

# Reconsidering production coordination: A principal-agent theory-based analysis

Gong, D.<sup>a,b,c</sup>, Tang, M.<sup>b,c,\*</sup>, Liu, S.<sup>b,c</sup>, Li, Q.<sup>b,c</sup>

<sup>a</sup>School of Economics and Management, Tsinghua University, China

<sup>b</sup>School of Economics and Management, Beijing Jiaotong University, China

<sup>c</sup>International Center for Informatics Research, Beijing Jiaotong University, China

## ABSTRACT

Production coordination is a common phenomenon in supply chains. Unlike the existing literature, we examine the production coordination problem from the perspective of asymmetric information: how a manufacturer (leading firm) coordinates the relationships with its subsidiary firm(s) and, subsequently, how market returns influence the leading firm's expected utilities, agency cost and the subsidiary firm's expected incomes. We develop an incentive contract model with asymmetric information based on principal-agent theory. Comparative analysis and simulations are conducted to test the model. Results show that the leading firm's expected utilities and agency cost and the subsidiary firm's expected incomes are significantly affected by the subsidiary firm's capability, cost coefficient, absolute risk aversion factor and output variance (common factors); sharp differences among the leading firm's expected utilities and agency cost and the subsidiary firm's expected incomes were found due to different market returns. Thus, the proposed approach (incentive contract model) can help leading firms apply incentives to optimize production modes to obtain production coordination while considering common factors; market returns differences are included in the new model, in contrast to previous approaches.

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### \*Corresponding author:

[mincong@bjtu.edu.cn](mailto:mincong@bjtu.edu.cn)  
(Tang, M.)

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## Nov pristop za usklajevanje proizvodnje: Teoretska analiza stranka-posrednik

Gong, D.<sup>a,b,c</sup>, Tang, M.<sup>b,c,\*</sup>, Liu, S.<sup>b,c</sup>, Li, Q.<sup>b,c</sup>

<sup>a</sup>School of Economics and Management, Tsinghua University, China

<sup>b</sup>School of Economics and Management, Beijing Jiaotong University, China

<sup>c</sup>International Center for Informatics Research, Beijing Jiaotong University, China

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### POVZETEK

Usklajevanje proizvodnje je pomemben vidik v dobavnih verigah. V nasprotju z obstoječo literaturo obravnavamo usklajevanje proizvodnje z vidika asimetričnih informacij: kako proizvajalec (vodilno podjetje) usklajuje odnose s svojimi hčerinskimi podjetji (strankami) in posledično, kako tržni donosi vplivajo na pričakovano zadovoljstvo vodilnega podjetja, stroške posrednika in pričakovane dohodke hčerinskih podjetij. Razvit je model spodbujevalnih pogodb z asimetričnimi informacijami, ki temeljijo na teoriji stranka-posrednik. Za testiranje modela so izvedene primerjalne študije in simulacije. Rezultati razkrijejo, da so pričakovano zadovoljstvo vodilnega podjetja, stroški posrednika in pričakovani dohodki hčerinskih podjetij močno odvisni od sposobnosti hčerinskega podjetja, stroškovnega koeficienta, absolutnega faktorja vpliva tveganja in izhodne variance (skupna dejavnika); nasprotja med pričakovanim zadovoljstvom vodilnega podjetja, stroški posrednika in pričakovanimi dohodki hčerinskih podjetij so posledica različnih tržnih donosov. Predlagani pristop (model spodbujevalnih pogodb) lahko pomaga vodilnim podjetjem uporabiti spodbude za optimizacijo proizvodnih modelov za izboljšanje uskladitve proizvodnje z ozirom na pomembne dejavnike. V pričujoči raziskavi so razlike v tržnih donosih vključene v nov model, kar pa v dosedanjih raziskavah ni bilo narejeno.

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### PODATKI O ČLANKU

#### *Ključne besede:*

Teorija stranka-posrednik  
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#### *\*Kontaktna oseba:*

mincong@bjtu.edu.cn  
(Tang, M.)

#### *Zgodovina članka:*

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