

Measures of seller concentration



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Most studies of competition infer competitive behaviour within countries from just one of a small number of measures, frequently through the use of statistically estimated measures. Although researchers may favour one method over another, there is no consensus regarding the “ best” measure by which to gauge competition (Northcott 2004). Furthermore, diverging results can be yielded by the various concentration measures even when applied to the same underlying market (Biker and Haaf 2000). These concerns relating to the measurement of competition are of particular importance as many markets become more concentrated[1]. In order to examine whether any particular measure of seller concentration is superior we compare and contrast several measures of seller concentration, in terms of their ability to meet the criteria proposed by Hannah and Kay (1977).

The final part of this paper focuses on whether vigorous competition contributed to the recent collapse of the Irish banking sector. Important changes in the structure and the functioning of the financial system in the past included domestic consolidation, regulatory reforms and reduced barriers to entry. These changes affected industry concentration and the intensity of competition. Therefore, we explore whether excessive competition in the financial sector explains the excessive risk taking by managers of financial institutions since the beginning of the millennium.

Seller Concentration Measures[2]

Seller concentration can be measured at two levels. The first type, aggregate concentration reflects the importance of the largest firms that form part of an economy. Despite being relatively uncomplicated to measure, data of this type is troublesome to obtain. Aggregate concentration may be imperative

for numerous reasons. It may reveal the economic importance of having large diversified firms, not adequately reflected through industry concentration measures. If it is high, it may signify that the economy's largest firms may have the ability to influence the regulators and politicians and may indicate implications for levels of seller concentration in particular industries.

The second type, industry concentration demonstrates the importance of the largest firms in a particular industry. The number and size distribution of firms is a key features of industry structure. This paper compares and contrasts a number of alternative measures^[3]of industry concentration. Hannah and Kay (1977) suggested a number of general criteria, which any measure should satisfy if it is to adequately reflect the most significant characteristics of the firm size distribution. However, as we will see not all of the concentration measures in use satisfy all of the Hannah and Kay criteria.

The n firm concentration ratio (Crn):

The CR_n ratio awards equal emphasis to the n largest firms, but neglects the small firms in the market. There are no set rules for the choice of n in the calculation and as Bailey and Boyle (1971) demonstrate the choice of n and the choice of size measure are not that critical for the majority of practical purposes.

In contrast, to the other measures the data requirements^[4]for the calculation of CR_n are the least demanding increasing its attractiveness. However, this may also be seen as a limitation as no account is taken of the number and size distributions of the firms outside the top n and furthermore

no account is taken of the size distributions within the top n firms.

(Lipczynski, Wilson and Goddard 2009). The CRn ratio fails to meet several of the Hannah and Kay criteria for example; a merger between two industry members would not cause CRn to increase. It is therefore deemed to be an unsatisfactory concentration measure in terms of meeting the criterion.

The Herfindahl-Hirchsman Index (HH):

The HH Index is the most widely treated measure of concentration[5]and compared to the CRn ratio, offers greater discrimination as it includes all firms in the industry and weights the firms according to market share. HH succeeds where CRn fails as it increases as the size distribution becomes more disproportionate. The HH index is more satisfactory in terms of its ability to meet the Hannah and Kay criteria. In contrast, as mentioned above, a practical difficulty with the HH index is its requirement for individual size data on all of the industry's member firms. However, if individual data are not available for the smaller firms in an industry, a rational approximation using data on the largest firms' results in a reasonably close approximation to the true value of HH. The inverse measure of HH, referred to as the numbers equivalent, is also useful in measuring inequality in the firm size distribution.

Hannah and Kay index (HK):

It is also possible to interpret the HH index as a weighted sum of all market shares of all firms in an industry. Hannah and Kay contributed to HH by enabling the relative weights attached to the larger and small firms to vary from the proportions used in the HH index. This is enabled by allowing the parameter $\hat{\pm}$ to be selected[6]and intended to reflect their ideas about

changes in concentration as a result of the entry or exit of firms, and the sales transfer among the different firms. The complimentary properties of HH apply equally to HK. Furthermore, this measure decreases the degree of inaccuracy, when estimated data must be used for smaller firms. The HK index can also be expressed as an inverse concentration measure referred to as the numbers equivalent. The properties and interpretation of this are the same as before.

Entropy coefficient (E):

For a given number of firms, E falls with an increase in inequality among those firms (White, 1982), and the weights E attaches to market share decreases in absolute terms as the market share of a firm becomes larger (Kwoka, 1981). Therefore, if the value of E is small, it signifies an industry with high concentration and vice versa. However, this approach may not be suitable when comparing concentration for two different size industries. For this reason, the relative entropy coefficient RE , was generated, as its maximum does not depend on the number of firms. Since E is an inverse concentration measure, $\exp(E)$ can be interpreted as a numbers equivalent that corresponds to the case $\hat{I}_{\pm} = 1$.

Variance of the logarithms of firm sizes (VL):

An advantage of VL is that the log element reduces the skewed effect providing a more reasonable measure of inequality across the entire firm size distribution. VL is also unaffected by scaling and therefore reflects situations accurately. A major limitation of this measure however, is that many would argue it is more accurate to interpret VL as a measure of

inequality in the firm size distribution and therefore this may avert its use and interpretation.

The Lorenz curve and the Gini coefficient:

Similarly, the Gini coefficient is more accurately interpreted as a measure of inequality in the firm size distribution.

Conclusion:

The HH index and the HK index are the most pleasing in terms of their ability to meet the Hannah and Kay criteria and appear to be the most applied in empirical literature. Before concluding, I think it is important to highlight that diverging results can be yielded by the various concentration measures even when applied to the same underlying market[7], most likely a result of the use of varying weighting schemes. Therefore, one should choose concentration indices depending on the characteristics of their industry and their perception regarding the relative impact larger and smaller firms have on competition, size distribution and number of firms.

Evaluate whether increased competition in the Irish banking sector significantly contributed to the recent collapse

There appears to be some disagreement in empirical literature regarding competition and its impact on stability.

Proponents of banking sector concentration argue that economies of scale drive bank mergers and acquisitions and therefore increased concentration is closely associated with efficiency improvements (Demirgüç Kunt and Levine, 2000). Casu and Molyneux (2003) suggest that high concentration in the banking sector increases internal efficiency and this corresponds to an

overall positive externality for the entire economy (Classens and Laeven 2004). Allen and Gale (2003) argue that larger banks can diversify better, thus highly concentrated banking industries tend to be less fragile than low concentrated banking industries. There is also the view that concentrated banking industries may also enhance profits and therefore lower bank vulnerability to adverse shocks. It has also been suggested that a concentrated banking industry is less complex to monitor thereby increasing control and reducing the risks of contagion. (Beck, Demirgüç -Kunt and Levine, 2003).

On the contrary, there is the view that increased competition could have a destabilising impact on an industry. Canoy, van Dijk, Lemmen, de Mooij and Weigand (2001) demonstrate that increased competition in the banking sector results in banks engaging in riskier products in an attempt to increase their profit margins.

Competition can affect the channel through which financial innovation contributes to financial stability. If on the one hand, credit derivatives improve stability because they improve risk sharing; on the other hand they also make it more attractive for a bank to acquire more risk. This latter effect dominates when credit markets are competitive, thus contributing to the destabilising effect on lending incentives (OECD 2009). Chatelain and Bandt (1998) suggest that high competition in the banking sector increases the probability of bank failures. Advocates of this “concentration-fragility” view note that larger banks frequently receive financial backing through implicit “too big to fail” policies that small banks do not enjoy (Boyd and Runkle, 1993). Proponents of this view disagree with the suggestion that a few large

banks are easier to monitor than many small banks. If size is positively correlated with complexity, then large banks may be more opaque than small banks, and therefore more difficult to monitor. This would tend to produce a positive relationship between concentration and fragility. (Arjan Tushaj 2010)

There appears to be fewer dichotomies in the literature in relation to competition and efficiency. Most empirical literature demonstrates that high levels of competition lead to reduced levels of efficiency in the banking sector[8].

Structure of the Irish banking system:

As can be seen economic theory and prior empirical research has conflicting ideas about the relationship between competition, concentration and banking sector fragility. We seek to contribute to the literature by focusing our analysis on the Irish banking system and seek to analyse whether increased competition in Ireland in recent decades has contributed to the sectors recent collapse.

Ireland provides an interesting setting in which to conduct this analysis as apart from the Icelandic experience, the Irish banking sector has proven to have been the worst performance of any banking sector during the current global downturn.

The Irish banking systems is oligopolistic in nature and is comprised of a small number of banks[9]focused on the small domestic market and a significantly larger amount of banks trading in the international markets. The first group concentrates on the SMEs and domestic retail sector, whereas,

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the second group focus on a range of activities from proprietary trading to specialist lending. The international sector is typically funded by the wholesale market whereas the domestic sector was traditionally funded by retail deposits. Therefore, domestic banks were relatively insulated from the vulnerabilities of the international markets. However, over time the number of domestic banks receiving funding from the wholesale markets has increased (CBFSA Banking Supervision: Our new approach 2010). The domestic savings pool on which these banks traditionally drew upon for deposit funds is limited by the size of the Irish economy. As the domestic banks extended their lending, they sourced external funds from international markets. However, these new sources were a lot more volatile and therefore resulted in these banks being largely exposed to the global economic slowdown.

EU membership, along with electronic advancement and the internet has resulted in reduced barriers to entry in the Irish banking sector. In order to reduce the risk of external takeover, Irish banks attempted to create economies of scale leading to a wave of mergers and acquisitions between incumbent banks. This period of consolidation reduced the number of banks and saw the emergence of Allied AIB and BOI as Ireland's two largest financial institutions. However, banks like BOS were easily able to set up operations in Ireland and compete alongside Irish banks. It could be argued that the entry of Bank of Scotland to the Irish mortgage market in 1999 was the stimulus for the existing banks to become more competitive. The average standard variable mortgage before BOS arrived was 0.7% above the EU average after its entry this dropped to 1.6% below the EU average.

EU membership, along with the ‘one size fits all’ interest rate regime resulted in an unanticipated consequence for the smaller Eurozone countries like Ireland in that credit was suddenly much cheaper than their higher growth potential would warrant (Dellepiane and Hardiman 2010).

The domestic banking sector in Ireland has therefore become highly concentrated and also highly contestable. In 2004 it was estimated that between 75-90% of all current accounts were controlled by the two largest Irish banks, namely AIB and BOI (Competition Authority in Ireland 2004). Consistent with these findings, Kennedy and O’Sullivan (2008) were able to estimate the HH index in the banking sector for Ireland, indicating a highly concentrated banking industry[10]with an overall HH index of 2, 193 in 2007, compared with 2, 179 in 2002. Therefore, it is evident that concentration in the Irish banking sector increased significantly in the last decade.

High concentration levels lead to increased competitive pressure as each rival attempts to protect their share of the market. In the Irish case, competitive pressure on the leading banks was driven by the unprecedentedly rapid expansion of Anglo Irish[11](Honohan 2008). This increase in concentration experienced in the Irish banking system took place against a backdrop of a rapidly expanding economy. Seminal research concludes that rapid economic growth should further stimulate competition in banking, inducing new entry, innovation and efficiency, making markets more competitive. (Greenwood and Jovanovic 1990, Kuznets 1955, Townsend 1973)

Irish banks had not been central to the financing of the export led Celtic Tiger period and appear not to have played a significant role in the early phase of the property bubble. However, the last four years of the boom, late 2003 onwards, were clearly bank led. Increased competition around this time resulted in new entrants and incumbents competing aggressively, stimulating demand with innovations such as 100 per cent LTV mortgages (Honohan 2008). This search for yield resulted because as competition intensified, profits became eroded and banks were pressed to find new revenue streams and to develop new business lines in order to satisfy their shareholders. As the property market began to surge, more and more banks began to participate in this market. Domestic banks became more focused on the value of collateral in their commercial property lending decisions, displacing the previous disciplined approach of cash flow analysis. This resulted in a deterioration of credit quality. There is evidence that the domestic banking sector has been competitive to the point that banks actually competed on non-price terms to maintain or grow market share. This was done to the detriment of their underlying risk profiles and led to significant losses (CBFSA Banking Supervision; Our new approach 2010). Many of the banks had inadequate risk management models and thus it is evident that the typical problem of information asymmetry and the associated adverse selection and moral hazard became an issue in the lending practises of many institutions. Irish banks built up huge exposures to the property sector[12].

The increase in bank lending due to increased competition led to rises in the prices of Irish houses and commercial property. Property bubbles grow as

long as buyers are willing to borrow increasingly large amounts in the expectation that prices will continue to rise. This process inevitably hits a limit where borrowers become reluctant to take on what start to appear as impossibly large levels of debt, and the self-reinforcing spiral of borrowing and prices starts to work in reverse (Kelly 2009).

The property market came to what Brian Lenihan accurately referred to as “a shuddering halt” in June 2008, taking with it the Irish banking system.

Conclusion:

Most people would agree that the Irish banks would not be in the situation they are at present had they not excessively over lent to land and property investments financed through short term foreign borrowing (Honohan 2010). In the absence of these lending practises, the banking sector would not have been as exposed to the global liquidity crisis. Therefore, the demise of the Irish banking sector can be attributed to negligent mortgage and subprime lending practises to property developers. This in turn was a result of the domestic banks increasing lending drastically as they attempted to compete for market share. Therefore, it is evident that increased competition in the Irish Banking sector did contribute significantly to the Irish banking sector.