will be understated by about 25%. It is possible, of course, that not all of the hypothetical spending by local participants would have been redirected into the local economy. Should this be the case, the importance of the import substitution effect is diminished. However, we did not survey local race participants about *where* they would have spent the redirected amounts because we believe such speculative information would be unreliable. It is also likely that some of the local race participants who stated that they were not sure if they would have participated in an out-of-town race would, in fact, have done so. If, for example, 50% of those who stated that they were "not sure" would have run in such a race, the amount of spending redirected into the local economy jumps to over \$1 million, or nearly 30% of total direct spending.

Local race participants who stated that they entertained out-of-town guests were also asked to estimate guest spending. Guests of marathon participants spent on average about \$240 apiece while those of half-marathon par-



**Table 3: Secondary effects of spending by Flying Pig Marathon participants**

Source	Gross Sales	Earnings	Employment
Non-local participants	\$4,376,165	\$1,424,189	105.9
Local participants ("sure")	965,343	589,959	39.5
Local participants (including 50% "not sure")	1,238,491	765,890	50.6
Local participants. Guests	195,084	119,223	8.0
Non-local sponsor spending	38,770	12,998	0.8
<b>Total</b>	<b>5,575,362</b>	<b>2,146,369</b>	<b>154.2</b>
<b>Total (including 50% "not sure")</b>	<b>5,848,510</b>	<b>2,322,300</b>	<b>165.3</b>

ticipants spent a bit less, roughly \$195 each. Collectively these out-of-town guests spent approximately \$165,000. Adding guest spending to import substitution spending estimates, the total spending associated with local race participants is just under \$1 million. We believe that this estimate is conservative given that it is based on only those local runners who were sure that they would have run in another race had the Flying Pig event not occurred. This total could climb to about \$1.2 million if 50% of those who were not sure they would have done so are included.

To calculate the total economic impact associated with the incremental area spending described above that can be attributed to the staging of the Flying Pig Marathon event, the multiplier effects must also be accounted for. We use the RIMS-II model of the Cincinnati metropolitan area to make these calculations. This model is produced by the U.S. Department of Commerce by modifying national input-output data to reflect local area industry characteristics. The Cincinnati area multipliers vary across sectors but typically fall in the 1.8 to 2.2 range. The smallest multiplier in this model is the one associated with generalized household spending, and we apply this multiplier to all locally redirected as well as out-of-town guest spending in the absence of specific information as to where such spending would have occurred. Because this application is conservative in calculating the multiplier effects associated with about one-third of the total incremental direct spending, we believe that our economic impact estimates are themselves fairly conser-

vative. In the RIMS-II model, the economic impact values cover gross spending, area earnings, and employment (full-time equivalent) for the year associated with the event. These impact estimates are shown in Table 3.

Table 3 includes two alternative sets of impact estimates generated by local race participants. One calculation includes the redirected spending flows (i.e., the import substitution amounts) for only those local participants in both races who indicated that they were "sure" that they would have competed in an alternative out-of-town race had the Flying Pig Marathon not taken place; the second calculation includes the contribution of 50% of those local runners who stated that they were "not sure" (a third option on the survey was to state that they were sure they would not have participated in another race). The impact from local participants on "gross sales," the typical measure of economic impact, is therefore between 17% and 21% depending upon which calculation is used. Either way, it is clear that omitting the import substitution effect from impact calculations will result in a significant underestimate of the economic effect of the marathon event. "Gross sales" is the measure generally used to represent economic impact because it approximates the event's effect on area output. The "earnings" measure represents the event's contribution to the sum of area wages, salaries, proprietor income, and other labor income less employer pension contributions, while the "employment" measure is for full-time jobs created or sustained in the area because of the event. All impact measures are annual.



## Conclusion

This paper addresses an important issue related to accurately estimating the economic impact of a sporting event, a marathon race, which arises out because of a phenomenon we call the import substitution effect. This effect occurs whenever local marathon participants would have spent money outside the local metropolitan area had the marathon event not taken place. This phenomenon, of course, may occur in other circumstances, but we focus our research on sporting events generally (and marathon events in particular) in part because we know of no economic impact study of an urban marathon that correctly accounts for this important source of impact. The literature on economic impact analysis contains numerous articles that suggest that honest and accurate economic impact analysis should ignore all locally sourced event-related spending on the grounds that such spending would have taken place within the metropolitan area economy regardless and therefore does not represent any incremental area spending attributable to the event being analyzed. And those papers that suggest that locally sourced impact might exist typically also take the position that it is so small, relative to total economic impact, that it may safely be ignored.

Our study suggests ignoring locally sourced impact is incorrect because not only does it exist in marathon events, it involves amounts large enough that excluding them would result in a significant understatement of total economic impact. However, this locally sourced impact is unrelated to actual local participant spending levels so that estimating such impact on that basis is also incorrect. The reason why actual local marathon event related spending should not be used is because locally sourced impact is based on the (hypothetical) amount that locals redirect into the local economy from expenditures they would otherwise have made outside the local area had they not participated in the marathon event. Consequently, those marathon economic impact studies that do include locally sourced impact but base it on actual local participant spending levels, often at a fraction of the total amount and for poorly articulated reasons, err in their estimates. Moreover, this error may be either an underestimate or an overestimate of that local contribu-

tion depending upon both the assumptions used and the characteristics of local race participants.

The hypothesis regarding the importance of locally sourced impact is supported by our economic impact analysis of the 2006 Flying Pig Marathon in Cincinnati. This study suggests that locally sourced impact associated with that race accounts for roughly 25% of total impact, in part because nearly one-half of local marathon participants and over one-third of local half-marathon participants would have run in a race outside the area had the Flying Pig not taken place. Given these results, it can be argued that careful economic impact analysis should take into account the possibility of this effect. While doing so requires both the identification of local vs. non-local participant groups as well as the use of separate surveys of each group, the survey instruments themselves are neither complicated nor difficult to administer. Therefore, even small city marathon analysts should be able to account for locally sourced impact in their economic impact analysis. Because such impact appears likely to be an important component of overall impact, ignoring it results in a substantial underestimation of the total economic impact. Given the widespread interest in obtaining such estimates, this study provides an important roadmap for obtaining accurate impact estimates.

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## Appendix

### Flying Pig Marathon survey of non-local participants

- 1.01 Including yourself, how many members were in your group that attended the Flying Pig Marathon?
- 1.02 Did you buy any gasoline while in the Cincinnati area? [If YES, answer question 1.3. If NO, skip to question 1.4.]
- 1.03 In total, how much did you spend on gasoline?
- 1.04 Did you pay for parking while in the Cincinnati area? [If YES, please answer question 1.5. If NO, please skip to question 1.6.]
- 1.05 In total, how much did you spend on parking?
- 1.06 Did you use any public transportation while in the Cincinnati area (e.g., taxi, bus)? [If YES, please answer question 1.7. If NO, please skip to question 1.8.]
- 1.07 In total, how much did you spend on public transportation?
- 1.08 Did you rent a car while in the Cincinnati area? [If YES, please answer question 1.9. If NO please skip to question 1.10.]
- 1.09 In total, how much did you spend on car rental?
- 1.1 While you were in the Cincinnati area for the marathon, did you stay over night? [If YES, please answer question 1.11. If NO, please skip to question 1.12.]
- 1.11 In total, how much did you spend on lodging?
- 1.12 While in the Cincinnati area for the marathon, did you or any members of your group go to any restaurants? [If YES, please answer question 1.13. If NO, please skip to question 1.14.]
- 1.13 In total, how much did you spend and/or your party spend at restaurants?
- 1.14 While in the Cincinnati area for the marathon, did you or any members of your group go to any drinking establishments? [If YES, please answer question 1.15. If NO, please skip to question 1.16.]
- 1.15 In total, how much did you spend and/or your party spend at drinking establishments?
- 1.16 While in the Cincinnati area for the marathon, did you or any members of your group go to any entertainment establishments (e.g., the movies, a museum, a concert, the zoo)? [If YES, please answer question 1.17. If NO, please skip to question 1.18.]
- 1.17 In total, how much did you spend at entertainment establishments?
- 1.18 While in Cincinnati for the Flying Pig Marathon, did you make any purchases at the Expo? [If YES, please answer question 1.19. If NO, please skip to question 1.20.]
- 1.19 In total, how much did you spend at the marathon Expo?
- 1.2 While in the Cincinnati area for the marathon, did you or any members of your group purchase any retail merchandise? [If YES, please answer question 1.21, 1.22 and 1.23. If NO, please skip to question 1.24.]
- 1.21 How much did you spend at department stores, variety stores, clothing, or souvenir shops?
- 1.22 How much did you spend at grocery or drug stores?
- 1.23 How much at any other type of store?
- 1.24 Is there any other form of spending that you can recall doing while in the Cincinnati area associated with the Flying Pig Marathon? [If YES, please answer questions 1.25 and 1.26. If NO, please skip to question 1.27.]
- 1.25 Please describe the type of spending?
- 1.26 How much did you spend?

### Flying Pig Marathon survey of local participants

1. Did you have any out-of-town guests here in town because you ran in the Flying Pig Marathon? [If YES, please answer questions 2 and 3. If NO please skip to question 4.]
2. What, primarily, did they spend their money on? (Please check all that apply.)
  - 2.01 Gasoline
  - 2.02 Parking
  - 2.03 Car rental
  - 2.04 Overnight lodging
  - 2.05 Restaurants
  - 2.06 Drinking establishments
  - 2.07 Entertainment (e.g., the zoo, a museum, movies)
  - 2.08 Retail purchases (e.g., souvenirs, department store, grocery)
  - 2.09 Public transportation (e.g., taxi, bus)
  - 2.10 Purchases at the marathon expo
  - 2.11 Other, Please Specify:
3. How much do you estimate they spent, in total, while they were in town visiting you?
4. If you had NOT run the Flying Pig Marathon, would you have participated in another out-of-town marathon (e.g., Chicago, Boston, Columbus, or some other marathon.) If YES please answer questions 5 and 6. If NO, then you are finished with this survey. Thank you for your time.
5. Including yourself, how many people would have traveled with you in attending such an alternative marathon?
6. In total, what would you likely have spent at such a race? (Please include spending on such things as registration fees, spending at the event's expo, travel expenses, lodging, food, entertainment, and other retail spending.)





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