

# IRREGURAL WORKING HOURS IN THE CZECH T&A INDUSTRY

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## Abstract

The Czech Textile and Apparel (T&A) industry has according to official statements faced many threats through the last twenty years. One of these threats is irregular working hours (periods). This factor has strengthened its influence in economic crisis that started in 2008. In this article we are analyzing both wage costs spend on downtime work and overtime work.

According to employers' statements the space for flexible employment and other factors of modern system of flexicurity are not enough achieved in the Czech Republic and there is no other way how to change the Czech industries or specific firms in more prosperous industries (firms). According to the employees' statements their social rights are critically threatened so that there is no space for negotiations in the form of social partnership (tripartite) and naturally these labor unions are defeating their interests in the forms of strikes or industrial actions.

Irregular working hours are crucial factor in the process of making the Czech labor market more flexible. There are many opportunities for employers that should be utilized in condition with attainment of social interests for workers.

**Key words:** working period, overtime, flexicurity

**JEL Code:** J08, J21

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## Introduction

The working period distribution in particular industry is a stressed topic to be solved. This topic has two main constraints. First one is economic and second part is juristic. According to Labor Code in particular economy (country) employers have to go along main rules of fair employment. Nevertheless due to wider globalization, supply chain management and information technology real business problem is to compensate volatile demand for finished or semi-finished goods with limited labor sources.

The main aim of this article is to analyze this problem in the Czech textile and apparel industry and find the solution of unpredicted changes of demand in contrary with the legal and fair employment in this industry. We use the methodology from analysis to synthesis, specifically across the board the analysis of time series data, the analysis of human resource management and generally economic method of analysis.

## **1 Labor force as a resource of production**

When we are going a bit far away from humanity evolution in society we manage the labor force as ordinary resource to production (as for instance raw materials). By utilization of supply chain management, IT/ICT technologies, there is an option in the mass production to assume the homogenous labor. Although we know a lot about psychologically tested dependence between working environment, stressing situation in the jobs, superior relation state and the individual working performance in this article we are going to describe the involvement of labor force in the process of production as any other factor of production (capital, raw resource). In the other words the labor force is able to be managed as any other factor of production.

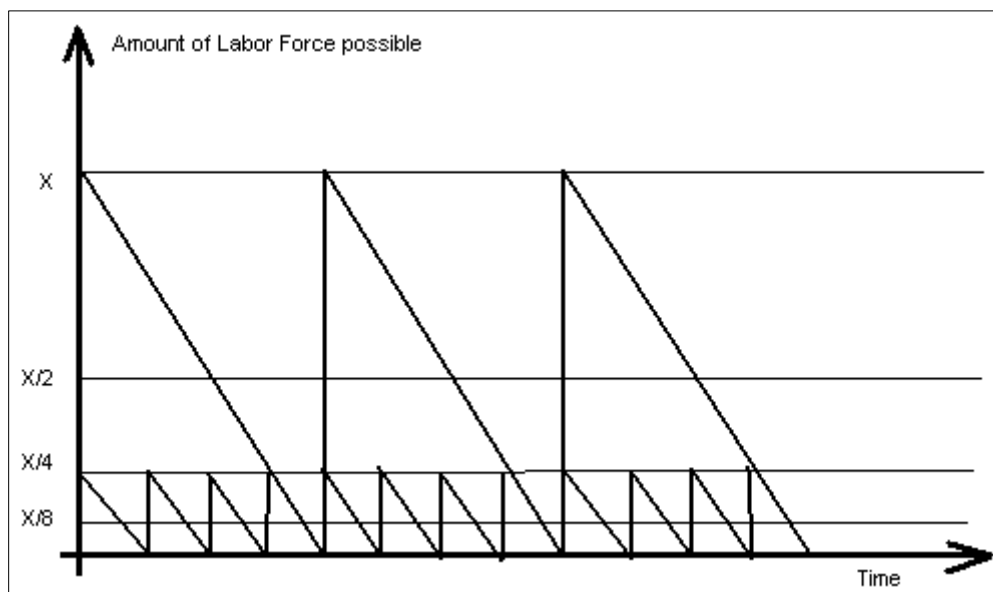
## **2 Economic models of Inventories**

The main problem in the Czech Textile and Apparel Industry is the surplus/shortage disparity of demand. Moreover it seems that by the evolution of time the volatile of demand is much more intensive than before (according to the index of new contracts in the industry).

### **2.1 Basic Economic Inventory Model**

In this model the distribution of labor force possible to be involved to production is described on the **Figure 1**.

**Fig. 1: Basic Economic Inventory Model**



Source: Wagnerová I., Makovský P. Study No.9 – Irregular distribution of working period in the T&A industry. Options, effects, solutions

On the graph on the **Fig.1** we observe the deterministic evolution of amount of labor possible (dependence of variable on time).

For instance in the time of zero value (for instance Monday early in the morning) we are able to involve X minutes of labor to the process of production. At the end of period (Friday late afternoon) we have no labor force to be involved and the whole labor amount needs to be invented (weekend failure of labor). When there is a four times lower reserve of labor force we are able to satisfy the whole demand, but we need to involve the flexible forms of employment and moreover the average labor amount to be processed is lower (on the value of X/8).

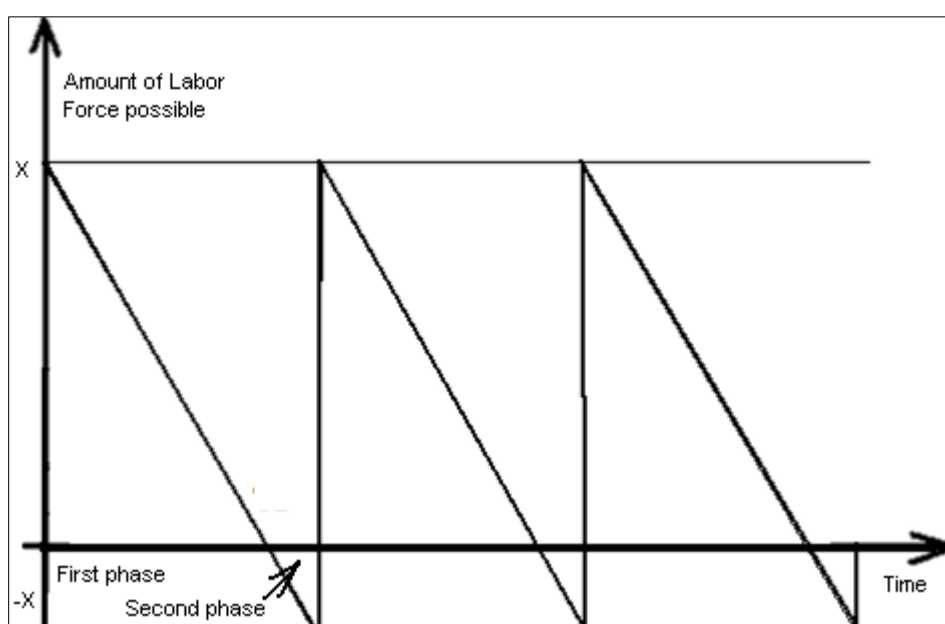
The main disadvantage of larger amount of labor is the higher costs spent on additional management and administration and in case of surplus demand greater costs spent on a golden handshake, access fare for overtime and access fare for downtime on production process. The main advantage of larger average labor amount being involved is the option of contracting greater unexpected stock of production including the increasing returns to scale. As in the Czech T&A industry, with lower average labor force they are dependent on the flexible forms of employment in order to achieve prosperity of the firm. Generally in the Czech T&A industry we have low labor “resources” so that we are able to gain only low rate contracts, we have lower increasing returns to scale and in condition with the unexpected

failure of additional production contract we have to pay lower access fare for downtime to unused labor force.

## 2.2 Economic Inventory Model with short term unmet demand

This model is modified from the previous one with the short term unmet demand. The involvement cycle of labor force possible now consist of two main phases. In the first one the labor force is transformed into the production, but in the second phase there is a shortage of labor force so that the production process is stopped and the firm needs to calculate additional costs of unmet demand. This situation is described on the **Figure 2**.

**Fig. 2: Economic Inventory Model with short term unmet demand**



Source: Wagnerová I., Makovský P. Study No.9 – Irregular distribution of working period in the T&A industry. Options, effects, solutions

In the end theoretically as we are able to optimize the total costs (minimization) and then derive the properly amount of labor force employed in the standard inventory model, moreover we are able to calculate optimal labor force employed for particular production process in the model with short term unmet demand. Hence the total costs are minimal according to the probability of satisfaction the contract, the time distribution into two phases is optimal and the costs of short term unmet demand is calculated. The fundamental derivation of all optimal values is Petr Makovský and Irena Wagnerová (2012) or generally in Josef Jablonský (2002).

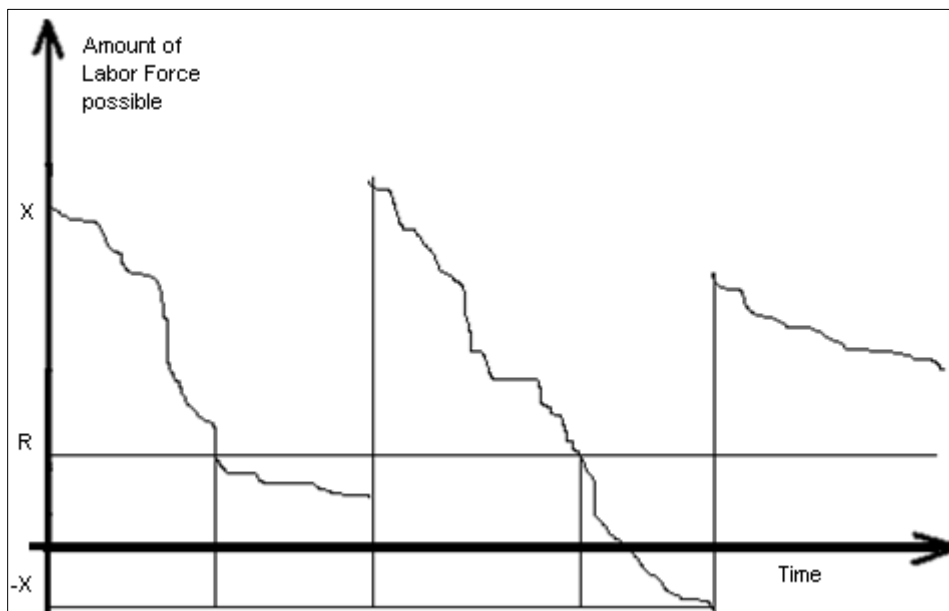
### 2.3 Economic Inventory Model with continuous stochastic demand for labor

Two previous models are in this chapter enhanced with the stochastic character of demand for labor. In the other words the value of demand for labor for production purposes in current time is created according to known probability distribution. Moreover we enhance the inventory models with “the point of reorder”.

As in previous model there are two alternatives. Either the real demand is higher than the expected demand and thus in the following cycle there is a lower amount of labor force or vice versa. Generally we assume the normal probabilistic distribution of demand for labor and add as a variable the level of service. The level of service means the probability that there is no unsatisfied demand during particular cycle. If we want to strengthen the level of service we need to create the insurance labor force deposit.

As in the previous models we are able to minimize the total cost and calculate optimal value of labor force demand for separate production line subject to the stochastic character of the demand for labor. Again for potential readers the fundamental solution is able to be studied in further references. In the end this model is described on the **Fig. 3**.

### 2.4 Fig. 3: Economic Inventory Model with continuous stochastic demand for labor



Source: Wagnerová I., Makovský P. Study No.9 – Irregular distribution of working period in the T&A industry. Options, effects, solutions

From the described three models of inventories we deduce that even the labor force is able to be managed as an inventory of labor. We have seen that in the theoretical way the distribution problems in Labor demand on particular production line are able to be solved.

The models are continuously enhanced with the factor of risk (the factor of short term unmet demand) and moreover enhanced with the stochastic factor of demand for labor. These ideas are further being practically analyzed and realized in the modern Supply Chain Management with great economic benefits for entrepreneurs.

Need to say one more time that it is unimaginable to solve the business problems of the volatile demand for firms finished or semi-finished goods in the employment of the labor force. Nevertheless the wage costs are an important deal in the total firm cost. This is a source of motivation for managers and entrepreneurs for broking the civil labor code to make the labor market more flexible.

### 3 Empirical part – a case study for the Czech T&A industry

As we have said before the non-productive costs (both access fare for overtime and access fare for downtime) are according to the statement of the employers' leaders ATOK<sup>1</sup> the critical factor of employing in the Czech Textile and Apparel industry. The common aim of these employers is to point out this case and strengthen the awareness of the inflexible labor market in order to modify the Civil Labor Code. The ATOK themselves are thinking that the situation in the other Czech industries is very similar. So that they expect others support.

#### 3.1 Economic quantification of the irregular working hours

We are going to analyze the evolution of the costs spend on the overtime wage and the costs spend on access fare for downtime, which are reported as the obstacles on the employer side. Data are reported in the ISPV<sup>2</sup> database. The T&A representatives are reported under the Code 7439 „*Other workers in the textile, clothing and leather production*“. Unfortunately the last year of this evidence is the year of 2010. The important table processed according to primary data is the **Table 1**.

The **Tab.1** shows the evolution of variables for particular quarters from the year of 2007 to the year of 2010 (16 observations). The important column is the working time and the non-working time. The working time consist of the real work period and the overtime benefits. The non-working time consists of the time of disease and the time of vacations. The residual value in this time is shared from the obstacles on employee side and obstacles on the employer side. The employee side obstacles are divided into feast days, marriages, funerals

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<sup>1</sup> Association of the Czech Textile and Clothing Industry

<sup>2</sup> Information System of the average wages

etc. While the employer side obstacles consist of the access fare for downtime caused with unmet demand for final goods which results in discontinuance of the production line. Need to underline that all the variables are monthly measured.

**Tab. 1: The evolution of wage paid according to the structure of working period**

Other workers in the textile, clothing and leather production (7439)		The Total workers employed weighted to average month	Time of employment					The hour wage rate median
			Working Time		Non-working time paid			
year	Quarter		Totally	Overtime paid	Totally	Consists of		
			hours per month	hours per month	hours per month	disease	vacation	
2007	1	3 591	151,7	11,8	23,5	10,9	7,5	86,7
2007	2	3 709	147,2	12,9	29,1	13,2	8,1	85,31
2007	3	3 809	140,1	13,1	36,3	13,6	14,4	84,97
2007	4	3 814	139,6	13,7	38,2	14,6	14,3	89,71
2008	1	3 847	151,3	11,1	23,3	7,6	8,6	90,64
2008	2	3 944	145,2	9,8	28,0	11,0	9,1	94,46
2008	3	3 870	138,3	8,7	34,7	12,7	14,8	96
2008	4	3 697	133,4	7,5	38,8	13,8	15,0	97,4
2009	1	3 059	137,7	5,7	25,4	8,3	10,2	98,3
2009	2	3 017	138,8	6,6	26,2	10,7	7,9	100,05
2009	3	2 973	135,7	6,7	31,6	11,8	12,7	102,79
2009	4	3 043	135,2	7,0	33,6	12,7	12,7	105,2
2010	1	2 790	152,7	7,9	16,0	6,4	5,2	106,09
2010	2	2 851	150,2	7,3	19,3	9,0	5,7	105,48
2010	3	2 882	143,8	7,4	27,0	9,7	11,9	105,91
2010	4	2 904	142,9	7,7	29,0	10,5	12,5	108,45

Source: processed database ISPV (<http://www.ispv.cz/cz/Vysledky-setreni/Archiv.aspx>)

For calculation of the (non-)working period there is a wage median used for any particular year. To solve the problem of the downtime costs we assume at first that the residual value is fully created with the downtime costs and at second that the residual value is divided between obstacles on the employee side, obstacles on the employer side and feast days regularly. **Tab. 2** shows these solutions.

All the calculated variables are mean values. For our purposes working time fund consists of working time, overtime time and non-working time. The wage is calculated as multiplication of working time fund and a rate wage median. Overtime value is the mean of monetary expression of overtime hours. Residual value is calculated as division between non-working time and the time of disease including vacations. Monetary value of residual is

calculated as multiplication of the residual value (time) and the wage rate median. Again need to highlight that we are talking about the mean value per month per person.

**Tab. 2: Calculations**

Period (quarterly)	Working Time Fund (hours per month per person)	Wage (CZK per month per person)	Overtime (CZK per month per person)	Residual Value of non-working time (hours per month per person)	Monetary expression of residual value (CZK per month per person)	downtime (hours per month per person)	Monetary expression of downtime (CZK per month per person)
2007/1	187,0	16205,69	1022,60	5,1	440,97	1,70	146,99
2007/2	189,3	16145,04	1103,26	7,8	661,66	2,59	220,55
2007/3	189,5	16103,44	1108,91	8,3	706,04	2,77	235,35
2007/4	191,5	17181,77	1229,91	9,3	836,90	3,11	278,97
2008/1	185,7	16832,99	1001,64	7,2	653,14	2,40	217,71
2008/2	183,0	17282,15	921,34	7,9	746,89	2,64	248,96
2008/3	181,7	17439,67	836,46	7,2	688,24	2,39	229,41
2008/4	179,7	17504,02	735,04	10,0	969,29	3,32	323,10
2009/1	168,8	16590,98	561,40	6,9	676,39	2,29	225,46
2009/2	171,6	17165,64	658,31	7,6	763,29	2,54	254,43
2009/3	174,0	17883,69	689,10	7,0	723,05	2,34	241,02
2009/4	175,8	18494,64	734,72	8,2	865,65	2,74	288,55
2010/1	176,7	18745,19	838,39	4,4	470,08	1,48	156,69
2010/2	176,8	18648,54	772,00	4,5	473,40	1,50	157,80
2010/3	178,2	18873,16	780,72	5,4	568,91	1,79	189,64
2010/4	179,6	19479,04	839,85	5,9	639,48	1,97	213,16

Source: processed database ISPV (<http://www.ispv.cz/cz/Vysledky-setreni/Archiv.aspx>)

When the whole amount of residual value is identified as an obstacle on the employer side, then it is the value of downtime costs per person. When we assume that the obstacles on the employer side is just the third of the residual value, then the total costs reported as an downtime cost is lower. The final distribution of the residual value between obstacles on the employer side obstacles on the employee side and fest days is subjective factor. But anyone is able to modify the final solution of downtime problem calculation according to his or her own preferences. The **Table 3** shows the final calculations of downtime and overtime costs in the Czech T&A industry. Moreover there are three alternatives shown. These two alternatives are different from each other in the downtime costs (calculated as the whole residual value of the non-working time or just third of this value).



**Tab. 3: Calculations**

Quarter	Total overtime (CZK)	Residual Value (CZK)	Total downtime (CZK)	Total (first alternative)	Total (second alternative)
2007/1	3671868,65	1583400,99	527800,33	5255269,63	4199668,98
2007/2	4092159,51	2454175,56	818058,52	6546335,07	4910218,03
2007/3	4223419,05	2689045,40	896348,47	6912464,44	5119767,51
2007/4	4691061,58	3192089,85	1064029,95	7883151,43	5755091,53
2008/1	3853070,71	2512496,24	837498,75	6365566,95	4690569,45
2008/2	3634014,37	2945907,05	981969,02	6579921,42	4615983,39
2008/3	3237506,72	2663843,31	887947,77	5901350,02	4125454,48
2008/4	2717133,84	3583047,88	1194349,29	6300181,73	3911483,14
2009/1	1717582,34	2069393,34	689797,78	3786975,68	2407380,12
2009/2	1986364,76	2303136,17	767712,06	4289500,93	2754076,82
2009/3	2048765,72	2149675,99	716558,66	4198441,72	2765324,39
2009/4	2235503,93	2633887,11	877962,37	4869391,04	3113466,30
2010/1	2339212,70	1311600,17	437200,06	3650812,87	2776412,76
2010/2	2201240,68	1349846,06	449948,69	3551086,74	2651189,37
2010/3	2250392,79	1639857,54	546619,18	3890250,33	2797011,97
2010/4	2438830,05	1856970,00	618990,00	4295800,05	3057820,05

Source: processed database ISPV (<http://www.ispv.cz/cz/Vysledky-setreni/Archiv.aspx>)

Values in the **Tab.3** are mean values for the average month in the quarter. **Need to highlight that in order to gain the amount for the quarter we need to multiply the value by third.** Total downtime costs in the industry are gained as the multiplication of the monetary expression of residual value per person and number of reported employees. The same way is used in calculation of the total overtime costs in industry.

## Conclusion

In conclusion we summarize that in the end we are able to classify and calculate the total overtime costs and the total downtime costs in the T&A industry. This analysis was initialized by the head employer institution in this industry ATOK. According to their proclamation these costs are the critical point in the lack of prosperity in the T&A industry. Data used are gained from the trustworthy source the ISPV (Information system about the average wages) administrated with the Ministry of social affairs in the Czech Republic. Unfortunately from the year 2011 the data about distribution of the total working time paid into working time and non-working time have not been reported. Finally to valorize the final calculation we have to say that the total costs spend on overtime and downtime working hours are low enough so that

the problem itself is in comparison with the other costs in industry or among the other industries marginal.

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