
Measuring farmers` costs of administrative burdens due to cross-compliance obligations

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Abstract: The shift from market support to cross-compliance based direct payments have increased transaction costs of farmers who increasingly complain about substantial administrative burdens with the direct payment scheme. Administrative burdens are one part of transaction costs arising at farm level due to administrative activities that are only conducted because of regulation requirements. A survey among 100 Swiss farmers was conducted in spring 2019 to analyse the costs of administrative burdens due to cross-compliance standards. Farmers were asked for their annual time requirements for collating information for the up to 14 forms they have to provide to proof compliance with cross-compliance standards. Group comparisons and regression analyses were applied to test for significant differences in time requirements across farm type, production system and sociodemographic characteristics of farmers. Applying the Standard Cost Model, the costs of administrative burdens were calculated for the Swiss farming sector as a whole and for different farm types. Time requirements vary widely between farmers and can only partly be explained by the farm type and production system. In our sample, organic farmers need 40% more time for collating information to proof cross-compliance as compared to conventional producers. Furthermore, specialized dairy and diversified dairy and crop producers need significantly more time than specialized crop producers. Age and education of farmers was not found to affect time requirements. The costs of administrative burdens was calculated to be 151 Mio CHF for the Swiss agricultural sector. On average, 5.7% of the budget spent on the six main direct payment programs are needed to cover the costs of these administrative burdens. Crop farmers, either organic or not, bear a rather insignificant share of the sectors administrative burdens. To effectively reduce costs of administrative burdens of the Swiss direct payment scheme, the focus should be on the biggest group of farmers, namely the specialized dairy producers contributing 34% to the sectoral costs. Future research on administrative burdens with the Swiss direct payments scheme should further develop the survey design and identify additional obligation related factors and farm and farmers` characteristics that contribute in explaining differences in time requirements.

Keywords: transaction costs, administrative burdens, Standard Cost Model, cross-compliance, agricultural policy

Introduction

The shift from market to direct payment support has increased public and private transaction costs of agricultural policies not only by the setup of the new system but also by its running costs (Vernimmen *et al.*, 2000; Rørstad *et al.*, 2007; Vatn, 2010; Weber, 2014). Since the Common Agricultural Policy (CAP) reform in 2003, transaction costs of the direct payment system have likely increased as fulfilling cross-compliance requirements became mandatory to be eligible for direct payments. A special interest of farmers and policy makers is therefore the reduction of administrative burdens, being defined as those administrative transaction costs that solely arise because of regulation requirements (Ecorys, 2018; Hasler and Werder, 2016). Up to now, hardly any study exists that analysed the costs of the administrative burdens due to cross-compliance standards (Ridier *et al.*, 2008).

This paper aims to quantify costs of administrative burdens of farmers as one component of private transaction costs related to administrative activities that are only conducted because of cross-compliance standards. Therefore, data on farmers` time requirements for different information obligations necessary to prove compliance with environmental and animal welfare standards in

Switzerland were surveyed. Analyses showed differences in time requirements per information obligation, farm type and production systems. Costs of administrative burdens were calculated at farm type and sector level applying the Standard Cost Model.

Administrative burdens are defined as costs arising due to administrative activities that businesses only conduct because of regulation requirements, and that businesses would discontinue if regulations were removed (EC, 2004). Various studies have analysed the transaction costs of agri-environmental programs for both, public authorities (e.g. McCann and Easter, 1999; Falconer *et al.*, 2001, Rørstad *et al.*, 2007) and farmers (Vatn, 2002; Mettepenningen *et al.*, 2009). However, costs of administrative burdens are not considered even though this concept is widely applied in other policy areas such as tax / fiscal policy (e.g. Pandey and Scott, 2002; OECD, 2010; EC, 2004; Nijsen and Vellinga, 2002; Torriti, 2012). The international Standard Cost Model framework is set out in the Administrative Burden declaration and the International Standard Cost Model Manual and few evaluations of agricultural policies in Europe have been conducted using this approach (OECD, 2014; Ecorys, 2018).

In the EU, each member country set up an Integrated Administration and Control System (IACS) to ensure that transactions financed are carried out correctly, to prevent and discover irregularities, to recover unduly paid amounts and to support farmers in making correct application. The IACS was set up with a view on reducing administrative burdens and ensuring efficient and effective controls and the administrative burdens of farmers were estimated to be 2% of the total support received (Ecorys, 2018). Studies conducted on transaction costs in Swiss agriculture have neither focused on administrative tasks only nor applied the Standard Cost Model approach and thus do not allow to draw conclusions on the costs of administrative burdens. One study that evaluated the farmers' and the cantonal authorities' administrative transaction costs of the Swiss agricultural policy in two cantons in 2011 showed that total transaction costs made up 1.8% to 2.8% of the total direct payments budget with farmers paying about two thirds of these costs (Buchli and Flury, 2005). Mann and Mack (2004) and Mann (2005) analysed farmers' transaction costs of Swiss agricultural cross-compliance programs and found that transaction costs vary between programs from 3% to 113% of the direct payments budget spent. However, their analyses have not focused on the administrative burdens of farmers, *i.e.* costs that arise due to administrative activities only because of the regulation. Even though the Swiss Federal Office for Agriculture introduced various measures to reduce administrative costs of the direct payment scheme (Hasler and Werder, 2016) they have not been quantified so far making monitoring and evaluation of the effect of respective policy measures difficult.

This paper contributes to the existing literature on farmers' transaction costs by quantifying the administrative burdens of Swiss farm businesses caused by cross-compliance standards. Time requirements for single information obligations related to cross-compliance standards were taken from a survey of 100 farmers conducted in spring 2019. Group comparisons and robust regression analyses were applied to test for significant differences in the time requirements across farm types and production systems. Survey data were combined with agricultural census data to extrapolate farm-level results to the farm type and sector level and analyse calculate time requirements of different farm types using the Standard Cost Model (SCM).

By quantifying the costs of administrative burdens for single information obligations and differentiating between farm types and production systems, we shed light on possible intervention points for substantial reductions of administrative burdens for farmers. The advantages and disadvantages of the applied methodology for policy monitoring is discussed and lessons learnt for further analyses are provided.

The concept of administrative burdens and the Standard Cost Model

The concept of administrative burdens relates to the transaction cost theory, saying that the governance of an economic organization determines the level of transaction (Williamson, 1985). In the case of agricultural policy, control mechanisms in form of information obligations were introduced to reduce asymmetric information between the governmental regulator (principle) and the farmer (agent) on the farm management.

Private, *i.e.* farmers' administrative costs due to governmental regulations are strongly affected by the design of the applied policy instrument and the public administrative procedure. Referring to the transaction cost categorization of Mettepenningen *et al.* (2009), private transaction costs comprise search costs, negotiation costs and monitoring and enforcement costs. In the case of cross-compliance standards, search costs arise when they are modified or new standards are implemented. Negotiation costs arise when farmers apply for direct payments, *i.e.* have to register for cross-compliance and voluntary agri-environmental programs, respectively, and include administrative but also operational tasks such as collating information from soil samples. Monitoring and enforcement costs result from monitoring and enforcement activities required by the government such as collating information for obligations related to cross-compliance, accompanying control agencies to the field or other administrative tasks in order to prove compliance with direct payment requirements.

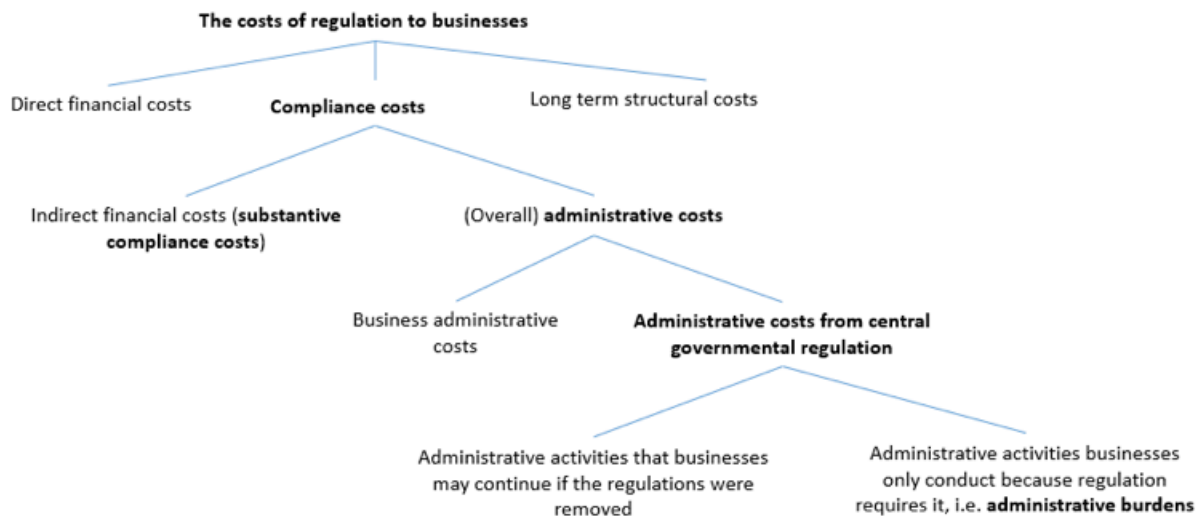


Figure 1. Definition of administrative costs and administrative burdens. Source: SCM Network (undated).

All of these private transaction costs include various administrative activities that must be undertaken to fulfill cross-compliance standards. If these administrative activities are only conducted by farmers because of regulation requirements and would not be continued in the absence of the regulation, then administrative burdens exist. As shown in Figure 1, administrative burdens are only one type of costs that regulation can impose on businesses.

The components of the costs of regulation to businesses are defined as follows (SCM, undated):

Direct financial costs such as taxes or fees for applying for a permit, arise from concrete and direct obligations to transfer a sum of money to an authority and are not related to a need for information on the part of the government.

Compliance costs are all the costs of complying with regulations except direct financial costs and long term structural costs. Compliance costs can be divided into *substantive compliance costs* (e.g., filters in accordance with environmental requirements) and *administrative costs*.

Administrative costs include e.g. documentation of the installation of a filter or an annual report on working conditions. *Business administrative costs* must be separated from administrative costs arising from governmental regulations, as they would need to be carried out anyway when running the business. Consequently, business administrative costs cannot be attributed to the compliance with regulations.

Administrative burdens are a subset of the administrative costs that businesses sustain simply because it is a regulatory requirement.

In this paper, we focus on measuring farmers' costs of administrative burdens imposed by the Swiss cross-compliance standards. We assume that the recording obligations within the scope of cross-compliance are solely because of regulatory requirements that farms would discontinue if the regulation were removed.

The concept of administrative burdens is used in the Standard Cost Model (EC, 2004, SCM, undated; Torriti, 2012) that was developed to measure and monitor the costs for businesses related to information obligations from governmental regulations. According to this model, the costs of administrative burdens (CAB) are estimated as follows:

$$\begin{aligned} CAB &= Price \times Quantity \\ Price &= Time \times Tariff \\ Quantity &= number\ of\ farms \times frequency\ of\ action \end{aligned}$$

Applying the Standard Cost Model requires the identification of information obligations related to the specific directive(s) under consideration, the identification of the target group and of relevant cost parameters and the choice of the data source to be used. More precisely, one directive may entail a wide variety of information obligations providing documentations and data for the government (or also third parties). Providing information requires specific administrative activities by farmers or third parties and it may also be necessary to make acquisitions to complete a specific activity. The costs of these activities are assessed based on the following parameters:

- the tariff, *i.e.* wage costs plus materials and overhead¹, for administrative activities of farmers or hourly costs for external service providers,
- the amount of time required to complete the administrative activity, usually being the mean time in minutes or hours it takes a business to perform a certain activity,
- the number of farmers, *i.e.* size of the population, affected by the regulation and
- the frequency that the activity must be completed each year by the farmer.

Data on time requirements are usually collected via interviews or by the stop-watch method, with the latter being very time-consuming. In order to represent the performance of a normally efficient business, the time requirements are derived from a selected sample. More precisely, following the EC (2004)

¹ Material costs consist of all materials purchased in order to satisfy the administrative obligations. Overhead costs are associated with the use of office materials, computers etc. As both cost items are relatively small, very divers across business and therefore difficult to calculate, these costs are often estimated using a mark-up percentage on the internal tariff of the (internal) wage costs.

definition “a normally efficient business is a company within the target group, which handles its administrative tasks in a normal way, *i.e.* neither handles its tasks better nor worse than could be expected”. Finally, the costs of the administrative burden for a specific regulation consists of the sum of administrative burdens for each single information obligation, calculated by extrapolating the data representing a normally efficient business to the whole population.

The Swiss cross-compliance standards and farms affected by these standards

To be eligible for direct payments, Swiss farmers must not only comply to the Direct Payments Ordinance but also with ordinances related to animal husbandry.

Figure 2 summarizes the forms that farmers have to fill in in order to prove compliance with the basic legal requirements and cross-compliance standards. From this figure it becomes clear that the forms to be filled in for meeting cross-compliance standards depend strongly on the type of farm (*e.g.*, arable farms without livestock, specialized or mixed livestock farms). Farms keeping livestock have to fill in two additional forms required by the direct payment ordinance and also have to collate information related to three animal health and welfare obligations.

By law, most forms have to be submitted annually to authorities. However, the recording frequency and type of recording (*e.g.*, as an electronic file or on paper) depends also on the cantonal requirements and may therefore vary. In addition to the basic inspections, additional controls are carried out based on the risks of the individual farm, such as non-compliance in the previous year. The frequency of controls may therefore be higher than usually required.

Ordinance on epizootic diseases (TSV), ordinance on veterinary medicinal products (TAMV, animal welfare ordinance (TschV)

Ongoing records required from livestock farmers:

- Accompanying document for clove-hoofed animals
- treatment journal
- inventory list of veterinary medicinal products
- formular regular outdoor exercise

Direct payments Ordinance (DZV)

Ongoing records for the Proof of Ecological Performance (PEP): field calendar, meadow journal

General records once a year:

- General information form
- Land survey form
- Animal survey form

Records once a year PEP:

- Suisse balance sheet
- Recording aid: Parcel plan, crop rotation report, biodiversity area report

Records once a year for

- voluntary programmes:
- feed balance GMF

Registration for

- programmes in the following year

Controls

At least every 4 years; area data every 8 years

Figure 2. Overview of forms for cross-compliance standards in Swiss agriculture. Source: FOAG (2014).

To identify the number of farms affected by the Swiss cross-compliance obligations, data on the number of farms per farm type and production system was taken from the Swiss agricultural census data of the year 2018². As shown in Table 1, 14.2% of all farms in the sample were specialized crop farms, 52.1%

² We follow the Swiss Federal Office of Statistics and define agricultural or horticultural holdings as holding that meet at least one of the following conditions: 1 ha of agricultural area; 30 ares of special crops (*e.g.* vines, orchards, berries, vegetables); 10 ares

were specialized cattle farms, 3.1% were specialized granivore farms and 30.5% were diversified farms. Specialized dairy farms are the biggest group of farms and the highest share of organic producers can be observed for specialized suckler cow farms.

About 98% of all Swiss farmers receive direct payments and are thus obliged to meet cross-compliance standards. When complying with cross-compliance standards, farmers receive food security payments and cultural landscape payments. These payments make up about two thirds of the total direct payment budget (FOAG, 2019). The remaining third of the budget is provided to farmers that voluntarily apply to different agri-environmental programs given that cross-compliance standards were met.

Farm type		All farms		Organic farms		
		No	%	no	%	
1 Specialized crop farms	1.1	Field crops	2'847	5.7	70	2%
	1.2	Horticulture	833	1.7	175	21%
	1.3	Fruits	639	1.3	83	13%
	1.4	Wine (vineyards)	2'278	4.6	131	6%
	1.5	Other specialized crops	463	0.9	66	14%
2 Specialized cattle farms	2.1	Specialized dairying	15'099	30.4	2'122	14%
	2.2	Suckler cows	4'043	8.1	1'358	34%
	2.3	Other cattle	1'561	3.1	275	18%
	2.4	Horses/sheeps/goats	5'227	10.5	875	17%
3 Specialized granivore farms	3.1	Specialized pigs	1'011	2.0	9	1%
	3.2	Specialized poultry	504	1.0	76	15%
	3.3	Granivores - mixed	30	0.1	1	3%
4 Diversified farms	4.1	Mixed: Dairying & field crops	2'472	5.0	107	4%
	4.2	Mixed: Suckler cows	1'363	2.7	252	18%
	4.3	Mixed: Livestock-granivores	4'361	8.8	414	9%
	4.4	Mixed: various/dairying	2'056	4.1	155	7%
	4.5	Mixed: various/cattle	984	2.0	61	6%
	4.6	Mixed: not classifiable	3'913	7.9	584	15%
Total			49'684	100%	6814	14%

Table 1. Number of conventional and organic farms of different types in Swiss agriculture 2018. Source: own calculation based on agricultural census data 2018

Empirical approach

Farmers` survey

Following the Standard Cost Model, we focused on the farmers` time required to provide authorities with the information to prove eligibility for direct payment and animal health and welfare ordinances (see Figure 2). As the number of information obligations differ between farm types and production systems (e.g., organic farmers need to provide additional information to receive direct payments), we considered both effects in our analysis.

A written survey was conducted in spring 2019 among 2'000 randomly selected farmers from the agricultural census database asking for farmers` perceived administrative workload with the Swiss direct payment scheme (Mack *et al.*, 2019b). A first letter invited farmers to participate in the survey. After four weeks, a reminder was sent by post to all farmers that had not participated in the survey up to that point. By returning the completed questionnaire, respondents agreed that their farm structural data could be merged with the survey data. The participation rate was at 40% (n = 808). A comparison of the farm

of sheltered cultivation (greenhouse, high tunnel); 8 sows; 80 fattening pigs; 80 fattening pig places; 300 poultry. Based on this selection, 49'684 farm businesses are operating in Switzerland.

structure from the sample with the whole population from the agricultural census showed that the sample was almost representative.

As an additional part of this bigger survey, specialized dairy farms, specialized field crop farms and mixed dairy and crop farms were invited to voluntarily respond to a second questionnaire. In this second questionnaire, farmers were asked about their time requirements and difficulties when collating information for the cross-compliance obligations. Neither time required for the compliance with voluntary direct payment programs nor the time required for the controls was asked for in this survey.

In total 100 farmers responded to the additional questions on how frequent they filled in the specific information obligation forms (*i.e.*, 1 = daily, 2 = twice a week, 3 = once a week, 4 = monthly or 5 = yearly). They also provided information on how many minutes it took them each time to collate the required information (from 1 = 30 minutes to 6 = more than 150 minutes). Furthermore, farmers were asked to rate the degree of difficulty for providing the required documentation for each of the information obligations (1 = easy, 2 = medium and 3 = difficult). Farmers characteristics age (in years) and education (1 = no vocational education and training, 2 = vocational education and training with certificate, 3 = vocational education and training with diploma, 4 = federal diploma of professional education and training, to 5 = federal diploma of professional education and training) was collected.

Data analyses

In a first step, the survey data were analysed descriptively using summary statistics and correlation analyses. It was counted how often farms take action to collate information for the different cross-compliance obligations, *i.e.* daily, biweekly, weekly, monthly or yearly. For each of these groups, from daily to yearly, the average stated time requirements in hours per year were calculated. We expect a great heterogeneity of stated time requirements between farms making it difficult to define a normally efficient farm based on a subset of observations. Therefore, based on the summary statistics, we calculated a size weighted average score of time requirements for each information obligation that is used as an input for the SCM:

$$WA = \frac{\sum_{i=1}^n w_i X_i}{\sum_{i=1}^n w_i}$$

WA = Weighted average; X_i = time per information obligation in hours per year

w_i = number of farms collating daily to yearly;

n = total number of farms per obligation

Second, group comparisons of stated time requirements for information obligations across farm types (*i.e.*, specialized dairy, specialized crop and mixed crop dairy producers), and production system (*i.e.*, organic and conventional producers) were conducted. More precisely, results are presented graphically and the Mann-Whitney-U Test was used to test for significant differences between organic and conventional producers.

Third, we applied a robust regression approach to estimate how average time requirements differ between farm types and production system when farmers` demographic characteristics age (in years) and education (scale from 1 = basic farm education to 5 = university degree) are considered as continuous variables. A robust approach was used to reduce the effect of outliers on the results and received estimates that can be interpreted as results of a normally efficient business, as assumed in the SCM. A Kruskal-Wallis-Test was

applied to test for significant differences in time requirements between farmers that find it either difficult, medium or easy to collate information for each cross-compliance obligation.

Fourth, applying the SCM, we calculated the costs of the administrative burden for Swiss farmers due to cross-compliance obligations. For farmers' tariffs, we assume hourly wages of 28 CHF (Gazzarin and Lips, 2018; Gazzarin, 2019). We do not take into account external costs from service providers, as we assume that farmers using service providers such as accounting firms would also use these services in the absence of direct payments. Furthermore, the different information obligations required for meeting cross-compliance standards were assigned to each farm type from the agricultural census data to provide information on the costs of administrative burdens at farm type and sector level.

Results

Time requirements for collating information for cross-compliance obligations

In the following section, descriptive summary statistics of the survey data are provided. As we observed a lot of missing or implausible values there is an indication that the survey was too demanding for some farmers and needs to be adapted in future research. As presented in Table 2, most farmers collated information for obligations related to direct payments annually. However, livestock farmers have to fill in a number of forms much more often during the year. This is especially true for the animal welfare program for which regular outdoor exercise must be recorded. Most farmers collate these data daily, biweekly or weekly. The median time requirements per group, *i.e.* farms collating information daily, biweekly, weekly, monthly or yearly, in hours per year are shown in the second part of Table 2. It shows that the more often farmers take actions to collate the information, the more time is required across the entire year. It shows further a few outliers with very high time requirements stated by single farmers that should be investigated in more detail in future. The last column of Table 2 shows the hours per year farmers spent with the different information obligations calculated as a size weighted average score using the summary data presented in the table. It shows that total annual time requirements for information obligations are low. For instance, even for farm types that need to fill in all information obligations, a total of 122.6 hours per year is required. This equates to 4.4% of a Swiss Standard Labour Unit³ per year.

Correlations of time requirements across all cross-compliance information obligations were analysed (results not shown here). In general, it shows that farmers requiring more time for one task also need more time for another task. Time requirements for general information sheets related to the farm structure (*i.e.*, general, area and animal information obligations) are not correlated with time requirements for other obligations. This holds mostly also true for time requirements for information obligations related to udder health, cleaning journal or manure management. These results suggest that time requirements for these obligations are very heterogeneous across the sample and thus farmer specific. In contrast, there is a strong positive correlation across additional crop production related information obligations showing that there is a certain number of farmers requiring a high amount of time with obligations related to prove an even nutrient balance or crop rotation plan. The same is true for additional information obligations required by livestock farmers. Especially farmers that require a high amount of time for obligations related to outdoor exercise of animals also need more time for other information obligations.

³ A Standard Labour Unit in Switzerland is currently based on 2'600 MPh.

Forms required for cross-compliance obligations	Number of farms collating data...					Median time requirements (hours/year) for farms collating data...						Hours per year	Relevant for farm type ^{a)}	
	daily	bi-weekly	weekly	monthly	yearly	daily	bi-weekly	weekly	monthly	yearly	NA per group			
General information	13	23	19	10	22	87	30.4	26	21.7	6	45	5/9/5/2/4	17	1, 2, 3, 4
Survey of areas	--	4	6	13	68	91	--	26	17.3	2	1	1/3/3/4/18	3.3	1, 2, 3, 4
Land parcel plan	--	--	1	6	79	86	--	--	13	2	0.5	-/-/-/26	0.8	1, 2, 3, 4
Nutrient balance	1	--	2	8	77	88	--	--	8.7	12	1.5	1/-/1/3/26	2.6	1, 2, 3, 4
Land parcel sheet	6	12	21	16	27	82	60.8	30.3	17.3	3	0.5	1/8/9/3/8	14.1	1, 2, 3, 4
Crop rotation report	--	--	1	7	52	60	--	--	17.3	2	0.5	-/-/0/4/18	1	1, 2, 3, 4
Animal survey / traffic	17	18	35	8	4	82	60.8	26	8.7	2	255	7/7/1/1/10	22.4	2, 3, 4
Accomp. document	8	12	33	15	1	69	60.8	17.3	8.7	2	150	8/4/9/2/0	16.8	2, 3, 4
Regular outdoor exercise	35	25	18	6	3	87	12.2	4.4	4.3	2	125	11/9/3/3/1	12.0	2, 3, 4
Udder health report	5	6	4	47	2	64	60.8	52	6.1	4.4	3.3	4/3/1/13/1	13.4	2, 4
Inventory list	6	3	10	38	14	71	30.4	17.3	8.7	1	0.5	3/2/3/9/5	5.2	2, 3, 4
Treatment journal	23	7	23	19	1	73	6.1	17.3	4.3	1	133	0/0/0/0/0	7.0	2, 3, 4
Cleaning journal	5	3	7	17	5	37	18.3	--	10.8	1	0.3	3/3/3/5/1	5.7	2, 1, 4, 1, 4, 4, 4, 6
Manure flow report	1	2	4	25	23	55	--	--	5.6	1.5	0.3	1/2/2/11/3	1.3	1, 2, 3, 4

Table 2: Time required by farmers to collate information for cross-compliance obligations. ^{a)} 1: all specialized crop farms; 2: all specialized cattle farms; 3: all specialized granivore farms; 4: diversified farms; 4.1: mixed dairy and field crop farms; 4.4: mixed various and dairying farms; 4.6: mixed not classifiable farms (see also Table 1).

Farmers were furthermore asked how difficult (*i.e.*, easy, medium, hard) they find collating documents for the different information obligations. By applying the non-parametric Kruskal-Wallis-Test, it was tested whether time requirements differ between these three groups. Only for the survey on areas, land parcel plan and crop rotation report significant differences could be observed, showing that farmers who find it difficult to collate documents for these obligations also needed more time to collate information. Thus, as for most of the forms no significant differences were observed, it can be concluded that the time required for the tasks at hand and the perceived degree of difficulty is not correlated with each other.

Figure 3 shows the time requirements in hours per year for administrative tasks related to all cross-compliance information obligations for organic and conventional specialized crop, specialized dairy and mixed crop and dairy farms. Outliers were removed for graphical presentation but not for summary and test statistics. In total 14 organic and 86 conventional farms answered the questionnaire, resulting in only a small number of observations for each of the organic farm types. Two organic producers and three conventional producers stated to run neither a dairy nor a crop or diversified dairy crop farm and were excluded from graphical presentation and summary statistics.

The results show higher time requirements for organic producers (median = 98.7 hours/year) than for conventional producers (median = 68.9 hours/year). This is especially true for dairy producers with the six organic producers stated a median time requirement of 240.3 hours per year and conventional producers 86.8 hours per year. Crop producers differed with 83.7 and 29.3 hours per year for organic and conventional producers, respectively. The one organic producer with a mixed dairy and crop farm stated 193.1 hours per year in contrast to on average 55.3 hours per year for the 37 conventional mixed producers.

Group comparisons between organic and conventional producers using a non-parametric Mann-Whitney -U-Test show significant differences at the 1% level ($p = 0.003$) for dairy and no significant differences for crop producers. Across all farm types, significant differences at the 10% level ($p = 0.075$) are observed. However, to verify the effect of the production system on time requirements and differences across farm types, a future study should be conducted based on a larger sample.

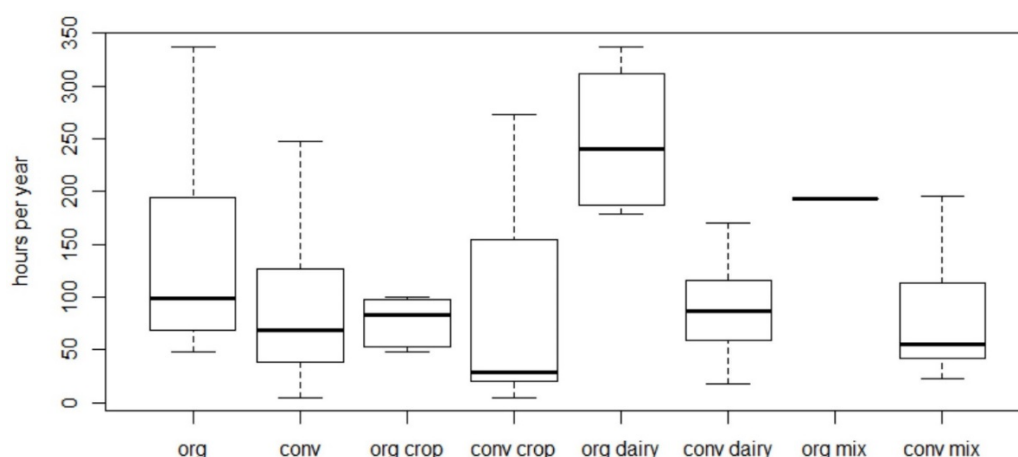


Figure 3. Time requirements of organic versus conventional farms. org= organic; conv=conventional.

Table 3 shows the results of five different robust regression models estimating the effect of farm type, production systems and farmers' sociodemographic characteristics age and education on hours per year required to collated information for proving cross-compliance. To enable the estimation of

interaction effects, those farmers that stated that they neither produce organic nor conventional and the one diversified dairy crop organic farmer was excluded from the regression analyses. Farmers of the sample used for the regression analyses are between 25 and 65 years with an average age of 48 years (median). Regarding education, 42 farmers have no vocational education and training, 7 farmers have vocational education and training with certificate, 32 farmers have vocational education and training with diploma, 6 farmers have a federal diploma of professional education and training and 8 farmers have an advanced federal diploma of professional education and training.

Supporting the descriptive results presented in Figure 1, regression results show that collating information for cross-compliance obligations is most time consuming for dairy and organic producers and especially for dairy organic producers. Age and education, both do not contribute significantly in explaining time requirements (Model 3 to 5) but considering both socio-demographic characteristics, it affects the results for farm type and production system. Estimated effects of farm type and production systems are robust when age is added to the regression, this is not true when education is considered.

	Model 1		Model 2		Model 3		Model 4		Model 5	
	coef	t-value	coef	t-value	coef	t-value	coef	t-value	coef	t-value
intercept	15.09	0.95	25.08*	1.80	43.06	1.56	13.38	0.73	30.06	0.65
Dairy	73.70***	3.94	58.25***	3.37	55.18***	3.26	60.92***	3.08	40.29	1.53
Mixed dairy	48.92**	2.59	39.04**	2.41	36.50**	2.32	37.64*	1.98	24.43	1.01
Organic	88.12***	4.32	64.34***	3.00	63.33***	3.01	55.40**	2.06	35.02	0.98
Organic dairy	--	--	101.30***	2.71	101.71**	3.10	65.42	1.48	118.51**	2.42
Age	--	--	--	--	-0.35	-0.69	--	--	0.26	0.33
Education	--	--	--	--	--	--	5.70	0.91	3.91	0.49
M-estimate	0.91		6.03		9.09		8.48		-3.88	
LS-estimate	11.1**		7.15		12.58*		13.61**		18.83***	
R-squared	0.15		0.18		0.19		0.19		0.19	
N	71		71		71		71		71	

Table 3. Regression results of time requirements by farm type, production system and farmers characteristics. *10% sign level, **5% sign level, ***1% sign level

The costs of administrative burdens for the Swiss agricultural sector and for specific farm types

Applying the Standard Cost Model and assuming an hourly wage rate of 28 CHF for farmers, Table 4 shows the costs of administrative burdens for the whole sector and for the different farm types. The total costs of administrative burden for the Swiss agricultural sector caused by cross-compliance standards sum up to 151 Mio CHF per year. In relation to the direct payment budget spent for the related direct payment programs⁴ (2'669 Mio CHF in 2018), the costs of administrative burdens make up a share of 5.7%. Specialized dairy producers, producers of horses/sheeps/goats and mixed livestock-granivore producers show the highest costs of administrative burdens of all farm types. Total costs of

⁴ The budget spent for the following six direct payment schemes in 2018 was used for calculating the costs share of administrative burdens: Cultural landscape payments, security of supply payments, biodiversity payments, landscape quality payments, production system payments and resource efficiency payments. We excluded payments related to water protection and resource programs and social transitional payments but included reductions or advances and back payments. Payments were excluded when they are not related to the cross-compliance obligations asked for in the survey.

administrative burdens are mainly driven by the number of farms of these specific farm types but not by the differences in the time requirements related to information obligations. In contrast to all other farm types, specialized crop producers bear a relatively small proportion of the sectors' administrative burdens. Even though making up 14.2% of all Swiss farms, their share on total administrative burdens is only 5.3%.

Based on the small number of observations for organic farms, we refrain from presenting the results for the production system organic versus conventional.

	Farm type	All farms		Time	administrative burdens	
		No	%	hours/year	CHF/year	% on total
Specialized crop farms	Field crops	2'847	5.7	40.1	3'196'611.60	2.12
	Horticulture	833	1.7	40.1	935'292.40	0.62
	Fruits	639	1.3	40.1	717'469.20	0.48
	Wine (vineyards)	2'278	4.6	40.1	2'557'738.40	1.70
	Other specialized crops	463	0.9	40.1	519'856.40	0.35
Specialized cattle farms	Specialized dairying	15'099	30.4	122.6	54'831'847.20	34.41
	Suckler cows	4'043	8.1	116.9	13'233'547.60	8.79
	Other cattle	1'561	3.1	116.9	5'109'465.20	3.39
	Horses/sheeps/goats	5'227	10.5	116.9	17'109'016.40	11.36
Specialized granivore farms	Specialized pigs	1'011	2.0	103.5	2'929'878.00	1.95
	Specialized poultry	504	1.0	103.5	1'460'592.00	0.97
	Granivores - mixed	30	0.1	103.5	86'940.00	0.06
Diversified farms	Mixed: Dairying & field crops	2'472	5.0	122.6	4'461'371.60	5.63
	Mixed: Suckler cows	1'363	2.7	116.9	4'461'371.60	2.96
	Mixed: Livestock-granivores	4'361	8.8	116.9	14'274'425.20	9.48
	Mixed: various/dairying	2'056	4.1	122.6	7'057'836.80	4.69
	Mixed: various/cattle	984	2.0	116.9	3'220'828.80	2.14
	Mixed: not classifiable	3'913	7.9	122.6	13'432'546.40	8.92
Total		49'684	100%		150'621'144.80	100%

Table 4. Yearly costs of administrative burdens for Swiss cross-compliance regulations.

Discussion

Conducting a survey among 100 Swiss farmers, data on annual time requirements for collating information for the different cross-compliance standards were collected. Group comparisons and regression analysis were applied to test for significant differences in time requirements across farm type, production system and sociodemographic characteristics of farmers. Applying the Standard Cost Model, the costs of administrative burdens were calculated for the Swiss farming sector as a whole and for different farm types.

Independent of the information obligation, farmers collating information to meet cross-compliance standards once a year stated that they require less time than farmers collating information more regularly during the year. A comparison across the individual information obligations shows that some of them required regular data collection. These obligations were declared as much more time consuming than those where data can be collated once a year. Most of the regulations that need regular data collecting during the year are related to livestock production, such as filling in the outdoor exercise journal for livestock.

On one hand, it is plausible that collating data and filling in forms once a year could require less time than if five minutes are invested every day. Thus, a well-organized filing of required information and an

efficient work organization can greatly reduce the costs of administrative burden of agricultural policies. On the other hand, the results may also be biased due to methodological challenges. More precisely, for calculating yearly time requirements for an information obligation, we multiplied the stated time per action with the frequency of recording and then sum them up over the year. Therefore, two points need to be considered. Firstly, with an increasing multiplier, any error will also be multiplied. And secondly, discrepancies can occur between the time it takes and the perceived time it takes when judging it in retrospect as one or more events per year.

It should be noted that no data were collected on the extent to which daily data collection was actually carried out 365 days a year or only over a certain period of time. Therefore, these points could have a strong impact on the results and should be considered in follow-up studies.

Correlation analyses showed that even if there are farmers who tend to need a lot of time with cross-compliance information obligations, there are also large individual differences in the time requirements depending on nature of the tasks. These are particularly evident in the very diverse time requirements for collating general information and survey areas, udder health and manure management. In contrast, high correlations of time requirements were found for the more demanding information obligations, such as the proof of an even nutrient balance. Farmers requiring a high amount of time for such obligations also need more time for other obligations. Interestingly, for most obligations, the stated time needed for collating information for cross-compliance obligations is not correlated to the perceived degree of difficulty. This is in line with results of Mack *et al.* (2019b) who found only a weak correlation between the stated time spent and the perceived burden due to administrative activities. Thus, high time requirements for administration does not necessarily mean a higher perceived burden.

The farm production system, namely organic versus conventional production, strongly affects the stated time requirements of farmers for information obligations. Our results show that organic producers need 40% more time as compared to conventional producers. Future studies should examine the differences between organic and conventional producers more closely. This aspect is particularly relevant for an efficient agricultural policy if the percentage of organic farms continues to increase. Furthermore, the results of Mack *et al.* (2019b) showed that there is a close correlation between the perceived burden with farm operational activities and the perceived burden with administrative activities. Thus, experiencing a high workload with farm operational activities, such as for organic production, can increase the discontent of farmers and the perceived administrative burdens that may also affect stated time requirements.

Besides production systems, also farm types contribute to explain stated time requirements. Especially dairy and diversified production were shown to be relatively time consuming with regard to cross-compliance obligations. Even though, differences between farm types exist, the explanatory power of the variables farm type and production system was only about 20%, meaning that other factors are more relevant in explaining the variance in time requirements. These might be related to farmers' characteristics and management capabilities. Therefore, we tested for the effect of age and education in our study but did not find any significant effect improving the explanatory power of the model. Other potential influencing factors on farmers' administrative burdens should be considered in future research as they may affect the stated time requirements.

Calculating the administrative burdens using the Standard Cost Model, our results show that on average 5.7% of the budget spent on the six main direct payment programs are needed to cover the costs of

administrative burdens. In total, these burdens make up 151 Mio CHF. Specialized dairy producers bear the largest share with 34% of the sectoral costs. Thus, especially already labour-intensive farm types and production systems, such as milk and/or organic production (see *e.g.* Serra *et al.*, 2005, Hennessy and Rehman, 2008, Kilkenny, 1993, Kimhi, 1994, Lass *et al.* 1989) bear most of the costs of administrative burdens due to Swiss agricultural policy. This is driven mainly by the large number of farms affected but also by the number of obligations necessary to collate information for. Information obligations necessary to meet cross-compliance standards of these farm types should be primarily addressed with respective measures aiming to reduce the administrative workload of the direct payment system. In contrast, crop farmers, either organic or not, bear a rather insignificant share of the sectors administrative burdens.

Information that should be considered in future research on the costs of administrative burdens include the effect of external service providers. For instance, from previous studies we know that the annually recording of nitrogen and phosphorus inputs and outputs for proving an even nutrient balance is outsourced by a majority of Swiss farmers, but this service is often offered for free (Heitkämper *et al.*, 2016; Mack und Huber, 2017). The SCM allows to easily include the costs and time requirements of external service providers and farmers but interrelations between stated time requirements and perceived administrative burdens are not well understood. For instance, previous studies have found that farmers who outsource their cross-compliance obligations perceive a higher administrative workload than their peers (Mack *et al.*, 2019a) which might also lead to higher stated time requirements for single information obligations. Thus, even if individual administrative activities related to cross-compliance obligations are outsourced this does not necessarily mean that higher external costs must arise nor that farmers perceive a lower administrative workload with potential effects on stated time requirements.

Another relevant aspect for future research is the digitalization of administrative tasks. The Swiss Federal Office for Agriculture has put a lot of effort into reducing the administrative burden of the direct payment system and has therefore pushed ahead with digitalization. The effect of manual or electronic data processing in connection with the cross-compliance obligations would be interesting to integrate in a future study on administrative burdens. A first study has already shown that the transition from paper to electronic forms has reduced the perceived administrative workload of about one third of a sample of Swiss farmers and that farmers' attitudes and skills influence the perceived administrative burden strongest (Stoinescu *et al.*, 2020). How such information could be integrated into the assessment of administrative burdens using the SCM would be interesting for future research.

Conclusion

The standard cost model is an easy-to-use approach to measure the costs of administrative burdens of agricultural policies. However, the collection of high quality data on time requirements is of utmost importance but also very demanding and complex. Our study has shown that a written survey of the time needed for collating information for various information obligations was difficult to understand and overtaxed some farmers. Based on this experience, it might be a better approach to collect higher quality data when interviews are conducted with farmers instead of sending a quantitative questionnaire.

As farm types and production systems significantly affect time requirements and therefore administrative burden estimates, the sampling for a representative group of farmers should be planned accordingly. Our study showed that time requirements can differ strongly between farmers. Therefore, we

recommend to use a size weighted average of the time requirements of a sample to represent the time requirements with information obligations of a normally efficient farms.

Administrative burdens with Swiss cross-compliance obligations amount to 5.7% of the direct payment budget. Focusing on measures to reduce these burdens for dairy and organic farmers can contribute most to a reduction of the sectors administrative burdens.

To develop efficient policy measures and reduce administrative burdens of farmers, future studies should identify additional obligation related factors and farm and farmers` characteristics that contribute in explaining differences in time requirements. In addition to quantitative time measurements to calculate administrative burdens with agricultural policies, it can be useful to include information on the perceived administrative burden as well. This would provide additional information that could be used to improve policy measures and advisory services.

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