Abstract | New regulations on the allocation of social housing recently came into effect in the Netherlands as a result of a state-support complaint filed by institutional investors to the European Commission. At least 90 percent of vacant social housing dwellings has to be allocated to households with a yearly income of less than €34,000 (prize level 2012). This has caused concerns about the availability of housing among (lower-)middle-income households. They can no longer access social housing, and due to the prevalence of social housing and the fiscal favoring of owner-occupied housing, the affordable private rented sector is almost absent in the Netherlands. Thus, currently they rely on the owner-occupied housing market with their restricted financial budgets and might lose out. This study substantiates this assumed 'squeezed middle' problem with empirical data for housing regions in the Netherlands. The adopted spatial analysis method shows to what extent and where lower-middle-income households have access to homeownership in the Netherlands, and how the 'squeezed middle' varies among the Dutch regional housing markets. The spatial analysis indicates that in some regions, there indeed is a group of middle-income households that is 'squeezed.' Yet, the study also reveals that the problem might be more qualitative than quantitative in nature: households may not be able or willing to trade-off location for access to more affordable or more appropriate housing.

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4.1 Introduction
In 1937 (p. 93), Lewis Mumford wrote that social needs should define the city: “social facts are primary, and the physical organization of a city, its industries and its markets, its lines of communication and traffic, must be subservient to its social needs.” Housing infrastructure constitutes an important element in the physical organization of the city, which—according to Mumford—should serve the needs of current and prospective inhabitants. Within this frame, the quality of the housing stock does not only depend on its physical structure and appearance, but it also depends on the extent to which inhabitants can access it. From a citizen’s perspective, housing is adequate if it is both affordable and appropriate for their household. Housing adequacy, including housing affordability, and appropriateness are thus relative concepts depending on households’ means and needs. These concepts may even vary among households with similar characteristics. The premise that a city should provide access to housing for all—including lower-middle-income households—is shared by authors like Lefebvre (1996). Yet, most of the attention in policy and theoretical debates is oriented to the availability of housing among the low-income households (Fainstein, 2010; Uitermark, 2009), although increasingly academics also point to the importance of available and affordable housing for lower-middle-income households like key workers (Peck, 2005; Raco, 2008).

Within the literature, the availability and accessibility of affordable housing in metropolitan areas increasingly receives attention (Chakrabarti & Zhang, 2014; Hananel, 2014).

Internationally, the Netherlands is famous for its provision of affordable housing within cities (Fainstein, 2010; Gilderbloom et al., 2009). In general, social housing associations provide housing for low-income households within the regulated rent system. Due to the new regulations, adopted housing associations need to allocate at least 90 percent of new or vacant social housing dwellings to households with a yearly income of less than €34,000 (price level 2012) (Priemus & Gruis, 2011). The other 10 percent can be allocated to households based on other criteria. These houses can, for example, be allocated to households because of social mixing and cohesion objectives, to very large households with a moderate income, or to households that are being displaced because of urban restructuring. Because social housing rents are regulated and only slightly differentiated based on area average real estate values, they are to a large extent evened out over the country.
Despite the large stock of social housing, it must be realized that the access to social housing often is limited, even for those who qualify for it. Waiting lists for social housing within the regulated rented market are very long, especially in high-demand areas like Amsterdam and Utrecht. Consequently, to a certain extent, low-income households will compete with the lower-middle-income households on the housing market.

Recent research has shown that the emphasis on the least well-off on the housing market in the Netherlands forces middle-income households, who are by definition excluded from social housing, to take more risk and enter owner-occupancy (Schilder & Janssen-Jansen, 2012). Often, they do not qualify for private rented housing as their income is too low in relation to the expensive—and small—stock of private rented housing. Despite their moderate income, they no longer have access to adequate housing (Sol & van der Vos, 2012). Elsinga and Lind (2013) already stated that the middle classes are the main losers of the changed regulation in the Netherlands. Households that are not allowed to access social housing and cannot buy into the owner-occupied market are ‘squeezed.’ However, given the fact that owner-occupied housing prices differ greatly across housing market regions (Neuteboom & Brounen, 2011), it is to be expected there will be huge regional differences with respect to affordable housing accessibility for lower-middle-income households and the degree of ‘squeezedness.’

In urban and housing studies literature, the concept of socio-spatial justice is often used in relation to low-income households. Only recently, the position of lower-middle-income and middle-income households received general political and societal attention. There are only limited empirical data on this ‘squeezedness’ problem and the variation and dissimilarities across the Netherlands and within regions. This hinders the understanding of regional differences in outcomes of the delivery of national policy goals that often have a “one-size-fits-all” appearance. The fact that regional differences in the effects of policy changes could potentially result in policies that have a positive effect in one housing market area, but no or even a negative effect in other housing market areas is under exploration and not adequately dealt with in policy-making. This paper addresses this gap with respect to access to owner-occupancy with the development of a spatial analysis instrument. The aim of this paper was to analyze the existence and size of a ‘squeezed middle’ in different parts of the Netherlands to reveal regional differences in access to affordable owner-occupied housing for lower-middle-income households.
Moreover, this paper extends this analysis with a more in-depth review of the spatial sorting of affordable housing supply within three housing market regions. In the second part of the empirical analysis, the affordable owner-occupied housing supply down to the neighborhood level will be analyzed for three housing market areas. This stepped approach can provide a more nuanced and richer image of the affordable owner-occupied housing accessibility problem. It enables the opportunity to increase understanding of what the accessibility numbers reflect and to what kind of housing and living environments lower-middle-income households still have access. Three questions are central in this article:

1. Is there a ‘squeezed middle’ in different regional housing markets of the Netherlands?
2. How does the accessibility of affordable owner-occupied housing for lower-middle-income households vary over the country?
3. Where and to what kind of housing do lower-middle-income households have access in the affordable owner-occupied housing market?

In the next section, we will provide some background on housing and its position in the Dutch constitution. Then, we will elaborate on the context of affordable housing in the Netherlands. Subsequently, the methodology is described, followed by the analysis and conclusion.

4.2 Context: affordable housing in the Netherlands

Dutch housing policy is—like in many other countries—aimed at improving low-income households’ access to affordable rented housing and at improving homeownership in general. The social housing sector grew rapidly in the post-World War II period. Social housing associations had a central role in fighting housing shortage in this postwar period. Simultaneously, homeownership has been promoted by fiscal policy. The mortgage interest deduction partly caused the increase in owner-occupied housing prices (Tweede Kamer der Staten-Generaal, 2013). It is the interplay of the growing social housing sector—providing housing to a growing part of the population—and the owner-occupied housing subsidies that made the production and renting of private rented housing very unattractive for both market investors and households. Consequently, this sector is almost absent in the Netherlands. In the next paragraphs, we will provide some background on the social rented housing sector, the private rented housing sector, and owner-occupied housing sector.
Social housing sector

The social housing sector in the Netherlands takes up a large 32 percent (2.4 million housing units) of the total housing stock and is the largest in Europe (Pittini & Laino, 2011). Social housing associations are private organizations with a public mandate. These organizations can solely work in the field of housing, with the exception of activities to improve the livability of neighborhoods in which they possess housing and they have to let social housing (housing units with a rent of at most €681 in 2012) with priority to households that qualify for housing subsidy (see the Management Decree Social Housing Sector (BBSH) articles 12 and 13—Rijksoverheid, 2010).

The rents of social housing are strongly regulated through a system of housing valuation (Woningwaarderingsstelsel). The quality of a house is reflected by a total of points assigned to different qualities of the house, like the size of different rooms, whether it is an apartment or a single family unit, etc. The total of points corresponds to a maximum rent. A score of at least 143 points means the maximum rent exceeds the social housing limit. These housing units can be (do not have to be) liberalized and leased out at any rate to new tenants, also to tenants who do not qualify for social housing. The liberalized housing units (rent of at least €664 in 2012) do no longer count as social housing. Rent control does not apply to liberalized dwellings and—although the housing association functions as landlord—these dwellings now belong to the private rented sector. In 2011, so-called scarcity points (Schaarstepunten) were incorporated in the housing valuation system, so the social housing rents would better reflect spatial differences in housing prices. Depending on the average square meter price, 15 or 25 points are added to housing units in the more expensive areas. An increase of one point relates to a maximum rent increase of about €4. This policy resulted in a huge potential to liberalize social housing units and transfer them to the private sector category. Within the private rented sector category, however, the former regulated stock often is the most affordable.

Dutch housing associations are hybrid in nature, as they are private corporations pursuing public goals in a strongly regulated environment, making use of collective infrastructure and their special status in Dutch law. Because of their position as social entrepreneurs and their large amount of assets (housing stock), they were able to compete in the unitary market in which there was no clear divide between the social housing market and the private housing market (Blessing, 2012, 2014; Elsinga & Lind, 2013). The housing
associations could—given their hybrid position—use loans for investments that are collectively backed by all social housing associations and subsequently also government-backed. As a result, they paid a lower interest rate compared to developers who had no access to these guarantees. Besides the provision of social rented housing, many social housing associations also developed housing for the liberalized market (private rented and owner-occupied units). It was in particular this provision of housing to middle-income households that conflicted with state-support regulation of the European Union (Bertram & Helderman, 2008).

Eventually, it was decided that the housing associations could only receive guaranteed loans for the production of social sector housing and no longer for their commercial activities. If a social housing association provides less than 90 percent of the social rented units to households within the primary target group, they are not allowed to receive state subsidies (i.e. the government-backed loans and the possibility to acquire land at below market rates). Moreover, if this is the case, housing associations can be fined. Dwellings of housing associations in the private rented category do not count as social housing.

These new regulations coincided with the breakdown of the Dutch real estate market. The production of new housing units fell by 30 percent between 2009 and 2011 (CBS, 2013). Although social housing associations’ production of units showed a slight increase in 2011, their development of units in the private rented sector dropped enormously. The production of private rented housing by social housing associations is expected to drop from 5,300 units in 2011 to 2,300 units in 2014 (WSW, 2012). The number and share of private rented housing of social housing associations could, however, still increase because part of the social housing stock that becomes available for new renters qualifies for liberalization.

**Private rented sector**

The private rented sector in the Netherlands is very small. In Amsterdam, this sector takes up the largest share with 14 percent, while in most areas the private rented sector does not exceed 5 percent of the total housing stock (figures from WoON2012 dataset; BZK/CBS, 2012). Because of the large—and for decades very dominant—social housing sector, the private rented market remained small and expensive (Priemus & Gruis, 2011; RLI, 2011). The described state aid regulation that restricts the social housing target
THE ‘SQUEEZED MIDDLE’

The ‘Squeezed Middle’ group at households earning no more than €34,000 a year however aims to create a more level playing field for the development of more affordable private rented housing (Eskinasi, de Groot, van Middelkoop, Verwest, & Conijn, 2012). Besides that only a part of the private rented stock will be in financial reach of lower-middle-income households, private landlords often demand an income of four or sometimes even five times the rent. With an income requirement of four times the rent, a household with an income of €34,000 qualifies for houses with a rent up to about €710. With an income of €40,000, a household would qualify for houses with a rent up to about €833. Social housing associations sometimes have less stringent income requirements for their private rented stock. Private rented housing opportunities for lower-middle-income households are therefore very limited, though in some cities with tight housing markets like Utrecht and Amsterdam, the investments of private sectors in affordable private rented housing are growing. Investors, however, only invest in very specific upcoming neighborhoods with not too high land prices and not too much risk. Large parts of these cities and other parts of the country do not attract much private investments in private rented housing; these areas still need to depend (solely) on social housing associations.

**Owner-occupied housing**

The share of owner-occupied housing varies from over 70 percent in more peripheral parts of the Netherlands down to 38.5 percent in Amsterdam (figures from WoON2012 dataset; BZK/CBS, 2012). Mortgage interest paid in the Netherlands is fully deductible from a homeowner’s taxable income. This policy, originally created to prevent income taxation of costs made to realize income, dates back to the beginning of the twentieth century (Haffner, 2002; Rouwendal, 2007). Gross interest payment can be deducted from one’s gross income resulting in significant tax savings for homeowners with a mortgage. Since the early 2000s, the mortgage interest deduction rules have been sobered (Rouwendal, 2007), but only recently the first more substantial modifications of the mortgage interest deduction scheme took place, while academia already advised for more fundamental reforms for years (Boelhouwer & Priemus, 2012). The Dutch owner-occupied housing sector has been growing until 2012, even while it has for long been restrained by the large social housing sector (Haffner & Boumeester, 2010; van der Heijden & Haffner, 2000). Mortgage interest deductions, next to liberalization of the financial market, simultaneously fed the housing bubble (Aalbers, 2009). Households were allowed to have higher mortgages, which spurred the increase in housing prices even more. Consequently, the housing prices have
increased by 250 percent since the mid-nineties (Tweede Kamer der Staten-Generaal, 2013). According to Rouwendal (2007, p. 381), “the current Dutch tax system induces households—in particular elderly households that would otherwise have repaid the mortgage—to take more financial risk than they would otherwise do.” Because of large differences in real estate values in the Netherlands, middle-income households do not have the same degree of access to owner-occupied housing in all housing market regions. Stricter mortgage regulations (Staatsblad, 2012)—in response to the housing crisis—in combination with reticent financial institutions to procure mortgage loans also limit access to homeownership for many households. These problems are not necessarily evenly distributed over the Netherlands.

In the next section, we will analyze how access to affordable owner-occupied housing for lower-middle-income households varies between regional housing markets in the Netherlands. We will build on research by Kromhout et al. (2010) in which they already provided a general view of the regional differences between lower-middle-income households’ access to affordable owner-occupied housing. They looked at the income needed per region to be able to afford at least 10 percent of the owner-occupied housing stock and at the share of the owner-occupied housing and private rented housing accessible to households with an income of €33,000, the level (in 2011) at which most households no longer have access to social housing.

4.3 Methodology
The empirical analysis consists of two parts. The first part deals with access to affordable owner-occupied housing for lower-middle-income households and thus is about the first two research questions as posed in section 4.1. The focus is on the regional differences within the Netherlands. Forty so-called COROP regions (geographical division for statistical use) are compared. The second part is more exploratory and looks into the spatial distribution and differences therein of affordable owner-occupied housing supply for lower-middle-income households within three Dutch housing regions.

Operationalization
Lower-middle-income households are defined as households earning in between €34,000 and €48,000 a year. Besides for these two boundaries, owner-occupied housing supply is also viewed for two other income levels: €38,000 and €43,000. Affordable owner-occupied housing is operationalized based on what a household could potentially finance by a mortgage loan. For each of
the income levels, the maximum amount to spend is calculated for both single-earner and dual-earner households (see table 4.1). For dual-earner households, the income is split into two equal parts. Single-earner households with the same income usually have access to slightly higher mortgages. The maximum mortgage is based on state-backed 30-year mortgages at an interest rate of 6 percent (determined in May 2012). We used the maximum mortgage to be backed by the Homeownership Guarantee Fund (see www.nhg.nl); these figures do not depend on the type of mortgage. Because the differences are relatively small, we will only look at the access of owner-occupied housing for dual-earner households. The availability for single-earner households will be comparable, but may be a bit higher. The maximum amount to spend is set at 92 percent of the maximum mortgage, to also cover transaction costs. This mortgage data are solely based on the income and therefore is only an approximation of a household’s housing budget. In reality, whether a household is able to obtain a mortgage loan and the amount of the mortgage loan depends on several other factors like contract status and household equity.

Interest rates also vary. Six percent is high compared to current interest rates, but it provides a more robust calculation for this study compared to lower interest rates. The maximum amount to spent as shown in table 4.1 does not necessarily fit reality, but it provides an estimation usable for spatial comparison, rather than precise determination of a household’s choice.

The potential supply for each of these categories is determined by gathering data on houses available for sale. These data are collected from the website

<table>
<thead>
<tr>
<th>Household income</th>
<th>First income</th>
<th>Second income</th>
<th>Maximum mortgage</th>
<th>8% of maximum loan</th>
<th>Maximum amount to spend (rounded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>34,000</td>
<td>17,000</td>
<td>17,000</td>
<td>137,047</td>
<td>10,964</td>
<td>126,000</td>
</tr>
<tr>
<td>34,000</td>
<td>34,000</td>
<td>0</td>
<td>146,498</td>
<td>11,720</td>
<td>135,000</td>
</tr>
<tr>
<td>38,000</td>
<td>19,000</td>
<td>19,000</td>
<td>163,733</td>
<td>13,099</td>
<td>151,000</td>
</tr>
<tr>
<td>38,000</td>
<td>38,000</td>
<td>0</td>
<td>163,733</td>
<td>13,099</td>
<td>151,000</td>
</tr>
<tr>
<td>43,000</td>
<td>21,500</td>
<td>21,500</td>
<td>185,277</td>
<td>14,822</td>
<td>170,000</td>
</tr>
<tr>
<td>43,000</td>
<td>43,000</td>
<td>0</td>
<td>188,266</td>
<td>15,061</td>
<td>173,000</td>
</tr>
<tr>
<td>48,000</td>
<td>24,000</td>
<td>24,000</td>
<td>206,821</td>
<td>16,546</td>
<td>190,000</td>
</tr>
<tr>
<td>48,000</td>
<td>48,000</td>
<td>0</td>
<td>216,829</td>
<td>17,346</td>
<td>199,000</td>
</tr>
</tbody>
</table>

Table 4.1 Maximum mortgage and housing price for different types of households and income levels (in €) (Source: calculation of maximum mortgage: nhg.nl, June 2012)
fundan.nl, a market leader when it comes to housing advertisement in the Netherlands. Aggregated regional owner-occupied housing data are collected for each of the 40 COROP regions of the Netherlands. The analysis will be limited to owner-occupied housing, as that is by far the most important alternative for lower-middle-income households. The share of owner-occupied housing per COROP area varies in between 38.5 percent in Greater Amsterdam (COROP Groot-Amsterdam) and 73.5 percent in Zeeuwsch-Vlaanderen. Other alternatives for social housing are private rented housing and liberalized rented dwellings rented by housing associations (basically, a sub-category of private rented housing). Private rented housing varies from 1.1 percent in the Delfzijl Region to 14.1 in Greater Amsterdam. More than half of the COROP regions have less than 5 percent private rented housing. Although the share of private rented housing—with 14 percent—is significant in Greater Amsterdam, the private rented sector will not be part of this analysis. Most of the private rented housing is expected to be too expensive for lower-middle-income households, as described in section 4.3. Another reason is that private rented housing data are not as centrally available as is owner-occupied housing data. There is no website like fundan.nl for private rented housing, and private rented housing is also often allocated to a new tenant without the dwelling first being advertised. Liberalized rented housing, rented out by social housing associations, is housing units that fall outside rent control boundaries. This category is marginal in size and does not exceed 2.2 percent of a COROP region’s total housing stock and will also be left out of the analysis in this article (these figures are based on the WoON2009 database: BZK/CBS, 2009). This share is currently growing. As a result of the worsened financial position of social housing associations—on its turn a consequence of the financial crisis and policy measures like an extra tax for social housing landlords—an increasing number of social housing is liberalized each year. Given the fact that these then private sector housing units have relative low rents, they offer potential options for lower-middle-income households.

**Embedded case study**

In the second part, three regions will be analyzed more in depth using GIS software. The three housing market regions will be compared for the opportunities lower-middle-income households have on the regional owner-occupied housing market. Kromhout et al. (2010) looked at the households with an income of over €33,000 that can afford less than 10 percent of the available houses for sale. They found a remarkable distribution of the problem
across the Netherlands, with unexpected similarities. For example, the share of households with an income of over €33,000 for whom less than 10 percent of the available for sale housing is affordable in the Zwolle Region (COROP Noord-Overijssel) and the Alkmaar Region (COROP Alkmaar en omgeving) is about the same as the share in Greater Amsterdam. This is remarkable given the differences in for example real estate prices in these regions. To explore this phenomenon, the COROP regions of Greater Amsterdam, Alkmaar Region, and Zwolle Region will be compared as an embedded case study. The supply of affordable housing in relation to the size of the group of lower-middle-income households will be looked at before zooming in at the actual location of the owner-occupied affordable supply. Where in the housing market areas do households with an annual income at the lower end of lower-middle-income households (€34,000) have access to housing? By collecting information on the addresses, combined with the size and the number of rooms of affordable units, the dataset is suitable for geocoding. The houses are mapped and then analyzed in relation to each other and in relation to the neighborhood. This will provide data to give an answer to the question to what kind of housing and living environments these households have access. The three areas are expected to differ much more than the general supply figure that was the result from the study from Kromhout et al. (2010) suggests. Given the fact that owner-occupied housing prices vary greatly across but also within different housing market regions, it is expected that the access for middle-income households to owner-occupancy is the lowest in Greater Amsterdam and the best in the Zwolle Region (proposition 1).

Besides differences between regions in general numbers of housing supply, the regions are expected to differ in the quality and diversity of housing supply and in the geographical distribution of supply within the housing market areas. A more differentiated affordable owner-occupied housing supply is expected for the housing market areas of the Alkmaar Region and the Zwolle Region compared to Greater Amsterdam. We expected that the middle-income households will have the least access to the most popular neighborhoods within their region (with the highest livability scores) in all regions (proposition 2), but that in Greater Amsterdam, this access is even more limited than in the Alkmaar Region and the Zwolle Region (proposition 3).

**Triangulation**

A process of triangulation is used to verify results. Part of this study is to further explore lower-middle-income households’ access to affordable owner-
occupied housing and to test the outcome of the report of Kromhout et al. (2010). Next to the spatial analysis described above, existing literature and relevant policy documents that stem from the three COROP regions have been analyzed. Furthermore, in-depth interviews have been conducted in the embedded case studies to further verify the position of lower-middle-income households on the regional housing market. This concerned three professionals from housing associations in the three regions and two municipal housing professionals in the COROP regions Greater Amsterdam and the Zwolle Region. In the next section, we will analyze how access to affordable owner-occupied housing for lower-middle-income households varies between regional housing markets in the Netherlands. We will already focus a large part of our attention to the three housing regions that will be analyzed more in depth later in this article.

**4.4 Regional differences in access to affordable owner-occupied housing across the Netherlands**

The analyses proved there are indeed large differences between Dutch regional housing markets. These differences are reflected in the different degrees to which lower-middle-income households have access to affordable housing. The available owner-occupied housing in financial reach of lower-middle-income households will be mapped for the 40 housing market areas. This section will end by confronting the owner-occupied housing supply data with the number of lower-middle-income households in the areas, thereby looking into the comparative availability of affordable housing.

Figure 4.1 shows the number of houses for sale within the range of households with an income of €34,000. The total supply of houses within reach of lower-middle-income households is divided by the total number of houses for sale in the region. The available houses are taken into account for one- or two-person households if they have at least 30 m² of floor space and for three- or more-person households if they have at least 60 m² of floor space. In a substantial number of COROP regions, less than 3 percent of houses for sale are potentially affordable for one- to two-person dual-income households with a yearly income of €34,000. There are even less houses for sale that are at least 60 m² and therefore potentially appropriate for households with at least three members.

For households with a household income of €38,000 (see figure 4.2) instead of €34,000, the availability of affordable owner-occupied housing increases. For
Figure 4.1 Percentage of potential affordable owner-occupied housing at an income of €34,000 for one- or two-person households (left) and three- or more-person households (right) (Source: Funda.nl; source base maps: CBS, 2009; made by authors)

Figure 4.2 Percentage of potentially affordable owner-occupied housing at an income of €38,000 for one- or two-person households (left) and three- or more-person households (right) (Source: Funda.nl; source base maps: CBS, 2009; made by authors)
one- or two-person households, about 6 percent of houses for sale in each area is accessible. In most of the Northern COROP regions, at least 14 percent of the owner-occupied housing for sale is in reach of household with an income of €38,000. There is also a clear distinction between the southern and northern parts of the Randstad, with the exception of Delft and Westland at the coast in between The Hague and Rotterdam. Additionally, the A2 highway corridor is visible, which crosses the country from the northwest to southeast and is seen as the important economic backbone of the Netherlands. In this corridor, lower-middle-income households with a yearly income of €38,000 can afford a relatively low share of the houses for sale.

The mapping of the opportunities for dual-earner households of more than three persons that earn €43,000 shows a larger area with more than 15 percent of supply in reach (see figure 4.3). There are, however, areas that show a greater increase in potentially accessible owner-occupied housing than other areas. While there is between 6 and 10 percent affordable in Greater Amsterdam, in the Zwolle Region more than 15 percent is available for the same budget. The Alkmaar Region has a percentage of potentially affordable supply in between these two regions. This point toward the conclusion that the groups of households with limited availability of affordable housing stretches further in Greater Amsterdam than in the Alkmaar Region and especially the Zwolle Region and some other areas. Again, the A2 corridor is clearly visible as a low supply area.

The average weighted availability for households of all sizes earning between €34,000 and €38,000 is depicted in figure 4.4. The average share of owner-occupied housing in reach differs from less than three to over 35 percent. Remarkable are some neighboring areas showing large differences, for example, The Hague that has much lower rates than neighboring areas, and Zaanstad and Flevoland that have several adjacent areas with much lower accessibility rates.

The share of owner-occupied housing as percentage of total housing for sale in reach of a specific group of households does not necessarily rightly reflect the housing market. It also matters how many people are competing for these houses. Figure 4.5 shows the number of houses in reach of households earning in between €34,000 and €38,000, divided by the number of households in the same category. The number of households already living in the area is used as a proxy of potential demand. The pattern visible in figure 4.5 is not much
Figure 4.3 Percentage of potentially affordable owner-occupied housing at an income of €43,000 for one- or two-person households (left) and three- or more-person households (right) (Source: Funda.nl; source base maps: CBS, 2009; made by authors)

Figure 4.4 Average percentage of potentially affordable owner-occupied housing for households with an income of in between €34,000 and €38,000 (left) and in between €38,000 and €43,000 (right) (Source: Funda.nl; source base maps: CBS, 2009; made by authors)
different from that in figure 4.4, but Greater Amsterdam is an example of an area in which the supply per household in the category is more limited than in other regions. This could also be explained by the smaller share of owner-occupied housing of the total housing stock in Greater Amsterdam. In this area, there are comparatively larger social and private rented housing sectors. Our first proposition, in which we expected to find that access among middle-income households to owner-occupancy housing is the lowest in Greater Amsterdam and highest in the Zwolle Region (proposition 1), turned out to be correct.

This last set of maps (see figure 4.5) shows it is likely that there is a significant difference between the three COROP regions—which will be further analyzed in the next section—when it comes to access to affordable owner-occupied housing among lower-middle-income housing within a region. Regardless, the number of houses for sale in financial reach of lower-middle-income households with a yearly income of in between €34,000 and €43,000 is limited. In many areas, the number of houses per household in the income region of €38,000 and €43,000—potentially affordable at an income level of €43,000—does not exceed 0.1.

### 4.5 Where do households have access to affordable housing?

The extent to which a household has something to choose does also depend on what houses are within financial reach of lower-middle-income households. In this section, the focus is on the three regions, Greater Amsterdam, Alkmaar Region, and Zwolle Region. These three areas are very similar in terms of the share of total owner-occupied housing supply that is within reach of households with an income of €34,000 (see figure 4.1). The three areas diverge to some extent when looking at the share of owner-occupied housing that is in reach at higher-income levels (see figures 4.2, 4.3 and table 4.2). In this section, supply in these three areas is analyzed on its specific location and its attributes. This has been operationalized based on housing size and neighborhood characteristics. For the latter, we used the livability index of the Ministry of General Affairs (2010) that is available on neighborhood level. We expected to find that lower-middle-income households will have the least access to the most popular neighborhoods within their region (with the highest livability scores) in all regions (proposition 2), but that in Greater Amsterdam, this access is even more limited than in the Alkmaar Region and the Zwolle Region (proposition 3).
The extent of the lack of accessibility is not only verified by an exploration of local policy documents but also based on a small number of interviews. In this exploratory part, the address and housing information of houses within financial reach of dual-earner households with a yearly income of €34,000 is collected. The housing units are at least 60 m² in size, responding to the minimum required floor space for three- or more-person households (see the last row in table 4.2).

**Spatial distribution of affordable owner-occupied housing**

**Greater Amsterdam**

The average number of affordable houses for sale per household (see figure 4.5) indicates the tightness of the regional housing market for lower-middle-income households in the area of Greater Amsterdam. At an income level of €34,000 for a dual-earner family, the maximum amount to spend on the purchase of a house is calculated to be €126,000. For this amount, in Greater Amsterdam, there are 95 units for sale of at least 60 m². These units are geocoded and mapped with a buffer of 500 m in figure 4.6. The houses for sale at these restrictions are clustered in a few locations. Most clear are clusters in Purmerend (10 units) in the center north, and clusters in Amsterdam South.
East (Zuidoost; 54 units) and some units in Amsterdam New West (Nieuw-West). For the rest, there are a few scattered locations with affordable owner-occupied housing supply. In 10 out of 16 municipalities in the region, there is no supply at all, just as in most of Amsterdam. The average number of rooms of these units is 2.6 and the average floor space is 70 m². Figure 4.6 also reveals the relationship between the livabilities—based on the livability index of the Ministry of General Affairs (2010)—that supply is predominantly located in areas with poor livability scores. This relationship is especially clear in Amsterdam in the center of the map.

**Alkmaar Region**

For the same category in the smaller Alkmaar Region, there is a supply of 25 units. 22 out of the 25 units are situated in the city of Alkmaar. 10 units are concentrated in the postwar apartment buildings of Honthorstlaan in the neighborhood De Hoef (in figure 4.7, the northeastern of the two larger concentrations). The other larger polygon in figure 4.7 consists of four units. These 25 owner-occupied units have 2.8 rooms in average and an average floor space of 69 m². Both are similar to that in Greater Amsterdam. Also, in Alkmaar, the highest supply is to be found in the neighborhoods with low livability scores.

**Zwolle Region**

In the Zwolle Region, owner-occupied supply of at least 60 m² for the category of dual-earner households with an income of €34,000 is the largest of the three areas with 99 units. These units are clearly more scattered over the area,

<table>
<thead>
<tr>
<th></th>
<th>Greater Amsterdam</th>
<th>Alkmaar Region</th>
<th>Zwolle Region</th>
<th>The Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of households</td>
<td>645,000</td>
<td>102,500</td>
<td>148,500</td>
<td>7,516,000</td>
</tr>
<tr>
<td>Median income (€)</td>
<td>44,500</td>
<td>48,000</td>
<td>42,500</td>
<td>44,500</td>
</tr>
<tr>
<td>Share households 34–38k</td>
<td>5.9</td>
<td>5.5</td>
<td>5.5</td>
<td>5.9</td>
</tr>
<tr>
<td>Share households 38–43k</td>
<td>5.1</td>
<td>7.2</td>
<td>6.9</td>
<td>6.5</td>
</tr>
<tr>
<td>Total number of houses for sale</td>
<td>14,932</td>
<td>3,282</td>
<td>5,226</td>
<td>232,000</td>
</tr>
<tr>
<td>Average share in reach 34–38k</td>
<td>3.8</td>
<td>4.7</td>
<td>6.2</td>
<td>11.7</td>
</tr>
<tr>
<td>Average share in reach 38–43k</td>
<td>9.2</td>
<td>11.3</td>
<td>13.3</td>
<td>19.3</td>
</tr>
<tr>
<td>Average reach per 1,000 households 34–38k</td>
<td>28.8</td>
<td>50.8</td>
<td>64.1</td>
<td>92.6</td>
</tr>
<tr>
<td>Average reach per 1,000 households 38–43k</td>
<td>57.7</td>
<td>78.1</td>
<td>90.9</td>
<td>116.4</td>
</tr>
<tr>
<td>Minimum number of units in reach</td>
<td>95</td>
<td>25</td>
<td>99</td>
<td>12,402</td>
</tr>
</tbody>
</table>

Table 4.2 Summary table affordable owner-occupied housing supply (Source: WoON2012, BZK/CBS, 2012, Funda.nl)
resulting in more choice (see figure 4.8). The most pronounced clusters are located in Steenwijk in the north and Kampen and Zwolle in the southwest of the region. Also, in this region, there is a relationship between the livability scores and the presence of affordable owner-occupied housing. Yet, the livability scores in this region do not get below moderately positive and are overall better than in both other regions. There are owner-occupied units available in more rural areas and in more urban areas. The average number of rooms is larger than in the other two regions, with 78 m². Also, the average number of rooms is remarkably larger with 3.4 rooms in average. There are also five units of more than 100 m². Forty percent of the houses have four rooms. The larger size of the available dwellings in the Zwolle Region with mean larger households will have more opportunities to find a suitable house on the owner-occupied market.

**Problem differentiation**

Our second proposition stated that the access among lower-middle-income households to owner-occupancy was expected to be predominantly located in neighborhoods with the lowest livability scores. The data confirm this proposition. Furthermore, the third proposition that access would be most difficult in Greater Amsterdam was verified. Though the problem of a lack of affordable owner-occupied units for lower-middle-income households seemed to be of a similar scope in the three analyzed COROP regions, the spatial exploration of section 4.5 reveals some differences. In Greater Amsterdam, supply is more concentrated in neighborhoods with moderate or negative livability scores. The Zwolle Region distinguishes itself from the other two regions by more and larger houses and more scattered units of supply, resulting in more spatial choice for households. And although the livability scores in the supply in the Zwolle Region are higher than those in Greater Amsterdam and the Alkmaar Region, they are still low compared to the neighborhoods where more expensive houses are for sale.

A scan of policy documents in the three areas and the qualitative material from the interviews suggest also a divide in problem perception between Greater Amsterdam and the other two areas. For Amsterdam, the housing market is characterized by a sharp divide between the area inside and the area outside of the beltway A10. There is very high pressure on centrally located neighborhoods, while some of the neighborhoods at the borders of Amsterdam are very unpopular. This view fits the analysis of a policy program manager of social housing association De Key in Amsterdam, but
**Figure 4.6** Livability scores per neighborhood and affordable owner-occupied housing supply for single-earner lower-middle-income households with an income of €34,000 in Greater Amsterdam (Sources: Livability index data: Ministry of General Affairs; Housing data: Funda.nl; Background layers: CBS, 2009; made by authors)

**Figure 4.7** Livability scores per neighborhood and affordable owner-occupied housing supply for single-earner lower-middle-income households with an income of €34,000 in the Alkmaar Region (Sources: Livability index data: Ministry of General Affairs; Housing data: Funda.nl; Background layers: CBS, 2009; made by authors)
the interviewee also points at causes and possible answers: “It is remarkable the difference in demand to housing within and outside of the ring is not reflected in prices, because we are stuck with the housing valuation system. There is a little change since the scarcity points, but for Amsterdam this effect is flattened. Because dwellings outside of the ring are larger, more expensive apartments are located outside of the ring” (Interview De Key). The Donner points (named after Minister of the Interior and Kingdom Relations Piet Hein Donner) refer to the earlier mentioned scarcity points, which mean that for allocated tight housing markets with high real estate square meter values, 15 or 25 points can be added for a house. Each point in practice means a potential higher rent of about €4. A dwelling with over 142 points can be liberalized, meaning the price level is not regulated anymore. An increase of 15 or 25 points in tight housing markets, therefore, also means more social housing units can be liberalized.

In the region of Greater Amsterdam, strategies that may be part of improving the position of lower-middle-income households on the housing market are the sale of affordable social housing association dwellings and the liberalization of social housing, transferring these units to the range of monthly rents of €650 to about €900. Though the sale of social housing is being encouraged,
during the first years of the financial crisis, it is hard to achieve. The sale of former social housing in Amsterdam is for example increasing again since 2010 to 1828 in 2012 (Woon Amsterdam, 2013). In general, most of these houses are in financial reach of lower-middle-income households (see also Wittebrood & Permentier, 2011). Neighborhoods with high shares of social housing do not coincide with neighborhoods with affordable owner-occupied supply visible in figure 4.7.

4.6 Conclusion
This study focused on access among lower-middle-income households to the owner-occupied housing market. Spatial analysis shows there is a group of middle-income households that have very limited access to owner-occupied housing. There are households in some COROP regions for whom less than three percent of the houses for sale are affordable and appropriate. These households also lack access to social housing.

The analysis shows that for households with the lowest income of €34,000 in Amsterdam, about 90 units for sale are potentially in reach. Compared to the number of households, however, there is more supply in the Alkmaar Region and especially in the Zwolle Region, confirming the first proposition that given the differences in housing prices across the Netherlands, it was expected that the access for middle-income households to owner-occupancy is the lowest in Greater Amsterdam and the best in the Zwolle Region (proposition 1). Stretching up the income level shows the share of housing for sale that is affordable is increasing much faster in the Alkmaar Region and the Zwolle Region than in Greater Amsterdam. This means the group of middle-income households for whom there is little affordable housing available is larger in Greater Amsterdam.

Further, our findings revealed that in Greater Amsterdam, affordable housing units are mainly clustered in some of the least popular neighborhoods. Consequently, the second proposition, formulating the expectation supply that would have the least access to popular neighborhoods, can be confirmed. In the Alkmaar Region and the Zwolle Region, there is also almost no supply in the neighborhoods with very high livability scores, but also due to the fact there are less negative and moderate scoring neighborhoods on the livability index, there is in these areas more supply in neighborhoods with relatively high livability scores, which also confirms proposition 3.
With respect to the degree of ‘squeezedness’ in Greater Amsterdam, lower-middle-income households seem to be more ‘squeezed’ than in the Zwolle Region and the Alkmaar Region. However, evidence also suggests that even in Greater Amsterdam, these lower-middle-income households are not completely squeezed out. The suggestion that there is no owner-occupied unit available—as often appears in the media—is false. The availability of some affordable housing may suggest that a part of the problem of a lack of affordable housing stems from a qualitative mismatch between supply and households’ preferences. As their options are limited to the neighborhoods with the lowest livability score, they may choose not to buy there and move to another region or prefer a different housing solution waiting for an opportunity that suits their preferences better. The interviewees also assumed that such a preferences approach is important. Consequently, a more refined view on the “appropriateness” of affordable housing units in further research is necessary to reveal the more qualitative issues at stake and to further understand the regional variation in affordable and appropriate housing supply. Costs of travel and energy can also be included in a measure of affordable housing, as these are related to the location and quality of the housing unit and also strongly affect a household’s budget.

The findings seem to fit the conclusion of Elsinga and Lind (2013) that in the short run, the middle classes in the Netherlands are the losers of the new regulation. Yet, in the longer run, this may change. It is to be expected that the liberalization of social housing, sale of social housing association dwellings, and new construction of housing for (lower-)middle-income households will all contribute to the improvement of opportunities for these households. But will it be enough? And how much will liberalization and sale of social housing affect the situation of lower-income households? More research is needed to investigate these issues.

Another important aim of our project was to determine the extent to which the size and the problems of this ‘squeezed middle’ group differ among regions in the Netherlands. There is a vast regional variation in housing markets that will influence the efficiency of proposed solutions. For the delivery of national policy aims with respect to affordable housing, it will be important to take into account the possible different regional outcomes of new regulations, policies, and proposed solutions. Until now, these variations that indeed do exist are often ignored by national policy-makers, but also in European regulation, that try to draft “one-size-fits-all” policies. However, based on our findings,
we would suggest that it may not even be possible to solve regional housing market problems with general national policies and that it would be more important to take regional differences into account in housing policy, also while discussing the continuance of the European regulations or the changing roles of housing associations. More differentiation in housing policy—at least temporary—might help to address some problems in the short run. Moreover, currently, many local authorities try to address the ‘squeezed middle’ problem on the housing market, which—in the eyes of some policy-makers—seemed to have appeared from one day to another as a result of the concurrent change in regulations, reform of the mortgage market, and less building activities. Finding ways to facilitate these local initiatives would help to ‘unsqueeze’ the lower-middle-income households.