Female farming – better or worse?

Economic performance of Swedish widows in the 18th and 19th centuries

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Introduction
The role of women in agriculture is an issue of great importance in many parts of the world today and research in this field has been extensive during the last decades. The vast majority of these studies address the situation in the developing countries, often with a clear purpose of giving policy directions. Recurrent topics of study have been household efficiency and gender specific differentials in farm production and productivity. Today, there seems to be a burgeoning interest in studying female farming also in the developed part of the world. The present paper turns to the past, as it investigates the productivity of female-headed households in Sweden during the period 1733–1881. This time span covers the Swedish agrarian revolution, when average output per farmstead more than quadrupled.\textsuperscript{1}

Studying agricultural historical development, confrontation with a predominant male world is inevitable. Women, in their capacity of wives or maid servants, are hardly noticed in the 18\textsuperscript{th} and 19\textsuperscript{th} centuries’ economic and fiscal source materials. However, in the case when the husband dies and the widow takes over charge and continues with the farm production, the woman comes into sight in Swedish source materials. Using these unique sources, individual outputs for a huge number of rural widows over a long period of time, can for the first time be studied.

Focusing on the economic outcome of widowhood this paper also puts some questions about the possibilities of maintaining female-headed farms in a predominant male world. Therefore, additionally three alternative scenarios are looked into. The first is the tendency of farm management conducted by widows to be dissolved by neighbors or relatives, a phenomenon today witnessed in some parts of Asia and Africa. In this case the widows were likely to loose land shortly after their husbands’ deaths due to weakened position and to traditional structures. The second scenario is that a female take-over was a fast and simple transition phase, mainly a temporary arrangement until there was a new male present to take control, either by remarriage or by generation shift. The last scenario, looked into, is based on the fact that widowhood was the only status that allowed women to hold legal competence and responsibilities equal to men during the 18\textsuperscript{th} and 19\textsuperscript{th} centuries. Did this imply that some women challenged the patriarchal society and went on, as persistent widows, and managed their own farms?

The economic outcome of female farming, as well as the above mentioned three scenarios, is tested by means of individual farm data for southern Sweden. The main source materials are priest payments rolls, reflecting fluctuations and long term trends in more than 2 000 individual farms’ annual economic output.

The framing of the paper is as follows: The first section outlines the structure of households, marriages and rights of inheritance. Section two deals with the area of research and the data. The third section reveals the patterns of female farming, while its economic outputs are presented and discussed in the forth section. Finally, the results are summed up in section 5.

1. Household, marriage and right of inheritance
The peasant household, as a production unity, was strictly tied to the nuclear family with its fixed tasks for different members of the family. Maids and farm hands constituted

\textsuperscript{1} Olsson & Svensson 2008.
complementing or extra labor. In both cases strictly job splitting between men and women prevailed. The role of women seems to have been in all essentials subordinated to the male head of the family and sometimes it is claimed that the most important role of the woman was to support the husband. The duties attended to women and men respectively, were not the same in all regions but depended on the aim and direction of the farm. Ulla Wikander demonstrates that gender based division of duties must also be seen in the light of time and space and that the agrarian population was under the influence of norms constructed in the cities.

It was not just that men and women engaged in different tasks; male tasks generally were surrounded by higher status than female tasks. As a consequence, male farmers found it degrading to engage in typically female tasks. The agrarian women, on the other hand, found it natural, also to engage in male tasks. Due to economic restrictions, it certainly was much more difficult to maintain such a division of labor in the lower socio-economic layers of the peasantry. Research in the late 1990s reports that, contrary to the common idea of men and women working in separate fields, it was quite common that men and women worked side by side even if they were engaged in different tasks. Inger Lövkrona describes both agrarian men and women as versatile; the women, however, being even more versatile than the men.

It was not until 1921, in connection with the adoption of universal suffrage, that Swedish women became legally fully equal to men. During the current period, unmarried women were represented by their fathers, or whenever applicable, by some male relative, while married women were represented by their husbands. In both cases the women were regarded as incapable of managing their own affairs. It was only when a woman became a widow that she was regarded as legally competent and thus could dispose of her own property, for example her land possessions.

As regards the right of inheritance, Swedish women had such a right even during the old medieval legislature, but her inheritance share was, until 1845, only half as big as the male share according to the legislature in the countryside. However, despite of this restriction, women could possess land, but the right of disposal was assigned to her father if she was unmarried or to her husband if she was married. In the beginning of the 19th century, during the commercialization period of the agricultural sector, land begun to be regarded as a good, which in turn led to a more rigid registration of land when an estate was distributed. Thus the weaker part, in this case the woman, obtained a stronger position against those who possibly tried to outmaneuver her. When a woman became widowed only a part of the matrimonial property was secured by legislation; land that she had inherited before or during the marriage, the morning gift, and one-third of the matrimonial property were hers. On top of this, she could dispose of her husband’s part of the matrimonial property, assuming that the husband

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4 Löfgren (1982).
5 Lövkrona (2001), p. 34. Johansen (2004), p. 177, also stresses that female tasks were regarded as shameful for most men.
had written a will in advantage of his spouse. A remarriage meant that she had to hand over the husband’s part to their children.\textsuperscript{11}

There were not only legislative obstacles; also traditional patterns among the peasantry played an important role despite great societal changes during the period 1750–1850.\textsuperscript{12} This applies not at least when it came to land transmission from one generation to another. Despite the law of inheritance, it was a common opinion that the farm should be transferred to a son, in the first place to the eldest son. Rosemarie Fiebranz has shown that strategies were developed to outwit the legislation in the patriarchal Swedish peasant society.\textsuperscript{13} Similar strategies can be found in for example Bangladesh and southern India where the male opposition against female land owners is strong.\textsuperscript{14} Martin Dribe and Christer Lundh have discovered four typical strategies of a slightly different type: 1) strategic marriages, 2) compensation systems, 3) retirement contracts, and 4) wills.\textsuperscript{15} All these strategies had different effects on women’s possibility to become head of the family farm.

It was common that the wife took over the farm for a year or two after her husband’s death, while questions about the division of the inheritance were investigated. During this period it was discussed whether the widow should go on heading the farm or if any of the children should take over it. Dribe & Lundh found that, during the period 1720–1840, it was quite common that the widow remained head of the farm even five years after her spouse’s decease, which is a rather amazing result considering the fact that women inherited only half as much as men, that women owned only one third of the matrimonial property, and that tradition favored the eldest son.\textsuperscript{16} There was however regional variations to this. In about 10 percent of the cases the farm was taken over by another person than the widowed spouse or his or hers children; in most of these cases it was younger widows with young children who had to leave the farm. A plausible explanation seems to be that the widow could not manage the farm herself until at least some of the children were old enough to take over it.\textsuperscript{17} Hanne Marie Johansen reports a higher risk for poverty and a weaker social stand for widows compared to widower. Despite the obvious risks it also meant a chance for the woman to take charge over her own property. Johansen expresses it like this: “Widowhood was a revolution in a woman’s life, both for the better and for the worse.”\textsuperscript{18}

2. The region and the sample

By the middle of the 18\textsuperscript{th} century Sweden shared the most common features of traditional societies’ agriculture: The village communities with its mixture of private and communal land ownership, the open field system with scattered strips, the balance between arable and grassing lands. On the fertile plains three-course-rotations prevailed, but in the more wooded areas annual seeding or two-course system existed.

\textsuperscript{11} Dribe & Lundh (2005), p. 298.
\textsuperscript{12} During this period the population grew very fast and at the same time a social differentiation took place in Sweden.
\textsuperscript{13} Fiebranz (2003), pp. 224–234.
\textsuperscript{15} Dribe & Lundh (2005), p. 295.
\textsuperscript{16} The probability that a widow (including the widows who remarried) would be head of the farm five years after the estate inventory was carried through was 48 percent (while the probability for a widower in the same position was 66 percent). Dribe & Lundh (2003), p. 301.
\textsuperscript{17} Dribe & Lundh (2003), p. 302.
In terms of land ownership preindustrial Sweden was divided. On one hand, there were freeholders and crown tenants, with secure possessions and with predictable and sinking real taxes and land rents. The crown tenants most often turned into freeholders during the period 1750–1850, as they purchased their lands from the Swedish crown. On the other hand, there were manorial tenants, with increasingly insecure tenancies: When demesne production was expanded in the 19th century every second of them was evicted. Those who remained experienced rising land rents, most often in the form of boon work, corvée, to the demesnes. This applies specially for Scania (Skåne); the region studied in this paper. Scania is the southernmost part of Sweden and since it was conquered from Denmark in 1658 it has been referred to as the granary of Sweden. Within its boundaries Scandinavia’s and northern Europe’s most frequent historical settings, in terms of natural conditions and property rights system, can be found.

One of the most common preindustrial tax forms in Europe and Latin America was tithes. The parsonage in Scania held one third of the tithes, the other two thirds were bound for the Crown and the Church, respectively. The latter two tithe payments were already in 1683 fixed by legislation in threshed grains, independent of changes in harvest. The priests’ tithes in many Scanian parishes remained still a flexible individual production tax, collected each year in sheaves from the harvested fields. Additionally, every tenth living calf, foal, lamb and gosling, born on the peasant farms, found its way to the parsonage’s barn. The parish priest held elaborate control of each of his peasant’s payments, in rye, barley, oats, wheat and peas, but also over their annual animal breeding. These unique source materials, together with additional sources about socio-economic, geographical, and individuals’ characteristics, have been compiled and linked in the Historical database of Scanian agriculture. The tithe data has been transformed into production data for each farm annually.

The sample used in this study covers the period 1733–1881 (although grain production data due to new tithe legislations stopped in 1864) and consists of 2 157 farms in 32 parishes. The average length of observation is 36 years and the total number of observed farm production years is 74 452. A widow appears, at some point in time, as farm possessor on 20 percent of the farms.

Other Scandinavian studies show that the total share of widowed persons in the Scandinavian population amounted throughout the 19th century to between 5 and 6 percent, but in 1801 barely one fourth of this group were men. The uneven distribution reflects the fact that the woman generally was younger than the man when they married but also that it was more common for a man to remarry shortly after his spouse’s death. As expected the share of female farm possessors is smaller than the widows’ share of the total population. About 10 percent of the land transmissions in the sample were registered to a widow, but many female possessions stayed short, and their total share of the observed farming years was 2.7 percent.

### 3. Patterns of female farming

In this section we investigate the three scenarios mentioned above: 1) Did male strategies lead to women loosing their right to land in the case of widowhood? 2) Should female-headed

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20 For an overview of tithes and tithes research, see Le Roy Ladurie and Goy 1982.
21 For a more thorough presentation, see Olsson & Svensson (2008).
22 Johansen (2004), pp. 173–174. This applies for Denmark but it may have been the same in Sweden.
farms be regarded as nothing more than a transition phase? 3) Did women take the opportunity, when widowed, to continue as independent heads of household?

3.1 Lost control over land?

Mead T. Cain found, in her study of the rural Bangladesh in the 1970s, a tendency of farm management conducted by widows to be dissolved by neighbors or relatives. Although for natural reasons there are differences between rural Bangladesh today and Sweden in the 18th and 19th centuries, there are also some similarities. In both cases the patriarchal structures were strong, the household was headed by the husband/father, sons were favored when it came to the division of inheritance and in both cases the law (the country law in Sweden and the Muslim law in Bangladesh) decreed that daughters’ inheritance should be half of the sons’. According to Cain it was not uncommon that female inheritors did not get their part of the inheritance. As was mentioned above, several strategies were taken into use in Sweden in order to prevent land to be controlled by women. In both cases the widow were specially exposed to risks when her children were not old enough to help her consider hers and the family’s interests. Just as in Bangladesh the land in Sweden was divided into a lot of small plots, which increased risk for disagreements about borders etc. Old conflicts tended to blow up just after the husband’s death.24 This is a scenario that seems to have been quite common also in other parts of the world. Katie Pickles, for example, mentions the same phenomenon in her study of mid-nineteenth-century widows in Nova Scotia.25

Comparing male and female transfers of land in respect to changes in farm sizes can reveal if there was any tendency of losing control over land. Table 1 shows the outcomes of 4 626 farm transfers in the Scanian sample. In all, 4.0 percent of them led to farm decreases and 0.5 percent to increases. Especially the 19th century was characterized by farm partition, in pace with increased farm productivity, and in many cases the division was carried out in connection with changes in farm heads.

<table>
<thead>
<tr>
<th></th>
<th>All transfers</th>
<th>Number of</th>
<th>Share that</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>decreases</td>
<td>increases</td>
<td>decreased</td>
<td>increased</td>
</tr>
<tr>
<td>All transfers to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>4 154</td>
<td>180</td>
<td>22</td>
<td>4.3%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Women</td>
<td>472</td>
<td>5</td>
<td>3</td>
<td>1.1%</td>
<td>0.6%</td>
</tr>
<tr>
<td>All transfers from:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>4 173</td>
<td>177</td>
<td>24</td>
<td>4.2%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Women</td>
<td>453</td>
<td>8</td>
<td>1</td>
<td>1.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>All transfers</td>
<td>4 626</td>
<td>185</td>
<td>25</td>
<td>4.0%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Sources: Historical database of Scanian agriculture

Only in 1.1 percent of the cases when land was transferred to a woman, this led to loss of land from the farm, while this was the case in 4.3 percent of the transfers to a male. This is maybe

not so surprising, since transfers to males most often went to the next generation, implying more than one possible heir, but transfers to women went to a single widow. Nonetheless it rejects a hypothesis of dissolution of female land possessions. Moreover, the same goes for transfers from women: Only in 1.8 percent of the cases this led to diminishing farm area, while it happened in 4.2 percent of the transfers from a man. During the periods of female possession, partitions of land certainly were not more common than during male possession.

Consequently, we can not reveal any patterns of women losing control over land when they were in charge. Despite strategies used to outwit the legislation, widows seem to have been able to resist male attempts to take over the farm. This is consistent with Dribe & Lundh, who found it quite common that male spouses left written wills in which they left their part of the matrimonial property to the widow.26 The result is also consistent with Beatrice Moring, who stresses the importance of higher survival rates for children during the 18th and 19th centuries for the possibilities for widows to manage their households. At this point of time children made up an important resource in agrarian work. A higher survival rate not only left the widow with a bigger maintenance burden, but also with more labor at her disposal.27

3.2 A short transition phase?

When a woman took over the responsibility for the household, she automatically also took over responsibility for the household members. Whether a woman could manage to maintain the status of the household was dependent on both economic circumstances and the supply of (male) labor. It was considerably more common that a widow could continue to lead the household if she lived in a city than if she belonged to the peasantry.28 In the countryside the supply of land was the most important factor for the household to survive, but the Swedish widow’s chances to land were dependent on whether the farm was a freehold/crown tenancy or if it was a tenancy on manorial land. In the latter case the landlords were often very restrictive. If the male tenant died, most often the widow’s only chance to stay on the farm was a quick remarriage with a spouse that the landlord could accept. Otherwise she had to leave the farm. The crown tenants, on the other hand, had in practice secure and hereditary tenancies. The land could only be inherited within the family, which also meant that the widow had no right to sell it.

So, property rights affected the women’s possibilities to stay on their farms in a profound and immediate way. On manorial land the landlord most often gave a widow a short respite, either a quick remarriage or leave the farm. Freeholding or crown tenancy widows could decide their future without external pressure from the state or landlord. This pattern is also reflected in Table 2. While there were no differences between the share of short term widows in the two categories, the share of persistent widows were almost three times higher for freeholders and crown tenants than for manorial tenants.

Table 2. Property rights and farm possessors by sex 1733–1881.

<table>
<thead>
<tr>
<th></th>
<th>Women &gt;3 years</th>
<th>Women 1–3 years</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeholders &amp; crown tenants</td>
<td>1 240</td>
<td>275</td>
<td>41 130</td>
<td>42 645</td>
</tr>
<tr>
<td></td>
<td>2.9%</td>
<td>0.6%</td>
<td>96.6%</td>
<td>57%</td>
</tr>
<tr>
<td>Manorial tenants</td>
<td>347</td>
<td>248</td>
<td>31 212</td>
<td>31 807</td>
</tr>
<tr>
<td></td>
<td>1.1%</td>
<td>0.8%</td>
<td>98.3%</td>
<td>43%</td>
</tr>
<tr>
<td>All</td>
<td>1 587</td>
<td>523</td>
<td>72 342</td>
<td>74 452</td>
</tr>
<tr>
<td></td>
<td>2.1%</td>
<td>0.7%</td>
<td>97.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Sources: Historical database of Scanian agriculture

The shorter periods of female possessions (1–3 years) led to either remarriages or transmissions to a new possessor. These relatively short periods of female farm management can be seen as transitional phases while waiting for the compulsory mourning year to pass and while searching for a new partner. In these cases, we can not prove whether there was a pressure from male kinsfolk or not. In any case, the inheritance rules for crown tenants indicate that such transmissions were from widow to adult children. As regards freeholders it is most plausible that young widows with small or none children aimed at remarriage, while older widows already were in possession of retirement contracts. Moring points to the fact that wills sometimes were made early in the marriage to improve the possibilities for the widow if the marriage should prove childless.29

Many women, however, stayed on heading their farms without remarrying, if they had the opportunity. These persistent widows held their farms for an average of 9–10 years, most often until they eventually retired and transmitted their farms to, typically, a son or a daughter with her stepson.30 The median possession length is somewhat shorter, 7 years, since the mean value is affected by some very long periods of possession. Four of the women held their farms for more than 30 years without remarrying, and 43 were sole proprietors for 12 years or longer.

Other researchers have also found that it was common that the wife took over the farm for a year or two after her husband’s death, while questions about the division of the inheritance were dealt with. Magnus Perlestam has discussed whether female farming was only a consequence of shortage of men.31 He defines three different reasons for women to take charge over the farm: 1) when the farm was to be transmitted from one generation to another, 2) when the husband was conscripted, and 3) when the husband was seriously physical or mentally ill. Perlestam found that during the period 1626–1640, which was dominated by the Thirty Years’ War, about 20 percent of all peasants responsible for a farm were women. In his second period (1690–1699) there was no war and the share of female farmers had diminished to 6 percent. The third investigation period (1710–1721) coincided with the Great Nordic War, when female farming once again became more common (14 percent).32 However, among these women we do not only find widows, at least not in a formal sense.

30 The average length of female possession, if it lasted beyond the three year transmission period, was 9.1 years. However, a fourth part of the series is truncated, because the dataset either starts or stops with a female possessor. The average for non truncated series is 9.2 years, for truncated 8.8 years. Longer periods of possession are of course more likely to be truncated.
Table 3. Geographical and natural conditions and farm possessors by sex 1733–1881.

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N.</td>
<td>Share</td>
<td>N.</td>
<td>Share</td>
</tr>
<tr>
<td>&gt;3 years</td>
<td>356</td>
<td>2.6%</td>
<td>109</td>
<td>0.8%</td>
</tr>
<tr>
<td>1–3 years</td>
<td>523</td>
<td>0.7%</td>
<td>2669</td>
<td>97.8%</td>
</tr>
<tr>
<td>Total</td>
<td>989</td>
<td>2.1%</td>
<td>3521</td>
<td>97.9%</td>
</tr>
</tbody>
</table>

**Sources:** Historical database of Scanian agriculture

Until 1814, Sweden certainly was engaged in some wars, but the military allotment system, introduced in 1683, had excluded the peasants themselves from being enlisted. After the end of the Great Nordic War the soldiers were in principal voluntarily recruited. The wars were hereafter not of the magnitude that a general shortage of men aroused. In our case, other reasons for long term widowhood as farm manager must be sought.

In the most fertile plains the widows tended to stay the longest; 2.6 percent of the farms were possessed by a persistent widow but in the more wooded areas only 1.5 percent were widows (see Table 3). Short term widow farmers were also here equally distributed, since men tended to die in the forests as well as on the plains. The lesser degree of persistency in the forest could be explained by the pronounced distance between traditional female work tasks and lumbering. The result is consistent with research on modern female forest ownership in Sweden. Gun Lidestav estimates that only 14 percent of female forest owners take charge of their forest properties themselves, while the share of men is about 64 percent. When it comes to the daily work in the forest only 6 percent of the women take part in this as against 65 percent of the men. Even if heavy field work also traditionally was a male work task, the woman on the farm, wife or maiden, always participated, e.g. in harvesting, and it is likely that she understood and could control the work, even if she did not perform all the work tasks herself.

The frequency of widows on different farm sizes reveals a likewise interesting pattern. While short term transitional widows range between 0.5–0.9 percent of the possessors, there is a clear tendency that they stayed as sole proprietors longer, the larger the farm was (see Table 4). This could also be explained by the fact that farm work was highly segregated in male and female spheres, and by the presence of servants. If the husband died on a small farm it would be a bigger step for the woman to hire and organize the work of a male servant as a substitute than on a large farm, were the bulk of the work already in the first place was done by servants, and where the female possessor already was used to act as a farm manager, leading employees at work.

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34 See discussion about male and female tasks in section 1.
Table 4. Farm sizes (in mantal) and farm possessors by sex 1733–1881.

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th></th>
<th>Women</th>
<th></th>
<th>Men</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;3 years</td>
<td>1–3 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N.</td>
<td>Share</td>
<td>N.</td>
<td>Share</td>
<td>N.</td>
<td>Share</td>
<td>N.</td>
</tr>
<tr>
<td>Small (&lt;0.25)</td>
<td>312</td>
<td>1.6%</td>
<td>143</td>
<td>0.7%</td>
<td>19 013</td>
<td>97.7%</td>
<td>19 468</td>
</tr>
<tr>
<td>Intermediate (0.25)</td>
<td>466</td>
<td>2.0%</td>
<td>200</td>
<td>0.9%</td>
<td>22 738</td>
<td>97.2%</td>
<td>23 404</td>
</tr>
<tr>
<td>Intermediate (&gt;0.25–0.4)</td>
<td>331</td>
<td>2.1%</td>
<td>96</td>
<td>0.6%</td>
<td>15 582</td>
<td>97.3%</td>
<td>16 009</td>
</tr>
<tr>
<td>Large (&gt;0.4)</td>
<td>523</td>
<td>3.1%</td>
<td>84</td>
<td>0.5%</td>
<td>15 009</td>
<td>96.4%</td>
<td>15 571</td>
</tr>
<tr>
<td>All</td>
<td>1 587</td>
<td>2.1%</td>
<td>523</td>
<td>0.7%</td>
<td>72 342</td>
<td>97.2%</td>
<td>74 452</td>
</tr>
</tbody>
</table>

Sources: Historical database of Scanian agriculture
Note: An average farm in the whole sample was taxed 0.31 mantal. In the 18th century 0.25 mantal was referred to as a minimum for a “whole” farm. After 1800 this limit was gradually sinking, in pace with increased farm productivity.

To sum up the patterns of female farming we can reject that it was common that the widows could not resist possible attempts from male relatives or neighbors to dissolve or shrink their farms. In the whole sample, the most common scenario was that the widows kept the farm unaltered for 1–3 years, and then either remarried or handed it over to another possessor. This was the case for 65 percent of the widows, but in this figure the manorial tenants is included. On most such farms staying as a widow was never an option, due to the intervention of the landlords.

When the women had the chance to choose it was the other way around. A majority, 55 percent, of the widowed freeholders and crown tenants stayed as sole proprietors for more than three years.

4. Comparing male and female farming

Is it possible to compare the economic outputs from farms headed by men and women respectively? Some methodological issues have been raised in connection with such comparisons. In an overview, Quisumbing emphasizes the necessity of considering all production inputs in the analysis, including educational levels of the farmers. Given that women are generally less educated, and more educated farmers are more likely to adapt new technology, and thereby enhance productivity, omitted educational inputs will “underestimate the consequences of underinvestment in women’s education in rural societies.”

In the late 17th century the Swedish government and the church decided that all adult Swedes should be able to read the most important protestant religious texts. There was no formal

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36 This early literacy campaign, statuted in the Church Law of 1686, aimed at the ability to read, but not at the ability to write.
contemporary discussion about any differences in how much basic reading a farmer’s son or
dughter must learn. Actually, it was often the mothers’ task at home to teach the children to
read, which propelled their rates of literacy upwards, sometimes rivaling those of men.\textsuperscript{37} When it came to the ability to write, freeholders in the early 19\textsuperscript{th} century seem to have been
more inclined to invest in their boys’ ability to master basic “commercial writing”. In the
manorial parishes, however, there were no significant differences between men’s and
women’s ability to write.\textsuperscript{38} In 1842 an elementary school system was decided on. It
comprised four compulsory years, equally for boys and girls. To sum up, these two literacy
campaigns, contributed to a high literacy rate among both men and women.

The children’s vocational training took place at the farm, and not least, as farm hands and
maids at others farms. Most sons and daughters left home when they were 15–19 years old,
and often spent more than ten years on different farmsteads, learning their occupation and
looking for a suitable marriage partner. The mean age of first marriage in the 19\textsuperscript{th} century in
the area was about 29 years for men and 27 for women.\textsuperscript{39}

The biggest difference in the professional training between men and women was connected to
the high degree of gender specific work tasks on the farm. In this sense, there was an
“underinvestment” in both men’s and women’s education, but not necessarily more for
women.

4.1 Modeling determinants of production outputs

Simple descriptive statistics are not sufficient to measure the economic impact of female
farming in this historical sample. As we have seen in tables 2–4 specially the persistent
widows are unevenly distributed over the regions geographical possibilities, over its forms of
property rights and over farm sizes. Each of these factors could have decisive impacts on the
production outcomes. This means e.g. that comparing simple mean values will tell us nothing
about the widows’ performances. Instead we turn to a multivariate analysis by estimating a
regression model using a panel data approach. The variable to be explained is change in
annual grain production of each individual farm.

The independent variables are presented in Table 5, except for farm size which is an infinite
variable. Before we examine the results for the widows, a brief discussion on the meaning and
outcomes of the analysis in general and of the impacts of other variables than sex is
necessary.\textsuperscript{40} From Table 6 we can understand that the regression analysis contains 2 039
farms with totally 66 775 farming year outputs.

The overall R-square value of the regression is 0.4419, which can be interpreted as if 44
percent of the variation in grain production is explained by the included variables. As
expected the regression explains more of the variance between the farms than within each of
them, since the weather had a huge impact on annual fluctuations in farm outputs – conditions
that are not investigated here.

\textsuperscript{37} Arnove & Graff (ed) (1987) p. 19. The phenomenon seems to have been unique for early modern Sweden and
for 19\textsuperscript{th} century United States.
\textsuperscript{39} Lundh (1999) p. 223.
\textsuperscript{40} For a more complete discussion of what constituted and explained agricultural growth in southern Sweden, see
Table 5. Descriptive statistics of the sample, percent and number of observations

<table>
<thead>
<tr>
<th>Variable</th>
<th>1733–1864</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>percent</td>
</tr>
<tr>
<td>Possessor by sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>97.2</td>
</tr>
<tr>
<td>Female</td>
<td>2.8</td>
</tr>
<tr>
<td>Change of cultivator</td>
<td></td>
</tr>
<tr>
<td>Years without transfers</td>
<td>94.1</td>
</tr>
<tr>
<td>Years with transfers</td>
<td>5.9</td>
</tr>
<tr>
<td>Type of land</td>
<td></td>
</tr>
<tr>
<td>Freehold</td>
<td>35.3</td>
</tr>
<tr>
<td>Crown tenants</td>
<td>20.0</td>
</tr>
<tr>
<td>Manorial tenants</td>
<td>15.5</td>
</tr>
<tr>
<td>Manorial tenants 2</td>
<td>26.7</td>
</tr>
<tr>
<td>Former manorial tenants</td>
<td>2.6</td>
</tr>
<tr>
<td>Early enclosures</td>
<td></td>
</tr>
<tr>
<td>Not enclosed</td>
<td>69.3</td>
</tr>
<tr>
<td>Enclosed</td>
<td>27.4</td>
</tr>
<tr>
<td>Re-enclosed</td>
<td>3.3</td>
</tr>
<tr>
<td>Radical enclosures</td>
<td></td>
</tr>
<tr>
<td>Not enclosed</td>
<td>77.3</td>
</tr>
<tr>
<td>Enclosed</td>
<td>17.1</td>
</tr>
<tr>
<td>Solitary initially</td>
<td>5.6</td>
</tr>
<tr>
<td>Natural conditions</td>
<td></td>
</tr>
<tr>
<td>Plains</td>
<td>18.2</td>
</tr>
<tr>
<td>Intermediate</td>
<td>44.7</td>
</tr>
<tr>
<td>Woods</td>
<td>37.1</td>
</tr>
<tr>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

Since our data presents crude outputs per farm, the size of the farms had a predominant impact. The mean output for all the farms was 56 hectoliters, and the size of the medium farm was 0.31 mantal, ranging from near zero to one. So, the farm-size coefficient in table 6 can be interpreted as follows: if the farm size increases a good three times, then output increases with 109 hectoliters (from 56 to 165). As expected the natural conditions also had a huge impact on grain production. Farms located in the woodlands performed almost 35 hectoliters less than farms in the fertile plains.

Modeling property rights, the freeholders here are the references. All other groups performed worse than them, e.g. for manorial tenants 20 or 17 hectoliters less per year. “Manorial tenants 2” denotes tenants who lived in the same parish as the manorial demesnes; the others lived in other parishes, more distant from the manor houses and demesnes.

The enclosure movement in Sweden was the take-off for agrarian change in many villages, and here the enclosure variables show great and significant impact on production outcomes. The early enclosures in this sample took place 1749–1800 and meant reallocations of land within the village communities in order to improve drainage and decrease the scattering of strips. Such measures improved production with about 9 hectoliters per farm, and even more in villages that went through repeated early enclosures.

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41 For a thorough analysis of Swedish enclosures and production outcomes, see Svensson 2008.
But the most profound impact had the radical enclosures. They started in 1803 and meant dissolution of the village communities, gathering all land in clearly defined individual plots. These enclosures paved the way for new farming techniques, the introduction more advanced crop rotation systems, including ley, and led to a wave of land reclamation. The impact of radical enclosures in the regression can be interpreted as a raise in grain production with 31 hectoliters, implying a long term increase with more than 50 percent.

Table 6. GLS-regression of grain production per farm in hectoliters 1733–1864, random effects

| Category                      | Coefficient | Std. error | Z     | P>|z| |
|-------------------------------|-------------|------------|-------|-----|
| Farm size                     | 109.170     | 3.3109     | 32.97 | 0.000 |
| Possessor by sex              | Male r.c.   | 1.1753     | .5309 | 2.21 | 0.027 |
|                               | Female      | 1.1753     | .5309 | 2.21 | 0.027 |
| Change of cultivator          | First year effect | -1.9478       | .3378 | -5.77 | 0.000 |
| Type of land                  | Freehold r.c. | -14.7736    | .6526 | -22.59 | 0.000 |
|                              | Crown tenants | -19.7035    | 1.5340 | -12.84 | 0.000 |
|                              | Manorial tenants | -17.0843    | 1.4004 | -12.20 | 0.000 |
|                              | Former manorial tenants | -15.2798   | 2.0113 | -7.60 | 0.000 |
| Early enclosures              | Not-enclosed r.c. | 9.3465    | .3334 | 28.03 | 0.000 |
|                              | Enclosed     | 19.3480    | .7420 | 26.08 | 0.000 |
| Radical enclosures            | Open-field r.c. | 31.1011    | .3701 | 84.03 | 0.000 |
|                              | Enclosed     | 5.5448     | 3.0401 | 1.82 | 0.068 |
| Natural conditions            | Plains r.c. | -30.4780   | 1.6456 | -18.52 | 0.000 |
|                              | Intermediate | -34.9141   | 1.8431 | -18.94 | 0.000 |
| Constant                      | 50.1253     | 1.8235     | 27.49 | 0.000 |

No. of observations 66 775
No. of groups 2 039

R-sq: 0.1303
Within 0.5168
Between 0.4419
Overall 0.4419

Wald chi2(18) 12015.84
Prob > chi2 0.0000

Sources: Historical database of Scanian agriculture
Note: r.c. denotes reference category
4.2 Widows economic output

The overall effect of female farming, compared to male farming, was a small but significant raise in grain production. The female coefficient in Table 6 can be interpreted as an enhancement with a little more than one hectoliter, implying that female farmers performed 2 percent better than men. In contrast the first year effect of change of cultivator, male or female, was significantly negative, an effect that even more strengthens the results for the women, since they in 65 percent of the cases held their farms for less than 3 years. But there does not seem to be any additional positive effect of long term female farming. When dividing the female variable into short term (1–3 years) and long term variables the significant outcomes is even higher for short term female households.

The women seem to have been even better off after the radical enclosures. With corresponding parameters as in Table 6, only measuring farms that had went through radical enclosures (11 390 observations), the female coefficient is 4.4 (almost significant at 1%, 0.015). Since, during this period the overall production level was 95 hectoliters per farm, the coefficient indicates that female farmers performed almost 5 percent better than men. Correspondingly, only measuring farms that still were in the village communities, the female coefficient is positively 0.9, but significant only at 10%.

When it comes to animal breeding, we cannot find any differences at all between male and female farming. In a multivariate analysis like the one we have shown for the grain outputs, the deviating coefficients for women are small and far from significant. During the period of investigation animal production generally stagnated. While the average farm quadrupled its grain production 1735–1865, its animal production decreased with 5–10 percent. This was partly due to cattle plagues in the 18th century. Besides, part of preindustrial animal breeding must not be seen as production but investments in farm capital, since it included draught animals. Better plows decreased the need for draught animals in the 19th century. Work with small animal was normally seen as typical female responsibilities. But even when the dependent variables are set for small animals, such as annual production of lamb, goslings and piglets, we find no differences between male and female farm managers.

Earlier research on differences in male-female productivity in agriculture has presented deviating results. In an overview, Quisumbing discusses 11 studies from Africa and Asia. Often the number of examined farms is small, but Quisumbing concludes that most of the studies reported insignificant dummies for the sex of the farm manager, indicating that female farmers are equally efficient as male farmers.42 The same conclusions are drawn in a recent paper by Njuki et.al. on Kenyan agriculture.43

Our results, on a historical but much larger sample than any of the studies on today’s developing countries, shows that female farmers were up to 5 percent more efficient than male. There are two plausible explanations to this. The first is the pattern of gender division of farm labor. As we have pointed out before, male tasks were often of higher status than female. Women were thus more likely to learn and take part in traditional male tasks, than men were to take part in female tasks. Consequently, the women’s agricultural skills were broader, and even if they hired a farm hand to do the heavy task, e.g. work with the plow or the scythe, they understood the work and could direct it.

43 Njuki et.al. (2006).
The second is the more universal tendency of discriminated groups to make compensatory efforts. A woman had a lot to prove, in front of household members, relatives and neighbors, when she took over charge of a farm. It is likely that she was more urgent to do everything by the book, more elaborate in choosing servants and more willing to make personal sacrifices for the good of the farm. That is at least so in the first years of management, which is consistent with our finding that male and female productivity tends to level out in the case of long term widowed farm heads.

5. Conclusions

In the paper we have presented some clear results on patterns of female farming and its economic outputs. We have been able to reject the hypothesis of dissolution of women-headed farms, seeing that it actually was more common that farms headed by men were split up, in connection with changes of cultivator.

In many cases farms headed by widows was a short transition phase between either a remarriage or a hand over to a new possessor. But in the case of freeholders and crown tenants, when there were no pressures from a private landowner for a new male cultivator, a majority of the widows stayed as sole proprietors for more than three years. We have also seen that it was more common for women to retain large peasant farms than smaller and likewise more common on the plains than in the wood lands. Possible explanations to this are the patterns of gender segregated work tasks in the peasant households and the presence of servants. It was less likely for women, on long-term basis, to manage farms that included forestry. It was more likely for women who used to lead several servants on major farms to be able to compensate for the lost of their husband by hiring an extra farmhand.

Female farming was generally more productive than male farming. For the whole period the difference was about 2 percent in favor of the women, but after the radical enclosures in Sweden, that meant a take-off for the agricultural revolution, the women performed almost 5 percent better than the men. Female and male productivity tends, however, to level out in the cases of long-term female managements, and it is likely that the female productivity boost is connected to compensatory measures, efforts from a subordinate group to prove themselves capable as farm managers.

Sources

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- Tithe rolls, Shurch Archives, Regional Archives of Lund
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