Changing Structure and Production patterns of Irish Agriculture – Trends and Prospects

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Keywords

Farm Structures/Systems, Farm Incomes, Farm Viability

Abstract

For Irish farming the 1990's can be considered a transition period between two different policy regimes. The period prior to 1990 involved high market price supports whilst the period post 2000 involved moving to decoupled and environmental income support mechanisms. This paper puts the focus on the country's farm structures over the 1992 to 2006 period. It deals with the distribution of farm sizes, farming systems, the farm labour force, the changing structure of production, farm incomes and other sources of income in supplementing farm household income. The analysis leads to an assessment of the current financial and demographic viability of Irish farms, and also to the development of some future scenarios of change in farm numbers and in their viability status over the next decade. Farm numbers in Ireland will continue to decline whilst the income contribution from off-farm employment to farm household income will increase. The exodus from dairy and sheep production to cattle farming will continue. For the longer run it is clear that the problems and issues arising from poor agricultural structures cannot be solved by agricultural measures alone. Multi-sectoral and complimentary measures within a framework of rural development programmes are required to assist and offer employment to those exiting from farming.

Introduction

The 1990s was a critical period for Irish agriculture. EU farm policies of the 1970s and 1980s were mainly associated with increasing market price support, export refunds, increasing production and rapid growth in the cost of the Common Agricultural Policy (CAP). The 1992 CAP reform centred on controlling output and budgetary expenditure by reducing price supports for the major agricultural commodities, alongside a system of direct compensatory payments with accompanying measures for environmental protection and rural development. The policy direction of the 1992 Reform was extended in the 2000 CAP Reform. Its main objective was to further reduce price support, with the aim of making European agriculture more competitive and market orientated. Protection of the environment was also linked to direct payments and a comprehensive rural development programme was put in place. The 2003 mid-term reform of the CAP under the Luxemburg Agreement finally broke the link between payments to farmers and agricultural production by "decoupling" direct payments from farm products. Essentially this allowed farmer's the freedom to produce to market requirements but under strict environmental and cross compliance regulations to protect both consumers and the environment.

This paper focuses on structural changes in Irish agriculture during the period 1992 to 2006 resulting from reforms of the CAP. The changes in farm sizes, systems and labour input to agriculture are presented followed by a review of developments in farm incomes, farm viability, structural farm and the growing importance of off-farm employment. Finally there is a brief discussion on changes likely to occur in the next decade.

Farm Numbers and Size

The decline in farm number and employment in agriculture has been an on-going process to the changing structure of Irish agriculture over the last century and is similar to trends in all developed economies.

In the period 1993 to 2005 farm numbers declined by 28,800, a fall of 18% or 1.4% on an annual basis. The rate of decline was slightly less than 50% of the rate in the previous decade, when the annual rate of decline was 3%. There was a considerable decline in farms of less than 30 ha (-30%), whilst the percent of farms in the over 50 ha size category increased from 12% to 18%. The average farm size has increased from 26.8 ha in 1993 to 31.8 ha in 2005, with the south-east having the largest farm size of 41.4 ha in 2005. This average farm size in Ireland is considerably higher than the EU-25 average of 15.8 ha or the EU 15 average of 20.2 ha.

However there is considerable variation in the EU farm size ranging from 1 ha in Malta to 79.4 ha in the Czech Republic.

Table 1: Number (000) and percent of farms by size 1993 to 2005

Size	**1993**		**2000**		**2005**	
Ha	**No.**	**(%)**	**No.**	**(%)**	**No.**	**(%)**
			(000)			
<10	38.8	(24)	28.4	(20)	27.7	(21)
10<20	44.9	(28)	34.3	(24)	30.1	(22)
20<30	29.4	(19)	25.0	(18)	22.5	(17)
30<50	27.4	(17)	29.6	(21)	28.7	(22)
50<100	16.9	(9)	19.5	(14)	19.6	(15)
100+	4.0	(3)	4.6	(3)	4.0	(3)
Total	**161.4**	**(100)**	**141.4**	**(100)**	**132.7**	**(100)**

Source: Central Statistics Office (CSO)

The Teagasc National Survey (NFS) is conducted annually on a random sample of Irish farms. Financial, technical and socio economic data are collected by a team of trained enumerators. The data can be weighted to provide population estimates.

The Teagasc National Farm Survey (NFS) is therefore essentially a Farm Management Survey which provides a breakdown of Irish farms by the main farm types and systems based on the EU farm typology. There has been a sizeable decline in the number and percentage of farms in the two dairying systems, with a corresponding increase in the percentage of farms in the drystock systems, which increased from 59% of all farms in 1993 to 70% in 2006 (Table 2).

Table 2: Main Farming systems in Ireland 1993 and 2006

	1993	**2006**
System	**%**	**%**
Specialist Dairying	19	15
Dairying + Other	15	8
Cattle Rearing	16	24
Cattle Other	27	28
Mainly Sheep	16	18
Tillage	6	7
All	**100**	**100**

Source: Teagasc National Farm Survey

Labour Supply to Farming

The decline in the farm labour force is evident from the data in Table 3, which shows the number of persons involved in farming, declining from 312,700 in 1991 to 247,700 in 2005 – a decline of 20% mainly confined to family labour. In 1991 the total number of Annual Work Units was 245,200 compared to 148,600 in 2005 – a decline of 40% (an Annual Work Unit is 1800 hours or more worked per annum). The percentage contribution of "spouses" and "other family" has declined, whilst the contribution of the farm holder has increased from 58% to 66% of total labour input.

Table 3: Labour Input to Farming 1991 and 2005

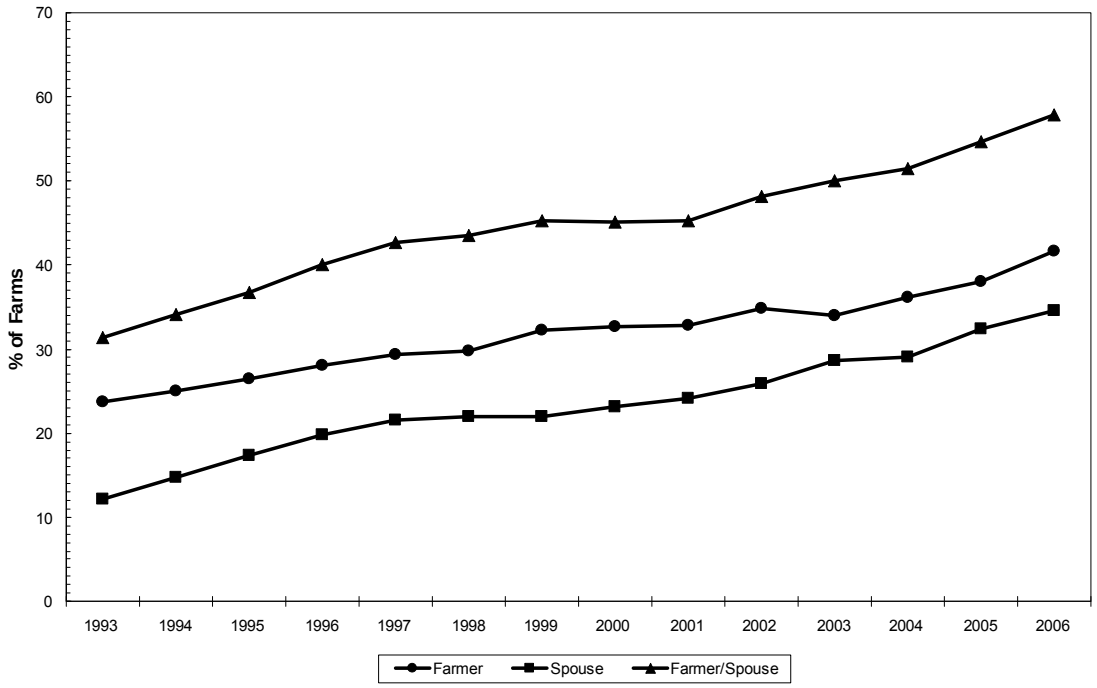
Category of Worker	Persons Involved	Annual Work Units (AWUs)	Persons Involved	Annual Work Units (AWUs)
	1991		2005	
	000	000 (%)	000	000 (%)
Farmholder	169.9	142.9 (58)	130.4	98.2 (66)
Spouse	72.1	53.0 (22)	45.3	22.3 (15)
Other family	57.3	38.2 (16)	57.9	21.1 (14)
Non-family workers	13.4	11.0 (4)	14.0	7.0 (5)
Total	**312.7**	**245.2 (100)**	**247.7**	**148.6 (100)**

Source: CSO

Off-Farm Employment

The Central Statistics Office Household Budget Survey (HBS) data show that in 1987 farming activities provided on average 49% of their Gross Household Income in farm households but by 1999/00 the proportion had fallen to 39% and in 2004/05 the percentage was only 32%. National Farm Survey data on off-farm employment amongst farm holders and spouses are shown in Figure 1. There has been considerable growth in off-farm employment and the data show the change in off-farm employment amongst farm holders and their spouses from 1993 to 2006.

Figure 1: Percentage of farms with off-farm job for farmer and/or spouse



Source: National Farm Survey

In 1993 an off-farm job was held by the farm holder on 22% of farms, by the spouse on 13% of farms and overall by either holder or spouse on 31% of farms nationally. By 2006 the corresponding results were on 42% of farms by the holder, 35% by the spouse and 58% by either spouse or holder on all farms. In 2006 the incidence of the holder having an off-farm job was highest in the small farm size groups, while the spouse was most likely to have an off-farm job in the intermediate size groups. The cattle and sheep systems had the highest incidence of the holder and/or the spouse having off-farm employment, while the dairy farms had the lowest; the same is true in relation to the holder. However, this distinction was not evident in relation to the spouse where the incidence of off-farm employment was higher for the dairying systems at 44%, with an overall mean estimate of 35% for all farming systems.

National Farm Survey data show that in 2006, 82% of farms the farmer and/or the spouse had some source of off-farm income, be it from employment, pension or social assistance.

Farm Viability

Viability in Table 5 is based on the farm's ability to generate an income which can reward all unpaid family labour at the agricultural wage rate and provide a return of at least 5% on all non-land assets. The division into full-time and part-time refers to the scale of the enterprise with full-time farms requiring in excess of 0.75 Labour Units to operate the farm, measured on the basis of Standard Man Day labour requirements for all enterprises on the farm. The presence or absence of an off-farm job is not a determining factor. The full-time viable farms therefore represent the larger and more viable "commercial" sector of Irish farming; the part-time viable category meet the financial criteria for viability but could be extremely small farm units. The data show a considerable decline in the number of full-time viable farms viz from 34,234 in 1993 to 20,245 in 2006, a decline of 40 percent. However, as overall farm numbers represented by the National Farm Survey declined from 164,600 in 1993 to 113,210 in 2006, the percentage of full-time viable farms declined from 21% of all farms in 1993 to 18% in 2006 – a decline of 3%, whilst the percentage of non-viable farms was very similar at 71% and 72% for 1993 and 2006 respectively.

Table 5: Farm viability based on returns to labour and non-land assets

	1993	**2006**
	Number of Farms (000) (%)	
Full-time farms(>0.75 Lab. Units) viable	34.2 (21)	20.2 (18)
Part-time farms (<0.75 Lab. Units) viable	12.3 (8)	11.0 (10)
Non-viable farms	114.8 (71)	82.0 (72)
Total	**161.3 (100)**	**113.2 (100)**

Source: National Farm Survey

There are many other definitions and concepts of farm viability viz. demographic, presence/absence of off-farm employment, household structure etc. but data in this paper refers only to the financial viability definition in an attempt to monitor the number of "commercial" farms in the country.

Selected variables are shown in Table 6 for full-time viable farms, full-time non-viable farms and all non-viable farms. Full-time viable farms have FFI which is 3.5 times that of Full-time non-viable. Both sets of farms require in excess of 0.75 labour units to operate. It is surprising that even though 50% of the non-viable full-time farms are in dairying – yet their incomes, investment, direct payments are much lower than their viable colleagues. The non viable full-time dairy units are smaller than the full-time viable and their cost

structure is also inferior, with 80% of output required to cover total net expenses compared to 61% on the viable farms. Demography and soil types are also superior on the viable units.

Table 6: Selected variables for Full-time viable (>0.75 Labour Units) and non-viable farms – 2006

	Viable Full-time (> 0.75 Labour Units)	**Non-Viable Farms Full-time (> 0.75 Lab Unit)**	**All**
No. Farms (000)	20.2	17.2	81.9
Family farm income (€)/farm)	51,100	14,900	7,800
Direct payments €/farm	32,000	29,000	12,100
Direct payments % G. Output	24	30	40
Direct payments % FFI	62	140	155
Land farmed (ha)	69.8	49.5	27.4
ESUs	52.5	31.8	12.2
Labour units	1.46	1.47	1.03
Net new investment (€)	14,800	9,400	4,200
Costs % of G. Output	61	79	74
Farm System			
% Dairying	61	50	16
% Cattle	16	29	61
% Sheep	12	17	19
% Tillage	11	4	4
Age of holder	50	54	56
Marital status %	83	69	63
Household size (No.)	4.3	3.5	3.0
Demographically viable (%)	90	81	68
Holder off-farm job (%)	15	15	46
Holder/Spouse off-farm job (%)	53	44	58
% on good soils (Soil 1)	63	54	44

Source: National Farm Survey

Farm Incomes

In the Teagasc National Farm Survey (NFS), the principal measure of the income which arises from the year's farming activities, is Family Farm Income per farm (FFI). FFI represents the financial reward to all members of the family, who work on the farm, for their labour, management and investment. It does not include income from non-farming sources and thus may not be equated to household income.

Data in Table 7 shows average Family Farm Income (FFI) per farm in current and real terms over the period 1995 to 2006 and also compared to the average industrial wage. The base year 1995 was chosen as this was the commencement of the existing NFS sample of farms having a minimum of 2 ESUs.

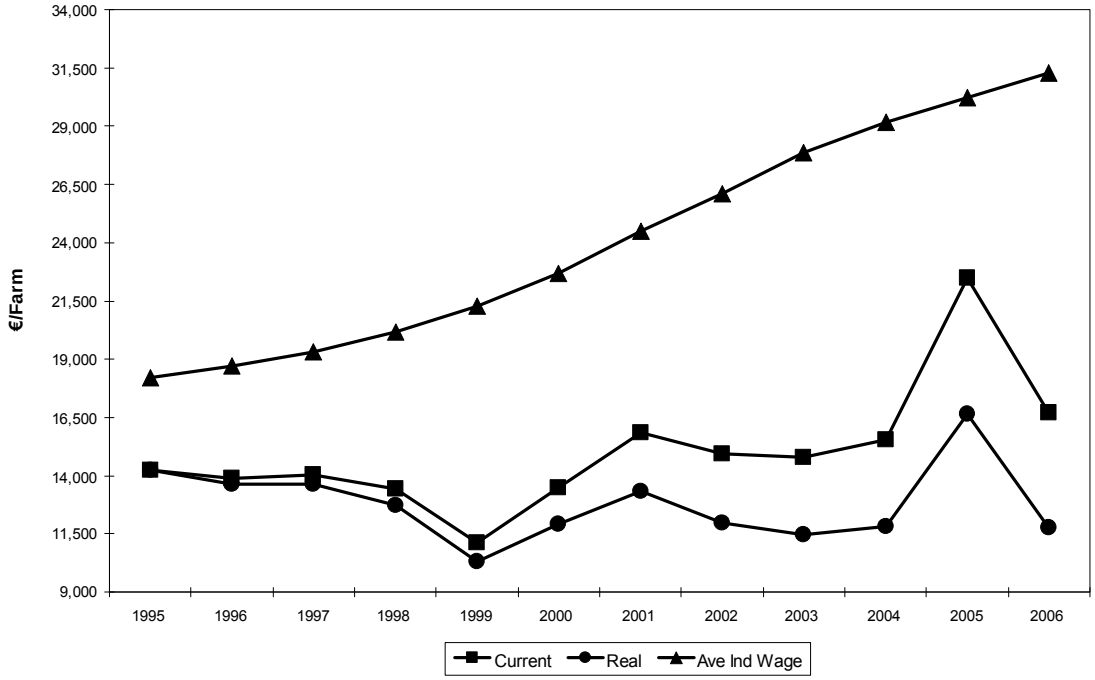
Table 7: Trends in Family Farm Income (FFI) and comparison to the Average Industrial Wage

Year	Average FFI €	FFI at Constant Prices (1995)	% Change FFI Current	Average Industrial Wage
1995	14236	14236	+23.7	18,200
2000	13499	11903	+21.7	22,680
2002	14917	11991	-5.8	26,080
2004	15557	11822	+5.4	29,160
2006	16680	11789	-25.7	31,260
2007	19687	13399	+18.0	33250

Source: National Farm Survey & Central Statistics Office (CSO)

The data shows farm income in 2006 was 38% above that for 1995 in current terms and when inflation (CPI) is taken into account that FFI has actually declined from €14,236 in 1995 to €13,399 in 2007, a decrease of 6% in real terms. The trend in FFI in current and real terms is shown in Fig 2.

Figure 2: Family Farm Income (FFI) per Farm (€) 1995-2006



The data in Table 7 and Fig. 2 shows (i) relatively low levels of FFI, (ii) the relatively static nature of farm incomes over the 12 years and (iii) the volatility in FFI as shown in the percentage annual changes (Table 7) compared to the steady rise in non-farm incomes. The slower growth in farm income relative to industrial incomes is also apparent – in 1995 average FFI was 78% of the industrial wage, but declined to 60% and 53% in 2000 and 2006 respectively.

In every year of the survey to date, the average FFI on the Dairy and Tillage systems was far higher than those on the drystock based systems. Average farm income on the largest Cattle Rearing and Cattle Other Systems size groups in 2006 was €49,699 and €44,592 respectively per farm, compared to €81,573 on the largest Specialist Dairying System. The average FFI for many sub-groups, especially in the Cattle and Sheep systems is below the average agricultural wage rate of €16,087 for 2006, so that those farm families do not receive a full return for their labour and no return on management or investment.

FUTURE STRUCTURE & VIABILITY OF IRISH FARMS

Farm Numbers - 2015

The rate of decline in farm numbers in Ireland has slowed down from 3% per annum in the 1980s to 2% in the 1990s and to 1% from 2000 to 2005 (Table 1). The data in Table 1 also shows that a major decline took place in the number of smaller farms (less than 20 ha) in the period 2000 to 2005 with farm numbers in the under 20 ha size group declining by 2% per annum, whilst the number of farms in the 20-50 ha declined by 0.8% per annum with the numbers of farms in the over 50 ha size group increasing by 0.8% per annum. Projecting these rates of change over the decade 2005 to 2015 would result in the outcome shown in Table 8. It should be pointed out that the numbers in Table 8 are based on CSO farm population data, which contain approximately 18,000 "micro" farms plus pig and poultry farms not represented by the NFS.

Table 8: Projected farm numbers by size 2015*

Ha	Number of farms	%
<20	45,440	38
2-50	45,630	39
>50	27,110	23
Total	**118,180**	**100**

This decline is less than previous projections for farm numbers but given the linkage of entitlements and land to the draw down of the Single Farm Payment (SFP), it is not surprising that the rate of decline has slowed. The decoupling of the SFP has also facilitated continuing in farming whilst having an off-farm job.

Farm Viability - 2015

A number of reports examining the future of Irish agriculture (Agrifood 2010; Agrivision 2015 Committee) have projected the number of viable farms in the future. As mentioned earlier in this paper, there are a number of methods of defining and measuring viability. The definition of viability used here is based on the farms ability to provide a return on non-land assets and reward unpaid family labour at the agricultural wage rate. Many very small farms could meet these criteria but at low farm income levels. In order to exclude this latter group and measure the larger, more commercial viable sector a further criterion was included i.e. farms must require minimum of 0.75 Labour Units to operate the farm business measured on a Standard Man Day basis. National Farm Survey data show that between 2001 and 2006, the full-time viable category numbered on this basis declined by 7% or 1.4% per annum. Projecting forward to 2015 on the basis of this rate of decline would result in the numbers of farms in this category declining to approximately **17,000 farms**. This would be equivalent to 15% of the farm population in 2015 based on National Farm Survey representivity (excluding pigs, poultry and farms <2ESU). This group represents the larger, more commercial sector of agriculture and will be comprised of mainly dairy farms, tillage farms and large cattle farms. Based on overall farm numbers projected to 2015 in Table 8, this would result in 101,000 non-viable farms which would be mainly cattle, sheep and smaller dairy farms. The majority of these farms would require off-farm employment or other income sources. It is likely therefore that the steady increase in off-farm employment since the early 1990s will continue over the next decade.

Off-farm Employment/Income - 2015

In 2006 on 58% of farm households either the holder/spouse had an off-farm job. Off-farm employment of either holder or spouse has grown at a steady rate of approximately 2% per annum since the early 1990s. The increased availability of off-farm employment during this period has provided opportunities for farm families to remain in rural areas, whilst farming or leasing their land. It is likely that even with reduced growth rates in the economy, off-farm employment will continue to grow, as many of the smaller drystock farm seek to increase their household incomes. The increase in the number of cattle farms will facilitate the growth in off-

farm employment. Assuming the continued availability of jobs in rural areas, it is possible that by 2015 up to 75% of all farms will have the holder/spouse working off the farm.

Farm Systems - 2015

To examine the changing trends in farming systems an application of a technique developed by Stigler, termed the "survivor technique" was used on NFS farm data from 1993 to 2005. This technique has been used for estimating returns to scale and optimum firm size in both industry and in agriculture. In the US it has been used to identify the growing, viable size categories in both the pig and dairy sectors. It is a statistical technique based on the hypothesis that plant sizes which are inefficient will decline. The smallest group which shows an increase in its relative share is classed as the "minimum efficient size group". However, in using the technique, it is important to consider that plants or farms may survive for many reasons other than their internal economic efficiency.

National Farm Survey data were used to measure, track and index the relative contributions of the main farming systems for a number of key variables from 1993 to 2005. The data is weighted to provide the percentage contribution for each farm system for the year 2005 in Table 9.

Table 9: Percentage Farm No^{s}, UAA, G. Output and FFI by farm system - 2005

System	Dairying	Dairying + Other	Cattle Rearing	Cattle Other	Mainly Sheep	Mainly Tillage	All Systems
				%			
Farms numbers	16	9	25	27	16	7	100
Land farmed (UAA)	19	13	18	22	17	11	100
Gross Output	31	16	13	19	11	10	100
Family Farm Income	29	15	14	22	12	9	100

Source: National Farm Survey

Nationally in 2005, the two dairy systems accounted for 25% of all farms, 32% of land farmed (UAA), 47% of gross output and 44% of total farm income. The two cattle systems accounted for 52% of all farms, 40% of land used, but only 32% of gross output and 36% of farm income. Similar data were generated from the 1993, 1997 and 2001 National Farm Survey data and an index of the change between 1993 and 2005 calculated for output, FFI, UAA and farm numbers.

In Table 10 the changing contribution of each farm system to total farm output is shown for selected years in the period 1993 to 2005. Dairy farms were still the most important contributors to gross output in 2005, but

their contribution declined gradually over the period from 62% of the total in 1993 to 47% in 2005. The decline in dairy farms proportion of total output resulted in an increase in drystock farms contribution to gross output. The contribution from suckler farms increased from 5% in 1993 to 13% in 2005, with Other Cattle systems increasing from 13% in 1993 to 19% in 2005. Sheep and tillage contributions remained more or less static over the period. Data in Table 10 also show the changes indexed to the 1993 base year.

Table 10: Percentage of Gross Output by farm system and percentage change 1993-2005

System	Dairying	Dairying + Other	Cattle Rearing	Cattle Other	Mainly Sheep	Mainly Tillage	All Systems
	Gross Output						
	%						
1993	41	21	5	13	10	11	100
1997	35	22	10	15	9	10	100
2001	32	20	13	14	10	12	100
2005	31	16	13	19	11	10	100
	(1993 = 100)						
1993	100	100	100	100	100	100	
1997	86	105	200	114	84	95	
2001	80	97	267	102	94	110	
2005	77	76	267	142	108	99	

Source: National Farm Survey

The proportion of total farm income arising from the main farm systems is shown in Table 11, for 1993 and 2005 with the change indexed over the period.

Table 11: Percentage of total FFI by farm system and % change 1993-2005

	Dairying	Dairying + Other	Cattle Rearing	Cattle Other	Mainly Sheep	Mainly Tillage	All Systems
	%						
1993	42	20	5	13	12	9	100
2005	29	15	14	22	12	9	100
	(1993 = 100)						
2005	69	76	262	170	100	99	

Source: National Farm Survey

Dairy farms contribution to FFI declined from 62% of total FFI in 1993 to 44% in 2005, whilst overall cattle systems contribution doubled from 18% to 36% over the period with Cattle Rearing system's proportion

increasing by 262% albeit from a very low base. The proportion of FFI from sheep and tillage farms remained constant at 12% and 9% respectively.

The change in the proportion of land used (UAA) by the main farm systems is shown in Table 12.

Table 12: Percentage of Land used (UAA) by Farm System and % change 1993-2005

System	Dairying	Dairying + Other	Cattle Rearing	Cattle Other	Mainly Sheep	Mainly Tillage	All Systems
				%			
1993	23	18	10	21	18	10	100
2005	19	13	18	22	17	11	100
				(1993 = 100)			
2005	85	74	175	102	95	108	

Source: National Farm Survey

The index shows the movement of land out of the dairy systems, with the proportion of land in the specialist dairying system at 85% in 2005 of what it was in 1993 and in the Dairy Other system at 74% of the 1993 figure. Land released by the dairy systems has moved into the cattle systems with the proportion of land on the Cattle Rearing system in 2005 at 18% nationally compared to the 10% proportion in 1993.

Finally the change in the proportion of farms in each farm system is shown in Table 13.

Table 13: Percentage of farm numbers by farm system and % change 1993-2005

	Dairying	Cattle Rearing	Cattle Other	Mainly Sheep	Mainly Tillage	All Systems
			%			
1993	35	17	28	16	6	100
2005	25	25	27	16	7	100
			(1993 = 100)			
2005	74	149	97	103	120	

Source: National Farm Survey

The proportion of all farms in the two dairy systems declined from 35% in 1993 to 25% in 2005, with the proportion farm numbers in the Cattle Rearing system increasing from 17% to 25% of total farm number in 2005.

The data clearly shows that over the last 12 years there has been a considerable shift of agricultural resources out of dairying and into cattle production – mainly the suckling system. The change has been regular and

consistent over the period and based on the survivor technique would indicate that this trend towards diverting resources into cattle production is likely to continue in the future resulting in declining dairy farm numbers.

The survivor technique can also be used to evaluate the categories of dairy farms most likely to exit in the future. Using NFS data dairy farms number can be tracked or monitored on the basis of farm size over the period 1993 to 2005 (Table 14).

Table 14: Percentage of Gross Output on Specialist dairy farms by farm size (ha) 1993-2005

Size (ha)	**<10**	**10<20**	**20<30**	**30<50**	**50<100**	**>100**	**All sizes**
1993	1	11	21	32	28	6	100
2005	0	4	9	34	37	9	100
				(1993 = 100)			
	0	40	43	107	135	159	

Source: National Farm Survey

The survivor technique applied to Table 14 data indicates that the minimum sized dairy farm not in decline is the 30-50 ha size group, as the number in the size classes less than 30 ha are clearly declining. NFS data show that the average number of dairy cows on the 30-50 ha size group was 50 cows in 2005. In the medium to long-term it could be argued that dairy farms will need to be in the over 50 ha group to survive and have minimum of 70 cows, as they show an increase in percentage terms of 135. In 2005 the over 50 ha size group of specialist dairy farms had an average 70 dairy cows based on NFS data.

Based on the trends shown in Tables 12 to 16, it is likely that the cattle sector will continue to expand due mainly to farms exiting the dairy systems. Given the outlook and market returns for sheep production, it is also likely that further resources will move from sheep to cattle production. The growth in the cattle sector since 1992 cannot be explained on the basis of farm economic efficiency or financial returns from the sector. However, farmers take many other factors into consideration when deciding on their enterprise mix. It is clear that the increase in off-farm employment is a major contributor in farmers' decision to move to cattle, which is the most compatible enterprise with holding a job outside the farm. The availability of off-farm employment since the early 1990's has also been a key factor in the movement of farms to the cattle sector.

Summary

The structure of Irish farming continues to change. Farm numbers and numbers employed have declined steadily and this will continue albeit at a slower rate. As a result of these changes farm size has increased by almost 20% since the early 1990s. Farming activities now provide a much smaller proportion of gross household incomes than 20 years ago and this is likely to continue with steady growth in off-farm employment. The movement of farmers out of dairying into the more extensive, and less labour intensive drystock enterprises has been encouraged by the expansion in off-farm employment. EU farm policies have contributed to structural change – the move away from price and market support policies to decoupled direct payments has resulted in many farmers being dependant on subsidies for their incomes. It is likely the emphasis on environmental and rural development policies will be deepened in future policy reforms. Overall average farm incomes continue to be low and have not kept pace with inflation or non-agricultural incomes. However, there is a core group of larger, viable farms, who form the main "commercial" sector of Irish agriculture. This group is composed mainly of dairy farms, tillage farms and the larger cattle farms and it is projected that there will be 17,000 of these by 2015. It is likely that more farmers will join the Rural Environmental Protection Scheme. The outlook for farm incomes over the next decade is not optimistic and they will continue to be relatively static based on FAPRI Ireland's recent projections for the major commodities to 2016 and with costs of inputs increasing. The structural change in farming will continue with more farmers changing to cattle production and supported by off-farm employment.

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