

Potential Strategies for Authorities After Price of Rice Noodle Increase in Guizhou

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I. Summary:

In this paper, we are going to analyze how the local governments of Qianxi and Xishui County in Guizhou should react when the price of rice noodles went up this October. For both counties, restaurants observed the increase of their input price and increased their price per serving, which had made public opinion exploded. The local authorities of both counties put a price ceiling to set the price back to the original level.¹² The result is a market failure caused by government intervention. This paper proposes to remedy this failure by implementing policies that would make residents value breakfast more and encouraging investment from restaurant chains.

II. Background and Context:

Rice noodle is a trendy snack in southern China that could be served from breakfast to dinner and differentiated from place to place with different add-ons and flavors. Guizhou Rice Noodle is known for its spicy flavor and its extraordinary use of beef or lamb. Generally, the producing process of rice noodles would be considered as complicated in 2 parts, both making rice noodles from raw rice and getting the best flavor and taste. First and foremost, processing rice noodles from raw rice involving at least nine steps: cleaning raw rice, soaking, grinding, sieving, spreading, pre-steaming, extruding, boiling, and cooling.³ This could be extraordinary trouble and hard for households to produce. After all, it is even harder for a household to preserve it because you can't put the freshly made rice noodle into the refrigerator. The traditional way of saving rice noodles for future use is to dry it, which is also hard to keep it clean at home. In addition, the flavor is even harder to master. Chinese foods are known for hard to cook and make, and the biggest reason is that the ingredients are not always strictly proportioned. Flavor and taste controlling are still based on the accumulated experience of a chief. The common ingredients include prickly ash, hot peppers, pickled cabbage, and ginger.⁴ But many restaurants claimed that they are using more than 20 spices in making the soup and cook the meat. Thus, although it has almost been 2 thousand years since rice noodle was firstly invented, it did not become affordable for the general public until the last 40 years when the electric mill was introduced to produce rice noodles. In the past, people use stone mills that either powered by humans or horses, which is inefficient and has a meager output. The appliances of modern technology have simplified the production process and therefore drive down its prices and made it a part of everyday life.

¹ "Two beef noodle restaurants "collusion prices", should we concern?" (in Chinese)

<https://new.qq.com/omn/20191013/20191013A0KFVF00.html>

² "Guizhou Xishui mutton noodle increased 2 yuan being summoned. Official: Insufficient reason for price increase" (in Chinese)

<https://news.163.com/19/1018/19/ERPT2D460001875P.html>

³ "Traditional Chinese Rice Noodles: History, Classification, and Processing Methods"
<https://www.cerealsgrains.org/publications/plexus/cfw/Documents/CFW-60-3-0515.pdf>

⁴ "Guizhou Cuisine"

https://www.chinadaily.com.cn/life/2011-02/17/content_12035311.htm

Note that Guizhou is one of the poorest provinces in China. In fact, Guizhou has the lowest per capita GDP in all of China and is still greatly suffering from poverty.⁵ Typical Chinese restaurants serving rice noodles in Guizhou are always family-owned small businesses, which always operated from 6 AM to 10 PM, earning little revenue.

The reason for the price increase of rice noodles this time in Qianxi County and Xishui County is due to the rise of the input price. In recent months, a huge wave of African Swine Fever has killed 1/4 of all the living pigs around the globe, which has caused a huge problem for China.⁶ China has always been the most significant consuming power for porks, which took a market share of more than 50% of the entire globe.⁷ According to the National Bureau of Statistics of China, the pork price nationwide in China went up by 23.1% in August compared with July and an additional 19.7% increase in September. By the end of September, the pork price has increased by 69.3% in the past 12 months. Many sources also pointed out that the pork price in many places in China is actually doubled or even tripled this year.⁸ For the past few months, even if the price is high, China is experiencing a shortage of pork. The shortage actually also drives up the price of other meat sources, for instance, beef and chicken, as a potential substitute, increased by 10-15% percent every month. These have driven up the price of the entire market. Even if we only consider the effect of the price increase of pork, the CPI of the entire market has grown up by 1.65%.⁹ For Qianxi County, a few restaurants notice the input price of meat, vegetable, and noodle dramatically increase and decide to ask all the other demand all restaurants increase their product's price together, which forms a Cartel. According to the Price Law of the People's Republic of China, this is illegal. For Xishui County, individual restaurants observed the increase of their input price and increased their price, at least no evidence of cartel is being found. Surprisingly, the local authorities of both counties decided to enforce to set the price back to the original level in order to maintain the social stability.

III. Description of the Problem:

To have a better sense of the rice noodle market in Qianxi County and Xishui County, we need to have an overview of the economic conditions in Guizhou Province. Because the target customers of rice noodle market are urban citizens, we hope to limit the range of our statistics and focus only on urban households. From the National urban and rural household survey (Table 1), we get the information that the annual per capita disposable income of urban households in Guizhou Province is about ¥29080 in 2017, and the Engle Coefficient (the proportion of money

⁵ "Guizhou Province"

<http://www.chinafolio.com/provinces/guizhou-province/>

⁶ "Quarter of world's pig population to die due to African swine fever"

<https://www.theguardian.com/world/2019/oct/31/quarter-of-worlds-pig-population-to-die-of-african-swine-fever>

⁷ "China's Leaders Are Penned In as Citizens Stomach High Pork Prices"

<https://www.wsj.com/articles/chinas-rising-pork-prices-amplify-beijings-woes-11568135558>

⁸ "Five ministries keep pork prices down and maintain supply. Expert: no room for price to continue increase" (in Chinese)

<https://finance.ifeng.com/c/7piEnS77igi>

⁹ "Consumer prices rose 3.0% in September 2019" (in Chinese)

http://www.stats.gov.cn/tjsj/zxfb/201910/t20191015_1702636.html

spent on food in household expenses) is 33%.¹⁰ Therefore, we can infer the daily food expenses per capital is around ¥26 ($29080 \times 0.33 \div 365 \approx 26$) in Guizhou Province.

According to the report from Xinhuanet, the official state-run press agency of China, we can find that the total income of the Chinese restaurant industry is around ¥3.9644 trillion, while the total income of the Chinese breakfast industry is around ¥0.84 trillion, about 22% ($0.84 \div 3.9644 \approx 22\%$) of the total income of the restaurant industry.¹¹ In other words, consumers' expenses on breakfast are about 22% of the total expenses on food. Therefore, we can infer urban households in Guizhou Province probably spend 22% of their daily food expenses on breakfast, which is ¥5.72. Because Qianxi County and Xishui County face similar economic conditions with roughly the same population, we hope to take Qianxi County as an example. From the Qianxi County government website, we can find that the urban population in 2017 is 39.6 (in ten thousand).¹² We assume the demand for rice noodles is 39.6 (in ten thousand per day) when the price is 0. When the price is ¥5.72, only half of the total population whose disposable income is above average would be willing to pay it. It is reasonable for us to infer that one unit decrease in price will lead to more increase in quantity demanded when the price is low, so we can get $D''(p) > 0$. Therefore, we can formulate a demand function $D(p) = -8.28\sqrt{p} + 39.6$ (in ten thousand per day).

In Guizhou Province, each family-based restaurant is pretty small and provides customers with relatively similar food. Therefore, we can assume the breakfast market in Qianxi County is perfectly competitive and has a horizontal supply curve. In this market, the supplier's lowest average total cost is roughly equal to the marginal cost and price. Before price increasing, market price $p = 10$ (per serving). Now, the new market price $p' = 12$ (per serving). With the supply and demand function, we formulate our supply and demand curve (Figure 1).

From Figure 1, we can find urban residents' demand for rice noodles in Qianxi county when the price is ¥10. In Qianxi county, about one-third of residents are willing to pay for the rice noodles. And, when the price increases to ¥12, the quantity demanded decreases. Therefore, consumers began blaming the suppliers and reported this situation to the local government. In order to cease consumer's anger, the Qianxi county and Xishui county government force the rice noodle restaurants to lower their prices back to ¥10. However, it is unfair for the local government to set the price floor for the suppliers. In this roughly perfectly competitive market, suppliers earn very low profits. What suppliers try to do is not to maximize their profits and seize the market power but to get balanced from input price increases and remain in the market. Therefore, suppliers try to increase the price, matching the new marginal cost. When the price ceiling is set, most suppliers may exit the market. Finally, market failure is caused by this government intervention.

¹⁰“Guizhou Province Statistical Yearbook 2017” (in Chinese and English)
<http://www.yearbookchina.com/navibooklist-N2017120264-1.html>

¹¹“40 years of change: Restaurant industry market size increased by 700 times” (in Chinese)
http://www.xinhuanet.com/politics/2018-12/11/c_1123834299.htm

¹²“Statistical Communiqué on National Economic and Social Development of Qianxi County in 2017” (in Chinese)
http://www.gzqianxi.gov.cn/zwgk/xxgkml/tjxx/tjgb/201806/t20180629_3333432.html

IV. Proposed Remedy:

To solve this market failure, we need to view it from two perspectives, both suppliers and consumers. From the supplier's perspective, the best solution is that the local government provides suppliers with subsidies, allowing the suppliers to go back to the original supply curve that $p = 10$. However, it is worth for us to notice that according to "Detailed Debt Data of 68 cities in Guizhou Province", the total debt of the Guizhou government is around ¥0.8607 trillion in 2017.¹³ It is not feasible for the local government to spend more and subsidize restaurants.

Nowadays, most of the breakfast restaurants are family workshops that cannot afford the cost of mechanized production. Therefore, most of the rice noodles in these restaurants are hand-made, leading to an increase in the cost of time and labor. Therefore, the government should propose a series of policies to engage investments from restaurants chain outside like a tax cut. The engaged restaurant chain will acquire local rice noodle restaurants and build the rice noodles manufacturing plant for local restaurants. Qianxi is a small county, so we should not worry too much about the transportation cost. With the manufacturing plant, local restaurants' efficiency will improve and their costs will decrease. Furthermore, they can solve the problem of food hygiene. Each owner receives the semi-processed rice noodles from the manufacturing plant and provides the consumers with rice noodles after final processing. Furthermore, with mergers, the suppliers have more power to negotiate the price with producers of input like vegetables, rice, and meat, further lowering the marginal cost. It is also beneficial to the restaurant chain which can share the profits with local restaurants together.

From the consumer's perspective, we propose that the government should conduct proper education for local residents, shifting the demand curve to the right. Nowadays, breakfast expenses only count for 22% of the total food cost. It is a little low, compared to its benefits. There are apparently many benefits of consuming breakfast with a good quality. According to the advice from the health department of University of New Hampshire, we can find that breakfast gives people the first boost of energy that they will carry throughout the day. Breakfast can give people increased concentration and help people retain information more efficiently and maintain healthy body weight.¹⁴ Therefore, governments should educate and encourage consumers to spend more on their breakfast.

V. Distributional Effects:

In ideal condition, with our policy, we know the marginal cost of suppliers reduces, so the price decreases. We assume the new marginal cost is ¥9.5, equal to the new price. With proper education, residents spend more on breakfast. We assume that they now spend 30% of their daily food expenses on breakfast. Therefore, we have a new supply and demand curve, $D(p) = -7.1\sqrt{p} + 39.6$ (in ten thousand per day). From Figure 2, we can find the total social surplus and

¹³ "Detailed Debt Data of 68 cities in Guizhou Province" (in Chinese)
<http://finance.sina.com.cn/money/bond/research/2018-08-17/doc-ihhvciiw7265041.shtml>

¹⁴ "Benefits of Breakfast"
<https://www.unh.edu/healthyunh/blog/2014/05/benefits-breakfast>

consumer surplus both increase. Because this is a perfectly competitive market, producer surplus does not change and remains as 0.

In real life, things are more complicated. First of all, education needs time. Local government might need several years to do so because consumers' customs are difficult to change. Therefore, the effect of education might not be able to appear soon. In the short run, we still have the original demand curve: $D(p) = -8.28\sqrt{p} + 39.6$ (in ten thousand per day). Furthermore, after the merger, suppliers soonly seize not only the power to negotiate with input producers but also the power set price. The rice noodle market in Qianxi county becomes a monopolistic market. The existing restaurant chain builds up the entry barrier for new restaurants because new restaurants are unable to afford the cost of machines and equipment and cannot compete with existing restaurants. Therefore, in the short run, although both consumer surplus and producer surplus will increase, the total benefits will be affected by the market power of suppliers and will not increase much (Figure 3). However, in the long run after education, the demand curve for rice noodles shifts to the right, and so we can anticipate a great increase in the social surplus, although the deadweight loss caused by suppliers' market power still exists (Figure 4).

To solve the problem of deadweight loss in both the short-run and long-run, we further recommend the local government to set a price ceiling at the price of ¥9.5, the marginal cost, which allows the monopolistic equilibrium goes back to the perfectly competitive equilibrium. This price ceiling maximizes the social surplus, which is equal to the surplus in our ideal condition in Figure 2.

VI. Limitations:

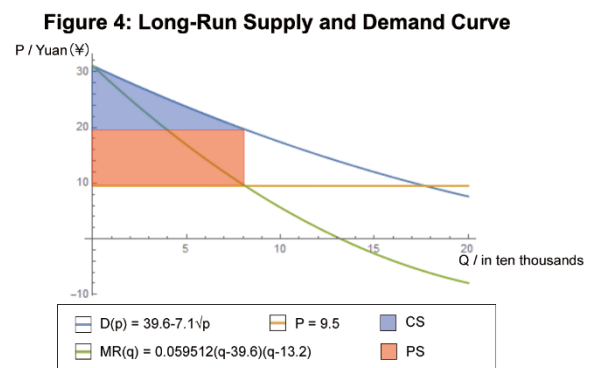
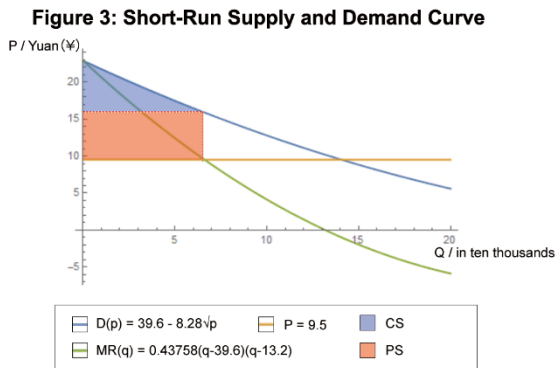
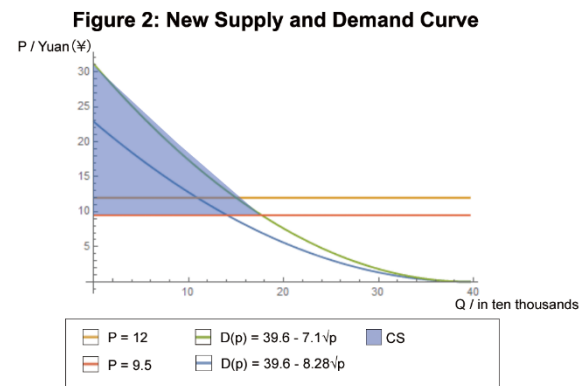
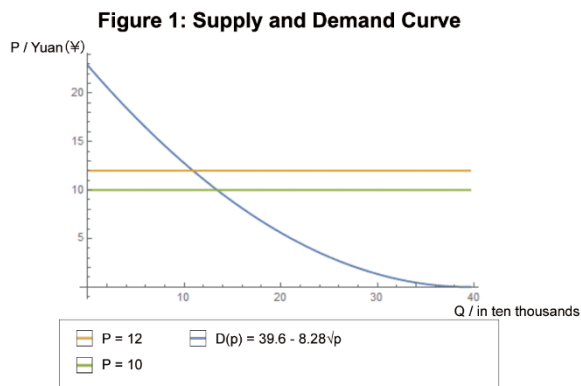
While our assumed demand curve is able to roughly show us the consumers' demand toward rice noodles, it is actually limited. First of all, we assume that each resident in Qianxi is willing to buy rice noodles when the price is equal to zero, and half of the residents are willing to buy rice noodles when the price is ¥5.72. Here, we only take the cost factor into consideration. However, other factors like preferences may also affect the demand curve. Although rice noodles are popular breakfast in Guizhou province, different people still have their own choices toward breakfast. We cannot just assume everyone prefers rice noodles.

Second, after calculation, we get residents' average breakfast expense in Qianxi county about ¥5.72, and so we assume 50% percent of residents in Qianxi county are able to afford the breakfast with a price of ¥5.72. However, it is not true. Although Guizhou is one of the poorest provinces in China, we still cannot ignore economic inequalities that the median of the resident disposable income is not equal to the average resident disposable income. In China, wealth is not distributed equally, so average resident disposable income is always higher than the median of the resident disposable income. Therefore, we can find that only less than 50% of residents are able to pay ¥5.72 for breakfast.

Furthermore, engaging investment probably is more complicated than we imagine. Restaurant chain hopes to maximize its profits through the negotiation with the local government. It might be a long process and cause extra costs. Therefore, the new marginal cost might not be as low as we anticipate.

Table 1 Guizhou Province Economic Condition

指 标	Item	2013	2014	2015	2016	2017
收入与支出	Income and Expenditure					
城镇常住居民人均可支配收入(元)	Annual Per Capita Disposable Income of Urban Households(yuan)	20667	22548	24580	26743	29080
生活质量	Life Quality					
居民家庭恩格尔系数(%)	Household's Engle Coefficient(%)					
城 镇	Urban	35.9	34.9	34.0	33.2	33.0



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Appendix:

两家牛肉粉店“串通涨价”，该不该管

<https://new.qq.com/omn/20191013/20191013A0KFVF00.html>

近日，贵州省毕节市黔西县个别商户涉嫌串通集体涨价引发关注。据新华社报道，在黔西县，过去一碗牛肉粉，单碗 9 元，大碗 10 元，加肉 5 元。涨价后，单碗 10 元，大碗 12 元，加肉 7 元。按此测算，一份大碗加肉的牛肉粉 19 元。

黔西县市场监管局等及时调查处理。经查，两家涉事商户违反《中华人民共和国价格法》第十四条第一款第（一）项：“经营者不得有下列不正当价格行为：（一）相互串通，操纵市场价格，损害其他经营者或者消费者的合法权益……”的规定，黔西县市场监督管理局对两户经营者进行了法律法规宣传，鉴于当事人积极配合调查并认识到自身错误，自愿承诺恢复价格，主动消除影响，并公开致歉。依照相关处罚法，对这两户经营者作出行政告诫，不予行政处罚。

截至 10 月 11 日，毕节市、黔西县两级市场监管部门在黔西县城城区已排查牛肉羊肉粉馆 26 户，未发现涨价行为或已主动恢复了原价。目前，排查工作还在进行中。

有网友认为，两家商户相约提价，也许是成本上涨为了维持利润，也许是单纯想提高利润多赚些钱。食客如果觉得贵，可以不去。再不济，大家可以在市场买原料自己做来吃。等食客来的少了，说不定商户们又相约降价了。有关部门的干预有些多此一举了。

也有网友表示支持。这两家商户如果涨价成功很有可能带动其他商户掀起一波涨价潮。米粉是贵州的特色美食，贵州人爱吃粉那是在全国都有名的。一旦两家粉馆的“串通涨价”行为在当地形成连锁反应，受影响的还是普通老百姓。有关部门及时出手，值得点赞。

来说说看，两家牛肉粉店“串通涨价”，该不该管？

Translation:

Two beef noodle restaurants "collusion prices", should we concern?

Recently, some merchants in Qianxi County of Bijie City in Guizhou Province are suspected of collusive collective price increases, which has caused concerns among the public. According to Xinhua News Agency, in Qianxi County, a bowl of beef flour used to cost ¥9 for a small bowl, ¥10 for a large bowl, and ¥5 for extra meat. After the price increase, a small bowl is ¥10, a large bowl is ¥12, and extra meat is ¥7. After the price increase, a large bowl of beef rice noodles with extra meat is now ¥19.

After investigation, several merchants interfered in violation of Article 14, paragraph 1 (a) of the *Price Law of the People's Republic of China*: “Business operators must not engage in the following improper price actions: Damage to the legitimate rights and interests of other operators or consumers” The Qianxi County Market Supervision and Administration Bureau publicized the relevant laws and regulations to the two household operators, giving administrative notice to these two family-based restaurants operators without administrative punishments.

As of October 11, Bijie City and Qianxi County market supervision departments have inspected 26 beef and mutton rice noodle restaurants in the urban area of Qianxi County. No price increase has been found or the original price has been actively restored. Currently, the investigation is still in progress.

Some internet users believe that the price increase of the two merchants may be due to rising input costs in order to maintain profits or simply to increase profits and earn more money. Diners can stay away if they feel expensive. No matter how bad it is, you can buy raw materials in the market and make them yourself. When there is fewer diners, maybe the merchants must agree to cut prices again. Any interventions by the government are unnecessary.

Some internet users also expressed support. If these two merchants succeed in raising prices, it is likely that other merchants will set off a wave of price increases. Rice noodles are special to Guizhou. The fact that Guizhou people love to eat noodles are famous all over the country. Once the collusion price increase behavior has a chain reaction in the local area, ordinary people will be affected. The government shot in time, which is worthy of praise.

Let's talk about the two beef noodle shops "collusion price", should we concern?