The Journal of Socio-Economics 38 (2009) 641–647

Contents lists available at ScienceDirect

The Journal of Socio-Economics

journal homepage: www.elsevier.com/locate/soceco

Tipping as risk sharing

Steven J. Holland*

Luther College, 700 College Drive, Decorah, IA, USA

ARTICLE INFO

Article history:
Received 15 August 2008
Received in revised form 12 January 2009
Accepted 7 February 2009

JEL classification:
D81
L84

Keywords:
Tipping
Gratuity
Social norm
Rational choice
Risk-aversion

ABSTRACT

Tipping is often dismissed as an exception to the assumption of rational economic agents. This paper describes situations where tipping is, in fact, an effective mechanism for risk sharing and welfare improvement. When risk-averse customers purchase a service with uncertain quality, tipping can reduce the customer's exposure to risk by making part of the price of the service discretionary. These findings help explain why we tend to tip restaurant workers but not retail workers and why some high-risk service providers, such as lawyers and automobile mechanics, are not typically tipped.

1. Introduction

Tipping is often described as an odd practice that challenges the assumption of rational economic agents (Frank, 1987; Landsburg, 1993; Bodvarsson and Gibson, 1997). Tipping requires customers to freely leave money for total strangers in the absence of any requirement to do so. What is more, these customers cannot expect an immediate *quid pro quo* because the tip is not left until after the service has been provided. It is difficult to understand why customers do not simply enjoy the service, pay the agreed price, and then leave with their pocketbooks a bit heavier. In most service industries this is exactly what happens, but in some sectors, especially the restaurant industry, tipping is significant. Tipping in restaurants is estimated to exceed $40 billion per year and makes up over half of many restaurant workers' incomes (Azar and Yossi, 2008).

In this paper, I examine whether tipping can be explained as a rational act of utility maximizing people. Efforts to understand what could possibly drive a rational customer to leave a tip have generated some interesting and imaginative theories.[1] Many economic models of tipping focus on the principal–agent relationship between tipped employees and their employers (Azar, 2004a). The idea is that employers want their employees to work hard to provide high quality service but find it difficult to observe employee effort. Customers, on the other hand, are in a good position to observe employee effort because they are ones receiving the service. Tipping for service quality, it is suggested, creates incentives for employees to give a high effort, reduces the employer's need to monitor, reduces transaction costs, and increases efficiency (Lynn et al., 1993). Azar (2005a) has developed a formal model that helps identify the conditions where tipping improves service quality and increases social welfare.

While the principal–agent theory explains many aspects of tipping it also has several weaknesses. First, empirical research suggests that service quality has a small impact on the size of the tip (Lynn and McCall, 2000), suggesting there are additional factors that may be more important. In addition, most of the instances where employer monitoring of service quality is most problematic (e.g., out of the office sales, legal services, teaching) have not resulted in widespread tipping. Finally, and perhaps most troubling, the principal–agent approach does not adequately explain why customers would voluntarily assume the employer's monitoring responsibilities—bringing us back to the claim that tipping is irrational.

Others have explored whether tipping is a mechanism for rational customers to induce better future service (Ben-Zion and Karni, 1977; Azar, 2007b; Azar and Yossi, 2008). By tipping, customers build a reputation for rewarding good service and rational servers respond by providing better service in the future (Azar, 2007b). The on-going relationship between customer and server takes on a self-enforcing tit-for-tat reciprocity. The obvious problem with this theory is that it requires a repeated interaction between the

* Tel.: +1 563 387 1130.
E-mail address: hollst03@luther.edu.

[1] For a good overview of theories from many different disciplines, see Lynn (2006). Azar (2007a) discusses several types of tipping and many of the theories used to explain them.

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doi:10.1016/j.socec.2009.02.001

customer and the server. In reality, most of us do not expect to encounter our server again but leave a tip anyway. It is not surprising then that empirical studies have found only a weak relationship between tipping and the frequency of patronage (Azar and Yossi, 2008; Lynn and McCall, 2000).

Social norms have also been employed to explain customer participation in tipping (Azar, 2005a; Conlin et al., 2003). There are many theories for why social norms exist, but once they are in place it is believed that people conform to them in order to avoid the negative feelings or social stigma associated with violating the norm. While there is empirical support for treating tipping as a social norm, most studies treat the existence of the norm as exogenous. As a result, social norm analysis has thus far only helped explain why tipping persists but not why it started in the first place. This has led some to argue that social norms alone cannot explain the existence of tipping (Azar, 2004b; Bodvarsson and Gibson, 1997).

It has been observed that social norms and informal institutions, of which tipping is one, usually arise on the edge of markets to improve market outcomes or address market failures (Arrow, 1971; Dixit, 2004). The current theories of tipping are all based on the idea that markets cannot induce the optimal level of server performance due to moral hazard or information asymmetries. This paper diverges from the current line of thinking by viewing the market "failure" not as a problem of monitoring or incentives but as an inefficient distribution of risk. Lynn et al. (1993) first mention the relationship between uncertainty and tipping, and Lynn (2006) notes a correlation between tip rates and the desire to avoid uncertainty. Estreicher and Nash (2004) ask why employees would be willing to accept an inherently riskier tip-based compensation, but believe the answer lies in tax incentives. This paper aims to make risk central to the analysis and to show that risk may, in fact, be an important factor driving the institution of tipping.

To focus on the role of risk in tipping, this paper assumes outcomes (i.e., the quality of meals) are independent of server performance. This assumption is not intended to imply that server effort does not affect the quality of service—it is obvious that it does in most cases. Instead, the assumption is merely intended to highlight that tipping *can* exist in the absence of a concrete relationship between server effort and the quality of outcomes. This is a significant point because there is some empirical evidence of a positive and significant correlation between tip size and food quality (Azar, 2007c). However, the principal–agent and future service theories predict the tip should depend entirely on the server's performance and be unrelated to factors such as food quality that are beyond the server's control. Evidence that tips vary with food quality suggests that social norms or other factors such as risk are important. This paper, then, supplements rather than contradicts the existing literature on tipping.

The main finding of this paper is that tipping is a rational way for customers and servers to share risk more efficiently. Using the restaurant industry as an example, I show that tipping reduces the risk faced by a risk-averse customer ("diner") by lowering the wage paid to the server ("waiter"), reducing the mandatory part of the meal price, and giving the diner more discretion over the total cost of the meal. As a result, when the meal is unusually bad the diner can choose to withhold a tip and reduce the loss of utility that would otherwise occur.

The level of tipping is constrained by the waiter's aversion to an uncertain level of compensation. As more of the waiter's compensation becomes tip-based the variance of his compensation grows. A risk-averse waiter will not give up one dollar in wages in exchange for a one-dollar increase in the expected tip. Wages will consequently fall at a slower rate than any increase in the expected tip, which increases the diner's expected total expenditure on the meal. Tipping, then, looks like insurance where the diner pays the waiter to assume some of the risk of a bad meal.

2. The model

This paper initially supposes a world where restaurants exist but tipping does not. The question is whether a diner could propose a plan to tip the waiter under certain conditions such that (1) the diner is better off after the plan is implemented, (2) the restaurant and its employed waiter are no worse off as a result of the plan, and (3) the plan is self-enforcing. I will proceed by first defining the objectives of all the interested parties and then show that tipping can improve everyone's well-being. I will then argue that the resulting "tipping scheme" is stable over time. Finally, I will use some of the insights gained from the model to help explain some previously puzzling behavior.

2.1. The diner's objective

When a rational, risk-averse diner sits down to a meal at a restaurant she is concerned about two things. First, she cares about the expected net benefit she receives, which is the difference between the expected value of the dining experience and the amount she knows she has to pay for it. A diner will want to maximize this difference. She will also be concerned about the risk she faces. Since the value of the meal is uncertain and cannot be observed until after she commits to paying for it, she will want to minimize the variance of the difference between the meal's quality and its price.

In order to focus on tipping as a way to share risk rather than a way to induce greater waiter effort, it is assumed that the quality of the meal is independent of the effort put forth by the waiter. We might suppose that waiter effort is constant and the quality of the meal is determined by other factors such as the ingredients used, the effort of the kitchen staff and the like. The quality or value of the meal, which represents the amount the diner would be willing to pay for it, is denoted as V, a random variable that takes on the value high (H) with probability p, medium (M) with probability q, and low (L) with probability r, such that $H \geq M \geq L$ and $p+q+r=1$.

When the diner orders a meal she commits to paying the price on the menu. It is assumed the restaurant operates in a perfectly competitive market so the price of the meal equals its marginal cost. Denote the waiter's wage as W and assume the cost of the food, the wages of the managers and the restaurant's operating expenses that go into producing the meal are equal to a constant, C. Therefore, the total price of the meal is equal to the waiter's wage per meal plus the cost of other expenses ($W+C$). Without tipping, the diner's expected net benefit of the meal is E ($V-W-C$).

Now suppose the diner proposes a plan to tip the waiter. A tip is modeled as a complete contract between the diner and the waiter. A complete contract is perfectly specified, meaning there will be a tip corresponding to every possible value of V. The contract in this model is much like a contract of adhesion where the diner chooses the terms of the contract and the waiter accepts or rejects the contract without negotiation. The waiter will accept the contract so long as the combination of the expected tip and his wage makes it worth the waiter's while to remain employed at the restaurant.

Since the meal value in this model is assumed to take on one of three states there are only three possible tips that need to be determined. The terms of the contract, or the proposed tipping scheme, are then defined as:

$$t = \left\{ \begin{array}{l} t_H \text{ if } V = H \\ t_M \text{ if } V = M \\ t_L \text{ if } V = L \end{array} \right\}$$

The total expenditure by the diner if the tipping scheme is accepted is ($W+C+t$) and the net benefit to the diner from eating out is the expected utility of ($V-W-C-t$). For the purpose of generality and