

**LEMBAR**  
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW**  
**KARYA ILMIAH : JURNAL ILMIAH**

Judul Prosiding (Artikel) : Optimal Strategy for Supplier Selection Problem Integrated with Optimal Control Problem of Single Product Inventory System with Piecewise Holding Cost

Nama/Jumlah Penulis : Sutrisno, **Widowati**, R H Tjahjana/ 3 orang

Status Pengusul : penulis ke- 2

Identitas Prosiding : a. Nama Prosiding : Journal of Physics: Conference Series  
b. Nomor ISBN : 17426588, 17426596  
c. Volume, nomor, bulan tahun : **893** (2017) 012067  
d. Penerbit : IOP Publishing  
e. DOI artikel (jika ada) : 10.1088/1742-6596/893/1/012067  
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g. Terindeks di Scopus : SJR (2017) 0.241 Q3  
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Kategori Publikasi Prosiding :  Prosiding Internasional Terindeks  
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 Prosiding Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2,79	3.00	2.89
b. Ruang lingkup dan kedalaman pembahasan (30%)	8,55	6.00	7.27
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	8,10	6.50	7.30
d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	8,28	7.00	7.64
<b>Total = (100%)</b>	<b>27,72</b>	<b>22.50</b>	<b>25.11</b>
<b>Nilai Pengusul== 40% x1/2</b>	<b>5,54</b>	<b>4.50</b>	<b>5.02</b>

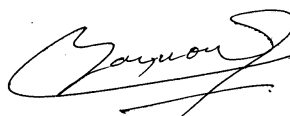
Reviewer 2



Prof. Dr. St. Budi Waluya, M.Si  
NIP. 196809071993031002  
Unit kerja : Matematika FMIPA UNNES

Semarang, April 2020

Reviewer 1



Prof. Dr. Basuki Widodo, M.Sc  
NIP. 19650506 1989031002  
Unit kerja : Matematika FSAD ITS

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 Prosiding Nasional

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Komponen Yang Dinilai	Nilai Maksimal Prosiding			Nilai Akhir Yang Diperoleh
	Prosiding Internasional Terindeks <input checked="" type="checkbox"/>	Prosiding Internasional <input type="checkbox"/>	Prosiding Nasional <input type="checkbox"/>	
a. Kelengkapan unsur isi prosiding (10%)	3,00			2,79
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			8,55
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00			8,10
d. Kelengkapan unsur dan kualitas terbitan/jprosiding(30%)	9,00			8,28
<b>Total = (100%)</b>	<b>30,00</b>			<b>27,72</b>

**Nilai Pengusul = 40% x 1/2 x 27,72 = 5,54**

**Catatan Penilaian artikel oleh Reviewer :**

**1. Kesesuaian dan kelengkapan unsur isi prosiding :**

Penulisan artikel baik dan mengikuti standard penulisan artikel di Prosiding The Asian Mathematical Conference 2016 (AMC 2016) - IOP Conf. Series: Journal of Physics: Conf. Series, yaitu abstract, Introduction, Result and Discussion (IRaD), Conclusion, dan Acknowledgement. Belum memuat Methodology. Artikel ini didukung dengan referensi yang sesuai.

**2. Ruang lingkup dan kedalaman pembahasan:**

Lingkup bahasan dari artikel ini adalah bidang matematika terapan, khususnya pada bidang riset operasi (supply chain management). Dalam artikel ini dibahas dengan baik tentang pemilihan pemasok dan kontrol pelacakan yang terintegrasi untuk sistem persediaan produk tunggal dengan partisi biaya holding. Relevansi hasil terkait aplikasi metode kontrol prediktif untuk sistem hybrid pada jumlah produk pengiriman yang optimal dari pemasok

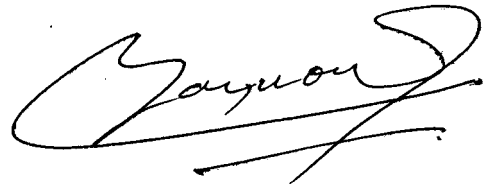
**3. Kecukupan dan kemutakhiran data/informasi dan metodologi :**

Informasi yang disajikan relatif baru dan hasil yang diperoleh memuat substansi orisinal dengan aspek aplikasi yang penting Sumber gagasan penulis untuk artikel ini cukup banyak, komprehensif dan update, yang lebih sepuluh tahun terakhir hanya 4 paper dari 13 sumber yang dirujuk. Methodologi belum disebutkan dalam artikel ini.

4. **Kelengkapan unsur dan kualitas terbitan:**

Artikel memenuhi standard penulisan dan isi untuk jurnal internasional. Artikel ini diterbitkan di jurnal internasional yang terindeks di Scopus (Q3).

Surabaya, 17 April 2020  
Reviewer 1

A handwritten signature in black ink, appearing to read 'Basuki Widodo', with a stylized flourish at the end.

Prof. Dr. Basuki Widodo, M.Sc  
NIP. 19650506 1989031002  
Unit kerja : Matematika FSAD ITS

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Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding			Nilai Maksimal Prosiding
	Prosiding Internasional Terindeks <input checked="" type="checkbox"/>	Prosiding Internasional <input type="checkbox"/>	Prosiding Nasional <input type="checkbox"/>	
e. Kelengkapan unsur isi prosiding (10%)	3,00			3,00
f. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			6,00
g. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00			6,50
h. Kelengkapan unsur dan kualitas terbitan/jprosiding(30%)	9,00			7,00
<b>Total = (100%)</b>	<b>30,00</b>			<b>22,50</b>

**Nilai Pengusul** =  $40\% \times 1/2 \times 22,5 = 4,50$

**Catatan Penilaian artikel oleh Reviewer :**

**1. Kesesuaian dan kelengkapan unsur isi prosiding:**

Artikel terdiri atas 4 bagian: Introduction, Mathematical Model, Numerical Experiment, Conclusion and Future Research. Kesesuaian dan kelengkapan unsur isi cukup baik. Hanya di pendahuluan kurang ditonjukkan nilai lebih dari artikel ini. Didukung 13 referensi.

**2. Ruang lingkup dan kedalaman pembahasan:**

Ruang lingkup dan kedalaman pembahasan cukup baik. Intrepretasi hasil kurang ditonjolkan dalam pembahasan. Pembahasan berkaitan dengan hybrid mathematical model of supplier selectionproblem integrated with inventory control problem. Lingkup Matematika Terapan sesuai dengan bidang ilmu pengusul.

**3. Kecukupan dan kemutakhiran data/informasi dan metodologi :**

Kecukupan dan kemutakhiran data/informasi dan metodologi cukup baik. Terdapat 13 referensi Sebagian besar berupa jurnal (42,6% referensi kurang up to date). Hasil yang didapat memuat substansi kebaruan.

4. **Kelengkapan unsur dan kualitas terbitan:**

Kelengkapan unsur dan kualitas terbitan cukup baik. Artikel diterbitkan dalam Journal of Physics: Conference Series Terindeks di Scopus: Scimagojr dan Scopus, SJR (2017) 0.241 Q3. Beberapa editorial kurang dilakukan dengan cermat.

Semarang,  
Reviewer 2



Prof. Dr. St. Budi Waluya, M.Si  
NIP. 196809071993031002  
Unit kerja : Matematika FMIPA UNNES



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# Certificate



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*This is to certify that*

**Sutrisno**

*has presented a paper with entitled*

**“Optimal strategy for supplier selection problem integrated with optimal control problem of single product inventory system with piecewise holding cost”**

*in*

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**25 - 29 JULY 2016**

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Journal of Physics: Conference Series  
Volume 893, Issue 1, 28 October 2017, Article number 012067  
Asian Mathematical Conference 2016, AMC 2016; Bali Nusa Dua Convention Center (BNDCC)Nusa Dua, Bali; Indonesia; 25 July 2016 through 29 July 2016; Code 131604

## Optimal strategy for supplier selection problem integrated with optimal control problem of single product inventory system with piecewise holding cost (Conference Paper) (Open Access)

Sutrisno, **Widowati** ✉, Tjahjana, R.H.

Department of Mathematics, Diponegoro University, Semarang, Indonesia

### Abstract

↕ View references (13)

In this paper, we formulate a hybrid mathematical model of supplier selection problem integrated with inventory control problem of a single product inventory system with piecewise holding cost. This model will be formulated in a piecewise affine (PWA) form that can be converted into mixed logical dynamic (MLD) form. By using this MLD model, we solve the supplier selection problem and control this inventory system so that the stock level tracks a desired level as the reference trajectory as closed as possible with minimal total cost. We use model predictive control for hybrid system to solve the problem. From the numerical experiment results, the optimal supplier was selected at each time period and the evolution of the stock level tracks the desired level well. © Published under licence by IOP Publishing Ltd.

### SciVal Topic Prominence ⓘ

Topic: Inventory control | Inventory | Optimal policies

Prominence percentile: 85.301 ⓘ

### Indexed keywords

Engineering controlled terms:

Costs Hybrid systems Inventory control Model predictive control  
Optimal control systems

Engineering uncontrolled terms

Inventory control problems Minimal total costs Mixed logical dynamics  
Numerical experiments Optimal control problem Optimal strategies Reference trajectories  
Supplier selection

Engineering main heading:

Problem solving

### Funding details

Funding sponsor	Funding number	Acronym
Universitas Diponegoro		UNDIP

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2 Citations in Scopus  
82nd percentile

1.61 Field-Weighted  
Citation Impact



PlumX Metrics

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### Cited by 2 documents

Quadratic programming model for optimal decision making of supplier selection problem integrated with inventory control problem

Hakim, D.U.H.E. , Sutrisno , Widowati  
(2019) *Journal of Physics: Conference Series*

Application of Robust Linear Quadratic Control for Inventory System with Unknown Demand: Single Product Case

Sutrisno , Widowati , Tjahjana, R.H.  
(2019) *2018 2nd International Conference on Informatics and Computational Sciences, ICICoS 2018*

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# Source details

## Journal of Physics: Conference Series

Scopus coverage years: from 2005 to Present

Publisher: Institute of Physics Publishing

ISSN: 1742-6588 E-ISSN: 1742-6596

Subject area: Physics and Astronomy: General Physics and Astronomy

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2017

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Accepted papers received: 05 September 2017

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# An intriguing application of telescoping sums

**Julius Fergy T. Rabago**

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**Abstract.** This note offers a simple, yet very intriguing application of telescoping sums. Particularly, the cancellation technique which is known as the method of differences is employed to establish analytically the closed-form solutions of some systems of nonlinear difference equations. The results delivered here, in addition, generalizes several results found in recent literatures.

## 1. Introduction

There has been an enormous amount of published work dealing with solution forms of some systems of nonlinear difference equations that are solvable in closed-forms. This type of equations appear very simple in form, however, in some situations, the structure and behavior of their solutions are quite difficult to formulate and completely understand. Nevertheless, several studies have dealt with the solution forms of several solvable systems of nonlinear difference equations, see, for instance, a recent work of Elsayed [3], Elsayed and El-Metwally [4], Elsayed and Ibrahim [5], Tollu et al. [12, 13], Touafek [14], Yazlik [16] and the papers cited therein. In these aforementioned works, we noticed that the results exhibited, particularly the solution forms of the systems being studied, were established through a mere application of induction principle. (in fact, at some point, the proofs of some of the statements presented are insufficient and are even completely omitted). We stress that this method can only validate analytically the solution form of a particular system of difference equation. However, it does not give much information on how these formulas are obtained. In an effort to explain theoretically some intriguing results in this research line, the author have revisited and re-examined in [8, 9, 10] and also in [11], with Bacani, several systems of nonlinear difference equations which have been studied previously in [1, 6, 14, 15, 16].

In this work, we turn our attention to a two-dimensional system of nonlinear difference equation which could be seen as a generalization of recent investigations. In particular, we shall show how the solution form of the system

$$x_{n+1} = \frac{x_n y_{n-k}}{y_{n-k+1}(\pm 1 - x_n y_{n-k})}, \quad y_{n+1} = \frac{y_n x_{n-k}}{x_{n-k+1}(\pm 1 \pm y_n x_{n-k})}, \quad (1.1)$$

with real initial conditions  $\{x_n\}_{n=-k}^0 := \{x_n\}_{-k}^0$  and  $\{y_n\}_{n=-k}^0$ , can be established analytically. Our technique uses appropriate transformation on the phase variables  $x_n$  and  $y_n$ , reducing the system into a linear type and employs the “method of differences” or, in particular, the idea of



# Social and economic influences on human behavioural response in an emerging epidemic

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**Abstract.** The human behavioural changes have been recognized as an important key in shaping the disease spreading and determining the success of control measures in the course of epidemic outbreaks. However, apart from cost-benefit considerations, in reality, people are heterogeneous in their preferences towards adopting certain protective actions to reduce their risk of infection, and social norms have a function in individuals' decision making. Here, we studied the interplay between the epidemic dynamics, imitation dynamics and the heterogeneity of individual protective behavioural response under the considerations of both economic and social factors, with a simple mathematical compartmental model and multi-population game dynamical replicator equations. We assume that susceptibles in different subpopulations have different preferences in adopting either normal or altered behaviour. By incorporating both intra- and inter-group social pressure, the outcome of the strategy distribution depends on the initial proportion of susceptible with normal and altered strategies in both subpopulations. The increase of additional cost to susceptible with altered behaviour will discourage people to take up protective actions and hence results in higher epidemic final size. For a specific cost of altered behaviour, the social group pressure could be a "double edge sword", though. We conclude that the interplays between individual protective behaviour adoption, imitation and epidemic dynamics are necessarily complex if both economic and social factors act on populations with existing preferences.

## 1. Introduction

The role of human behaviour in the spread and control of infectious diseases has received significant attention [1]. Various behavioural changes, including vaccination, taking antiviral drugs, health protective actions such as social distancing, wearing masks, reducing travels, practicing better hygiene and avoiding crowded places, have been incorporated into epidemic models. Without including behavioural changes, the disease spreading model will predict the worst possible scenario [2]. In the course of epidemic outbreak, individuals are not passive, they weigh up the costs and risks associated with certain protective actions with the benefit of reducing the infection risk, and then choose the best strategy that maximizes their own benefit. This individual-level decision making can be concisely described in the language of game theory.

In biology, strategies are inherited, but the underlying mechanism for the evolution of strategy adoption in epidemiology is imitation process. Imitation dynamics can be coupled into one-population susceptible-infective-recovered (SIR) compartmental model via the replicator

