

# Warehouse receipt financing for smallholders in developing countries: Challenges and limitations

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Data Appendix Available Online: A data appendix to replicate main results is available in the online version of this article.

## Abstract

A warehouse receipt is a document issued by a warehouse operator as evidence that a specified commodity of stated quantity and quality has been deposited at a particular warehouse by a named depositor. When backed by an appropriate legal and regulatory framework, a warehouse receipt becomes a formal financial instrument that allows the depositor to confer a security interest in the stored commodity to another party without requiring physical delivery, allowing the warehouse receipt to serve as possessory collateral for a loan. Warehouse receipt financing, in theory, permits smallholders farmers in developing countries to store their surplus safely in a modern warehouse to sell at a later date when prices are higher, while allowing them to use the stored commodity as collateral to secure a loan to finance household consumption and investment needs in the interim. However, in practice, warehouse receipt financing generally has not been embraced by smallholders in developing countries in which it is available. Here, we develop and analyze a formal stochastic dynamic model of seasonal commodity marketing that exposes the transaction cost and risk reallocation problems that undermine the benefits of warehouse receipt financing to smallholders.

## Supporting Information

Filename	Description
<a href="#">agec12514-sup-0001-data.zip</a> 9.9 KB	Supporting Information

Please note: The publisher is not responsible for the content or functionality of any supporting information supplied by the authors. Any queries (other than missing content) should be directed to the corresponding author for the article.

## REFERENCES

ACE Global Depository. (2013). *Warehouse receipt financing* (Technical Report). Dubai, United Arab Emirates: Author.

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---

Aning, A. (2015). *The role of warehouse receipt systems in agricultural modernization in Africa* (Technical Report). Accra, Ghana: African Center for Economic Transformation.

[Google Scholar](#)

---

Bellman, R. E. (1957). *Dynamic programming*. Princeton, NJ: Princeton University Press.

[Google Scholar](#)

---

Blackwell, D. (1965). Discounted dynamic programming. *Annals of Mathematical Statistics*, 36(1), 226–235.

[Google Scholar](#)

---

Coulter, J., & Onumah, G. E. (2002). The role of warehouse receipt systems in enhanced commodity marketing and rural livelihoods in Africa. *Food Policy*, 27(4), 319–337.

[Web of Science®](#) | [Google Scholar](#)

---

Coulter, J., & Shepherd, A. W. (1995). *Inventory credit: An approach to developing agricultural markets (FAO Agricultural Services Bulletin 120)*. Rome, Italy: Food and Agriculture Organization of the United Nations.

[Google Scholar](#)

---

Coulter Consulting Ltd. and Sullivan & Worcester UK LLP. (2014a). *Study on appropriate warehousing and collateral management systems. Volume I: Key findings* (Technical Report). Wageningen, the Netherlands: Technical Centre for Agricultural and Rural Cooperation.

[Google Scholar](#)

---

Coulter Consulting Ltd. and Sullivan & Worcester UK LLP. (2014b). *Study on appropriate warehousing and collateral management systems. Volume II: Technical country reports* (Technical Report). Wageningen, the Netherlands: Technical Centre for Agricultural and Rural Cooperation.

[Google Scholar](#)

---

Food and Agriculture Organization of the United Nations. (2015). *Ghana food and agriculture policy trends*. Rome, Italy: Food and Agriculture Organization of the United Nations.

[Google Scholar](#)

Gardner, B. L., & Lopez, R. (1996). The inefficiency of interest-rate subsidies in commodity price stabilization. *American Journal of Agricultural Economics*, 78(3), 508–516.

[Web of Science®](#) | [Google Scholar](#)

---

Ghana Grains Council. (2017). *Home page*. Retrieved from <http://www.ghanagrainscouncil.org/en/>.

[Google Scholar](#)

---

Ghana Statistical Service. (2013). Ghana Living Standards Survey 2012-2013. Retrieved from <http://catalog.ihsn.org/index.php/catalog/5350> (accessed 20 August 2019).

[Google Scholar](#)

---

Hollinger, F., Rutten, L., & Kiriakov, K. (2009). *The use of warehouse receipt finance in agriculture in transition countries* (Technical Report). Washington, DC: The World Bank.

[Google Scholar](#)

---

International Finance Corporation. (2013). *Warehouse finance and warehouse receipt systems: A guide for financial institutions in emerging economies*. (Technical Report). Washington, DC: The World Bank.

[Google Scholar](#)

---

International Finance Corporation. (2015). *Money in the barn: How warehouse receipts can improve the life of farmers* (Technical Report). Washington, DC: The World Bank.

[Google Scholar](#)

---

International Food Policy Research Institute. (2016). Medium and Large-Scale Farmers and Agricultural Mechanization in Ghana Survey. Retrieved from <http://www.ifpri.org/publication/medium-and-large-scale-farmers-and-agricultural-mechanization-ghana> (accessed 20 August 2019).

[Google Scholar](#)

---

International Fund for Agricultural Development. (2008). *Empowering farmers in Tanzania through the warehouse receipt system* (Brief). Rome, Italy: Author.

[Google Scholar](#)

---

Judd, K. L. (1998). *Numerical methods in economics*. Cambridge, MA: MIT Press.

[Google Scholar](#)

---

Larson, D. F. (2007). On inverse carrying charges and spatial arbitrage. *Journal of Futures Markets*, 27(4), 305–336.

[Web of Science®](#) | [Google Scholar](#)

---

Larson, D. F., Anderson, J. R., & Varangis, P. (2004). Policies on managing risk in agricultural markets. *The World Bank Research Observer*, 19(2), 199–230.

[Web of Science®](#) | [Google Scholar](#)

---

Lowry, M. N., Glauber, J. W., Miranda, M. J., & Helmberger, P. G. (1987). Pricing and storage of field crops: A quarterly model with application to soybeans. *American Journal of Agricultural Economics*, 69(4), 740–749.

[Web of Science®](#) | [Google Scholar](#)

---

Maître d'Hôtel, E., & Le Cotty, T. (2018). Why does on-farm storage fail to mitigate price volatility? *Agricultural Economics*, 49(1), 71–82

[Web of Science®](#) | [Google Scholar](#)

---

Miranda, M. J., & Fackler, P. L. (2002). *Applied computational economics and finance*. Cambridge, MA: MIT Press.

[Google Scholar](#)

---

Mulangu, F. M., Kemeze, F. H., & Miranda, M. J. (2017). *Warehouse receipts and financial practices: The case of Ghana* (Technical Report). Accra, Ghana: African Center for Economic Transformation.

[Google Scholar](#)

---

Onumah, G. E. (2010). *Implementing warehouse receipt systems in Africa: Potential and challenges*. Paper presented at Fourth African Agricultural Markets Program Policy Symposium, September 6–7, Lilongwe, Malawi.

[Google Scholar](#)

---

Stokey, N. L., & Lucas, R. E., Jr. (1989). *Recursive methods in economic dynamics*. Cambridge, MA: Harvard University Press.

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---

United Nations Conference on Trade and Development. (1996). *Collateralized commodity financing, with special reference to the use of warehouse receipts* (Technical Report). Geneva, Switzerland: Author.

[Google Scholar](#)

---

U.S. Agency for International Development. (2010). *ICT to enhance warehouse receipt systems and commodity exchanges in Africa* (Briefing Paper). Washington, DC: Author.

[Google Scholar](#)

---

U.S. Agency for International Development. (2013a). *Ethiopia warehouse receipt system and regulation: A case for expansion* (Technical Report). Washington, DC: Author.

 | [Google Scholar](#) |

---

U.S. Agency for International Development. (2013b). *Improving food security with warehouse receipts* (Brief). Washington, DC: Author.

 | [Google Scholar](#) |

---

Wehling, P., & Garthwaite, B. (2015). *Designing warehouse receipt legislation: Regulatory options and recent trends* (Technical Report). Rome, Italy: FAO.

 | [Google Scholar](#) |

---

Weidemann Associates, Inc. (2000). Warehouse receipts: Financing agricultural producers. Technical Note No. 5, Washington, DC, Oct.

 | [Google Scholar](#) |

---

William, J. G., & Kaserwa, N. (2015). Improving smallholder farmers access to finance through warehouse receipt system in Tanzania. *International Journal of Economics and Financial Research*, 1(92), 41–49.

 | [Google Scholar](#) |

---

Williams, J. C. (1984). Fractional reserve banking in grain. *Journal of Money, Credit and Banking*, 16(4), 488–496.

 | [Web of Science®](#) | [Google Scholar](#) |

---

Wright, B. D., & Williams, J. C. (1982). The economic role of commodity storage. *Economic Journal*, 92(367), 596–614.

 | [Web of Science®](#) | [Google Scholar](#) |

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