

“Is Postal Service a Natural Monopoly?”

A 30-year retrospective on Panzar’s seminal paper

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Introduction

Three seminal papers have shaped the postal sector in the past two centuries, the first by Sir Rowland Hill in 1837 (Hill, 1837), which introduced the penny post, a uniform rate paid by senders for mail delivery. Previously charges were based on distance and paid by the receiver. The second seminal paper, by Ronald Coase 1939 (Coase, 1939) addressed issues raised by Hill a century earlier. Coase pointed out that Hill was in favor of uniform rates if they covered delivery costs. Hill’s advice on delivery cost was disregarded in favor of uniform rates, which makes little sense for basic public services such as railroad transportation. Hill also questioned whether the post is a natural monopoly but felt that this position was politically untenable. The third is a more recent paper written by John Panzar thirty years ago (Panzar, 1991). His paper readdressed the cost/price and universal obligation topics raised by Hill and Coase and tried to understand how the postal network evolved nearly sixty years since Coase’s analysis.

Specifically, Panzar’s paper “Is Postal Service a Natural Monopoly” (1991), questioned whether the postal service is technologically a Natural Monopoly. He reached the conclusion that indeed it is based on simple logic. He suggested that empirical analysis would be helpful to answer the question such as international comparisons, but they were not available to him. He did not envision the growing competition for package delivery in the last mile.

In this paper, we examine Panzar’s conclusions 30 years later. We draw on empirical data drawn from the US and main European postal markets to see how the postal sector has evolved. We use this information to see if his logical conclusion still holds that the postal sector is a natural monopoly.

The paper is organized in four sections: The first summarizes the main findings from Panzar's paper and other papers from the last decade that address the issue of natural monopoly. The second section addresses the emerging factors in the US and Europe that have dramatically changed the postal sector since the Panzar's paper was published. The third section summarizes our observations and explains whether we believe Panzar's conclusions remain valid or if instead a new approach to understanding the delivery market is more effective. In the final section we propose an ongoing research agenda because market conditions are evolving rapidly.

Panzar's seminal paper and reactions to it

Microeconomics textbooks analyze extensively the issue of Monopolies. While the Pareto efficient amount of output in a competitive market is achieved when price equals marginal cost, a monopolist achieves its desired output level by setting marginal revenue equal to marginal cost. Hence a monopolist produces too little output and sells it at above competitive prices. This outcome leads to allocative inefficiency as many potential consumers of the service with a willingness to pay equal to or greater than marginal costs will not be served, generating the well-known dead weight loss. In order to solve the above market failure, a regulator should impose price equal to marginal cost. In some cases, even a monopolist would earn negative profits from operations and thus decide to exit the business. This is the typical case defined in university textbooks as a "Natural Monopoly" and this case can often refer to public utilities (Varian, 2010, p.451-454).

In 1991, Panzar (1991) considered the possibility that the Postal Service is a sector which is structurally characterized by conditions leading to a Natural Monopoly. After a comparison with the telecommunication sector and a qualitative assessment of economies of scope and economies of scale present in the industry, he reached the conclusion that indeed it is a Natural monopoly. He claimed that logically the Postal Service is a natural monopoly even though it may be difficult to prove empirically. No potential competitor sought to enter the market despite prices being prescribed for political reasons. By contrast, cross subsidies in the telecommunications industry led MCI to enter the long-distance market because AT&T was directed to raise long distance rates to subsidize local service. Panzar did not believe empirical studies of economies of scale based on an incumbent regulated monopolist such as AT&T would yield meaningful results about the cost structure of potential entrants. Panzar thought that a cross-section of firms' cost structures would

yield far more accurate results of economies of scale and scope, but they did not exist for basic network services. Despite the lack of empirical evidence, he firmly believed the postal service was a natural monopoly because it is cheaper to deliver local and national mail together than to deliver them separately. He felt that having two or more mail carriers delivering to the same box would be inefficient. Similarly, it would be inefficient to have more than one company sorting mail.

Panzar distinguished the postal network from other network industries such as telecommunications networks, electric power and transportation networks by saying that the bulk of postal costs are labor costs, whereas, in the other industries, the bulk are equipment costs. Furthermore, much of the capital investment is in motor vehicles and general-purpose buildings. Second, the equipment used by the post service is not industry specific. Postal trucks can be used by other industries, so they are not sunk costs. Therefore, competition is workable if a competitor such as UPS could find a product niche that uses equipment in novel ways. In UPS's case, it shipped parcels on airways with excess capacity and shipped overnight (Panzar, 1991, p. 224-225).

Four years later in another seminal paper entitled, "Unnatural Monopoly," Estrin and de Meza (1995) investigated the merits of statutory monopoly as a mean of preventing wasteful market fragmentation. They utilized a simple quantity-setting Nash game to understand if a public firm can repel entry (Estrin & de Meza, 1995, p.484). The main finding was that in case of economies of scale, e.g., in postal services, an average cost pricing public firm would find it difficult to repel entry and even when the profits of the entrant are included in the social welfare statutory monopoly may be justified (Estrin & de Meza, 1995, p.484). This paradox justifies the title of the paper of "Unnatural monopoly".

In 2003 during the 10th Conference on Postal and Delivery Economics organized in Toledo, Spain by the Center for Research and Regulated Industries, a paper was presented based on the intuition from Panzar. Gori et al. (2003) analyzed 19th and 20th century myths of the postal sector. From that analysis it emerged that, as Panzar underlined, the most obvious unpriced postal service is delivery service (Panzar 1991, p.225). From their analysis, delivery is the costliest component of the whole value chain and that in the nineties on average in OECD countries represented 65% of the total costs (Gori et al., 2003, p.11). They went a step further and underlined the fact that the Universal Service Obligation in postal services is not focused on maximizing the use of the service, but on granting the right to every citizen to freely receive mail and to set affordable prices such

that nobody is excluded from its use (Gori et al., 2003, p.5). Moreover, from their analysis it emerged that it is crucial the possibility of being reached through the postal network by the community and being informed of the basic but fundamental events of a democratic country such as an election. They further put the label of “Public Network Good” on postal services linked to the ubiquity of postal delivery (similarly to public security -police and conventional military forces) that are 1) provided by networks, 2) incur high fixed costs (recurrent not sunk cost like other network industries), 3) are labor intensive (in many countries highly unionized), 4) are supposed to stimulate positive externalities and 5) de jure single consumers cannot be excluded (Gori et al., 2003, p.20).

How has last mile evolved in the US and Europe?

The emerging factors that have dramatically changed the postal sector since the 1991 paper was published need to be addressed to understand if Panzar’s reasoning is valid after 30 years. The dramatic drop in postal volumes, the growth of competing parcel networks stimulated by B2C e-commerce, the evolution of the nature of parcels and the growth of value-added services in this sector (e.g., same day delivery) have been very disruptive factors and have had an impact on postal operators.

In the US, since 2006 total mail volume has diminished by 39% and the mail volumes are less than in 1984 even though the population has grown from 236 million to 331 million people. Due to a rapidly growing population delivery points are growing more than a million per year. In 2006 there were 5.6 daily pieces of mail per delivery point in 2020 three and in 2030 the estimate is 1.7. The USPS is meant to be self-sufficient but its losses since 2007 has nearly reached 90 billion \$ (WSJ, 2021, p.16). Probably the COVID has exacerbated these downward trends and will probably have a lasting effect. The issue is whether the earnings losses from the decline in mail volumes will be offset by the growth in parcels. Even though the conventional view is that the complete offset will not take place there is also who believes that without the health care funding problem, more freedom in its pricing policy and the growth in parcels, the postal service is now or could turn profitable (e.g. Johnson, 2017 updated on 2021).

The USPS responded to these its earnings challenges by presenting on March 2021 a ten-year plan which included a series of initiatives and proposals to improve the financial sustainability of USPS. Initiatives mainly link to the health care plan, greater pricing flexibility and improvements in the

transportation sector (USPS, 2021, p.6) but it still keeps the 6-day delivery system for mail and great effort to grow on the parcel side.

Due to the USPS's difficult situation both houses of Congress are now moving to reform the USPS. The Postal Reform Act being discussed will address two main topics: the healthcare bailout and the issue of maintaining an integrated network for the delivery of mail and parcels. On the latter, the postal reform of 2006 (Postal Accountability and enhancement Act) specified that mail should not be used to subsidize packages. Today the debate is on the opportunity to eliminate cost and pricing distinctions between mail (a service that only USPS can provide) and packages, a service for which there are many delivery options (Steidler, 2021). Steidler's suggests that the mail and parcels are becoming separate markets segments with different competitive dynamics.

In Europe, Table 1 documents that volumes have decreased dramatically not at the same rate across the major markets mainly to the impact of e-substitution linked to new digital solutions for the transmission of legal, tax and administrative documents.

Table 1 Mail Volume decrease 2012-19

Spain	-5%
Germany	-6%
UK	-23%
France	-39%
Italy	-42%
The Netherlands	-58%

Source: EU DG Growth Report

Recently, Parcu et al. (2021) have carried out an analysis on last mile delivery in the main European markets and their analysis appears quite clear: the exit from the letter delivery of Whistl in the UK and the mergers in the Netherlands and Italy signal the fragility of existing equilibria in a rapidly declining mail industry. In contrast, the competitive dynamics in parcel markets remains more heterogeneous across the different countries. For parcels, the growth of e-commerce justifies further investments and innovation, making entry economically attractive (Parcu et al., 2021, p.14).

Hence, it emerges that End-to-End competition in mail is diminishing almost everywhere marked by consolidations. A decade ago, in Germany, the Netherlands and Italy there were E2C competitive national networks, and the same was true fifteen years ago in the UK. This common trend in these countries is that service ends up being provided by one national postal network (guaranteeing some sort of access regimes in all six major markets in some case downstream access while in others a system incentivizing consolidators), some small mail local networks and many parcel networks. Moreover, economies of scope between mail and parcels seem to exist only in the small e-commerce standard parcels which often go through the mail network. These parcels are mainly generated outside the EU and are the lower end of the international e-commerce market which by the way will be heavily impacted by the new EU directive on VAT and small value consignments.

Extending the analysis from the US to G7 countries plus the Netherlands, Spain and the BRIC countries, the great majority of mail volumes in the world are delivered by one postal network while larger parcels and courier express see everywhere even in China and India and Brazil the growth of several parcel networks and in some cases of platforms developing their own delivery networks.

Is Postal Service still a Natural Monopoly?

Panzar based his belief that the Postal Service was a natural monopoly on a simple example. He assumed one type of mail class with two service types: local mail delivery and national mail deliver. His conclusion was that one delivery system lowers delivery cost for both mail types. The problem today is much more complex. Parcels and mail are increasingly evolving as differentiated product, as customers now expect same day delivery of parcels. Perhaps Adam Smith's idea that workers with general skills – farmer, toolmaker, blacksmith – would be replaced by specialized workers operating within distinct industries is actually taking place in postal delivery.

The recent Postal Service marketing plan *Delivering for America* (USPS, 2021) suggests that specialization is crowding out economies of scope. The plan points out that operations and infrastructure is increasingly misaligned because of the relative growth of package delivery (USPS, 2021, p.9). In 2020, package delivery needs tested the Postal Service's processing and transport capacity (USPS, 2021, p. 10) while mail infrastructure such as sorting machines were operating at

50% capacity (USPS, 2021, p. 11). The Postal Service plans to introduce new package sorting machines and larger capacity trucks to accommodate package growth (USPS, 2021, p. 11).

Besides faster delivery requirements for packages than mail, package mailers, businesses, require more support services. In response, the Postal Service is bundling B2C services through USPS Connect (USPS, 2021, p. 21). This type of service suggests a specialized workforce devoted to packages.

Taken as a whole, the Postal Service's marketing plan indicates that mail and parcels are evolving into two separate markets. Given that mail is a declining market with increasing costs, it will remain a monopoly because it is unprofitable to serve even by one company constrained by price ceilings for its mail products.

In Europe, the evolution into two separate markets is also taking place. Recent research on competition in the postal sector, using secondary data of the main postal operators, reached a conclusion that there are three possible clusters of mail markets. The first cluster is characterized by high concentration and low fragmentation, the second cluster with moderate concentration and fragmentation and the third one with high fragmentation (small local mailers) and lower concentration (Parcu et al., 2021, p.5). At the same time in all these clusters there is a vibrant and dynamic competitive environment concerning parcels. Hence, a growing divergence between the business models of these segments is observed.

These means that to address the issue of natural monopoly in the postal sector we have to focus on the Universal service of mail services.

The Universal Service Dilemma

We have already underlined above one of the main differences between Telecommunication and Postal services is that all citizens need to have a postal address. They are automatically connected free of charge to the postal network as soon as they are born and registered and do not need to pay any fee for it, whereas connection to utilities and other network industries is on a voluntary basis and implies the payment of a subscription fee.

Despite the progressive opening of the market and changes in users' preferences, it emerges, even more after the Covid 19, crisis that it is fundamental to preserve the unity of a seamless universal

service network to ensure accessibility, efficiency and sustainability of the postal sector, granting a minimum set of services to all citizens within the whole national territory regardless of their geographical location or factors such as income, age, level of digitization, etc. Otherwise, there would be the risk that citizens living in disadvantaged areas (such as mountain, island, remote or sparsely populated areas), suburban areas as well as the less well off, elderly, disabled or people with low digital skills or without internet access may no longer be able to use the postal services that would be too expensive because of the high costs that transport, sorting and, above all, delivery would require.

In addition, as Universal Service is crucial for economic and social cohesion, considering the increasing burden on the provider, also due to the dramatic and persistent drop in mail volumes (accelerated by the Covid pandemic), the regulatory framework both in the US and in Europe will have to unequivocally reaffirm the principle of full compensation of the net cost (which will tend to increase as volumes decrease) of universal postal obligations with national funding and general taxation.

All these influences may suggest that in comparison to the mail sector, the parcel market is becoming a distinct market with its own requirements. If true, economies of scope between mail and parcels may be disappearing. Paradoxically, diminishing mail volumes would suggest that a monopoly for this service may be most efficient for last mile delivery. Probably due to the death spiral anticipated by Crew and Kleindorfer (2016) two decades ago mail delivery is becoming less commercial and more basic mail making it a losing business but socially more important hence the natural monopoly should be the delivery of mail only not parcels and courier express.

Conclusion and way forward

After three decades the Panzar 1991 paper still provides interesting insights but from our analysis it has emerged that due to the dramatically diminishing mail volumes and the disappearance of the economies of scope between mail and parcels due to value added services linked to e-commerce the natural monopoly characteristic of postal service is limited to the last mile delivery of mail.

He claimed that logically the Postal Service is a natural monopoly even though it may be difficult to prove empirically. Competitive entry was not considered by Panzar a strong indicator that conditions for a natural monopoly exist because prices for regulated services are often prescribed for political reasons. He firmly believed the postal service was a natural monopoly because it is

cheaper to deliver local and national mail together than to deliver them separately. He felt that having two or more mail carriers delivering to the same box would be inefficient.

All these views seem to be still valid and, furthermore, diminishing mail volumes enhances the whole issue of economies of scale not allowing for more than one national network (this is the case already in the US but more and more it is true also for the main European markets).

Moreover, compared to the early Nineties the problem today is much more complex. Parcels and mail are differentiated products and becoming increasingly so because customers now expect, for example, same day delivery of parcels or parcels with non-standard sizes. Probably an evolving process of specialization is taking place in postal delivery.

If the observed diverging trends will continue, they could lead to a sort of death spiral of the mail sector the natural monopoly and to the statutory monopoly characteristics could turn more to an unsustainable (from a financial point of view) unnatural monopoly as discussed by Estrin and Meza. This is probably true in the US, but it could be extended also to Europe leading to further consolidation in the last mile in Europe in the mail segment.

Further research should be carried out to assess how long this unsustainable financial burden will be tolerated versus the concept of Universal service and the fact that postal operators are the carriers of last resort, and that postal addresses and postal delivery are a right from birth. Will the Public Network Good characteristics of the last mile still hold? Will the public opinion in ten years' time think that it is crucial for a country that there is the possibility of being reached through the postal network by the community and being informed of the basic but fundamental events of a democratic country for example an election and even more the surge of the vote by mail in the US. Thus, will the last mile in mail delivery in ten years' time be still considered a natural monopoly but even more will it be politically relevant.

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