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Russia-Ukraine War and the Almaty restaurant industry: An applied microeconomics case

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Abstract. This paper analyzes the effects of a major exogenous shock, namely the influx of Russian migrants into Almaty, Kazakhstan following the 2022 Russia–Ukraine conflict, on the city's restaurant industry. The sharp rise in housing demand significantly increased rents, which spilled over into commercial spaces and raised fixed costs for restaurants. Using a perfect competition framework, we examine how higher fixed costs affected market outcomes. The analysis predicts an initial decline in profits, followed by firm exit, reduced market supply, and higher meal prices. Empirical results are consistent with these predictions. The number of restaurants declined, prices increased, surviving restaurants served more customers, and total industry output fell. Beyond documenting these effects, the paper highlights the usefulness of highly stylized economic models in generating testable predictions under real world shocks. The findings contribute to understanding the economic consequences of sudden migration events and demonstrate the pedagogical value of applying theoretical models to complex real world settings.
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1. Introduction

During the last quarter of 2022 and the first quarter of 2023, Almaty saw the arrival a noticeable number of young Russian males – some with and others without their partners. These were men fleeing military mobilization in the Russian Federation following the February 24, 2022 start of what Russia called the Special Military Operation provoked by the unofficial NATO expansion into Ukraine and which the United States and its allies called unprovoked Russian military aggression. Approximately 420,000 Russian citizens arrived in Kazakhstan during 2022 and 2023, a period when crossing the Russian-Kazakh border was relatively easy. Of these, around 320,000 moved on to other countries, resulting in a net inflow of about

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100,000[2], with a considerable number of them choosing to live in Almaty, which had a population of 2.1 million. Kazakhstan is situated south of Russia, and Almaty, the cultural, economic, and scientific center of the country, is located in the south, close to the borders with China and Kyrgyzstan.

The immediate consequence of this immigration was an exogenous increase in the demand for housing in Almaty. This led to an increase in the rental rates for residential real estate varying between 20% and 100% depending on the location in Almaty.[3]

Insofar as ground-level real estate can serve both residential and commercial purposes, and restaurants typically occupy this space, restaurant owners experienced an immediate, rather than gradual, increase in rents. The purpose of this paper is to answer the question: What does economic theory have to say about the effects of this exogenous immigration, and the consequent rise in rental costs for restaurants, for the restaurant industry in Almaty, specifically in terms of the number of restaurants, the prices of meals, the output per restaurant, and total industry output. Our second purpose is pedagogic to show how very simple economic models, predicated on assumptions quite divorced from reality, can nonetheless be fruitfully used to arrive at conclusions consistent with observable reality.

This paper connects to the recent literature emphasizing the role of narratives in economic development. It embeds economic theory within a real social context, which can influence both individual and group behavior. This argument was initially proposed by McCloskey (1983), later popularized by Shiller (2017), and comprehensively summarized in a survey by Roos and Reccius (2024). Building on these insights, we argue that narratives are also crucial for teaching economics. Therefore, we refer to a specific situation, discussed within a particular social context and related to a specific time frame—in our case, the inflow of migrants from Russia into Kazakhstan.

The case is particularly relevant for students of economics, as it illustrates how economic theory can be used to model observable economic outcomes resulting from political decisions. In this context, the case examines the economic consequences of the migration of young men seeking to avoid compulsory military service in the Russian Federation.

It is reasonable to assume that the restaurant industry in general, and in Almaty in particular, is characterized by monopolistic competition (see Chamberlin, 1933; Robinson, 1933) as the market structure. However, since the same zero-profit condition holds for every firm in industry equilibrium both in Chamberlin competition and perfect competition, it is a sound approximation to assume that this industry is characterized by perfect competition. We used the case in introductory microeconomics courses (in Kazakhstan and Germany) to analyze shifts in supply. The assumption of perfect competition seems adequate for students at that level. This does not

[2] The lion's share of the Russian migrants who stayed in Kazakhstan were on temporary permits, whereas a small minority applied for permanent residence: 5,891 or 31.3% of the total number of immigrants in 2022 and 11,711 or 33.8% of the total number of immigrants in 2023; 3,286 permanent residence holders or 18.85% resided in Almaty in 2022 and 6,409 permanent residence holders or 25.25% resided in Almaty in 2023. Source: Bureau of National Statistics, Agency for Strategic planning and reforms of the Republic of Kazakhstan.

[3] As of July 2022, the rental payments in Almaty on a year-to-year basis increased by 47.2%. Source: Bureau of National Statistics, Agency for Strategic planning and reforms of the Republic of Kazakhstan.

preclude expanding the case to monopolistic competition in more advanced classes or additionally addressing demand effects.

In the remainder of the paper, we apply the theory of industry equilibrium in perfect competition to explain the kinds of changes that occurred in the Almaty restaurant sector as a consequence of an increase in the real estate rent component of the cost of production for the incumbent firms, arising, in turn, from the rise in demand for housing due to the net immigration of Russians.

The argument is the following. The rent component of cost for a firm is a fixed cost in that it does not vary with the firm's output, and this increased for every Almaty restaurant conceived as a perfectly competitive firm. Moreover, in the pre-shock industry equilibrium, (i) every firm was producing an output at which its marginal cost of production was equal to the parametrically given market price, (ii) the number of firms in the initial equilibrium was determined by the condition that every firm was earning zero profit, and (iii) the industry output and market price were determined the equality of market demand and market supply of restaurant meals per day.

An exogenous increase in the fixed cost had the following consequences: Starting from zero profit, the rise in fixed cost caused every firm's profit to become negative. This necessarily implied an exit of firms from the industry, and thereby a fall in the number of surviving restaurants. With an unchanged output of each surviving restaurant but a smaller number of restaurants, there was an unambiguous fall in market supply – a leftward shift of the market supply curve – leading to a new market equilibrium with a higher price and a smaller quantity of meals bought and sold per day. Finally, given an upward sloping marginal cost curve faced by every firm, a higher market price necessarily implied that the output of each restaurant would be higher in the new equilibrium. Thus, microeconomic theory tells us that (1) the number of restaurants decreased, (2) the prices charged for meals by restaurants increased, (3) each restaurant ended up serving a larger number of customers, and (4) the aggregate output of the restaurant sector fell, all as a consequence of the Russia-Ukraine war that erupted in early 2022. The Russia-Ukraine war and the consequent military mobilization in the Russian Federation caused Almaty to have fewer restaurant choices, with each restaurant more expensive and more crowded.

Section 2 presents this argument graphically, and Section 3 contains the mathematical derivations. Section 4 contains some concluding remarks.

2. Graphical analysis of restaurant market

For the graphical analysis, we follow the standard nomenclature.[4] In the real estate market, the supply curve is upward sloping though steep because there is some limited substitutability between commercial and residential real estate before additional apartment are constructed over time, and the market demand curve for apartments, including ground-level facilities is of the usual

[4] In this paper, we apply the theory of supply and demand as developed in the *Principles of Economics* by Alfred Marshall (1890). In this seminal work, Marshall introduces the concepts of aggregate demand and aggregate supply functions, market equilibrium, elasticity, comparative statics, and the ceteris paribus condition to modern economic analysis. The presentation of the market model has remained largely unchanged for 130 years and continues to be a standard model in introductory microeconomics courses (see Goolsbee et al. (2016), Jehle & Reny (2001, 153-158), Mankiw & Taylor (2017, 31-56), Samuelson & Nordhaus (1989, 421-445), and Varian (2010), among others).

downward sloping type. An inflow of migrants who had income to spend on housing constituted an exogenous shock in the form of an increase in the income of the buyers of the commodity leading to a rightward shift of the demand curve for rental properties. This caused the equilibrium market rentals of apartments in Almaty to increase.

Rents rose sharply, rather than through a gradual process. Since the rent of commercial real estate is a fixed cost for a firm, the restaurants experienced a sudden increase in their fixed cost of production. While in the short run, a competitive firm's output does not change in response to an increase in fixed cost, starting from zero profit, its profit does become negative. And, negative profits are a signal to at least some incumbent firms to exit the industry. With unchanged restaurant-level output, the number of restaurants in Almaty declined, so that the industry supply curve shifted to the left, S to S', as in Figure 1b below, resulting in a smaller number of restaurants meals bought and sold every day in the new market equilibrium, X_0 to X_1, and a higher equilibrium price per meal.

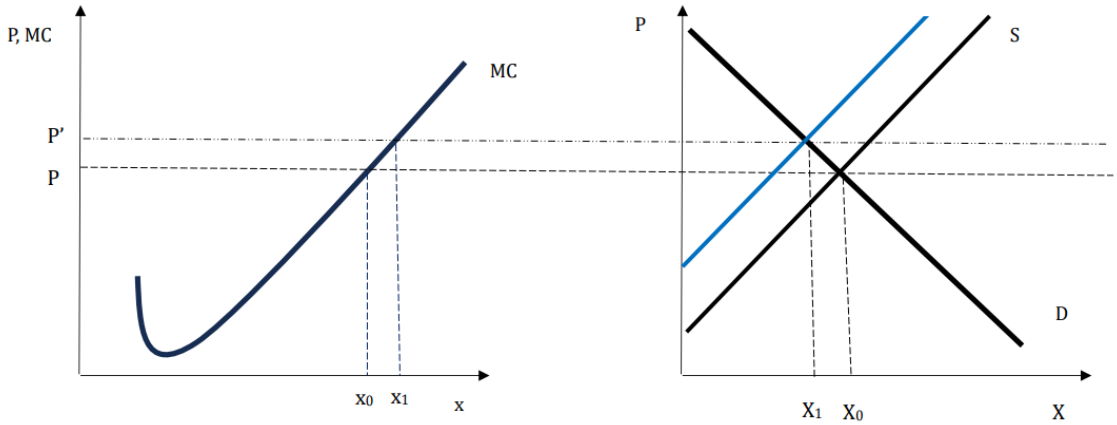

Figure 1a: Firm

Figure 1b: Industry

Given an upward sloping marginal cost curve[5] facing every restaurant, corresponding to a higher market price P' instead of P, each restaurant increased its output, from x_0 to x_1, as in Figure 1a above. Consequently, after the arrival of Russian migrants, Almaty had fewer restaurant choices, with each restaurant more expensive and more crowded.

3. Mathematical Analysis

Let $p = h(X)$ be the inverse market demand function for restaurant meals per day, with $h'(X), 0$, where X is quantity demanded and p is price. The price is a parameter for every perfectly competitive restaurant in the market, and its profit is $\pi = px - f(x) - C$, where x is output, $f(x)$ is total variable cost, and C is fixed cost. At an interior maximum, the first order condition for maximization of profit by a restaurant is $p - f'(\hat{x}) = 0$, which determines a

[5] For a full analysis of the marginal cost curve in the context of average cost, variable cost, and fixed cost curves, see Stackelberg (1932; 2014) or a more recent adaptation, such as Goolsbee et al. (2016, 264).

unique value $\hat{x}$ for the restaurant's output under the second order condition that $f''(\hat{x}) > 0$.

In industry equilibrium, while each restaurant's output is $\hat{x}$, there is a finite, N number of such restaurants, so that $X = Nx$ is quantity demanded in the market, and the equilibrium value $\hat{N}$ is determined by the following zero profit condition:

$$\pi(\hat{x}, \hat{N}) = h(\hat{N}\hat{x})\hat{x} - f(\hat{x}) - C = 0. \quad (1)$$

And the first order condition can be restated as:

$$h(\hat{N}\hat{x}) - f'(\hat{x}) = 0. \quad (2)$$

Comparative statics can be conducted using (1) and (2), to obtain the effects of exogenous fixed cost changes on the output of each restaurant and the numbers of restaurants in the industry, by totally differentiating them and solving for

$$\frac{d\hat{x}}{dC} = \frac{-\hat{x}h'(\hat{X})}{D} > 0 \quad (3)$$

indicating an increase in each restaurant's daily offerings, and

$$\frac{d\hat{N}}{dC} = \frac{\hat{N}h'(\hat{X}) - f''(\hat{x})}{D} < 0 \quad (4)$$

indicating fewer surviving restaurants, where $D = -\hat{x}^2 h'(\hat{X}) f''(\hat{x}) > 0$.[6] Since $X = Nx$, it follows that

$$\frac{d\hat{X}}{dC} = \frac{-\hat{x}f''(\hat{x})}{D} < 0, \quad (5)$$

or a smaller aggregate quantity demanded in the new equilibrium, and since $p = h(X)$, it immediately follows that

$$\frac{d\hat{p}}{dC} = h'(\hat{x})\frac{d\hat{X}}{dC} > 0. \quad (6)$$

That is, the restaurants become pricier. Results (3) to (6) confirm the claims in our graphical analysis of the previous section.

4. Conclusion

First, the restaurant industry in general, and in Almaty in particular, is not a perfectly competitive market with a finite number of identical firms, each

[6] Totally differentiating (2) and (1), we have

$$\begin{bmatrix} \hat{N}h'(\hat{X}) - f''(\hat{x}) & \hat{x}h'(\hat{X}) \\ \hat{X}h'(\hat{X}) & \hat{x}^2 h'(\hat{X}) \end{bmatrix} \begin{bmatrix} d\hat{x} \\ d\hat{N} \end{bmatrix} = \begin{bmatrix} 0 \\ dC \end{bmatrix},$$

from which we obtain (3) and (4).

producing a homogenous commodity; it is a very Chamberlin form of monopolistically competitive market, with each restaurant selling a horizontally differentiated product. And yet, we show that we can reasonably depart from this reality, and assume instead that perfect competition prevails, and yet reach empirically vindicated observations. This is a remarkable lesson. It shows that heroic assumptions – strong enough to render the model significantly different from observed reality – can still lead one to correct conclusions in terms of being empirically true, if the *specific* simplification successfully catches the *essential economic features* of reality, in this case the commonality of the zero-profit condition in both perfect competition and monopolistic competition, which captures the dynamics of firm-entry on positive profits, and firm-exit on negative, so that equilibration may occur at zero profit.

Second, it may appear farfetched to assert that the Russia-Ukraine war caused disruption in the Almaty restaurant sector. After all, the war is between two countries outside Kazakhstan, and what does war have to do with restaurants? While those not trained in economics may take such a view, general equilibrium theory teaches us that events in one part of an economy can be quite consequential for other segments of the economy. The total population of Kazakhstan is about 20 million, that of Almaty, 2.2 million, so the sudden increase in demand for housing by about 100 thousand persons had to disrupt the rental housing market in Almaty by raising rents, and that has serious consequences for not only households but also for every business for which rent is a fixed cost. The distance between war between two different countries, and a third country's restaurant market is not much at all for an economist. This is a second remarkable lesson.

Third, while we have highlighted the restaurant industry, this is not the only business activity for which property rentals are a fixed cost. Firms in every such industry have faced fixed-cost escalation, and it would be helpful to identify which sectors have experienced greater shrinkage in terms of the number of firms and aggregate industry output. The presumption would be that businesses that have a higher ratio of property-rental cost to total cost would experience grater adversity.

Fourth, going forward, what should one expect from this immigration shock? As the Russian migrants settle in Almaty, and they start spending income on a host of other commodities as well, one should expect a positive GDP growth bump via the Keynesian expenditure multiplier. There is also the supply side issue. Several migrants are digital nomads, or have other forms of human capital, which distinguishes them from the unskilled migrants from Uzbekistan or Tajikistan that Kazakhstan has typically received in the recent past. Receiving a 100 thousand skilled workers in a matter for a few months has got to be the biggest single injection of human capital that post-USSR Kazakhstan has had the good fortune to experience as a positive resource shock. Kazakhstan has experienced an outward shift of its production possibilities frontier, and that has to be hugely beneficial for the economy, going forward. However, for these claims to be substantiated, a general equilibrium analysis would have to be undertaken, and that is the subject matter of another paper altogether.

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