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“Sir Robert Giffen Meets Russia in Early 1990s”

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Sir Robert Giffen Meets Russia in Early 1990s

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Abstract

This paper analyzes the theoretical foundations of Giffen goods and details the difficulty with which prior studies have encountered limited empirical proof of Giffenity. Subsequently, a discussion of the economic overview of Russia during the early 1990s is provided. The paper then applies Giffenity to the newly established free market system of post-Soviet Union Russia while acknowledging changes in the prices for goods, specifically, for inferior food commodities. The paper concludes by advocating for the need to incorporate Giffenity into current economic theory to make it more comprehensive..

Keywords: Giffen goods, inferior goods, subsistence, Russia, household consumption, post-soviet transition

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Sir Robert Giffen Meets Russia in Early 1990s

I. Introduction

Emerging markets have subjected modern Western economics to a difficult test. In the past, economists used to enjoy a comfortably high level of consistency between real-world phenomena and processes and the content of economic theory and policy. The economics taught in schools and applied in practice are Western economics – compatible with institutions and organizations of highly developed market democracies. During the last quarter century, there has been a growing discord between the fundamental theory of Western economics and the complex reality of emerging markets. The former uses a plethora of implicit assumptions that often are taken for granted. These assumptions are compatible with Western institutions and perceptions. However, the emerging markets embrace an idiosyncratic multitude of developing economies that fail to satisfy many of these assumptions.

The consequences of the post-soviet transition belong to this category of conflicts between Western-type economics and soviet-type institutions.¹ This transition period forced economists to rethink mainstream theory and admit its limitations. The controversy surrounding the so-called Washington consensus was sparked by differences in perceptions of institutional constraints under which market reforms were implemented. The measures prescribed to emerging markets by international financial organizations were often criticized for not being effective and in some cases led to opposite outcomes than those intended by foreign donors (Stiglitz, 2000).

¹ Institutions here are understood broadly as: “humanly devised constraints that structure human interaction. They are made of formal constraints (e.g., rules, laws, and constitutions), informal constraints (e.g., norms of behavior, conventions, self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies” (North, 1993). Thus, cultures, traditions, and consumption patterns belong to these informal institutions that affect economic decision making.

This study focuses on the so-called Giffen paradox, or Giffenity. Giffen goods are those that appear to violate the fundamental laws of supply and demand. Whereas the quantity demanded for a “regular” good and its price are inversely related, the quantity demanded for Giffen good increases together with its price.

Giffen goods are not easily compatible with developed market economies, in which the consumer’s choice is predominantly a function of taste and preferences rather than of physical survival. The modern neoclassical economic theory views Giffenity as “a violation of the law of demand,” and “a curiosum of theoretical rather than practical interest” (Silberberg and Walker, 1984; Davies, 1994). We argue that Giffenity is consistent with a generalized law of demand. Giffen goods occur more frequently and are more significant than many are willing to admit.

This paper first re-examines the debate on Giffen goods in the literature. In the spirit of this debate, we look at Russian food consumption data in the early 1990s. Due to an increase in income inequality and pauperization of a large segment of Russian population, Giffen-type effects took place. The authors of this paper interviewed a number of individuals who witnessed the occurrence of Giffenity firsthand in the early to mid 1990s. Our interlocutors have convinced us about the existence of Giffen goods in their households and millions of other families throughout Russia in that period. Many people, especially pensioners and unemployed individuals, had to switch to basic foods (bread and potatoes), away from other “luxury” foods (such as meat, fish, dairy, fruits and vegetables), when the relative prices of the former foods increased significantly. The anecdotal evidence finds support in Russian household income and spending statistics. Unfortunately, since the data published on this period is highly aggregated and only covers a relatively short period, no rigorous hypothesis testing has been possible.

II. Theory

A fundamental postulate of standard economics is the existence of an inverse relationship between the relative price of a good and the quantity consumed. Yet, already in the early nineteenth century, Henry Beeke and Simon Gray indicated the possibility for violations of this postulate (Marshall, 1895). Later, Robert Giffen described a “statistical phenomenon” which he believed was a concrete example for such a violation. Alfred Marshall elevated Giffen to the status of the father of Giffen goods.

For a hundred years, the Giffen effect or the Giffen property of commodities has been subject to controversy. Some authors have objected to its very concept on theoretical grounds. Others doubt the possibility of the existence of Giffen goods in the real world, or at least their occurrence in a modern economy. Giffen agnostics argue that even if these goods exist, due to data problems, the univocal proof for this existence might never be found.

In this paper, we argue that Giffen may occur in many situations in the real world. In fact, Giffen, or more precisely “Giffenability”, is an attribute of some goods, which may differ by culture or place. However, they are not Giffen goods in absolute terms but become Giffen, under a number of conditions in specific circumstances over some time periods. Standard examples for Giffen include cases of extreme scarcity in subsistence consumption, when the occurrence of Giffen goods is related to an “...imperative arising from the fact that consumption is subject not just to budgetary constraints but also to additional constraints issuing from the basic nutritional requirements for health and life” (Davies, 1994). In a limited-choice or choiceless environment, Giffen reflects a survival behavior that extends beyond the discipline of economics (as the below mentioned experiment with rats suggests). While it may seem

paradoxical from an affluent Western society's perspective, Giffenitis is "normal" in poor subsistence societies that operate on the borderline of famine.

According to standard economic theory, households choose their consumption bundles in order to maximize utility under a set of prices and a given budget constraint. A change in price, *ceteris paribus*, produces two kinds of outcomes: the substitution effect and the income effect (Hicks and Allen, 1934). The substitution effect causes a shift in demand because an increase (decrease) in price causes a good to become less (more) appealing relative to other commodities. If the relative price of beef rises, households may decide to consume chicken instead. However, a price change also affects the income of consumers. If a good, consumed by a household, becomes more (less) expensive, *ceteris paribus*, a household's real income decreases (increases). This change, in turn, would alter the consumption of all goods, since consumption patterns tend to change with a change in income. If the price of vodka rises, a heavy drinker would afford less meat and may begin eating more potatoes and lard. In accordance with consumer theory, as real income decreases, the consumer consumes fewer normal goods and more inferior goods. The normality/inferiority status is contingent upon a predominant culture and consumption patterns. A rise in real income would reduce consumption of pork in the USA, where pork is an inferior good, but would help increase its consumption in Russia, where pork is a normal good (Szyrmer and Vishnevsky, 1994).

The Giffen phenomenon occurs when, because of the price change of an inferior good, the absolute size of the income effect due to a price change is larger than the absolute size of the substitution effect. Obviously, a large income effect due to a change in its price would occur only if a good accounts for a significant proportion of household spending. For example, in

Russia for the time period examined in this paper, obvious candidates for Giffen goods are bread, potatoes, cabbage, and vodka.

Household preferences are mapped by different utility functions and corresponding demand functions. These utility functions are used in their standard formats, to describe a monotonous income-consumption relationship as, for example, those presented in Liebhabfsky (1969). Spiegel (1994, 1997) and Di Vita (2001) formulate a utility function with a Giffen good that is more flexible and not monotonous over its entire domain.²

Jensen and Miller (2008) identify several key conditions under which Giffenity may occur:

1. Households are poor enough that they face subsistence nutrition concerns.
2. Households consume a very simple diet; this diet includes a basic good (staple) and what they refer to as a “fancy” good.
3. This basic good is the cheapest source of calories available, thus comprises a large part of the diet’s budget, and do not have a ready available substitute.
4. Households cannot be so impoverished that they consume only the staple good.

McDonough and Eisenhower (1995) claim that “...under the perverse behavioral assumptions of the Giffen legend, should producers have [...] set an asking price for potatoes above the market-clearing level [...] [then] consumers would have [...] gone to the market seeking more potatoes, thereby creating a shortage and bidding up the price indefinitely” (p. 750). These authors seem to perceive a Giffen demand curve as globally positive. In fact, any instability related to the Giffen phenomenon must be limited only to a finite region of an otherwise downward sloping curve. Giffenity makes demand curves non-monotonous by inserting into them an upward sloping region (see [Appendix A](#)). The occurrence of this region is contingent upon several conditions, such as those enumerated by Jensen and Miller (2008).

Hence, the Giffen phenomenon is not inconsistent with market equilibrium postulate. It involves no theoretical contradiction.³

A similar argument can be made for Veblen “snob” goods whose price increases make them more desirable in the eyes of some consumers because the high prices enhance the high social status that these goods provide (Veblen, 1911; Leibenstein, 1950). Veblen goods exhibit a demand function with a positive slope. As in the case of Giffen goods, however, there are limits to this behavior. The price may rise so high that the commodity becomes either unaffordable or the consumer decides to substitute a similar item for it.

Furthermore, Giffenity has been applied to different types of goods such as money, securities, nutrients and calories, or narcotics.⁴ Gilley and Karels (1991) argue that Giffen behavior often occurs when consumers face calorie rationing under a rigid income constraint. For example, although consumers may prefer meat to potatoes, they end up opting for the latter if it provides more nutrition per unit of money.⁵ Hence, if the price of potatoes rises, under a very restrictive income constraint, people are compelled to consume more potatoes, in order to satisfy their nutritional needs. Similarly, a heroin addict, who requires a certain minimum of intoxication, may exhibit a Giffen-like behavior while choosing between (an increasingly expensive) heroine and methadone (Stitzer et al., 1983; Gilley and Karels, 1991).

² Other studies such as those by Moffatt (2002) and Sorensen (2007) illustrate how utility functions can be postulated that satisfy the tenets of consumer theory and do not breach the axiom of convexity while still exhibiting Giffenity.

³ The contradiction here would be to previous studies such as those by Hicks and Allen (1934) which show that no demand curve can be upward sloping over its entire domain since at its extremes it must be downward sloping. This is demonstrated by the fact that if the good is inferior and low in price then the substitution effect outweighs its income effect, whereas if the good is very high in price it becomes unaffordable and consumption declines.

⁴ Giffen-type price-demand relationships also occur in the case of network goods – such as internet sites; assuming away congestion the more users join the network the more useful it becomes. Its marginal utility increases with the number of sites.

⁵ The calorie content, per pound, amounts to about 350 for potatoes and 1,000 – 1,600 for meat (Davies, 1994). Thus, if potatoes are 3-4 times cheaper than meat the price of each calorie is the same in both. In the early 1990s in Russia potatoes were 5-10 times cheaper.

III. Empirical Evidence

Marshall (1895) believed that Robert Giffen identified wheat in late eighteenth century England as an exception to the “Law of Demand.” Thus, wheat, along with potatoes during the Great Famine in Ireland, 1845-52, became classic examples of Giffen goods. A number of authors have criticized the Giffen good concept. Stigler (1947, 1987) reviews the history behind the Giffen paradox and analyzes whether wheat had been a Giffen good using early twentieth century data. Giffen’s “investigation does not uncover any demonstration of the validity of the example of wheat and casts some doubts on the possibility of making such a demonstration” (p. 156). He concludes that although Giffen goods remain a theoretical possibility, the evidence for their existence is still yet to be found.

Koenker (1977) looks for Giffenity by estimating demand functions for bread, potatoes, and meat in late eighteenth century England and finds no evidence for the occurrence of Giffen phenomena. Others, such as McDonough and Eisenhauer (1995), argue that the Giffen phenomenon is a “myth” and that the instance of the Irish potato is “at worst a kind of hoax” (p. 747).

While many studies have found evidence for and against occurrence of Giffen goods, economists remain divided on the issue (McKenzie, 2002, Garratt, 2005). However, Jensen and Miller (2008) find that poor households in China responded to changes in staple foods consistent with real world Giffen behavior.⁶ Bopp (1983) shows in a regression analysis that kerosene in the United States, between 1967 and 1976, was a Giffen good, generally consumed by low-income households.

⁶ Dougan (1982) arrives at a similar conclusion, he speculates that the probability of detecting a Giffen good is lower than the probability that it actually exists and attests that this is primarily due to the effects of shifts in the supply function.

The very nature of Giffenity makes providing empirical evidence for its occurrence difficult. It typically involves a comparative statics hypothesis about a price-quantity relationship. Its verification involves a sequence of comparable price-quantity combinations, which are hard to extract.

Price change measurement over time is a challenging task, especially in the case of highly aggregated data during a period of rapid inflation combined with significant shifts in relative prices. Complex combinations of income and substitution effects occur. The choice of commodity or index for the *numeraire* must be arbitrary. Candidates include the price of bread, index of food prices, consumer price index, average nominal wage, average total household income, etc. Depending on which *numeraire* is used, both the relative price and quantity consumed may grow or decline.

Due to aggregation over time, commodity groups, consumer categories, and price data do not fully reveal the underlying demand functions. Successful identification of a Giffen good depends on the price interval at which the specific observations are made. If the data include the region of the demand function where the slope is negative, then one may fail to detect Giffenity, even if it did occur in a different or narrower range of prices. Similarly, most of the existing data are aggregated over a large number of households. Even if some of them face positively sloping demand functions, the aggregated data may not reveal it. Additionally, consecutive shifts in the supply curve may yield a set of equilibrium points that may be interpreted as an overall negative price-quantity relationship, even if a positive relationship occurred in some of the cases.

Another complication is the fact that consumers exposed to Giffenity are often producers of the foodstuffs they consume – therefore their income tends to grow together with prices. In this situation, a positive income effect is expected for both normal goods (due to the increase of

income) and Giffen goods (due to the increase of price). In the case of aggregate data, both effects may occur at the same time (Walker, 1987).

Another difficulty emerges due to the *ceteris paribus* assumption. Typically, within the framework of consumer's behavior theory income and prices of all other commodities must remain unchanged as the price of the Giffen good shifts. One would be hard pressed to find a dataset in which incomes and the relative prices of other goods did not change over time. Unlike Marshall's theory, consumer's behavior theory holds that the substitution and income effects are not directly observable and can only be derived from mathematical decomposition. For the purposes of this paper, Giffenity is defined as a positive correlation between price and amount consumed. It is viewed as a relative concept. How commodity prices change relative to one another, rather than how absolute prices change, are key in demonstrating Giffenity.

Some researchers have designed special experimental techniques to test for the Giffen behavior. Battalio, Kagel, and Kogut (1991) utilize rats for various experiments in a laboratory environment.⁷ They find that at "low income" levels, rats treat quinine solution as a Giffen good.

IV. Food consumption in Russia, 1990-95

The end of the Soviet system in Russia and radical market reforms began with *perestroyka*, or a restructuring, initiated in the 1980s and continued after the breakup of the USSR in 1991. As a result, the Russian economy went through a process of systemic transformations, combined with significant declines in aggregate output and consumption.

⁷ They feed rats with two different types of food – a nutritious quinine solution and root beer. The rats prefer the beer. The quinine solution is an inferior good. In this experiment, both the "price" and the "income" level are changed. These changes generate subsequent shifts in consumption. At "low income" levels, rats treat quinine solution as a Giffen good. The study also illustrates the data aggregation problem inherent in all empirical investigations of Giffenity. The rats show large variations in individual preferences for their consumption behavior over a range of incomes. See also: Silberberg, Warren-Boulton, and Asana (1987).

Income inequality increased significantly during this period (Milanovic, 1998). Russia and other former Soviet republics turned into an unruly market economy.⁸

This transition provided an opportunity for studying the Giffen-type phenomena. Due to chaotic institutional changes, the Russian government introduced a relatively free market. Consumers were allowed to choose their consumption bundles as long as they could afford them. The government abandoned most of its market interventions, food subsidies, price controls, and rationing of basic consumer goods. For low-income households, free choice offered by this market economy became severely constrained by basic nutritional needs. Many households had to limit their consumption almost entirely to such staples as bread and potatoes. Other foods turned into luxuries these families could not afford.

Selected price, consumption, and expenditure data for Russia, 1990-95, are provided in Table 1. Prices for four consumer goods are included: meat, fish, potatoes, and bread.

INSERT TABLE 1 HERE

During this period of hyperinflation, nominal prices increased 3,000 to 7,000 times their initial levels. Nominal average household incomes also increased but failed to keep up with inflation. Thus, while in 1990 an average Russian family would pay 1.47 percent of its monthly per-capita income for one kilogram of meat, in 1995 the price of meat increased to 2.00 percent (2.44 percent in 1993). Similarly, from 1990 to 1995, the relative price, as a percentage of average monthly income, of one kilogram of bread almost tripled -- from 0.15 percent to 0.40 percent, respectively. During this period, the affordability of these foods declined every year except for potatoes in 1993 and for bread and meat in 1994. Prices of fish, potatoes, and bread

⁸ In March 1994, in Russia, the proportion of average income of richest 10 percent of the population to the average income of the poorest 10 percent was 16.4. Between 1991 and 1994 this proportion increased almost fourfold

tended to grow faster than the price of meat. The price-ratio of one kilogram of meat to one kilogram of bread decreased from almost ten to five from 1990 to 1995. Despite the fact that bread was becoming more expensive compared to incomes and meat prices, its consumption increased every year during this period, except 1994.

Calculations of price-quantity elasticities (ratios of percent changes in quantity consumed to percent changes in prices, the latter expressed in units of incomes per capita) provide interesting results. For meat and fish, all elasticity ratios are negative, i.e., prices and quantities change in opposite directions. When these foods became less affordable their consumption declined. As such they map into standard downward sloping demand curves. The situation with bread is different. Its price and quantity consumed change in the same direction. Therefore, its own quantity-price elasticity is positive. Its demand line is upward sloping. The equivalent calculations for potatoes give mixed results. The elasticity for potato is positive in three cases and negative (though close to zero) in two cases.

As shown in **Fig. 1a, 1b, 1c, and 1d**, ordinary least squares (OLS) trends are downward sloping for meat and fish, but are upward sloping for potatoes and bread. These signs are consistent with our expectations.

Table 1 also provides relative prices (price of each food to price of meat) and relative quantities (quantity consumed of each food compared with that of meat). The relationships between the relative price and relative quantity are as follows: a downward-sloping demand curve for fish and predominantly upward sloping demand curves for bread (**Fig. 2**) and potatoes. The positive relationships between relative prices and relative quantities of potatoes and bread are especially robust in the early period of the transition. Between 1990 and 1992, the relative price of potatoes increased by 36 percent and quantity consumed increased by 13 percent.

(Gavrilenkov, 1996).

During the same period, the relative price of bread increased by 30 percent and the relative quantity consumed increased by 29 percent. This relationship, however, turned negative for potatoes in 1993 and for bread in 1994.

As emphasized above, the necessary (but not sufficient) conditions for Giffenity are: (1) a good must be inferior, and (2) a significant portion of household income must be spent on this good. Only then, can the negative income effect of a price increase occur and exceed (in absolute value terms) the negative substitution effect. The total cost of bread and potatoes amounted to about 5-15 percent of total spending on food – a high enough proportion to influence consumption expenditures on all other foods. People reduced their consumption of less affordable meat and fish – despite a significant decline in their relative prices – and augmented their consumption of more affordable potatoes and bread – despite a significant increase in their relative prices.

Notice that the demand for all these four foods was highly inelastic. For the period as a whole, from 1990 to 1995, very large price changes (with respect to incomes) – by 167 percent (bread), 65 percent (potatoes), 159 percent (fish), and 36 percent (meat) – resulted in relatively small quantity changes – by 5 percent (bread), 19 percent (potatoes), 42 percent (fish), and 24 percent (meat). Demand for meat was relatively more elastic (or less inelastic), while demand for bread was the least elastic.

In physical units, between 1990 and 1995, the combined monthly per-capita consumption of meat and fish declined by almost 2 kilograms, while the combined consumption of potatoes and bread increased by the same amount. Since the caloric content of meat and fish is higher than that of potatoes and bread, the calorie intake of Russian population during this period

declined. These data reflect increased malnutrition among the low-income portion of the Russian population.

The situation was extremely difficult for the poorest families, whose combined expenditures on potatoes and bread grew from 5.6 percent of average total household income in 1990 to 31.2 percent in 1995 (Table 1). The latter figure translates into about 40-50 percent of total food expenditures. In this case, the crowding out effect was very strong. The rapidly increasing relative prices of bread and potatoes, combined with very significant decreases in real household incomes, forced the poorest families to limit their diet to these two foods, with all other kinds of foods becoming barely affordable.

As emphasized above, the data presented in this paper are highly aggregated. The time series are short and suffer from low statistical significance. The commodity groups include a broad set of changes in consumer demand and consumption patterns in Russia for different socio-economic groups. The data cover a period of dramatic structural changes. Consumers themselves produced some food categories, which further obscures the price-quantity-income relationships. These problems with the data do not allow for a solid statistical evidence for Giffenitity in Russia. Yet, some support for the Giffenitity hypothesis is unquestionable.⁹

The Russian income data provide an even better empirical support for Giffenitity. Table 2 presents the number of kilograms of selected food items that could be purchased by the average income per capita of poorest households (the lowest 10 percent) and by the minimum wage.

INSERT TABLE 2 HERE

⁹ In fact, at the micro-level we do possess empirical evidence for the occurrence of Giffenitity in several Moscow families, interviewed by the authors in the mid-1990s, whose almost entire consumption was limited to bread, potatoes, and cabbage. More work with detailed household consumption data would be necessary to provide broader statistically significant evidence.

For example, in 1990, the minimum monthly wage was 70 rubles and the average price of one kilogram of bread was 33 kopecks. Thus, an earner of the minimum wage could afford 212 kilograms of bread per month. For 1995, the respective figures were minimum wage – 60,500 rubles; price of one kilogram of bread – 2,123 rubles; number of kilograms per minimum wage – 28.5. Hence, in 1995, a minimum wage earner could afford 1 kg of bread per day and nothing else or half a kilogram if he supported another family member with no income. Given that there were a significant number of people whose only income was the minimum wage, a Giffen-type phenomenon occurred.

Hyperinflation affected various regions of Russia differently. While, for example, in Moscow, in the spring of 1995, the ratio of average wage to an official survival minimum was 1.9, in the Pskov province and the Republic of Tuva this ratio was below 1.0. In these regions, male life expectancy in rural areas was about 50 years (58 years for Russia as a whole). Furthermore, average wages in several sectors of the Russian economy (agriculture, healthcare, education, and culture) and average pension for the entire country remained below the bare minimum (Golovachov, 1995; Gavrilentov, 1996; Latsis, 1996).

V. Conclusion

The post-Soviet transition of the 1990s imposes a severe test on various neoclassical concepts that were often viewed as universal economic laws. It did not invalidate these laws (as argued by some opponents of market reforms in former Soviet bloc countries), but rather helped delineate their respective domains beyond which they are not directly applicable. Giffenity belongs to these concepts. In our opinion, Giffenity should warrant attention of economists not because of its peculiar nature but rather because of its pervasiveness, especially in poor countries and in the countries undergoing radical rapid transformations.

Giffen in Russia exposes the cost of the Russian transition to a market economy. The welfare and sovereignty of Russian consumers were wrecked again, this time by powerful rent-seekers combined with incompetent and ineffective policies (Woodruff, 1999). High food subsidies undermined both public finance and reforms in agriculture. They contributed to fiscal deficits, hyperinflation and a large-scale pauperization. Removal of the subsidies without true privatization and restructuring of agriculture led to a further gradual devastation of this mismanaged sector. Low productivity and high transaction costs resulted in very high food prices. Low-income families had to reduce their diets to basic foodstuffs that further increased the demand for these necessities.

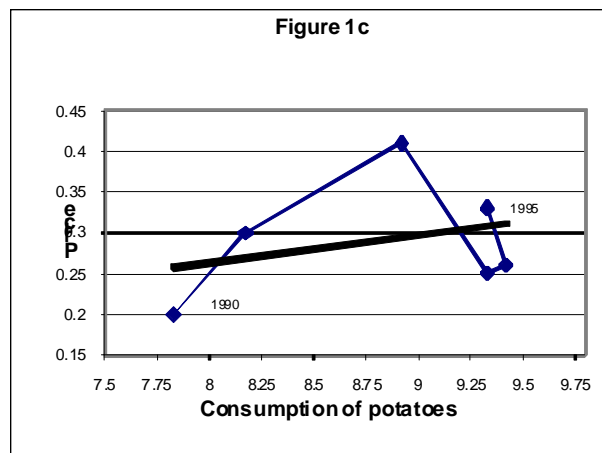
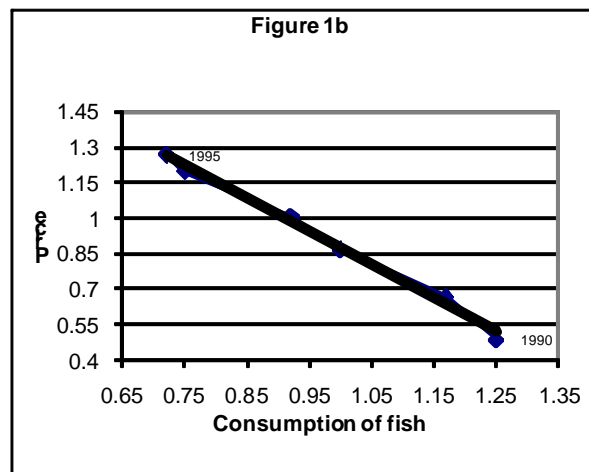
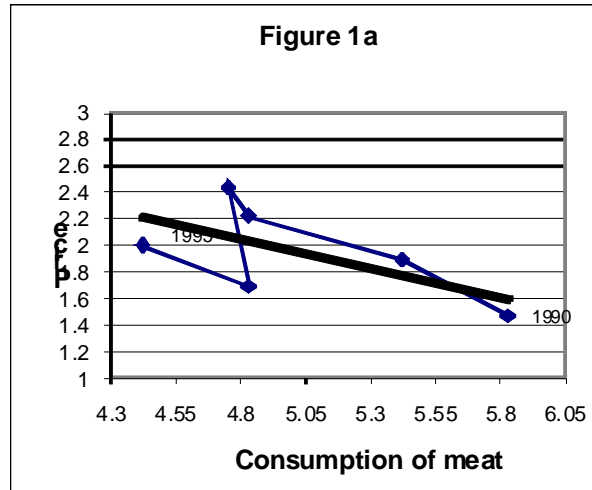
The combined effect of high demand, local monopolies in food production and distribution, lack of transparent ownership rights in agriculture, high demonetization, etc., increased the prices even more and further increased poverty. Consequently, many families had to spend most of their income on food, with little demand left for non-farm products. As a result, the low domestic demand for industrial goods and services contributed to further economic decline and further poverty. After a severe economic and financial crisis in August-September 1998, certain regions of Russia found themselves almost at the brink of mass starvation similar to the famine in 1840s in Ireland and in 1930s in Ukraine. At the end of 20th century, in Russia and elsewhere, Giffen goods remained a painfully real phenomenon.

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Figures 1a, 1b, 1c, and 1d Four consumer goods (meat, fish, potatoes, and bread): prices (percent of average monthly income per capita) and quantities consumed (monthly, per capita, kilograms), Russia, 1990-95



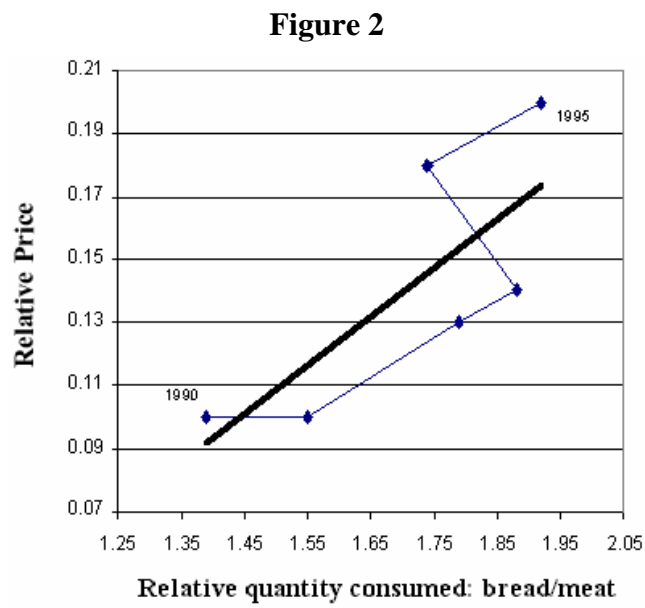
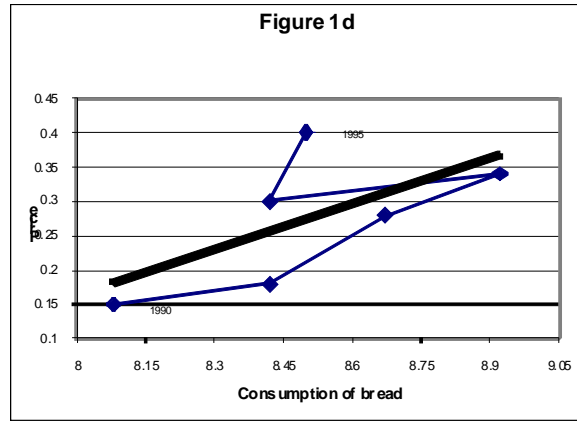


Table 1

Four consumer goods: meat, fish, potatoes, and bread, data on prices, consumption, and expenditures, Russia, 1990-95

	1990	1991	1992	1993	1994	1995
Prices, per kilogram						
<i>Ia Nominal Prices (Rubles)</i>						
Meat	3.16	8.79	88.89	1102.44	3496.61	10658.00
Fish	1.05	3.11	34.78	456.57	2485.54	6745.57
Potatoes	0.43	1.39	16.60	113.28	527.62	1764.57
Bread	0.33	0.85	11.27	155.33	621.39	2123.11
<i>Ib Relative Prices, Expressed as Percent of Average Monthly Income per Capita</i>						
Meat	1.47	1.89	2.22	2.44	1.69	2.00
Fish	0.49	0.67	0.87	1.01	1.20	1.27
Potatoes	0.20	0.30	0.41	0.25	0.26	0.33
Bread	0.15	0.18	0.28	0.34	0.30	0.40
<i>Ic Relative Prices, Expressed in Kilograms of Meat</i>						
Meat	1.00	1.00	1.00	1.00	1.00	1.00
Fish	0.33	0.35	0.39	0.41	0.71	0.63
Potatoes	0.14	0.16	0.19	0.10	0.15	0.17
Bread	0.10	0.10	0.13	0.14	0.18	0.20
Quantities, monthly consumption per capita						
<i>Id Quantity Consumed, Kilograms</i>						
Meat	5.83	5.42	4.83	4.75	4.83	4.42
Fish	1.25	1.17	1.00	0.92	0.75	0.72
Potatoes	7.83	8.17	8.92	9.33	9.42	9.33
Bread	8.08	8.42	8.67	8.92	8.42	8.50
<i>Ie Quantity Change, Percent, to Price Change, Percent (Elasticity)</i>						
Meat		-0.3	-0.6	-0.2	-0.1	-0.5
Fish		-0.2	-0.5	-0.5	-0.9	-0.9
Potatoes		+0.1	+0.2	-0.1	+0.4	-0.0
Bread		+0.2	+0.1	+0.1	+0.5	+0.0
<i>If Relative Quantities Consumed, per Kilogram of Meat</i>						
Meat	1.00	1.00	1.00	1.00	1.00	1.00
Fish	0.21	0.22	0.21	0.19	0.16	0.16
Potatoes	1.34	1.51	1.84	1.96	1.95	2.11
Bread	1.39	1.55	1.79	1.88	1.74	1.92
Expenditures, monthly per capita						
<i>Ig Spending on Selected Food Items, Rubles</i>						
Meat	18.44	47.63	429.63	5236.59	16900.28	47072.83
Fish	1.31	3.62	34.78	418.52	1864.16	4834.32
Potatoes	3.37	11.36	147.99	1057.31	4968.44	16469.32

Bread	2.66	7.16	97.65	1384.99	5229.99	18046.41
<i>1h Percent of Total Income Spent on Selected Food Items</i>						
Meat	8.58	10.22	10.74	11.59	8.19	8.83
Fish	1.39	0.78	0.87	0.93	0.90	0.91
Potatoes	1.57	2.44	3.70	2.34	2.41	3.09
Bread	1.24	1.54	2.44	3.06	2.54	3.39
<i>1i Percent of Total Income Spent on Selected Food Items (Poorest 10 percent of households)</i>						
Potatoes	2.97	4.06	9.75	5.77	8.69	15.32
Bread	2.22	2.41	6.07	7.14	8.65	15.88

Source: Different publications of Russia's Goskomstat.

Table 2

The number of kilograms of selected food items (meat, fish, potatoes, and bread) that could be purchased by the average income per capita of poorest households (the lowest 10 percent) and by the minimum wage

	1990	1991	1992	1993	1994	1995
<i>2a Poorest 10 Percent of Households</i>						
Meat	29.7	27.1	14.8	14.8	14.9	9.4
Fish	89.5	76.5	38	35.7	20.9	14.8
Potatoes	218.6	171.2	79.5	143.9	98.6	56.7
Bread	284.8	280	117.1	104.9	83.7	47.1
<i>2b Minimum Wage</i>						
Meat	22.2	20.5	10.1	13.3	5.9	5.7
Fish	66.7	57.9	25.9	32	8.2	9
Potatoes	162.8	129.5	54.2	129.1	38.9	34.3
Bread	212.1	211.8	79.9	94.1	33	28.5

Appendix A: Extended demand function incorporating a Giffen good

The extended demand function for “Giffenable” goods looks like a stylized “Z” (**Fig. 3**). When the price of such a good is very low (less than P_A), the good is almost free and its demand curve is very steep. When the price exceeds P_A , the demand curve is less steep but remains downward sloping. The consumer can enjoy making choices in accordance with his/her preferences. This is the “standard” Marshallian segment of the demand function. When prices are higher than P_M but lower than P_G the function is upward sloping. This is the Giffen segment,

or the “crowding-out” segment, where people increase the consumption of a basic (inferior) good at the expense of other goods. Here the positive income effect of a price increase is greater (in absolute value terms) than the negative substitution effect. Point *G* is a point of extreme monoculture. The consumer spends almost his/her entire income on one good (potatoes in 19th century Ireland) in order to meet dietary requirements. Beyond this point, *ceteris paribus*, a higher price must lead to a reduction in consumption. Point *S* denotes starvation. Due to very high prices, a starving consumer cannot afford to purchase the food that would satisfy even minimum nutritional survival requirements.¹⁰

One can assume that in the case of Russia in the early 1990s, the consumption of bread was located somewhere between the points *M* and *G*. Bread had a monotonous upward sloping demand curve at that time. Potatoes, in turn, were likely to remain in the vicinity of point *M*, in some years above *M* (upward slope), while in some cases below *M* (downward slope). Finally, the demand for meat and fish followed the downward sloping curve, between points *M* and *A*. Another way of looking at demand curve on Fig. 3 would be to assign its different segments to different income groups in their demand for bread. For high-income families in Russia, the cost of bread is a very low fraction of their income – they are located below point *A*. Middle-income families would be located somewhere between *A* and *M*, low-income families between *M* and *G*. At the same time, many unemployed people and pensioners ended up somewhere between points *G* and *S*.

¹⁰ Many regions in countryside of soviet Ukraine in winter 1932-33 climbed along this kind of demand function. The food was cheap and abundant in the fall, yet Ukrainian peasants could not safely store it, since any stashed food discovered by the authorities was confiscated and its owners punished. In mid-fall the prices of food (potatoes) began growing gradually reaching the levels *M*, *G*, and *S*. By early spring 1933, several millions of Ukrainian peasants starved to death (Magocsi, 1996).

Figure 3
Demand function for a Giffenable good

