Risk Management and The Role of Off-Farm Income[1]

David Freshwater and Simon Jette-Nantel[2]

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In recent years the focus of income support in agricultural policy has shifted from raising levels of farm income to reducing the variability of farm income (Freshwater and Headley, 2004; Gardner 1992). Several explanations exist for the shift in focus, but the two most compelling are: first, the growing recognition that average farm household income is now greater than the average income of non-farm households, and second, the challenge of maintaining income support to farmers in the face of trade agreements that require non-output distorting farm programs. In practice, the fundamental argument for risk management policy has been that farmers are exposed to considerable risk in their enterprises, some would say levels of risk that are above those facing other small businesses, and that these risks induce farm production decisions that are socially sub-optimal (OECD, 2000, Harwood, Heifner, Coble, Perry and Somarwu, 1999; CAPI, 2004). That is, farm risk has public externality effects in the form of less efficient agricultural production and the public provision of risk management tools allows both farmers and society to benefit.

The thesis of this paper is that the public benefits of risk management policy are smaller than are usually stated. While farming is a risky activity, we contend that the majority of farmers, operating farms of various types and sizes, have developed internal risk management strategies that appear to be more effective than those provided by governments. Consequently, government policies are used less frequently than is expected by policy makers, unless these policies contain a high level of subsidy. In this case risk management policies are really income support policies, because they significantly raise expected income as they reduce income variability. In this situation it is quite possible that risk management policies are in fact socially undesirable. High levels of subsidy allegedly made to reduce farm level risk may not only provide disincentives to adopt internal risk management schemes but they may also induce farmers to undertake riskier decisions than are socially desirable.

The Context

In the OECD countries government support for agriculture is pervasive, with the exception of a few highly export oriented countries, such as New Zealand and Australia (OECD, 2009a). Relatively high levels of support have been in place in

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[2] Professor and Graduate Research Assistant, Department of Agricultural Economics University of Kentucky.

most countries for an extended period of time and in most countries the stated goal of this support is to support the survival of the family farm. In general the family farm is seen as fully owned by the family and providing full time employment for a nuclear family with the possibility for periods where several generations of the family are engaged in the farm in order to provide intergenerational continuity. Thus agriculture is treated differently by public policy in two other respects beyond high levels of income support. The first is a strong sense of a specific desirable farm structure, and second, there is the belief that there should be continuity of farm ownership over multiple generations. It is hard to think of other occupations or businesses where public policy beliefs like this are widely applicable.

Yet, in most OECD countries, the farm structure has drifted away from the idealized depiction of family farms defined within policy objectives. A small number of large farms now account for the majority of agricultural output (OECD, 2000, p.47-48), while a large number of small part-time farms account for the bulk of the farm population. The large farms have steadily increased their share of assets, output and income over recent decades, typically at the expense of traditional, family size, full-time farms that occupy the middle of the farm size distribution. Historically, income support policies aided this transition because they provided support on the basis of commodity output, which provided both an incentive and a mechanism for farm growth (Gardner, 2006; Schmitz, Furtan, Bayliss, 2002).

The second important phenomenon is the steady shift from full time to part time farming (OECD, 2003). The shift occurs at two levels. At the household level it has been relatively easy to explain decisions by the spouse of the operator to engage in off-farm work. As farms replaced labor with capital there was less need for a second full-time worker. Specialization in a small number of commodities reinforced this trend (Dimitri, Effland and Conklin, 2005). As levels of education in the farm population increased there was also a larger incentive for spouses to use their human capital off the farm for both personal fulfillment and economic reasons. And finally, as the range of employment opportunities in rural areas expanded there were better opportunities for off-farm employment.

But, it is increasingly clear that in most OECD countries these arguments are now equally applicable to the farm operator (OECD, 2009c). Initially the case was made that off-farm employment by operators applied to small farms that were below minimum efficient scale, and for these farms income from non-farm sources was a mechanism to allow the farm to either grow to full time status, or to remain as a life-style activity. However, it is now clear that a considerable number of large and very large farms have operators who have significant off-farm income. This can be in the form of employment or business income. For these farmers it may be more efficient to hire labor for farm operations and employ their management skills in operating both the farm business and a non-farm business.

The issue of off-farm income is crucial for the consideration of risk management policy because it raises the crucial question of whether income diversification has

become the risk management strategy of choice for farm households. If so, do we need government provided subsidized risk management policies for farming?

A final point of importance to the context is the relative unwillingness of farmers to adopt the risk management policies that governments have provided unless they are highly subsidized (OECD, 2009b, p. 38). In general agricultural policy analysis starts from the assumption that risk in agriculture is considerable and that farmers are risk averse. This suggests that farmers when offered an actuarially fair risk mitigation toll should be willing to pay the price to use it. Of course it may be possible that a modest subsidy may be required to overcome initial reluctance to commit to an unfamiliar policy, but current programs have been in existence for long periods and subsidy levels seem to be far above the level that would trigger adoption by a skeptical but risk averse individual.

Why Do Farmers Reject Unsubsidized Risk Management Programs?

The reluctance of farmers to adopt risk management tools provided through public policy has numerous potential explanations. But it mainly reflects discrepancies between farmers' reality and analysts' beliefs about farmers risk attitude, risk perception, and available set of risk management tools.

First, it could be that farmers are either not risk averse, or that they fail to fully understand the risks that face them and consistently understate them. This, however, appears to be implausible because it is inconsistent with other decisions of farmers. Of the remaining reasons that can explain farmer's behavior it is likely that some combination provides the best explanation for farmers' decisions.

A second explanation is that farmers and policy makers come to different assessments of the benefits and costs of various policy tools. In particular policy makers may be overstating the benefits and understating the costs. In particular, if the policy is calibrated on the conditions facing the average farmer it may not be reflecting very many actual farmers whose specific circumstances diverge from the average in multiple dimensions. (that would lead to underestimation of risk by the effect of averaging on the variance?) If we look only the average farm the analysis will not be reflecting any particular farm, but how do we know that it will systematically lead to overestimation of risk by the analyst? In addition, while risk management programs adopt actuarial approaches the nature of risk at the individual level can be quite different. For an individual some forms of risk may be zero or one in terms of outcomes. That is an event either occurs or does not occur. For example, either a herd of cattle on a farm has hoof and mouth disease or it does not. From a policy perspective the event probability is the likelihood of the disease across all farms, but for each farmer the only meaningful event is whether the disease strikes his or her specific herd.

A third reason for the differences in perception is that policy makers and farmers approach risk management from a different decision making perspective. For policy makers the decision nexus is typically the farm, while for farmers it is the farm

household. This is an important difference because the impact of risky outcomes differs considerably depending on the context in which the risk occurs. At the farm level a risk may have high consequences, but seen from the farm household level, especially if non-farm income and wealth represent a large share of total income and wealth, the consequences may be quite different in magnitude.

The fourth reason that farmers may choose not to adopt risk mitigation tools is a belief that high consequence events will be covered by *ad hoc* disaster response. In all OECD countries the common practice of government is to come to the aid of farmers when a high impact event occurs, such as flooding, animal disease pandemics, or other disasters that spread beyond a community to a larger region or significant share of producers. In this environment risk management programs provide far less actual benefit than the designers calculate, because farmers may anticipate protection even if they do not participate in risk management programs.

A fifth reason, and the focus of this paper, is that farmers adopt internal risk mitigation strategies that may largely make publicly provided tools irrelevant. Only a high level of subsidy (income enhancement) leads to farmers adopting the tool, and then it is largely because of its income effect. If a farmer already has an effective internal risk management strategy, then even a subsidized premium for a public policy tool imposes a cost that exceeds the value of the program to that farm.

The sixth and final reason for the disconnect between farmers' behavior and policy makers expectations is to be found in the mechanics of farm income calculations. Returns in farming are largely measured by net farm income. This is at best a flawed measure of the return to agriculture and can systematically understate actual returns (Freshwater, 2007). We know a major portion of the return to farming comes from increases in wealth and this is rarely considered in calculating risk return relationships in policy formation. In addition net farm income is a problematic variable on its own. It is not directly measured but is a residual obtained by subtracting expenses from revenues, so small errors in either of these indicators can induce large errors in net farm income. Because farming is subject to risks, net income in any particular year may not be a good measure of the underlying risk return relationship; but we have few data sets that capture net income over a period of time at the farm level. Finally, to some extent it may be appropriate to think of net farm income as a choice variable for the farm. Individual operators have the ability to manipulate farm income to optimize their tax exposure and in cases where the farm is part of a larger portfolio of income sources it may be advantageous to report lower levels of net farm income to reduce the total tax burden of the household. If this results in farmers amplifying the underlying variability in farm income then agriculture will appear to be riskier than it actually is.

Given these reasons, we should not be surprised that farmers behave differently than policy makers expect when making decisions about risk management tools. Most importantly the reluctance to embrace these tools suggests that we have an imperfect understanding of the context in which risk management decisions are

made. Farmers are not irrational in their behavior, we simply have not understood the context in which their decisions are made.

Policies for Risk Management

Currently there are three broad approaches to risk management policy. They can be roughly associated with OECD countries, the World Bank and FAO, although there is considerable overlap among the three approaches in practice. Each approach is grounded in a specific perspective on the nature of risks facing farmers and the possibilities for effective policy given the context in which farmers operate and policy will exist.

In the OECD countries the main thrust of risk management policy has been to provide income support for individual farmers depending upon their specific production practices and levels of market prices (OECD 2000, OECD, 2009b). More recently some OECD countries have moved to more specific risk mitigation approaches, rather than direct support for commodity prices, but their approach remains focused on farm level support. In the OECD farms are well integrated into market economies and in general the level of farm records and the capacity of member country governments are high enough to support a farm specific risk management approach.

The World Bank believes that agricultural risk severely impacts low income farmers in developing countries and that this impedes the modernization of agriculture and leads to low farm incomes and low agricultural productivity (World Bank, 2005). The Bank has adopted a two part strategy that is based upon increasing the integration of agriculture into market economies and providing index based insurance against natural disasters. Index based natural disaster insurance is a preferred approach because farmers are often only weakly integrated into markets so prices may not be good indicators, and because farm records are not readily available. And an index provides an easily measured trigger for risk based payouts.

The FAO has historically followed a broad approach to risk management, livelihood strategies, that has emphasized placing the farm within a larger decision making context (FAO, 2005). This approach recognizes that even in developing countries farm decisions and outcomes are part of a broader set of decisions and outcomes for the household and that there may be nonfarm options for household labor and investments that can compete with or complement farming. A main goal for the FAO approach is to improve the viability of the farm household. This can involve both farm and nonfarm strategies. Most importantly this portfolio approach results in a focus on the benefits of diversification both on the farm and off the farm as a way to mitigate risk.

Clearly each of these approaches reflects a specific perspective on the conditions facing farmers and how farms are organized to deal with these conditions. In essence each policy approach reflects a specific “structure of agriculture”. But if the actual structure of agriculture does not correspond to the structure imagined by

policy makers than we might expect that the policies put in place will provide less risk mitigation than was expected.

Structure of Agriculture and Risk Management Policy

The point introduced in the preceding paragraph is relevant to the OECD countries. Agricultural policy in these countries has evolved over almost 100 years. Historically, a major focus of farm policies has been the preservation of the family farm, reflecting a desire to support the independent and full time farmers. However, the structure of agriculture has changed in that period and it is questionable whether the basic model of farm decision making that underpins policy development has adequately captured the nature of the structural changes and the actual ways that farmers make decisions.

The Conventional Approach

To elaborate, two possible structures of agriculture can be considered (Figure 1). Model 1 can be loosely thought of as the standard perspective that underpins policy development and analysis in the OECD countries[3]. A bi-modal structure of agriculture exists in most OECD countries where a small share of total farm numbers are full time enterprises that generate the vast majority of household income from agriculture and account for a large share of total agricultural output. These farms received the bulk of public support when support was delivered through commodity payments and remain the focus of policy as it shifts to risk management. These farms are seen as having high levels of technical efficiency, are open to market based risk management strategies and are able to adopt new technicality and increase productivity. As a result, a small proportion of the aggregate farm population constitutes the core group of producers who provide OECD countries and much of the world with food and fiber.

Over time farmers have reduced the number of commodities they produce even though there are natural risk mitigation benefits from on-farm diversification. For example, combining livestock and crop enterprises is widely recognized as providing income stability because low crop prices tend to be correlated with higher livestock prices and vice versa (OECD 2009b, p.112). However, the combined effect of farm programs which provide income stability and the income enhancing benefits of specialization have biased farmers production decisions towards inherently less stable but higher return (Mafoua-Koukebene, Hornbaker and Sherrick. 1996). If risk in agriculture is increasing, it may well be because current farm policy has encouraged it.

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[3] France is a significant exception to this situation, because French policy has implemented CAP programs within a distinct framework that favors medium, or family size, farms. French policy provides relatively high levels of support to these farms and lower levels of support to larger or smaller farms. As a result France has both fewer part-time farms than its peers and a more uniform farm size distribution.

The second group, making up the majority of farmers, operates relatively small farms in terms of resources and output and the farm provides only a part of household employment and income. These farms have received limited public support, because their level of output was too small to trigger large enough commodity payments to have any real impact on the ability of the farm to support the household. While they account for a larger share of farm assets than their share of farm numbers, they have much smaller share of farm output. Part time farms are typically seen as inefficient agricultural producers with either too little investment per unit of output or too much investment depending on whether they re limited resource farms or life-style farms.

The main economic argument underlying the standard model, i.e. the presence of significant economies of scale, might seem to suggest that these small farms should not be considered part of agriculture for policy purposes. But they remain a part of the discussion of agricultural policy because of their role in generating political support. Were they to be excluded the rationale for public support would be more difficult. Small farms provide the majority of farm numbers that are used to make the well-being of farmers a significant public policy issues. Small farms also provide the low levels of farm income that are used to show that average farm income is below average income from wages and salaries. Hence, smaller farms tend to be the public policy face of agriculture when it appeals to the public for support.

Risk Management Policy under conventional model

The conventional perspective tends to look at agriculture sector in isolation, which provides an economic rationale for public risk mitigation policies. This view of agriculture focuses on improving the competitiveness and technical efficiency of farm production, which, given the presence of economies of scale, is most likely to come from increases in capitalization and specialization from large farms. However, if large farms face high levels of risk due to price and yield instability they may be unwilling to undertake the investments in increasing productivity that society requires. In this circumstance risk management policy that transfers risk to the public may be socially optimal because it will result in higher levels of farm output that more than compensate for the costs of taking on the risk. Essentially this argument hinges on an inability of specialized large full time farms to internalize risk management that then requires the socialization of risk.

An Integrated Approach

A second perspective on agriculture, Model 2, views agriculture as an integral part of the economy, and approaches the farm structure from the decision process of the farm household, rather than looking at resource endowments and commodity outputs in farming.

Farm assets and capital markets

First, farm assets are seen as part of a larger capital market. In regions such as western Canada returns on farmland are substantial and can attract non-farm investors (Painter, 1997; Agcapita). In this context, various contractual agreements

can be used to effectively redistribute the farm income risk between owners and operators (Allen and Lueck, 2003). In cases of crop sharing, risk is effectively share between owner and farm operator. And even in cases where farm operators to pay a cash rent for the asset, the financial risk associated with high leverage and debt financing are reduced (Baker and Thomassin, 1989).

The growing number of purchases of farms by investors seeking portfolio benefits whose primary activity is outside agriculture attest of the presence of such opportunities and the interest of outside investors to exploit them (Top Crop Manager). And, to some extent this farm structure makes farm income risk management a lesser concern for public policy, since it is then possible to fully exploit the alleged benefits from economies of scale while reducing the risk faced by individual farmers and households. In addition, if the rents are determined in a competitive market, it must be assumed that any benefits from a subsidized risk management program would be captured in large part by land owners, which presumably hold well diversified portfolios dominated by non agricultural assets.

Farm households as the decision making units

The approach also assumes that household assets and labor can be allocated across a range of opportunities and that a welfare maximizing household will allocate these resources so that marginal returns are equalized. This means that all farms allocate resources on the basis of opportunity cost which should maximize household and society's welfare.

In addition, if a farm is operated as a full time activity it is often because there are few alternative uses for its labor and capital, and none of these offer as high a return as farming. However, when these alternatives exists, large and small farms may allocate considerable shares of their inputs to non-farm uses, and while this may reduce the technical efficiency of agricultural production it increases the efficiency of resource use of the household and the larger economy[4]. In this model small farms provide only part of the employment and income of the household because the opportunity cost of getting bigger is too high. Similarly, large farms may have considerable off-farm earned income if the household can generate more money at the margin from off-farm activity than from the farm.

The crucial factor in household decisions is the local environment in which it operates. This environment certainly includes the agronomic situation of the farm

[4] A recent paper by Lien, Kumbhakar and Hardaker (2010) suggests that there may be no loss of technical efficiency with off-farm work. Their study in Norway showed no link between farm size and off-farm work and no reduction in technical efficiency with off-farm work. Similarly Jette-Nantel, Freshwater, Beaulieu and Katchova show that operators of large commercial farms in Canada are more likely to use off-farm income to mitigate higher levels of farm risk. As risk on farms of this size increase there is a higher adjustment in off-farm employment than for smaller farms experiencing similar farm income risk

and farm market conditions. It also includes the types and levels of government support available to the farm since these alter market returns. But the local economy can also be important in offering employment opportunities where there are high rates of return, or where there are important non-monetary benefits[5]. More complex rural economies that exhibit higher levels of economic and social development clearly increase the opportunity cost of full-time farming. And consequently one finds full time farming a more common situation in regions where agriculture remains a large share of local GDP or value-added.

From this point of view, the need for public risk management policies is far less clear. If both large and small farms typically have off-farm employment and investment opportunities and farms of both these sizes take advantage of these opportunities, then risk in agriculture is readily managed by processes that are internal to the farm household. While there may be farms in some regions or that produce some specific commodities (milk), where off-farm employment is more problematic, this is not a justification for broad public policies that transfer risk to the government on terms that are highly favorable to farmers.

Indeed providing such programs is doubly distorting. First because it results in transfers that are not necessary, and secondarily because the presence of these programs alters the relative cost of various risk management approaches. As result farmers are less likely to engage in self protection through either on farm diversification or through off-farm employment. Moreover they are also less likely to hold adequate cash reserves or untapped lines of credit that provide self-protection.

As will be shown in more detail below for Canada, it is clear that farmers in much of the OECD are in fact increasingly turning to off-farm employment, and that this phenomenon results in risk in farming playing a very different role in practice than is assumed by policies that still view full time farm employment by the household as the norm. This suggests that it may be worth considering how the FAO "livelihood" approach to managing risk in agriculture can be adapted to a developed country context.

In the OECD countries, as in developing countries, the livelihood approach offers farmers an important way to offset farm level risk through employment diversification. There is little reason to believe that off-farm income has strong positive correlation with farm income and some evidence by Da Rocha and Restucia (2006) suggests that in the OECD countries agricultural GDP is effectively

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[5] For example, in the United States an important reason for one member of the household to seek off-farm employment is to gain access to health benefits. While farmers can buy health insurance individually, it is very expensive and offers limited coverage compared to plans offered by governments or corporations. Off-farm employment can also generate important personal benefits in the form of social connections and independence.

uncorrelated, or even negatively correlated, with other major sectors of the economy including construction, manufacturing, and retail. In this environment a natural portfolio will involve farming and at least one other income source, because large risk mitigation effects can be obtained with relatively low reductions in expected income.

The exceptions to this strategy come from one or more of three impediments to forming a portfolio. First there may be an absence of non-farm employment alternatives in some regions. Second, the returns from agriculture may be large relative to other employment activities, so it is rational to specialize in farming. And finally, if government programs reduce the underlying risk in agriculture to the point that it is not an important issue farm households may choose to remain specialized in farming.

In practice a combination of these is relevant, especially in those regions of OECD countries where the local economy is undiversified and remains specialized in agricultural production. Conversely, in those regions where agricultural output is large but the rural economy is highly diversified, such as, the mid-west of the United States, the Ile de France surrounding Paris, the Po Valley in Italy, or Southern Ontario in Canada, it is possible to find large farms that have high levels of off-farm income from employment or investments. In these regions agricultural income can be far higher than in rural areas that are specialized in farming, but the share of agriculture in regional GDP is typically low.

In summary, the two structures of agriculture presented above are not mutually independent, and in fact they are only two ways of describing the current situation. But the differences in focus are important for justifying risk management policy in the OECD countries. They lead to different answers to the question – is risk management an appropriate function for agricultural policy? While, by focusing on agriculture in isolation, the conventional approach can rationalize risk management as policy function, the integrated approach cannot be used to justify risk management programs even in presence of economies of scale. It can, however, be used to highlight the synergies between a healthy farm sector and rural development.

Rural Development as Risk Mitigation

For off-farm income to be an effective risk mitigation technique there have to be off-farm employment opportunities. This leads to the conclusion that rural development is a risk mitigation approach for agriculture. A more diversified rural economy improves opportunities for farmers to gain off-farm employment opportunities as well as providing a higher quality of life in terms of access to a broader range of goods and services.

A series of papers by Kostov and Lingard first introduced the idea that rural development is risk management (2001, 2003, 2004). Their thesis is that rural development transforms a specialized local economy that faces high levels of risk

due to a narrow economic base and susceptibility to external shocks to one that is more stable. Rural development results in diversification and deepening of the local economy, so there are both more opportunities for employment and income and less impact from internal and external shocks.

The typical perception of a farm dependent community is one where primary agriculture is a major source of income and employment and the main source of regional exports. While there may be other sectors in the local economy they are largely oriented to serving farming and farmers, so instability in agriculture leads to general regional economic instability. In this context low farm prices lead to low incomes for all. And, historically support for farm prices has been seen as providing support for all rural households and firms

An important point that Kostov and Lingard make is that rural development alters the environment in which enterprises and entrepreneurs operate and this opens up new opportunities and changes existing risk relationships. Rural development reshapes the *milieu* in which farming takes place. If a farm household can earn a significant amount of its total income off the farm then it is less exposed to the underlying risks in agriculture, even if these risks remain unaltered. With diversification, the family may be prepared to undertake riskier farming activities to capture higher average farm income because the consequences of adverse farm outcomes are smaller.

Moreover, the aggregate benefits to the region from rural development can spillover onto the farm household. A more diversified and larger local economy will be more stable and it will offer better amenities for households in the form of a greater variety of: public services, retail establishments and social opportunities. In this environment agricultural output can expand at the same time that agriculture becomes a smaller share of regional output and employment. Essentially this is simply the regional counterpart to the national experience with agriculture in OECD countries.

The reshaping of the CAP in Europe to shift funding from direct support to farmers via Pillar 1 to rural development follows this logic. However, Pillar 2 funds, with the exception of Axis Four support for LEADER, remain focused on farm based diversification. While there are certainly some opportunities for farmers to manage risk by adding new activities to their farm, such as agri-tourism or processing, these are relatively limited in scope and may not offer as much income or risk management benefit to farm households as a broader rural development efforts.

In essence the idea of Kostov and Lingard provides a bridge between farm business risk management strategies in the OECD countries and the idea of the livelihood approach championed by FAO. By adding non-farm activity whether in OECD countries or developing countries it is possible to reduce risk. Thus a potentially powerful risk mitigation approach is to expand off-farm employment opportunity through investments in rural development.

Some Evidence from Canada

On average Canadian farmers now earn far more income from off-farm sources than they do from farming[6]. Consequently Canadian farm households now have higher total incomes than do average Canadian households and their net worth is several multiples higher. A clear consequence of the larger role of off-farm income is a decoupling of low household income from negative farm income (Figure2). While the share of farms reporting negative net farm incomes has increased, the share of farm households with low income has fallen. Moreover, in recent years government payments are roughly the same size as net farm income, and much of this support is provided through risk management programs.

Under the conventional view, off-farm income has been seen as only playing a major role for small farms that do not account for much agricultural output. But this seems to be a less accurate description of the current structure of agriculture. Figure 3 shows off-farm income by farm sales class for farm operators. In principle operators would be least likely members of the household to engage in off-farm employment because they are the main source of farm labor. Yet the figure shows that operator off-farm income in the highest sales class (greater than $.5 million) is almost the same as for operators in the smallest sales class (between $10,000 and $50,000).

For the largest farms off-farm income is now about the same size as farm program payments, while it is larger than program payments for all other size classes. This alone suggests that the role of farm income transcends farm size class and that it has at least as substantial a role in operator income as government payments. While investment income is a larger proportion of total off-farm income as sales classes get bigger, employment income is by far the dominant share. To be sure net market income still exceeds earned off-farm income for the two largest sales class, but there is not a large difference.

When farm households are examined the role of off-farm income is even greater (Figure 4). Once again focusing on the largest farms shows that off-farm household income for large and very large farms is far greater than program payments, and that for all farms but the very largest, off-farm income for the household exceeds market income for the farm enterprise. While the data is only for one year the growth rate of off-farm income was higher for the two largest farm sizes than for smaller farms, and for all but very large farms, the growth rate of off-farm income exceeded the growth in net operating income.

Figure 5 provides additional data for farms with sales greater than $100,000, which would include all commercial farms. These farms account for about 45% of all farms in Canada. The table shows various family income classes and those with low

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[6] All data in this section is derived from Statistics Canada: *Statistics on Income of Farm Operators 2007* and Statistics Canada: *Statistics on Income of Farm Families 2007.*

household income have farm losses and below average off-farm income. Households with more than $50,000 in income have farm income and household income of roughly similar magnitude. Thus, for farm households with more than $100,000 in total income, on average roughly $97,000 came from off-farm income and about $92,000 from net farm income, with $70,000 of the off-farm income coming from employment.

Figure 6 shows that off-farm income plays a major role in most types of farm. In the figure income is decomposed into three sources – market income, government payments and off-farm income, In 2007 off-farm income is the largest component of income for all types of farm but hogs and poultry. In hogs government payments account for the majority of income and in poultry the presence of marketing boards allow market income to dominate. For oilseed and grain farms, fruit and tree nut farms, and beef production off-farm income exceeds 50% of total income. Finally, for all farm types but hog and pig producers, off-farm income plays a larger role than government payments.

Conclusion

There are multiple reasons why government risk mitigation programs have not been broadly adopted by farmers unless they are highly subsidized, but it would seem that one reason is that farmers have found a better alternative. Off-farm income is now a major source of farm household income for farms of all sizes and largely accounts for the improvements in the relative position of farm households in national income distributions. But off-farm income also offers major risk mitigation strategy because it is largely uncorrelated with farm income. Indeed high levels of risk seen in agriculture may be a rational response by farm households to a more secure household income stream.

Canadian data confirms that farms of all sizes commonly have significant sources of off-farm income from employment and investments. Moreover there is a relatively high incidence of operator involvement in off-farm employment, not just other members of the household. To some extent larger farms may have some advantages in adopting a portfolio of income sources. On larger farms there is the possibility of hired labor that can free operators to focus on management and other high return activities. In addition as the portfolio benefits of farming become more apparent the interest in wealthy individuals adding farm assets to their investment portfolio has increased. The most common way to do this is to buy a farm since there are few opportunities to hold farm assets through passive investments.

Once the portfolio benefits of farming and other activities are recognized, either by traditional farm households or by others (investors), the perspective on income variability in farming changes. Variability in farm income now becomes a significant problem only if it is highly correlated with other income sources. While governments and farm organizations have interpreted higher levels of variability in

net farm income as a situation crying out for more public policy to mitigate risk,[7] it could be the case that the appropriate government response is to focus agricultural risk management policy on off-setting catastrophic risk and on encouraging better integration of the farm sector within the whole rural economy, either by bringing more private equity into the sector and/or by fostering more off-farm income as better ways to deal with more frequent risk. While the availability of equity financing and private investment are aspatial approaches that can be applied across a country; clearly opportunities for off-farm income vary by region, and it may be the case that greater efforts in rural development in those regions where off-farm employment opportunities are weak could be effective public policy.

In the context of the "layers of risk" approach proposed by the OECD off-farm income spills across the first two layers – the normal risk layer and the insurance layer (OECD 2009, p.30). With income diversification the effects of farm risk that call for external insurance on a full time farm become part of normal risk and are managed internally by the farm households engaged in part-time farming. To be sure some forms of agricultural risk will still require specific public policy. For example, off-farm income is unlikely to be an adequate buffer for catastrophic risk.

In addition, there will be regions in some countries where prospects for broad rural development strategies are limited. These regions are most likely to be remote with limited ability to attract people other than for farm related occupations. In thee places if farming is a viable economic activity from the perspective of society then it may be necessary to provide publicly supported risk management tools, but these tools should be carefully calibrated to only stabilize farm income and not increase it.

[7] The typical argument is that due to high risk in agriculture farmers require higher incomes to via government support to provide a "fair" risk return relationship.

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Figure 1:

Model 1

- Large farms
  - Full time operator
  - Resources allocated to improve farm
  - Increased productivity requires specialization and capital, which increases risk
- Small farms
  - Part time operator
  - Resources allocated across multiple activities
  - Low farm productivity

Model

- Focus on farm as decision m
- All farms allo resources on opportunity c
- Size of farm d determine be local conditio determine be

Figure 2:

Figure 7: Prevalence of negative net farming income and low family income, 1983-2003 (percent)

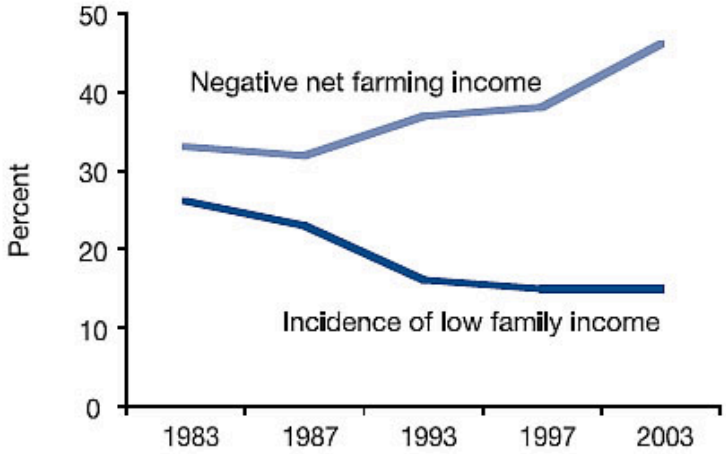


Figure 3:

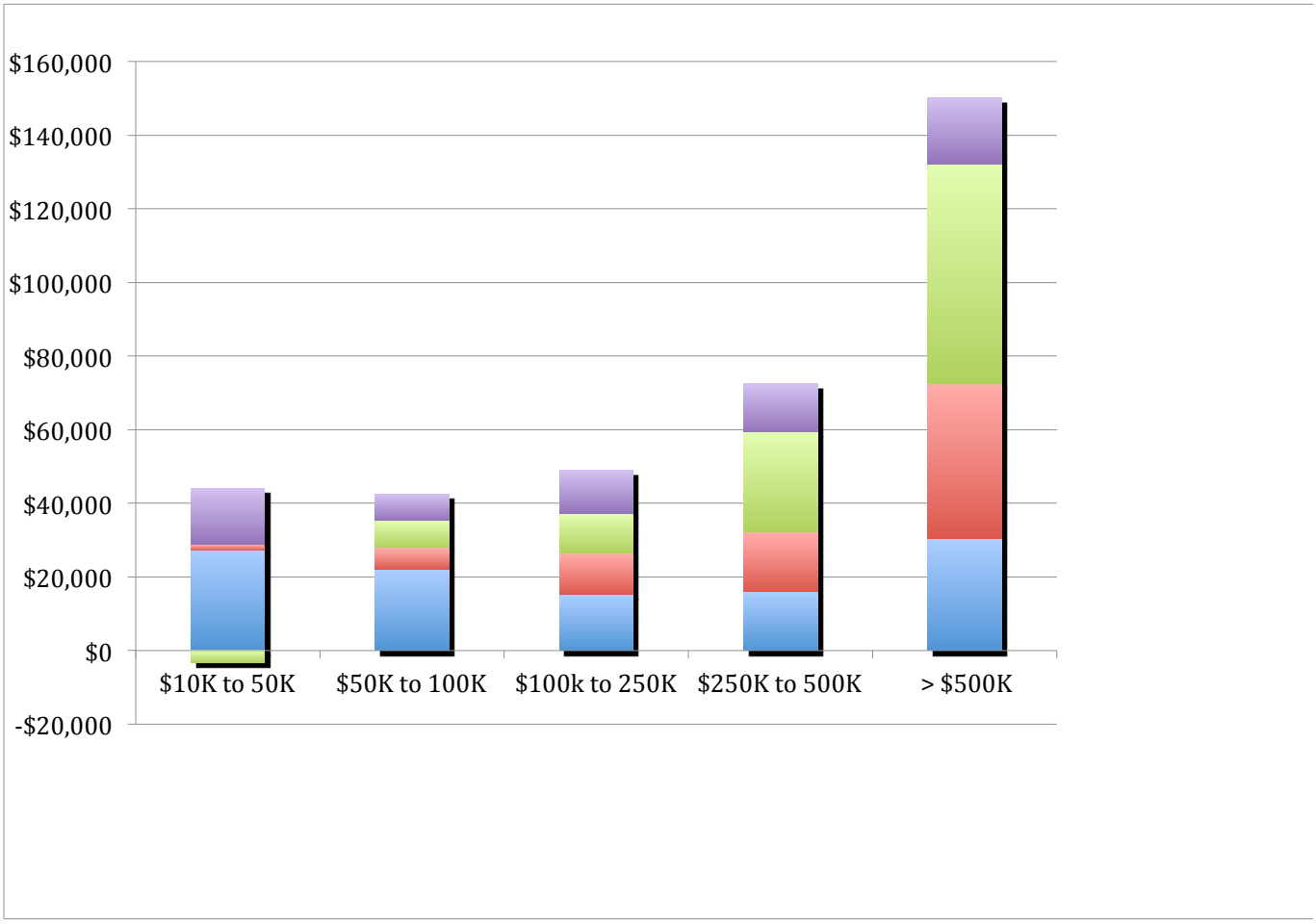

Operator Income by Sales
2007
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
-$20,000
$10K to 50K
$50K to 100K
$100k to 250K
$250K to 500K
> $500K

Figure 4:

Income Classes for Farm Families
Sales > $10,000, 2007

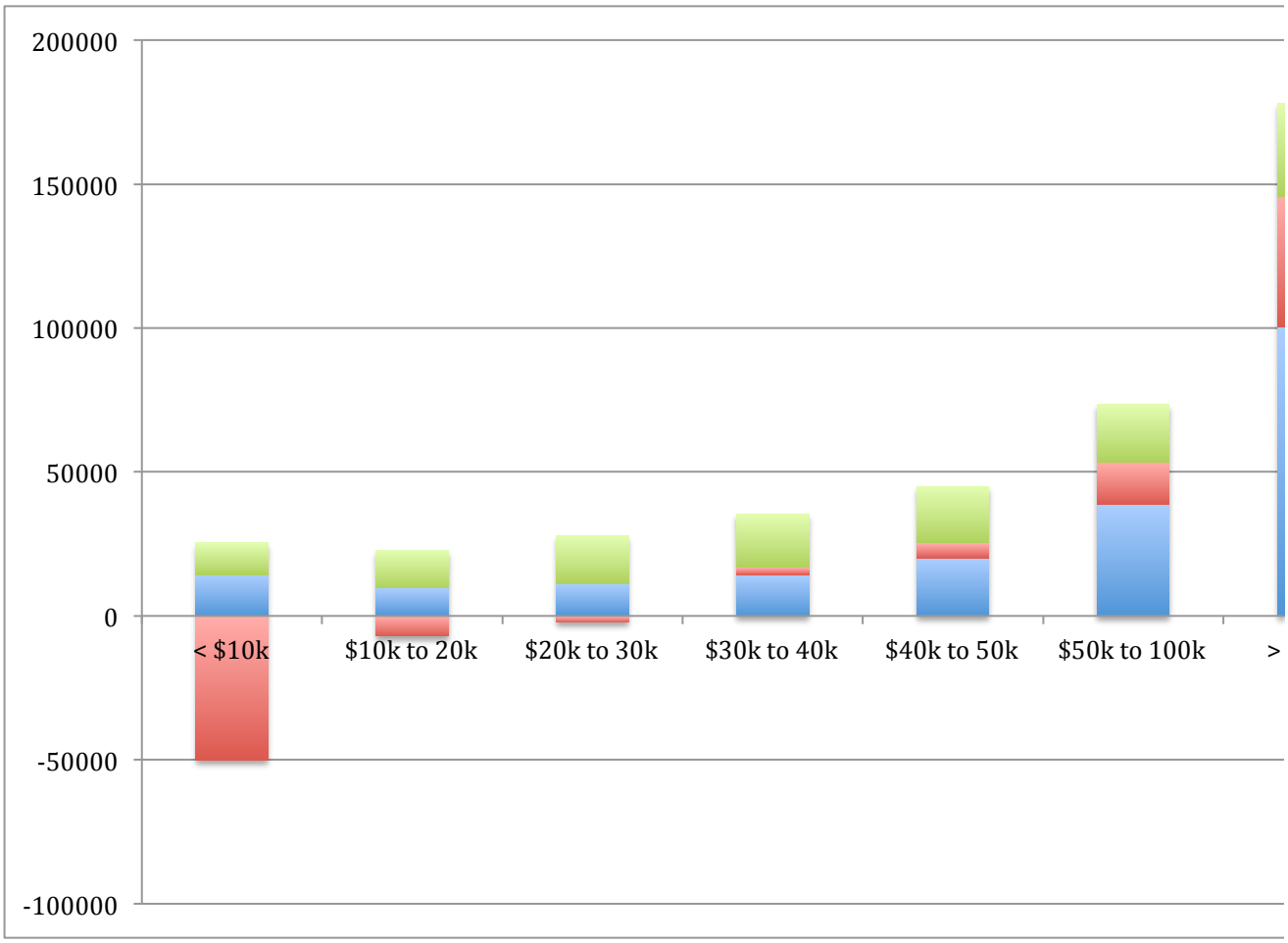


Figure 5

Family Income Classes for Farms v
$100,000, 2007

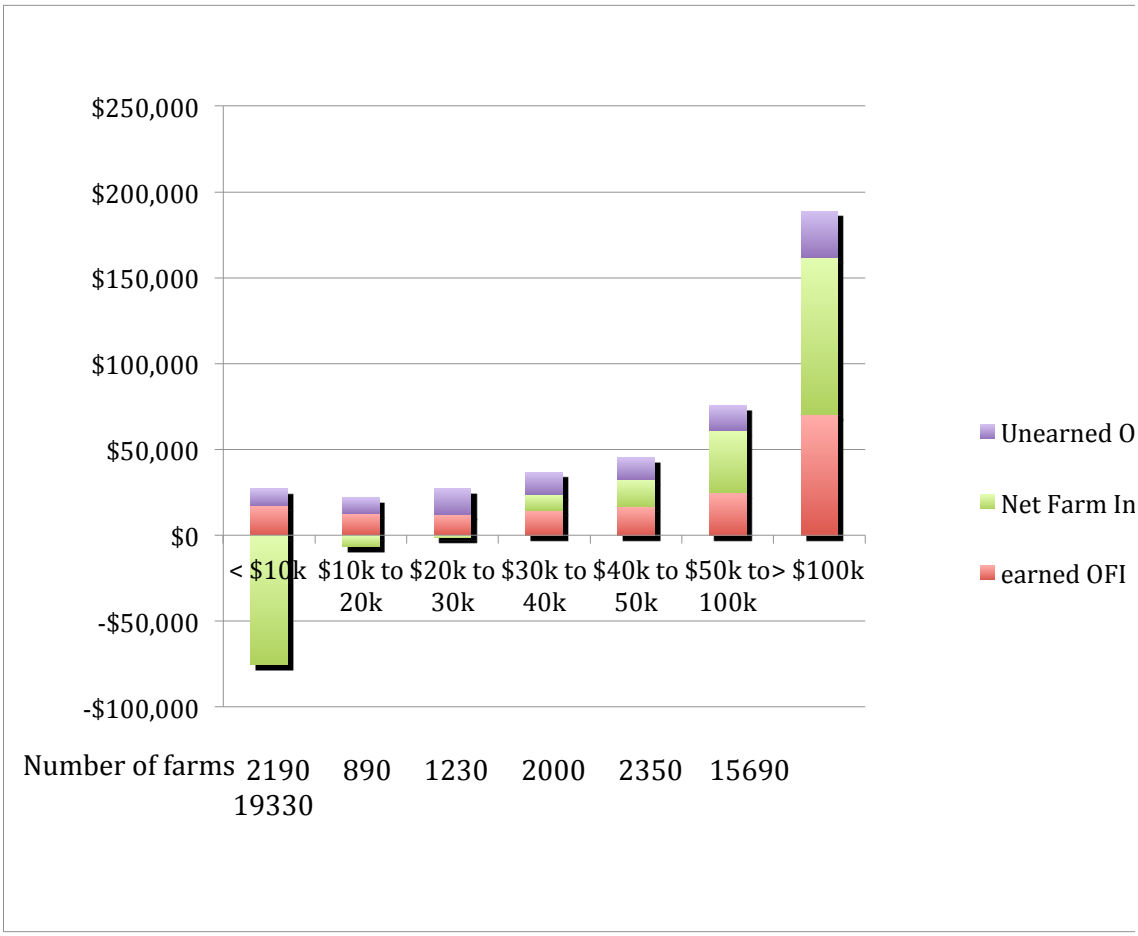
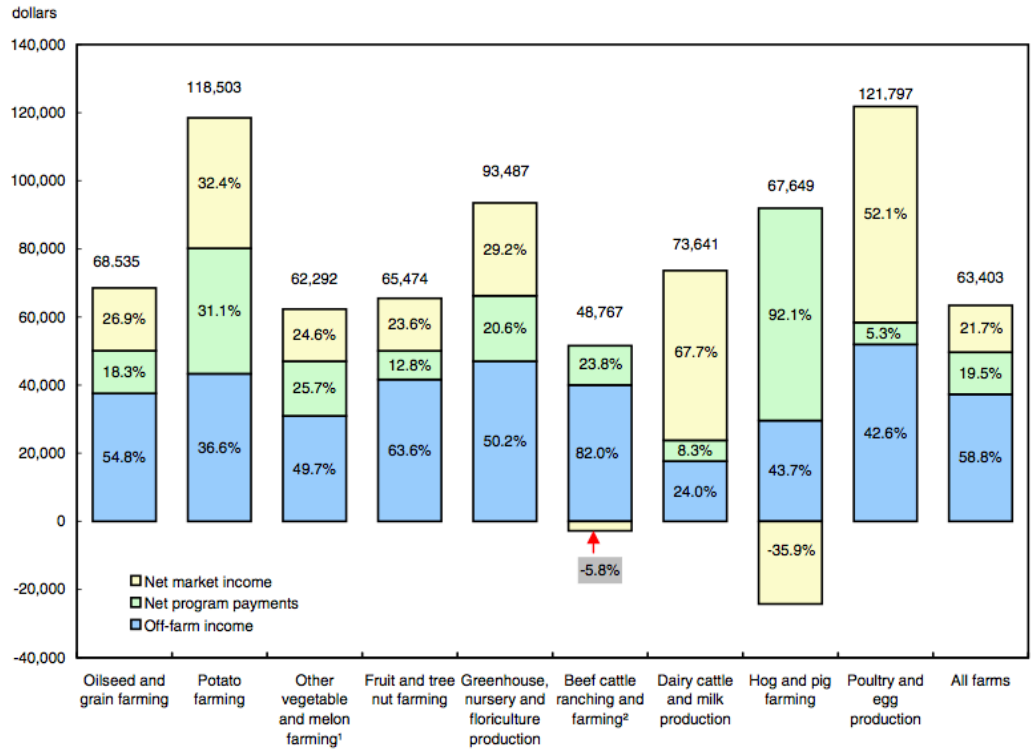


Figure 6:

Income Sources by Comm
2007

Chart 2
Share of off-farm income and farm income by farm type, Canada, 2007



1. Except potato.
2. Including feedlots.

Source(s): Statistics Canada, Whole Farm Database.