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Foreclosure's Price-Depressing Spillover Effects on Local Properties: A Literature Review

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ABSTRACT:
The costs of foreclosure often spill over from foreclosed properties to other nearby properties. This short paper reviews some of the research on foreclosure's price-depressing impact on sales of nearby properties, only one of several forms of spillover effects. The studies reviewed here focus on various cities, use different datasets and methodologies, employ different assumptions, and cover different time periods. Their conclusions about foreclosure effects range from reducing nearby properties' sales value by as little as 0.9% to as much as 8.7%. Research also shows that negative spillover effects tend to diminish with distance and time, as does the marginal impact of each additional foreclosure. This paper also presents two studies with rough estimates on New England communities' possible losses from foreclosures' spillover effects on nearby property values.

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Discussions on foreclosure prevention and intervention often focus on the occupants of the foreclosed properties. Nonetheless, research has shown that the harm caused by foreclosures frequently goes beyond the physical walls of foreclosed homes, devastating the local communities as well. Foreclosure's spillover effects, often referred to as (negative) externalities, vary in form: lowering nearby property values, reducing the local property tax base, increasing blight and crime, disrupting social ties, etc. An early survey of major U.S. cities' leaders shows that destruction of housing/neighborhood vitality, rising crime rates, and reduced commercial activity are the top concerns for foreclosed/vacant properties' spillover effects. (Accordino and G. Johnson, 2000) Despite this variety of spillover effects, this review focuses on foreclosures' price-depressing spillover effects on nearby properties.

Economic Reasoning and Early Research

Foreclosures could negatively impact nearby housing values via three primary channels: blight, valuation, and supply. Prior to entering foreclosure on their properties, owners with delinquent mortgages usually have limited financial means to properly maintain and/or upgrade their houses. This in turn frequently leads to physical blight because of the declining housing conditions. After the delinquent owners foreclose, such properties may be vacant for some time, which attracts vandalism and crime, further exacerbating the blight, making the neighborhood undesirable for potential homebuyers. Secondly, foreclosed properties are usually sold at a significant discount. Property is appraised partially on the basis of sales of nearby comparable properties, and the discounted sales of foreclosed properties could therefore lower such valuation benchmarks. Lastly, a high concentration of foreclosures could potentially increase the local supply of available properties and lower the values of nearby homes, especially in areas with a stable housing demand.

Foreclosures could negatively impact nearby housing values via three primary channels: blight, valuation, and supply.

Early surveys of Minneapolis area foreclosure prevention programs estimate that a foreclosed home could cost neighborhoods as much as $10,000, mostly in the form of lower housing values. (Moreno, 1995) Another early study uses 1992-1994 property tax delinquency data in Cleveland as a proxy for foreclosure and concludes that, on average, a

residential property's sale price decreases by $788 when the "nearby area" has one percentage point increase in property tax delinquency—while holding other conditions constant. (Simons and et al, 1998) Nonetheless, "nearby property" in this study is defined as being on the same page of the county auditor's map book as the foreclosed property. This definition is rather problematic because of the lack of spatial consistency. Adjacent properties could be on two separate pages by arbitrary page division. That being said, this is one of the early studies using mathematical models to quantify the spillover effects of foreclosures.

Recent Improved Research and Findings

As the risk of foreclosure began to increase, two 2006 studies signaled a new approach to understanding foreclosures' spillover effects and used more sophisticated mathematical models. Shlay and Whitman find that the presence of abandoned properties in Philadelphia depresses the prices of properties located within 150 feet by $7,627, but this negative effect diminishes with distance. (Shlay and Whitman, 2006) Using a similar regression model, a widely cited study by Immergluck and Smith examines foreclosures' spillover impacts on Chicago home sales in 1999. It estimates that, on average, a foreclosure within one-eighth mile of a single-family home could lower its sale price by 0.9%—holding other conditions constant. (Immergluck and Smith, 2006)

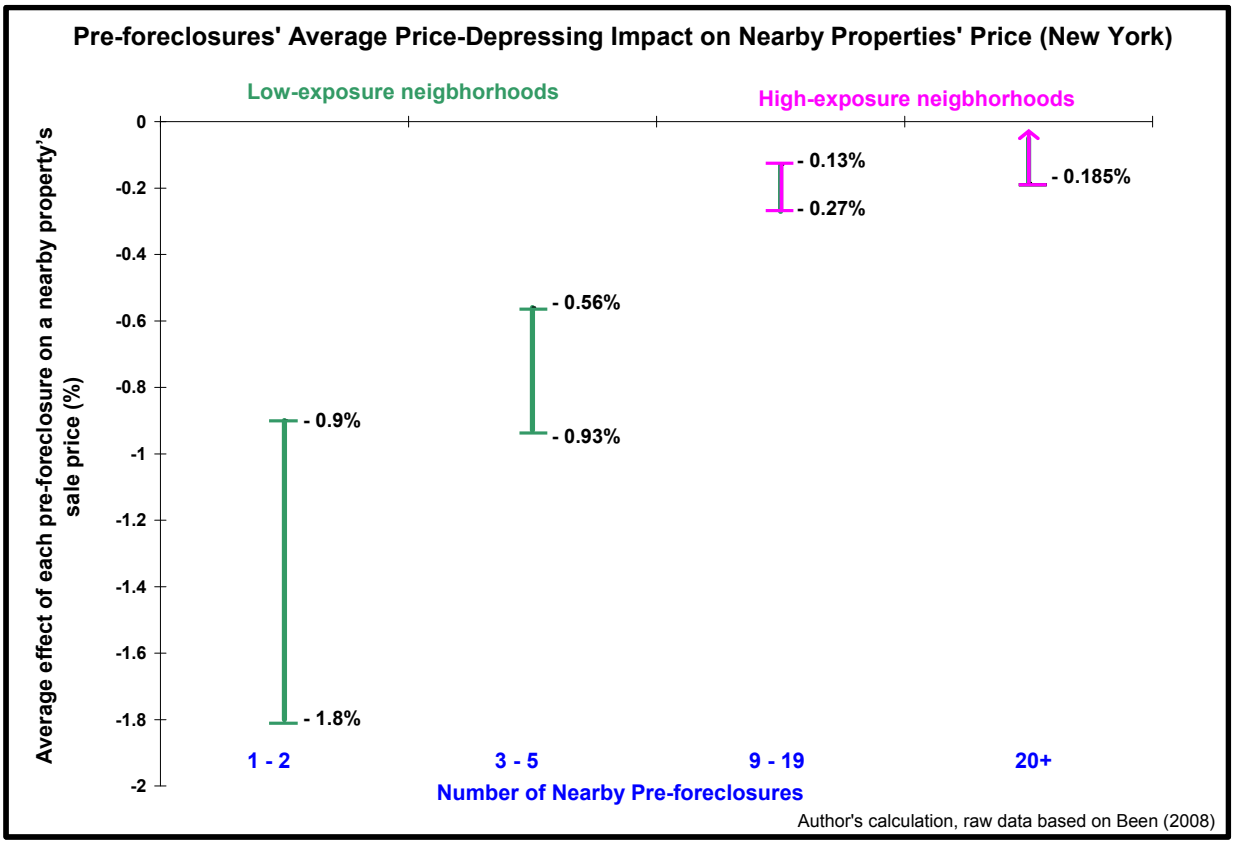
Despite these two studies' pioneering roles in refining the mathematical models to quantify spillover effects, they are subject to some methodological limitations. For instance, possible multicollinearity (i.e., independent variables highly correlated among one another) and reverse causation are either unaddressed or weakly controlled. Discussion on foreclosures' longitudinal and spatial aspects, as well as the nonlinearity of their marginal effects, is very limited or absent. Three recent studies improve on some of these limitations.

Been's research on New York City indicates that additional pre-foreclosures (i.e., properties with pending foreclosure petitions) have diminishing marginal spillover effects. (Been, 2008) This study does not directly quantify the marginal impact of additional pre-foreclosures, but

rather it aggregates its spillover effects by a neighborhood's foreclosure exposure[1] and the number of foreclosure petitions in the area. The diminishing spillover effects could therefore be indirectly illustrated by the declining *average* effect of each pre-foreclosure on a nearby property's sale price as the number of foreclosures increases in the area (see table and chart below).

Neighborhood's exposure to foreclosures [1]	Number of nearby pre-foreclosures	*Total* effects of these pre-foreclosures on a nearby property's sale price	*Average* effect of each pre-foreclosure on a nearby property's sale price [2]
Low Exposure [1]	1 to 2	- 1.8%	- 1.8% to -0.9%
	3 to 5	- 2.8%	-0.93% to -0.56%
High Exposure [1]	9 to 19	- 2.5%	-0.27% to -0.13%
	≥ 20	- 3.7%	≤ -0.185%

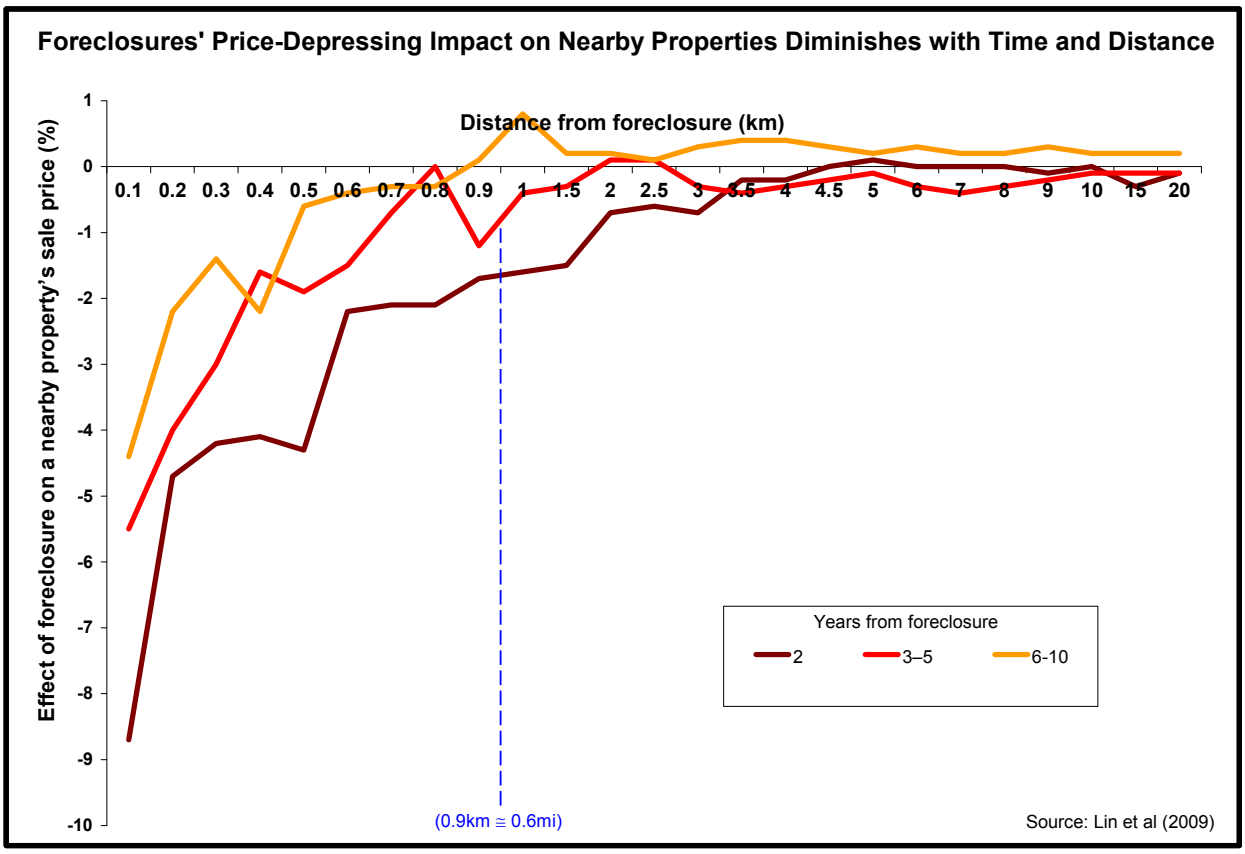
Source: Been (2008) and author's calculation



[1] "Low exposure" here means that the neighborhood's median home sale is within 1,000 feet of only one property with foreclosure petitions; while "high exposure" means more than 15 properties have foreclosure petitions.
[2] Calculated by dividing the "total effects of these pre-foreclosures on a nearby property's sale price" by the "number of pre-foreclosures." Although this method is imperfect, it helps approximate the rough marginal effect of each additional pre-foreclosure.

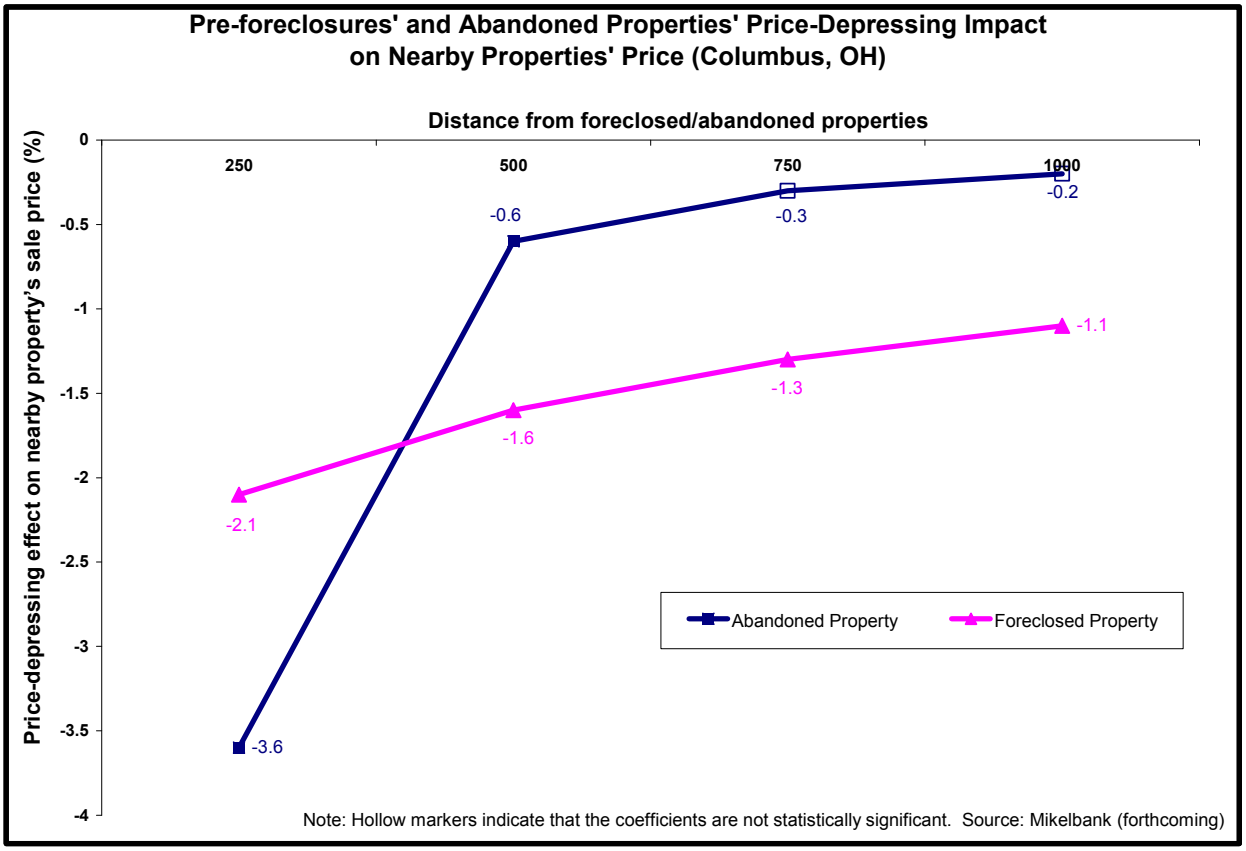
Been's findings suggest the importance of preventing early foreclosures from happening in the first place since they tend to have bigger price-depressing effects.

Although it is not explicit in its intent, Been's study is one of the few that attempt to assess the nonlinearity of foreclosures' marginal effects when the number of pre-foreclosures increases. Its findings suggest the importance of preventing early foreclosures from happening in the first place since they tend to have bigger price-depressing effects on nearby properties.



With an improved model and newer data from Chicago, Lin et al. analyze foreclosure spillover effects with special attention to their longitudinal and spatial aspects. (Lin et al., 2009) Their research shows that such spillover effects tend to be significant within ~0.6 miles and 5 years of foreclosure. The price-depressing effect is most severe (-8.7%) on adjacent properties within 2 years of foreclosure, and it diminishes to as low as -1.7% at about 0.6 miles (0.9km) away (see chart above).

Similarly, the price-depressing effect diminishes with time: it lowers nearby homes' sales price by as much as -8.7% within the first 2 years of foreclosure, and this effect weakens to -5.5% within 3-5 years, and -4.4% after 6 years. Foreclosures have virtually no negative effect beyond ~0.25 miles (0.4km) if the foreclosure is six or more years in the past. Furthermore, this study also shows that the intensity of the spillover effects is closely tied to housing cycles and could be reduced by about half during housing market boom years.



Using 2006 Columbus, Ohio, data, Mikelbank separates the spillover effect of pre-foreclosures from that of vacant/abandoned properties and corrects spatial errors in regression models.[3] Mikelbank concludes that pre-foreclosures' negative impact on nearby homes' sales prices is less than that of vacant/abandoned properties, but it is more spatially persistent (see chart above). For instance, a pre-foreclosure within 250

[3] Spatial errors exist when a regression model does not control for, or controls but with significant deficiency, unmeasured neighborhood influences common to houses in physical proximity.

feet of a property, on average, could impact its sale price by -2.1%—holding other conditions constant—but such impact intensifies to -3.6% for a vacant/abandoned property. Nonetheless, pre-foreclosure's negative impact diminishes to -1.6% (i.e., a reduction of half a percentage point in intensity) as the distance increases to 250-500 feet; while a vacant/abandoned property's negative impact drastically decreases to merely -0.6% at the same distance (i.e., a reduction of three percentage-points in intensity).

Foreclosure Spillover Effects: What They Mean for New England Communities

Despite the fact that these studies focus on different cities, use different methodologies and data sets, employ different assumptions, and cover different time periods, they all confirm that foreclosures not only hurt those individuals losing their homes, but also could depress nearby properties' sales prices. These studies also suggest that foreclosures often tend to have more far-reaching negative spillover impacts spatially and longitudinally compared with other undesirable conditions such as abandoned properties. To combat such negative externalities, it is probably more effective to prevent initial foreclosures from happening since they tend to have more severe price-depressing effects than later foreclosures.

These studies confirm that foreclosures not only hurt those individuals losing their homes, but also could depress nearby properties' sales prices.

The studies all focus on a specific city, so their findings, especially the quantitative conclusions, cannot be generalized for New England, as local housing market conditions and spatial features could critically alter these spillover effects. Nevertheless, two other reports do provide back-of-the-envelope estimates of spillover effects in the region. Both reports use generic multipliers, such as the price-depressing coefficient of -0.9% seen in Immergluck and Smith's Chicago study, which may not fit many local conditions in New England. Therefore, these two reports' estimates are coarse and in these two reports are coarse and require cautious interpretation.

A report by the Center for Responsible Lending (CRL) provides estimates of the price-depressing spillover effects on nearby properties

associated with foreclosures of subprime mortgages originated in 2005 and 2006. CRL's projection is based on 2005-2006 owner-occupied first-lien subprime mortgages—a subset of the subprime loan pool. Because CRL's estimates rely on Home Mortgage Disclosure Act (HMDA) data, it uses high-cost loans as an indicator of subprime, and only includes reported loans required by HMDA regulations (e.g., mostly in metropolitan statistical areas). Lastly, it uses the price-depressing coefficient of -0.9% concluded in Immergluck and Smith's Chicago study to model for all geographies in the United States.

Because of these various limitations, CRL's projections should be interpreted with caution. For instance, instead of using Immergluck and Smith's -0.9% price-depressing coefficient uniformly to approximate every foreclosure's impact, one might take into account Been's findings that each additional foreclosure has a diminishing negative impact. At the higher extreme, the price-depressing impact would be twice as severe (a 1.8% drop in property value) as what CRL's estimate suggests if all of the impacted properties have no more than two foreclosed homes within 1,000 feet. Nonetheless, at the lower extreme, this price-depressing impact would be only one-fifth as severe (a 0.185% drop) compared with CRL's estimate if all of the impacted properties have 20 or more foreclosed homes within 1,000 feet. Because foreclosures have tended to be spatially concentrated, the price-depressing impacts of each additional foreclosure would be in the direction of the lower extreme. For instance, about 50% of the Massachusetts properties with foreclosure petitions and/or foreclosure auctions in 2007 clustered in 50-60 ZIP code areas (i.e., 10%) out of Massachusetts' roughly 500 ZIP code areas.[4] Of course both of these two assumptions are extreme scenarios, but they help demonstrate that an accurate estimate is based on local real estate market and its spatial patterns.

[4] There are more than 500 ZIP codes in Massachusetts, but we excluded the ones that are reserved for P.O. Boxes/institutions (e.g., universities) and those without residential properties. Granted that ZIP code areas vary in size and housing density,, our calculation at least shows that foreclosures are highly concentrated spatially. The raw data are from the Warren Group.

Estimates of 2005-2006 Subprime Foreclosures' Spillover Effects on New England Communities

County/State	Number of Subprime Loans 2005-2006	Proportion of All Loans that are Subprime, 2005-2006	Projected Cumulative Foreclosure Rate on 2005-2006 Subprime Loans	Projected Number of Total Homes Lost to Foreclosure	Number of Neighboring Homes Experiencing Devaluation	Decrease in House Value/Tax Base from Foreclosure Effect ($)	Average Decrease per Housing Unit Affected ($)
Fairfield CT	12,552	19.5%	10.5%	1,318	118,494	424,638,223	3,584
Hartford CT	13,234	24.8%	14.2%	1,879	128,713	260,004,353	2,020
Middlesex CT	1,943	16.8%	14.2%	276	8,872	16,529,626	1,863
New Haven CT	15,299	27.4%	16.0%	2,448	159,366	399,428,512	2,506
New London CT	4,045	22.9%	15.1%	611	20,585	43,140,252	2,096
Tolland CT	1,555	17.7%	14.2%	221	4,988	9,614,145	1,927
Total / Average of CT	**48,628**	**23.0%**	**13.9%**	**6,753**	**441,018**	**1,153,355,110**	**2,615**
Androscoggin ME	1,881	29.1%	13.5%	254	6,840	8,703,989	1,272
Cumberland ME	3,635	17.7%	17.8%	647	20,018	42,929,761	2,145
Penobscot ME	2,526	30.7%	13.3%	336	5,430	6,649,831	1,225
Sagadahoc ME	445	18.8%	17.8%	79	734	1,207,311	1,646
York ME	3,353	20.9%	17.8%	597	9,105	16,497,187	1,812
Total / Average of ME	**11,840**	**22.1%**	**16.2%**	**1,913**	**42,127**	**75,988,080**	**1,804**
Barnstable MA	3,629	18.6%	19.9%	722	20,445	60,950,517	2,981
Berkshire MA	1,166	16.2%	12.0%	140	5,972	8,273,301	1,385
Bristol MA	7,818	20.8%	19.5%	1,525	99,946	321,218,252	3,214
Essex MA	10,505	19.7%	16.9%	1,775	129,095	549,401,455	4,256
Franklin MA	812	19.2%	15.4%	125	2,395	3,643,952	1,521
Hampden MA	8,636	30.8%	15.4%	1,330	80,836	166,366,190	2,058
Hampshire MA	1,094	13.9%	15.4%	168	3,177	7,148,109	2,250
Middlesex MA	13,210	14.5%	16.5%	2,180	201,932	816,181,670	4,042
Norfolk MA	6,544	14.4%	18.5%	1,211	79,181	299,335,942	3,780
Plymouth MA	9,327	22.3%	18.5%	1,725	55,214	210,177,059	3,807
Suffolk MA	8,938	23.1%	18.5%	1,654	231,447	1,831,459,276	7,913
Worcester MA	13,346	23.0%	17.3%	2,309	103,907	246,010,808	2,368
Total / Average of MA	**85,025**	**19.6%**	**17.5%**	**14,864**	**1,013,548**	**4,520,166,531**	**4,460**
Hillsborough NH	5,524	18.8%	14.3%	790	41,289	78,763,927	1,908
Rockingham NH	4,088	17.3%	15.6%	638	10,619	26,152,162	2,463
Strafford NH	1,792	21.9%	15.6%	280	5,720	9,944,156	1,739
Total / Average of NH	**11,404**	**18.6%**	**15.0%**	**1,707**	**57,628**	**114,860,244**	**1,993**
Bristol RI	483	14.4%	19.5%	94	5,065	14,010,606	2,766
Kent RI	4,199	26.4%	19.5%	819	42,040	110,666,338	2,632
Newport RI	764	13.9%	19.5%	149	8,746	27,591,890	3,155
Providence RI	14,642	32.7%	19.5%	2,855	183,453	802,320,325	4,373
Washington RI	1,528	16.7%	19.5%	298	5,119	14,226,120	2,779
Total / Average of RI	**21,616**	**27.5%**	**19.5%**	**4,215**	**244,424**	**968,815,279**	**3,964**
Chittenden VT	1,016	10.8%	15.1%	153	5,001	9,989,651	1,997
Franklin VT	671	20.9%	15.1%	101	1,419	2,230,472	1,572
Grand Isle VT	99	20.8%	15.1%	15	40	73,150	1,836
Total / Average of VT	**1,786**	**13.7%**	**15.1%**	**270**	**6,460**	**12,293,273**	**1,903**
Total / Ave of New England	**180,299**	**12.1%**	**16.5%**	**29,722**	**1,805,205**	**6,845,478,517**	**3,792**

Source: Center for Responsible Lending (2008)

Another report, released by the Majority Staff of the Joint Economic Committee (MSJEC) of the U.S. Congress, takes a different approach from the CRL study. It forecasts the cumulative effects covering the period from the second quarter of 2007 to the end of 2009. It assumes that all foreclosures during this period are entirely a result of subprime loans that were still active as of March 2007—a very coarse assumption. For instance, Mortgage Bankers Association data show that only about 55% to 66% of the foreclosures in New England between Q1 2006 and Q2 2008 are related to subprime mortgages, and subprime mortgages' share in foreclosures has been on the decline since Q2 2007. This means that about one-third to one-half (and possibly more if the current trend continues) of the foreclosures in New England are from prime loans, which MSJEC's estimate does not include. MSJEC's report therefore may have underestimated the number of potential foreclosures. However, in using the price-depressing coefficient of -0.9% from Immergluck and Smith's Chicago study, MSJEC's report may have overestimated because of the limitations of using the -0.9% coefficient as discussed earlier. MSJEC's estimates for the New England region are listed below:

Estimated Impact of Subprime Foreclosures on Property Values and Property Taxes (Q3 2007 – Q4 2009)

State	Estimated Active Subprime Loans	Average Home Value (2007--Q2)	Estimated Total Subprime Fore-closures 3Q07-4Q09	Estimated Cumulative Loss of Property Value (in 2007 dollars)			Estimated Cumulative Loss of Property Taxes (in 2007 dollars)		
				Total	Direct	Neighborhood	Total	Direct	Neighborhood
CT	83,575	$282,815	14,079	$1,405,560,135	$874,646,011	$530,914,124	$19,040,191	$11,848,249	$7,191,941
ME	24,460	$185,475	5,583	$296,733,417	$224,333,232	$72,400,186	$3,076,978	$2,326,224	$750,754
MA	115,780	$323,303	22,292	$3,009,182,395	$1,557,268,422	$1,451,913,973	$25,956,635	$13,432,701	$12,523,934
NH	30,544	$250,101	4,302	$461,256,428	$231,094,893	$230,161,535	$7,534,584	$3,774,915	$3,759,669
RI	26,033	$269,181	5,833	$662,456,460	$328,832,356	$333,624,104	$7,137,593	$3,542,982	$3,594,611
VT	6,289	$202,856	1,316	$73,332,809	$56,894,221	$16,438,588	$1,153,567	$894,979	$258,588

Source: The Majority Staff of the Joint Economic Committee. (2007)

The differences in these two reports' projections result partly from their different objectives, data sets, assumptions, and methodologies. Clearly, it is a challenge to accurately gauge the spillover effects at the local level, given the uniqueness of each real estate market. Furthermore,

lower house values in turn also reduce the net worth of the homeowners and their communities, often limiting their economic mobility and prospects. Such induced effects are not included in the discussion, and it would be difficult to quantify them.

Although the actual extent of foreclosures' spillover effects on New England communities needs further research, all studies examined agree that foreclosures' detrimental impacts are communal. That is why foreclosure prevention and mitigation efforts need to go beyond the physical constraints of individual foreclosed houses and instead embrace a more comprehensive approach aimed at protecting local communities' vitality.

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