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Why Ask? The Role of Asking Prices in Transactions

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Why Ask? The Role of Asking Prices in Transactions

BY BENJAMIN LESTER

*"2009 Mercedes C300 Sport 4MATIC —
$19,000 or Best Offer" –Craigslist*

Many goods are offered for sale with an *asking price*. When a seller posts an asking price, it's typically implied that this is the price he is willing to accept in exchange for his good but that he would also entertain offers below the asking price. For example, when potential buyers read the advertisement above, they understand that they can either offer $19,000 and be sure of getting the car, as long as it hasn't sold yet, or they can offer less than $19,000, in which case they may not get the car, depending on how much the seller values it and whether any other buyers offer more.

This method of selling a good or service appears in a variety of markets and goes by many names. For example, it's often called the *listing* price in the housing market or the *sticker* price in the market for new cars. Companies are typically listed for sale with an *offer* price. In the classified section, sellers will often announce a price followed by the phrase "or best offer," while Internet auction sites like eBay allow sellers the option of posting a "buy-it-now" price. While each of these markets may work slightly differently, they all share the feature that sellers post some price, and buyers can either pay that price or try to buy it for less.

As consumers, we often take it for granted that sellers use different conventions to sell different types of goods and services. However, the methods that sellers use to determine whom they trade with and at what price are more than a matter of habit or tradition. These different methods can lead to very different outcomes, both for potential buyers and the seller, and even for the economy as whole. For example, if the seller of the car above doesn't include an asking price, some potential buyers might not contact him because they think the car is out of their price range. On the other

hand, if the seller chooses only one price at which he will trade, and specifies that he will accept nothing less, he might miss out on a buyer who would have been willing to pay just a little bit less than the chosen price. Now, suppose all the cars for sale in the economy were being sold to the "wrong" buyer at the "wrong" price. Suddenly these small mismatches at the microeconomic level would aggregate up to a big problem at the macroeconomic level!

For this reason, a fundamental task of economic theory is to understand why different goods are sold using different pricing mechanisms and how these mechanisms determine both what types of buyers end up buying a particular good or service and how much they end up paying. While certain methods of price determination have been studied extensively, the reason why a seller would benefit by using an asking price remains an open question. This article explores the most common explanations for why sellers use asking prices, how the asking price a seller chooses affects the ultimate selling price and time on the market, and why this method of selling a good can lead to more efficient trading outcomes.

ASKING PRICES: A MIX OF POSTED PRICES, AUCTIONS

Before we explore the reasons why a seller might choose to sell a good with an asking price, it's helpful to note that an asking price combines elements of two popular methods of price determination: *posted* (or "take-it-or-leave-it") prices and auctions.

A posted price is one that a seller sets as nonnegotiable, and customers can either buy at that price or not buy at all. Most transactions take place with posted prices: milk at the supermarket, meals at a restau-

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rant, shoes at a department store, and so on. Auctions, on the other hand, are less ubiquitous. In a typical *first-price* auction, each would-be buyer places a bid, and the one who places the highest bid wins, so long as it exceeds the seller's own value for his good. Auctions are more common when the good for sale is unique, like a piece of art, a company, or an oil field. They are also commonly used when a good is expected to elicit a wide range of bids.

When a seller posts an asking price, a buyer can pay that price and trade with certainty, as is the case with a posted price. However, if nobody offers the asking price, then the good is sold to the highest bidder, as in an auction.[1] In this sense, an asking price is a hybrid of a posted price and an auction. Therefore, in order to understand why asking prices are an attractive selling method, it's helpful to explore the advantages of posted prices versus auctions.

THE ADVANTAGES OF POSTED PRICES

While there are many reasons why a seller might find it profitable to use posted prices, here we will focus on two of the most well-established explanations. First, buyers tend to like posted prices because they provide them with certainty: As long as the good is available, buyers know they can buy it at the posted price. Hence, by using a selling method that is appealing to buyers, a seller can attract more buyers. Second, a posted price can signal important information to buyers, either about the good for sale or about the seller's motivation to sell the good. In this case, the posted price can help sellers attract the right buyers. Let's explore both of these explanations in greater detail.

When a seller posts a price at which he is always willing to sell, potential buyers can be assured that, as long as the good is still available, they can buy it with certainty. This can be especially important to a buyer who is either averse to risk or impatient. For example, suppose you waited until the day before your anniversary to buy your spouse a present. The prospect of bidding for a gift and finding out at midnight that you didn't get it isn't terribly appealing. Instead, you would naturally seek out a store where you could be certain to walk out with a gift in hand.[2]

This element of certainty can also be important to buyers who have made a significant investment before making a purchase, either in terms of money or time. For example, suppose you are remodeling your kitchen. You spend months picking out paint colors, tiles, and custom-made cabinets. It would be pretty frustrating if, at the end of all this, there was uncertainty over whether the appliances that fit in just right would be available at a price within your budget. Again, in this situation, you would naturally be attracted to a vendor who posted fixed prices; indeed, you might even be willing to pay him a little more for the certainty of getting your appliances when your kitchen was ready![3]

A second advantage of posted prices is that they provide a seller with the opportunity to send a signal that

In order to understand why asking prices are an attractive selling method, it's helpful to explore the advantages of posted prices versus auctions.

contains information relevant to buyers. For example, sometimes it's difficult for buyers to discern the quality of a good from an advertisement, or even from looking at the good. In these cases, the price itself can convey information about the quality of the good, such as how well it was manufactured, the types of materials that were used, or how long it's expected to last.[4] When prices serve this signaling function, they steer buyers toward the right sellers. That is, buyers looking for higher-quality goods are drawn to sellers of high-priced goods, while those willing to accept lower quality in exchange for a lower price seek out sellers of lower-priced goods.[5]

Prices can also provide a channel for sellers to signal something about their own motivation to sell, which can be completely unrelated to the quality of the product. For example, a store that is going out of business might drop its prices, as in the typical slogan "Everything must go!" A store that did not have the same sense of urgency would have no incentive to drop its prices as low.[6] As a result, prices can again play a valuable signaling role and help ensure that buyers who are more price-sensitive end up trading with sellers who are more motivated to sell.

THE ADVANTAGES OF AUCTIONS

The main advantage to a seller of using an auction is that it offers a way to *price discriminate* — that is, to charge different buyers different prices, depending on how much each buyer is willing to pay. In other words, auctions offer

sellers greater flexibility than posted prices do, since posted prices place certain limitations on a seller. One way to think about this inflexibility is to realize that a posted price acts as both a ceiling and a floor on the possible price that the seller can charge.

For example, when it turns out that there are buyers who are willing to pay a lot — that is, when demand is high — posted prices act as a ceiling on the price the seller can get. Auctions, on the other hand, place no such upper bound on the eventual transaction price. Posted prices are also limiting when demand is low, as they serve as a floor on prices. This can have important consequences: When the seller has committed not to sell below his posted price, it's possible that a sale may not occur even if there is a buyer who values the good more than the seller. This would not happen if the good were sold via an auction instead.

In short, auctions offer two advantages over posted prices. First, they allow sellers to sell their goods to the buyers who value them the most. Second, they do not rule out profitable sales in cases when no big spenders make offers.

ASKING PRICES: A MIDDLE GROUND

Asking prices are a way to capture some aspects of all the advantages discussed above. Because an asking price offers the buyer some degree of certainty, using this mechanism could stimulate demand and thus increase profits. Moreover, as we noted earlier, asking prices can serve as a signal to would-be buyers about the quality of the good being sold or the seller's eagerness to sell. Yet, asking prices also allow sell-

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In some situations, using an asking price can be the seller's best, or most profitable, way of selling a good among all possible methods for determining prices.

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ers to engage in some price discrimination. They leave open the possibility of getting top dollar from a high-valuation buyer. However, since the asking price is not a take-it-or-leave-it offer, price-conscious buyers still have a chance. As a result, the seller does not have to forgo profitable sales.

Indeed, in some situations, using an asking price can be the seller's best, or most profitable, way of selling a good among all possible methods for determining prices, includ-

ing posted prices, auctions, bargaining, and any other way one could imagine.[7] Consider situations in which buyers have to incur a cost in order to learn how much they value a good. For example, in the real estate market, this cost can be interpreted as the time and energy spent going to see a house, researching the quality of the school district, finding out how long it would take to commute to work, and so on. When buyers face such hurdles, sellers will often choose to use an asking price, as it provides the best balance between the flexibility of an auction, which helps the seller get a good price, and the certainty of a posted price, which helps attract buyers. However, if the buyers' cost of learning their valuation is small enough, this balance shifts and an auction is the optimal way to sell a good. On the other hand, for goods that are similar and more or less interchangeable — so that there is nothing to learn by going to inspect any one particular seller or store — posted prices are optimal.

DISCUSSION AND CONCLUDING REMARKS

Why do certain types of buyers end up buying certain goods or services? Why do they end up paying what they do? Basic economic theory predicts that a good or service should sell for the price that equates supply with demand: Those willing to pay at least that price will buy; those willing to accept that price or less will sell.

Yet, anyone who has ever bought a house or car, walked through a bazaar, or perused Craigslist knows that some goods aren't sold at a single price, and they are not always acquired by the buyer who is willing to pay the most. To understand these types of markets, economists have to dig deeper into the details of how prices and allocations are determined. In this article, we have explored one particular method of price determination: asking prices. We have proposed several reasons why sellers might find it profitable to sell their goods or services with an asking price and how this pricing mechanism can lead to the "right" buyer ultimately getting a particular good or service.

What, then, does the theory tell us about how asking prices affect actual sale prices and how long it takes to sell a good? When sellers use asking prices, economists expect to see certain patterns in the data. First, there should be a particular type of price dispersion, with some sales taking place at the asking price and then other sales taking place

at various prices below the asking price. Second, we should expect a relationship between the asking price that a seller chooses and the amount of time the good spends on the market, though this relationship depends on the reason for using an asking price to begin with. If the asking price is being used to offer buyers certainty or if it is a signal of the seller's motivation to sell, then lower asking prices should attract more buyers and hence shorten the good's time on the market. If, however, the asking price is a signal of quality, then it's unclear whether a low asking price will be associated with a long or short time on the market.

With a workable theory such as this, economists can begin to identify the underlying causes of differences in prices and allocations in these markets and forecast changes. In the housing market, for example, the ratio of asking prices to actual sale prices varies widely from one location to another and can change significantly over time. A theory of asking price mechanisms offers a means to interpret such variations in a way that standard pricing theory can't. And given the housing market's impact on economic conditions, interpreting house price movements is a vital part of understanding the overall economy. ■

NOTES

[1] Of course, there is also a third possibility: that two buyers end up offering the asking price at the same time and a bidding war ensues. In this case, the good can end up selling for more than the asking price. This is more common in some markets than it is in others — houses will sometimes sell above the listing price, while new cars almost never sell for more than the sticker price. To learn more about the relationship between asking prices and bidding wars, see the paper by James Albrecht and his coauthors, along with my own work with Ludo Visschers and Ronald Wolthoff.

[2] To read more about how this type of certainty can be attractive when buyers are risk averse, see, for example, the articles by Eric Budish and Lisa Takeyama or Timothy Mathews.

[3] In the 1990s, Yongmin Chen and Robert Rosenthal, along with Michael Arnold, were among the first to note that buyers would appreciate a cap on the maximum price they would have to pay before they made a significant investment.

[4] The idea that prices may provide a signal about quality has been around for quite some time. See Asher Wolinsky's 1983 article for an early formalization of this idea and Alain Delacroix and Shouyong Shi's 2013 article for a more recent contribution.

[5] You might ask, "Why doesn't a seller just say that he is selling a higher- or lower-quality good?" Economists would call this *cheap talk*, since any seller could (and would like to) make such a claim. However, when a seller who must pay a lot to make a high-quality good commits to accepting no less than a certain price, he is taking an action that a seller who produces lower-quality products at a lower cost wouldn't take. Hence, setting and committing to this posted price is informative about the quality (and cost) of the good that a seller produces. Economists call this outcome a *separating equilibrium*.

[6] Albrecht and his coauthors use this explanation to try to understand how housing prices can sometimes signal the urgency with which sellers want to sell their houses.

[7] I describe and analyze these situations more formally in my paper with Visschers and Wolthoff.

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Regions Defined and Dissected

BY PAUL R. FLORA

In 2013, the federal government confirmed what every kid from Waynesboro, PA, had understood 50 years earlier — that Franklin County was inextricably tied to the Washington–Baltimore region. Forsaking the Phillies and Pirates, Little Leaguers from south-central Pennsylvania traveled instead to watch Frank Robinson in the Orioles' outfield. In the fall, local families jeered the Eagles and Steelers, and cheered as Johnny Unitas led the Baltimore Colts to victories. Good-paying jobs beckoned and TV signals emanated from over the Blue Ridge mountains and inside the dual beltways.

Franklin County is one of several new metropolitan statistical areas (MSAs) in the Federal Reserve's Third District and one of many small MSAs that have been drawn into the much larger statistical constellations of Philadelphia, New York, and Washington–Baltimore (Figure 1).[1] How are these delineations drawn? And what do they reveal about economic vitality and policy challenges in the tristate region? This report describes how population levels and commuting patterns define the Third District's economic regions using U.S. Office of Management and Budget (OMB) standards. Specifically, how did Franklin County, PA, become tied to the Washington–Baltimore region? Why did a largely rural, four-county region on the Delmarva Peninsula become an MSA? Are Trenton's ties to New York stronger than its ties to Philadelphia?

The Franklin County example highlights how successful the federal criteria are at capturing the economic and cultural relationships among geographic areas. For researchers, the MSA classification provides a valuable common basis on which to group and study economic regions as distinct labor markets. However, some economic development patterns will always pose a challenge to a necessarily rigid classification system. Indeed, some of the expansion of these statistical areas has resulted from localized commuting patterns that don't appear to create the economic benefits one would anticipate from a resilient MSA. This report analyzes the census data to distinguish between commuting generated by adjacent counties and commuting generated by competition from larger, more distant labor markets.

COMMUTERSHEDS DEFINE REGIONS

Numerous criteria may be used to define regions. Watersheds and river basins are a pragmatic choice for environmental planning purposes. Marketing areas were once defined primarily by the strength of television and radio signals. Sports affinities can define a region culturally.[2] Each of these definitions has some relevance for regional economics, and not surprisingly, fan affiliation is closely aligned with the OMB's larger combined statistical areas (CSAs). However, commuting patterns are a prime way for economists to define and understand regional economies, and the OMB's more rigorous approach, which focuses on the strength of commuting patterns among adjacent population centers, sometimes called *commutersheds*, is of most interest for regional economists.[3]

A commutershed is the broad geographic area from which a

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city's labor force is drawn. A regional economy's resilience is greatly improved by having an extensive commutershed that can provide easy access to good jobs for the region's residents and access to skilled workers for the region's firms. Small, isolated regions have less diversity in the types of jobs and skills found there than do large, integrated urban areas. The quality of a region's transportation infrastructure can greatly enhance or impair accessibility within the commutershed, as can natural features such as waterways that require bridges or tunnels. Residents in the Trenton metro area benefit from the proximity and convenient rail access into both New York and Philadelphia; Wilmington residents can easily reach Philadelphia and Baltimore.

However, much of the expansion of urbanized areas is a product of highways and sprawl, not of enhanced transit infrastructure and compact development. One key to why the Salisbury, DE–MD MSA expanded from two counties to four was the suburban growth of rural areas along the Route 13A corridor and outward from each small town. (See the accompanying discussion, *How Are MSA Boundaries Decided?*) Similar forces help explain the emergence of Cham-

bersburg–Waynesboro and East Stroudsburg as MSAs and of their absorption into larger CSAs.

SPRAWLOPOLIS: NEW YORK AND PHILADELPHIA VIE FOR TERRITORY

In contrast to a *megalopolis* made up of a chain of large metro areas such as the Northeast corridor of Boston, New York, Philadelphia, Baltimore, and Washington, *sprawlopolis* may be a better term for CSAs. The commuting threshold to combine two statistical areas into a CSA is lower than it is to merge counties and statistical areas — requiring only that the combined percentage of out-commuters from and in-commuters to the smaller statistical area be 15 percent or greater.[4] CSAs form and expand as long as smaller adjacent metro areas meet the threshold requirement. Their expansion stops when metro areas give way to adjacent rural counties. For example, rural Fulton County, PA, stops the Washington–Baltimore CSA from expanding beyond Franklin County. Alternatively, when the next adjacent metro area has a stronger commuting relationship

FIGURE 1
Tristate MSAs
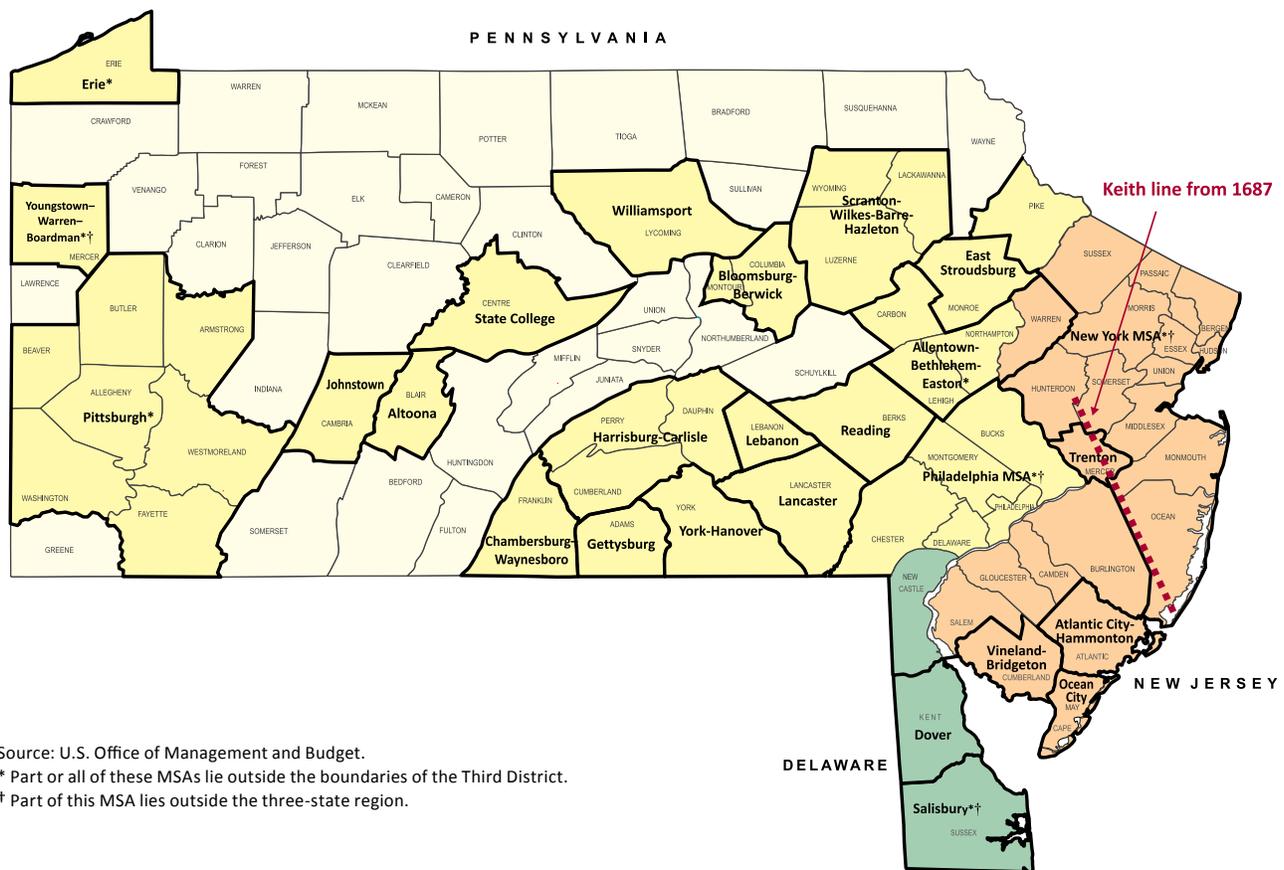
Source: U.S. Office of Management and Budget.
* Part or all of these MSAs lie outside the boundaries of the Third District.
† Part of this MSA lies outside the three-state region.

How Are MSA Boundaries Decided?

The Office of Management and Budget periodically reviews its criteria for delineating metropolitan statistical areas and then realigns areas based on population levels from the decennial census and county-to-county commuting flows from the Census Bureau's American Community Survey.

The OMB's latest delineation of the Salisbury, MD–DE MSA offers an illuminating glimpse into the rationale. Previously consisting of Somerset and Wicomico counties, MD, it was expanded to include Worcester County, MD, and Sussex County, DE (Figure 2) — creating an MSA with a total of 373,802 people, a larger population than Trenton's.[5] And Sussex County contained over half of that total population.

Since the 2000 census, Sussex County had been designated as the Seaford, DE, micropolitan statistical area. That determination had been made based on three characteristics of the census-designated Seaford urban cluster: First, Seaford's population exceeded the 10,000-person threshold that qualified the county as a core-based statistical area (CBSA). Second, Seaford was the largest urban area in the county, which identified the CBSA with Seaford. Third, the Seaford cluster had fewer than 50,000 people, which meant it would be a micropolitan statistical area and not an MSA.

Over the next 10 years, Sussex County would add over 40,000 people — a growth rate of 26 percent.[6] Yet, the county remained largely rural; 60 percent of its 197,145 people were scattered among nine urban clusters (ranging from 2,556 people in Milton to 24,129 in Lewes) and one urbanized area (24,588 in the Delaware portion of Salisbury — primarily consisting of the former Seaford cluster). Still, none of those urban areas met the 50,000 population threshold to qualify Sussex County as an MSA; however, the Salisbury urbanized area also contained 73,254 people in a portion of Wicomico County, and therein lies the key.[7]

Because each county's portion of Salisbury is its largest urban area, Sussex and Wicomico counties are jointly considered the central counties of a single CBSA. Furthermore, Salisbury qualifies as an MSA, since its urbanized area has more than 50,000 residents. Interestingly, had the Lewes cluster not had 459 fewer people than the Sussex portion of the Salisbury urbanized area, then Sussex would have remained a micropolitan statistical area (Table 1).

But with 22 miles of mostly farmland separating their downtowns, how did the former Seaford cluster become part of the Salisbury urbanized area? By 2000, Seaford's development had sprawled about seven miles southward along the Route 13A corridor as far as Laurel, DE, and Salisbury had sprawled about seven miles northward to Delmar on the state line.[8] Since then, the remaining distance appears to have been spanned, in part, with a single, large housing development sprouting up midway between Laurel and Delmar.

A Common Urban Area Tied Sussex to Salisbury

Salisbury MD-DE MSA by County	2010 Population	Largest Qualifying Urban Area	
		Name	Population
Sussex, DE	197,145	Part of Salisbury Urbanized Area	24,588
Somerset, MD	26,470	Princess Anne Urban Cluster	10,396
Wicomico, MD	98,733	Part of Salisbury Urbanized Area	73,254
Worcester, MD	51,454	Ocean Pines Urban Cluster	28,959

Source: U.S. Census Bureau.

In addition, census designations can (under yet more arcane criteria) utilize combinations of half-mile "hops" and 2.5-mile "jumps" to connect urban areas interrupted by farmland.

Finally, Somerset County, which had been part of the prior Salisbury MSA, still qualifies as an outlying county to the new MSA, as nearly 30 percent of its 9,180 residents commute to work in Sussex and Wicomico counties, exceeding the 25 percent threshold of residents who commute out or workers who commute in. Worcester County, which had not previously been included in the Salisbury MSA, draws just over 25 percent of its workforce from Sussex (9.0 percent) and Wicomico (16.8 percent). Although it is adjacent to both counties, Worcester would not qualify as part of either Sussex or Wicomico if they were not considered a single cluster of central counties.

Individually, Somerset and Worcester are too small and rural to be considered independent MSAs. However, due to the strength of their commuting ties with the two central counties (out-commuting from Somerset and in-commuting to Worcester), they are both delineated as outlying counties to the Salisbury MSA (Figure 2). Even so, had the census not hopped and skipped across miles of farmland, Sussex and Worcester would still be independent micropolitan statistical areas — taking two-thirds of the present MSA's population with them.

FIGURE 2
Salisbury MSA Expanded Mainly from a Sliver of Farmland
Commuting flows for Salisbury's outlying counties.
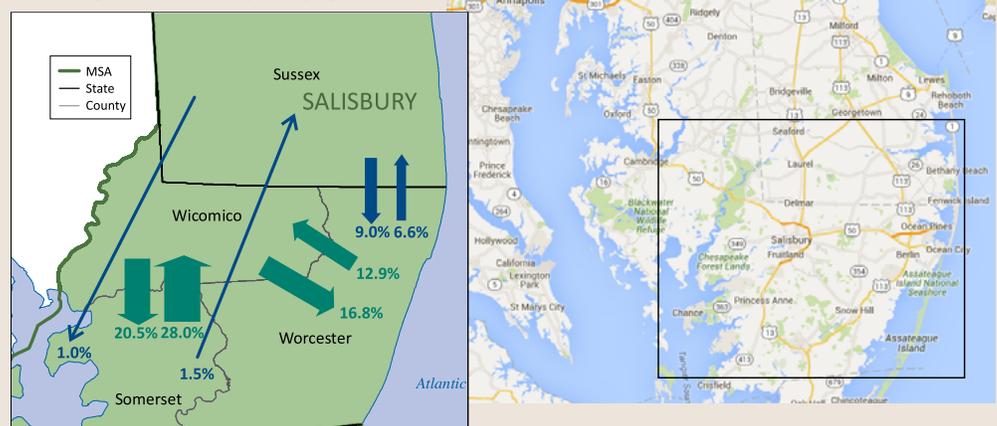
Source: U.S. Census Bureau.

with a second large metro area, then expansion of the first is blocked in that direction. An example, as we will see, is the Trenton MSA, sandwiched between the New York and Philadelphia MSAs. The upshot is that CSAs along the Northeast corridor abut one another but do not merge or combine into a megalopolis.

On the basis of population levels and commuting patterns, the Chambersburg–Waynesboro, PA, MSA was combined with the Hagerstown, MD, MSA, and thus with the CSA known as Washington–Baltimore–Arlington, DC–MD–VA–WV–PA. While over 4,000 residents of Franklin County made their way to jobs in the Baltimore–Washington area (more than to adjacent Cumberland County to the north), the strongest tie was driven by the 9,284 Franklin County residents commuting south to adjacent Washington County, MD. The stream of commuters to the Baltimore–Washington area has long existed and recently grown, but the greatest increase in commuting is the local back and forth across the Mason–Dixon line between Franklin County and Washington County.

The Trenton MSA (Mercer County) benefits greatly from its location along the primary rail corridor between New York and Philadelphia. Yet, localized commuting patterns among its adjacent counties continue to play a dominant role. Trenton has been combined with various incarnations of the New York CSA since 1993, when it was plucked from an earlier Philadelphia CSA on the basis of 1990 census data. Before that, Trenton had been partnered with Philadelphia since 1981 on the basis of 1980 census data, and before 1981 and significant suburban expansion, Trenton had been a standalone MSA dating back to 1950, when such designations were first made.

This tug of war between New York and Philadelphia began in the early 17th century with border disputes and multiple survey efforts to distinguish the colonial provinces of East Jersey and West Jersey. In 1687, surveyor George Keith established a 70-mile boundary between the provinces that was disputed before it was finished. The Keith line was eventually invalidated but not before municipal boundaries were established on its basis. To this day, team allegiances and other cultural references — is it called a *hoagie* or a *sub*? — shift along this line (Figure 1).

What drives Trenton to New York today? Annual census surveys averaged over 2006–2010 show significant cross-commuting patterns between Trenton and its much larger neighbors. Commuters from the New York and Philadelphia MSAs supply nearly half of Trenton's workforce: 21.8 percent and 23.9 percent, respectively (Figure 3). Most of

those commuting into Trenton are from suburbs throughout the adjacent counties of Bucks, Burlington, and Middlesex. However, Trenton's out-commuting ties are far stronger to New York — 23.0 percent of Mercer County residents commute into New York versus only 7.9 percent into Philadelphia. Jobs are more plentiful and wages are higher around New York than around Philadelphia.

Since none of the four possible one-way commutes met the 25 percent threshold, Trenton remained an independent MSA. However, the lower 15 percent threshold for in-commuters and out-commuters combined is easily met by both large MSAs; New York absorbs Trenton into its CSA with a combined 44.8 percent compared with Philadelphia's 31.8 percent. Interestingly, the share of commuters coming from the Pennsylvania side of the Delaware River would have had to increase only 1.1 percent in order for the Philadelphia MSA to have regained Trenton in a merger of statistical areas, as was the case in the 1980s. One could easily imagine that happening if a sizeable, well-placed transit-oriented development were built across the river from downtown Trenton.

A tug of war for Trenton has little value if only for bragging rights. However, transit-oriented developments represent wiser, more sustainable development for urban areas. Creating a transit-oriented development adjacent to

Trenton's Commuting Ties Much Stronger to New York
Mercer County residents commuting to New York and Philadelphia MSAs; commuters from New York and Philadelphia MSAs into Mercer County.
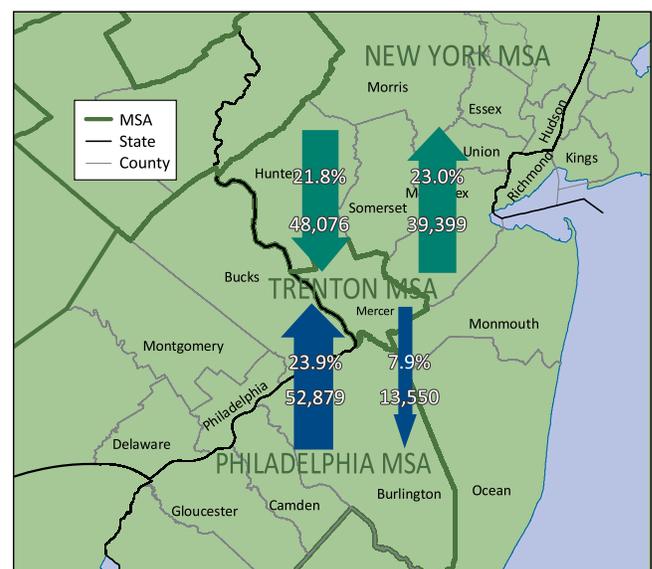
Source: U.S. Census Bureau.

Trenton would benefit its residents and businesses while providing a larger workforce with easier access to jobs. Strengthening the existing transit connections with faster, more frequent trains between Trenton and Philadelphia would also benefit Trenton's — and Philadelphia's — urban core. Downtown development would increase as households and businesses seek to locate near the transit stops. The growth of downtown housing in turn would attract more retail shops and other commerce. Compact development with workforce housing would also offer the benefit of walkable commutes to local jobs.

RISE OF THE LONG-DISTANCE COMMUTER

East Stroudsburg stands out as an exception to the dominance of

TABLE 2
Rise in Treks to New York City Gives East Stroudsburg Longest Average Commute Time

| Rank*	Metropolitan Statistical Area	Average one-way commute time		Percent commuting 45 minutes or more each way		Number commuting 45 minutes or more each way	
		1980	2013	1980	2013	1980	2013
1	East Stroudsburg, PA	20.1	37.9	10.4	30.5	2,989	22,102
2	Philadelphia—Camden—Wilmington, PA—NJ—DE—MD**	25.1	28.6	16.6	20.8	357,405	558,425
3	Dover, DE	17.8	27.6	8.0	20.1	3,377	14,672
4	Gettysburg, PA	20.2	27.2	11.4	19.7	3,432	9,350
5	Trenton, NJ	21.7	27.6	9.8	19.0	13,440	31,721
6	York—Hanover, PA	19.6	26.8	7.3	18.9	10,417	39,179
7	Allentown—Bethlehem—Easton, PA—NJ	18.8	27.0	7.1	18.3	19,437	67,438
—	**Third District MSAs****	**22.1**	**26.6**	**12.0**	**17.6**	**494,434**	**1,111,355**
8	Reading, PA	17.9	25.6	5.1	16.7	7,026	31,035
—	**United States**	**21.7**	**25.8**	**11.6**	**16.2**	**10,923,652**	**22,150,805**
9	Lebanon, PA	17.0	23.8	5.1	14.3	2,443	8,656
13	Chambersburg—Waynesboro, PA	18.5	23.6	6.5	12.4	3,182	8,505
14	Salisbury, MD—DE**	18.7	22.6	8.3	12.3	7,263	19,323
22	Williamsport, PA	17.6	20.0	4.8	7.4	2,228	3,719

Source: U.S. Census Bureau.
*Rank among 22 Third District MSAs by percent of residents commuting 45 minutes or more each way.
**Includes counties outside the three-state region.

A Surge in Super-Commuting from East Stroudsburg
Monroe County commuters bypass closer counties in favor of New York.
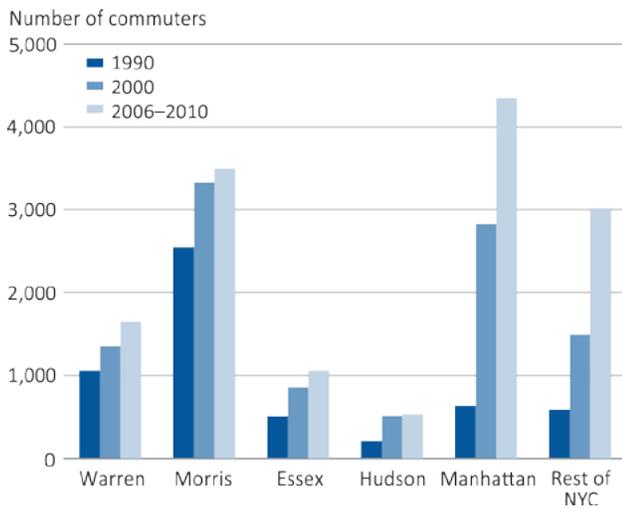
Source: U.S. Census Bureau.

local commuters over those to distant urban cores. As with Chambersburg–Waynesboro, the East Stroudsburg MSA was promoted from its prior categorization as a stand-alone micropolitan statistical area. It was then combined into the New York CSA. However, in contrast to Chambersburg–Waynesboro, and despite population growth of 22 percent and a pattern of residential sprawl, East Stroudsburg's commuting linkages have grown much stronger to the distant urban core of New York even as they have also grown among adjacent counties.

Long-distance commuting from Monroe County in the Poconos along the Interstate 80 corridor to Manhattan and the other four boroughs of New York rose dramatically in recent decades (Figure 4). Long-distance commuting from East Stroudsburg tripled from 1980 to 2013 — from 10.4 percent to 30.5 percent.[9] The increase was much smaller for the nation, from 11.6 percent to 16.2 percent. In 2013, Philadelphia and Dover commuters were distant seconds, with 20.8 percent and 20.1 percent, respectively. The average travel time for East Stroudsburg residents was a hefty 37.9 minutes, compared with the next-longest time of 28.6 minutes for Philadelphia residents and a national average of 25.8 minutes.

Numerous reasons have been cited for the increase in long-distance commuting from East Stroudsburg:

• Rising home prices in and near New York (the "drive till you qualify" rationale);
• The pull of starry night skies and other rural amenities;
• A desire for less risk after the 9/11 tragedy;
• Limited job opportunities in Monroe County.

Commutes reflect a tradeoff of one's time for higher wages, lower housing costs, or a preferred lifestyle. East Stroudsburg's caravan of commuters who depart before dawn and return after dusk reflect one of several extreme responses to the hard choices faced by workers in the high-cost New York metropolitan area.[10] Rail service could reduce the time, improve the schedule, and alleviate the stress of East Stroudsburg's road warriors. Indeed, for decades, long-range transportation plans for East Stroudsburg, the Lehigh Valley, and other regions have expressed great enthusiasm for transit to larger cities. However, these plans have languished, as federal law requires that they demonstrate reasonable expectations of available funding. [11]

POLICY IMPLICATIONS

The simple examples described in this article illustrate the potential for creating significantly more robust regional economies by strategically improving transit or encouraging more compact urban development. Households can benefit from greater mobility — easier access to more jobs with shorter commute times and less congestion. Firms can benefit from a larger skilled labor pool and by the boost to productivity that tends to accompany the growth of metropolitan areas.

What compact urban design can accomplish for cities can be mirrored by better rural planning practices, as well.[12] Compact development in rural areas preserves open space and retains the lifestyle that prior residents enjoyed and new residents seek. Consolidating new growth within existing rural villages and towns could reduce the number and scale of MSAs, such as Salisbury, and could increase the efficiencies (and thus lower the cost) of providing fixed-rail transit from East Stroudsburg into New York City. ◼

NOTES

[1] On the basis of its 2010 population estimate, Franklin County was delineated by the OMB as the Chambersburg–Waynesboro, PA, MSA — a promotion from its prior status as a micropolitan statistical area. In turn, commuting patterns tied Franklin County to the Hagerstown, MD, MSA, and thus with the combined statistical area (CSA) designated as the Washington–Baltimore–Arlington, DC–MD–VA–WV–PA CSA.

[2] For a look at how baseball allegiances often mirror commuting ties, see the fascinating *New York Times* interactive graphic.

[3] In its 2010 notice of new criteria for delineating metropolitan statistical areas, the OMB states that "the general concept of a metropolitan statistical area is that of an area containing a large population nucleus and adjacent communities that have a high degree of integration with that nucleus."

[4] Other significant "acquisitions" by large CSAs of far-flung Third District MSAs included Atlantic City, MD; Ocean City, MD; and Dover, DE, by the Philadelphia–Reading–Camden, PA–NJ–DE–MD CSA. Reading, PA, and Vineland, NJ, continued to be included. Both Atlantic City and Ocean City have been part of prior incarnations of the Philadelphia CSA. East Stroudsburg and the Allentown–Bethlehem–Easton MSAs were absorbed by the New York–Newark, NY–NJ–CT–PA CSA.

[5] After the 2000 census, Wicomico qualified as an MSA, Sussex and Worcester qualified as micropolitan statistical areas, and Somerset was ineligible as a CBSA on its own. However, Somerset had enough residents commuting into Wicomico to be considered an outlying county of the small, largely rural MSA.

[6] Wicomico's population grew by over 14,000 people (17 percent) to reach a total population of 98,733 in 2010.

[7] The Salisbury urbanized area includes an additional 239 people in neighboring Somerset County, MD.

[8] Delmar's motto is "The little town too big for one state."

[9] Long-distance commuters are defined here as those who commute 45 minutes or more one way. This metric allows historical comparisons with 1980 and 1990, when commutes were shorter. In 2013, 22.5 percent of East Stroudsburg residents commuted 60 minutes or more, compared with 8.4 percent for the nation.

[10] In addition to the time spent commuting, researchers have associated long commutes with greater incidences of neck and back pain, obesity, worry, even divorce. See the articles by Anette Haas and Liv Osland, and Erika Sandow. Alois Stutzer and Bruno Frey found "a large negative effect of commuting time on people's satisfaction with life" after compensating for offsetting benefits, such as higher wages and lower housing costs. The paradox persisted even after accounting for potential frictions, benefits to other household members, and other explanations. Whether their extreme commute reflects a voluntary choice or one imposed by life events, these commuters represent one manifestation of the victims of a culture that Philip Slater cautioned against in his 1960s book, *The Pursuit of Loneliness*.

[11] Passenger rail service from the Poconos to New York City and to Philadelphia operated for nearly 100 years before ending in the 1960s. The Lackawanna Railroad established eight stations in Monroe County. In 1881, five trains departed from New York City daily for the Poconos.

[12] See Randall Arendt's *Rural by Design*.

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Over-the-Counter Swaps – Before and After Reform

BY MICHAEL SLONKOSKY

One of the landmark events of the financial crisis was the collapse and bailout of insurer AIG and the bailout of many large banks to which it had sold credit default swaps (CDS), including Goldman Sachs ($12.9 billion in swaps), Société Générale ($12 billion), and Deutsche Bank ($12 billion).[1] One lesson policymakers drew from this crisis was that financial firms could build up huge risk exposures essentially hidden from the view of regulators in over-the-counter (OTC) derivatives markets. The Dodd–Frank Act sought to shift most derivatives trading from an unregulated and opaque chain of bilateral deals to trades carried out in transparent, central marketplaces under the watchful eye of regulators. As a result, U.S. regulators have spent nearly five years writing and revising regulations governing OTC derivatives. In the U.S., the rulemaking is nearly complete, and market participants have moved a significant share of their business toward centralized trading and settlement.[2] European regulators' rulemaking process should be substantially completed by 2016.

Now that the main elements of the new regulations can be described, let's see how a simplified trade would be typically carried out by a fictional set of institutions both before and after the reform.[3] First Bank is a large dealer bank that buys and sells securities and derivatives. High Yield (HY) is a mutual fund that has a large portfolio of junk bonds. HY wants to hedge against the risk of a downturn in the junk bond market.

BEFORE THE REFORM

First Bank sells HY a swap based on an index that is dependent on the value of a basket of junk bonds. The terms of the swap say that First Bank makes payments to HY if the value of the index falls and vice versa if the index rises. The offer that First Bank makes to HY for the swap includes the price that HY must pay to First Bank for this deal as well as what collateral HY must post in case HY were to default on its obligations. In the OTC market, collateral is referred to as margin, which may take the form of cash or other types of securities.[4] By contrast, a large dealer bank such as First Bank might post no margin at all. The terms of this agreement are completely private, as the counterparties — the participants in this deal — do not announce the terms of their deal in any public forum.

Now suppose that First Bank does not want to take on all of the risk of junk bond prices falling and being forced to make payments to its customer HY. So, First Bank finds another customer, say dealer bank Second Bank, which is bullish on the likelihood of junk bond prices skyrocketing and is willing to buy the swap. As is common in trades between dealer banks, neither party posts margin.

Let's stop here and follow the money: If junk bond prices fall, Second Bank makes payments to First Bank, and First Bank makes payments to HY.[5] What do we notice about these transactions?

First, all terms of the agreement, including margin requirements, are negotiated bilaterally, and the risks to all counterparties depend on First Bank and Second Bank's risk controls. What happens if junk bond prices collapse? Second Bank's bet on a price boom has not panned out,

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so it is contractually required to make payments to First Bank. But Second Bank has not posted any margin that can be seized by First Bank. Thus, First Bank may be unable to make its contractual payments to HY, which is also out of luck because First Bank has not posted any margin, either. This knock-on chain of defaults is one type of what financial economists call *contagion*. Of course, this example is too simple. Large dealer banks are engaged in thousands of transactions and, typically, no single pair of trades will really count for much. But if lots of financial firms are either hedging or taking large bets on the junk bond market, then we are talking about real money!

Second, the market is opaque. Other market participants — let alone regulators — have no straightforward way to learn the terms of the deals that First Bank or HY have made, or even to know that First Bank and HY have actually made a deal. This information could be important to potential customers deciding whether they want to do business with First Bank or HY.[6] Furthermore, HY itself has no way of knowing that by buying protection against a decline in the junk bond market, it has become exposed to the risk of Second Bank defaulting. But HY's ignorance of the risk it is taking on when it trades with First Bank is not the only problem. When junk bond prices plummet, other market participants start worrying about who is exposed to the shock. If market participants suspect that Second Bank is exposed, they may pull back from doing business with First Bank or HY.

AFTER THE REFORM

The regulations impose changes in how swaps are cleared, traded, and reported.[7] There are actually two sets of regulations, one for *standardized* swaps and another for *nonstandardized* (or customized) swaps. An example of a nonstandardized swap is a CDS on a particular firm, a so-called *bespoke CDS*, or any swap traded by only a few market participants. Standardized swaps are ones used by many firms — for example, our CDS on a high-yield bond index. These types of swaps will be moved to central platforms, which include well-known exchanges such as the Chicago Mercantile Exchange, Inc.[8]

How standardized swaps are regulated. *Clearing.* Let's return to our initial example. For a moment, put aside considering precisely how prices are determined and how parties are matched to each other and just assume that HY trades with First Bank and that First Bank trades with Second

Bank. Standardized swaps must be *centrally cleared*. This means that to execute these trades, First Bank and Second Bank must be members of a central counterparty that clears high-yield index swaps.[9]

Let's call our central counterparty Counterparty California ("Risk checks in, but it never leaves"), or CC. In this type of arrangement, CC guarantees the trades of each of its members. First Bank and Second Bank do not actually contract with each other. Instead, First Bank sells the swap to CC, and CC sells the swap to Second Bank. CC becomes the counterparty to every trade.

How can adding another link in the chain help? The most important way is that CC is designed to manage risk.[10] CC requires all of its members to post margin and typically requires members to contribute to a reserve fund that can be used in the event that a member defaults. In addition, CC limits the total risk exposure of its members. It imposes

> There are actually two sets of regulations, one for standardized swaps and another for nonstandardized (or customized) swaps.

position limits on its members, such as a limit on the total dollar value of high-yield swaps that First Bank can sell. CC also nets offsetting contracts among its members, thereby reducing each member's exposure to others.[11] Third, CC has formal procedures to handle defaults by its members. For example, if junk bond prices fall and Second Bank is unable to meet its contractual payments, CC may auction off the contract to its other members and reimburse First Bank for any losses, first from Second Bank's margin account and second from the reserve fund. Finally, CC is regulated by the Commodity Futures Trading Commission (CFTC). Indeed, it may receive special regulatory attention as a systemically important financial institution.[12]

Trading. Now let's go back a step and ask about how counterparties are matched and how prices are determined. The regulations require that the swap be executed via one of two types of trading platforms. One type is a centralized exchange called a designated contract market. A real-world example of such an exchange is Bloomberg. Exchanges execute trades through a *central limit order book*, which publicly lists bids and offers and uses some well-defined mechanism to match them.[13] For example, First Bank posts the price at

which it agrees to buy the swap, and Second Bank posts the price at which it agrees to sell, and they are matched electronically according to some well-defined rule. In this way, HY can see whether it is getting a good deal from First Bank — if Second Bank is willing to buy the contract from First Bank at a much better price than First Bank was willing to pay, HY will not be happy — and other market participants (and the CFTC) can learn a lot about supply and demand conditions in this market.

A second possibility is that First Bank and Second Bank are members of a new type of entity called a swap execution facility (SEF) along with a number of other dealer banks and other large participants. Although swaps may be traded using a central order limit book, the SEF is permitted to use an alternate mechanism to ensure that HY can learn whether it got a good deal from First Bank. In addition to its own offer price, First Bank must quote HY offers from at least two other members of the SEF.[14]

Reporting. First Bank and Second Bank must report the initial primary terms of the trade and continue to provide information about any changes in the contract over time. These terms must be reported to a swaps data repository (SDR), which makes some of this information public (sometimes with a delay) and some of this information available only to the CFTC.[15] So, the CFTC has extensive information on the derivatives exposures of individual firms and sectors.

How nonstandardized swaps are regulated. Now consider that HY has taken a particularly large position in a single firm and wishes to hedge against the possibility of a ratings downgrade or a default by that firm. Unlike the index swap, this bespoke CDS contract would be regulated by the Securities and Exchange Commission (SEC) as a *security-based swap.* More generally, if a swap is not sufficiently standardized or not in high enough demand to be centrally cleared, it can still be traded bilaterally. The trade is executed much as it was before the new regulations, but with some important differences.[16]

Most important, under the proposed rules, HY and First Bank are not free to choose their own margin requirements. Unlike margin requirements for standardized swaps, which are set by the clearing houses, the proposed margin requirements for nonstandardized swaps are written into the regulations under the SEC's regulatory purview. The proposed regulatory requirements are quite detailed, imposing minimum amounts for particular classes of swaps, and they

are designed to be conservative. For example, both dealer First Bank and mutual fund HY would have to post margin, since both swaps dealers and financial firms must post margin.[17] However, if HY were a large agribusiness firm seeking to hedge the risk of default by a supplier, regulations require only First Bank to post margin — although First Bank itself might require HY to post margin for it to be willing to do business with HY.

Furthermore, the types of securities that can be posted as margin are restricted. The firms can post cash or U.S. Treasury securities freely, but less liquid securities, such as corporate bonds, would require a *haircut.* That is, per dollar, a corporate bond would contribute only 80 cents toward the margin requirement. In addition to the margin requirements, First Bank will have to report information about the trade to an SDR.

SOME CRITICISMS OF THE REGULATIONS

The main goal of this article is to be descriptive, but let me conclude with some of the more significant criticisms that economists and other analysts have leveled at the new regulatory framework. Probably most fundamentally, some critics view the regulations as a costly response to a problem that doesn't exist. For example, Peter Wallison has argued that OTC derivatives played only a minor role in the financial crisis. Many commentators have noted that central clearing concentrates risk at large clearing organizations. This concentration of risk poses a challenge for regulators such as the CFTC and SEC, which have not traditionally focused on safety and soundness concerns. As a result, the concentration of risk at a few institutions raises concerns for critics of Dodd–Frank's resolution mechanism for systemically important financial institutions.[18]

In addition, the Dodd–Frank Act exempts foreign exchange swaps and forwards from the new regulatory framework.[19] Darrell Duffie has argued persuasively against the decision to exempt foreign exchange derivatives from the regulation, and John Hull argues that nearly all derivatives, not just standardized derivatives, can be centrally cleared. Also, some view the introduction of new futures contracts that are close substitutes for swaps as an example of *regulatory arbitrage,* in which traders innovate to avoid costly regulations in swaps markets and shift transactions to less closely regulated venues.[20]

NOTES

[1] A CDS is a type of insurance contract in which the seller pays the buyer when the credit risk of a security or group of securities rises. It is just one type of a wide range of derivative contracts grouped under the general term *swaps* for regulatory purposes.

[2] In the U.S., mandatory centralized trading for one group of swaps began in February 2014. At the end of 2014, over half of interest rate swaps and over 80 percent of credit default swaps were trading on centralized platforms.

[3] In this article, I can go over only the basics, as no single rulemaking document gives a complete account of the U.S. regulations. The Commodity Futures Trading Commission's website provides links to all of its rulemaking. Davis Polk's memorandum is a readable account of the regulations as of March 2013.

[4] In this article, I gloss over a lot of details about margin. For those interested, the Bank for International Settlements defines margin at http://www.bis.org/cpmi/glossary_030301.pdf.

[5] Actually, Second Bank is unlikely to wish to take a large bet like this and will search for customers willing to bet that junk bond prices rise, but that would only complicate the example.

[6] Knowing the terms of the deal might also be important to market participants who want to engage in similar trades but don't want to get a bad deal.

[7] The Securities and Exchange Commission (SEC) has jurisdiction over security-based swaps, or swaps based on individual stocks or bonds or narrowly focused indexes. The Commodity Futures Trading Commission (CFTC) has jurisdiction over all other swaps such as those based on broad securities indexes and government securities. The CFTC and SEC will share rulemaking authority over mixed swaps, or swaps that could fit into either category.

[8] As I will make clear, the regulations are written so that platforms might use a wide variety of trading mechanisms, although regulators expect most standardized transactions to migrate to the existing exchanges. But whatever the precise trading mechanism, the central platforms must clear all trades according to standardized rules.

[9] The regulation refers to central counterparties as derivatives clearing organizations (DCOs). The Chicago Mercantile Exchange is an example of a real-world DCO. The regulation refers to members of a DCO as a futures commission merchant. In this article, I assume that all customer swaps are intermediated by dealer banks. In fact, larger customers may be granted direct access to central clearing and trading mechanisms via certain types of agency agreements with dealer banks.

[10] Viral Acharya and Alberto Bisin demonstrate theoretically that from society's standpoint, bilateral trading can lead to too much risk.

[11] Imagine that First Bank and Second Bank have a second deal in which Second Bank's customer is hedging against the decline in junk bond prices and subsequently sells the swap to First Bank. If the contracts are for the same dollar amount, then while First Bank and Second Bank's gross exposure to each other is doubled, their net exposure to each other is actually zero.

[12] For example, CFTC regulations require CC to have risk mitigation techniques sufficient to withstand the failure of one or two clearing members and their affiliates, depending on how risky CC's profile is and on whether CC is designated systemically important in multiple jurisdictions. Currently, eight institutions are designated financial market utilities that are systemically important. For example, the CFTC is the primary regulator of Chicago Mercantile Exchange, Inc. and ICE Clear Credit, L.L.C.

[13] The regulations do not prescribe a particular method for matching orders.

[14] This system is called a *request for quote* system.

[15] The reporting delay and the division between public and nonpublic information are intended to balance the benefits of transparency and the need to monitor any abusive practices against ensuring that traders have an opportunity to keep trades secret long enough to make a profit. For example, large trades, known as *block trades*, are reported with a lag to give traders a chance to make some profit on the trade.

[16] The rules for nonstandardized swaps have not yet been finalized. Here, I describe the proposed rules as of September 2015. The most recent version of the SEC's proposed margin requirements for nonstandardized swaps can be found at https://www.sec.gov/rules/proposed/2012/34-68071.pdf.

[17] Alternatively, First Bank may use its own model for determining margin requirements, but this model must meet the specifications of the SEC.

[18] David Skeel critically examines Dodd–Frank's resolution scheme for systemically important institutions and proposes an alternative.

[19] A forward is a nonstandardized contract between two parties to buy or sell an asset at a specified future time at a price agreed upon beforehand.

[20] See the illuminating exchange between Robert Litan and Darrell Duffie about *futurization* of swaps, in which traders have designed futures contracts that are essentially identical to the regulated swaps contracts.

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RESEARCH RAP

Visit our website for more **abstracts** and **papers** of interest to the professional researcher produced by economists and visiting scholars at the Philadelphia Fed.

IMPACT OF UNCONVENTIONAL MONETARY POLICY ON FIRM FINANCING CONSTRAINTS: EVIDENCE FROM THE MATURITY EXTENSION PROGRAM

This paper investigates the impact of unconventional monetary policy on firm financing constraints. It focuses on the Federal Reserve's maturity extension program (MEP), which was intended to lower longer-term rates and flatten the yield curve by reducing the supply of long-term government debt. Consistent with those models that emphasize bond market segmentation and limits to arbitrage, around the MEP's announcement, stock prices rose most sharply for those firms that are more dependent on longer-term debt. These firms also issued more long-term debt during the MEP and expanded employment and investment. These responses are most pronounced for those firms with stronger balance sheets. There is also evidence of "reach for yield" behavior among some institutional investors, as the demand for riskier debt also rose during the MEP. The authors' results suggest that unconventional monetary policy may have helped to relax financing constraints and stimulate economic activity in part by affecting the pricing of risk in the bond market.

Working Paper 15–30. Nathan Foley-Fisher, Federal Reserve Board; Rodney Ramcharan, University of Southern California; Edison Yu, Federal Reserve Bank of Philadelphia.

DISCLOSURE OF STRESS TEST RESULTS

Should regulatory bank examinations be made public? Regulators have argued that the confidentiality of the examination process promotes frank exchanges between bankers and examiners and that public disclosure of examination results could have a chilling effect. The author examines the tradeoffs in a world in which examination results can be kept confidential, but regulatory interventions are observable by market participants, as they typically are for stress tests. Inducing banks to communicate truthfully requires regulators to engage in forbearance, which is priced

into banks' uninsured debt and raises the costs of inducing truthful communication. Regulators that disclose exam results bear higher monitoring costs and impose excessive capital requirements because interventions are not as sensitive to underlying risks. My model predicts that disclosure is optimal when the regulator's model is relatively inaccurate.

Working Paper 15–31. Mitchell Berlin, Federal Reserve Bank of Philadelphia.

THE SYSTEM OF NATIONAL ACCOUNTS AND ALTERNATIVE ECONOMIC PERSPECTIVES

Brent Moulton and Nicole Mayerhauser (2015) point out that, for more than 50 years, economists have featured the concept of human capital in their models of labor, growth, productivity, and distribution of income. The authors recommend the addition to the System of National Accounts (SNA) of supplemental person-level accounts: i.e., a System of Person Accounts (SPA). They see this as the best way of recognizing the processes of human capital creation as well as related issues of how income is distributed among individuals and families. The authors argue that this change would support three different perspectives from which economic activity can be viewed: (1) a current period outcomes perspective, (2) a risky possibilities perspective, and (3) a resources perspective. Moreover, these gains could be realized without changing the SNA in any substantial respects.

Working Paper 15–32. Alice O. Nakamura, University of Alberta; Leonard I. Nakamura, Federal Reserve Bank of Philadelphia.

FOREIGN COMPETITION AND BANKING INDUSTRY DYNAMICS: AN APPLICATION TO MEXICO

The authors develop a simple general equilibrium framework to study the effects of global competition on banking industry dynamics and welfare. They apply the framework to the Mexican banking industry, which under-

went a major structural change in the 1990s as a consequence of both government policy and external shocks. Given the high concentration in the Mexican banking industry, domestic and foreign banks act strategically in the authors' framework. After calibrating the model to Mexican data, the authors examine the welfare consequences of government policies that promote global competition. They find relatively high economywide welfare gains from allowing foreign bank entry.

Working Paper 15–33. Dean Corbae, University of Wisconsin–Madison, National Bureau of Economic Research; Pablo D'Erasmo, Federal Reserve Bank of Philadelphia.

HEALTH-CARE REFORM OR LABOR MARKET REFORM? A QUANTITATIVE ANALYSIS OF THE AFFORDABLE CARE ACT

An equilibrium model with firm and worker heterogeneity is constructed to analyze labor market and welfare implications of the Patient Protection and Affordable Care Act, commonly called the Affordable Care Act (ACA). The authors' model implies a significant reduction in the uninsured rate from 22.6 percent to 5.6 percent. The model predicts a moderate positive welfare gain from the ACA because of the redistribution of income through health insurance subsidies at the exchange as well as the Medicaid expansion. About 2.1 million more part-time jobs are created under the ACA at the expense of 1.6 million full-time jobs, mainly because the link between full-time employment and health insurance is weakened. The model predicts a small negative effect on total hours worked (0.36 percent), partly because of the general equilibrium effect.

Working Paper 15–34. Makoto Nakajima, Federal Reserve Bank of Philadelphia; Didem Tüzemen, Federal Reserve Bank of Kansas City.

EXCESS RESERVES AND MONETARY POLICY NORMALIZATION

In response to the Great Recession, the Federal Reserve resorted to several unconventional policies that drastically altered the landscape of the federal funds market. The current environment, in which depository institutions are flush with excess reserves, has forced policymakers to design a new operational framework for monetary policy implementation. The authors provide a parsimonious model that captures the key features of the current federal funds market, along with the instruments introduced by the Federal Re-

serve to implement its target for the federal funds rate. The authors use this model to analyze the factors that determine rates and volumes as well as to identify the conditions such that monetary policy implementation will be successful. They also calibrate the model and use it as a quantitative benchmark for applied analysis, with a particular emphasis on understanding how the market is likely to respond as policymakers raise the target rate.

Working Paper 15–35. Roc Armenter, Federal Reserve Bank of Philadelphia; Benjamin Lester, Federal Reserve Bank of Philadelphia.

GENTRIFICATION AND RESIDENTIAL MOBILITY IN PHILADELPHIA

Gentrification has provoked considerable debate and controversy about its effects on neighborhoods and the people residing in them. This paper draws on a unique large-scale consumer credit database to examine the mobility patterns of residents in gentrifying neighborhoods in the city of Philadelphia from 2002 to 2014. The authors find significant heterogeneity in the effects of gentrification across neighborhoods and subpopulations. Residents in gentrifying neighborhoods have slightly higher mobility rates than those in nongentrifying neighborhoods, but they do not have a higher risk of moving to a lower-income neighborhood. Moreover, gentrification is associated with some positive changes in residents' financial health as measured by individuals' credit scores. However, when more vulnerable residents (low-score, longer-term residents, or residents without mortgages) move from gentrifying neighborhoods, they are more likely to move to lower-income neighborhoods and neighborhoods with lower values on quality-of-life indicators. The results reveal the nuances of mobility in gentrifying neighborhoods and demonstrate how the positive and negative consequences of gentrification are unevenly distributed.

Working Paper 15–36. Lei Ding, Federal Reserve Bank of Philadelphia; Jackelyn Hwang, Princeton University; Eileen Divringi, Federal Reserve Bank of Philadelphia.

A TRACTABLE CITY MODEL FOR AGGREGATIVE ANALYSIS

An analytically tractable city model with external increasing returns is presented. The equilibrium city structure is either monocentric or decentralized. Regardless of which structure prevails, intracity variation in endogenous vari-

ables displays exponential decay from the city center, where the decay rates depend only on parameters. Given population, the equilibrium of the model is generically unique. Tractability permits explicit expressions for when a central business district (CBD) will emerge in equilibrium, how external increasing returns affect the steepness of downtown rent gradients, and how wages and welfare vary with population. An application to urban growth boundary is presented.

Working Paper 15–37. Satyajit Chatterjee, Federal Reserve Bank of Philadelphia; Burcu Eyigungor, Federal Reserve Bank of Philadelphia.

AGENCY AND INCENTIVES: VERTICAL INTEGRATION IN THE MORTGAGE FORECLOSURE INDUSTRY

In many U.S. states, the law firms that represent lenders in foreclosure proceedings must hire auctioneers to carry out the foreclosure auctions. The authors empirically test whether processing times differ for law firms that integrate the mortgage foreclosure auction process compared with law firms that contract with independent auction companies. They find that independent firms are able to initially schedule auctions more quickly, but when postponements occur, they are no faster to adapt. Since firms schedule the initial auction before contracting, independent auction companies have an incentive to conform to the law firms' schedules in order to secure the contracts. The authors argue that this is evidence of a cost of integration stemming from poorly aligned incentives within the firm.

Working Paper 15–38. Lauren Lambie-Hanson, Federal Reserve Bank of Philadelphia; Timothy Lambie-Hanson, Haverford College.

BANKING PANICS AND PROTRACTED RECESSIONS

This paper develops a dynamic model of bank liquidity provision to characterize the ex post efficient policy response to a banking panic and study its implications for the behavior of output in the aftermath of a panic. It is shown that the trajectory of real output following a panic episode crucially depends on the cost of converting long-term assets into liquid funds. For small values of this liquidation cost, the recession associated with a banking panic is protracted. For intermediate values, the recession is more severe but short lived. For relatively large values, the contemporaneous decline in real output in the event of a panic is substantial but followed by a vigorous rebound in real activity above the long-run level. The author argues that these theoreti-

cal predictions are consistent with the observed disparity in crisis-related output losses.

Working Paper 15–39. Daniel Sanches, Federal Reserve Bank of Philadelphia.

WHO IS SCREENED OUT OF SOCIAL INSURANCE PROGRAMS BY ENTRY BARRIERS? EVIDENCE FROM CONSUMER BANKRUPTCIES

Entry barriers into social insurance programs will be effective screening devices if they cause only those individuals receiving higher benefits from a program to participate in that program. We find evidence for this by using plausibly exogenous variations in travel-related entry costs into the Canadian consumer bankruptcy system. Using detailed balance sheet and travel data, we find that higher travel-related entry costs reduce bankruptcies from individuals with lower financial benefits of bankruptcy (unsecured debt discharged, minus secured assets forgone). When compared across filers, each extra kilometer traveled to access the bankruptcy system requires approximately $11 more in financial benefits from bankruptcy.

Working Paper 15–40. Vyacheslav Mikhed, Federal Reserve Bank of Philadelphia; Barry Scholnick, University of Alberta School of Business.
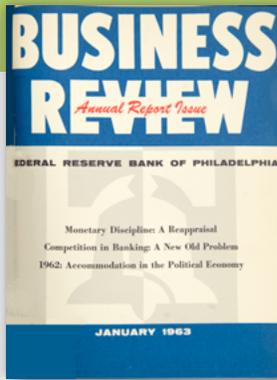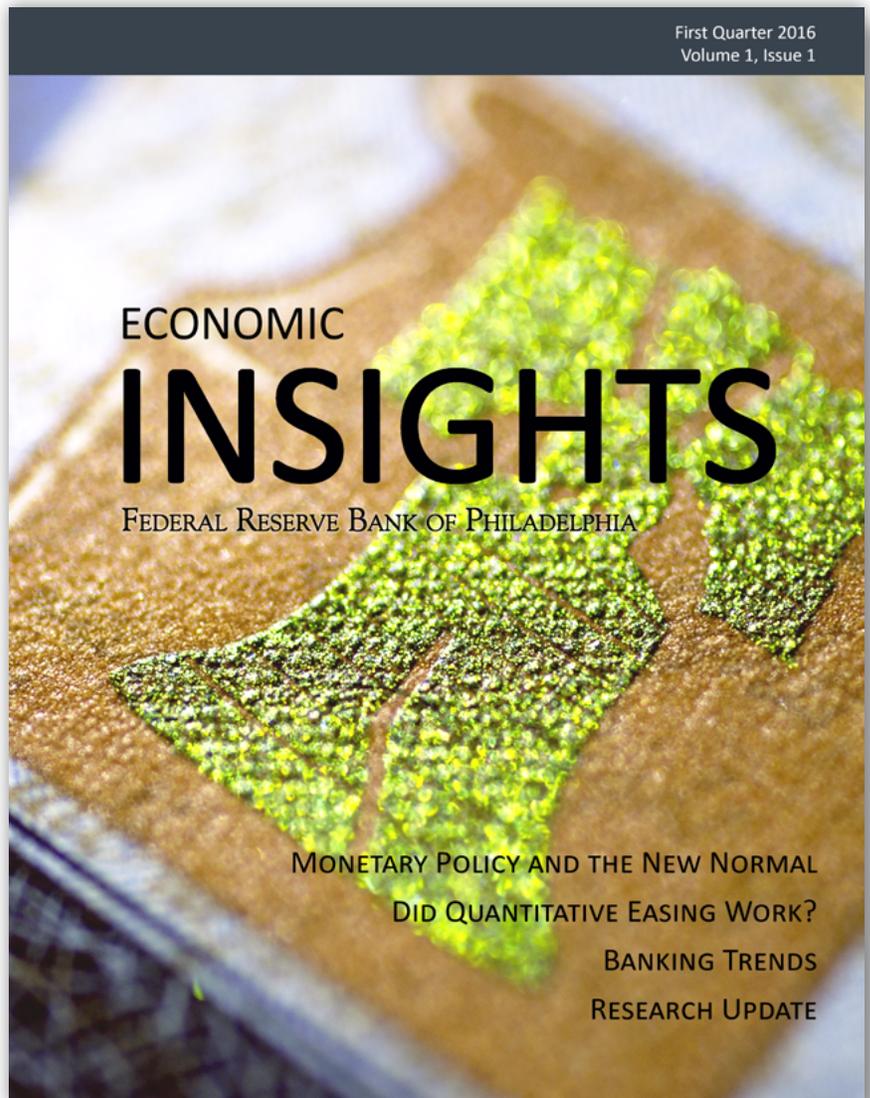
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