Expert Opinion

To: *Commissie "Structuur Nederlandse Banken" en de Generale Thesaurie, Directie Financiële Markten, Afdeling Financiële Stabiliteit, Ministerie van Financiën, Korte Voorhout 7, 2511 CW Den Haag*

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Re: *Expert Opinion on the Intensity of Competition in the Dutch Banking Sector*

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Executive Summary

1. Measuring the intensity of competition is challenging. Measuring competition in the banking sector is even more challenging for a fundamental reason: the price of credit also reflects the characteristics of the buyer and the interest rate paid on a deposit may reflect the characteristics of the bank and/or the credibility of the deposit insurance scheme.

2. Going into the crisis the Netherlands scored average to potentially somewhat less competitive compared to other European countries. The banking market for SME credit for example is highly concentrated. A broadening of information sharing between banks on SME lending in a new public credit register may under the right conditions intensify competition and allow for improved supervision.

3. Five years into the crisis the Dutch banking sector is much more concentrated than other European countries (if one looks at the less-preferred non-structural "easy-to-calculate measures" of market power and concentration). Reduced foreign bank presence, increased state-ownership of banks and exacerbated information asymmetries may have reduced competition during the last five years.

4. A particular area of concern is the mortgage market where behavioral constraints imposed by the European Commission such as price-leadership restrictions have further limited competition.

5. Conditions that foster competition in the financial sector have been empirically shown to strengthen the positive impact of financial development on real activity.

6. Conventional state aid to the sector may soften competition in the short run and long run. Foreign bank entry presence is commonly found to be both a good indicator for the intensity of local competition and a contributor to it. (Foreign) bank entry can be stimulated by removing discretion in local rules and regulations. When the privatization of a nationalized institution takes place, one should consider breaking up the institution and/or to sell the financial institution to a foreign buyer and not to a domestic buyer. Regulatory downsizing of banks is expected to intensify competition.

7. Theory makes ambiguous predictions about the relationship between the competitiveness of the banking system and its stability. Empirical work seems similarly mixed in its findings. Cross-country studies however mostly show that more competition goes together with more financial stability. Regulation and supervision that are incentive compatible however are of first-order importance for financial stability.

8. Going into the crisis the Netherlands had somewhat less stable banks than other countries, even when controlling for their potentially somewhat less competitive form and other bank characteristics.

9. Large-scale government crisis interventions such as blanket guarantees, liquidity support, recapitalizations, and nationalizations surprisingly may actually spur more competition in banking, possibly because banks that are not supported and which charter value is therefore negatively affected (have to) start to compete more fiercely and take more risk.

10. Bail-out expectations for "guaranteed" banks may lead to larger risk taking by the remaining banks.

Main Arguments

1. Measuring competition in banking is challenging. Interest margins for example may not be a good indicator of competition as they may reflect risk (and other average borrower characteristics) as well. Also, deposit rates may reflect bank characteristics and/or the credibility of the deposit insurance scheme backing these deposits, potentially inducing cross-country heterogeneity.

   There are several ways in how the literature has proceeded in measuring competition in banking. The first set of measures is based upon observed *market structure*. Within these traditional market-structure-based methods, i.e., structure-conduct-performance (SCP), efficiency, and scale and scope economies analyses, the focus is on measuring market concentration with an *n*-bank concentration ratio (C*n*), which is the sum of the market share of the *n* largest banks, or with a Herfindahl-Hirschman Index (HHI), which is the sum of banking market shares squared (often multiplied by 10,000).[1] The presumption then is that a more concentrated market is less competitive.[2] However, whether concentration indicators capture the intensity of competition for a market is a serious concern. A more fundamental criticism leveled against the SCP and the efficiency hypotheses relates to the embedded—assumed—one-way causality from market structure to performance. In other words, most SCP studies do not take into account the conduct of the banks in the market and the impact of performance of the banks on market structure. In fact, studies that have attempted to determine the degree of competition relying on various indexes of concentration such as the C5, the HHI, and the like, reach conflicting (and to some extent troublesome) results.

   A second set of indicators aim to measure the degree of competition more directly, i.e. without looking at market structure. Some of these employ measures that assess the *reaction of output prices to input prices*. Here, one can differentiate between the approaches taken by Panzar and Rosse (1987) (the H-statistic) and Boone (2008).[3] The usefulness of the different approaches hinges on data availability and the questions being addressed. The special nature of banking markets (e.g., asymmetric information, switching costs, and network effects in retail markets (see e.g., Carletti (2010)) prompted the introduction of alternative and complementary approaches.

   A third set of measures proxies for the *contestability* of the banking market. This is achieved by investigating entry requirements, formal and informal barriers to entry or exit for domestic and foreign banks, activity restrictions, direct indicators of switching costs. Most of these indicators apply at country-year level and are computed by the World Bank.

   > Despite the methodological advances in the measurement of the intensity of competition in the banking sector, one should be aware that the price of credit reflects the characteristics of the buyer and that the interest rate paid on a deposit may reflect the characteristics of the bank and/or the credibility of the deposit insurance scheme.

2. We now delineate how the Dutch banking sector "fares" when employing these different indicators of market structure, reaction of output prices to input prices and contestability, i.e., we aim to answer the question: "What is the degree of competition in the Dutch banking sector in an international perspective?" Afterwards, we turn to specific market segments of the Dutch banking market.

It remains useful to round up the extant assessments of market conditions prior to 2007 because the financial crisis and governmental response may have fundamentally altered the competitive conditions in the banking sector only in some countries. Furthermore, credit risk may be more difficult to assess within countries and across-countries given the difficult and different economic environments in today's markets. In addition the data needs of the preferred assessments methods (e.g., the H-statistic and Lerner) prevent a more current analysis.

The concentration ratio **C5** (i.e., the combined market shares of the largest 5 banks based on the banks' total assets at country level) in the Netherlands was on average equal to around 80 percent during the period 1995-2004 and was somewhat higher towards the end of this period. This is higher than the EU-25 average which was around 60 percent for the same time period. But then market concentration is typically higher in smaller countries. The same was true for the **HHI** the which during the same time period equaled 1,770 which was among the highest in Europe, the average for the EU-25 indeed equaled only 1,369 (Allen, Bartiloro and Kowalewski (2005)). Notice that the Department of Justice and other agencies in the US for example generally consider markets in which the HHI is between 1,500 and 2,500 points to be *moderately concentrated* (and consider markets in which the HHI is in excess of 2,500 points to be *highly concentrated*).[4]

We now turn to the reaction of output prices to input prices. Many studies bring the Panzar and Rosse (1987) methodology to banking.[5] The so-called **H-statistic** is the sum of the pass-through rates of input prices on output prices, i.e., the elasticities of the total interest revenue to total assets for the banks with respect to their factor input prices (after controlling for other bank characteristics). Three different input prices are often considered: (1) the deposit rate, measured by the ratio of annual interest expenses to total assets; (2) wages, measured by the ratio of personnel expenses to total assets; and (3) price of equipment or fixed capital, measured by the ratio of capital expenditures and other expenses to total assets. Perfect competition implies an H-statistic equal to 1. Indeed, an increase in input prices augments both marginal costs and total revenues to the same extent as the original increase in input prices. A monopoly situation yields an H-statistic that can be negative or zero. Monopolistic competition yields values of H in between 0 and 1. The interpretation of competition based on the H-statistic requires that the banking sector be in a long-run equilibrium (Nathan and Neave (1989)).

By far the most comprehensive application to date of the Panzar and Rosse (1987) methodology is a paper by Claessens and Laeven (2004). They compute the H-statistic

for 50 countries for the period 1994 to 2001.The empirical results by Claessens and Laeven (2004) show that many banking markets are actually characterized by monopolistic competition, with H-statistics ranging between 60 and 80 percent. The Netherlands scores 86 percent in their study, indicating somewhat more competition than in the average country. In addition, Claessens and Laeven find no evidence of a relationship between bank system concentration and H, but find that fewer entry and activity restrictions result in higher H-statistics and hence more competition. On both accounts the Netherlands was mostly unrestricted in 2007 (Barth, Caprio and Levine (2007)).

Another measure that is currently widely used in the empirical banking literature to measure the intensity of banking competition is the **Lerner index**. The index proxies for current and future profits stemming from pricing power and is calculated for each bank during a certain period as "price minus marginal cost divided by price" (in general, it has shortcomings as marginal costs are unobservable and need to be estimated from accounting data. The latter may not reflect true costs of inputs. In addition, in banking it has shortcomings as prices may reflect risk and risk-taking by banks). Price can be proxied by a ratio of total operating income to total assets, while marginal cost can be derived from a translog cost function for example. A higher Lerner index implies more pricing power and hence a lower intensity of competition for the involved bank (i.e., this index varies between 0 and 1 with 0 being perfect competition).

Beck, De Jonghe and Schepens (2013) calculate the average Lerner index across all domestic banks for 79 countries for the period 1993 to 2008. The Netherlands scores 15 percent in their study, which is somewhat above the average value of 12 percent (with a standard deviation of 14 percent) indicating that the intensity of competition in the Dutch banking sector is less than average (Germany: 8 percent; UK: 11 percent; US: 17 percent). But the Lerner index in the Netherlands fell somewhat, from 17 in 1993 to 10 percent in 2008, implying on average a slight intensification of competition for individual banks (see also Table 1).

The **Boone index** measures the *degree of profit reduction* following marginal cost increases. The more sensitive profits are to being inefficient, the more competitive the banking sector. Schaeck and Cihák (2010) find that the Dutch banking system is the most competitive one in Europe, but that its competitiveness (i.e. the degree of profit reduction) has slipped somewhat due to a reorganization in the late 1990s. van Leuvensteijn, Bikker, van Rixtel and Sørensen (2011) apply the Boone index to the loan markets and report a middle position in Europe for the Netherlands in terms of its competitiveness.

A third set of measures proxies the contestability of the banking market. The World Bank indicators averaged over the period 1995-2004 show that the Netherlands scores 1.5 for activity restrictions (with 1 being the least restrictions and 4 the most), had no bank entry denied, and scored 90 on the financial freedom index suggesting "minimal government interference" (Schaeck and Cihák (2010)).

Next to the market structure, reaction of output prices to input prices, and contestability, it is worth considering other indirect measures of the intensity of competition. Take for example switching rates and the corresponding longevity of bank – customer relationships (OECD (2007)). Switching rates for households and small and medium-sized enterprises (SMEs) in the Netherlands in 2005 were below EU-15 average (4 and 9 percent versus 8 and 12 percent, respectively) while relationships lasted longer (14 and 10 years versus 10 and 9 years, respectively). These indirect measures are also not inconsistent with somewhat softer competitive conditions.

In sum, across all these measures the Netherlands scores average to potentially somewhat less competitive than other European countries going into the crisis.

Our discussion up to now looked at the banking sector as one system delineated at the country level, and did not consider specific sub-segments of the Dutch banking market. In a competition policy context, it is very important to delineate the relevant market, not only geographically but also in product space. We now provide some more discussion of the Dutch retail banking market mainly based on Boot (2007) who discusses the consumer and SME lending markets. We also employ information from the OECD (2010) and from the merger decision by the European Commission on the proposed Fortis-ABN Amro merger (European Commission (2007a)). A detailed competition analysis, however, requires more detailed data, which are often only scarcely available for the Dutch banking sector.

The retail banking market is highly concentrated and the largest banks have a very similar market shares in the segments of consumer and SME lending. Boot (2007) argues that this may open the market to tacit collusion, with banks competing more for new customers or when these customers buy new products like mortgages. Important also is to have a competitive fringe that induces competition.

Boot (2007) identifies frictions that may hinder competition in the consumer segment. One of them is related to the tax advantages of Dutch mortgages. The tax deductibility of loan rates and the beneficial tax treatment of savings within a mortgage scheme lead to the bundling of mortgage loans and life-insurance products. Consumers then may face larger switching costs at the time of loan rate resets making the market less competitive. Also, this lower degree of standardization relative to international markets may lead to a lowered attractiveness to foreign entrants. To arrange these more complex arrangements the local banks seem indispensable.

The Netherlands Banking Association has introduced the switching pack or "overstapservice" for checking accounts in January 2004 which enhances switching. While this is an important step forward, number portability (as in telecom) would further reduce frictions, and stimulate competition and services by banks.

The Dutch banking market for SMEs is also highly concentrated. The Dutch SME lending market is primarily served by three banks, ABN AMRO, ING, and Rabobank. As mentioned above, detailed data on the status of SME financing are difficult to find in

the public domain. In practice, it is observed that the Dutch banking sector is highly concentrated: the three largest players (ING, ABN AMRO/Fortis and Rabobank) have a very high combined market share in many relevant national markets. For example, in the Dutch market for commercial banking, the combined market share of these three players was between 90 and 100 per cent in 2007.

We rely on information provided in the case merger decision of Fortis-ABN Amro (European Commission (2007a)) where market shares are reported coming from survey data. These numbers show that the three main players have a joint market share of about 90 percent for the "main bank relation". Also other product segments for commercial customers are very highly concentrated as shown in Table 2.

The market for SMEs is characterized by high entry barriers stemming from asymmetric information, cross-selling, and other inertia. Indeed, banks that serve SMEs obtain potentially valuable proprietary information about their clients (see e.g., Mester, Nakamura and Renault (2007), Norden and Weber (2010)). This may lead to hold-up problems in lending relationships making markets less competitive. Information sharing about loan exposures, collateral and loan defaults is an important way to reduce hold-up problems.

Padilla and Pagano (1997) for example theoretically show that information sharing serves as a commitment device by banks to reduce hold-up problems and to incentivize entrepreneurs, leading to lower default rates. Next to reducing moral hazard problems, information sharing may also reduce adverse selection (Jappelli and Pagano (1993)), expand the credit market (Jappelli and Pagano (2002)), Brown, Jappelli and Pagano (2009)), and shape the scope of bank entry and induce potential collusive behavior (Bouckaert and Degryse (2006)).

Empirical work shows that information sharing *per se* and a greater coverage of any information sharing mechanism that is in place promotes the competitiveness of banking systems. Countries like Germany, Italy and Spain, for example, have public credit registries that are operational since 1934, 1962 and 1962, respectively. This implies that a within-country difference-in-difference analysis (i.e., a before-and-after comparison) of the impact (of the introduction) of an information sharing system on banking competition is not possible due to a lack of data (in addition one could also criticize such a study because it would have to employ historical data and therefor may lack external validity, i.e., insights for the current banking environment). Access to a micro-dataset that allows studying the characteristics of loans granted to the same firm right before and after the introduction or expansion of a public credit registry can make the identification of the impact of competition convincingly possible.

Recent work, however, has performed cross-country time series analysis of the impact of information sharing on banking competition. Giannetti, Jentzsch and Spagnolo (2010), for example, consider the EU-27 member states over the period 1990–2007. They do perform a difference-in-difference analysis, but there is only a limited amount of variation in the information sharing variable because there are (unfortunately) not

many countries that have changed their systems of information reporting during the sample period. They find that after the introduction of a *public* register the C3 concentration ratio drops with about 12 percent due to new entry of banks. There is no impact on concentration when a *private* bureau is created. They also find that bank profitability as well as the net-interest margin declines. In sum, they find that public registries contribute to the intensification of competition (measured by various indicators) and these effects are more pronounced for highly concentrated markets.

Lin, Ma and Song (2010) show in a cross-country study covering 60 countries that firms face fewer financing constraints in countries where an information sharing mechanism is present and if so when the coverage of this mechanism is broader. Furthermore, they find that greater banking concentration induces more financing constraints but that its impact is mitigated when there is information sharing and if so when coverage is broader. This shows that policy makers should be less concerned about the potential anti-competitive effects when the institutional environment contains other competitive forces like information sharing mechanisms.

Setting up and running public credit registries and/or private credit bureaus involve pecuniary costs. Private bureaus are for-profit organizations and some of them are owned by banks. Their coverage is typically determined by their main shareholders as well as by the potential buyers of information. Public credit registers are typically owned by central banks and run on a non-profit basis. Reporting to public registries is mandated by law for specific items of data.

Who has access and the fees involved may differ substantially. The "devil truly is in the details here" as the fee structure (and/or the prevailing regulatory framework) may partly or completely undo the pro-competitive impact on the banking sector, for example when the fees that are charged are disadvantageous to (or in effect exclude) foreign banks, non-shareholders, smaller players or non-bank credit providers. Disadvantages may exist when there are high joining fees, high fixed access fees and/or discriminatory volume-based access fees. The European Commission (2007b) did an inquiry on the joining and transaction fees and found that some (but not all) private bureaus charged high joining fees. The joining fees for public credit registries are typically zero. Transaction fees for access to most credit registries are generally below one euro per consultation, whether positive or negative data is requested. However, some private credit bureaus charge transaction fees significantly above these levels which may then hurt banking competition.

The question arises whether having a public credit registry would require a lot of taxpayers' money. We think it need not, for sure not in the long run. Indeed, a public registry can be funded by uniform fees levied on the financial institutions consulting the registry. Mandatory consulting of the registry can be imposed for any corporate loan a financial institution grants. The examples discussed above show that the break-even fee can be low (even lower than one Euro per inquiry). This fee and the scope of the information that is being shared can also be used as an instrument to influence competition. Furthermore, the supervisory role of the Dutch Central Bank can be made

easier and more effective in this way. When a firm is covered by the registry, this generates two beneficial impacts. First, the firm can now induce competition between banks as it can more easily convince banks that have access to the registry to grant loans at appropriate conditions. Second, firms may also be incentivized to perform well as a non-repayment will deteriorate future loan conditions or even deny access to future credit. This should reduce non-performance and improve overall financial stability.

Credit information sellers like Dun & Bradstreet do have coverage of the Netherlands. However, it seems clearly desirable to expand the information sharing arrangements in the banking industry to achieve a more thorough coverage of loans to SMEs. However, setting up additional information sharing via a "private credit bureau" warrants careful scrutiny to ensure that the sharing will not promote collusive actions. This could happen in particular when information on loan rates is shared *to* banks. Indeed, more transparency may induce more competitive behavior but may also induce more collusion. As the empirical evidence above demonstrates – and under the clear condition of no joining fees, low and uniform transaction fees, and access for all potential credit providers – a public credit registry may stimulate banking competition.

A public credit registry organized at the Central Bank may also have other merits as it allows "the social planner" to monitor banks, their loan portfolios, and their risk taking. It may also allow studying the behavior of banks and credit supply effects (see e.g. Mian (2012) who makes a case for introducing a public credit registry in the United States). Information about loan-specific interest rates charged by banks can be shared *with* the supervisor (as this information would help in its supervisory role), but should not be shared *by* the supervisor *with* competing banks. Furthermore, if the Central Bank is in charge fair access to the credit registry for entering foreign (or even *de novo*) banks can be more easily assured.

The Netherlands currently relies on private credit bureaus such as Bureau Krediet Registratie and Dun & Bradstreet to manage information sharing between banks on individual households (BKR) and firms (D&B). Our discussion above shows that non-discriminatory and cheap access to these bureaus is required in order to have competition across the different segments in the credit market. While credit information sellers like Dun & Bradstreet do cover the Netherlands, it seems clearly desirable to expand on the information sharing arrangements in the industry to achieve a more thorough coverage of loans to SMEs for example. Establishing a public credit registry with non-discriminatory access for all incumbent banks and potential (foreign) entrants may foster more competition in the credit market (through branching rather than through M&As).[6] Equally important is that requiring financial intermediaries to report loan volumes, the degree of collateralization, loan performance and even loan rates will improve the supervision of banks by De Nederlandsche Bank as well as it will allow the Nederlandse Mededingingsautoriteit to measure the intensity of competition better. One should however refrain from allowing the sharing of information on loan rates between as this may lead to collusive practices (such as price fixing).

To conclude, the Dutch banking market for SME credit is highly concentrated but a broadening of information sharing between banks on SME lending in a new public credit register may under the right conditions intensify competition and help the supervisor in its supervisory role. Such a public credit registry can be funded by uniform per-transaction fees levied on financial institutions consulting the registry.

3. What is the degree of competition today, five years into the crisis, in the Netherlands in particular? In general during the last 5 years governments in the Western economies are clearly caring much less about competition issues, implicitly trading off competition for financial stability. Indeed, distress situations are often handled with urgency, implying that competition issues may not get the attention they deserve. Interest rates currently are at a historical low in many countries while deposit rates offered on savings accounts have (even if often perceived as low) become relatively high. In the Eurozone many banks offer deposit rates that are higher than the policy rates set by the ECB a practice that rarely happens during normal times and which may reflect the inherent risk present in the current deposit insurance schemes. Loan rates on the other hand seem less competitive and have been under upward pressure due to the increased capital requirements that are imposed on banks. They may also reflect the uncertain economic environment.

One of the problems with the estimations of the H-statistic and Lerner index for example is that quite a few bank-years are needed to obtain precise estimates, i.e., it is difficult to provide real-time estimates. Given that the financial landscape in Europe fundamentally started changing only after 2007 one has to rely on the less-preferred non-structural "easy-to-calculate measures" of market power and concentration, such as the number of banks, their average market share or Cn concentration ratios. Beck, De Jonghe and Schepens (2013) however show a significant correlation exists between the Lerner and such non-structural measures of market power. The **C5**, in the Netherlands stood at 85 percent in 2011, much higher than in most surrounding countries (France: 50 percent; Germany: 30 percent; UK: 45 percent) (CPB (2013)).

Next to the observed changes in concentration, we now discuss how previously identified important indicators of competition likely have developed during the last five years.

As discussed above, other crucial elements that may determine the intensity of local competition include foreign bank presence and the willingness of foreign banks to locally "engage". Due (directly or indirectly) to the crisis, a number of foreign banks simply left the Netherlands. In addition, national governments across most European countries formally or informally pushed their banks to lend locally and to reduce their lending abroad (e.g., the Vienna Initiative tried to counter such a large‑scale and uncoordinated withdrawal of cross‑border bank groups from emerging Europe). On both accounts the intensity of competition in the Netherlands may have been reduced over time (though not necessarily compared to other countries where a similar foreign bank retrenchment likely took place).

Another issue of possible concern is the partial or complete state-ownership of banks that in most respects inevitably resulted from the crisis. While state-ownership of some banks may initially spur the remaining private banks to compete more fiercely and take more risks, in the long run a banking sector that is dominated by state-owned banks (that may increasingly come under political sway) may well gravitate towards reduced competition.

Furthermore, it seems likely that the financial crisis has increased the information asymmetries in the deposit and credit markets, also in the Netherlands. Large depositors (that are not necessarily insured) may not be fully informed about deposit rates that are more dispersed than before and about their bank's safety and soundness (hence our recommendation for more transparency on this account through an electronic information platform). For banks, on the other hand, it is increasingly difficult to assess the creditworthiness of their borrowers (hence our recommendation to enhance information sharing among banks). The increase in information asymmetry on both fronts may lead to a reduction in competition.

Finally, we further evaluate the potential impacts of the different forces – concentration, foreign presence and information asymmetry – on two important segments of the Dutch banking system, i.e., on mortgage and SME lending. We argue that the three factors at play are relevant for both these segments for the following reasons. Concentration has increased in both the segments of mortgage and SME lending due to the exit of some market players. The impact is probably a bit more pronounced for mortgage lending given the already very high concentration in the SME market. Foreign bank presence has probably most decreased in the mortgage market and was as such less relevant. Asymmetric information may also have increased for both mortgage and SME lending. For example, the number of mortgage initiations has dropped and uncertainty about collateral values may have increased, implying that local knowledge might be more relevant than before. For SME lending, local knowledge about the firm's prospects has always been important and is even more important in a crisis period.

To conclude, five years into the crisis the Dutch banking sector is much more concentrated than other European countries (if one looks at the less-preferred non-structural "easy-to-calculate measures" of market power and concentration). Reduced foreign bank presence, increased state-ownership of banks and exacerbated information asymmetries may have further reduced competition in this time frame. These forces are in particular relevant for mortgage and SME lending.

4. We now discuss the intensity of competition in the banking sector in the Netherlands through the prism of the competitive situation in the Dutch mortgage market. This market is highly concentrated. Concentration has further increased since the financial crisis as foreign mortgage lenders exited (e.g., GMAC, Sparck, ELQ, DSB and later BNP Paribas). As no new lenders entered the market the competitive fringe has become smaller (see also Table 3). CPB (2013) shows that interest rates on all types of mortgages have increased by approximately one percentage point relative to the neighboring countries.

Several factors have been identified to explain this difference: (1) Higher costs of funding stemming mainly from the business models of some banks leading to higher deposit rates; (2) increased riskiness of Dutch mortgages due to high loan-to-value ratios and house price reductions; and (3) a softening of competition.

We concentrate on the findings regarding the softening of competition. Research on the Dutch mortgage market identifies two forces that may hamper competition. First, there is the aforementioned exit of foreign banks and the lack of new entry. Mortgage markets are often very national due to local taxation and valuation issues. Many (foreign) banks now focus on their home market making these markets overall less competitive, in particular those with important local factors. The increased concentration has led to an increase of about 10 to 20 basis points in mortgage rates (Mulder and Lengton (2011)).

Second, the European competition authority has imposed so-called "price-leadership restrictions" on the banks that received state-aid. These restrictions require that these banks to refrain from offering mortgage rates that are among the three lowest. Such behavioral restrictions may lead to a softening of competition in the short run given the important market shares of this group of banks. Mulder and Lengton (2011) actually show that these behavioral restrictions contribute to between 20 to 30 basis points of the increase in mortgage rates. Removal of these restrictions is expected to intensify competition again but notice that the introduction of such coordination devices such as behavioral restrictions may also have longer term impacts in terms of the way banks interact and compete.

In all of this it is important to note is that many mortgage contracts embed option-like features, e.g., the right to prepay part or the entire amount of the loan. These options are typically not explicitly priced but are part of the charged loan rates. Yet these options are typically not taken into account in empirical work measuring competition. Competition in the mortgage market may therefore be underestimated given the presence of these option features. Results on the changes in competition should be less prone to this criticism we surmise.

The mortgage market is characterized by substantial switching costs such as notary costs, and other transaction costs imposed by the incumbent mortgage provider. Competition for switchers is therefore less intense than for new mortgage applicants.

For all these reasons the mortgage market remains an area of continuing concern.

5. Following King and Levine (1993) a large empirical literature developed documenting the beneficial impact of financial development on growth (Levine (2005)). Legal origin in general (Levine, Loayza and Beck (2000)) and improvements in creditor rights, contract enforcement, and financial reporting in particular (Levine (1999)) influence the magnitude of the impact of financial development on growth. But so does the intensity of competition, or at least the conditions that foster competition.

   The liberalization of banking systems (and capital accounts and equity markets) for example makes country-level growth opportunities predict more strongly output and investment growth across many countries in Bekaert, Harvey, Lundblad and Siegel (2007). Or the lifting of intrastate branching restrictions in the U.S. for example increased the quality of bank loans rose and per capita GDP growth in Jayaratne and Strahan (1996) and reduced financing constraints, particularly among small startups, and improved allocative efficiency across the entire firm size distribution in Kerr and Nanda (2007). Or the branch entry restrictions in Italy that had been locally applied differentially to savings versus national banks in 1936 and that resulted in Guiso, Sapienza and Zingales (2004) in a differential composition of credit availability in the 1990s (see also Carbó-Valverde, Rodríguez-Fernández and Udell (2005); Carbó Valverde, López del Paso and Rodríguez Fernández (2007)).

   > In sum, conditions that foster competition in the financial sector have been empirically shown to strengthen the positive impact of financial development on real activity.

6. All State aid that was given during the financial crisis needs to strike a balance between making the banks viable again and maintaining a level playing field across banks combined with an adequate intensity of competition.

The Competition DG of the European Commission through its involvement in the implementation of the financial assistance with conditions programs has the objective to ensure that this balance is made appropriately for large banks.

State aid can soften competition in the short run by prolonging loss-making strategies by the supported banks that drive out sound banks pursuing in-normal-times profitable strategies. State ownership of many large banks may soften competition in the long run by modifying their objectives from profit-making to serving narrow political (Sapienza (2004)) and/or (more benignly) wider public objectives. These may include for example regional development or small-firm support. Notice that the softening of competition may facilitate the intertemporal subsidizing of young and small firms within the confines of valuable firm-bank relationships (Petersen and Rajan (1995)).

As discussed above, in the short run, state aid has often been conditioned on behavioral restrictions imposed on large banks. For example, banks receiving state aid were not allowed for a number of years to make acquisitions in certain business areas, to aspire or maintain price leadership (see e.g., the discussion on mortgages above, but it also applies to other market segments like checking accounts), or to pursue advertising with State aid or government shareholding. It seems therefore implicit that competitive behavior in the short run has been restricted. Some of these behavioral restrictions like the ones on "no price leadership" should be removed in order to fully restore the competitive environment.

Foreign bank presence can only be substantial when entry restrictions are non-binding and profit opportunities exist (at least to entice entry). Foreign bank presence is commonly found to be both a good indicator for the intensity of local competition and a contributor to it, and foreign banks may promote best practice (Giannetti and Ongena (2009)). The re-segmentation of the European banking sector is therefore worrisome and once the Banking Union is in place efforts should be made to re-attract foreign banks also to the Netherlands. Therefore when the privatization of a nationalized institution takes place, one should consider breaking up the institution and/or to sell the financial institution to a foreign buyer and not to a domestic buyer. We make this claim for the following two reasons: the selling of an important part of a bank to another large Dutch bank is not possible for competition reasons, and selling it to a smaller existing Dutch bank may create more similar-sized Dutch banks opening the door for tacit collusion. From a competition perspective, splitting and selling the banks to foreign parties may therefore be the preferred solution. We are not of the opinion that existing private banks should be scaled down in terms of their "relationship banking" activities.

In this context it should also be noted that some of the structural measures that are currently being proposed such as the breaking-up of banks that are too-big-to-fail and the writing of living wills in practice may also lead to an intensification of competition.

Indeed, the potential down-sizing of existing very large banks should mechanically lead to a decrease in market concentration and potentially to an increase in the intensity of competition (recall however that the correspondence between market concentration and competition across markets and time is found to be tenuous at best; however in this case one could argue that *ceteris paribus* competition should intensify if more banks will compete). Of course the magnitude of these effects will depend on exactly how the bank in case is broken up. If distinct segmented business areas are split off (for example retail and investment banking) the effect on competition may be muted. But even in the unlikely case that the retail banking division of a very large bank is split, the effect on local competition may be minimal if the split would be done by geographical area. The writing of living wills should in principle have a similar though much smaller effect than a breaking-up of too-big-to-fail banks (as in principle enforceable living wills for such banks should be more costly leading to pressures to downsize).

Another structural measure is to split up the retail and wholesale/trading parts of the banking system (as e.g. advocated in the Volcker rule, the Vickers report, and the Liikanen report). In general, banks executing certain trading activities on behalf of their clients, when well-managed and with appropriate risk controls, should not constitute a problem. However, Boot and Ratnovski (2012b) discuss the potential impacts for banking and financial system stability and argue for clear limitations on the size of the proprietary trading activities by banks. They further argue that this is even more important when retail banking is more competitive (see also Boot and Ratnovski (2012a)). Their argument goes as follows. Relationship banking generates rents, franchise value and spare capital. This free capital is more easily employed for trading activities as trading is easily scalable, whereas traditional banking activities are not. Trading induces two potential market failures: First, the misallocation of capital (risks may undermine the franchise value from relationship banking) and second risk-shifting (taking risks that benefit only shareholders). More competition in relationship-based activities aggravates these two market failures inducing a larger need for structural measures. We are not aware of empirical tests of this theoretical insight.

In sum, conventional state aid to the sector may soften competition in the short run and long run. Foreign bank entry presence is commonly found to be both a good indicator for the intensity of local competition and a contributor to it. (Foreign) bank entry can be stimulated by removing discretion in local rules and regulations, and by selling domestic institutions to foreign buyers. Regulatory downsizing of banks intensifies competition.

7. Theory makes ambiguous predictions about the relationship between the competitiveness of the banking system (where inherently a one-to-one mapping from market structure to the competitive behavior of banks is made) and banking sector stability. With some simplifications we have two views (see also Beck (2008) for a further discussion).

The first view is the traditional "competition-fragility" view stating that bank competition is eroding market power and therefore also the charter value of banking, which may lead to more risk-taking (Marcus (1984); Chan, Greenbaum and Thakor (1986); Keeley (1990)). Therefore, in systems with limited competition, banks have better profit opportunities, capital cushions and therefore fewer incentives to aggressively take risks. This has positive repercussions for financial stability. In a more competitive environment, on the other hand, banks earn fewer informational rents from their relationships with borrowers, reducing their incentives to properly screen borrowers, again increasing the risk of fragility (Boot and Greenbaum (1993); Allen and Gale (2000); Allen and Gale (2004)) potentially leading to more lax lending standards. Also, a more concentrated banking system has larger banks allowing for more diversification within banks, and fewer banks which may reduce the supervisory burden and thus enhance overall banking system stability.

The other alternative view is the 'competition-stability' view: the idea is that more competition will actually enhance stability because more money is left on the table for the entrepreneur and this will increase his effort. Therefore, competition reduces the moral hazard of the entrepreneur, which is good for banks and for financial stability. Furthermore, a less concentrated banking system with more banks imply that banks become less too-big-to-fail. Banks then should receive less implicit subsidies through their too-big-to-fail status stemming from the government's safety net and this should reduce risk taking and improve banking stability. Larger banks may also be more complex and therefore harder to monitor than small banks.

The empirical evidence on the competition-stability trade-off is derived from three different types of studies. There are bank-level analyses, individual and cross-country studies, and regional banking fragility assessments. Unfortunately, the results are mixed.

Some papers studying *bank-level evidence* find support for the charter-value hypothesis. Keeley (1990) for example finds that after the relaxation of state branching restrictions in the 1980s in the US, banks reduced their capital cushions and increased their interest rates on certificates of deposit. Dick (2006) studies the deregulation in the 1990s in the US and reports increased charge-off losses and loan loss provisions. Jiménez, López and Saurina (2010) find for a sample of Spanish banks for the period 1988 to 2003 that banks with higher market power, as measured by the Lerner index, have lower non-performing loan ratios.

Other papers support the competition-stability theory. Jayaratne and Strahan (1998) for example find that branch deregulation resulted in a sharp decrease in loan losses, and Boyd, De Nicolo and Jalal (2006) find for an international sample of banks that more

competition leads to lower risk (i.e., a higher Z-score which can be interpreted as the number of standard deviations by which returns would have to fall from the mean to wipe out all equity in the bank).

Empirical work employing *individual country* data provide similarly ambiguous results, while overall the *cross-country studies* point mostly to a positive relationship between competition and stability in the banking system. Schaeck, Cihak and Wolfe (2008) find a negative relationship between bank competition (measured by the H-statistic) and systemic bank fragility using a more refined measure of competition in the banking market – the H-Statistics. Beck, Demirgüç-Kunt and Levine (2006b) assess whether the probability that a country suffers a systemic banking crisis in a specific year depends on the concentration of the banking system, controlling for other determinants. They find that more concentrated banking systems are less likely to suffer systemic banking crises. They attribute this finding to concentration allowing for better possibilities for banks to diversify risk and not easier supervision or charter value. Finally, cross-country evidence shows that regulatory policies restricting entry and banks' activities are negatively associated with bank stability (see e.g., Barth, Caprio and Levine (2004); Beck, Demirgüç-Kunt and Levine (2006b); Beck, Demirgüç-Kunt and Levine (2006a)). Limiting contestability of the banking sector thus seems to undermine rather than to strengthen bank stability, a result contradicting the charter value hypothesis.

Finally, Degryse, Elahi and Penas (2013) assess how a region's banking system characteristics (in particular bank capitalization, liquidity, concentration, wholesale funding and foreign bank entry) impact on the region's banking fragility (as measured by several countries banking indices in a regions being in the left tail). Their findings are supportive of the competition-stability view in most regions as an increase in competition in the banking industry significantly reduces so-called exceedances or co-exceedances.

When looking at the Netherlands over the period from 2007 until the present, the Dutch government had to intervene (to prevent outright bankruptcy or as a precautionary measure) in all major banks except for Rabobank: There was the nationalization of ABN Amro and state aid for ING, and SNS Reaal (turning into a nationalization later). Furthermore, it had to intervene in Aegon, an important insurance company. While highly concentrated, the individual banks as well as the Dutch system did not seem particularly stable during this period. Furthermore, the large Dutch banks are internationally very active and some of the instability has been imported from those activities. Finally, it is impossible to identify the counterfactual, i.e., how stability would have been when concentration was smaller and the system more competitive, and less internationally active.

Recent empirical work shows that financial sectors that have become too big relative to the size of the economy may lead to more volatile growth and instability (Beck, Degryse and Kneer (2013)). There are two views on the financial sector. The *financial facilitator view* emphasizes the role of the financial sector in mobilizing funds for investment and contributing to an efficient capital allocation in general. This supports capital formation

and productivity growth, and ultimately economic growth. It also encompasses additional, more or less public services such as providing access to basic payment, transaction and savings services that are important for the participation of the whole population in a modern market economy.

A very different view is one that focuses on financial services as a sector in itself. The *financial center view* towards the financial sector sees it more or less as an export sector, i.e., one that seeks to build a nationally based financial center stronghold by building on relative comparative advantages, such as skill base, regulatory policies, subsidies, etc. National policies in various countries see considerable economic benefits that would come from professional services (legal, accounting, consulting, etc.) that typically cluster around a financial center. Beck, Degryse and Kneer (2013) show that, in line with the financial-center view, the results for high-income countries suggest that a large financial sector might stimulate growth in the short term. However, this comes at the cost of higher growth volatility. The recent experience of Iceland and Cyprus – and, to a lesser degree, of the UK and the Netherlands – support a more general finding, based on pre-crisis data. The financial facilitator function is especially powerful in developing and emerging markets, both for growth in the long term and reducing volatility in long and medium term.

The first question we should ask ourselves in the current reform debate is what kind of financial system we are aiming for. Continuing to focus on the financial center approach while at the same trying to reduce riskiness of finance through restrictions and tighter regulation will have negative repercussions for competition, without truly reducing riskiness (as banks may also take more risks abroad as in Ongena, Popov and Udell (2012)). To the contrary, a continuous focus on large banks will create more of the same bail-out expectations that have built up in the years leading up to the current crisis. So, a first lesson out of the current crisis should be to refocus the attention of public policy on the facilitating role of financial sectors and away from the attempt to create national champions and financial centers.

Furthermore, banks' business models have contributed to the build-up of the recent crisis. For example, a too great reliance on non-interest revenues and wholesale funding seem to induce a greater likelihood of a bank being affected by the global turmoil (see e.g., Huang and Ratnovski (2009)).

> To conclude theory makes ambiguous predictions about the relationship between the competitiveness of the banking system and its stability. Empirical work seems equally mixed in its findings. Cross-country studies however mostly show that more competition goes together with more financial stability. Regulation and supervision that are incentive compatible however are of first-order importance for financial stability.

8. Beck, De Jonghe and Schepens (2013) study the stability – competition relation across all domestic banks for 79 countries, including the Netherlands, for the period 1993 to 2008. The individual banks' Z-scores they calculate indicate some slippage over time for the banks in the Netherlands (see Table 4) from 97 in 1994 to 69 in 2008. One has to keep in mind however that the various individual bank series are somewhat volatile possibly due to various time-varying bank characteristics and changes in the banking sector.

   Yet, even when controlling for individual bank Lerner indices and other bank characteristics a similar picture arises (see Table 5 Columns 1 and 4). The estimated coefficient on the country – year dummy for the Netherlands for a specification with the ln(Z-score) as the dependent variable drops almost monotonically from 0.54 in 1993 to -0.56 in 2008. This is a sizeable drop given that the ln(average Z-score) is around 4.5. This implies that *ceteris paribus* banks in the Netherlands before 1999 had higher and after 1999 lower Z-scores than banks in other countries. Most of this effect seems due to the increase in volatility of the return on assets (see Table 5 Column 2) and not due to a shortfall in equity (see Table 5 Column 3).

   In sum, the Netherlands went into the crisis with somewhat less stable banks than other countries, even when controlling for their potentially somewhat less competitive form and other bank characteristics.

9. Recent empirical work has started to investigate if large-scale government interventions such as blanket guarantees, liquidity support, recapitalizations, and nationalizations affect competition in banking?

Calderon and Schaeck (2012) exploit data for 124 countries that witnessed different policy responses to 41 banking crises between 1996 and 2010. They most surprisingly find that government interventions robustly reduce Lerner indices and net interest margins (and hence intensify competition), though the interventions coincide with an increase in the number of zombie banks and their market share. This effect remains present for at least five years. The competition-intensifying effect of interventions is greater if banking sectors are more concentrated and less contestable prior to the crises, but the effects are mitigated in more transparent banking systems. While interventions reduce loan rates while sustaining the provision of credit, deposit rates also decline. Liquidity support, recapitalizations, and nationalizations also negatively affect access to banking.

Other recent work may provide an explanation for this intensification in competition by investigating how public guarantees affect banking competition for both the protected banks (i.e., those subject to the explicit or implicit guarantees or government ownership for example) as well as for the competitor banks. The reasoning goes as follows. Public guarantees distort competition, as "guaranteed" banks are able to refinance at more favorable terms than other banks as the State will step in and compensate if such a bank becomes insolvent. The charter value of competing banks may then drop and induce them to behave more competitively and take more risk.

Gropp, Hakenes and Schnabel (2011) for example measure implicit guarantees on the basis of expectations given by rating agencies on the probability of external support (i.e., the *Support Ratings* provided by the rating agency Fitch/IBCA). They show that in countries where competitors with external support have a larger market share (their MSI1 and MSI2 indicators) the other banks exhibit more risk taking. Their empirical analysis is based on data covering 5,000 banks in 30 countries in 2003. Their bank risk-taking measure is the relative importance of problem loans and a risky-assets-to-total-assets ratio.

In sum, large-scale government crisis interventions surprisingly may actually spur more competition in banking, possibly because banks that are not supported start to compete more fiercely.

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10. In Gropp, Hakenes and Schnabel (2011) the Netherlands is one of the countries with the highest MSI1 and MSI2 ratings (ranking it 5th and 2nd on this measure, respectively) suggesting large bail-out expectations for "guaranteed" bank competitors.

> The results of their model would then imply that large bail-out expectations for "guaranteed" bank competitors may lead to larger risk taking incentives by the remaining banks in the Netherlands.

Our Recommendations

Our following long-term recommendations (to be implemented over a five- to ten-year horizon) are based on our reading of the theory and empirical evidence in the various points (indicated between parentheses) we discussed above.

(1) To increase the transparency of certain segments of the retail banking market and spur competition there banks should be obliged to offer and report the conditions on their basic banking products (checking account, including overdrafts; time deposits; single-repayment loans; …) in a standardized manner on a unified electronic platform that is accessible by all bank accountholders. A simple and almost-free procedure should allow accountholders to transfer the assets and liabilities between banks (without having to change account information etc.).

(2) The Netherlands currently relies on private credit bureaus such as Bureau Krediet Registratie (individuals) and Dun & Bradstreet (firms) for the information sharing between banks both on individual households and firms. Non-discriminatory and cheap access to these bureaus is required in order to have competition in different segments of credit markets. While credit information sellers like Dun & Bradstreet do have coverage of the Netherlands, it seems clearly desirable to expand on the information sharing arrangements in the industry to achieve a more thorough coverage of loans to SMEs. Establishing a public credit registry with non-discriminatory access for incumbent banks and potential (foreign) entrants may foster more competition in credit markets (through branching rather than through M&As). Equally important is that requiring financial intermediaries to report loan volumes, the degree of collateralization, loan performance and even loan rates will improve the supervision of banks by De Nederlandsche Bank as well as it will allow the Nederlandse Mededingingsautoriteit to measure the intensity of competition better. One should however refrain from allowing the sharing of information on loan rates between as this may lead to collusive practices (such as price fixing).

(3 to 6) Conditions that foster competition in the financial sector have been shown to strengthen the positive impact of financial development on real activity. Foreign bank entry presence is commonly found to be both a good indicator for the intensity of local competition and a contributor to it. Bank entry can be stimulated by removing discretion in the local application of rules and regulations, and when the occasion arises by selling domestic institutions to foreign buyers.

(7 and 8) Theory and empirics are ambiguous about the impact of competition on individual bank stability as well as on financial system stability. Most cross-country studies find that more competition goes together with more bank stability. While competition is not detrimental for banking system stability, it is important to have a good regulatory and institutional framework in place. Regulatory and supervisory failures have been at the origin of many financial crises. Supervisors and policy makers

should focus more on creating an incentive-compatible setting to create financial stability. Competition however is important to promote an efficient financial system.

(9 and 10) The crisis has shown that an effective crisis resolution framework is critical for competition in the banking market. Early intervention reduces the risk of too-harsh competition from undercapitalized banks that gamble for resurrection. Avoiding unnecessary bail-outs further reduces distorting effects on marginal funding costs as bail-out expectations allow banks to fund them more cheaply. An effective bank resolution framework therefore imposes market discipline and reduces the moral hazard risk that can lead to aggressive risk taking and herding effects in the financial system and that we have seen at work in the current crisis.[7] Our short-term recommendation in this regard is that risk-taking by banks that are not directly and explicitly "touched" by government intervention should be especially monitored.

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Appendix

TABLE 1
INDIVIDUAL BANK LERNER INDICES

Bank Name (End of Sample)	Former Bank Name	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
ABN AMRO Clearing Bank N.V.	Fortis Bank Global Clearing N.V.												0.12		0.01	0.06	0.11
Asahi Bank (Nederland) N.V.				0.11													
Bank Bercoop NV	Cooperatieve Voorschotbank b.a.			0.23	0.20												
Bank Mendes Gans NV		0.33	0.38	0.30		0.28											
Bank Nederlandse Gemeenten NV, BNG														0.27	0.27	0.21	0.22
Bank of Tokyo - Mitsubishi UFJ (Holland) NV	Bank of Tokyo - Mitsubishi (Holland) NV		0.15	0.16	0.17	0.11	0.13	0.21	0.27	0.14	0.26	0.20	0.19	0.18	0.21	0.18	0.17
BinckBank NV	Binck NV													0.19	0.45	0.31	0.09
BNP Paribas Bank NV												0.05					
CenE Bankiers	Crediet- en Effectenbank NV	0.21	0.23	0.23	0.22	0.25	0.25	0.25	0.25	0.20	0.20						
Chiao Tung Bank Europe NV																	
CITCO Bank Nederland NV			0.07	0.10										-0.08	-0.02	0.00	
Commerzbank (Nederland) NV		0.18	0.19	0.25	0.24	0.24	0.20	0.19									
Credit Europe Bank N.V.	Finansbank (Holland) N.V.												0.29	0.19	0.14	0.14	0.09
Delta Lloyd Bank NV		0.15	0.16	0.16													
Demir-Halk Bank (Nederland) N.V-DHB Bank				0.26	0.26	0.27	0.23	0.28	0.34	0.29	0.22	0.18	0.18	0.21	0.20	0.19	0.15
Deutsche Bank de Bary NV		0.09	0.08	0.11	0.11												
Dexia Bank Nederland NV	Kempen & Co N.V. (Old)	0.27	0.30	0.32	0.39	0.45	0.45	0.45	0.35	0.21	-0.25	0.29	-0.25	0.43			
DSB Bank N.V.														0.05	0.07		
Fortis Bank (Nederland) N.V.	Fortis Bank Nederland (Holding) N.V.	0.07	0.04	0.07	0.05	0.05	0.03	0.07	0.10	0.01	-0.01	0.07	0.09	0.07	0.14	0.16	0.16
Friesland Bank N.V.		0.16	0.15	0.14	0.14	0.13	0.15	0.14	0.18	0.16	0.13	0.16	0.05	0.12	0.02	-0.04	-0.07
Fuji Bank Nederland N.V.				0.20	0.19	0.20											
GE Artesia Bank	Banque Artesia Nederland NV	0.14	0.12	0.14	0.15	0.18	0.20	0.19	0.21	0.01	0.18	0.19	0.20	0.21	0.17	0.17	0.11
Generale Bank Nederland NV		0.07	0.04	0.03	0.08												
Hollandse Koopmans Bank		0.20	0.15	0.13													
Indonesische Overzeese Bank NV - INDOVER Bank									0.09	0.06	0.17	-0.11	-0.23	-0.25	-0.11		
ING Bank NV		0.12	0.12	0.10	0.09	0.09	0.11	0.11	0.12	0.12	0.11	0.09	0.09	0.09	0.10	0.12	0.12
ING Direct NV													0.04				
KBC Bank Nederland NV		0.16	0.10	0.06	0.11	0.16	0.13	0.16	0.11	0.11	-0.03	0.18	0.21	0.21	0.23		
LeasePlan Corporation NV	ABN AMRO Lease Holding NV		0.14	0.15	0.14	0.13	0.13	0.11	0.11	0.14	0.13	0.14	0.13	0.16	0.24	0.23	0.15
MeesPierson NV		0.12	0.10	0.12													
Mizuho Corporate Bank Nederland NV	Mizuho Bank Nederland NV			0.17	0.18	0.25	0.25	0.16	0.20	0.19		0.17	0.16				0.16
NIBC Bank NV	NIB Capital Bank NV	0.33	0.36	0.37	0.38	0.38	0.36	0.34	0.31	0.35	0.18	0.36	0.37	0.35	0.29	0.26	0.19
Nomura Bank Nederland NV																	
Rabo Real Estate Group-Rabo Vastgoedgroep	Rabo Bouwfonds NV								0.19	0.18	0.20	0.21	0.23	0.01	0.11	0.09	-0.16
Rabobank Nederland-Rabobank Group		0.14	0.13	0.14	0.13	0.13	0.14	0.15	0.13	0.12	0.11	0.11	0.08	0.08	0.12	0.13	0.12
RBS Holdings NV	ABN Amro Holding NV	0.12	0.11	0.11	0.10	0.09	0.10	0.10	0.11	0.09	0.07	0.05	0.05	0.07	0.00	0.00	0.03
Robeco Direct NV																	-0.07
SNS Bank N.V.	SNS Bank Nederland N.V.				0.10	0.10	0.12	0.13	0.14	0.13	0.12	0.12	0.12	0.13	0.12	0.12	0.07
Spaar en Voorschotbank				0.21	0.16	0.18	0.19	0.19									
Staalbankiers NV	Staal Bank NV	0.05	0.08	0.04	0.11	0.10	0.02	0.04	0.12	-0.03	-0.09	-0.22	-0.25	-0.22	-0.02	-0.01	0.02
The Economy Bank NV																	0.29
Theodoor Gilissen Bankiers NV	Theodoor Gilissen NV											0.04					
Triodos Bank NV													0.07	0.08	0.09	0.08	0.08
UFJ Bank Nederland NV	Tokai Bank Nederland NV	0.25	0.26	0.25	0.24	0.24	0.25										
Yamaichi Bank Nederland NV																	
Yapi Kredi Bank Nederland N.V	Kocbank Nederland N.V.						0.10	0.25	0.44	0.30						0.21	
Yapi Kredi Bank Nederland NV (old)												0.19	0.21	0.23			
Average		**0.17**	**0.16**	**0.17**	**0.17**	**0.19**	**0.18**	**0.19**	**0.20**	**0.15**	**0.11**	**0.12**	**0.10**	**0.12**	**0.13**	**0.12**	**0.10**

Notes. The table reports the Lerner index for individual banks in the Netherlands at year-end 1993 to 2008. The data was provided by Glenn Schepens and was used in Beck, De Jonghe and Schepens (2013).

TABLE 2

MARKETSHARES ACCORDING TO THE NOTIFYING PARTY

%	Main banking relation	Deposits / savings	Loans with fixed term	Documentary credits	Domestic payments	International payments
ABNAMRO	[30 − 40]	[20 − 30]	[20 − 30]	[30 − 40]	[20 − 30]	[30 − 40]
Fortis	[5 − 10]	[5 − 10]	[0 − 5]	[5 − 10]	[5 − 10]	[5 − 10]
Combined	**[40 − 50]**	**[30 − 40]**	**[30 − 40]**	**[40 − 50]**	**[30 − 40]**	**[30 − 40]**
Rabobank	[20 − 30]	[20 − 30]	[30 − 40]	[20 − 30]	[20 − 30]	[20 − 30]
ING	[20 − 30]	[30 − 40]	[10 − 20]	[20 − 30]	[30 − 40]	[20 − 30]
Others	[5 − 10]	[10 − 20]	[10 − 20]	[10 − 20]	[5 − 10]	[10 − 20]

Notes. Source: European Commission (2007a), Table 1.

TABLE 3

MARKETSHARES IN DUTCH MORTGAGE MARKET ON THE BASIS OF THE NUMBER OF NEWLY REGISTERED
MORTGAGES

Aanbieder	2004	2010
Rabobank	25,7%	30,2%
ING	21,7%	20,2%
ABN Amro	14,3%	20,0%
SNS	11,2%	6,7%
Fortis	8,4%	-
AEGON	1,3%	5,6%
BNP Paribas	0,5%	7,7%
Overig	16,8%	9,6%
Concentratiegraad		
HHI	1.579	1.883
C4	72,8%	78,5%

Notes. Source: NMa (2011).

TABLE 4
INDIVIDUAL BANK Z-SCORES

Bank Name (End of Sample)	Former Bank Name	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
ABN AMRO Clearing Bank N.V.	Fortis Bank Global Clearing N.V.												12		21	63	22
Asahi Bank (Nederland) N.V.																	
Bank Bercoop NV	Cooperatieve Voorschotbank b.a.				83												
Bank Mendes Gans NV			87	140		196											
Bank Nederlandse Gemeenten NV, BNG															43	31	66
Bank of Tokyo - Mitsubishi UFJ (Holland) NV	Bank of Tokyo - Mitsubishi (Holland) NV			125	137	300	147	128	45	37	41	144	246	201	128	149	202
BinckBank NV	Binck NV													6	9	16	12
BNP Paribas Bank NV																	
CenE Bankiers	Crediet- en Effectenbank NV		52	74	165	535	325	394	259	56	72						
Chiao Tung Bank Europe NV																	
CITCO Bank Nederland NV			55	54										94	20	18	
Commerzbank (Nederland) NV			37	23	55	32	25	210									
Credit Europe Bank N.V.	Finansbank (Holland) N.V.													28	63	108	144
Delta Lloyd Bank NV			81	44													
Demir-Halk Bank (Nederland) N.V-DHB Bank					29	85	45	48	13	12	15	32	546	104	135	95	35
Deutsche Bank de Bary NV			96	53	51												
Dexia Bank Nederland NV	Kempen & Co N.V. (Old)		28	32	16	16	106		19	4	1	4	3	8			
DSB Bank N.V.																20	
Fortis Bank (Nederland) N.V.	Fortis Bank Nederland (Holding) N.V.		72	52	37	50	109	34	30	21	21	56	15	19	17	201	0
Friesland Bank N.V.			135	107	108	103	102	42	31	22	17	11	42	35	57	51	6
Fuji Bank Nederland N.V.				71	294												
GE Artesia Bank	Banque Artesia Nederland NV		106	36	25	45	70	108	207	6	9	9	105	41	40	68	50
Generale Bank Nederland NV			117	72	48												
Hollandse Koopmans Bank			40	38													
Indonesische Overzeese Bank NV - INDOVER Bank									55	23	42	40	31	26	43		
ING Bank NV			135	163	160	174	27	27	28	37	22	35	24	33	65	69	12
ING Direct NV																	
KBC Bank Nederland NV			53	74	20	17	45	49	14	10	3	9	8	15	24		
LeasePlan Corporation NV	ABN AMRO Lease Holding NV			55	167	217	152	306	159	45	59	173	190	68	52	96	44
MeesPierson NV			99	62													
Mizuho Corporate Bank Nederland NV	Mizuho Bank Nederland NV				282	78	88	230	74	70		155	88				66
NIBC Bank NV	NIB Capital Bank NV		65	72	385	66	64	361	13	12	14	21	16	36	31	22	24
Nomura Bank Nederland NV																	
Rabo Real Estate Group-Rabo Vastgoedgroep	Rabo Bouwfonds NV									178	174	59	46	118	123	23	13
Rabobank Nederland-Rabobank Group			431	332	375	650	125	111	371	273	261	495	204	195	159	237	343
RBS Holdings NV	ABN Amro Holding NV		113	128	89	108	69	54	48	72	34	35	29	87	6	8	7
Robeco Direct NV																	
SNS Bank N.V.	SNS Bank Nederland N.V.					123	128	190	120	61	82	215	203	68	80	133	31
Spaar en Voorschotbank					142	321	93	104									
Staalbankiers NV	Staal Bank NV		92	17	22	545	270	124	45	11	9	24	35	47	54	26	30
The Economy Bank NV																	68
Theodoor Gilissen Bankiers NV	Theodoor Gilissen NV												14				
Triodos Bank NV														411	147	150	244	202
UFJ Bank Nederland NV	Tokai Bank Nederland NV		50	79	118	170	225										
Yamaichi Bank Nederland NV																	
Yapi Kredi Bank Nederland N.V	Kocbank Nederland N.V.						24	12	7	15					93		
Yapi Kredi Bank Nederland NV (old)												50	46				
	Average		97	83	128	192	112	141	85	51	51	83	115	69	64	84	69
	Standard Deviation		85	66	113	188	81	117	101	67	69	118	147	59	47	74	88
	ln(Average)		4.6	4.4	4.8	5.3	4.7	4.9	4.4	3.9	3.9	4.4	4.7	4.2	4.2	4.4	4.2

Notes. The table reports the Z-score for individual banks in the Netherlands at year-end 1993 to 2008. The Z-score can be interpreted as the number of standard deviations by which returns would have to fall from the mean to wipe out all equity in the bank. The data was provided by Glenn Schepens and was used in Beck, De Jonghe and Schepens (2013).

TABLE 5

EVOLUTION IN BANKING SECTOR STABILITY IN THE NETHERLANDS COMPARED TO OTHER COUNTRIES CONTROLLING FOR THE LERNER INDEX AND OTHER INDIVIDUAL BANK CHARACTERISTICS

Year	(1) ln(Z-score)	(2) -ln(sd(ROA))	(3) Equity / Total Assets	(4) ln(Z-score), 5 year average
1993	0.54	0.75	-1.77	
1994	0.40	0.56	-1.46	
1995	0.66	0.78	-1.35	0.51
1996	0.71	0.84	-1.50	0.54
1997	0.43	0.48	-0.36	0.52
1998	0.55	0.56	-0.22	0.58
1999	-0.32	-0.30	-0.66	-0.01
2000	-0.59	-0.54	-0.26	-0.40
2001	-0.63	-0.57	-0.05	-0.45
2002	-0.13	-0.18	0.71	-0.24
2003	0.03	0.03	0.56	-0.37
2004	0.06	0.06	0.33	0.06
2005	-0.17	-0.16	0.29	0.11
2006	0.27	0.26	0.51	0.22
2007	-0.29	-0.16	-0.30	-0.05
2008	-0.56	-0.56	0.71	-0.24

Notes. The table reports the estimated coefficients on the country-year dummy for the Netherlands and the indicated year in Table 5 of Beck, De Jonghe and Schepens (2013). They run regressions for all domestic banks for 79 countries, including the Netherlands, for the period 1993 to 2008 with as the dependent variable the ln(Z-score) averaged over the last three years, and its components -ln(sd(ROA) and Equity over Total Assets, on the individual bank Lerner index and other bank controls. The data was provided by Glenn Schepens and was used in Beck, De Jonghe and Schepens (2013).

Endnotes

[1] See Bresnahan (1989), Degryse and Ongena (2008) and Degryse, Kim and Ongena (2009) for further discussions. Alegria and Schaeck (2008) derive the analytical relationships between the various concentration measures.

[2] Market structure results as an appropriate competition indicator in a Cournot model, i.e., a model in which companies compete on the amount of output they will produce and where products are homogeneous.

[3] There are a host of other methods like the conjectural variations models, structural demand models, and other structural models (sunk costs and entry), but (to our current knowledge) these have never been applied to Dutch banking data.

[4] Most empirical studies we mention consider markets at a national level. Other literature shows that some markets are much more local in nature (e.g., Degryse and Ongena (2005)). Markets may also be differently delineated for the purposes of competition law.

[5] Bikker and Haaf (2002) offer a broad review of the results of many studies.

[6] Giannetti, Jentzsch and Spagnolo (2010).

[7] See also Beck (2008).